A MODEL OF E-COMMERCE ADOPTION FOR INFORMATION COMMUNICATION TECHNOLOGY SMALL-MEDIUM ENTERPRISES IN UGANDA

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MODEL PENERIMAGUNAAN E-DAGANG BAGI PERUSAHAAN KECIL DAN SEDERHANA TEKNOLOGI KOMUNIKASI DAN MAKLUMAT DI UGANDA

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DISERTASI YANG DIKEMUKAKAN UNTUK MEMENUHI SEBAHAGIAN DARIPADA SYARAT MEMPEROEH IJAZAH SARJANA MASTER SISTEM MAKLUMAT

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DECLARATION

I hereby declare that the work in this thesis is my own except for quotations and summaries which have been duly acknowledged.

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ABSTRACT

In order to be successful in this 21st century and to be capable in facing more complex challenges, the small medium enterprises (SMEs) in the information communication technology (ICT) sector in Uganda need to move in tandem with the progress of technology. E-commerce has many benefits for ICT SMEs sector in terms of faster communication within the firm and more efficient for managing resources of the firm. Challenges are far higher for ICT SMEs in developing countries than in developed countries, as far as e-commerce adoption is concerned. E-commerce adoption by ICT SMEs in Uganda still face the issue of scant adoption, and the ICT SMEs that have adopted e-commerce technologies still stay at the initial stages such as using emails or websites. The aim of this study is to focus on the ability to understand the knowledge regarding the ICT SMEs' of e-commerce adoption in Uganda. To achieve that, this study is developing an e-commerce adoption model for ICT SMEs sector and validated the model. This study runs into two phases by doing the preliminary study and the survey. During the preliminary study phase, e-commerce adoption model is developed based on the technology acceptance model (TAM) of perceived ease of use, perceived usefulness, perceived trust and intention to use. While in the survey phase as a quantitative method, the questionnaire is developed and then the sample size is identified. After conducting the survey, the questionnaire is analyzed using the multiple linear regression analysis. Multiple linear regression analysis found that the factors of perceived ease of use and perceived usefulness are significantly and positively contributed to the factor of perceived trust. While perceived trust significantly and positively contributed to the factor of intention to use. This shows that perceived trust has great contribution in clarifying intention to use e-commerce in Uganda ICT SMEs sector. The developed e-commerce adoption model is expected to help the Uganda ICT SMEs towards developing and accelerating e-commerce implementation. Thus, the ICT SMEs sector in Uganda will be improving in terms of the e-commerce adoption.

ABSTRAK

Untuk mencapai kejayaan pada abad ke-21 dan keupayaan untuk menghadapi cabaran yang kompleks, dalam sektor komunikasi teknologi maklumat (KTM) di kalangan industri Kecil sederhana (IKS) di Uganda perlu bergerak seiring dengan perkembangan teknologi semasa. E-dagang mempunyai banyak manfaat bagi IKS dari segi komunikasi yang cepat dan cekap untuk menguruskan sumber syarikat. IKS di negara membangun menghadapai pelbagai cabaran berbanding negara maju dalam penerimaan e-dagang. Penerimaan e-dagang adalah sedikit, tidak lengkap dan hanya pada tahap awal seperti mempunyai e-mel atau laman web. Oleh itu, motivasi utama kajian adalah untuk mengetengahkan pemahaman pengetahuan mengenai penerimaan e-dagang bagi IKS di Uganda dengan membangunkan model penerimaan e-dagang untuk IKS dan kemudian mengesahkan model tersebut. Kajian dijalankan dalam dua fasa iaitu dengan melakukan kajian awal dan tinjauan. Semasa fasa kajian awal, model penerimaan e-dagang dibangun berdasarkan model TAM yang dilihat mudah diguna, dilihat kegunaannya, dilihat kepercayaannya dan keinginan untuk menggunakannya. Semasa fasa tinjauan yang merupakan kaedah kuantitatif, soal selidik dibangun dan kemudian sampel kajian dikenalpasti. Selepas menjalankan tinjauan, soal selidik dianalisis dengan menggunakan analisis regresi linear berganda. Analisis regresi linear berganda mendapati faktor yang dilihat mudah diguna dan dilihat kegunaannya secara signifikan dan positif menyumbang kepada faktor dilihat kepercayaannya. Sementara faktor dilihat kepercayaannya secara signifikan dan positif menyumbang kepada faktor keinginan untuk menggunakannya yang mana menunjukkan bahawa kepercayaan mempunyai sumbangan yang kuat dalam menjelaskan niat untuk menggunakan e-dagang di IKS Uganda. Model penerimaan e-dagang dijangka membantu IKS Uganda ke arah pembangunan dan mempercepatkan pelaksanaan e-dagang. Oleh itu, negara membangun terutamanya Uganda akan bertambah baik dari segi sektor e-dagang.

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CHAPTER I

INTRODUCTION

1.1   INTRODUCTION

To attain achievement and capability in the 21st century is facing more complex challenges, and the developing countries around the world needs to progress ideas based on economic and community. The adoption of Information Technology (IT) proves the development of an economic system. Many researchers have been focused on the adoption of e-commerce technology by Small Medium Enterprise (SMEs) sector over last 10 years. Therefore, this study revolves around the adoption of e-commerce technologies among SMEs in Uganda.

1.2   RESEARCH BACKGROUND

The existence of the internet has brought huge benefits to SMEs. The world is now a globalized market, and customers around the world can interconnect with each other conveniently. The internet nowadays holds an essential part in people's contemporary lifestyle. In 1994, electric commerce (e-commerce) which is the procedure of promoting, transferring, buying, or exchanging services, information and goods through the internet came into existence (Mohammed et al. 2013). The Internet helps SMEs manage their information and assimilate e-commerce processes. E-commerce has many benefits for Information Communication Technologies (ICT) of SMEs through the provision of more efficient interaction and effective organizational performance. These features are beneficial as the transfer of electronic documents and information have become unified, thus increasing the SMEs' competence (Ahmad et al. 2015). E-commerce contributes to decreasing the cost of companies, providing better quality products/services, helping penetrate both customer and supplier bases, and delivering

new ways or channels for product/service delivery. Therefore, the SME sector can be seen the benefits of e-commerce not only for large companies. (Pham et al., 2011).

Through the rapid spread of information and communication technologies (ICT) and the ever-decreasing prices of communication, markets in different parts of the world have become more integrated. The spread of ICT SMEs has led several commentators to argue that these technologies are creating a new information economy in which information is the critical resource and basis for competition in all sectors – manufacturing and probably even more in services. Generally, from the performance perspective, the competitiveness effect of ICTs is derived from the impact e-commerce technology adoption has upon the productivity of the factor inputs. In this regard, e-commerce technology can improve efficiency and increase productivity of ICT SMEs through different ways, including improvements in the efficiency of resource allocations, reduction of transaction costs, and technical improvement, thus leading to the outward shifting of the production function (Susanna W., 2001).

The SME sector in Uganda, like in other areas of the world, is viewed as an important sponsor in the evaluation of the market economic system through the production of labor and cash flow development. In Uganda, SMEs are described as enterprises employing a minimum of 5 employees and a maximum of 50 employees, with a minimum annual sale turnover of 360 million Uganda shillings and total assets of maximum 360 million Uganda shillings (MFPED, 2008). SMEs are a feasible option for job creation and employment. This means that it is a perfect road to guide Ugandan youth towards beginning their own businesses and in turn, create more jobs as their businesses grow (Ahaibwe et al., 2014).

Currently, ICT SMEs face many problems. While large companies try to expand their internal processes, ICT SMEs are more worried about completeness. The adoption of e-commerce is not easy and cannot be completed all at once. The process where an organization moves from a low level to a high level of e-commerce happens slowly (Brand & Huizingh, 2008). Therefore, it is obvious that any company which wants to start the adoption process of e-commerce will face many problems.

So far there is little empirical evidence of how the diffusion and adoption of e-commerce technology can be a catalyst for ICT SMEs' competitiveness and growth in developing countries such as Uganda. Thus, managers of these companies need to find solutions for these problems and realize the opportunities that the companies will achieve after the adoption process (Abid et al., 2011). After a review on the effects of e-commerce adoption of ICT SMEs in terms of diffusion and growth, this study chooses to particularly focus on how e-commerce adoption is affected by ICT SMEs using survey data obtained from companies in Uganda. In doing so, this research will contribute to a new perception on Ugandan ICT SMEs. This is done by checking out existing models and theories, creating a conceptual model which may recognize the factors that may affect the adoption of e-commerce, and using them in the development of developing countries like Uganda.

1.3   RESEARCH PROBLEM

Many studies on Internet adoption among ICT SMEs have been conducted in developing countries such as South Africa, Egypt and Ghana rather than on SMEs' e-commerce adoption. The fact that the internet's fast growth gives huge benefits to ICT SMEs is also evident in Uganda. The internet allows people all over the world to share information and communicate. According to the internet world statistics, in June 2016, the internet usage in Africa was at 28.7% penetration rate (Internetworldstats.com, 2016).

Representatives and African development partners forecast a lot of options in the continent's effort to stop extensive poverty and in the role of SMEs. In Uganda, 80% of the SMEs are situated in urbanized areas, for example the capital city of Uganda, Kampala. But these SMEs have not adopted e-commerce (MFPED, 2008). SMEs play a crucial role in the improvement of the Ugandan economy. The sector's contribution to the Gross Domestic Product (GDP) is more than 50% and provides jobs for 2.5 million people (Osunsan et al., 2015; Sands, 2012). This indicates the importance of SMEs in Uganda's economic advancement.

It is important for ICT SMEs to be able to benefit from this new strategy. If SME managers do not realize and estimate the advantages properly, there will be little incentive for future improvements in order to reach more sophisticated levels of e-commerce. Obviously, managers of ICT SMEs face many different barriers to the adoption of new technology.

The problems faced by Ugandan ICT SMEs are such as the high costs needed to access the internet, language obstacles, and difficulty in understanding e-commerce procedures and technology needed to use it (Maswera et al., 2008). Challenges are far higher for ICT SMEs in developing countries than in developed countries, as far as e-commerce adoption is concerned (Tan et al., 2007). Ahmad et al. (2015) stated that there is still the issue of scant adoption of e-commerce by ICT SMEs. ICT SMEs that have adopted e-commerce technologies stay at the initial stages such as using emails or websites. These websites are usually informative but lack cooperating facilities such as online transactions (Maswera et al., 2008). In Uganda, the adoption of e-commerce by ICT SMEs is still scarce - they have primarily adopted e-commerce for marketing as well as communication purposes via the creation of a corporate site (Sands, 2012).

E-commerce is all about utilizing the internet to do business better and quicker. But ICT SMEs in Uganda face many barriers in using e-commerce. Although E-commerce adoption is advantageous for ICT SMEs, there are still several challenging issues including trust that burden the acceptance and adoption of e-commerce among managers of ICT SMEs (Chaudhry et al. 2016). Previous researchers who have explored the role of e-commerce in ICT SMEs had emphasized the need for investigating managers' trust in order to provide a better understanding of how this affects their acceptance and use of such e-commerce technologies (Davis, 1989; Sila, 2013). Therefore, to give motivation to the managers and stakeholders of ICT SMEs for them to trust that e-commerce adoption technology has huge benefits for their companies, this study would develop a model for e-commerce adoption.

1.4   RESEARCH QUESTIONS

Based on the research problem, using the context of the Ugandan ICT SME sector, this research seeks to answer the following research questions:

1. What are the factors that affect e-commerce adoption in ICT SMEs?

2. How can we develop an adoption model that is applicable in Ugandan ICT SMEs?

1.5   RESEARCH OBJECTIVES

Based on the research problem, it is clear that not many studies have highlighted the TAM model's factors that affect managers' perceived trust in e-commerce technology adoption. Therefore, using the context of the Ugandan ICT SME sector, the research attempts to achieve the following objectives:

1. To develop an e-commerce adoption model for ICT SMEs.

2. To validate the e-commerce adoption model for ICT SMEs using a multiple linear regression analysis.

1.6   RESEARCH SCOPE

The scope of this research is on ICT SMEs companies in Uganda that use e-commerce technology for merchandise purchase and sales, and information exchange. This study uses a questionnaire survey to answer questions on the adoption of e-commerce by Ugandan ICT SMEs.

Setting the scope of this research provides a guideline for developing the aims of the research. Al Qirim (2005) noted that e-commerce adopters are those who use e-commerce technologies such as the intranet, email, websites and other advanced applications such as online ordering and e-payment. The scope of the study is narrowed to the ICT segment of the SME sector because businesses in the ICT sector are more

eager to adopt innovation. Therefore, the owners/managers of Ugandan ICT SMEs are the unit of analysis that has been chosen for this study.

The justification for selecting Ugandan SMEs for this research is provided. Firstly, Uganda is one of the developing countries that have shown some remarkable achievements in developing its ICT SMEs. In addition, ICT SMEs and/or e-commerce related studies would be quite exclusive since such studies are still unfamiliar in Uganda. Therefore, the findings of this study will offer important insights into the effect of the investigated factors on the decision of owners/managers of Ugandan ICT SMEs to improve their adoption of e-commerce.

1.7   RESEARCH METHOD

In order to measure and anlyse the affect e-commerce adoption on ICT SMEs, a quantitative methodology will be followed. A quantitative research can be defined as follows:

"Quantitative is predominantly used as a synonym for ny data collection technique (such as a questionnaire) or data analysis procedure (such as graphs or statistics) that generates or uses numerical data" (Saunders et al. 2007).

A survey technique was used in this reseach. According to creswell and plano 2011), a survey is well-known quantitative method, in which the researcher uses a questionnaire to whole population (or sample of them) to elicit the opinion, manners or charactrestics of the statistical popualtion. Questionnaire as an instrument of measurement is broadly applied to collect data for the survey. The collected data will be coded and analysed using statistical package for social scinece (SPSS v.20) wich includes different statistical analysis tools to analyse the collected data. These tools include cronbach's alpha coefficient, descritptive statistics, ANOVA, correlation and multiple linnear regression analysis.

1.8   THESIS ORGANIZATION

This thesis consists of five chapters. Chapter I offers an examination of the background of the research, research problem, research objectives, research questions, research scope, research process and thesis organization. The other chapters of the thesis are structured as explained below.

Chapter II offers an outline of e-commerce adoption and ICT SME related literature, along with the concepts of perceived trust, factors affecting e-commerce adoption, theories of adoption, the TAM model, and the proposed model.

Chapter III exhibits the research approach of the study. This chapter also provides an overview of the research methodology, in addition to sampling strategies. The last component of Chapter III discusses improvements to the questionnaire and the techniques as well as procedures used for information collection. This chapter additionally covers the validity analysis of the instrument used. Additionally, the pilot test results are mentioned in addition to the statistical resources utilized to evaluate the formulated investigation hypotheses.

Chapter IV deals with the data analysis as well as procedures utilized to evaluate the hypotheses of the investigation. It begins with descriptive statistics on the respondents, the ANOVA for demographic factors, and the correlation between variables. This is followed by the description of multiple linear regressions used to conduct hypothesis testing.

The final chapter of this study, Chapter V discusses as well as concludes the study. The chapter begins with a conceptual model of the research findings and achievement of the research objectives. It also presents the research contributions. Finally, this chapter discusses the limitations of the research, and recommendations for further studies.

1.9   SUMMARY

The study background is described in this chapter. Since the internet was started, the world has become a global village. Then, e-commerce was introduced in 1994. Various researches on e-commerce adoption have been conducted for different countries. This study chooses to focus on the ICT SME sector of Uganda. The objective of the research is to highlight the need to understand ICT SMEs' adoption of e-commerce and improve the e-commerce adoption model for the specific case. The next step taken is to validate the model using a multiple linear regression on the data collected through the use of a questionnaire survey. The study will provide useful input towards Uganda's development.

LITERATURE REVIEW

2.1   INTRODUCTION

Chapter Two presents some early works conducted on e-commerce adoption among ICT SMEs. The main point of the literature review is to identify the factors other researchers have studied on. This review also takes into consideration recently published studies related to e-commerce, especially studies on developing countries' e-commerce sector. The concept of trust along with theories and models on the adoption of e-commerce are also discussed.

2.2   ELECTRONIC COMMERCE TECHNOLOGIES

E-commerce is viewed as among the novel and dynamic worldwide elements which arose during the late 20th century. It has become among the primary variables for the worldwide economic system. E-commerce type principally depends on the most present information and communication technologies in extending the global marketplace from the East to the West and throughout the different continents around the world.

2.2.1   Definition of E-commerce

A lot of publications have defined e-commerce in different ways. Rhee and Riggins (1998) defined e-commerce as the sharing of transaction data, preserving company corporal relationships, and doing business transactions using internet-based technology. Sullivan (1998) defined e-commerce as anything that improves the interactions with a current customer plus boosts the revenue from the buyer. While some studies defined e-commerce as a process of purchasing as well as selling items on the internet.

Subsequently, the word was created and the expression "exchange of information" was included with the marketing and "buying of goods" (Chong, 2008). Rainer and Cegielski (2011) also explained e-commerce as a procedure of purchasing, selling, transferring, or exchange of items, service, or info via computer networks, like the web.

Chaffey (2007) defined e-commerce as electronically mediated transactions between a company and some third party. Therefore, e-commerce is not restricted just to purchasing but also selling. E-commerce is the procedure of blending together tasks which comprise of the purchasing as well as selling of products and services over computer networks by businesses, governments and other organizations or individuals. It is beneficial for traditional businesses as it adds flexibility and speed through electronic transactions. It also saves cost and increases competitiveness and efficiency through the redesigning of traditional business methods.

2.2.2   Types of E-commerce

E-commerce has many different types. The four main categories of e-commerce related to commerce situations include Business-to-Consumer (B2C), Business-to-Business (B2B), Government-to-Business (G2B), and Consumer-to-Consumer (C2C). B2B is transactions between two separate businesses that involve the exchange of information, products, or services. B2B is the largest part of e-commerce. B2C are transactions that contain the exchange of information, products, or services from business to individual consumers. C2C is transactions between customers. C2C is the exchange of information, products, or services through the internet. C2C is also called Person-to-Person (P2P) transactions. Meanwhile, G2B is transactions between governments and businesses. Consumers and organizations can do business with governments using the internet, e.g. for the payment of taxes.

2.2.3   Benefits of E-commerce

E-commerce has considerable and evident influence on businesses as it modifies the way products are manufactured, services are created, and how both products and services are delivered to clients. It also changes the way companies interact with each

other as it facilitates easy and efficient communication. This makes e-commerce an attractive proposition for the growth of SMEs (Boyer & Oslon, 2002). The adoption of e-commerce is important to SMEs as well as large companies, as evidenced by Lawson–Body and O'Keefe's (2006) study which found that companies can leverage on e-commerce to conduct activities. Therefore, companies' management should realize the potential of e-commerce in improving the performance of SMEs.

Past studies have mentioned several advantages of adopting e-commerce. These include minimizing the costs related to a company's activities, streamlining processes for the smooth running of operations, improving the market reach of a company, opening venues of opportunity, and enhancing operational efficiency in the short as well as long terms. In addition to the above benefits, e-commerce adoption also assists in reinforcing the interaction between companies and their suppliers, customers, and partners through the creation of a novel method of a selling and buying products which has significant influence on company performance (Sila, 2013; Hajli et al., 2014).

Literature related to e-commerce adoption point to several types of cost reductions such as transaction costs, coordination costs, distribution costs, and marketing and administration costs. Additional reductions in cost are also brought about by the adoption of e-commerce, as evidenced Al-Bakri et al.'s (2010) study on cost reductions in terms of marketing, customer support, and cost-related supply chains.

Furthermore, the benefits of e-commerce also cover other business areas such as the relationship of a firm with its suppliers, access to new customers and markets, and reach to suppliers who were inaccessible prior to e-commerce adoption (Vatanasakdakul et al., 2004). E-commerce also facilitates timely responses and reactions to market changes owing to the rapid rate of data exchange available and the precise control that can be exerted over operations and processes to fine-tune them with the aim of meeting production demands and customers' desires (Zeng et al., 2003).

More importantly, e-commerce also enables the integration and analyses of data and assists in minimizing staffing overheads and other costs that are intangible yet affect the timely and quality delivery of products and services; as such, it helps provide

customer satisfaction when it comes to product/service delivery (Vatanasakdakul et al., 2004). In addition to the above advantages, e-commerce also helps in the making of timely decisions as it enables managers to keep abreast of market changes through the monitoring of products and services by which they can determine the demand for the firm and act according to any changes observed (Moodley, 2003).

2.2.4 Challenges and Barriers of E-commerce

Many studies have categorized several challenges and barriers in e-commerce. Based on Arendt (2008), small companies encounter more problems in finding e-commerce solutions compared to large firms. Small corporations need to carefully estimate the challenges and possible benefits of implementing e-commerce. Additionally, the new strategy requires a lot of changes in the business aspects of a company's transactions. In case the strategy doesn't fit the company's mission, it may lead to poor customer experience as well as minimal investment returns. This is riskier for small firms since they may be afflicted by insufficient knowledge and capital, and there are a lot of issues with security, orders as well as buy suspensions. Thus, the obstacles for SMEs to apply e-commerce are such as the lack of capital, knowledge and protection (Arendt, 2008).

The difficulties as well as barriers to the adoption of e-commerce are numerous more so for small businesses compared to large businesses. Arendt (2008), Duan (2012) and Abid et al. (2011) who conducted their studies on SMEs in Australia indicated that internal challenges are better than external challenges. Most Australian small-sized companies lack knowledge and skills, and face cost barriers (Abid et al., 2011). Security risks also increase along with the company's gradual openness to the environment, as the company may be much more vulnerable to attacks. This may subsequently adversely impact the company's inner environment and may end the e-commerce utilizing procedures in its beginning stages (Oh et al., 2012).

Moreover, Oh et al. (2012) stated that security risk is increasingly evident in the world and thus, companies are more susceptible to attacks. This in turn can discourage companies' e-commerce adoption. The most general problem as mentioned in recent publications is the security problem which is related to the lack of trust.

Research on small and medium sized firms suggested that significant obstacles that are faced by these kinds of firms are such as startup costs, followed by recurring costs. As small companies have no quick access to capital, this becomes a significant obstacle. However, with technological developments, declining investment along with other variables may probably come out as less important than skills as well as knowledge (Fillis et al., 2003; Arendt, 2008).

The primary obstacle is the absence of compatibility between technical infrastructure and a company's e-commerce technology. Abid et al. (2011) who examined the barriers to the beginning of e-commerce application found that small firms are not prepared to introduce e-commerce. The preparation process made is insufficient and they undervalue the sophistication of technology and also the intricacy of the process.

Stockdale and Standing (2004) opined that it all depends on how the world categorizes e-commerce barriers. Generally, it is put into 4 groups; insufficient understanding and source, degree of skills of workers, security issues, as well as the e-readiness of small enterprises. Likewise, Lawson et al. (2003) grouped barriers to e-commerce into technical and social barriers. MacGregor and Vrazalic (2005) grouped the same issue into four barriers: technical know-how, management time, economic concerns and education. These barriers are summarized in Table 2.1.

Table 2.1   E-commerce barriers

E-commerce barriers		References
Technological	Lack of technical skills and IT knowledge	Stockdale and Standing (2004)
	Lack of trust	Oh et al. (2012), Stockdale and Standing (2004), Yousefi and Nasiripour 2015 & Malaquias and Hwang 2016)
	Lack of security	Oh et al. (2012).
	Technical barriers	Lawson, et al. (2003) & MacGregor and Vrazalic (2005)
	Education barriers	MacGregor and Vrazalic (2005)
Environmental	Social barriers	Lawson, et al. (2003)
	Economic concerns	MacGregor and Vrazalic (2005)

Continuation

Organizational	Lack of skills and knowledge	Arendt (2008), Duan (2012), (Abid et al. 2011) & Stockdale and Standing (2004)
	Cost barriers (Lack of capital/resources)	Arendt (2008), Duan (2012) & (Abid et al. 2011) & Stockdale and Standing (2004)
	Lack of e-readiness of small business	Stockdale and Standing (2004)
	Management time barriers	MacGregor and Vrazalic (2005)

2.3   SMALL & MEDIUM ENTERPRISES

Small and medium enterprises exist in every economic sector and they play a key role in a country's economic development (Jones and Alrousan, 2016; Hamid et al., 2016). Undoubtedly, SMEs open opportunities for employment and contribute highly to the economy (Mirbargkar, 2009). As such, they are required for the long-term growth, sustainability, and validity of an economy (Thassanabanjong et al., 2009). In developing nations, SMEs account for over 60% of the gross domestic product (GDP) and over 70% of total employment (Ayygari et al., 2011). Indeed, SMEs in developed nations also employ a huge percentage of the workforce. For instance, in Australia, SMEs employ approximately 42% of the entire private sector workforce (Loera & Marjnski, 2015). In the European Union (EU), SMEs account for around 66% of all businesses employment (Loera & Marjnski, 2015), while in the USA, they represent a huge proportion of firms, and approximately 50% of the US' GDP is produced by the non-agricultural SME sector (Hammer, 2010). Therefore, SMEs must be supported as they constitute a major driving force for boosting private ownership and business skills (Gadenne & Sharma, 2009).

2.3.1   Definition of SMEs

SMEs have no universal accepted definition. Every country or region develops its own definition for SMEs. Each country defines how the situation of their SMEs is. According to Tetteh and Burn (2001), SMEs are defined as firms with less than 500 employees, and it is further divided into three categories. The categories are micro, small and medium enterprises. A micro enterprise is a firm that has 5 or less employees.

A small enterprise is a firm that has 5 to 20 employees, while a medium enterprise is a firm that has 20 to 50 employees.

The European Union (2003) defines SMEs into three categories. The first category which is micro enterprises are defined as "enterprises with a maximum number of 10 employees, a maximum turnover of 2 million euros and a maximum balance sheet of a total of 2 million euros". The second category which is small enterprises are defined "as enterprises with a maximum number of 50 employees, a maximum turnover of 10 million euros and a maximum balance sheet of a total of 10 million euros". The third category is medium enterprises which is defined as "enterprises with a maximum number of 250 employees, a maximum turnover of 50 million euros and a maximum balance sheet of a total of 43 million euros".

The World Bank defines an SME as a firm that has around 300 employees and a total annual asset of around US$15 million (Zavatta, 2008). These definitions may not apply to all countries or economies. Africa itself defines SMEs as firms that employ 0-250 employees (Ayyagati et al., 2005). However, in Uganda, SMEs are defined as enterprises which hire a minimum of 5 employees and a maximum 50 employees with an annual sales turnover of 360 million Uganda shillings as well as a complete property of maximum 360 million Uganda shillings (MFPED, 2008). Table 2.2 summarizes the definition of SMEs.

Table 2.2   The summary of SMEs definition

Source		Burn&Tetteh (2001)	European Union (2003)	Zavatta (2008)	Ayyagariet al. (2005)	MFPED (2008)
Micro	No. employee	<5	<10	-	-	-
	Turnover	-	<2 million euros	-	-	-
	Balance sheet	-	<2 million euros	-	-	-
Small	No. employee	5 – 20	10 – 50	-	-	-
	Turnover	-	<10 million euros	-	-	-
	Balance sheet	-	<10 million euros	-	-	-
Medium	No. employee	20 – 50	50 – 250	-	-	-

To be continued

Continuation

	Turnover Co	-	<50 million euros	-	-	-
	Balance sheet	-	<50 million euros	-	-	-
Total	No. employee	<500	-	300	0 – 250	5 – 50
	Turnover (million)	-	-	-	-	360 Uganda shillings
	Balance sheet	-	-	-	-	-
Total asset (million)		-	-	US$15	-	360 Uganda shillings

2.3.2   ICT sector in Uganda SMEs

The latest developments in the area of Information Communication Technology (ICT) have resulted into information societies that are attracting investments in ICTs and creating jobs globally (Gurumurthy, 2004). Not quite long ago, ICTs had not contributed much towards national growth; however, in today's world ICT SMEs are a key driver for most economies, including Uganda (Ssewanyana and Busler, 2007). The advent of telecommunications and mobile telephony in Uganda in the late 1990s is considered to have ushered in most of the technological achievements that the nation boasts of now. In fact, it is believed that most jobs in Uganda's services sector are created by ICT, with about 40% contributed by the telecommunications sub-sector alone.

The use of new technologies, particularly ICT has been proven to have positive effects to a certain extent when utilized by any individual, organization, or network. Generally, ICT adoption in business boosts the competitive advantage of enterprises in their respective industries when used in their operations. These technologies allow companies to gain access to necessary information at any place and any time (Ghobakhloo et al., 2011). In Lester and Tran's (2008) study, they said that the Internet and mobile technologies also help increase marketing capacities by helping SMEs overcome their size disadvantage and get a wider market reach. Through the use of ICTs, firms are also provided with means for better process management, resulting in

lower costs and optimal use of resources for business operations (Castel & Gorriz, 2012).

Currently, ICT firms in Uganda provide various products and services including telecommunication services such as mobile phone lines, fixed phone lines, and broadband services. They also offer software solutions and managerial services (e.g., human resources, sales management, and accounting and finance management), web-based products and services (e-learning, training, and consultancy), and have also successfully developed cellular phone applications. ICT SMEs play a crucial role in the development of the economy and society. ICT SMEs are important for any country in the world, whether developing or developed. However, ICT SMEs in developing countries face many challenges and at the same time, play an important role for the development of the economy (Tan et al., 2007).

2.4   FACTORS INFLUENCING THE ADOPTION OF E-COMMERCE

Many studies have focused on the factors of e-commerce adoption. Mac Gregor and Vrazalic (2005) in their study conducted in Australia identified that technological factors, environmental factors and organizational factors are the factors that influence e-commerce adoption. Mikkelsen (2014) indicated in his study that perceived risk, signal cues, perceived trust, situational normality, perceived ease of use and perceived usefulness are factors that could affect e-commerce adoption of small e-commerce stores. Ghamatrasa (2006) identified in her study conducted in Iran that organizational readiness, compatibility, external pressure, perceived ease of use, perceived usefulness and entrepreneurial orientation are named as some factors which could influence e-commerce adoption.

Ahmad et al. (2015) indicated that three grouped factors; technological, environmental and organizational are factors influencing e-commerce adoption. They divided these factors into sub-factors: for the technology factor, it is divided into perceived relative advantage, perceived compatibility and perceived complexity; for the environmental factor, it is divided into external change agents, pressure from trading partners and form competitors; and lastly for the organizational factor, it is divided into

e-commerce knowledge and management's attitude towards e-commerce. They described that all these factors are positively related to e-commerce adoption.

Kim et al. (2008) suggested that perceived risk, customer loyalty, perceived advantage and intention to use are factors that determine e-commerce adoption. Similarly, Mohammed et al., (2013) discovered that perceived ease of use, safety measures, willingness of executives, perceived usefulness, organization readiness and consumer requirements are factors influencing the adoption of e-commerce. Meanwhile, Hamid et al. (2016) suggested that perceived ease of use and perceived usefulness are factors which influence the adoption of brand new technology. Additionally, Davis (1989) indicated through his findings that perceived ease of use and perceived usefulness are factors that have a good relationship with e-commerce. This shows that researchers have found various factors in their respective studies, and thus result in conflicting findings. The bulk of papers reviewed specifically utilize perceived ease of use and perceived usefulness as factors of e-commerce adoption.

Thus, this study suggests perceived ease of use, perceived usefulness, perceived trust and the intention to use as factors describing the adoption of e- commerce technology amongst SMEs in Uganda. Table 2.3 displays a summary of the e-commerce adoption factors.

Table 2.3   Summary of e-commerce adoption factors

Factors		References
Technological	Perceived risk	MacGregor and Vrazalic (2005), Mikkelsen (2014), Kim et al. (2008)
	Perceived trust	Mikkelsen (2014), Kim et al. (2008), Tim (2014), Rousseau et al. (1998)
	Perceived ease of use	Mikkelsen (2014), Ghamatrasa (2006), Mohammed et al. (2013), Hamid et al. (2016), Davis (1989), Yusuf & Lee (2015), Cheung & Vogel (2013), Park et al. (2014), Muk & Chung (2015), Thanh (2010), Adnan et al. (2015)
	Perceived usefulness	Mikkelsen (2014), Ghamatrasa (2006), Mohammed et al. (2013), Hamid et al. (2016), Davis (1989), Yusuf & Lee (2015), Cheung & Vogel (2013), Park et al. (2014), Muk& Chung (2015), Thanh (2010), Adnan et al. (2015)

To be continued

	Continuation	
	Perceived compatibility	Ghamatrasa (2006), Ahmad et al. (2015)
	Perceived relative advantage/benefit	Ahmad et al. (2015), Kim et al. (2008)
	Perceived complexity	Ahmad et al. (2015)
	Security	Mohammed et al. (2013)
Environmental	Situational normality	MacGregor and Vrazalic (2005), Mikkelsen (2014)
	External pressure (trading partners, competitors)	MacGregor and Vrazalic (2005), Ghamatrasa (2006), Ahmad et al. (2015)
	External change agents	MacGregor and Vrazalic (2005), Ahmed et al. (2015)
	Customer needs	MacGregor and Vrazalic (2005), Mohammed et al. (2013)
Organizational	Entrepreneurial orientation	MacGregor and Vrazalic (2005), Ghamatrasa (2006)
	E-commerce knowledge	MacGregor and Vrazalic (2005), Ahmad et al. (2015)
	Management attitude toward e-commerce	MacGregor and Vrazalic (2005), Ahmad et al. (2015)
	Intention	MacGregor and Vrazalic (2005), Kim et al. (2008), Davis (1989), Yusuf & Lee (2015), Cheung & Vogel (2013), Park et al. (2014), Muk& Chung (2015), Thanh (2010), Adnan et al. (2015)
	Willingness of manager	MacGregor and Vrazalic (2005), Mohammed et al. (2013)
	Company readiness	MacGregor and Vrazalic (2005), Mohammed et al. (2013)

2.5   THE CONCEPT OF PERCEIVED TRUST

The most significant factor for a majority if not all successful companies is perceived trust (McAllister, 1995). The benefits firms get through perceived trust include the lessening of transaction costs; increased productivity and versatility; likewise, perceived trust assists companies' design of successful marketing or tactics accurately (Dyer, 1997; Zaheer et al., 1998; Dhillon and Chen, 2003). Perceived trust is determined by the integrity, character or ability of a person or thing. Kini and Choobineh (1998) defined perceived trust "as a situation where even if the consequence remains indiscernible the trusted has trust on the trustee that the latter will care about the former's advantages as well as the formers willingness to rely on the latter's decisions".

Zaltman and Moorman (1988) described that perceived trust might be regarded as a circumstance where one party's perception is hinged on the terms of another party

which may result in the growth or maybe upkeep of a two-way relationship. The meaning of perceived trust continues to be provided in different ways according to various channels of literature. In psychology for example, studies defined perceived trust as an institution-based trust, while in social psychology, it represents trusting beliefs and intentions (McKnight and Chervany, 2001).

Boeyen and Moses (2003) divided perceived trust into two primary types which are direct trust and third-party trust. The initial category is a trust bond developed by two parties, while the second kind is developed among parties who are strangers but need to believe in one another based on a reliable third party. Third-party trust is important on the internet because internet transactions largely happen between parties that are strangers. Nooteboom and Six (2003) mentioned that perceived trust isn't just restricted to a situation where someone decides to believe in a party to a specific degree and thus reduces his/her trust in other parties. Therefore, the truster's tendency to take part in the services or maybe goods supplied by the reliable company's competitors might reduce with the presence of trust (Zaheer et al., 1998). Furthermore, in an unsure situation, trust could boost the end-user's inspiration to interact with the opposite party (McKnight and Chervany, 2001).

Also, parties who do not have any kind of relationship with end-users generally work together with the people they trust, most especially in uncontrollable or unfamiliar situations. Trusted relationships at present are not only developed exclusively between people or organizations as it can also be created between individuals and shopping agents or perhaps between people and computing methods (Lee and Turban, 2001).

Additionally, if confronted with unpredictable communication channels or maybe non-established scenarios, individuals could have distinct degrees or distinct behaviors of trust beliefs as well as intentions. There are three crucial factors which relate to the development of perceived trust connection between internet businesses and end users, which are the goodwill of the business, the caliber of the website, and the security of the internet business atmosphere (McKnight et al., 2002).

In addition to this, McKnight & Chervany (2001) noted that e-commerce trust may center on web vendors (interpersonal trust), the end-users' general trust (dispositional trust) and the transaction's web surroundings (institutional trust). Trust is defined in more than one aspect in most literatures. Over half of the selected books and articles are however consistent in the belief that there ought to be more than one significance to the word (McKnight et al., 1996). Perceived trust is investigated in different fields, which becomes the reason why the word does not possess a single characterization due to diverse definitions from the perspectives of economics, marketing, sociology, political science and psychology.

Hoffman (1999), Gefen and Straub (2000) and Jarvenpaa (1999) also stated that trust has been made a serious factor due to the public nature of the Internet as a transaction platform for global e-commerce constitutions. This is similar to the concept of trust being an important facilitator of e-commerce. Be it economic, social, financial or religious, perceived trust is core to almost all daily interactions, practices and transactions. Trust is comprehensively chosen by e-commerce literature as a major barrier in its adoption and growth. Untrusted perceptions in e-businesses must be resolved if businesses desire to build, confirm and maintain trust with its customers as recommended in commonly cited research (Cheskin, 1999).

2.6 THEORIES OF ADOPTION

E-commerce technology from its foundation is facilitated by IT. Thus, it is important that IT adoption models need to be explained first in order to help explain e-commerce technology adoption. In general, these models follow three forms, namely the diffusion strategy, a domestication strategy and adoption strategy (Titah and Barki, 2006). These approaches are primarily concerned with explaining personal novel technology adoption. In general, these models are called technology adoption models. IT adoption models for instance the Theory of Reasoned Action (TRA), Unified Theory of Acceptance, Use of Technology (UTAUT), Diffusion Of Innovation (DOI), and Technology Acceptance Model (TAM) were examined in this research. The most relevant model to help support this research is thus selected, with details to support the justification.

Davis (1989) developed the TAM model with the target of explaining users' inclination towards utilizing as well as accepting technologies. Bwalya (2009) defined the model as the degree to which an individual think that using a certain product can possibly improve his/her overall performance on the task. Perceived usefulness is defined as the degree to which a person believes that utilizing a certain program will be effortless, while perceived ease of use is a person's perception of the key individuals in their life who decide whether they need to or not perform specific action is definitely the very subjective majority. Venkatesh et al. (2003) facilitated the reasons regarding the adoption type of technology related to the TAM model and referenced the resulting model as the UTAUT. The model helps administrators examine the potential of a booming and performing technology and the reason behind the acceptance of that technology.

UTAUT is a mix of 8 behavioral models of technology adoption which are the basic principles of reasoned action, motivational look, TAM, concept of planned conduct, a mix of the TAM and also the theory of planned conduct, the interpersonal cognitive principle, PC utilization model, and the innovation diffusion theory. In a majority of previous studies on technology, the innovation adoption and diffusion single models of UTAUT were utilized in the area of information system, advertising, social psychology and administration. According to the UTAUT model, three constructs directly influence the intent to make use which are community impact, energy expectancy (complexity) as well as performance expectancy (relative advantage).

The DOI theory was created by Everett Rogers to examine the qualities of technology adopters including images, compatibility, relative advantage, complexity, invisibility, results' demonstrability, and innovative use. The DOI stresses the inclination of the organizations and individuals to accept new technology following their perception of this technology's compatibility to their values beliefs, its absence of complexity and its relative advantages (Napoli et al., 2000; Forman, 2005; Lewis et al., 2003; Lee et al., 2011). The DOI principle emphasizes on the tendency of businesses as well as people to take on brand new technology (Forman, 2005; Lewis et al., 2003; Lee et al., 2011). Diffusion of new advancement principles had originated from sociology

and wasn't initially perceived as a model for technology adoption, but rather a model for typical innovation.

Based on Ajzen and Fishbein (1980), theory of reasoned action TRA is among the pioneering theories that initially explain computer usage and acceptance behavior. Under this concept, an individual's subjective norms as well as attitude are both determinants of behavioral intent. An individual's ingrained beliefs of the results of an action performed multiplied by the analysis of outcomes are driven by attitude. Whereas, the establishment of an extremely subjective norm is a multiplicative aspect of a person's normative values, in other words the perceived expectation and motivation of essential individuals or staff on a person. Under various labels, analysis on the designs revealed that similar constructs can be found in every model. Usability (perceived ease of use of TAM, effort expectancy of UTAUT, technical complexity of DOI) is the most common construct. Strong influences on the intention to use and actual use are perhaps the broadest set of constructs which may likewise be continually shown.

An extensive review of IT adoption models discussed upfront had revealed that the TAM model may be the sole theory employed in studies to analyze the factors connected to method qualities via perceived ease of use and also perceived usefulness. The purpose of the present research is to explore the effects of the adoption of e-commerce technology on users' perceived trust in such systems.

Thus, the TAM model was used to help understand users' adoption behavior for an information system. Several researchers had tested the TAM model with solid results (Surendran, 2012). Davis (1989) had particularly investigated on TAM as the appropriate model. The reason behind selecting the TAM model is in its convenience as well as effectiveness of forecasting people's use and adoption of new technology (Davis, 1989).

2.7   TECHNOLOGY ACCEPTANCE MODEL (TAM)

The emergence of multiple innovative IS, their high complexity, and difficulties in dealing with them are considered impediments for end-users who usually face problems

in terms of the ability to deal with these new technologies when applied to an organization or when replacing traditional systems with more modern ones. Thus, this will lead to the failure of these new systems to reach the goals of an organization which is to achieve the greatest possible degree of competition. The failure of user acceptance of new technologies has led to the establishment of an important model to determine whether users will be able to accept these new technologies and the possibility of dealing with them. The model which was developed by Davis (1989) is called the TAM model.

The technology acceptance model (TAM) was initially developed by Davis in 1989 according to the theory of reasonable activity (TRA) (Fishbein and Ajzen, 1980; Ajzen and Fishbein, 1975). TAM is suggested as it describes as well as forecasts the behavioral component of behavioral intentions and information technology depending on the use and acceptance of information technology. It models exactly how users accept and adopt certain technology (Lee and Yusuf, 2015). A lot of researchers have applied TAM in numerous various solutions such as e -learning (Vogel and Cheung, 2013), teleconference (Park et al., 2014), and brief message services (Muk & Chung, 2015). This model explains what causes individuals to reject or accept Information Technology. Chooprayoon et al. (2007) determined that the primary objective of the TAM model is to present a strategy for learning the consequences of external variables on internal opinions as well as people's motives and perceptions. Behavioral intention is in turn determined by two particular beliefs, which are perceived usefulness and perceived ease of use. Additionally, TAM suggests that perceived usefulness is influenced by the perceived ease of use because the easier a system is to use, the more useful it can be. Figure 2.1 shows Davis' initial TAM model built in 1989.
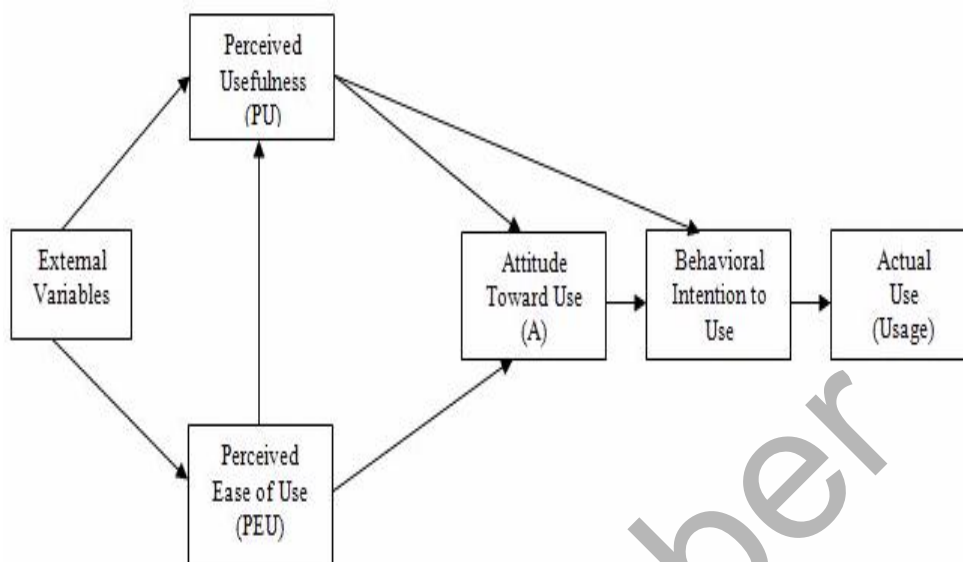
Figure 2.1   Technology acceptance model

Source: Davis 1989

TAM is considered as one of the most influential theories commonly used to explain the acceptance of individual IS (Lee et al., 2003) because it suggests only a small number of factors, namely perceived usefulness and perceived ease of use which together account for use. These factors are specific, simple, easy to understand, and can be manipulated through the design and implementation of the system. Taylor and Todd (1995) showed that TAM can be applied to understand the behavior of both novice and experienced users with different emphasis on the determinants of intention. In addition, TAM has been used in longitudinal studies (Venkatesh and Davis, 2000; Kim and Malhotra, 2005), thus confirming that both perceived usefulness and perceived ease of use remain the determinants of intention and behavior over time, and that perceived ease of use significantly influences perceived usefulness.

From the above discussion, it is clear that managers of ICT SMEs must recognize that the failure of new systems is often due to the lack of users' acceptance either because they do not see the desired benefit from the use of it or because they encounter complications that caused them difficulties in dealing with the new system, and thus difficulty in performing their daily duties as required which in turn results in system failure. Therefore, this study adapts perceived ease of use and perceived

usefulness as factors affecting perceived trust in the e-commerce technology adoption by the ICT SME sector (see Figure 2.2).
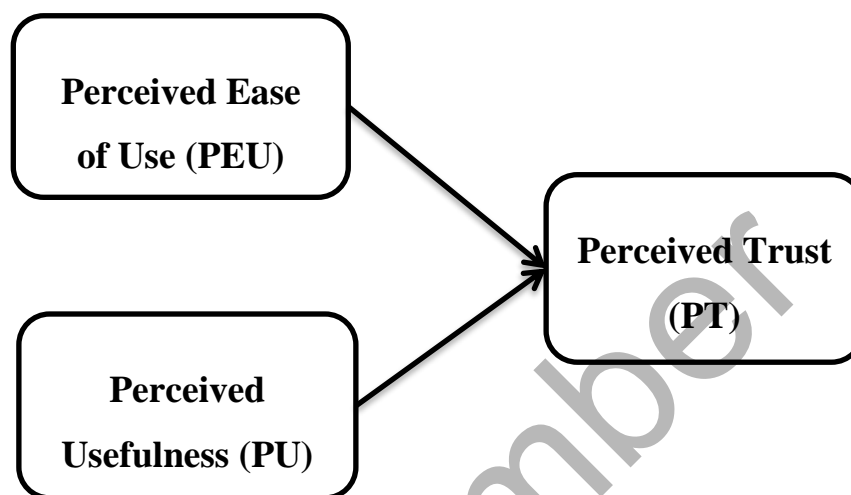
Figure 2.2   Factors influencing perceived trust in e-commerce adoption

This study proposes a model that focuses on e-commerce adoption behavior as its core feature. The conceptual model can be divided into perceived usefulness and perceived ease of use as factors used initially by Davis in his TAM model (Davis, 1989). This study adds perceived trust (PT) as an additional element in building the model.

PT is defined as how a user evaluates or assesses transactions (e.g., seller) (Ba & Pavlou, 2002). PT is measured as an important component in the success of any business transactions as it reduces uncertainty (Al-Sharafi et al., 2016; Yousefi & Nasiripour, 2015). One of the most daunting barriers in e-commerce adoption is the lack of perceived trust (Yousefi & Nasiripour, 2015; Malaquias & Hwang, 2016). Many researchers have highlighted the importance of perceived trust (Sila, 2013). Therefore, this study aims to shed light on these four factors: perceived ease of use, perceived usefulness, perceived trust and intention to use/ adopt.

Based on these variables, the study's hypotheses were derived on the basis of the advancement of the research model and also the factors that may affect e-commerce adoption by ICT SMEs in Uganda.

a. Perceived ease of use factor

Based on Horton et al. (2001), the key variable in the TAM model is perceived ease of use. Additionally, to make clear explanations why companies adopt e-commerce, perceived ease of use has been estimated as very important in numerous significant scientific studies (Hoffman et al., 1999; Gefen, 2000). Consequently, it is clear that the perceived ease of use is actually a crucial factor when studying people's intentions to adopt internet-based e-commerce technologies (Ismail and Shajari, 2010).

A number of researchers have extended TAM and also described in their studies that there is a relationship between perceived ease of use and perceived trust. Cho et al. (2007) stated that perceived ease of use positively affects perceived trust. Awad & Ragowsky (2008) discovered that perceived ease of use positively effects perceived trust among IT adopters. Mikkelsen (2014) and Herzallah and Mukhtar (2016) suggested that there is a good relationship between perceived ease of use and perceived trust. Therefore, perceived ease of use is a crucial factor that impacts perceived trust in the adoption of e-commerce technologies. Based on the above stated relationship between perceived ease of use and perceived trust, this study thus hypothesizes that:

H1: Perceived ease of use positively affects perceived trust towards using e-commerce.

b. Perceived Usefulness Factor

Davis (1989) defined perceived usefulness as "the degree at which a person believes that using a specific system would improve job performance". Park et al. (2014) also hypothesized perceived usefulness to be a straight forecaster of a person's behavioral intention to use a technology of interest. Moreover, a study conducted in Palestine on e-commerce services showed that perceived usefulness is a major influencing factor of perceived trust (Herzallah & Mukhtar, 2016).

In addition, several researches have conveyed that perceived usefulness positively affects perceived trust in e-vendors (Awad & Ragowsky, 2008; Mikkelsen,

2014). Thus, perceived usefulness is considered an important factor that affects perceived trust in e-commerce technology adoption. Therefore, it is hypothesized that:

H2: Perceived usefulness positively affects perceived trust towards using e-commerce.

c.   Perceived trust factor

According to earlier studies, there exists a good relationship between perceived trust and intention to use e-commerce. Thus, perceived trust is regarded as a factor which considerably predicts a user's goal to accept the usage of e-commerce services. Previous analysis found that perceived trust is a primary component that influences subscribers to recognize e-commerce (Chaudhry et al., 2016). Rousseau et al. (1998) identified perceived trust in their study as a psychological state comprising the intent to recognize vulnerability primarily based upon the good expectations of motives or someone else's actions. Thus, following these actions, perceived trust is considered an important factor that affects the intent to use e-commerce technologies. In these studies, perceived trust has been shown to positively affect the intention to use e-commerce technology. Therefore, it is hypothesized that:

H3: Perceived trust positively affects intention to use e-commerce.
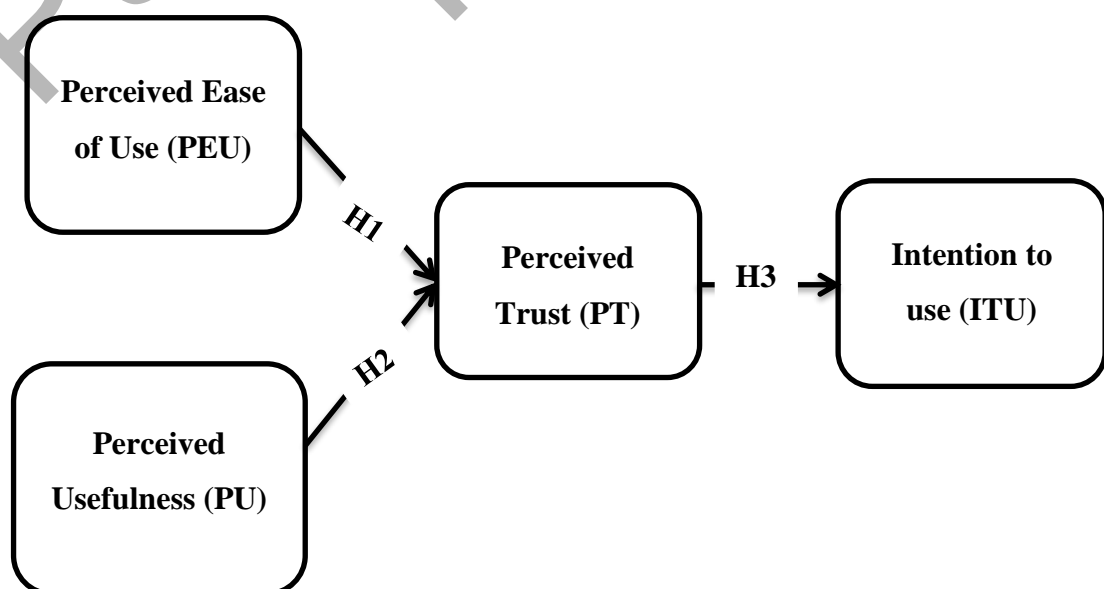
Figure 2.3   proposed model

2.8   CHAPTER SUMMARY

Chapter 2 describes previous studies linked to the study's area of focus alongside the theoretical framework and proposed conceptual model. This chapter started by explaining e-commerce and its various types. After that, this chapter described the challenges and barriers facing the adoption of e-commerce, and the benefits arising from the utilization of e-commerce. It was mentioned that there is no universal definition of SME as every country has its own definition for SMEs. Therefore, this chapter proceeded to explain some of the definitions of SMEs, especially in terms of Ugandan SMEs and subsequently, the subsector of Ugandan ICT SMEs. This chapter also described the factors which affect e-commerce adoption. Many factors are known to affect e-commerce adoption such that every researcher applies different factors as seen fit. This study chose to utilize perceived ease of use, perceived usefulness, perceived trust and intention to use e-commerce as factors influencing e-commerce adoption. Finally, the study's hypotheses were formulated, and a conceptual model was proposed based on the combination of factors from previous studies on the theory of adoption and the TAM model.

CHAPTER III

METHODOLOGY

3.1   INTRODUCTION

Chapter three presents the methodology applied in the study. This chapter is divided into four phases as mentioned chapter 1. It began with preliminary study and literature review phase, theoretical analysis and design phase which contain population and sample, the instrument of the questionnaire, pilot test, this phase also concentrated data collection and statistical analysis of data, data analysis and result phase, and last phase which is discussion and conclusion phase.

3.2   RESEARCH PROCESS

The research process is a step-by-step process of developing a research. It is generally a guideline used to solve a problem by outlining its specific components, for example the important phases, tasks, methods, techniques and tools needed (Ayyash et al., 2012b). Figure 3.1 reflects the research process that is applied to address the proposed research issue. In this research, the process is developed in four phases as presented in Fig 3.1 The objectives of each phase are outlined.

Phase1: Preliminary Study and Literature Review

Review of the existing books, journals and proceedings to identify the issues that are related to e-commerce, trust, and to identify the problem statement, the objectives of the proposed research, and research questions.

Phase 2: Theoretical Analysis and Design

Based on the analysis of literature review, this research identified the factors that affect e-commerce adoption, proposed a research model, and formulate research hypothesis. Study design is developed to determine research methodology including selection of suitable approach for the proposed research which includes quantitative, data collection strategy and data analysis strategy.

Phase 3: Data Analysis and Results

To test research model by investigating the relationship between TAM and perceived trust in e-commerce, and the subsequent effect of perceived trust on intention to use.

Phase 4: Discussion and Conclusion

To discuss research result in the context of existing literature, research contribution and recommendations for future research.

Figure 3.1   Research process

3.3   PHASE 1: PRELIMINARY STUDY AND LITERATURE REVIEW

In this phase, a look into the importance of the TAM model and its continuous use by ICT SME sectors worldwide and as a strategic tool for e-commerce adoption is carried out. Discussion on the details of this phase is included in Chapters I and II. The former deals with the identification of the existing problems in e-commerce adoption and the accompanying lack of trust which had resulted in the motivation of the study, while the latter deals with the discussion and the review of issues related to the adoption factors of e-commerce and other related work. The input, activities involved and deliverables of Phase 1 are shown in Table 3.1

Table 3.1   The input, activities and deliverable of phase 1

Phase 1: Preliminary study and literature review		
Input	Activities	Deliverables
- Books	- Review of the existing documentation relevant to TAM, trust and e-commerce.	- Research problem
- Journals		- Research questions
- Proceedings		- Research objectives.
-Publish and unpublished papers	- Review the issues that are related to TAM, trust, and e-commerce.	- Related theoretical knowledge relevant to the TAM and e-commerce.
- White papers	- Define problem statement	
- Online related articles	- Define the research objectives	
	- Define research questions	

3.4   PHASE 2: THEORETICAL ANALYSIS AND DESIGN

This phase deals with the analysis of existing issues related to TAM, e-commerce, and trust, together with the identification of adoption factor theories linked to e-commerce, proposal of a research model, formulation of research hypotheses, determination of a suitable method to the research, population and sample, research instrument, design of the questionnaire, and discussion on the validity, reliability and pilot study, data collection and statistical analysis of data. The detailed discussions on this phase are categorized into Chapters II and III.

3.4.1 Population and Sample

Beryman and Bell (2011) defined population as a universe objective from which samples are selected. They also defined a sample as a population segment that is chosen for examination. There are two types of sampling methods, namely probability and non-probability sampling, with each having its own divisions and categories. The primary difference between the two is that in probability sampling, each object has an equal opportunity of being chosen, while for non-probability sampling, the chances that an object can be chosen are unknown (Beryman and Bell, 2011; Saunders et al., 2007). The probability sampling method was used this study based on a random selection sample. The target population of this study is ICT SMEs in Uganda. The total number of ICT enterprises in Uganda which have right postal addresses is 112 (FSDAfrica, 2015).

After determining the population of the study, the sample size required should be decided. For the researcher, it is important to consider whether the sample size provides enough accuracy to base the study's findings and decisions with confidence. Depending upon whether the collected data is categorical or quantitative in nature, there are numerous formulas to calculate the required sample size; the formulas entail knowledge of the proportion or variance within the population and the maximum desirable error determination. The possibility of using any one of these formulas to construct an optimum sample size provided a population size, a specific margin of error as well as a preferred confidence interval table is negligible, prompting researchers to altogether avoid the formula.

Krejcie and Morgan (1970) have designed a table to determine the test size for a given population for easy reference. Many researchers commonly use Krejcie and Morgan's formula to estimate their study's sample size. Their calculations can be utilized to determine the correct sample size for almost any study. Thus, this study used Krejcie and Morgan's formula to identify the sample size. Table 3.1 displays the sample size supplied by Krejcie and Morgan.

Table 3.2   Krejcie and Morgan (1970) sample size table N = number of population
             S = sample size

N	S	N	S	N	S
10	10	220	140	1200	291
15	14	230	144	1300	297
20	19	240	148	1400	302
25	24	250	152	1500	306
30	28	260	155	1600	310
35	32	270	159	1700	313
40	36	280	162	1800	317
45	40	290	165	1900	320
50	44	300	169	2000	322
55	48	320	175	2200	327
60	52	340	181	2400	331
65	56	360	186	2600	335
70	59	380	191	2800	338
75	63	400	196	3000	341
80	66	420	201	3500	346
85	70	440	205	4000	351
90	73	460	210	4500	354
95	76	480	214	5000	357
100	80	500	217	6000	361
110	86	550	226	7000	364
120	92	600	234	8000	367
130	97	650	242	9000	368
140	103	700	248	10000	370
150	108	750	254	15000	375
160	113	800	260	20000	377
170	118	850	265	30000	379
180	123	900	269	40000	380
190	127	950	274	50000	381
200	132	1000	278	75000	382
210	136	1100	285	1000000	384

        To use Table 3.2, the dimensions of a population should be determined using
the column on left Then value in the next is the sample size that is required. Based on
Table 3.2, the sample must consist of 86 respondents based on the population size of
112 ICT SMEs. In this thesis, the respondents selected as samples come from different
ICT SMEs and seem to be sufficient to satisfy the needs of this research.

3.4.2   Research Instrument

Different methods exist for the collection of data in different settings, with each method having its own advantages and disadvantages. These methods include telephone interviews, interviews conducted through electronic media, face-to-face interviews, computer-assisted interviews, personal or electronically administered interviews such as through fax or email; questionnaire interviews, and observation of events or individuals with or without electronic gadgets.

Sekaran (2000) opined that one of the most efficient data collection mechanisms is the questionnaire. For the study, personally administered questionnaires will be utilized due to its advantages such as shorter time frame for collecting completed responses, researchers' ability to classify items in depth due to the direct responses and clear communication between respondents and researcher, researchers' higher prospect to present the research topic for respondents to give direct and sincere feedback; and the low cost even when the number of respondents is high (Sekaran, 2000; Newton and Rudestam, 2014).

The mailing or emailing of questionnaires is another method that can be applied when a wider geographical area is to be studied. Mailed questionnaires can be completed at the respondents' convenience, unlike personally administered questionnaires. However, the return rates for mail questionnaires are normally lower than personally administered questionnaires, even though it might be more convenient for the respondents. Moreover, clarity is an issue since distance exists between the researcher and respondents. Items or questions included in the questionnaire may be misunderstood or exaggerated. Therefore, bringing together the advantages and disadvantages of personally administered questionnaires and mail questionnaires, this study chose to use personally administered questionnaires to collect data from respondents

3.4.3   Questionnaire Content

The key reason of conducting this study is to develop an e-commerce adoption model. To be able to answer the research questions and fulfill the research objectives, this study had created a questionnaire survey to gather data from respondents. The respondents of this study are managers from the ICT SME sector in Uganda. This questionnaire was adopted from previous researches and revised by experts. The experts were verified based on their knowledge and experience in e-commerce issues.

The questionnaire is divided into two sections. Section A contains demographic questions, while section B measures the factors of e-commerce adoption. The questions were designed in the close-ended form in order to collect data that are easily understandable from respondents. The first section includes general questions that were designed to obtain respondents' personal information such as gender, age, working and experience, along with the number of employees in the company and the respondents' knowledge on e-commerce usage and e-commerce terms. Section B contains questions on the four factors examined in this study which are perceived ease of use, perceived usefulness, perceived trust and the intention to use. Each factor makes use of five questions. The items selected for constructs must stand for the principles, thus generalizations were done to make certain the content's validity over the scale of the study review. Thus, in this research, the items selected for constructs were taken from prior studies to ensure the validity of information (Wang and Liao, 2008).

A five-point Likert scale was adopted in the study as the interval scale used to measure the study variables. Additionally, an ordinal scale was used to measure respondents' profiles. Table 3.3 shows the designed Likert scale that was used to examine how strongly subjects agree or disagree with the statements included in the questionnaire. while, Table 3.5 to 3.8 show the items of perceived ease of use, perceived usefulness, perceived trust and intention to use. The questionnaire is attached as Appendix B.

Table 3.3   Likert scale score value

Scale	Measurement level
5	Strongly agree
4	Agree
3	Slightly agree
2	Disagree
1	Strongly disagree

Table 3.4   Structure of the questionnaire

Sections	Subjects
A	Demographic profile of respondents
B	Factors of adoption:
	Perceived ease of use
	Perceived usefulness
	Perceived trust
	Intention to use

Table 3.5   Perceived ease of use items

Items	Adaption from
1. Learning to use e- commerce services is easy to me.	(Hoang, 2010; Ghamatrasa, 2006)
2. It is easy to make the e-commerce technology do what I want them to.	(Hoang, 2010; Ghamatrasa, 2006)
3. My interaction with e-commerce technology is clear and understandable.	(Hoang, 2010; Ghamatrasa, 2006)
4. I think becoming skillful at using e-commerce technology is easy.	(Ghamatrasa, 2006; Hoang, 2010)
5. I find it easy to use e-commerce technology.	(Hoang, 2010; Ghamatrasa, 2006)

Table 3.6   Perceived usefulness items

Items	Source
1. Using e-commerce technology makes me save time.	(Hoang, 2010; Mikkelsen, 2014)
2. E-commerce technology improves the performance of my business	(Mikkelsen, 2014; Ghamatrasa 2006)
3. E-commerce technology makes me save cost.	(Mikkelsen, 2014; Hoang, 2010)

Continuation

4. E-commerce technology in my job increases my productivity.	(Mikkelsen, 2014; Hoang, 2010)
5. E-commerce technology makes it easier for my company to do business.	(Mikkelsen, 2014; Ghamatrasa, 2006)

Table 3.7   Perceived Trust in e-commerce items

Items	Source
1. In my opinion, e- commerce technology is reliable.	(Hoang, 2010; Mikkelsen, 2014)
2. I believe in the information that e- commerce technology provides.	(Hoang, 2010; Carter and Belanger, 2005)
3. I believe that e-commerce technology has good intentions towards me	(Hoang, 2010; Carter and Belanger, 2005)
4. I expect that e-commerce service will protect my personal and monetary information	(Tim R., 2014; Carter and Belanger, 2005)
5. Given the state of existing e-commerce technology, I believe that technology related errors are quite rare.	(Hoang, 2010; Carter and Belanger, 2005)

Table 3.8   Intention to use items

Items	Source
1. I would use e-commerce service in my company on a regular basis in the future.	(Ghamatrasa, 2006; Carter and Belanger, 2005
2. I would use e-commerce service in my company frequently in the future.	(Ghamatrasa, 2006; Carter and Belanger, 2005
3. I would use e-commerce service for gathering information	(Ghamatrasa, 2006; Carter and Belanger, 2005)
4. I would use e-commerce service to inquire about online service.	(Ghamatrasa, 2006; Carter and Belanger, 2005)
5. I would strongly recommend others to use E-Commerce and IT services in their business	(Ghamatrasa, 2006; Carter and Belanger, 2005

3.4.4 Instrument Validity

Validity describes the accuracy of a measurement in measuring what it is designed to measure (Churchill, 1999; Davis, 1989). Hair and Anderson (2010) defined validity as the level of how a scale or measurement set accurately measures the concept under study. Two common methods of validity are used in this study; construct validity and content validity. Hair et al. (2010) defined content validity as a process of evaluating variables' relationships and their concept definitions. It could also be referred to as professional and expert subjective agreement concerning concepts and individual items.

In this study, the logical content/validity instrument was confirmed through consultation with three experts. Feedback from three experts was requested as to the level to which the items in the questionnaire are clear and suitable for gauging the concepts they are meant to measure. They were also requested for feedback on the modification of the questionnaire items with respect to phrases for their clarity and comprehensiveness.

Table 3.9   Expert demographic data

No	Years of experience	University	Expertise
1	6	University kebangsaan Malaysia	Electronic commerce
2	9	Kampala international university	Information technology
3	13	East Africa university	e-commerce technology

Table 3.10   The revised questionnaire by expert

No	Years of experience	The statement before content validity	The statement after content validity
1	9	In my opinion e-commerce is reliable	In my opinion e-commerce technology is reliable
2	13	I believe that e-commerce have a good intentions towards me.	I believe that e-commerce technology have a good intentions towards me.

3.4.5 Instrument Reliability

Based on Hair et al. (2007), reliability is connected to consistency only as validity is linked to accuracy. Crowther and Lancaster (2009) likewise reported that the amount where findings are similar might be attained when identical activities are repeated in different scenarios is viewed as reliability. Furthermore, Zikmund (2003) and Sekaran (2000) found that inner consistency and repeatability/stability are the two dimensions which form the reliability test. In two unique events, the latter may be determined through a test-retest reliability where similar scales or actions are utilized on the exact same respondents. Nevertheless, owing to time restrictions, the process is not ideal for this particular research.

Sekaran (2000) and Zikmund (2003) described the former as inner consistency as it applies to the homogeneity of the things measured in a construct. An inter-product consistency reliability in addition to split-half reliability is often utilized to identify the consistency amount (Hair et al. 2006). The Cronbach Alpha coefficient is the first consistency test which is normally utilized for multi-point scaled items. On the other hand, the split-half method of reliability is utilized by a measure of many items where the findings obtained from one half of the scale items by the researcher may be checked by the other half (Zikmund, 2003). Nonetheless, the Cronbach Alpha is the perfect index in almost all cases for inter-item reliability (Sekaran, 2000).

The present study utilizes the inter-item reliability index namely the Cronbach Alpha to assess the reliability of the instrument (Hair et al., 2007; Pallant, 2006; Saunders et al., 2007; Crowther and Lancaster, 2009). The present chapter also explain the reliability of the tests findings. The acceptability level of instruments used in the study is shown in Table 3.11.

Table 3.11   Alpha coefficient ranges and strength

Alpha Coefficient Range	Strength of Association
< 0.6	Poor
0.6- to < 0.7	Moderate
0.7- to < 0.8	Good
0.8- to < 0.9	Very good
> 0.9	Excellent

3.4.6 Pilot Test

A pilot study is an essential task used to validate a newly adapted or developed questionnaire to ensure the simple psychometric property of the new questionnaire (Straub, 1989). A full pilot study involves information collection using the original questionnaire and data analyses on the sample information. The pilot study can also be seen as a small-scale evaluation before the actual survey (Chua, 2009). The questionnaire testing involves a small number of respondents from the same target population as the actual study (Chua, 2009).

Therefore, a pilot study was conducted from 15th June until 28th June 2017 based on these guidelines. Questionnaires were shared with 15 ICT SME managers in Uganda. However, only 10 questionnaires were returned, which equals to approximately a 66.6% response rate.

The format, content, and terminology of the pilot study allow the respondents leeway to criticize the instrument. The pilot study also helps the researchers to determine whether respondents understand the questionnaire and easily complete it. A pilot test also assesses the goodness of the measurement of reliability. To ascertain the reliability of the scales in the questionnaire, the data was examined using SPSS. By calculating the Cronbach Alpha coefficient, the reliability of scales to be utilized in the questionnaire is verified as indicated by Sekaran (2006) and Hair et al. (2010). Table 3.12 displays the alpha coefficient ranges, and their strength suggests that all items have a value above 0.7. In fact, all of the values calculated are above 0.8. Thus, the Cronbach's Alpha of this research is excellent and very good. Therefore, it was concluded that the measurement tool is usable, reliable, and consistent for survey data collection.

Table 3.12   The result of testing reliability analyzes for pilot study

Variables	Number of Items	Cronbach Alpha
Perceived ease of use (PEU)	5	.864
Perceived usefulness (PU)	5	.852
Perceived trust (PT)	5	.904
Intention to use (ITU)	5	.810

3.4.7 Data Collection

To collect data from respondents, this study utilized the survey questionnaire method. Respondents were asked about their perceptions of the study variables in order to highlight the existing relationships between the variables of the study. The major reasons for adopting this method are efficiency, accuracy and promptness in order to assess information collected on the population's perceptions of the variables chosen.

Data collection is an essential requirement of a research's methodology. This particular analysis adopts primary data collection. Primary data is collected using questionnaires in order to obtain direct responses. Data is collected from ICT SME managers in Uganda.

3.4.8 Data Analysis

This study uses the Statistical Package for Social Science (SPSS) (version 20) to evaluate the preliminary data. Quantitative analysis was used in this research to analyse data through SPSS. SPSS is a computer program used for statistical analysis. SPSS fits with the quantitative approach and survey strategy which are adopted in this research. SPSS has many features and properties which can provide appropriate results; these results lead to the achievement of the research's purpose. SPSS can provide several statistics for each element in the research questionnaire. SPSS is also useful to study the causal relationships between the questionnaire elements.

SPSS is widely used by researchers as a data analysis technique. In this study, SPSS was used to analyze five different methods namely factor analysis, descriptive statistics, ANOVA, correlations, and multiple linear regressions to provide answers to the research objectives.

3.5   PHASE 3: DATA ANALYSIS AND RESULTS

This phase deals with the review of results obtained from the data analysis. Moreover, it discusses the validity of the proposed model using a multiple linear regression. The detailed discussion of this phase is contained in Chapter IV. The input, activities involved and deliverables of Phase 3 are shown in Table 3.13.

Table 3.13   The input, activities and deliverable of phase 3

Phase 3: Data analysis and Results		
Input	Activities	Deliverables
- The factors that affect perceived trust in e-commerce.	- Test the research model by investigate the relationship between the variables (hypothesis testing)	- Results of hypothesis testing
- Research model		
- Research hypothesis		
- Research methodology		

3.6   PHASE 4: DISCUSSION AND CONCLUSION

This phase deals with the discussion of the research findings. In addition, the limitations and suggestions for future research and the overall conclusions are discussed. The detailed discussion of this phase is included in Chapter V.

3.7   CHAPTER SUMMARY

The population of this study comprised of managers from 86 ICT SMEs in Uganda. The respondents are managers who use e-commerce in their companies. They are the most suitable candidates for this study due to the nature of their work involving e-commerce applications and their influence on the decision-making for e-commerce adoption.

The survey questionnaires used in this study were adopted from survey items which were already tested for reliability and used for empirical studies by other researchers. The questions are closed-ended and its flow is clear and logical in order to foster accurate and consistent responses. The questionnaire was divided in two sections, with each measuring a respective independent or dependent variable and the demographic profile of the respondents. Altogether, there are 20 questions measuring continuous variables, while 7 questions ask on the background of the respondents. A

Likert scale was employed to indicate the intensity of respondents' views for each question in the survey.

The questionnaires were reviewed by 3 experts to ensure that the format and wordings are easily understood and comprehensive. Four variables namely perceived ease of use, perceived usefulness, perceived trust, and intention to use were identified from the literature review. The research instrument was designed to collect information based on the research questions. A questionnaire which consists of two sections with different set of questions was thus developed and later, pre-tested and piloted. The results of the pilot survey confirmed the reliability of the instrument. This was followed by the data collection strategy and the development of the instrument. Finally, SPSS 20 was used to analyse the collected data. The next chapter discusses the results from the data analysis.

CHAPTER IV

RESULTS AND DISCUSSION

4.1   INTRODUCTION

The purpose of this study is to investigate e-commerce technology adoption among ICT SMEs in Uganda. This chapter describes the results obtained from the analysis of the data in accordance with the analyses techniques described in Chapter 3. This chapter consists of eight main sections. The first section is the introduction, followed by a descriptive analysis of the respondents' profile which will provide a better understanding of the respondents' characteristics pertaining to the phenomena being investigated in the current study. In the third section, ANOVA will be presented. Correlation analyses between variables are described in the fourth section, while the testing of the model using multiple linear regression analyses is presented in section five. This chapter also describes the results of model validation through regression analysis and the research hypotheses' results. And finally, the chapter's summary is presented in the eighth section.

4.2   DESCRIPTIVE ANALYSIS PROFILE RESPONDENTS

The current study used descriptive analysis to analyze the profiles of the participants. This type of analysis is conducted at the early stage of any analysis prior to carrying out other types of statistical analyses. In this study, the respondents' characteristics are important since they provide better insights or information on the study population. The demographic characteristics collected from the respondents include their gender, age, education level attained, and working experience, together with some other information such as the number of employees, the use of electronic commerce technology and the e-commerce terms used in their respective companies.

a. **Gender**

According to Table 4.1 and Figure 4.1, from the total number of 86 usable questionnaires, 30.2% of them were answered by female respondents, whereas the majority of respondents were males who make up 69.8% of the total respondents participating in this study. The result shows that a majority of owners/managers working in Ugandan ICT SMEs are male.

Table 4.1   Gender of respondents

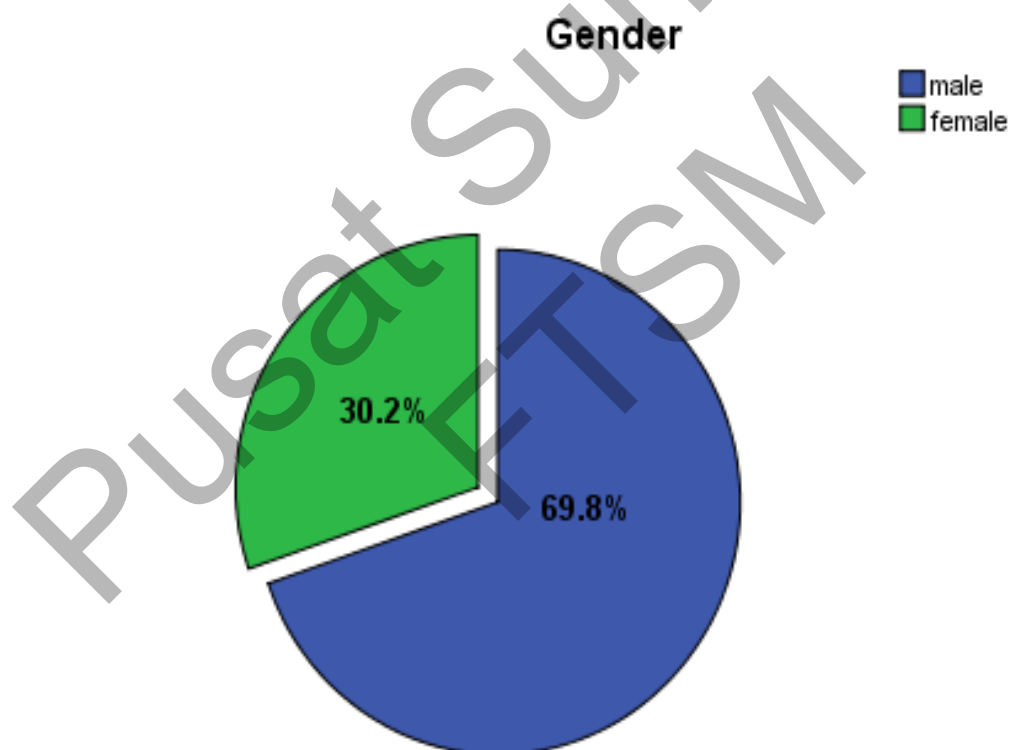| Gender	Frequency	Percent
Male	60	69.8
Female	26	30.2
Total	86	100.0

Figure 4.1   Gender of respondents

b.   Age

As seen in Table 4.2 and Figure 4.2, most of the respondents which comprise of 45.3% of the usable responses belong to the 31-40 years age group. The second largest group of respondents is the 20-30 years group (39.5% of the respondents). Such result confirms that the present survey is highly influenced by these two main age groups (i.e. between 31-40 years and between 20-30 years). However, the above 40 years age group represents 15.1% of respondents, thus resulting in a lower influence on the overall survey.

Table 4.2   Age of respondents

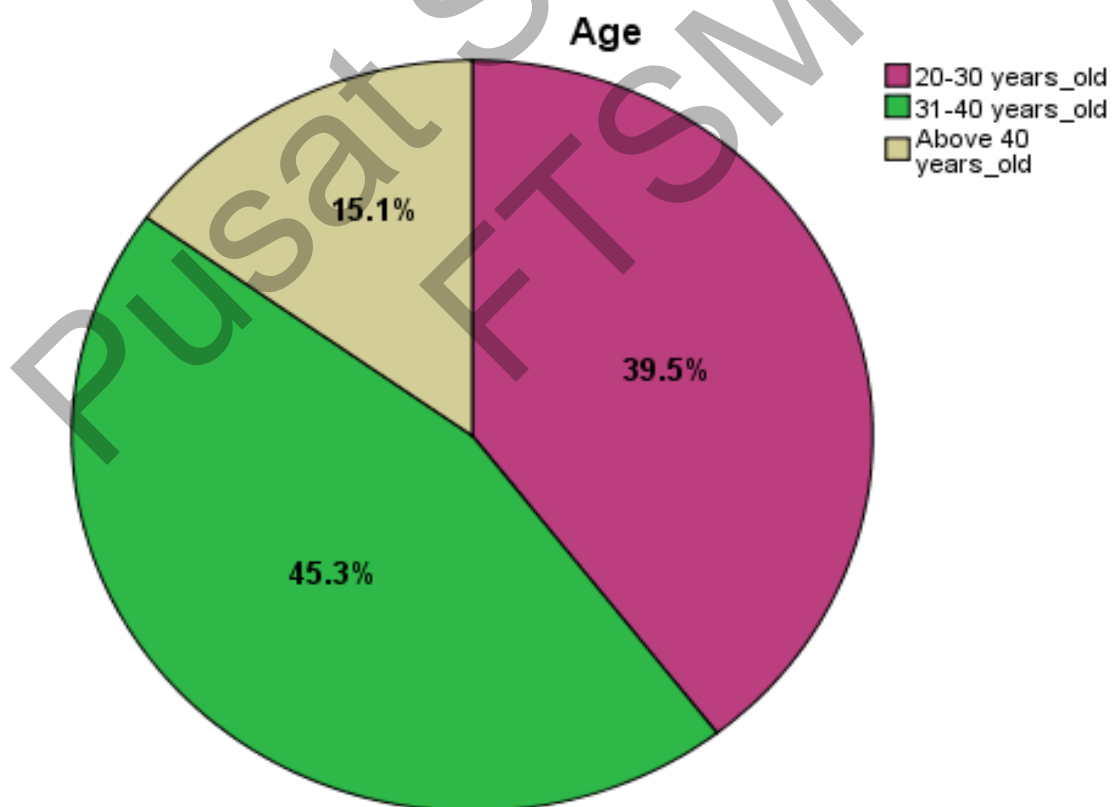| Age	Frequency	Percent
20-30 years old	34	39.5
31-40 years old	39	45.3
Above 40 years old	13	15.1
Total	86	100.0

Figure 4.2   Age of respondents

c.   Education Level

As depicted in Table 4.3 and Figure 4.3 above, numerous views were put forward when respondents were asked of the level of education they have attained. It was found that 34.9% of the respondents are college degree holders. The second most frequent education level is qualification in other fields totaling at 27.9%. Whereas, 22.1% of the respondents revealed that they hold high school diplomas. Table 4.3 also shows that 15.1% of the respondents hold a master's degree. These findings indicate that most owners/managers of Ugandan ICT SMEs have different levels of tertiary or higher education.

Table 4.3   Education level

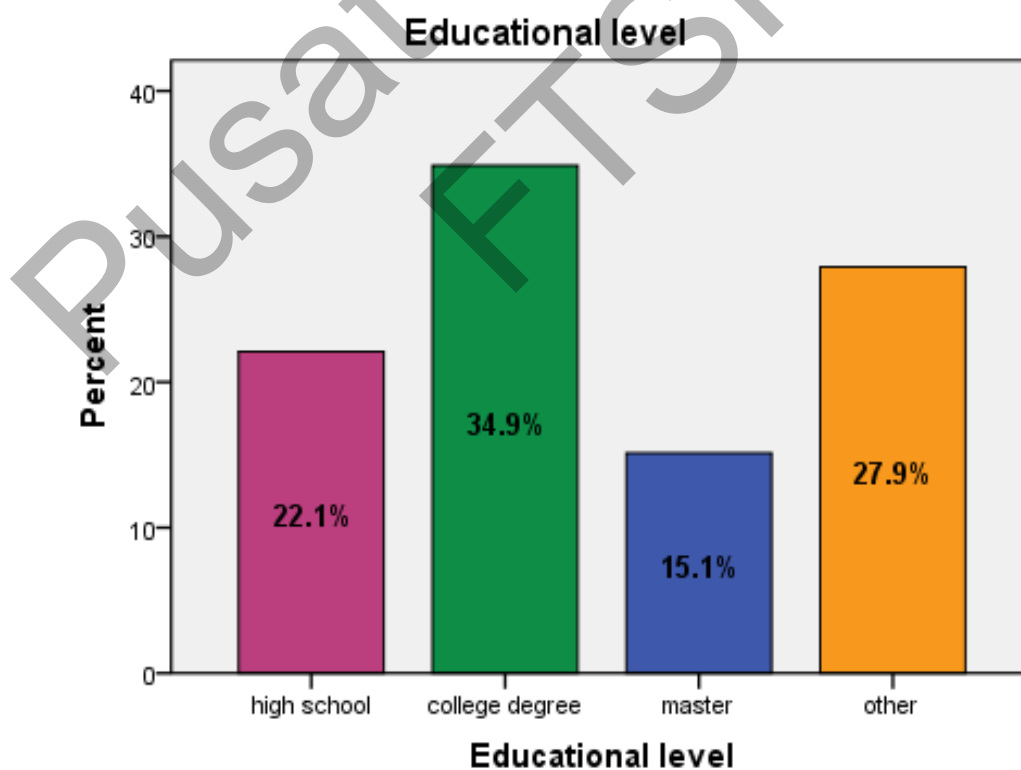| Educational Level	Frequency	Percent
High school	19	22.1
College degree	30	34.9
Master	13	15.1
Other	24	27.9
Total	86	100.0

Figure 4.3   Education level

d.   Working Experience

Concerning the respondents' working experience, the findings revealed that a majority of respondents (48.8%) are those who have been working in their position for 0-5 years. The second most frequent response (27.9%) represented respondents who have stayed in their working positions for more than 10 years. Lastly, as showed in Table 4.4 and Figure 4.4, it is worth mentioning that 23.3% of the study respondents had stated that they had just joined their organizations with less than 5 years of experience.

Table 4.4   Working experience

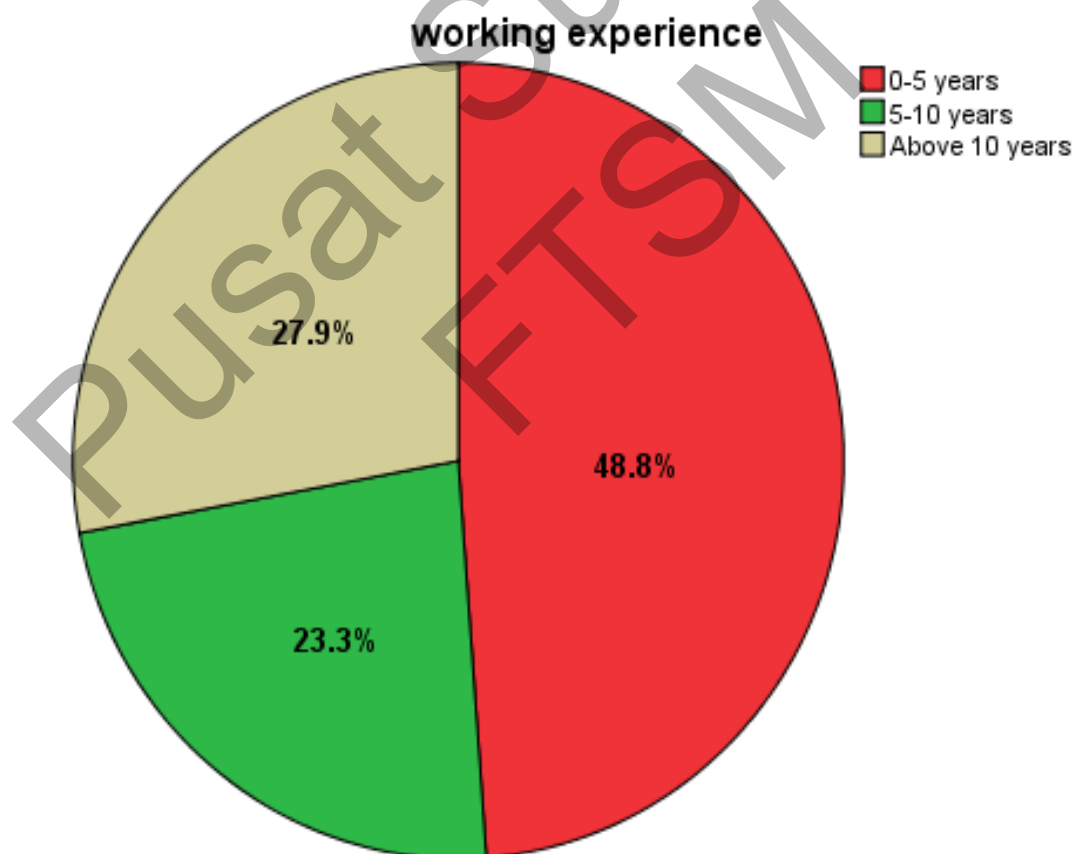| Years of Experience	Frequency	Percent
0-5 years	42	48.8
5-10 years	20	23.3
Above 10 years	24	27.9
Total	86	100.0

Figure 4.4   Working experience

e.   Number of Employees

Concerning the number of employees in the respondents' companies, a majority of respondents (43.0%) revealed that the number of employees in their companies is between 35-50 employees. The second largest response (29.1%) was from respondents who companies had above 50 employees. As depicted in Table 4.5 and Figure 4.5, 14.0% of respondents' companies had between 5-20 employees. Lastly, 14.0% of the respondents revealed that their companies had between 20-35 employees.

Table 4.5   Number of employees

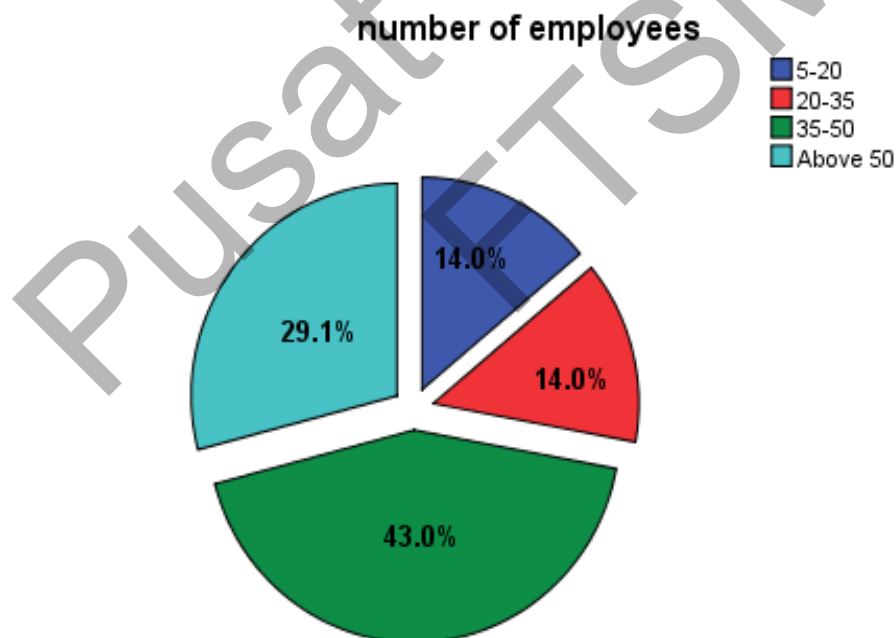| Number of employees	Frequency	Percent
5-20	12	14.0
20-35	12	14.0
35-50	37	43.0
Above 50	25	29.1
Total	86	100.0

Figure 4.5   Number of employees

f.   E-commerce Usage

As shown in Table 4.6, a majority of respondents (97.7%) use e-commerce technology in their companies, whereas only 2.3% of respondents do not use electronic commerce technology in their companies. This result indicates that most of the ICT SMEs in Uganda are familiar with e-commerce technology usage. Therefore, most of the respondents seemed to be able to use the online services provided by e-commerce technologies.

Table 4.6   E-commerce usage

Response	Frequency	Percentage
Yes	84	97.7%
No	2	2.3%
Total	86	100.0

g.   E-commerce Terms

As depicted in Table 4.7, an assessment on e-commerce technology terms used in Uganda ICT was carried out, where usage is categorized into four e-commerce terms. Respondents can choose more than one term (e.g. email and website). 29.6% of respondents use emails in their companies, 24.9% have websites, whereas 23.8% use databases and lastly, 21.7% of the respondents use online transactions.

Table 4.7   E-commerce terms

Response	Frequency	Percentage
Email	82	29.6%
Website	69	24.9%
Database	66	23.8%
Online transaction	60	21.7%
Total	277	100.0%

4.3   ANOVA RESULTS

The multiple regression results did not give good support to the assumptions about the influence of demographic factors on the intention to use e-commerce technology in some cases, thus an ANOVA test had been carried out to test the effect of demographic factors on the intention to use e-commerce technology in Ugandan ICT SMEs.

The ANOVA test conducted in this study is described in this specific section. A one-way ANOVA involving one dependent variable (referred to as a factor), which has different levels. These levels correspond to different groups or conditions (Pallant 2010). Thus, the above-mentioned method is going to be utilized to look at the impact of demographic factors on the intention to use e-commerce technology in this study. To find out where the differences lay, post-hoc assessments were also used.

Previous studies that have been conducted evaluate and measure the influence of demographic factors and intention to use using different theories and models of adoption. However, most of these studies were conducted in developed countries (Abu-Shanab et al., 2010). Two demographic factors namely educational level and number of employees are examined in this study. Researchers such as Baker et al. (2007), Sulaiman et al., (2007), and Afeef et al. (2011) had chosen these factors as the main demographic factors affecting e-commerce.

a.   Education Level and Intention to Use

This section describes the outcome of the one-way ANOVA test which was used to explore the effect of different educational levels on the intention to use e-commerce technologies. Participants were split into 4 groups based on their educational background which are: High school, College degree, Master and Others.

Table 4.8   Outcomes of one-way ANOVA test for educational groups and intention to use e-commerce technology

Test of Homogeneity of variances

▪ Levene Statistic	▪ df1	▪ df2	▪ Sig.
▪ 1.823	▪ 3	▪ 82	▪ .149

ANOVA

▪	▪ Sum of Squares	▪ Df	▪ Mean Square	▪ F	▪ Sig.
▪ Between Groups	▪ 33.295	▪ 3	▪ 11.098	▪ .822	▪ .486
▪ Within Groups	▪ 1107.635	▪ 82	▪ 13.508	▪	▪
▪ Total	▪ 1140.930	▪ 85	▪	▪	▪

As shown in Table 4.8, the ANOVA revealed no significance differences between the educational level on intention to use e-commerce technology for a variety of training organizations. A statistically significant difference was identified. at $p < .489$ which is not greater than .05 $F(3,82) = .822$, $p = .486$ therefore it is not significant. The eta square could be estimated using the info coming from the output and also the formula for eta squared as follows. Table 14.9   shows the guidelines proposed by Cohen (1988) for interpreting the value of eta square.

$$\text{Eta squared} = \frac{Sum\ of\ squares\ between\ groups}{Total\ sum\ of\ square} \quad \text{Eta square} = \frac{33.295}{1140.930} \quad \text{Eta square} = 0.02$$

Table 4.9   Guidelines proposed by Cohen (1988)

Eta squared value	Effects
Eta square = .01	Small effect
Eta square = .06	Moderate effect
Eta square = .14	Large effect

The effect size of educational level on intention to use e-commerce technology in Uganda ICT SMEs is 0.02, which is considered small effect. Looking at the mean values, there is no big differences involving educational level in terms of intention to use e-commerce in Uganda ICT SMEs.

Post hoc comparisons using the Tukey test were also conducted. Table 4.10 shows that there's no significant difference between education groups and the intention to use e-commerce in Ugandan ICT SMEs.

Table 4.10   Post-hoc tests for education and intention to use

- Multiple Comparisons
- Dependent Variable: ITU
- Tukey HSD

(I) Educational level	(J) Educational level	Mean Difference (I-J)	Std. Error	Sig.	95% Confidence Interval	
					Lower Bound	Upper Bound
high school	college degree	-1.56316	1.07759	.472	-4.3891	1.2628
	Master	-1.10931	1.32287	.836	-4.5786	2.3599
	Other	-.47149	1.12861	.975	-3.4313	2.4883
college degree	high school	1.56316	1.07759	.472	-1.2628	4.3891
	Master	.45385	1.22038	.982	-2.7466	3.6543
	Other	1.09167	1.00652	.700	-1.5479	3.7313
Master	high school	1.10931	1.32287	.836	-2.3599	4.5786
	college degree	-.45385	1.22038	.982	-3.6543	2.7466
	Other	.63782	1.26565	.958	-2.6814	3.9570
Other	high school	.47149	1.12861	.975	-2.4883	3.4313
	college degree	-1.09167	1.00652	.700	-3.7313	1.5479
	Master	-.63782	1.26565	.958	-3.9570	2.6814

b.   Number of Employees and Intention to Use

This section explains the relationship between the number of employees and the intention to use e-commerce. The participants were divided into four groups based on the definition of SMEs in Uganda which are: 5-20 employees, 20-35 employees, 35-50 employees, and above 50 employees.

Table 4.11   Results of one-way ANOVA test for number of employees and intention to use e-commerce technology

Test of Homogeneity of variances

Levene Statistic	df1	df2	Sig.
6.632	3	82	.000

ANOVA

ITU	Sum of Squares	Df	Mean Square	F	Sig.
Between Groups	94.588	3	31.529	2.471	.068
Within Groups	1046.342	82	12.760		
Total	1140.930	85			

As shown in Table 4.11, the ANOVA results revealed that there is no significant difference between the number of employees and intention to use e-commerce. The statistical significant difference is at $p < .068$ which is greater than .05, $F(3,82) = 2.47$,

p = .068. Therefore, it is considered not significant. The effect size calculated using eta square was .009 which is considered small. This result tells that Ugandan ICT SMEs do not have problems in terms of their number of employees with the intention to use e-commerce technology. Table 4.12 shows that the post-hoc comparisons using the Tukey test showed no significant difference between the number of employees and intention to use e-commerce technology in Ugandan ICT SMEs.

Table 4.12   Post-hoc tests for number of employees and intention to use e-commerce

Multiple comparisons

(I) number of employees	(J) number of employees	Mean Difference (I-J)	Std. Error	Sig.	95% Confidence Interval	
					Lower Bound	Upper Bound
5-20	20-35	-.75000	1.45833	.955	-4.5745	3.0745
	35-50	-2.82207	1.18669	.089	-5.9342	.2900
	Above 50	-2.33667	1.25450	.252	-5.6266	.9533
20-35	5-20	.75000	1.45833	.955	-3.0745	4.5745
	35-50	-2.07207	1.18669	.307	-5.1842	1.0400
	Above 50	-1.58667	1.25450	.588	-4.8766	1.7033
35-50	5-20	2.82207	1.18669	.089	-.2900	5.9342
	20-35	2.07207	1.18669	.307	-1.0400	5.1842
	Above 50	.48541	.92482	.953	-1.9399	2.9107
Above 50	5-20	2.33667	1.25450	.252	-.9533	5.6266
	20-35	1.58667	1.25450	.588	-1.7033	4.8766
	35-50	-.48541	.92482	.953	-2.9107	1.9399

4.4   ANALYSIS OF CORRELATION BETWEEN VARIABLES

According to Pallant (2010), a correlation investigation is a statistical technique utilized to describe the power and guidance of linear relationships between two variables. Thus, to calculate the strength and crucial relationship between the variables, a bivariate association was utilized. The treatment calculates the Pearson correlation coefficient which ranges from -1 to +1. The warning sign offers an insight into the sturdiness of the relationship between two variables. A great correlation of 1 to -1 suggests that the importance of one variable could be decided precisely by understanding the value of another variable, whereas in cases where the specified two variables may take the value of 0, the results indicate that no relationship exists between them. To describe the sturdiness of the relationship between the two variables, Cohen (1988) had supplied a guide on coefficient correlations as shown in Table 4.13.

Table 4.13   Cohen's guideline of correlation strength

r values	Strength of relationship
r = + 0.10 to 0.29 or r = - 0.10 to - 0.29	Small
r = + 0.30 to 0.49 or r = - 0.30 to - 0.49	Medium
r = + 0.50 to 1.0 or r = - 0.50 to - 1.0	Strong

Table 4.14   Summary of the correlations of variables of the study model

Variables	Correlation coefficient	Strength of relationship
Perceived ease of use (PEU) and perceived trust (PT)	.605**	Strong
Perceived usefulness (PU) and perceived trust (PT)	.618**	Strong
Perceived trust (PT) and intention to use (ITU)	.665**	Strong

Table 4.14 shows a summary of correlations between the independent variables and dependent variables. Generally, the table shows that there are actually positive and significant relationships between perceived ease of use and perceived trust, perceived usefulness and perceived trust and lastly perceived trust and intention to use. The table as well show that there is a strong relationship between perceived ease of use and perceived trust (r =.605, p < 0.1), strong relationship between perceived usefulness and perceived trust (r =.618, p < 0.1), and finally perceived trust with intention to use (r=.665, p < 0.1).

4.5   TESTING THE MODEL USING REGRESSION ANALYSIS

Multiple linear regressions are used to look at the relationships between one dependent variable and several independent variables. Many techniques are usually used in multiple linear regressions which include regular, hierarchical or may be stepwise and sequential regression (Pallant, 2010). In a standard multiple linear regression, all independent variables are entered into the situation at precisely the exact same time, and each is thought to have precisely the exact same value (Tabachnick and Fidel, 2007). In addition, the multiple linear regression method provides solution to the study's concerns while allowing for the assessment of hypotheses postulated in the study.

Hair et al. (2007), Saunders et al. (2007) and Sekaran (2006) found that the multiple linear regression is the most suitable statistical approach to be used to foresee the variance in a single dependent variable caused by the impact of a lot more when

compared to a private independent variable. Therefore, the present study used the multiple linear regression method to look at the relationships between perceived ease of use, perceived usefulness, perceived trust and intention to use e-commerce technology. The independent variables are assumed to have equal value.

The method calculates the relative contribution of particular variables, in addition to presenting which variable and set best predicts the outcome. For instance, R^2 shows the way a set of variables is great in predicting a result. The R^2 standard value is 1 which indicates the best linear relationship between both sets of variables. Contrarily, if the value is equal to 0, it shows no linear relationship between the variables. In the regression model's significance, the value of R^2, unstandardized coefficients, and standardized coefficients are shown. Based on Leech et al. (2005), the definitions of the above mentioned are as follows:

1. The regression model's significance: The ANOVA examination is utilized to assess the significance of regression type in which levels under .05 indicate that the mix of independent variables can significantly predict the dependent variable.

2. The importance of R^2: The value which varies from 0.0 to 1 hints that part of the variance could be depicted from the mix of the independent variables. In line with the statement by Leech et al. (2005), a R^2 value of more than 0.49 shows that the strength of the relationship is seen as extremely large. Whereas, if the value is somewhere between 0.26 to 0.49, it is considered as large, while values between 0.13 to 0.26 are considered medium, and between 0.2 to 0.13 as small.

3. Unstandardized coefficients (B): The regression equation independent variables' coefficient.

4. Standardized coefficients (β): The standard amount of dependent variables' expansion by individual standard deviation. The value ranges from 1.0 to 1.0. A nonpositive value means that the independent variables have a negative relationship with the dependent one, while a great value indicates a great relationship. The value

also belongs to the mass of every independent variable in the effect of the dependent variable.

4.5.1 Assumption of the Regression Analysis

The objective of the multiple linear regression analysis is to predict a center from a mix of several independent variables. Prior to that, analysis was carried out to make specific assumptions such as sufficient sample size, multicollinearity, homoscedasticity, linearity, and normality as recommended by Hair et al. (2006), Tabachnick and Fidell (2007), and Pallant (2010). For generalizability, Tabachnick and Fidell (2007) had provided the formula to calculate the essential sample size by taking into consideration the number of independent variables which are actually used: $N > 50 + 8m$ (where m = the number of independent variables) which had totaled to 82 cases. Appropriately, as there are 2 independent variables in the present study, thus there should be $50+8*2 = 66$ cases. Hence, the first assumption is met.

The next assumption is multicollinearity. Based on Hair et al. (2006), multicollinearity is the degree to which some other variables can explicate a variable in the evaluation. Tabachnick and Fidell (2007) found that the appearance of multicollinearity occurs when a high degree of correlation is realized between the variables. Multicollinearity identifies the challenge in clarifying the outcome of any single variable owing to the relationship of theirs. There are several ways to assess collinearity between independent variables which include the Pearson correlation, Tolerance Value and Variance Inflation Factors (VIF). For the multicollinearity test, the Pearson correlation, VIF along with tolerance assessments were performed. The Pearson correlation displays the correlation between two or more independent variables in which the correlation is recognized as sizable at the 0.01 level or perhaps even at the .05 depth. Depending on the concept of thumb, Pearson correlations with a significant value of more than 0.80 show multicollinearity between the independent variables (Allison, 1999; Sekaran, 2000; Cooper et al., 2003).

Table 4.15 depicts the correlation analysis of the study variables by utilizing the Pearson correlation. The variables that have a significant relationship with perceived

trust in e-commerce include perceived ease of use at .605 and perceived usefulness at .618. All of the correlations among independent variables exhibited values under 0.8. As stated previously, there are additional methods to assess multicollinearity such as Tolerance Value and (VIF). The results of the tolerance and VIF tests were examined to confirm that multicollinearity does not exist before the regression was finished.

Tolerance is defined by Hair et al. (2006) as "the quantity of the variability of the selected independent variables not defined by other variables", while VIF is "the opposite of the tolerance printer". Based on Hair et al. (2006), the standard cut-off threshold is .10 which corresponds to a VIF value of less than 10.

The results show the tolerance values for each independent variable; perceived ease of use at .881, and perceived usefulness at .881. The VIF values for perceived ease of use are 1.135 and 1.135 for perceived usefulness. Using this analysis, the results propose that multicollinearity does not exist among all independent variables since the Pearson correlation for all independent variables is under 0.8, and the tolerance values are significantly more than .10 while the VIF values are less than 10. Therefore, the end result means that the current study does not have any problems with multicollinearity.

Table 4.15   Analysis for multicollinearity by Pearson correlation, tolerance and VIF values

Variables	Correlations	Tolerance	VIF
1 perceived ease of use	.605	.881	1.135
perceived usefulness	.618	.881	1.135

Homoscedasticity is the third assumption for the regression of variables in this study. The homoscedasticity assumption deals with the variance within the regression line for the values of the dependent variable. Put simply, based on Hair at al. (2006), the valuation of variance of the dependent variable is concentrated to just a small range of the independent variables. This specific assumption was examined using scatter plot diagrams of the standardized residuals in the study. The assumption of homoscedasticity was therefore fulfilled and no issue had come up as to the use of the multiple linear regression analysis. The results of the homoscedasticity test are illustrated in Figure 4.6.

Scatterplot
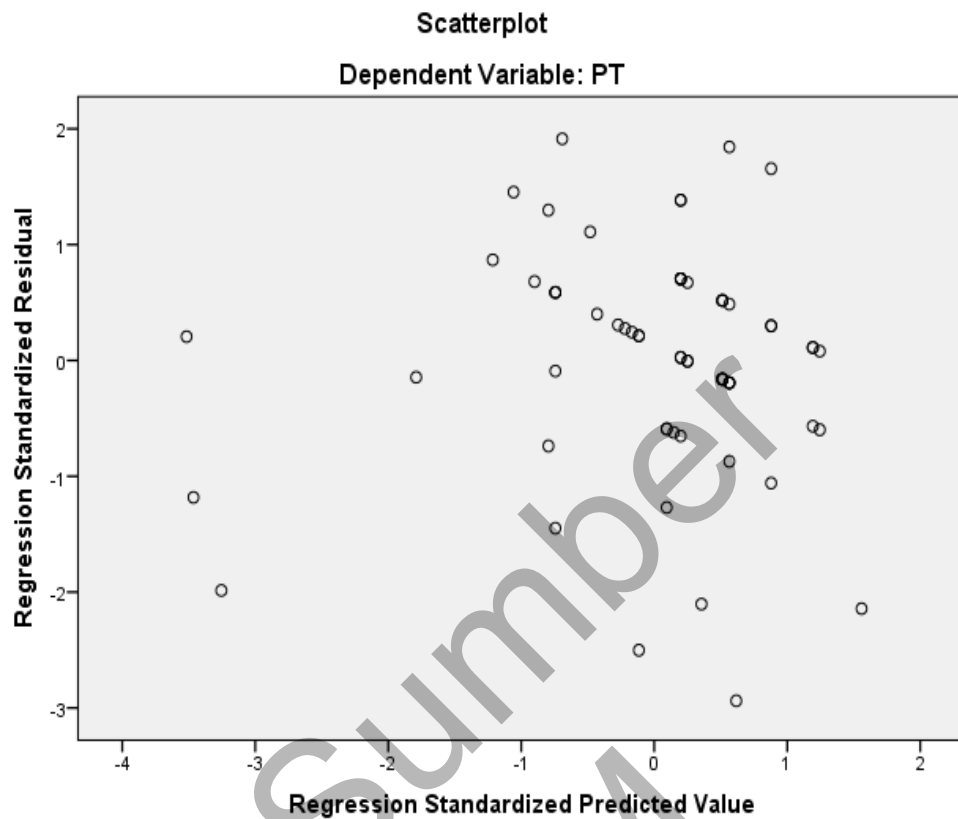
Dependent Variable: PT

Figure 4.6   Homoscedasticity for perceived trust in e-commerce

The fourth assumption for the regression is the linearity of variables. Linearity concerns the manner of which the relationship between variables may be portrayed in a straight line (Johnson and Wichern, 2007; Tabachnick and Fidell, 2007). To be able to assess the assumption, linearity residual plots had been used as suggested by Hair et al (2006). The result of evaluating linearity using scatter plot diagrams are shown in Figure 4.7, which reveals that the assumption of linearity was satisfied once the figures showed the distribution of scatter to be at the center of the shape. The results of the linearity assumption offer justification to the use of several regressions to look at the relationship between the dependent and independent variables. The result for linearity and homoscedasticity assessments for perceived trust in E-commerce is shown in Figures 4.6 and 4.7. The results suggest that the assumptions of multicollinearity, homoscedasticity, and linearity of data have been met.
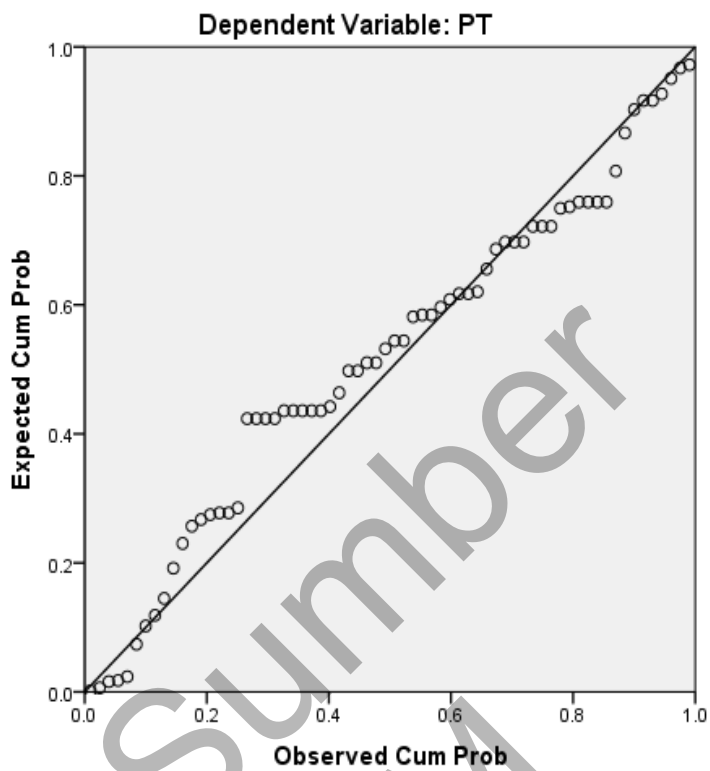
Normal P-P Plot of Regression Standardized Residual

Dependent Variable: PT

Figure 4.7   Linearity test for perceived trust in e-commerce

Furthermore, the linearity and homoscedasticity assessments of intention to use have been performed. The result of linearity test by scatter plot diagrams in Figure 4.8 below shows no proof of nonlinear pattern to the residuals.

Normal P-P Plot of Regression Standardized Residual
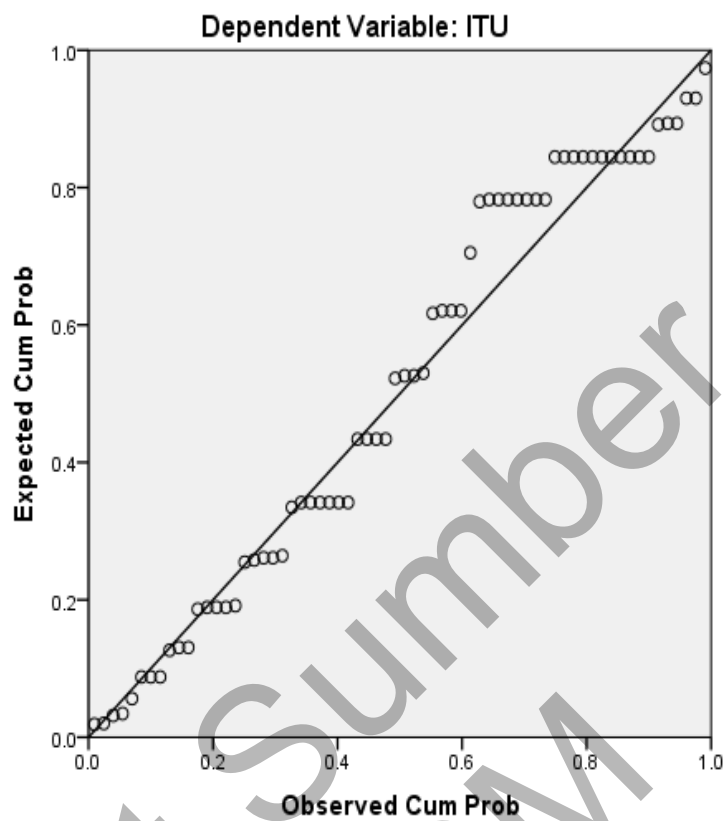
Dependent Variable: ITU

Figure 4.8   Linearity test for intention to use

The outcomes for the homoscedasticity test as illustrated in Figure 4.9's scatter plot diagrams show that the finding of the pupil zed residuals test portrayed that there is no homoscedasticity to the set of independent variable and dependent variables.
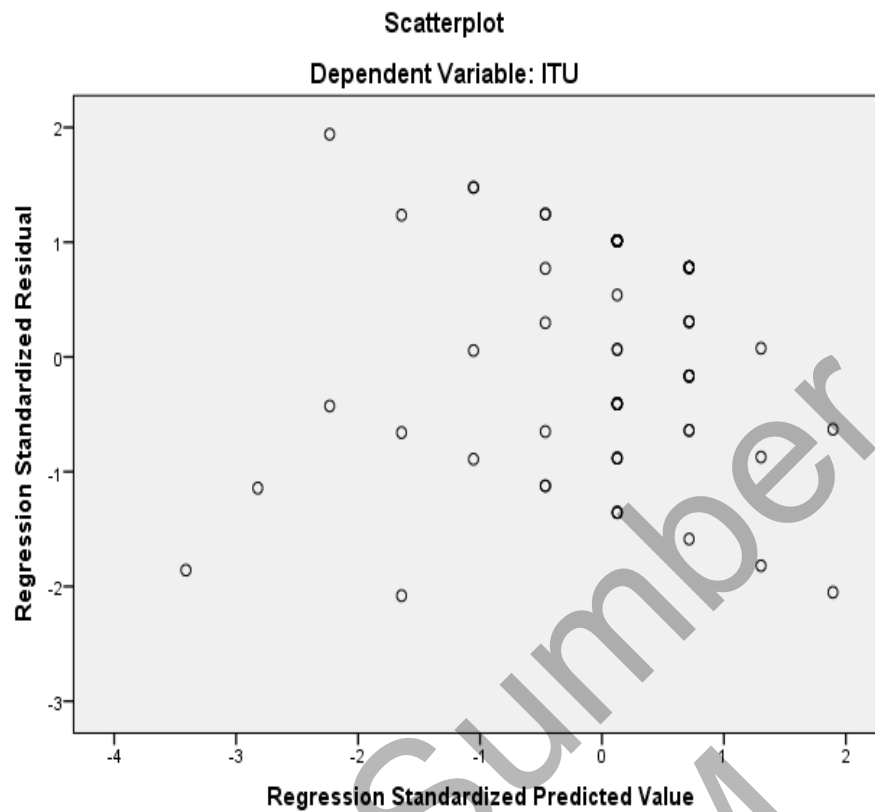
Figure 4.9   Homoscedasticity test for intention to use

The outcomes of linearity & homoscedasticity assessments for intention to use e-commerce shown in Figures 4.8 and 4.9 where no exaggerated cluster was observed. The assumptions of linearity and homoscedasticity of data are therefore met.

Normality is the final assumption of regression, (Pallant 2010) reported that the residual must be typically sent out to the expected dependent variable scores. A histogram generally assesses the normality using a visualization of the regular distribution given that probably the highest displayed a bell-shaped curve for all the examined residuals and no exaggerated cluster was observed as shown in Figures 4.10. The assumption of normality regression analysis was achieved.
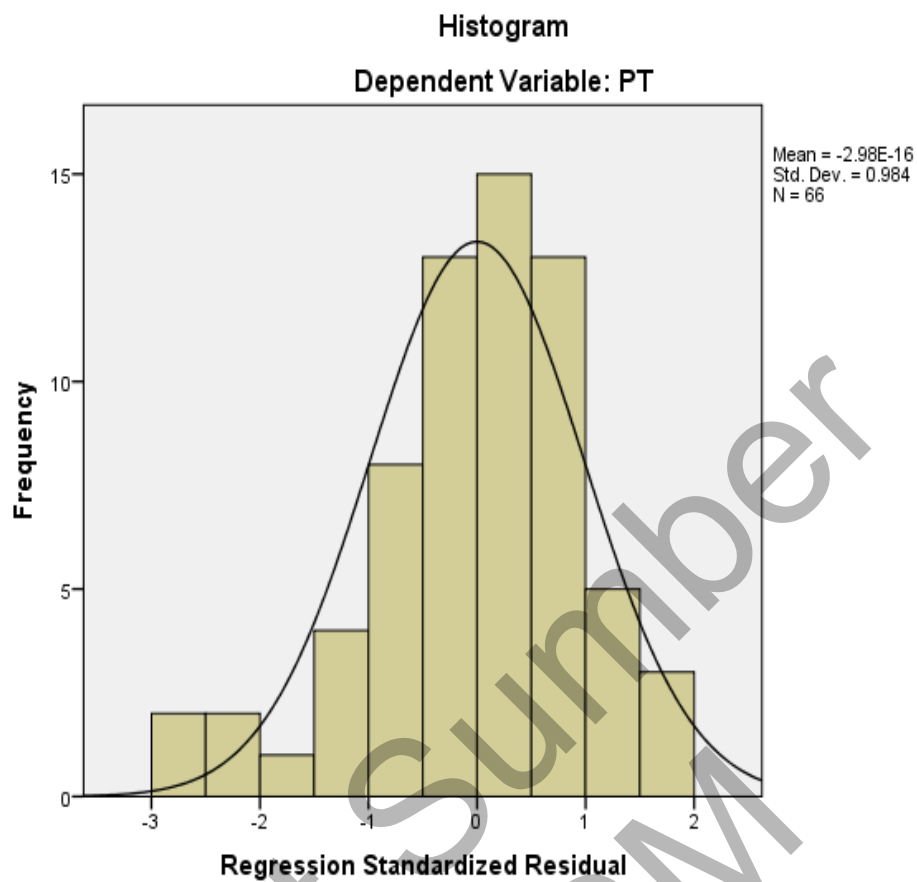
Histogram

Dependent Variable: PT

Figure 4.10   Normality test for perceived trust

4.5.2   Evaluating Each of the Independent Variable

This section is to evaluate as well as determine the strength and prediction of the independent variables on the dependent variable. Put simply, this part determines which variable contributes to the model as well as predicts the dependent variable. This analysis is interested in assessing the contribution of each independent variable in the model. The first analysis is to evaluate the multiple linear regression of the relationship between perceived ease of use, perceived usefulness and perceived trust.

The result illustrated in Table 4.16 shows that the two independent variables contribute significantly to perceived trust. Perceived ease of use has the highest contribution to perceived trust compared to perceived usefulness at (β=.324). Perceived usefulness (PU) also significantly and positively contributes to perceived trust (PT) (β=.307).

Table 4.16   Results of multiple linear regressions between perceived ease of use, perceived usefulness, and perceived trust.

Model Summary (b)

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.518a	.269	.245	1.474

a. Predictors: (Constant), PU, PEU.

b. Dependent Variable: PT.

ANOVA (b)

Model		F	Sig.
1	Regression	11.565	.000b
	Residual		
	Total		

a. Dependent Variable: PT

b. Predictors: (Constant), PEU, PU

Coefficients (b)

Model		Unstandardized Coefficients		Standardized Coefficients	T	Sig.
		B	Std. Error	Beta		
1	(Constant)	8.808	2.747		3.206	.002
	PEU	.276	.098	.324	2.826	.006
	PU	.322	.120	.307	2.677	.009

Dependent Variable: PT

P<.05, ** p<.001

As shown in Table 4.16, the R²: is significant at F=11.565 and p<.001. Based on these results, the regression equation's common expression is stated as follows: perceived trust = 8.808 +.324 perceived ease of use +.307 perceived usefulness. The

two independent variables as observed have a positive relationship to perceived trust as indicated by the good R-value of .518a in Table 4.16. The computed R square value of .269 indicates that the variable details more than 26.9 % of the variance in perceived trust (with a standard error estimate of 1.474). Put simply, just about all independent variables have an impact on perceived trust.

The final regression analysis in this study was conducted to evaluate the simple linear regression involving perceived trust and intention to use. The R^2 value of .136 implies that perceived trust defines 13.6 % of the variance in the intention to use with a standard error estimate of 2.111.

Table 4.17　　Results of simple linear regression between perceived trust and intention to use.

Model Summary (c)

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.369a	.136	.122	2.111

a. Dependent Variable: ITU

b. Predictors: (Constant), PT

ANOVA (c)

Model		F	Sig.
1	Regression Residual Total	10.067	.002b

a. Dependent Variable: ITU

b. Predictors: (Constant), PT

Coefficients (c)

Model		Unstandardized Coefficients		Standardized Coefficients	T	Sig.
		B	Std. Error	Beta		
1	(Constant)	12.086	3.373		3.583	.001
	PT	.490	.154	.369	3.173	.002

Dependent Variable: ITU

P<.05, ** p<.001

The result in Table 4.17 shows that the Beta value is .369 which shows that perceived trust has a strong contribution in explaining the intention to use e-commerce technologies. Additionally, perceived trust has a significant value of $p < .05$ which confirms that there is a positive significant relationship between perceived trust and intention to use. The R^2 was statistically significant with $F = 10.067$ and $p <. 002$. Consequently, the standard term of the regression equation is stated as follows: intention to use = 12.086 +.369 perceived trust.

4.6   HYPOTHESIS TESTING

In support of the study, the following hypotheses have been tested to look at the relationship between perceived ease of use, perceived usefulness, and perceived trust. Also, the influence perceived trust has on the intention to use e-commerce technology in Uganda ICT SMEs was also tested. Table 4.18 shows the conclusion of this section which is the acceptance or rejection of the stated hypotheses.

The three hypotheses to be examined are:

H1: Perceived ease of use positively affects perceived trust towards using e-commerce technology in Uganda ICT SMEs.

As shown Table 4.16 the result reveals that there's a significant and positive relationship between perceived ease of use and perceived trust (β = .324, t=2.826, p <.006). For every device increase in perceived ease of use, the result implies that there's an expected increase of .324 in perceived trust in e-commerce technologies. Thus, Hypothesis 1 is accepted. Figure 4.11 depicts the relationship.
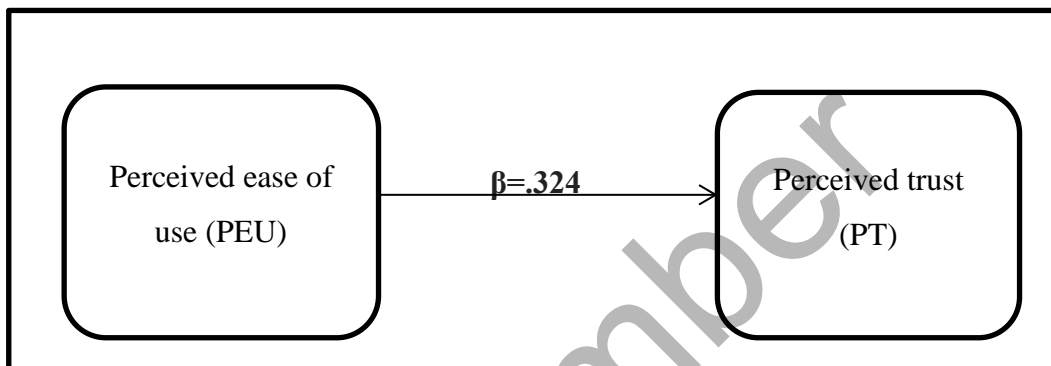

Figure 4.11   The relationship between perceived ease of use and perceived trust.

H2: Perceived usefulness positively affects perceived trust towards using e-commerce technology in Uganda ICT SMEs.

The result from Table 4.16 reveals a positive and significant relationship between perceived usefulness and perceived trust (β=.307, t=2.677, p <.009). Base on this result, as each device increase in perceived usefulness of e-commerce technology, an increase of .307 in perceived trust was expected. As a result, Hypotheses 2 is accepted. Figure 4.12 shows the relationship
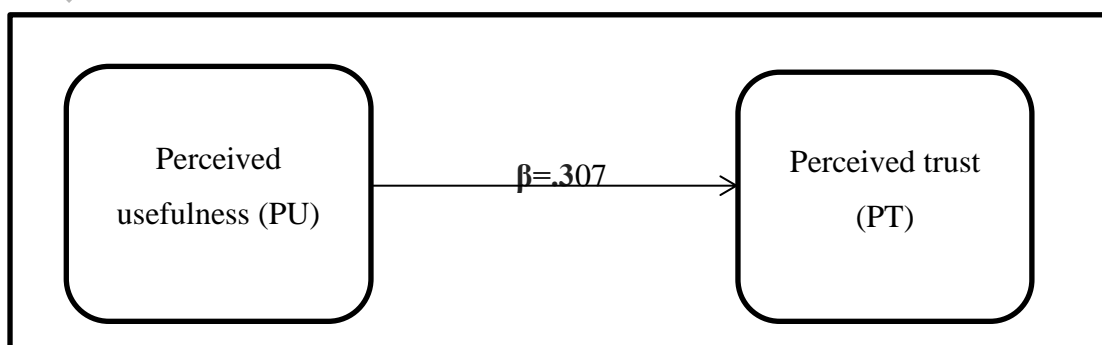

Figure 4.12   The relationship between perceived usefulness and perceived trust.

H3: Perceived trust positively affect intention to use e-commerce towards using e-commerce technology in Uganda ICT SMEs

The result in Table 4.17 shows a significant and positive relationship between perceived trust and intention to use e-commerce technology (β = .369, t=3.173, p <.002). This result shows that with each increase in perceived trust, there's an expected increase of .369 in intention to use e-commerce technology in Ugandan ICT SMEs. Therefore Hypothesis 3 is accepted. Figure 4.13 shows the relationship.
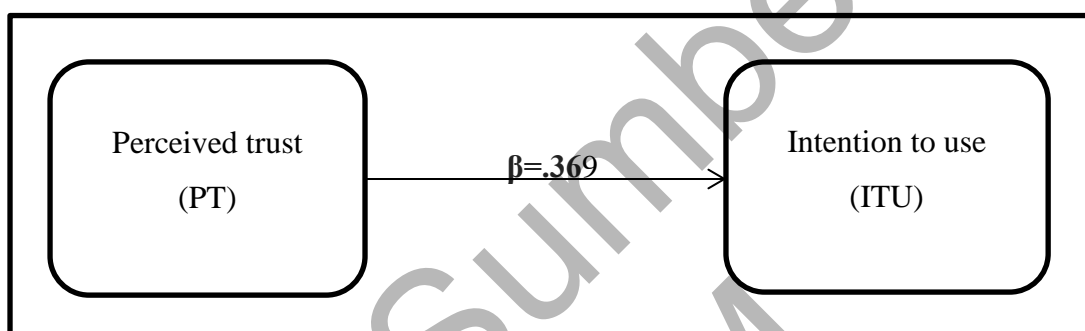

Figure 4.13   Relationship between perceived trust and intention to use.

As hypothesized, perceived ease of use and perceived usefulness positively affects perceived trust. Similarly, perceived trust positively influences the intention to use e-commerce in Ugandan ICT SMEs. As hypothesized, the results showed that perceived trust has the biggest effect on intention to use e-commerce technology (β=.369, t=3.173, p<.002), followed by other factors. Figure 4.14 presents the research model on the results of the hypothesis testing.