جـــامـعـــة الـــشـرق الأوسـط
MIDDLE EAST UNIVERSITY
Amman - Jordan

The Impact of Internet of Things on Customer Satisfaction:

Field Study on Passengers in Queen Alia International Airport

أثر إنترنت الأشياء على رضا الزبائن:

دراسة ميدانية على الركاب في مطار الملكة علياء الدولي

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Thesis Submitted in Partial Fulfillment of the Requirements for Master Degree in E-Business.

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Authorization

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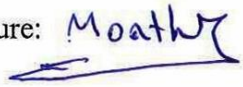
Signature: 

Committee Discussion and Decision

This thesis of the student Moath Jehad Mohammad Faqir, which studied "The Impact of Internet of Things on Customer Satisfaction: Field Study in Queen Alia International Airport", has been defied, accepted and approved on……29…… of January 2019, by the following committee members:

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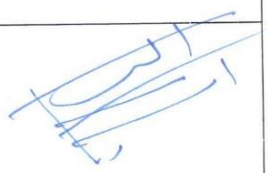
1	Dr. Ahmad Al-Sukkar	Supervisor	
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The Researcher

Dedication

To my dear mother, who made me what I am today in success and happiness, who stood by my side and supported me at every moment in my life and educational stages. I wish I can give you more than words, thank you for everything and I pray for Allah to prolong your life and maintain your health and wellness and always be happy, you are the dearest person to my heart.

Moath Jehad Mohammad Faqir

الإهداء

الى امي الغالية التي جعلتني ما انا عليه اليوم من نجاح وسعادة والتي وقفت بجانبي وساندتني في كل لحظة في حياتي ومراحل تعليمي. كم اتمنى ان اهديك أكثر من الكلمات، شكرا لك على كل شيء وادعوا الله ان يطيل عمرك ويديم الصحة والعافية عليكِ ويسعدك دائما يا اعز الناس الى قلبي.

معاذ جهاد محمد الفقير

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The Impact of Internet of Things on Customer Satisfaction: Field Study on Passengers in Queen Alia International Airport

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Abstract

The purpose of this study is to investigate the impact of Internet of things on customer satisfaction in Queen Alia International Airport. This study use the descriptive analytical method is used to classify and analyze the data collected from 376 respondents. Data gathered from passengers at Queen Alia International Airport by questionnaire and carried out, after asserting normality, validity and reliability of the tool, descriptive analysis (SPSS) was conducted and correlation between variables checked. Finally, the impact was tested by multiple regressions.

The result of this study show that after the variables (Security, Scalability), that significance were (0.000) less than (0.05), indicating that Security, Scalability have a statistically significant effect on customer satisfaction, and the rest of the element (Cost) has a positive effect that is apparent, but not statistically significant.

This study conducted at Queen Alia International Airport in Amman. It is recommended to give more attention to the security and scalability in order to have a better effect on customer satisfaction.

Keywords: Internet of things, Customer satisfaction, Queen Alia International Airport.

أثر إنترنت الأشياء على رضا الزبائن:
دراسة ميدانية على الركاب في مطار الملكة علياء الدولي

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الدكتور أحمد صالح السكر

الملخص

الغرض من هذه الرسالة هو استقصاء تأثير إنترنت الأشياء على رضا العملاء في مطار الملكة علياء الدولي. ومن أجل تحقيق أهداف هذه الدراسة. تم جمع بيانات 376 استبانة من المسافرين في مطار الملكة علياء الدولي في عمان والقيام بالتحليل الاحصائي على تلك البيانات بعدما تم التأكد من التوزيع الطبيعي وصدق وثبات الاداة، تم اجراء التحليل الوصفي والتحقق من ارتباط المتغيرات واختبار التأثير بواسطة الانحدار المتعدد. وقد اظهرت النتائج ان الامن وقابلية التوسع لهم تأثير هام من الناحية الاحصائية على رضا الزبائن. وان عامل التكلفة له ايضا تأثير ايجابي ولكن ليس ذات دلالة إحصائية.

أجريت هذه الدراسة في مطار الملكة علياء الدولي في عمان. وتوصي بأنه من المستحسن إعطاء مزيد من الاهتمام للأمان وقابلية التوسع من أجل الحصول على تأثير أفضل على رضا الزبائن.

الكلمات المفتاحية: إنترنت الأشياء، الأمن، التكلفة، القابلية للتوسع، رضا الزبائن، مطار الملكة علياء الدولي.

Chapter One

General Framework

1.1 Introduction.

1.2 Study Problem.

1.3 Study Objectives.

1.4 Study Significance.

1.5 Study Questions and Hypothesis.

1.6 Study Model.

1.7 Study Limitations.

1.8 Study Delimitations.

1.9 Study Conceptual and Operational Definitions.

1.1 Introduction

The internet is one of the best and most commonly used inventions that have been made to serve people, its main purpose is to facilitate communication between individuals around the world. In our present time, the majority of people use the internet for almost everything; whether it's to research information, receive mail or even start up a business. Moreover, it's a challenge for many to function in life without it. In recent years, the internet of things started to surface, prompting to a new industrial revolution that ultimately will change the ways we live in our world. (Atzori et al, 2010)

Customer satisfaction play an important role within any business, and it improves the business profit as well as its reputation. (Ganiyu et al., 2012)

The Internet of Things (IoT) is another innovation that enable things and machines to be associated with web, so as to empower them speaks with different things and individuals. More than 50 billion things and machines will be associated with web in 2020, this innovation will completely make a transformation on the planet as we probably am aware it. (Guerra, D, 2012).

The IoT industry and expansion began to take a place within the business and government. And during the high competition between different businesses and companies, companies try to get the chance to gain the competitive advantages. IoT improves many aspects of one's life, for example, when it comes to data and information collected; imagine going to the market and know what to get without checking the needs for the house or own, so this will save time and feel satisfied and comfortable. To add to that, computers can keep track on viability of things at home and to know the expiration dates of the products which surely leads to an improvement in safety and quality. IoT is one the ways that will cause a reinvention of various industrial sectors leading to a new and more enhanced level of productivity. In addition to that, it will enable machines to

conduct work on our behalf while continually assessing risk and relationships. The companies will have the opportunities to identify customers, understand their needs, and facilitate a quick reliable service. (Jenner, 2015)

The IoT revolution will most certainly save time and effort for the masses. The agonizing routine tasks can be simple done with a press of a button. This enhances the customer service in a broad range of services. The aviation business relies heavily on having an excellent and high quality standard in the field of customer services. Customers are the pillars of what keeps the airline operating and prospering, hence their satisfaction along with the airline's economic, capacity, time, etc. accommodation are vital in the airline industry.(Bogicevic et al.,2017)

IoT is starting to get implemented in the airline sector to boost operational efficiency, increase profitability and customer loyalty. One of the most promising technologies is the Radio Frequency Identification (RFID). The concept behind the technology functions on the basis of electromagnetic fields. The tags help automatically identify and track objects attached to it, in our case luggage, pets and cargo shipping are one of the identified objects. RFID will most certainly save time, effort and increase the quality of baggage handling, tracking pets during transit flights or transit inventory, and easing cargo shipments. In the long run, the implementation of such technologies will drastically change the business models. Online checking can be facilitated too. This makes the checking in process for large numbers of passengers an easy job. It avoids accumulation or slow processing of information regarding the passenger's information or check-in preferences. (Jenner, 2015)

1.2 Study Problem

The IoT industry and expansion began to take a place within the business and government. During the high competition between companies, they try to get the chance to gain the competitive advantages.

IoT aims to improve the performance and quality of work and to facilitate businesses and people's lives. In agreement with the researchers IoT have many advantages such as saving time, decreasing total costs, improving communication, improving quality of life, increase the efficiency of automation and control which lead to customer Satisfaction. IoT Used in many applications such as healthcare, wearables, smart home, connected car, smart city, industrial internet, smart retail and airports. (Lee, I. & Lee, K. 2015). Therefore many studies like Roman et al., (2013) and Gomes, et al., (2011) indicate that security and scalability is the top challenges facing the development of IoT which for sure case an impact on customer satisfaction. Many problems have been addressed about the importance of IoT services costs and how it play a sufficient role on spreading it and encouraging people to use it.(chen,2017)

As a researcher know IoT technologies at airports appeared lately in the Middle East such as Dubai, Qatar and Jordan. So the core problems of this study is:

- **"Is there any Impact of Internet of Things on Customer Satisfaction on passengers in Queen Alia International Airport"?**
- **Is there is any impact of IoT security on customer satisfaction.**
- **Is there is any impact of IoT cost on customer satisfaction.**
- **Is there is any impact of IoT scalability on customer satisfaction.**

1.3 Study Objectives

The purpose of this thesis is to investigate the impact of IoT on customer satisfaction, and the main objectives of this thesis is to investigate the following:

- Examined "The impact of IoT (security, cost, and scalability) on customer satisfaction."
- Examined "The impact of IoT security on customer satisfaction."
- Examined "The impact of IoT Cost on customer satisfaction."
- Examined "The impact of IoT Scalability on customer satisfaction."

1.4 Study Significance

This thesis significance proved the impact of IoT on customer satisfaction in Queen Alia International Airport in Amman.

It show the importance of IoT in Queen Alia International Airport in Amman and how it will help to increase the customer satisfaction and help to facilitate the services provided in the airport.

1.5 Study Questions and Hypothesis

This study focused on answering the following questions:

- Is there any impact of IoT (security, cost, and scalability) on customer satisfaction?
- Is there any impact of IoT security on Customer satisfaction?
- Is there any impact of IoT Cost on customer satisfaction?
- Is there any impact of IoT scalability on customer satisfaction?

Study Hypothesis:

This thesis aimed to test one main hypothesis and three sub hypothesis in accord with the previous stated questions and objectives, which show as following:

Main Hypothesis

- $H_0$1: There is no direct impact of IoT (security, cost, and scalability) on customer satisfaction, at the level of significance ($\alpha \leq 0.05$) on passengers in Queen Alia International Airport.

Sub Hypothesis

- $H_0$1.1: There is no direct impact of IoT security on Customer satisfaction at the level of significance ($\alpha \leq 0.05$) on passengers in Queen Alia International Airport.
- $H_0$1.2: There is no direct any impact of IoT Cost on customer satisfaction, at the level of significance ($\alpha \leq 0.05$) on passengers in Queen Alia International Airport.
- $H_0$1.3: There is no direct impact of IoT scalability on customer satisfaction, at the level of significance ($\alpha \leq 0.05$) on passengers in Queen Alia International Airport.

1.6 Study Model

The Model sources: adopted by the researcher based on previews studies:

Independent variable: Emelie Bruse (2015), Rose et al., (2015), Lee, I. & Lee, K. (2015)

Dependent Variable: Ganiyu et al., (2012), Bogicevic et al., (2017), Moh'd, (2017)

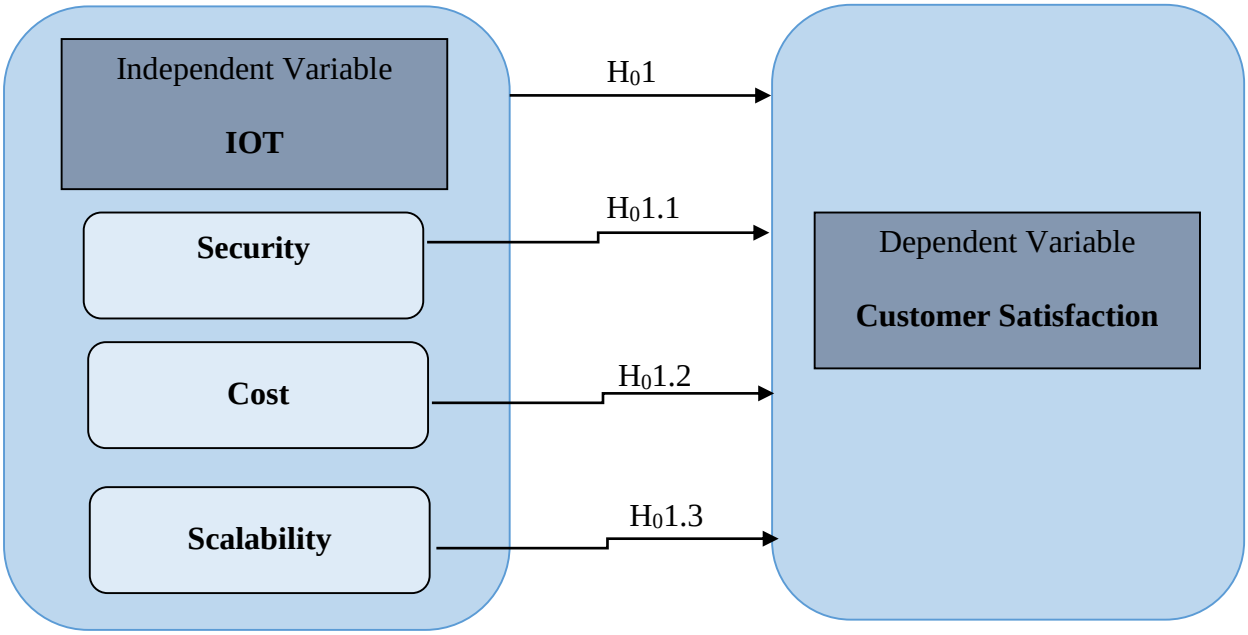

Figure 1: Study Model

1.7 Study Limitations

The limitations for this thesis are:

- **Human limitation:** this thesis implemented with the passengers through Queen Alia International Airport in Amman.
- **Place limitation:** this thesis was conducted at Queen Alia International Airport in Amman.
- **Time limitation**: 2018
- **Scientific limitation:** the thesis focused on determining "the impact of IoT on Customer Satisfaction" and adapt the prior's studies recommendations.

1.8 Study Delimitations

This thesis was implemented on passengers at Queen Alia International Airport which limits its generalizability doesn't extend to other airports and industries. The results of this thesis are restricted only to the passengers at Queen Alia International Airport.

1.9 Study Conceptual and operational Definitions

Internet: "The Internet is a huge interconnected computer system which is globally used to access and send information, either by personal or business computer users; in addition to that it is used for business transactions, research, entertainment and education**."** (Gulliksson and Riis. 2017)

The researcher define the internet: is the global system of interconnected computers and networks the enable sharing of information and data between people.

Internet of things (IoT): "IoT has the ability to connect any machines or device to the internet, it also enables the devices themselves to interact plus be connected to each other and to humans. IoT provides TVs, phones, fridges and home devices internet connection. With the availability of wireless connectivity this communication whether between devices or humans and devices is possible at any time and place. The most

important technologies of IoT are RFID technology, detection technology and sensor network, in addition intelligent technology." (Gulliksson and Riis. 2017).

The researcher define the Internet of things: is a new technical term that define connecting machines with each other through internet.

Security: "is the main issue that must be overcome in order to introduce the IoT into the real world. "IoT engineers and developers are dealing with millions of objects that will interface with one another and other entities, like humans and virtual entities. So to make sure and consider the importance of security and protection of data, services and information during the interaction in order to limit the incidents that may affect the entire IoT which is complicated." (Roman et al., 2013)

The researcher define the Security: Security play a main role in human lives, in IoT the security mean the defense of any electronic threats and hacks which may affect the IoT application and privacy of its users.

Scalability: "Scalability is the ability of a system, network, or process to deal with a growing amount of work in a proper manner or accommodate that growth with enlargement." (Gomes, et al., 2011)

The researcher define the Scalability: Is the ability of IoT to enhance its performance and quality through developing its operations, connectivity, and many other things that will develop IoT.

Customer Satisfaction: "Customer satisfaction is the overall effect of evaluation, psychological and perception to the consumption experience by the customer to a service. In other words, it considers how the customers get more benefits and advantages than their cost." (Ganiyu et al., 2012)

The researcher define the Customer satisfaction: The measure of happiness and pleasure felt by the customer about saving time, cost, and effort with the IoT services obtained.

Queen Alia International Airport (QAIA): Is the main airport in Jordan was built in 1983. And it's managed by the Airport International Group (AIG) with contract for 25 years. Accordingly, AIG invested an estimated US$750 million in the construction of the new terminal. Inaugurated on 2013.

Chapter Two

Theoretical Framework and Previous Studies.

2.1 Theoretical Framework.

2.1.1 Internet of Things (IoT)

2.1.1.1 History of IoT

2.1.1.2 How IoT works

2.1.1.3 Benefits of IoT

2.1.1.4 Consumer and enterprise IoT applications

2.1.1.5 IoT security and privacy issues

2.1.2 Customer satisfaction

2.1.2.1 Model of Customer Satisfaction Measurement

2.1.2.2 The Kano Model of Customer Satisfaction

2.2 Previous Studies.

The following chapter will review the related literature and previous relevant studies that are related to Internet of things (IoT) and customer satisfaction.

2.1 Theoretical Framework

This section entails the theory provided by past studies, which are related to the Internet of things (IoT) and customer satisfaction as well as their dimensions.

2.1.1 Internet of Things (IoT)

The Internet of Things (IoT) is a new conception that is expanding rapidly in wireless telecommunication. The concept of which is the predominant in many aspects of our lives such as "Radio-Frequency identification (RFID) labels, actuators, sensors, smart phones", and many other technologies which facilitate interaction connection with each other through a unique addressing schemes. Atzori et al., (2010), while Gulliksson and Riis. (2017) explains the IoT in their article. IoT "is the ability to connect any electronic device (thing) to the internet such as televisions, cameras, phones and many other home devices". With IoT, devices are able to communicate among themselves and also with people, new ways to communicate are developed as such, with the use of wireless connectivity, communication between the devices (or the devices and humans) is available all the time and in any other place. The most important technologies of loT are RFID technology and detection technology and intelligent technology.

Using the IoT technology will help the business leader to take good care of their businesses and watch out what happening in their companies' in addition better understanding for how their clients behave. By incorporating information from IoT with systems, the businesses will be able to simplify their work structure improve the customer satisfaction, in addition find out a new business opportunities and predict the risks in their market.

The term Internet of Things (IoT) is a new concept is having been in existence for few years, but with the development of advanced wireless technology IOT become one of the promising concepts in the industry. The basic idea of this concept is the presence of a type of objects such as RFID, mobile phones, sensors, actuators, in addition many other things which through unique addressing structures, are able to interact altogether. Atzori et al, (2010)

IoT have many factors such as Security, cost, people, time, interoperability, infrastructure but the important factors will use in this thesis are:

- **Security**

Security is an important component that enable the building and growth of IoT technologies and applications. The relevant stakeholders would not be discouraged to adopt the IoT solutions and development without guarantees in the level of security, privacy and authenticity. In the early days of IoT development security was not considered an issue and has been developed on ad hoc basis. Lee, L, & Lee, K. (2015)

- **COST**

It enables the tracking of performance by supervisors and managers in real time. Advanced technologies in control and monitoring like metering and smart grid are used to detect operational patterns and identify such improvements, or for future consequences predictions to optimize operations, if it is done properly and consistently it will lead to lower costs and increase productivity. Lee, I & Lee, K. (2015).

Bradley, et al., (2013), stated that IoT will generate in the future more than around14 trillion dollars in value; the lower costs and increasingly profits will take a place between companies and industries from 2013 to 2022. Four industries constitute over half of 14 trillion dollars in value. Which includes 11% of it at retail trade and 12% of it at manufacturing, finance and insurance at 9% and information services at 9 %. In addition,

industries such as education, healthcare and wholesale will take a place from 1 % to 7. Manufacturers can have a greater value from better agility in factories, as well taking advantages of workers' skills as much as possible. In addition, advertising and marketing tools play a vital role for retailers in value.

- **Scalability**

Things and machines are connected daily to an infrastructure of global information, so many scalability issues appear such as addressing and naming to the pure of the resulting system, networking and communicating of data, due to wide interconnection of units, knowledge management and information due to opportunity of build counterpart that is digital to entities that are in physical space, management and services providing due to wide number of services/ options of service execution that can be available and the need to handle various resources. Miorandi et al., (2012). An IoT system connects many actuators, sensors, other devices to provide and share information, and applications through internet. It challenges the systems' development and design to meet adaptability and scalability to the people's need and changing in environment. Scalability aims to achieve flexibility so as to allow a better address and attain the specific needs. The goal of making devices' scalable is to meet the varying in demands which it could never be static as the peoples' taste and interests' changes by time in addition to the environmental conditions. It is very important as it contributes to efficiency, competitiveness, and quality. The significance of scalability is that it allows working the system gracefully with no too much delay and consumptions of unproductive resource and makes a good use of available resources". Gupta, et al., (2017)

2.1.1.1 History of IoT

Kevin Ashton, prime supporter of the Auto-ID Center at MIT, first referenced the trap of things in an acquaintance he made with Procter and Gamble (P&G) in 1999. Expecting to bring radio repeat ID (RFID) to the thought of P&G's senior organization, Ashton called his presentation "Web of Things" to unite the cool new example of 1999: the web. MIT educator Neil Gershenfeld's book, When Things Start to Think, furthermore appearing in 1999, didn't use the right term anyway gave a sensible vision of where IoT was going (Kranenburg, 2008).

IoT has progressed from the get together of remote advances, microelectromechanical structures (MEMS), micro services and the web. The intermixing has helped tear down the storage facilities between operational technology (OT) and information technology (IT), engaging unstructured machine-made data to be analyzed for encounters to drive improvements (Atzori et al., 2010).

Notwithstanding the way that Ashton's was the essential notice of the trap of things, related contraptions has been around since the 1970s, under the monikers embedded web and inevitable handling.

The fundamental web mechanical assembly, for example, was a Coke machine at Carnegie Mellon University in the mid-1980s. Using the web, programming designers could check the status of the machine and choose if there would be an infection drink foreseeing them, should they make the trek to the machine (Miorandi et al., 2012).

IoT created from machine-to-machine (M2M) correspondence, i.e., machines partner with each other by methods for a framework without human joint effort. M2M implies partner a contraption to the cloud, managing it and social event data (Gubbia et al., 2013).

Taking M2M to the accompanying measurement, IoT is a sensor arrangement of billions of insightful devices that interface people, systems and distinctive applications to assemble and share data. As its foundation, M2M offers the accessibility that engages IoT (Giusto et al., 2010).

IoT is in like manner a trademark extension of SCADA (supervisory control and data anchoring), a class of programming application program for process control, the social event of data persistently from remote regions to control rigging and conditions. SCADA structures consolidate hardware and programming parts. The gear collects and sustains data into a PC that has SCADA programming presented, where it is then taken care of and showed it in a favorable way. The headway of SCADA is with the true objective that late-age SCADA systems shaped into unique IoT structures (Sebastian and Ray, 2015).

The possibility of the IoT organic framework, regardless, didn't for the most part make its check until the focal point of 2010 when, to some degree, the assembly of China said it would make IoT an indispensable need in its five-year plan.

2.1.1.2 How IoT works

An IoT natural framework includes web-enabled sagacious devices that use introduced processors, sensors and correspondence gear to accumulate, send and follow up on data they get from their environment. IoT contraptions share the sensor data they assemble by interfacing with an IoT entry or other edge device where data is either sent to the cloud to be bankrupt down or researched locally. A portion of the time, these devices talk with other related devices and follow up on the information they get from one another. The contraptions do by far most of the work without human mediation, regardless of the way that people can connect with the devices for instance, to set them up, give them bearings or access the data Yang et al., (2014).

The accessibility, frameworks organization and correspondence traditions used with these web-enabled devices, all things considered, depend upon the unequivocal IoT applications passed on (Marrocco et al., 2009).

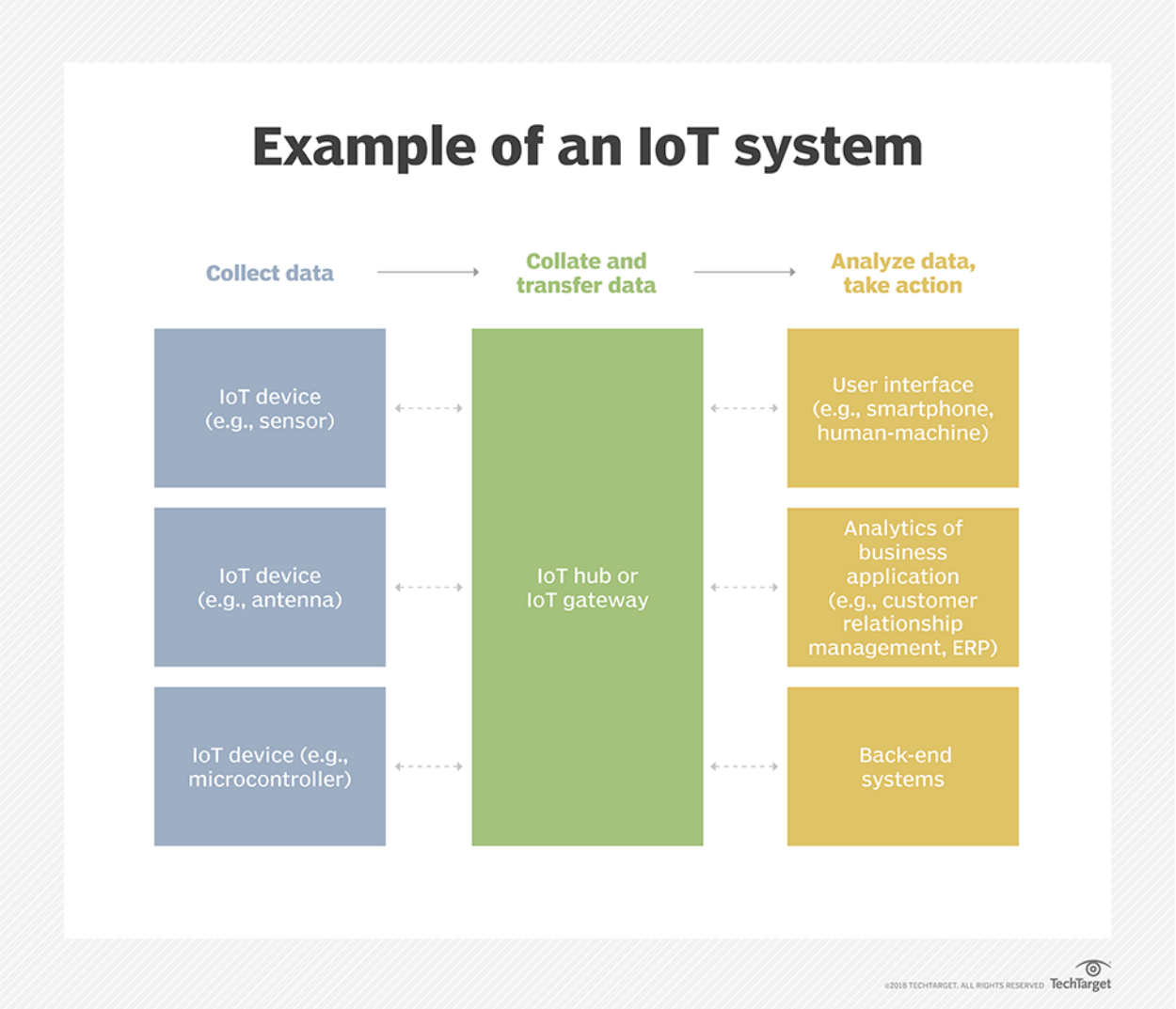

Figure 2: Example of an IoT System

Reference :(Marrocco et al., 2009)

2.1.1.3 Benefits of IoT

The internet of things offers various advantages to associations, empowering them to Ashton, (2009):

1- Screen their general business forms.

2- Enhance the client encounter.

3- Save the time and cost.

4- Upgrade representative profitability.

5- Coordinate and adjust plans of action.

6- Settle on better business choices.

7- Increase profit and income.

IoT urges associations to rethink the habits in which they approach their associations, undertakings and markets and gives them the gadgets to upgrade their business frameworks.

2.1.1.4 Consumer and enterprise IoT applications

There are different authentic employments of the snare of things, stretching out from buyer IoT and adventure IoT to amassing and mechanical IoT. IoT applications run different verticals, including vehicle, telco, essentialness to say the very least (Issarny et al., 2011).

In the client piece, for example, sharp homes that are outfitted with canny indoor controllers, savvy machines and related warming, lighting and electronic devices can be controlled remotely through PCs, mobile phones or other PDAs (Botterman, 2009).

Wearable contraptions with sensors and programming can accumulate and dismember customer data, sending messages to various headways about the customers with the purpose of making customers' lives less requesting and logically pleasing. Wearable devices are similarly used for open security - for example, improving

individuals available to come back to work's response times in the midst of emergencies by giving streamlined courses to a territory or by following advancement authorities' or firefighters' key signs at dangerous areas (Toma et al., 2009).

In human administrations, IoT offers various points of interest, including the ability to screen patients even more eagerly to use the data that is created and research it. Recuperating focuses routinely use IoT systems to complete errands, for instance, stock organization, for the two pharmaceuticals and helpful instruments (Kos et al., 2012).

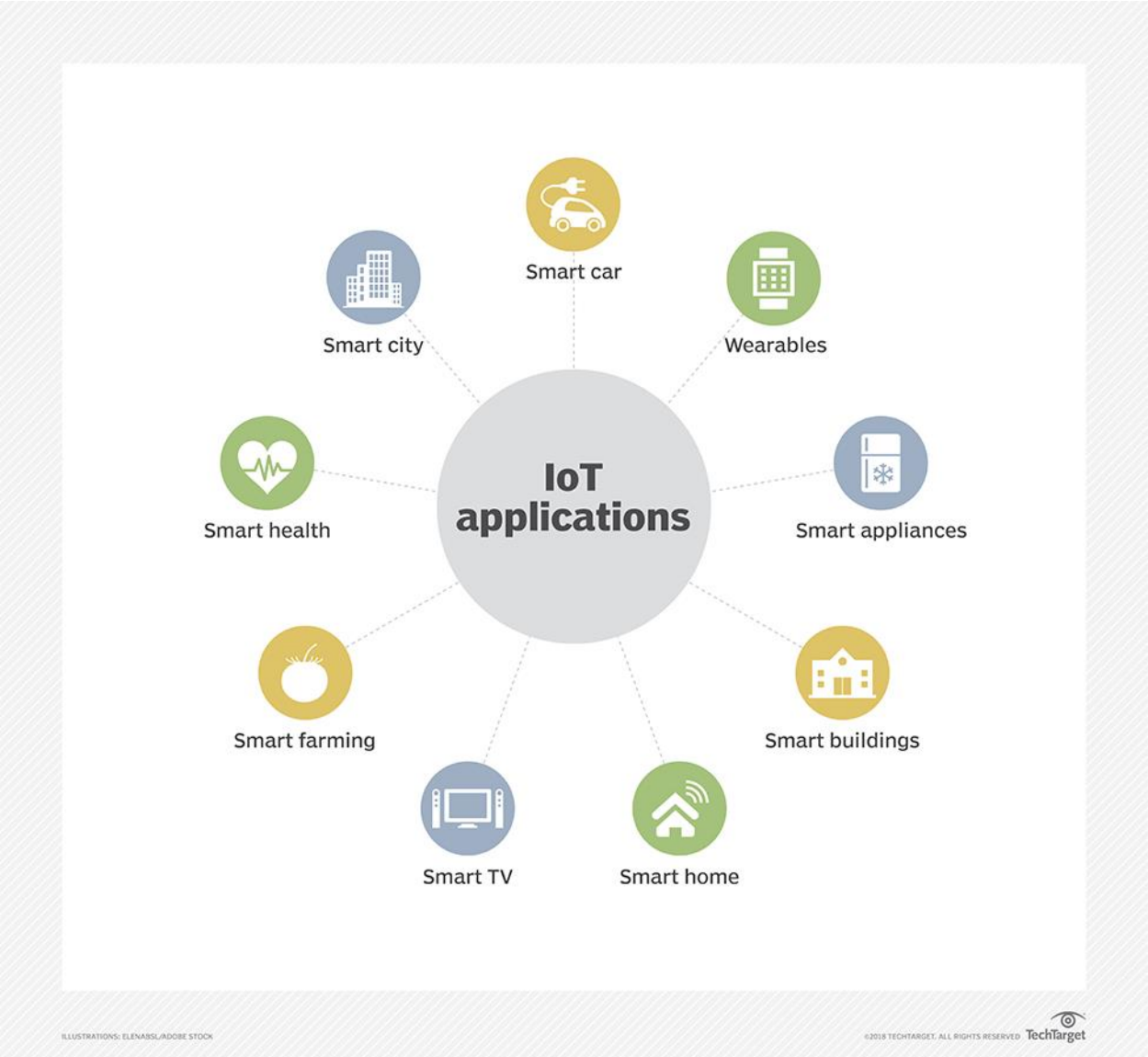

Figure 3: IoT Applications

Reverence: (Kos et al., 2012).

Splendid structures can, for instance, decline essentialness costs using sensors that recognize what number of occupants are in a room. The temperature can change normally - for example, turning the constrained air framework on if sensors perceive a gathering room is full or turning the glow down if everyone in the work environment has returned home (Zhangm et al. 2011).

In agriculture, IoT-based splendid developing systems can energize screen, for instance, light, temperature, sogginess and soil moistness of item fields using related sensors. IoT is moreover instrumental in motorizing water framework systems (Floerkemeier et al., 2007).

In a splendid city, IoT sensors and courses of action, for instance, sharp streetlights and sagacious meters, can enable straightforwardness to traffic, spare imperativeness, screen and address regular concerns, and upgrade sanitation (Welbourne et al., 2009).

2.1.1.5 IoT security and privacy issues

IoT interfaces billions of contraptions to the web and incorporates the usage of billions of data centers, which should all be tied down. As a result of its all-encompassing ambush surface, IoT security and IoT insurance are referred to as genuine concerns (Pereira et al., 2013).

A champion among the most well-known continuous IoT ambushes a botnet that attacked space name server provider Dyn and cut down various locales for a sweeping time period in one of the best appropriated renouncing of-advantage Distributed Denial-of-Service (DDoS) strikes anytime seen. Aggressors got to the framework by abusing insufficiently moored IoT contraptions (Clayman and Galis, 2011).

Since IoT devices are solidly related, all of the software engineer needs to do is abuse one vulnerability to control all of the data, rendering it unusable. Besides, makers

that don't invigorate their devices as often as possible - or using any and all means - relinquish them unprotected against cybercriminals (Vázquez, 2009).

In addition, related devices habitually ask for that customers input their own information, including names, ages, addresses, phone numbers and even web based life accounts - information that is valuable to developers (Xia, 2009).

In any case, developers aren't the principle risk to the snare of things; security is another huge stress for IoT customers. For instance, associations that make and disperse client IoT devices could use those devices to get and move customers' near and dear data (Arsénio et al., 2014).

2.1.2 Customer satisfaction

Customer satisfaction play an important role in affecting on any organizations profitability. In accordance with singh (2006), “satisfied customers form the foundation of any successful business as customer satisfaction leads to repeat purchase brand loyalty, and positive word of mouth”. Companies always focus in implementing their strategies which ensure the retention of customers, and to be more service-oriented. Moh'd, (2017) also worth mentioning that satisfied customers always help the businesses in reducing the operational costs and increase the profits. So most of the organizations realized the importance of understanding all what have to be known about the satisfaction of customers and how to keep them happy. In the end, with the increasing of competition, the shrinking and stagnation in the 1990 of the global markets, there were a force on businesses were to worry about the surveys of customer’s satisfaction, especially as the customers’ surveys became complicated. As emphasis on the satisfaction of customer programs has become tough, companies’ main objective became to develop the programs to have a better understand of the customers.

Early forms of research have portrayed satisfaction as an evaluative judgment concerning an express purchase decision (Bearden and Teel, 1983; Oliver, 1979; Oliver and DeSarbo, 1988). Ordinary models expect buyer devotion as the result of a mental strategy, while new made models in like manner suggest that loaded with feeling frames also add to the desire for customer dependability (Fornell and Wernerfelt, 1987; Oliver, 1997).

Most of past steadfastness considers conceptualized commitment as a kind of reiterated purchases of an explicit thing or organization (Homburg and Giering, 2001). Some of them focused on the gathering the things were purchased (Brown, 1952), others checked unwavering quality through the degree of purchases contrasting with an explicit brand (Brody and Cunningham, 1968).

Jacoby and Chestnut (1978) and Dick and Basu (1994) made basic duties to explore and construe the differing times of endurance (Jacoby and Chestnut, 1978; Dick and Basu, 1994). Regardless of the way that their undertakings, it was Oliver (1997) who contributes the most to the elaboration of the endurance manufacture. This maker organized a point by point arrangement of commitment that presents four one of a kind sorts of dedication (Oliver, 1997).

In any case, the emotional sort of dependability suggests the nearness of contemplations or feelings that a substance is perfect over others (Harris and Goode, 2004). For example, store an is supported over store B in an explicit market. Second, enthusiastic commitment involves a perfect like or outlook reliant on satisfied usage of the substance (Harris and Goode, 2004). Third, conative commitment contains the headway of the desires reliant on a bigger measure of duty (Janda, Trocchia and Gwinner, 2002). Finally, action dependability reflects the difference in objectives into exercises (Harris and Goode, 2004).

Dick and Basu (1994) develop a structure that communicated that customer devotion is a mix between the temper of a person to a component and the repetitive help (number of visits) of that person on that component.

Enduring with earlier research, outlook is viewed as serving a thing examination work. It addresses a connection between a thing and the object of an evaluation (Dick and Basu, 1994). The component of the temper reflects the circumstance of the article along a line of (un) favorability (Ajzen and Fishbein, 1980).

An individual outlook towards a substance relies upon the attitudinal quality (uttermost point) and the component of attitudinal division (isolated from contenders) Dick and Basu, (1994).

Satisfied customers are most likely going to shape or sustain positive brand attitudes which would provoke customer steadiness in the sentiment of progressively visit purchases, purchases in increasingly significant volume, and purchases of various stock and endeavors offered by the firm .An inspirational mindset toward the thing ought to enhance the general reputation of the firm, and subsequently help in setting up and keeping up relationship with firms. Anderson and Weitz, (1989). The general finding, that solid customer as a rule have a dynamically inspiring mindset towards the store, was avowed by (East et al. 1997).

The repetitive help is the events an individual uses or visits a component. Distinctive examinations have insisted the nearness of a comfortable association between both, with the objective that a customer who visits the store even more much of the time, spends more at that store and is logically dedicated (Enis and Paul, 1970).

2.1.2.1 Model of Customer Satisfaction Measurement

Since buyer dedication is the objective of best associations, the organizations quality ought to be assessed by how well they in reality satisfy the customers. There have been distinctive undertakings to check as a rule buyer unwaveringness Brink and Berndt, (2008). A significant parcel of these models generally speaking contain somewhere around one of the going with parts like Employee acknowledgments or satisfaction, Customer satisfaction, Brand regard and picture, Price or motivator for money, Advocacy and unwavering quality and Competitive benchmarking.

2.1.2.2 The Kano Model of Customer Satisfaction

The Kano appear, portrayed by Noriaki Kano amid the 80s, relates the thing progression of an affiliation and the purchaser devotion of the client. Such model gatherings thing characteristics reliant on customer perspective of these properties. This model segments tendencies into five classes of significant worth (Bonacori, 2010):
(B. Llosa, 2003).

1. Attractive Quality: this class gives satisfaction when totally practiced, anyway does not cause disillusionment when not fulfilled. That is in light of the fact that, this property is ordinarily unexpected and incorporates additional an impetus for the customer and subsequently captivates them.

2. One – dimensional Quality: this characteristic outcomes in purchaser faithfulness when fulfilled and frustration when not fulfilled. This piece of the things is granted by the association and along these lines expected, which is the reason the nonattendance of the property makes fast dissatisfaction.

3. Must be Quality: this characterization delineates properties which are taken as permitted when fulfilled anyway results in disillusionment when not fulfilled. This quality

watches out for the fundamental features of thing that are depended upon and expected to work, the nonattendance of these attributes or frustration make dissatisfaction.

4. Indifferent Quality: these credits insinuate points of view that are neither extraordinary nor horrendous and their embodiment or nonattendance does not result in either purchaser faithfulness or customer disillusionment.

5. Reverse Quality: these attributes combine the refinements among customers, who are different in their tendencies and subsequently could suggest that one customer get satisfied through the qualities while another gets frustrated.

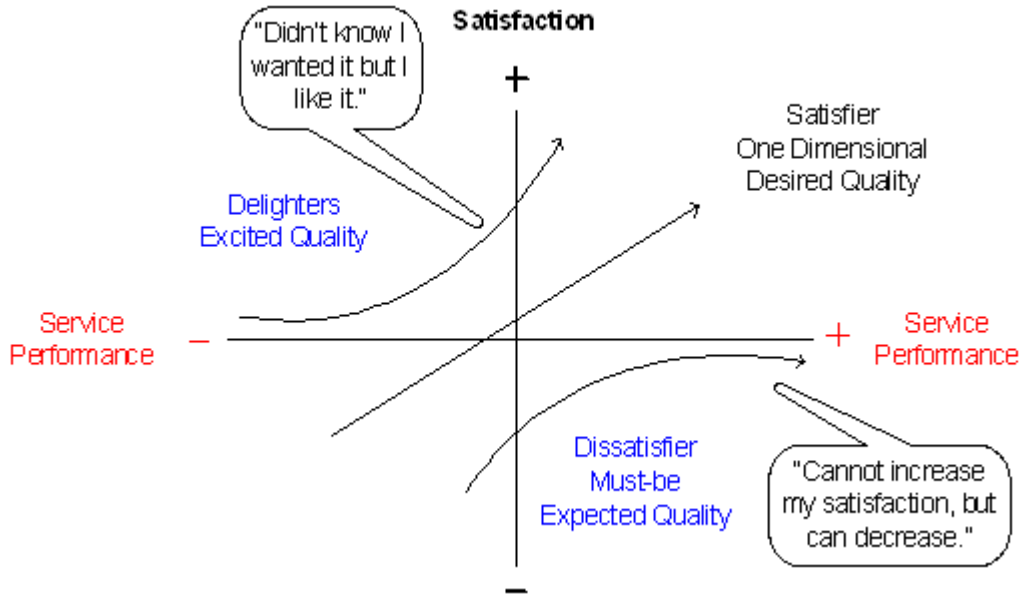

Figure 4: Statisfaction Figure

(B. Llosa, 2003).

2.2 Previous Studies

The previous studies review was used to establish how other scholars investigated the same problem as following:

- Miorandi et al., (2012) study entitled **"Internet of things: Vision, applications and research challenges",** IoT used as a basic keyword to cover numerous sides related to the expansion of the Internet, through the wide spread of distributed devices with embedded identification and sensing abilities. In the future IoT looking forward to connect digital and physical objects with a perfect high communication technology to enable a new level of services and applications.

- Ganiyu et al., (2012) study entitled **"Is Customer Satisfaction an Indicator of Customer Loyalty?"** The objective of this research is to inspect whether customer satisfaction is an indicator of customer loyalty. "As the result of the research supported the argument that strong relationship exists between customer satisfaction and loyalty. Though, the customer satisfaction may cannot reach the goal of building a loyal customer base. Many researchers also claimed that customer loyalty and satisfaction aren't directly connected, especially in competitive business environments because there is a big difference between satisfaction which is a passive customer condition, and loyalty which is an active or proactive relationship with the organization".

- Chen et al., (2014) study entitled "**Services innovation impact to customer satisfaction and customer value enhancement in airport". the** purpose of this research was to generate an assessment model to investigate service innovation effect, customer value increasing and customer satisfaction in an airport. Although this research used means end theory to examine service innovation items and to investigate the impact to the relationship between customer satisfaction and customer values. This research used

online questionnaire and survey to collect data which 300 person participated in this survey which the periods were within two months. The outcomes of this research showed that service innovation and customer satisfaction can affect customer value, also this research evaluated on innovative services like, social media communication, self-check in kiosk, micro-hotels and X-ray in the airports, and outcomes showed that all this services detect a positive moderation impact. Security check had a significant appraisal factor in the airports service.

- Yannuzzi et al., (2014) Study entitled **"Key ingredients in an IoT recipe: Fog Computing, Cloud Computing, and more Fog Computing",** this study will discuss the challenges that will face the IoT. The study is focused on three basic requirements which are mobility, actuation and reliable control, and finally the scalability which is the most important in IoT deployment, "which cover large geographical areas and require a real time decisions based on data analytics. Based on the analysis we show the reasons why Fog Computing is the usual platform for IoT and debate the inevitable relationship of the Fog and the Cloud in the future". In addition, it discussed other technologies will help to support the expansions of IoT.

- Bruse, (2015) thesis entitled **"Internet of Things Definition, applications and comparison of wifi based communication protocols for implementation of an irrigation system", this** study aim to discover the importance of the IoT and the role of the communication protocols and internet which is the key of IoT design. In addition, it explained six different types of communication protocols has been made that help for a distributed system.

- Rose et al., (2015) study entitled **"The internet of things: An overview. The Internet Society (ISOC)".**The IoT is an emerging matter of economic importance, technical and social. Consumer products, vehicles, industrial components, sensors and many other items are being joint with Internet connectivity and data analytic abilities that will lead to convert the way we live and work. The IoT in the future will affect the world economy and internet. Around 100 billion devices will be connected through IoT, in addition the global economy impact of more than 11 trillion dollars.

- In Lee, I., & Lee, K. (2015) study entitled **"The Internet of Things (IoT): Applications, investments, and challenges for enterprises",** discusses five managerial and technical challenges. The term Internet of Things, or the Industrial Internet, is a new technology standard imagined as a worldwide network of devices and machines able to interact together. The IoT is one of the most significant invention of future technology and it make a huge attraction and attention around the industry. The study clarify five IoT technologies that are essential in the deployment of successful IoT based services and products also discusses some IoT types for company applications used to improve customer value. However, it inspects the net present value technique and the real option method usually used in the explanation of plans and explicate how the real option method can be useful for IoT investment.

- Wenjie Gong (2016) study entitled **"The internet of things (IoT): What is the potential of the internet of things (IoT) as a marketing tool"**, identified the marketing sides of the IoT applications besides the general technological sides of the IoT. The aim of the investigation is demonstrate how IoT can be used as a tool of marketing in IoT technologies and applications. Experiences have demonstrated that IoT will have a huge effect in the near future. Around 51% of the world's top global marketers believe that IoT

will take place and transform the marketing landscape by 2020. Marketers can take the advantages of the IoT future. However, there is not much literature which is designed for marketing perspectives for IoT.

- Hefnawy et al.,(2016) study entitled **"IoT for smart City Services: Lifecycle Approach".** Which proposes applying the lifecycle approach through IoT will lead the enabled service system of smart city to improve integration with services, people and systems, although emphasize the information accuracy, and traceability and saving information for a long time, "Like other engineered systems, the lifecycle aspect of IoT enabled smart city service systems is very important to analyze and address concerns across different lifestyle phases and ensure systematic involvement and seamless flow of information between different stakeholders of the smart city ecosystem.

- Kaur and Maheshwari, (2016) study entitled **"Building Smart Applications using IoT and Cloud- Based Architectures"**, discussed the smart city conceptions and highlighted necessity to improve quality, interconnected and performance of several services with the employment of information and communication technologies (ICT), technologies of smart city improve IoT based and cloud based services in which users use sensors and smart phones. IoT and cloud computing are being the most important models in ICT that play a significant role determining the future generation of computing. Both concepts influences on building solution and organizing smart applications for smart cities. "Cloud computing presents the delivery of hardware and software resources on demand over the internet as a service. On the other hand, IoT concept envision a new generation of devices (sensor, both vital and physical) that are connected to the internet and provide different services for value- added applications. Dubai as a smart city was discussed with some

application-based scenarios. An IoT based healthcare framework is also proposed in the paper".

- Balaji, M. S., & Roy, S. K. (2017) study titled **"Value co-creation with Internet of things technology in the retail industry"** the study focused on the importance of IoT and how its aim to make a bridge between the real world and digital world. The IoT fast expansions this last year's made the retail industry adopt it and focus in implementing it in the customers experience shopping. The result of the study survey which collected from 289 users of IoT technologies in the retail industry showed that it make a value co-creation.

- Bogicevic et al., (2017) study entitled **"The impact of traveler-focused airport technology on traveler satisfaction"** It is suggested by the present trends in air transport that the number of passengers will double to around 8 billion by 2037. The newest update of the 20-year Air passenger forecast, shows an increase of around 3% annual growth rate are leading to doubling in the numbers of passengers from today's level around 4.1 billion. That increase will generate huge benefits for the world and could support 100 million jobs globally. Moreover, this growth prospects for economics and air transport benefits that are driven by aviation, can be limited if airports as the main players in the industry of aviation are more and more rebranding themselves as destinations, instead of just a transit station. Recently, passengers are forced to spend time in airports due to increased security measures. Many airports are trying to improve passengers' experiences while waiting for their aircraft departures. In the light of the projected growth of air traffic, airports will not be able to handle the demand and need to look for other means and will need to innovate by introducing new concepts to optimize the employ of emerging processes, designs, and technologies for the complete ground journey from check in to

boarding of aircraft. It is expected to spend around 1.2-1.5$ on infrastructure development of global airport by 2030, in addition it increases in capital spending. These investments seek to ensure major expansion projects in airport develop facilities of cost efficient that balance capacity with demand. While the delivering functionality, levels of operational efficiency and services re required to justify the investment that is being made. The study aims to develop an instrument that test a theoretical model and capture the perception of passengers of the airport technologies that examine the relationship between different types of airport technologies and passengers enjoyment, satisfaction and confidence. The level passengers' satisfaction can be gained while passing through the airport when transferring, arriving, and departing to a large extent, the impact of the passenger's willingness to repeat the flying experience.

The purpose of the study is to show an effect of traveler satisfaction and to show a positive relationship between the confidence of passengers and self-services technologies in airports, so the

- Gupta, et al. (2017) study titled **"Scalability in Internet of Things: Features, Techniques and Research Challenges",** Scalability is the key issues in any IoT technologies or application, the IoT will be developed and spread fast next year's so it's necessary to make the systems more scalable to avoid the threats and damages. In this study the researchers focused in presenting the importance of scalability for IoT and how importance it is for developing the IoT, in addition it discuss different types of scalability and challenges.

- Moh'd, A. (2017) study entitled **"The Impact of Social Media Marketing on Customer Satisfaction through Brand Image (Field Study based on Customers of Jordan Telecommunication Companies, Applied on the Students of the Private Universities that Located in Amman-Jordan)"** this study investigated the Influence of social media marketing on customer satisfaction over brand image. Over the past years many study models have been focused on study of expected customer satisfaction Through the use of technology, in addition to the factors of confidence and safety were prepared as the most important factors to determine customers' intent to integrate into E-marketing. During this study, the questionnaire methodology was used to evaluate and to clarify the extent to which users of social media respond to the variables of the model.

- Huang, C., & Lv, Y. (2018), study titled **"An Internet of Things System Based on Device-to-Device Communication Technology and Radio-Frequency Identification"** the purpose of this study was to design a suitable mobile communication system for various application scenarios in IoT. The result of the study exhibits that there is a good mobility in the proposed system, the research findings have great application potential as the recommendations of this study concluded.

- Sebastian & Hartmann (2019) Study titled: **"Impact of IoT Challenges and Risks for SCM", The purpose of this study was to offer a comprehensive overview of the challenges and risks of the "IoT"** in supply chain management, it used a systematic literature review methodology by peer-reviewing 102 journal articles on the subject of "IoT", and its finding were the identification, categorization, and description in a timeline.

- Al-Turjman (2019) study entitled **"Cognitive routing protocol for disaster-inspired Internet of Things"** Study proposed a system for information conveyance in expansive scale systems for fiasco the executives, where various remote sensors are appropriated over city traffic-foundations, shopping-shopping centers' stopping territories, air terminals' offices, and so forth. As a rule, system provides food for vitality productive applications in the Internet of Things (IoT) where information is spread through transfers from various sensor-hubs towards a portal associated with an expansive scale system, for example, the Internet. researcher think about the whole system vitality while picking the following bounce for the steered bundles in the focused on remote sensor arrange. Study conveyance approach considers asset constraints as far as jump check, and remaining-vitality levels. Broad reproductions are performed and accomplished outcomes affirm the viability of the proposed methodology in contrast with other pattern vitality mindful steering conventions in the writing.

- Jan et al., (2019) study entitled **"A payload-based mutual authentication scheme for Internet of Things"** Study proposed plot utilizes the lightweight highlights of Constrained Application Protocol (CoAP) to empower the customers to watch assets dwelling on the server, in a vitality productive way. think about utilize Advanced Encryption Standard (AES), with a key length of bits, to build up an anchored session for asset perception. it assess think about plan for a true situation utilizing NetDuino Plus 2 sheets. ponder plot is computationally effective, acquires less association overhead and in the meantime, gives a vigorous protection against different assaults, for example, asset fatigue, Denial-of-Service, replay and physical altering.

- Maueret et al., (2019) study entitled **"Applying Sound-Based Analysis at Porsche Production: Towards Predictive Maintenance of Production Machines Using Deep Learning and Internet-of-Things Technology"** Study proposed break down sounds delivered by a mechanical machine and arrange diverse states. The specialized acknowledgment depends on modest item equipment and open-source programming, showing the appropriateness of existing advances and the possibility of the usage. Particularly, it was portrayed that the proposed methodology can be connected to tackle prescient support tasks.and shows the plausibility of the Sound Detective's reference design and examines difficulties and learnings amid execution. In particular, key learnings incorporate the significance of information quality, preprocessing and consistency, impacts of the test setup on certifiable expectation execution and the pertinence of microcomputers, the objective equipment and sort of the programming dialect for complex investigations.

- Kaur and Sharma (2019) study entitled **"Interoperability among Internet of Things (IoT) Components Using Model-Driven Architecture Approach"** Study proposed a model-driven methodology (MDA) for making gadgets good. In the proposition, creators took a shot at stage autonomous model (PIM) and calculation free model. Calculation free model (CIM) is caught for the data and moved into the stage autonomous model and Unified Modeling Language (UML) apparatus produce the Java code as a vocabulary.

- Teixeira et al., (2019) study entitled **"SIoT: Securing Internet of Things through distributed systems analysis"** Study proposed to think about case that conventional ways to deal with break down appropriated frameworks are not sufficiently expressive to address this test. As an answer for this issue, examine present SIoT, an apparatus to investigate security parts of circulated IoT projects and along these lines ensure them

against cradle flood assaults. examine key knowledge is to take a gander at a conveyed framework as a solitary body, and not as independent projects that trade messages. We at that point can crosscheck data derived from various hubs. To develop this worldwide perspective of a disseminated framework, contemplate present a novel calculation that finds between program interfaces proficiently. Such connections let us construct a between program see, an information that we would thus be able to forward to a conventional cushion flood static investigation instrument. think about demonstrate that our calculation dependably ends and it effectively models the semantics of a disseminated framework. ponder has executed arrangement over the LLVM compiler, and have utilized it to anchor five ContikiOS applications against support flood assaults. examine arrangement produces code as protected as the code anchored by increasingly customary investigations; notwithstanding, applications instrumented by study arrangement have under 6% of runtime and program measure overhead by and large.

2.2.1 Distinctive Features of the Current Study.

Few academics have studied Internet of Things, and Customer satisfaction, and gave note to the factors (security, cost, and scalability) and its impact on Customer satisfaction.

Therefore, this study is the first to cover “the impact of internet of things on customer satisfaction” through the use of factors such as security, cost, and scalability.

Chapter Three

Methods and Procedures.

3.1 Study Methodology

3.2 Study Population

3.3 Study Sample

3.4 Sources of data and information collection

3.5 Validation and consistency of the study instrument

3.6 Tests for the study instrument

3.7 normal distribution test

Chapter Three
(Method and Procedures)

The researcher clarifies in this chapter the system of the investigation and its techniques notwithstanding its locale and test, and after that itemized the poll (the examination device) and clarify what is its honesty and solidness. The section likewise clarifies the measurable techniques that were received in the investigation of the information.

3.1 Study Methodology

The researcher used descriptive analytical method to classify and analyze the data to describe the population of the study by recording the researcher of the events and presenting them and describing them through analytical descriptive tables. The tables are the primary data collected by the questionnaire and analyzed using the SPSS program. Which relate to the variables of the study, to reach real results and propose appropriate recommendations.

In this thesis an Internet of Things testing on Customer Satisfaction to evaluating and acceptance by Queen Alia International Airport users during a survey methodology will be employed to collect data, which aims to test The Impact of Internet of Things on Customer Satisfaction.

This study follows the descriptive and analytical approach. Descriptive approach depends on literature review to build the conceptual frame work and exploring the relationships between the study variables. Literature review extended also to develop the questioner items. Analytical approach used to assure reliability and validation for the measurement scale and testing the hypotheses and interpreting the results regarding the

data gathered. Data collected to investigate the impact of IoT on customer satisfaction on Queen Alia international Airport.

3.2 Study Population

The field of the current study is in Queen Alia International Airport in Amman which is the main and largest airport in Jordan. In addition of the passengers through the airport. In order to determine the size of the study population, the researcher obtained the historical data on the number of passengers through Queen Alia International Airport in 2017, which were 6.8 million passengers according to the Airport International Group (AIG) website.

3.3 Study Sample

Study is based on a stratified random proportional sample for passengers in Queen Alia International Airport in Amman. According to Sakaran, (2013), the sample study size was around 376 of 400 passengers after expecting an increase in the passengers' numbers in 2018.

The Questionnaire:

Initial items to measure various constructs will be developed depending on prior researchers.

All variables will be measured by five-point Liker-type scale to tap into the managers' perceptions, ranging from value 1 (strongly disagree) to value 5 (strongly Agree) used through the questionnaire.

3.4 Sources of data and information collection

The researcher collected data and information related to the study and its variables based on the following sources:

• Secondary sources: This data will be acquired through reference to the writing and books and references outside periodicals and past investigations identified with the factors of the examination, notwithstanding data accessible on the Internet and sites.

• Primary Sources: The information to be acquired through an exceptional questionnaire will be produced for this reason.

Table 3-1: The distribution of the paragraphs of the questionnaire and their number for each item

variables	
Security	Questions from (1 to 6)
Cost	Questions from (7 to 14)
Scalability	Questions from (15 to 22)
Customer satisfaction	Questions from (23 to 32)

3.5 Validation and consistency of the study instrument

The researcher adopted a Likert scale consisting of five values for data collection, in which the respondent selects one of them to answer the paragraph (strongly disagree, Disagree, Neural, Agree, strongly Agree), and rely on an ordinal scale showing the mean of the arithmetic mean. Analysis, and to interpret the arithmetic averages of element clauses, (Sekaran equation, 2010) was adopted:

Category length = Top limit (5) - Minimum (1) / Number of categories (3).

(5-1) / 3 = 4/3 = 1.33

Table 3-2: The statistical standard for the interpretation of arithmetic averages and their estimates

Mean	Degree of approval
From 1.00 - less than 2.33	a low degree
From 2.33 - less than 3.67	a medium degree
From 3.67 - less than 5.00	a high degree

3.6 Tests for the study instrument

The analyst referenced the unwavering quality trial of the investigation device so as to illuminate its legitimacy and legitimacy in the tests, in this way depending on the accompanying tests:

1. Validation of study tool:

The veracity of the investigation instrument will be checked by displaying it to a gathering of employees worried about the examination factors. Their perceptions will be taken and the poll will be altered in like manner.

2. Reliability of the Study Test:

To measure the stability of the questionnaire and the level of internal consistency of its values, the coefficient of Cronbach Alpha will be used. Table (3-3) shows that.

Table 3-3: Internal consistency coefficients (Cronbach Alpha)

variables	Stability coefficient
Security	.977
Cost	.983
Scalability	.986
Customer satisfaction	.981
Total	**.995**

"Table (3-3) shows that the stability coefficients were higher than 70%. This indicates internal consistency between the paragraphs. (99.5 %), which is higher than 70% indicating internal consistency among all paragraphs, which confirms the validity of the questionnaire in the hypothesis test." (Abu-Salih, 1989)

3.7 normal distribution test

Table 3-4: Normal distribution of data

One-Sample Kolmogorov-Smirnov Test		
		Dependent
N		376
Normal Parameters[a,b]	Mean	3.466
	Std. Deviation	1.37769
Most Extreme Differences	Absolute	.251
	Positive	.183
	Negative	-.251-
Test Statistic		.251
Asymp. Sig. (2-tailed)		.000[c]

a. Test distribution is Normal.

b. Calculated from data.

c. Lilliefors Significance Correction.

Though shows that the distribution of data was followed by normal distribution. The Significance is less than 0.05 and the Kolmogorov-Smirnov Test and this show that the distribution of data was followed by normal distribution.

Chapter Four

View the results and test hypotheses

4.1 Characteristics of Study Sample

4.2 Paragraph compliance

4.3 Test hypotheses

Chapter Four

View the results and test hypotheses

This chapter inspects the effect of variables and the outcomes got from the factual medicines and breaks down directed by the scientist concerning the attributes of the example by clearing up the measurable aftereffects of their answers, in particular number juggling means and standard deviations. Foreordained speculations and their measurable meanings.

4.1 Characteristics of Study Sample:

In this study, the researcher dealt with some of the demographic variables of the sample in terms of (Gender, age, Marital status, Nationality, Education, Average income annually, Smart phone type, IoT product, use the IoT services and devices in general) The sample of the study was as follows:

Table 4-1: Description of the study sample according to the demographic variables

Variable	**Level / category**	**Number**	**percentage %**
Gender	Male	271	72.1
	Female	105	27.9
0Age	under 18	6	1.6
	18-30	102	27.1
	31-45	58	15.4
	46-60	196	52.1
	over 60	14	3.7
Marital status	Single	206	54.8
	Married	170	45.2
Nationality	Jordanian	308	81.9
	Other	68	18.1
Education	High School	25	6.6
	bachelor degree	170	45.2
	Master degree	40	10.6
	Doctoral Degree	141	37.5
Average income annually	Less than 10,000JOD	21	5.6
	10,000JOD - 20,000JOD	13	3.5
	21,000JOD-30,000JOD	70	18.6
	31,000JOD-40,000JOD	207	55.1

	More than 40,000JOD	65	17.3
Smart phone type	IOS	111	29.5
	Android	191	50.8
	Other	74	19.7
IoT product	Smartwatch	17	4.5
	Smart refrigerator	9	2.4
	Home monitoring system	69	18.4
	Smartphone application	209	55.6
	Other	72	19.1
use the IoT services	Once a year	6	1.6
	Daily	140	37.2
	Weekly	34	9.0
	Once a month	187	49.7
	Do not use	9	2.4

Table (4-1) shows the sample description based on the demographic variables of the sample.

4.2 Paragraph compliance

The arithmetical averages and standard deviations of the sample responses of the study on the paragraphs:

Independent Variables:

1- Security

Table 4-2: The arithmetical averages and standard deviations of element (Security)

N	Paragraph	Mean	standard deviation	Rank	Approval Degree
1	The security of personal devices are acceptable	3.40	1.56	3	Medium
2	The personal devices passwords regularly updated	3.35	1.49	4	Medium
3	The personal information of passengers are secured.	3.46	1.52	2	Medium

4	The E-Gate is impossible to be used from unauthorized people.	3.50	1.37	1	Medium
5	the software of IoT device regularly updated	3.16	1.68	6	Medium
6	Using E-Gate of QAIA is allowed only for residents and citizens of Jordan to enhance security.	3.29	1.52	5	Medium
	Total	**3.3608**	**1.44**		Medium

"Table (4-2) shows that the computational circles of the sample responses ranged between (3.16- 3.51) with the highest computation (3.51) and the standard deviation (1.37) for paragraph (4) which is " The E-Gate is impossible to be used from unauthorized people", The lowest mean (3.16) for paragraphs (5) which is " the software of IoT device regularly updated"."

2- Cost

Table 4-3: The arithmetical averages and standard deviations of element (Cost)

N	Paragraph	Mean	standard deviation	Rank	Approval Degree
7	IoT is considered very important for the cost.	3.3378	1.49	6	Medium
8	The mobile application used to manage IoT devices.	3.3165	1.53	7	Medium
9	The service of Self Check-in provided from Royal Jordanian airlines save costs.	3.3537	1.50	5	Medium

10	The service of Self Check-in provided from Royal Jordanian airlines save time.	3.3590	1.55	3	Medium
11	The service of E-Gate provided save costs comparing with VIP services (ex. Tekram).	3.4468	1.54	2	Medium
12	The service of E-Gate provided save time comparing with VIP services (ex. Tekram).	3.5638	1.55	1	Medium
13	Using the Royal Jordanian Airlines mobile application help to reduce cost for passengers.	3.3059	1.47	8	Medium
14	Using the Royal Jordanian Airlines mobile application give discounts through paying online.	3.3564	1.54	4	Medium
	Total	**3.3800**	**1.44**		Medium

"Table (4-3) shows that the computational circles of the sample responses ranged between (3.31- 3.56) with the highest computation (3.56) and the standard deviation (1.55) for paragraph (12) which is " The service of E-Gate provided save time comparing with VIP services (ex. Tekram)", The lowest mean (3.31) for paragraphs (13) which is " Using the Royal Jordanian Airlines mobile application help to reduce cost for passengers

3- Scalability

Table 4-4: The arithmetical averages and standard deviations of element (Scalability)

N	Paragraph	Mean	standard deviation	Rank	Approval Degree
15	The services of Self Check in provided from Royal Jordanian airlines increase scalability.	3.3218	1.49	8	Medium
16	The Self Check-in machines number are suitable.	3.4176	1.55	6	Medium
17	The Wi-Fi connections inside the airport cover all the area.	3.4415	1.54	5	Medium
18	The mobile connections provided inside the airport is strong.	3.4681	1.50	2	Medium
19	The places of the E-Gate and Self Check-in counters is easy to reach.	3.4654	1.50	3	Medium
20	Using the Royal Jordanian Airlines mobile application help to facilitate the passenger services.	3.4654	1.55	4	Medium
21	Using IoT services provided are easier than Conducting with employees.	3.3750	1.54	7	Medium
22	Allowing all the nationalities to use the E-Gate in Jordan will help to improve the services and performance in QAIA.	3.4787	1.54	1	Medium
	Total	**3.4292**	**1.46**		**Medium**

" Table (4-4) shows that the computational circles of the sample responses ranged between (3.32- 3.48) with the highest computation (3.48) and the standard deviation (1.54) for paragraph (22) which is " Allowing all the nationalities to use the E-Gate in Jordan will help to improve the services and performance in QAIA", The lowest mean (3.32) for paragraphs (15) which is " The services of Self Check in provided from Royal Jordanian airlines increase scalability".

4- Dependent Variable (Customer satisfaction)

Table 4-5: The arithmetical averages and standard deviations of element (Customer satisfaction)

N	Paragraph	Mean	standard deviation	Rank	Approval Degree
23	The time it took for the Self Check-in was reasonable.	3.4255	1.47	3	High
24	I feel satisfied about the services provided in QAIA	4.2048	0.98	1	High
25	The services at QAIA meet my needs	3.4069	1.55	6	Medium
26	Ground services are better (ticketing, baggage handling, check-in, etc.)	3.3431	1.48	9	Medium
27	The terminal building had a welcoming ambience	3.2473	1.70	10	Medium
28	The “Assistance Agent” that assisted you at our airport treated you in a friendly and professional manner	3.4069	1.52	5	Medium
29	The move through the check points was easy and fast	3.3910	1.48	7	Medium

30	QAIA employees help elderly and special needs people	3.3803	1.55	8	Medium
31	The employees are friendly and facilitate your needs.	3.4096	1.52	4	Medium
32	The effort and time took from the step of check-in till the boarding time was reasonable.	3.4441	1.57	2	Medium
	Total	**3.4660**	**1.37769**		Medium

"Table (4-5) shows that the computational circles of the sample responses ranged between (3.25- 4.20) with the highest computation (4.20) and the standard deviation (0.98) for paragraph (24) which is " I feel satisfied about the services provided in QAIA", The lowest mean (3.25) for paragraphs (27) which is " The terminal building had a welcoming ambience ".

Descriptive analysis of the independent variable

Table 4-6: Descriptive analysis of the independent variable (IOT)

	Element	Mean	standard deviation	Approval Degree
IOT	Security	3.3608	1.44478	Medium
	Cost	3.3800	1.44162	Medium
	Scalability	3.4292	1.45637	Medium
	Total	**3.3900**	**1.43412**	**Medium**

"Table (4-6) shows that the computational circles of the sample responses ranged between (3.36- 3.43) with the highest computation (3.43) and the standard deviation (1.47) for Element (Scalability) with medium degree, then the element (Cost) Where it reached the arithmetic mean of the element (1.44) and the standard deviation (1.44), The lowest mean (3.36) for Element (Security) and it the standard deviation (1.44)."

4.3 Test hypotheses

- **The main hypothesis**

H01: There is no direct impact of IoT (security, cost, and scalability) on customer satisfaction, at the level of significance ($\alpha \leq 0.05$).

A simple and multiple regression analysis was carried out to determine the effect of IoT on customer satisfaction at the level of significance ($\alpha \leq 0.05$).

Table 4-7: b (Model Summary)

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.988[a]	.976	.975	.21568

"Table (4-7) shows that the value of the correlation coefficient of the variable (IoT) and the variable (customer satisfaction) was % 98.8. The value of the coefficient of determination (R2) is 0.976, so % 97.6 of the total variance is explained by the model and the rest is explained by other factors."

Multiple regression test:

Table 4-8: Analysis of variance (ANOVA)

Model		Sum of Square	Df	Mean Square	F	Sig.
1	**Regression**	694.459	3	231.486	4976.209	.000[b]
	Residual	17.305	372	.047		
	Total	711.764	375			

"Table (4-8) shows that the value of F is (4976.209) and the statistical significance level is (0.00) and thus is less than (0.05). Thus, the null hypothesis was rejected and the

alternative hypothesis is accepted. There is impact of IoT at the significant level ($a \leq 0.05$) on customer satisfaction."

- **The results of the first sub-hypothesis test**

H01.1: There is no direct impact of IoT security on Customer satisfaction at the level of significance ($\alpha \leq 0.05$).

A simple and multiple regression analysis was carried out to determine the effect of IoT security on customer satisfaction at the level of significance ($\alpha \leq 0.05$).

Table 4-9: b (Model Summary)

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.981[a]	.963	.963	.26426

"Table (4-9) shows that the value of the correlation coefficient of the variable (IoT security) and the variable (customer satisfaction) was %98.1. The value of the coefficient of determination (R2) is 0.963, so %96.3 of the total variance is explained by the model and the rest is explained by other factors."

Multiple regression test:

Table 4-10: Analysis of variance (ANOVA)

Model		Sum of Square	Df	Mean Square	F	Sig.
1	**Regression**	685.647	1	685.647	9818.677	.000[b]
	Residual	26.117	374	.070		
	Total	711.764	375			

"Table (4-10) shows that the value of F is (9818.677) and the statistical significance level is (0.00) and thus is less than (0.05). Thus, the null hypothesis was

rejected and the alternative hypothesis is accepted. There is impact of security at the significant level (a ≤ 0.05) on customer satisfaction."

- **The results of the second sub-hypothesis test**

H01.2: There is no direct impact of IoT Cost on Customer satisfaction at the level of significance (α ≤ 0.05).

A simple and multiple regression analysis was carried out to determine the effect of IoT Cost on customer satisfaction at the level of significance (α≤0.05).

Table 4-11: b (Model Summary)

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.977[a]	.954	.954	.29457

"Table (4-11) shows that the value of the correlation coefficient of the variable (IoT Cost) and the variable (customer satisfaction) was %97.7. The value of the coefficient of determination (R2) is 0.954, so %95.4 of the total variance is explained by the model and the rest is explained by other factors."

Multiple regression test:

Table 4-12: Analysis of variance (ANOVA)

Model		Sum of Square	Df	Mean Square	F	Sig.
1	**Regression**	679.312	1	679.312	7828.834	.000[b]
	Residual	32.452	374	.087		
	Total	711.764	375			

"Table (4-12) shows that the value of F is (7828.834) and the statistical significance level is (0.00) and thus is less than (0.05). Thus, the null hypothesis was

rejected and the alternative hypothesis is accepted. There is impact of Cost at the significant level (a ≤ 0.05) on customer satisfaction."

- **The results of the Third sub-hypothesis test**

H01.2: There is no direct impact of IoT scalability on Customer satisfaction at the level of significance (α ≤ 0.05).

A simple and multiple regression analysis was carried out to determine the effect of IoT scalability on customer satisfaction at the level of significance (α≤0.05).

Table 4-13: b (Model Summary)

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.975[a]	.951	.951	.30408

"Table (4-13) shows that the value of the correlation coefficient of the variable (IoT scalability) and the variable (customer satisfaction) was %97.5. The value of the coefficient of determination (R2) is 0.951, so %95.1 of the total variance is explained by the model and the rest is explained by other factors."

Multiple regression test:

Table 4-14: Analysis of variance (ANOVA)

Model		Sum of Square	Df	Mean Square	F	Sig.
1	**Regression**	677.183	1	677.183	7323.859	.000[b]
	Residual	34.581	374	.092		
	Total	711.764	375			

"Table (4-14) shows that the value of F is (7323.859) and the statistical significance level is (0.00) and thus is less than (0.05). Thus, the null hypothesis was rejected and the

alternative hypothesis is accepted. There is impact of scalability at the significant level ($a \leq 0.05$) on customer satisfaction."

Table 4-15: Variables Supported table

Hypothesis No	Variables	Support/not
Ho1	**IoT ⇨ customer satisfaction**	Supported
H01.1	**security ⇨ customer satisfaction**	Supported
H01.2	**Cost ⇨ customer satisfaction**	Supported
H01.3	**scalability ⇨ customer satisfaction**	Supported

H01: The alternative hypothesis was accepted "There is an impact of IoT (security, cost, and scalability) on customer satisfaction.

H01.1: There is an impact of IoT security on Customer satisfaction.

H01.2: There is an impact of IoT Cost on customer satisfaction.

H01.3: There is no direct impact of IoT scalability on customer satisfaction.

Chapter Five

Discussion of Results and Recommendations

5.1 Descriptive Results

5.2 Hypothesis Results

5.3 Recommendations

Chapter Five

Discussion of Results and Recommendations

5.1 Descriptive Results

- It shows that the computational circles of the sample responses ranged between (3.36- 3.43) with the highest computation (3.43) and the standard deviation (1.47) for Element (Scalability) with medium degree, then the element (Cost) Where it reached the arithmetic mean of the element (1.44) and the standard deviation (1.44), The lowest mean (3.36) for Element (Security) and it the standard deviation (1.44)."
- It shows that the computational circles of the sample responses ranged between (3.25- 4.20) with the highest computation (4.20) and the standard deviation (0.98) for paragraph (24) which is " I feel satisfied about the services provided in QAIA", The lowest mean (3.25) for paragraphs (27) which is " The terminal building had a welcoming ambience ".

5.2 Hypothesis Results

1- There is impact of IoT at the significant level ($a \leq 0.05$) on customer satisfaction.

2- The result show that after the variables (Security, Scalability), that significance were (0.000) less than (0.05), indicating that Security, Scalability have a statistically significant effect on customer satisfaction, and the rest of the element (Cost) has a positive effect that is apparent, but not statistically significant.

3- There is impact of security at the significant level ($a \leq 0.05$) on customer satisfaction.

4- There is impact of Cost at the significant level ($a \leq 0.05$) on customer satisfaction.

5- There is impact of scalability at the significant level ($a \leq 0.05$) on customer satisfaction.

6- The security play a significant role in customer satisfaction which correspond with Chen et al., (2014) that showed that the most dominant factor on airport customer satisfaction was the security.

The results of this study were disagreed with Ganiyu et al., (2012) study where they showed that customer loyalty and satisfaction aren't directly connected, especially in competitive business environments because there is a big difference between satisfaction which is a passive customer condition, and loyalty which is an active or proactive relationship with the organization. And agreed with Chen et al., (2012) study where they showed that service innovation and customer satisfaction can affect customer value, also this research evaluated on innovative services like, social media communication. And agreed with Lee, I., & Lee, K. (2015) study where they showed that inspects the net present value technique and the real option method usually used in the explanation of plans and explicate how the real option method can be useful for IoT investment. And agreed with Bogicevic et al., (2017) study where they showed that catches travelers' impression of air terminal advancements and tests a hypothetical model that looks at the relationship among various kinds of air terminal advances and travelers' certainty, happiness, and fulfillment. A traveler's dimension of fulfillment picked up while going through the air terminal while leaving. And agreed with Gupta, et al. (2017) study where they showed that presenting the importance of scalability for IoT and how importance it is for developing the IoT, in addition it discuss different types of scalability and challenges.

5.3 Recommendations

1. The study recommends Access (IoT) on intelligent cities that can help us reduce environmental impacts and improve efficiency for things like energy use. This helps us understand and improve our way of life and how we work.
2. Define the primary objective of investing in Internet things, you may want to provide greater public utility, such as improving operational efficiency or providing a better customer service experience.
3. Information security is one of the most important priorities of the project. You need an effective protection system to prevent theft of customer data, company secrets and so on.
4. The technical initiative should be studied in a cloud environment. Cloud provides a scalable platform for device management and development, and provides cost-effective solutions for the volume of data generated.
5. A mechanism to analyze data from devices and systems that operate according to the Internet concept should be available in order to make a permanent assessment of the operation of these devices.
6. The research recommend the researchers to investigate and focus more about the IoT and its impact on customer satisfaction because there is few studies about it

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Appendices

Appendix (1)

The Arbitrators of the Questionnaire

No.	Name of Arbitrator	University
1	Prof. Ahmad Ali Saleh	Middle East University
2	Prof. Abdel Aziz Sharabati	Middle East University
3	Prof. Samir Jabali	Middle East University
4	Prof. Mohammad Adaliyeh	Middle East University
5	Prof. Zobagh Al-Samourai	Jarash University
6	Prof. Ahmad Malkawi	Jarash University
7	Prof. Sulieman Al-Dalahimeh	Jarash University
8	Prof. Sahar Abu Bakir	Amman Arab University
9	Prof. Ghassan Al-Omari	Amman Arab University
10	Prof. Khalid Bin Hamdan	Amman Arab University

Appendix (2)

The Questionnaire

Dear participant

This questionnaire being conducted as part of study entitled **"The Impact of**

Internet of Things on Customer Satisfaction".

The purpose of this questionnaire is to investigate the impact of internet of things on customer satisfaction at Queen Alia International Airport. The questionnaire also seek to explore what form of support can best insure the development of internet of things.

This study will be conducted according to accepted and applicable national and international ethics guidelines and principles. Please consider that all information you provide will be kept strictly confidential for the university purposes.

It would be greatly appreciated if you could take few minutes of your time to partake in this questionnaire.

Researcher Name: **Supervised by:**

Moath Jehad Faqir Dr. Ahmad al sukkar

Middle East

University,

Business

Department

Master Program of E-Business

Amman, Jordan

Please give us a few minutes of your valuable time to answer the following questionnaire using (x) in the specific box.

Part ONE

Q.1 Gender Male ☐ Female ☐

Q.2 Age under 18 18-30 ☐ 31-45 ☐ 46-60 ☐ over 60 ☐

Q.3 Marital status Single ☐ Married ☐

Q.4 Nationality Jordanian ☐ Other ☐

Q.5 Education

- High School ☐ - bachelor degree ☐
- Master degree ☐ - Doctoral Degree ☐
- Other ☐

Q.6 Average income annually

- Less than 10,000JOD ☐ - 10,000JOD - 20,000JOD ☐
- 21,000JOD-30,000JOD ☐ - 31,000JOD-40,000JOD ☐
- More than 40,000JOD ☐

Q.7 Smart phone type IOS ☐ Android ☐ Other ☐

Q.8 Do you own any IoT product, such as a: (you can select more than one)

- Smartwatch ☐ - Smart refrigerator ☐
- Home monitoring system ☐ - Smartphone application ☐ - Other ☐

Q.9 How often do you typically use the IoT services and devices in general?

- Once a year ☐ - Daily ☐ - Weekly ☐ - Once a month ☐ - Do not use

Part TWO

Please give us a few minutes of your valuable time to answer the following questionnaire using (x) in the specific box.

Security: Security play a main role in human lives, in IoT the security mean the defense of any electronic threats and hacks which may affect the IoT application and privacy of its users.						
#	**Security**	**Strong Disagree**	**Disagree**	**Neutral**	**Agree**	**Strongly Agree**
1	The Security of Personal Devices are acceptable					
2	The Personal Devices passwords regularly updated					
3	The personal information of passengers are secured					
4	The E-Gate is impossible to be used from unauthorized					
5	The software of IoT Device regularly updated					
6	Using E-Gate of QAIA is allowed only for residents and citizens of Jordan to enhance security					

Cost: it's the amount of money paid for a service or product, in addition the cost plays an important role for any human live and time. Cost can judge the service provided by IoT services which may help to develop						
#	**Cost**	**Strong Disagree**	**Disagree**	**Neutral**	**Agree**	**Strongly Agree**
7	IoT is considered very important for the cost.					
8	The mobile application used to manage IoT devices.					
9	The service of Self Check-in provided from Royal Jordanian airlines save costs.					
10	The service of Self Check-in provided from Royal Jordanian airlines save time.					
11	The service of E-Gate provided save costs comparing with VIP services (ex. Tekram).					
12	The service of E-Gate provided save time comparing with VIP services (ex. Tekram).					
13	Using the Royal Jordanian Airlines mobile application help to reduce cost for passengers.					

	Scalability: Is the ability of IoT to enhance its performance and quality through developing its operations, connectivity, and many other things that will develop IoT.					
14	Using the Royal Jordanian Airlines mobile application for paying online.					
#	**Scalability**	**Strong Disagree**	**Disagree**	**Neutral**	**Agree**	**Strongly Agree**
15	Check-in provided from Royal Jordanian airlines increase scalability.					
16	The self-check-in machines numbers are suitable					
17	The wifi connections inside the airport cover all the area					
18	The mobile connections provided inside the airport is strong					
19	The places of the E-Gate/self-check-in counters is easy to reach					
20	Using the Royal Jordanian Airlines mobile application helps to facilitate the passenger services					
21	Using IoT services provided are easier than conducting with employees					
22	Allowing all the nationalities to use the E-Gate in Jordan will help to improve the services and performance in QAIA					

Customer satisfaction: The measure of happiness and pleasure felt by the customer about saving time, cost, and effort with the IoT services obtained.						
#	**Customer satisfaction**	**Strongly disagree**	**Disagree**	**Neural**	**Agree**	**Strongly agree**
23	The time it took for the Self Check-in was reasonable.					
24	I feel satisfied about the services provided in QAIA					
25	The services at QAIA meet my needs					
26	Ground services are better (ticketing, baggage handling, check-in, etc.)					
27	The terminal building had a welcoming ambience					
28	The "Assistance Agent" that assisted you at our airport treated you in a friendly and professional manner					
29	The move through the check points was easy and fast					
30	QAIA employees help elderly and special needs people					
31	The employees are friendly and facilitate your needs.					
32	The effort and time took from the step of check-in till the boarding time was reasonable.					

Appendix (3)

SPSS Output

Reliability

Notes

Output Created		06-JAN-2019 17:50:58
Comments		
Input	Data	C:\Users\harb\Desktop\New folder (5)\طلاب\sAhem\AbedData.sav
	Active Dataset	DataSet1
	Filter	<none>
	Weight	<none>
	Split File	<none>
	N of Rows in Working Data File	376
	Matrix Input	
Missing Value Handling	Definition of Missing	User-defined missing values are treated as missing.
	Cases Used	Statistics are based on all cases with valid data for all variables in the procedure.
Syntax		RELIABILITY /VARIABLES=a1 a2 a3 a4 a5 a6 /SCALE('ALL VARIABLES') ALL /MODEL=ALPHA.
Resources	Processor Time	00:00:00.02
	Elapsed Time	00:00:00.02

Scale: ALL VARIABLES

Case Processing Summary

		N	%
Cases	Valid	376	100.0
	Excluded[a]	0	.0
	Total	376	100.0

a. Listwise deletion based on all variables in the procedure.

Reliability Statistics

Cronbach's Alpha	N of Items
.977	6

```
RELIABILITY
  /VARIABLES=b1 b2 b3 b4 b5 b6 b7 b8
  /SCALE('ALL VARIABLES') ALL
  /MODEL=ALPHA.
```

Reliability

Notes

Output Created		06-JAN-2019 17:51:10
Comments		
Input	Data	C:\Users\harb\Desktop\New folder (5)\طلاب\sAhem\AbedData.sav
	Active Dataset	DataSet1
	Filter	<none>
	Weight	<none>
	Split File	<none>
	N of Rows in Working Data File	376
	Matrix Input	
Missing Value Handling	Definition of Missing	User-defined missing values are treated as missing.
	Cases Used	Statistics are based on all cases with valid data for all variables in the procedure.

Syntax		RELIABILITY /VARIABLES=b1 b2 b3 b4 b5 b6 b7 b8 /SCALE('ALL VARIABLES') ALL /MODEL=ALPHA.
Resources	Processor Time	00:00:00.02
	Elapsed Time	00:00:00.08

Scale: ALL VARIABLES

Case Processing Summary

		N	%
Cases	Valid	376	100.0
	Excluded[a]	0	.0
	Total	376	100.0

a. Listwise deletion based on all variables in the procedure.

Reliability Statistics

Cronbach's Alpha	N of Items
.983	8

RELIABILITY
/VARIABLES=c1 c2 c3 c4 c5 c6 c7 c8
/SCALE('ALL VARIABLES') ALL
/MODEL=ALPHA.

Reliability

Notes

Output Created		06-JAN-2019 17:51:20
Comments		
Input	Data	C:\Users\harb\Desktop\New folder (5)\طلاب\sAhem\AbedData.sav
	Active Dataset	DataSet1
	Filter	<none>
	Weight	<none>
	Split File	<none>
	N of Rows in Working Data File	376
	Matrix Input	
Missing Value Handling	Definition of Missing	User-defined missing values are treated as missing.
	Cases Used	Statistics are based on all cases with valid data for all variables in the procedure.
Syntax		RELIABILITY /VARIABLES=c1 c2 c3 c4 c5 c6 c7 c8 /SCALE('ALL VARIABLES') ALL /MODEL=ALPHA.
Resources	Processor Time	00:00:00.02
	Elapsed Time	00:00:00.02

Scale: ALL VARIABLES

Case Processing Summary

		N	%
Cases	Valid	376	100.0
	Excluded[a]	0	.0
	Total	376	100.0

a. Listwise deletion based on all variables in the procedure.

Reliability Statistics

Cronbach's Alpha	N of Items
.986	8

```
RELIABILITY
  /VARIABLES=x1 x2 x3 x4 x5 x6 x7 x8 x9 x10
  /SCALE('ALL VARIABLES') ALL
  /MODEL=ALPHA.
```

Reliability

Notes

Output Created		06-JAN-2019 17:51:31
Comments		
Input	Data	C:\Users\harb\Desktop\New folder (5)\طلاب\sAhem\AbedData.sav
	Active Dataset	DataSet1
	Filter	<none>
	Weight	<none>
	Split File	<none>
	N of Rows in Working Data File	376
	Matrix Input	
Missing Value Handling	Definition of Missing	User-defined missing values are treated as missing.
	Cases Used	Statistics are based on all cases with valid data for all variables in the procedure.

Syntax		RELIABILITY /VARIABLES=x1 x2 x3 x4 x5 x6 x7 x8 x9 x10 /SCALE('ALL VARIABLES') ALL /MODEL=ALPHA.
Resources	Processor Time	00:00:00.02
	Elapsed Time	00:00:00.09

Scale: ALL VARIABLES

Case Processing Summary

		N	%
Cases	Valid	376	100.0
	Excluded[a]	0	.0
	Total	376	100.0

a. Listwise deletion based on all variables in the procedure.

Reliability Statistics

Cronbach's Alpha	N of Items
.981	10

RELIABILITY

/VARIABLES=a1 a2 a3 a4 a5 a6 b1 b2 b3 b4 b5 b6 b7 b8 c1 c2 c3 c4 c5 c6 c7 c8 x1 x2 x3 x4 x5 x6 x7 x8 x9 x10

/SCALE('ALL VARIABLES') ALL

/MODEL=ALPHA.

Reliability

Notes

Output Created		06-JAN-2019 17:51:45
Comments		
Input	Data	C:\Users\harb\Desktop\New folder (5)\طلاب\sAhem\AbedData.sav
	Active Dataset	DataSet1
	Filter	<none>
	Weight	<none>
	Split File	<none>
	N of Rows in Working Data File	376
	Matrix Input	
Missing Value Handling	Definition of Missing	User-defined missing values are treated as missing.
	Cases Used	Statistics are based on all cases with valid data for all variables in the procedure.
Syntax		RELIABILITY /VARIABLES=a1 a2 a3 a4 a5 a6 b1 b2 b3 b4 b5 b6 b7 b8 c1 c2 c3 c4 c5 c6 c7 c8 x1 x2 x3 x4 x5 x6 x7 x8 x9 x10 /SCALE('ALL VARIABLES') ALL /MODEL=ALPHA.
Resources	Processor Time	00:00:00.00
	Elapsed Time	00:00:00.03

Scale: ALL VARIABLES

Case Processing Summary

		N	%
Cases	Valid	376	100.0

	Excluded[a]	0	.0
	Total	376	100.0

a. Listwise deletion based on all variables in the procedure.

Reliability Statistics

Cronbach's Alpha	N of Items
.995	32

FREQUENCIES VARIABLES=Gender Age Marital Nationality Edu Income Phone IoTPruducts UseIoT

/ORDER=ANALYSIS.

Frequencies

Notes

Output Created		06-JAN-2019 17:53:28
Comments		
Input	Data	C:\Users\harb\Desktop\New folder (5)\طلاب\sAhem\AbedData.sav
	Active Dataset	DataSet1
	Filter	<none>
	Weight	<none>
	Split File	<none>
	N of Rows in Working Data File	376
Missing Value Handling	Definition of Missing	User-defined missing values are treated as missing.
	Cases Used	Statistics are based on all cases with valid data.

Syntax		FREQUENCIES VARIABLES=Gender Age Marital Nationality Edu Income Phone IoTPruducts UseIoT /ORDER=ANALYSIS.
Resources	Processor Time	00:00:00.02
	Elapsed Time	00:00:00.02

Statistics

		Gender	Age	Marital	Nationality	Edu	Income	Phone
N	Valid	376	376	376	376	376	376	376
	Missing	0	0	0	0	0	0	0

Statistics

		IoTPruducts	UseIoT
N	Valid	376	376
	Missing	0	0

Frequency Table

Gender

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	male	271	72.1	72.1	72.1
	Female	105	27.9	27.9	100.0
	Total	376	100.0	100.0	

ge

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Less 18	6	1.6	1.6	1.6
	18-30	102	27.1	27.1	28.7
	31-45	58	15.4	15.4	44.1
	46-60	196	52.1	52.1	96.3
	Over 60	14	3.7	3.7	100.0
	Total	376	100.0	100.0	

Marital

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	single	206	54.8	54.8	54.8
	Married	170	45.2	45.2	100.0
	Total	376	100.0	100.0	

Nationality

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Jordanian	308	81.9	81.9	81.9
	Other	68	18.1	18.1	100.0
	Total	376	100.0	100.0	

Edu

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	HSchool	25	6.6	6.6	6.6
	Bech	170	45.2	45.2	51.9
	Master	40	10.6	10.6	62.5

	PhD	141	37.5	37.5	100.0
	Total	376	100.0	100.0	

Income

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Less 10,000	21	5.6	5.6	5.6
	10,000- 20,000	13	3.5	3.5	9.0
	21,000-30,000	70	18.6	18.6	27.7
	31,000- 40,000	207	55.1	55.1	82.7
	More 40,000	65	17.3	17.3	100.0
	Total	376	100.0	100.0	

Phone

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Ios	111	29.5	29.5	29.5
	Android	191	50.8	50.8	80.3
	other	74	19.7	19.7	100.0
	Total	376	100.0	100.0	

IoTPruducts

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Smart Watch	17	4.5	4.5	4.5
	SmartRefrig	9	2.4	2.4	6.9
	monotoring	69	18.4	18.4	25.3
	SApplication	209	55.6	55.6	80.9
	other	72	19.1	19.1	100.0

	Total	376	100.0	100.0	

UseIoT

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	once a year	6	1.6	1.6	1.6
	daily	140	37.2	37.2	38.8
	weekly	34	9.0	9.0	47.9
	once a month	187	49.7	49.7	97.6
	dont use	9	2.4	2.4	100.0
	Total	376	100.0	100.0	

```
DESCRIPTIVES VARIABLES=a1 a2 a3 a4 a5 a6 AA
  /STATISTICS=MEAN STDDEV MIN MAX.
```

Descriptives

Notes

Output Created		06-JAN-2019 17:53:47
Comments		
Input	Data	C:\Users\harb\Desktop\New folder (5)\طلاب\sAhem\AbedData.sav
	Active Dataset	DataSet1
	Filter	<none>
	Weight	<none>
	Split File	<none>
	N of Rows in Working Data File	376
Missing Value Handling	Definition of Missing	User defined missing values are treated as missing.
	Cases Used	All non-missing data are used.

Syntax		DESCRIPTIVES VARIABLES=a1 a2 a3 a4 a5 a6 AA /STATISTICS=MEAN STDDEV MIN MAX.
Resources	Processor Time	00:00:00.02
	Elapsed Time	00:00:00.02

Descriptive Statistics

	N	Minimum	Maximum	Mean	Std. Deviation
a1	376	1.00	5.00	3.4016	1.56321
a2	376	1.00	5.00	3.3484	1.49252
a3	376	1.00	5.00	3.4628	1.52445
a4	376	1.00	5.00	3.5053	1.36625
a5	376	1.00	5.00	3.1596	1.67684
a6	376	1.00	5.00	3.2872	1.51875
AA	376	1.17	5.00	3.3608	1.44478
Valid N (listwise)	376				

DESCRIPTIVES VARIABLES=b1 b2 b3 b4 b5 b6 b7 b8 BB
/STATISTICS=MEAN STDDEV MIN MAX.

Descriptives

Notes

Output Created		06-JAN-2019 17:54:04
Comments		
Input	Data	C:\Users\harb\Desktop\New folder (5)\طلاب\sAhem\AbedData.sav
	Active Dataset	DataSet1
	Filter	<none>

	Weight	<none>
	Split File	<none>
	N of Rows in Working Data File	376
Missing Value Handling	Definition of Missing	User defined missing values are treated as missing.
	Cases Used	All non-missing data are used.
Syntax		DESCRIPTIVES VARIABLES=b1 b2 b3 b4 b5 b6 b7 b8 BB /STATISTICS=MEAN STDDEV MIN MAX.
Resources	Processor Time	00:00:00.00
	Elapsed Time	00:00:00.02

Descriptive Statistics

	N	Minimum	Maximum	Mean	Std. Deviation
b1	376	1.00	5.00	3.3378	1.48961
b2	376	1.00	5.00	3.3165	1.53305
b3	376	1.00	5.00	3.3537	1.50373
b4	376	1.00	5.00	3.3590	1.55309
b5	376	1.00	5.00	3.4468	1.53964
b6	376	1.00	5.00	3.5638	1.55303
b7	376	1.00	5.00	3.3059	1.47497
b8	376	1.00	5.00	3.3564	1.54596
BB	376	1.00	5.00	3.3800	1.44162
Valid N (listwise)	376				

DESCRIPTIVES VARIABLES=c1 c2 c3 c4 c5 c6 c7 c8 CC

/STATISTICS=MEAN STDDEV MIN MAX.

Descriptives

Notes

Output Created		06-JAN-2019 17:54:22
Comments		
Input	Data	C:\Users\harb\Desktop\New folder (5)\طلاب\sAhem\AbedData.sav
	Active Dataset	DataSet1
	Filter	<none>
	Weight	<none>
	Split File	<none>
	N of Rows in Working Data File	376
Missing Value Handling	Definition of Missing	User defined missing values are treated as missing.
	Cases Used	All non-missing data are used.
Syntax		DESCRIPTIVES VARIABLES=c1 c2 c3 c4 c5 c6 c7 c8 CC /STATISTICS=MEAN STDDEV MIN MAX.
Resources	Processor Time	00:00:00.02
	Elapsed Time	00:00:00.03

Descriptive Statistics

	N	Minimum	Maximum	Mean	Std. Deviation
c1	376	1.00	5.00	3.3218	1.49850
c2	376	1.00	6.00	3.4176	1.54527
c3	376	1.00	6.00	3.4415	1.54291
c4	376	1.00	6.00	3.4681	1.49454
c5	376	1.00	6.00	3.4654	1.50160
c6	376	1.00	6.00	3.4654	1.55396

c7	376	1.00	6.00	3.3750	1.54240
c8	376	1.00	5.00	3.4787	1.54215
CC	376	1.00	5.00	3.4292	1.45637
Valid N (listwise)	376				

DESCRIPTIVES VARIABLES=x1 x2 x3 x4 x5 x6 x7 x8 x9 x10 Dependent
/STATISTICS=MEAN STDDEV MIN MAX.

Descriptives

Notes

Output Created		06-JAN-2019 17:54:41
Comments		
Input	Data	C:\Users\harb\Desktop\New folder (5)\طلاب\sAhem\AbedData.sav
	Active Dataset	DataSet1
	Filter	<none>
	Weight	<none>
	Split File	<none>
	N of Rows in Working Data File	376
Missing Value Handling	Definition of Missing	User defined missing values are treated as missing.
	Cases Used	All non-missing data are used.
Syntax		DESCRIPTIVES VARIABLES=x1 x2 x3 x4 x5 x6 x7 x8 x9 x10 Dependent /STATISTICS=MEAN STDDEV MIN MAX.
Resources	Processor Time	00:00:00.00
	Elapsed Time	00:00:00.02

Descriptive Statistics

	N	Minimum	Maximum	Mean	Std. Deviation
x1	376	1.00	5.00	3.4255	1.46598
x2	376	1.00	5.00	4.2048	.98147
x3	376	1.00	5.00	3.4069	1.55327
x4	376	1.00	5.00	3.3431	1.47941
x5	376	1.00	5.00	3.2473	1.69391
x6	376	1.00	5.00	3.4069	1.52380
x7	376	1.00	5.00	3.3910	1.48012
x8	376	1.00	5.00	3.3803	1.54800
x9	376	1.00	5.00	3.4096	1.52396
x10	376	1.00	5.00	3.4441	1.57381
Dependent	376	1.10	5.00	3.4660	1.37769
Valid N (listwise)	376				

```
DESCRIPTIVES VARIABLES=AA BB CC Independent
  /STATISTICS=MEAN STDDEV MIN MAX.
```

Descriptives

Notes

Output Created		06-JAN-2019 17:54:59
Comments		
Input	Data	C:\Users\harb\Desktop\New folder (5)\طلاب\sAhem\AbedData.sav
	Active Dataset	DataSet1
	Filter	<none>
	Weight	<none>
	Split File	<none>

	N of Rows in Working Data File	376
Missing Value Handling	Definition of Missing	User defined missing values are treated as missing.
	Cases Used	All non-missing data are used.
Syntax		DESCRIPTIVES VARIABLES=AA BB CC Independent /STATISTICS=MEAN STDDEV MIN MAX.
Resources	Processor Time	00:00:00.00
	Elapsed Time	00:00:00.02

Descriptive Statistics

	N	Minimum	Maximum	Mean	Std. Deviation
AA	376	1.17	5.00	3.3608	1.44478
BB	376	1.00	5.00	3.3800	1.44162
CC	376	1.00	5.00	3.4292	1.45637
Independent	376	1.06	5.00	3.3900	1.43412
Valid N (listwise)	376				

```
NPAR TESTS
  /K-S(NORMAL)=Dependent
  /MISSING ANALYSIS.
```

NPar Tests

Notes

Output Created		06-JAN-2019 17:55:13
Comments		
Input	Data	C:\Users\harb\Desktop\New folder (5)\طلاب\sAhem\AbedData.sav
	Active Dataset	DataSet1
	Filter	<none>
	Weight	<none>
	Split File	<none>
	N of Rows in Working Data File	376
Missing Value Handling	Definition of Missing	User-defined missing values are treated as missing.
	Cases Used	Statistics for each test are based on all cases with valid data for the variable(s) used in that test.
Syntax		NPAR TESTS /K-S(NORMAL)=Dependent /MISSING ANALYSIS.
Resources	Processor Time	00:00:00.02
	Elapsed Time	00:00:00.03
	Number of Cases Allowed[a]	196608

a. Based on availability of workspace memory.

One-Sample Kolmogorov-Smirnov Test

	Dependent
N	376

Normal Parameters[a,b]	Mean	3.4660
	Std. Deviation	1.37769
Most Extreme Differences	Absolute	.251
	Positive	.183
	Negative	-.251-
Test Statistic		.251
Asymp. Sig. (2-tailed)		.000[c]

a. Test distribution is Normal.

b. Calculated from data.

c. Lilliefors Significance Correction.

```
REGRESSION
  /MISSING LISTWISE
  /STATISTICS COEFF OUTS R ANOVA COLLIN TOL
  /CRITERIA=PIN(.05) POUT(.10)
  /NOORIGIN
  /DEPENDENT Dependent
  /METHOD=ENTER AA BB CC.
```

Regression

Notes

Output Created		06-JAN-2019 17:56:07
Comments		
Input	Data	C:\Users\harb\Desktop\New folder (5)\طلاب\sAhem\AbedData.sav
	Active Dataset	DataSet1
	Filter	<none>
	Weight	<none>
	Split File	<none>
	N of Rows in Working Data File	376

Missing Value Handling	Definition of Missing	User-defined missing values are treated as missing.
	Cases Used	Statistics are based on cases with no missing values for any variable used.
Syntax		REGRESSION /MISSING LISTWISE /STATISTICS COEFF OUTS R ANOVA COLLIN TOL /CRITERIA=PIN(.05) POUT(.10) /NOORIGIN /DEPENDENT Dependent /METHOD=ENTER AA BB CC.
Resources	Processor Time	00:00:00.02
	Elapsed Time	00:00:00.03
	Memory Required	2788 bytes
	Additional Memory Required for Residual Plots	0 bytes

Variables Entered/Removed[a]

Model	Variables Entered	Variables Removed	Method
1	CC, AA, BB[b]	.	Enter

a. Dependent Variable: Dependent

b. All requested variables entered.

Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.988[a]	.976	.975	.21568

a. Predictors: (Constant), CC, AA, BB

ANOVA[a]

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	694.459	3	231.486	4976.209	.000[b]
	Residual	17.305	372	.047		
	Total	711.764	375			

a. Dependent Variable: Dependent

b. Predictors: (Constant), CC, AA, BB

Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	.253	.029		8.836	.000
	AA	.482	.047	.506	10.214	.000
	BB	.097	.050	.102	1.960	.051
	CC	.369	.031	.390	11.869	.000

Coefficients[a]

Model		Collinearity Statistics	
		Tolerance	VIF
1	(Constant)		
	AA	.027	37.525
	BB	.024	41.087
	CC	.061	16.485

a. Dependent Variable: Dependent

Collinearity Diagnostics[a]

Model	Dimension	Eigenvalue	Condition Index	Variance Proportions			
				(Constant)	AA	BB	CC

1	1	3.875	1.000	.01	.00	.00	.00
	2	.117	5.755	.99	.00	.00	.01
	3	.006	24.752	.00	.14	.07	.98
	4	.002	42.055	.00	.86	.92	.01

a. Dependent Variable: Dependent

```
REGRESSION
  /MISSING LISTWISE
  /STATISTICS COEFF OUTS R ANOVA
  /CRITERIA=PIN(.05) POUT(.10)
  /NOORIGIN
  /DEPENDENT Dependent
  /METHOD=ENTER AA.
```

Regression

Notes

Output Created		06-JAN-2019 17:56:21
Comments		
Input	Data	C:\Users\harb\Desktop\New folder (5)\طلاب\sAhem\AbedData.sav
	Active Dataset	DataSet1
	Filter	<none>
	Weight	<none>
	Split File	<none>
	N of Rows in Working Data File	376
Missing Value Handling	Definition of Missing	User-defined missing values are treated as missing.
	Cases Used	Statistics are based on cases with no missing values for any variable used.

Syntax		REGRESSION /MISSING LISTWISE /STATISTICS COEFF OUTS R ANOVA /CRITERIA=PIN(.05) POUT(.10) /NOORIGIN /DEPENDENT Dependent /METHOD=ENTER AA.
Resources	Processor Time	00:00:00.08
	Elapsed Time	00:00:00.09
	Memory Required	2236 bytes
	Additional Memory Required for Residual Plots	0 bytes

Variables Entered/Removed[a]

Model	Variables Entered	Variables Removed	Method
1	AA[b]	.	Enter

a. Dependent Variable: Dependent

b. All requested variables entered.

Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.981[a]	.963	.963	.26426

a. Predictors: (Constant), AA

ANOVA[a]

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	685.647	1	685.647	9818.677	.000[b]

	Residual	26.117	374	.070		
	Total	711.764	375			

a. Dependent Variable: Dependent

b. Predictors: (Constant), AA

Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	.321	.035		9.279	.000
	AA	.936	.009	.981	99.089	.000

a. Dependent Variable: Dependent

```
REGRESSION
  /MISSING LISTWISE
  /STATISTICS COEFF OUTS R ANOVA
  /CRITERIA=PIN(.05) POUT(.10)
  /NOORIGIN
  /DEPENDENT Dependent
  /METHOD=ENTER BB.
```

Regression

Notes

Output Created		06-JAN-2019 17:56:29
Comments		
Input	Data	C:\Users\harb\Desktop\New folder (5)\طلاب\sAhem\AbedData.sav
	Active Dataset	DataSet1
	Filter	<none>
	Weight	<none>
	Split File	<none>

	N of Rows in Working Data File	376
Missing Value Handling	Definition of Missing	User-defined missing values are treated as missing.
	Cases Used	Statistics are based on cases with no missing values for any variable used.
Syntax		REGRESSION /MISSING LISTWISE /STATISTICS COEFF OUTS R ANOVA /CRITERIA=PIN(.05) POUT(.10) /NOORIGIN /DEPENDENT Dependent /METHOD=ENTER BB.
Resources	Processor Time	00:00:00.03
	Elapsed Time	00:00:00.09
	Memory Required	2236 bytes
	Additional Memory Required for Residual Plots	0 bytes

Variables Entered/Removed[a]

Model	Variables Entered	Variables Removed	Method
1	BB[b]	.	Enter

a. Dependent Variable: Dependent

b. All requested variables entered.

Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.977[a]	.954	.954	.29457

a. Predictors: (Constant), BB

ANOVA[a]

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	679.312	1	679.312	7828.834	.000[b]
	Residual	32.452	374	.087		
	Total	711.764	375			

a. Dependent Variable: Dependent

b. Predictors: (Constant), BB

Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	.310	.039		8.006	.000
	BB	.934	.011	.977	88.481	.000

a. Dependent Variable: Dependent

```
REGRESSION
  /MISSING LISTWISE
  /STATISTICS COEFF OUTS R ANOVA
  /CRITERIA=PIN(.05) POUT(.10)
  /NOORIGIN
  /DEPENDENT Dependent
  /METHOD=ENTER CC.
```

Regression

Notes

Output Created		06-JAN-2019 17:56:36
Comments		
Input	Data	C:\Users\harb\Desktop\New folder (5)\طلاب\sAhem\AbedData.sav
	Active Dataset	DataSet1

	Filter	<none>
	Weight	<none>
	Split File	<none>
	N of Rows in Working Data File	376
Missing Value Handling	Definition of Missing	User-defined missing values are treated as missing.
	Cases Used	Statistics are based on cases with no missing values for any variable used.
Syntax		REGRESSION /MISSING LISTWISE /STATISTICS COEFF OUTS R ANOVA /CRITERIA=PIN(.05) POUT(.10) /NOORIGIN /DEPENDENT Dependent /METHOD=ENTER CC.
Resources	Processor Time	00:00:00.06
	Elapsed Time	00:00:00.09
	Memory Required	2236 bytes
	Additional Memory Required for Residual Plots	0 bytes

Variables Entered/Removed[a]

Model	Variables Entered	Variables Removed	Method
1	CC[b]	.	Enter

a. Dependent Variable: Dependent

b. All requested variables entered.

Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.975[a]	.951	.951	.30408

a. Predictors: (Constant), CC

ANOVA[a]

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	677.183	1	677.183	7323.859	.000[b]
	Residual	34.581	374	.092		
	Total	711.764	375			

a. Dependent Variable: Dependent

b. Predictors: (Constant), CC

Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	.302	.040		7.515	.000
	CC	.923	.011	.975	85.580	.000

a. Dependent Variable: Dependent