FACTORS AFFECTING ONLINE PRINTING ADOPTION BY THE SRI LANKAN PRINTING INDUSTRY

W.G. Charitha Weerasinghe

(139071P)

Master of Business Administration in Information Technology

Department of Computer Science & Engineering

University of Moratuwa
Sri Lanka

December 2016

FACTORS AFFECTING ONLINE PRINTING ADOPTION BY THE SRI LANKAN PRINTING INDUSTRY

W.G. Charitha Weerasinghe

(139071P)

Dissertation submitted in partial fulfilment of the requirements for the degree Master of Business Administration in Information Technology

Department of Computer Science & Engineering

University of Moratuwa

Sri Lanka

December 2016

Declaration

I declare that this is my own work and this dissertation does not incorporate without acknowledgement any material previously submitted for a Degree or Diploma in any other University or institute of higher learning and to the best of my knowledge and belief it does not contain any material previously published or written by another person except where the acknowledgement is made in the text.

In addition, I hereby grant to University of Moratuwa the non-exclusive right to reproduce and distribute my dissertation, in whole or in part in print, electronic or other medium. I retain the right to use this content in whole or part in future works (such as articles or books).

…… ……..

W.G. Charitha Weerasinghe Date

The above candidate has carried out research for the Masters Dissertation under my supervision.

…… ……..

Dr. H.M.N. Dilum Bandara Date
(Research Supervisor)

Abstract

The printing technologies revolutionized over the time to bring much quality and durable output to its customers. It started with offset and screen-printing and then the technology moved into digital form creating the digitally created print outputs. With the advent of Internet, most print shop owners tend to go online and make their sales in the digital space. They identified that moving into the online market will reduce most of the crowded hazels in their physical store, as well as they can reached to new customers without any boundaries or landmarks.

In this study, we tried to identify what are the drivers that contributes to the, consumers' adoption of online version of the physical print industry. In addition, the drawbacks and barriers that need to be address and overcome to successfully move a print business to the digital space are also analyzed. We used the Technology Acceptance Model (TAM) to identify the consumers' attitudes towards online printing services and behavioural intension to use the online printing services.

Through the study, we found that consumer characteristics, print product characteristics, website characteristics, and environmental characteristics have a significant impact in the customer decision to select online printing services compared to in-store printing services. Among consumer characteristics, gender, age, and monthly income level perform a major role in moving towards the online printing. Product characteristics such as product type and product price and channel characteristics such as user-friendly website designs and its customer service features get more attention from its potential users. We believe print vendors who are planning to move into the online printing can use these findings as guidelines to decide how to use, when to use, and what ways to use these new technologies with their traditional work process.

Keywords: online printing, web store, web-to-print, web-2-print, e-commerce

Acknowledgments

I wish to express my deepest appreciation to all those who have supported me in so many ways.

First and foremost, I wish to express my sincere thanks to my research supervisor Dr.Dilum Bandara, Senior Lecturer of the Department of Computer Science and Engineering, University of Moratuwa. I am extremely grateful and indebted to him for the continuous sincere and invaluable support, expert guidance, encouragement and attention extended to me throughout the course of this project.

Further, I wish to convey my sincere thanks to all the staff members of the Department of Computer Science and Engineering, University of Moratuwa, for the resources provided to me in bringing this study a success.

In addition, I would like to thank all the participants, who spent their valuable time to take part in the survey questionnaire.

Finally, I wish to convey my earnest thanks to all those who helped in numerous ways to making this study a success, whose names have not been mentioned above.

Table of Contents

List of Figures

List of Tables

List of Abbreviations

3D	Three-Dimensional
APPs	Applications
B2B	Business-to-Business
CSE	Computer Science & Engineering
EC	E-Commerce or Electronic Commerce
ELS	Electronic Learning System
ERP	Enterprise Resource Planning
FB	Facebook
IBM	International Business Machines Corporation
ICT	Information and Communications Technology
IPG	Internet Payment Gateway
IS	Information Systems
IT	Information Technology
KM-1 PRINTING	Konica Minolta 29.5-inch Print System
LMS	Learning Management System
MBA	Master of Business Administration
MIAC	Model of Intention, Adoption, and Continuance
POD	Point on Demand
SLAP	Sri Lanka Association of Printers
SLIP	Sri Lanka Institute of Printing
SMEs	Small to Medium Size Enterprises
SPSS	Statistical Package for the Social Sciences
SSL	Secure Socket Layer
TAM	Technology Acceptance Model
TLS	Transport Layer Security
TTF	Task-Technology Fit
UTAUT	Unified Theory of Acceptance and Use of Technology
W2P	Web-to-Print / Web-2-Print
WWW	World Wide Web

1 INTRODUCTION

This research is focused on analyzing the online printing adaptation of customers over their usual on-store printing activities. Furthermore, the research tries to identify the factors that drive them towards these newer trends and what holds them backs. Section 1.1 elaborates the motivation and background of the research. Section 1.2 and 1.3 discusses the research problem and research objectives, respectively. Significance of the research is presented in Section 1.4, while rest of the thesis is outlined in Section 1.5.

1.1 Background and Motivation

The conventional routines in printing techniques and approaches changed rapidly over the past few years. These modern printing technologies include, Web-2-Print solutions, mobile printing with designer Apps, Print ERPs, Store-front solutions, 3D printing, KM-1 printing, Point On Demand (POD) printing, and Cloud printing. However, injecting those newer technologies and integrating them with the current process raise many challenges and obstacles to the management, employees, as well as for the customers.

Because of the technology adaptation issues, many printing firms get less than what they have expected from these new integrations. Consequently, some of them have given up those changes and gone back to the traditional process. A more effective application of these newer technologies for the print process will enable printers to go for a much larger customer base, as well as diversify and expand their business into newer markets with much commitment and confidence. Fenton (2010) identified that, specifically for the print industry, sales and marketing efforts, financial metrics, and operational excellence as the three critical success factors that drive the business in to the next level of excellence. From there, operational excellence focuses on the increasing productivity to reduce costs and turnaround times. Increasing operational productivity has become one of the never-ending mantras and battles in print production today. The benefits include driving down the cost of manufacturing, speeding turnaround times, and more competitive prices (Fenton, 2010).

Fenton (2010) further expresses that both the large and small-scale printers need to master the three business pillars, namely sales and marketing efforts, financial metrics, and operational excellence, to become a leader in the market. Therefore, to increase the market value, printers have to start listening and being responsive to their customers' changing needs. As a highly demanded service, print industry needs to focus on their potential customers' challenging and changing requirements and demands to stay alive in the competitive market. Among out of those requirements, online printing and web-store facilities are one major form of interaction they expect from a print service provider to ease their busy schedules.

1.2 Problem Statement

The traditional workflow of a customer order in a printing company involves customer coming to the store, works with a graphic designer if he/she needed to do artwork or else brings the design file, checks the material samples and confirms the order, and when the print is ready, pays and collects it. However, this traditional routine becomes such a pain to the firm when the business grows with the time. While more customers means more business, it also requires hiring more designers, more parking and office space, more cashiers to serve them, etc. That brings many concerns for the management to fulfill the customer requirements and their satisfaction. As a solution for these dilemmas and worries, most companies are likely to go online and provide their usual service in a virtual way. However, physical establishments of business and direct or face-to-face interactions with the customers become less and thinner, as they move online. Some customers like it, because they do not have to come there and wait for their prints to be ready, especially when it involves routing activities such as printing business cards.

However, this change has been accepted only by the small fraction of the regular customers. Therefore, it is imperative to understand what is holding the customers back without reaching to next level of printing. We plan to address this problem by discovering the critical factors and issues there are to be fulfilled first to build the

bridge between the customers and the online printing services. The research problem to be addressed can be more formally stated as follows:

What are the critical success factors affecting the adoption of online printing in the Sri Lankan printing industry?

1.3 Research Objectives

This study is an effort to propose a theoretical framework to customers' online printing acceptance and intention to use the online solutions based on the Technology Acceptance Model (TAM) (Venkatesh et al., 2003). The objectives of the study are to analyze the relationship of customers' intention to use online printing solutions with selected constructs such as their attitude towards online printing, perceived usefulness, and perceived ease of use, consumer characteristics, product characteristics, medium (website) characteristics, and environmental characteristics. Then use those findings to develop a list of guidelines or structural model of customers' acceptance towards online printing solutions, which would provide printers with suggestions for better implementing web-to-print solutions for the company. Therefore, objectives of the research can be stated as follows:

- Identify the factors affecting technology adaptation (customer perspective) in the printing industry.
- Identify the impact of customer perception towards new technologies on service-driven industry (focus towards printing services).
- Identify the factors affecting people embracing new technologies in printing market.
- Provide guidelines for the print company management on how to use, when to use, and what ways to use those new technologies (a set of guidelines to evaluate their readiness to implement such an online printing solution for their company).

1.4 Importance and Benefits of Research

The introduction of the Internet as a shopping channel has enabled shoppers to gain shopping benefits such as convenience and timesaving, better information, and price savings. The use of the Internet as a shopping medium has empowered shoppers with advantages over traditional storefront or in other words in-store shopping. For example, Chang (2015) found convenience and timesaving, powerful research instrument, lower search costs and better product selection, and better price information and lower prices as the key advantages. Next, each of these advantages are discussed in detailed.

Convenience and Time Saving

Doing shopping on the Internet offers convenience and timesaving benefits to buyers, as compared to shopping in traditional in-store or brick-and-mortar stores. Changing consumer lifestyles and lack of time may make it more difficult for consumers to shop at physical locations such as stores and shopping malls (Davies, 1995; Cheeseman & Breddin, 1995).

GartnerG2 research director David Schehr mentioned, "all of their research shows that consumers are most interested in convenience, not price." People may prefer to sacrifice some money over the conveniences they gain form shopping online. According to him, shoppers do still expect bargains online, but fast delivery and a wide selection are more important factors; price comes into the picture along with convenience, but it is no longer the main reason people shop online (Regan, 2002).

Powerful Research Instrument

Shoppers are able to use the Internet as a powerful search instrument in the purchasing process. For products such as books, music, and videos reviews and recommendations are important factors in influencing purchase decision. With such products, shoppers are not only able to browse through a larger selection on the Web on sites such as Amazon.com, but are also able to conveniently obtain reviews and recommendations that are usually unavailable in offline stores (Chang, 2015).

Lower Search Costs and Better Product Selection

Shopping using the Internet reduces the time and costs of traditional shopping; shoppers can shop at a convenient time from the comfort of home, and need not to travel to physical storefronts. Shoppers are able to locate many vendors online using search engines and websites designed to navigate shoppers, view detailed product information from a variety of vendors' websites, compare price and quality among different vendors, and make purchases online.

Better Price Information and Lower Prices

The Internet makes it easier for shoppers to compare prices between vendors. Online vendors offer the prices of their goods in their websites. Simply by viewing different vendor websites, shoppers are able to obtain and compare prices easily, as compared to visiting different physical storefronts, which is costly and time consuming (Chang, 2015).

Ease of Transactions

There is no need to take time off to go to the printer's office and order your goodies. Web-to-print enables the customers to buy their desired stuff within a few clicks. It gets easier for the printer too as they do not have to explain everything to each customer. All the information, templates, and products are online.

Wide Market

While offline printers can just reach customers nearby or some fixed clients, web-to-print allows the business to transact beyond local, state and international boundaries. Printers can take orders from anywhere in the world.

Figure 1.1 shows several other additional advantages to the customers if they go online rather going to physical store. These factors can be used as the main drivers to motivate the users to go on Internet shopping to gain more shopping benefits as well as the convenience and timesaving for them as a personal gain.

Figure 1.1: Why consumers prefer shopping online

Source: (www.designbuy.com / en.wikipedia.org/wiki/Web-to-print).

Those advantages and benefits of online shopping and Internet marketing are common to online printing as well. However, in the current context, consumers are much more reluctant to go for a print product ordered through the Internet than electronic items, cloths, shoes, or bags. All these items carry the same uncertainty when they are ordered through a web-store. However, consumers may consider that ordering a print product through the Internet is a much risker bargain than the rest.

Through this research effort we are trying to identify the plus points and trying to address the drawbacks and barriers, so that the online printing can be promoted as same as the any other online marketing topic. Currently only a few print vendors in the Sri Lanka offer web-based online print solutions. The reason for this can be, they may fear to invest in those solutions, as there is no previous study on the Sri Lankan print industry. Therefore, print vendors do not have any knowledge base or materials to be referred before investing on such a solution. Therefore, the proposed study is

important and beneficial to the management in the printing industry to be able to refer before investing in those without much hesitation.

1.5 Outline

The remainder of this thesis is organized as follows. Chapter 2 provides a detailed discussion on diverse literature associated with technology acceptance models and the factors customers' acceptance of newer technologies and trends. Chapter 3 presents the research methodology adopted for the study. Chapter 4 presents the analysis of gathered sample data and discussion on observations and results. Conclusions drawn from the analysis and interpretation of data are presented in Chapter 5. Furthermore, Chapter 5 discusses the limitations of the study and directions for future research.

2 LITERATURE SURVEY

The technology implementation and adaptation strongly rely on the change acceptance of the end users of the system. Whatever the changes made to existing or traditional process ultimately needs to be accepted by the customers or employees. Then the management can integrate that process with the current business process with the 'good to go' attitude. Therefore, to get that confidence, management and policy makers need to have a basic understanding about the factors that decide the mindset of employees, as well as the end-node of the business value stream, the customers.

Related work is analyzed in Section 2.1 to identify a suitable model or theoretical framework to identify the factors regarding the subject. There we discuss six related models to develop a conceptual framework. Section 2.2 describes the factors and drivers for customers' acceptance of newer technologies and trends. About 27 prior works related to the online service industries are discussed and analyzed to identify the independent and dependent variables related to the proposed study. Finally, they are short-listed depending on the significance to the proposed study.

2.1 Models on Introducing New Information Systems

2.1.1 Technology Acceptance Model (TAM)

Technology Acceptance Model (TAM) proposed by Davis in 1986 is the most widely used model for technology acceptance and use. TAM has also proven to be successful in explaining and predicting the user behaviors and expectations in meeting the new technologies in information technology (Legris, Ingham, & Collerette, 2003).

Figure 2.1 illustrates the TAM model. Each factor is described in Table 2.1. TAM posits that acceptance of a new Information System (IS) or new technology can be predicted based on users' behavioral intention (BI), Attitude towards use (A), and two other internal beliefs, namely the Perceived Usefulness (PU) and Perceived Ease of Use (PE). Davis (1986) defined perceived usefulness as "the prospective user's

subjective probability that using a specific application system will increase his or her job performance within an organizational context" (p. 985) and perceived ease of use as "the degree to which the prospective user expects the target system to be free of effort" (p. 985).

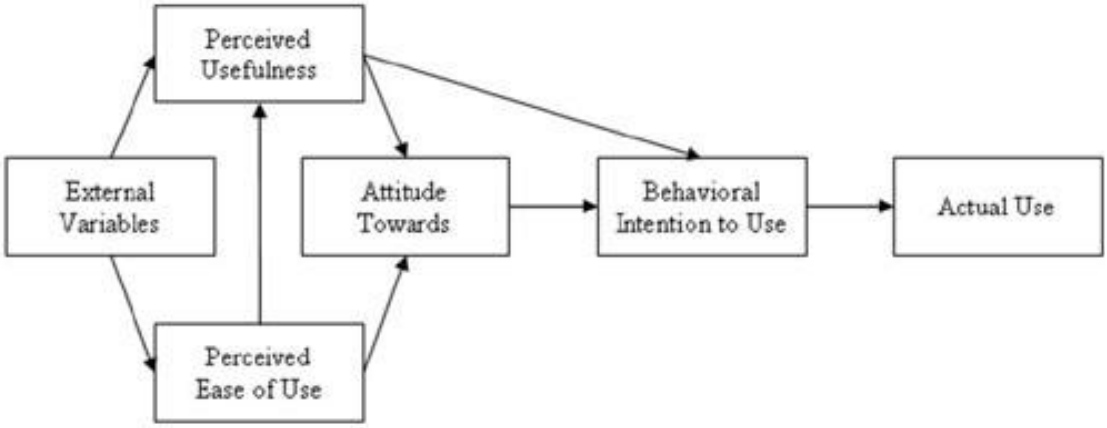


Figure 2.1: Technology Acceptance Model (TAM)

Source: (David, 1986).

Table 2.1 – Definitions of TAM's factors.

Factor	Definition
Perceived Usefulness (PU)	Perceived usefulness can be defined as the degree to which a person believes that using a particular system would enhance his or her job performance (Davis, 1989); (Davis, Bagozzi & Warshaw, 1989).
Perceived Ease of Use (PE)	PE is defined as the degree to which a person believes that using a particular system would be free of effort or Effortless in other words (Davis, 1989); (Davis, Bagozzi & Warshaw, 1989).
Attitude Towards (A)	The factors, PU and PE predict attitudes of user towards the information system or the newer technology. Furthermore, Attitude towards (A) and Perceived Usefulness (PU) influenced the user's Behavioral Intention (BI) to use the system or new technology.

According to TAM, Behavioral Intention (BI) defines the actual use of a given IS system and therefore determines technology acceptance. Attitude towards use (A) and Perceived Usefulness (PU) jointly influence BI. BI is also indirectly affected by the Perceived Ease of Use (PE). A is directly affected by both PU and PE, while PU is directly influenced by PE. Further, TAM theorizes that perceived usefulness and perceived ease of use are affected by external variables. Thus, U and E mediate the effect of external variables on user's attitude and behavioral intention, and therefore the actual system use (Alharbi & Draw, 2014).

Several studies have extended the TAM by adding new variables (Surendran, 2012). Agarwal and Prasad (1998a, 1998b) modified TAM by adding the construct of compatibility to the model. Moon and Kim (2001) added a new variable called "playfulness factors" to study the acceptance of the World Wide Web. Lim (2000) proposed to modify TAM by adding variables like experience, self-efficacy, perceived risk, and social influence. Another study by Agarwal and Karahanna (2000) added cognitive absorption, playfulness and self-efficacy to the TAM model. Chau (1996) in a study reviewed TAM by included two types of perceived usefulness; near-term and long-term. Van der Heijden (2000) after analyzing the individual acceptance and usage of the website added two new constructs to TAM, namely perceived entertainment value and perceived presentation attractiveness.

Chau and Hu (2002) combined the factor of peer Influence with TAM. According to study by Franco and Roldan (2005), the relationship between perceived usefulness and behavioral intention was strong among goal-directed users. Chau and Hu (2001) compared three models; TAM, the Theory of Planned Behavior (TPB), and a decomposed TPB model that is potentially adequate in the targeted healthcare professional setting in Hong Kong. The results indicated that TAM was superior to TPB in explaining the physicians' intention to use telemedicine technology. The study conducted by Sun and Zhang (2003) found voluntariness can be factor in determining the behavioral intention to use.

Hun-Pin Shih (2004) combined the TAM and the information behavioral model of Choo (1991) that takes notice of the relevance of the information. Lee (2009) combined the TAM with Theory of Planned Behavior, perceived risk and perceived benefit to understand the adoption of internet banking.

2.1.2 Evolution of the TAM

To identify the factors affecting, people embracing new technologies in printing market, we planned to use the TAM by Davis et al. (1989) and Venkatesh et al. (2003). The TAM has been continuously studied and expanded. Two major upgrades being the TAM 2 (Venkatesh & Davis, 2000; Venkatesh, 2000) and the Unified Theory of Acceptance and Use of Technology (UTAUT) (Venkatesh et al., 2003).

2.1.2.1 Extended Technology Acceptance Model (TAM2)

An extension to the TAM was developed by Venkatesh and Davis (1996, 2000), that outlined perceived usefulness and usage intentions as it related to the processes of social influence and cognitive instrumental.

Venkatesh and Davis (1996, 2000) reported that perceived usefulness is based on usage intentions in many empirical TAMs. It is important to understand the determinants of the perceived usefulness construct because it drives usage intentions and how these determinants influence changes over time, with increasing system usage. Although the original TAM model was based on the determinants of perceived ease of use, the determinants of perceived usefulness enabled organizations to design organizational interventions that would increase user acceptance and usage of new systems. For this reason, Venkatesh and Davis conducted a study published in 2000 to extend TAM that examined how the perceived usefulness and usage intention constructs change with continued information system (IS) usage (Venkatesh & Davis, 1996, 2000).

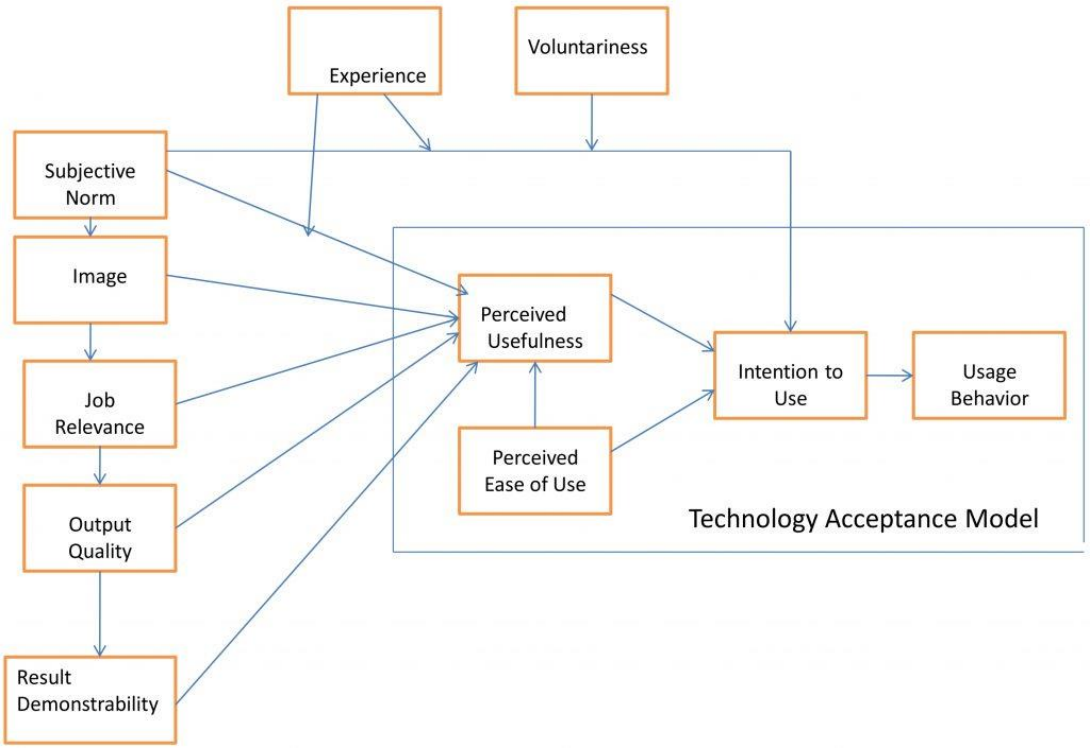


Figure 2.2: TAM2 model

Source: (Adapted from Venkatesh & Davis, 2000).

Figure 2.2 shows an overview of TAM2. TAM2 model added, "Theoretical constructs involving social influence processes (subjective norm, voluntariness, and image) and cognitive instrumental processes (job relevance, output quality, result demonstrability, and perceived ease of use)." These instrumental determinants in the TAM2 are defined in Table 2.2.

Table 2.2: TAM2 instrumental determinants.

Process	Variable	Definition of Variable
Social Influence	Subjective Norm	"A person's perception that most people who are important to him/her think he/she should or should not perform the behavior in questions" (Fishbein & Ajzen, 1975, p. 302).
	Voluntariness	"Extent to which potential adopters perceive the adoption decision to be non-mandatory" (Venkatesh & Davis, 2000, p. 188).
	Image	"The degree to which use of an innovation perceived to enhance one's status in one's social system" (Moore & Benbasat, 1991, p. 195).
	Experience	"The direct effect of subjective norm on intentions may subside over time with increased system experience" (Venkatesh & Davis, 2000, p. 189).
Cognitive Instrumental	Job Relevance	"An individual's perception regarding the degree to which the target system is applicable to the individual's job. Job relevance is a function of the important within one's job of the set of tasks the system is capable of supporting" (Venkatesh & Davis, 2000, p. 191).
	Output Quality	"In perceptions of output quality, users will take into consideration how well the system performs the tasks that match their job relevance" (Davis, Bagozzi, & Warshaw, 1992, p. 985).
	Result Demonstrability	"Tangibility of the results of using the innovation will directly influence perceived usefulness" (Moore & Benbasat, 1991, p. 203).

2.1.2.2 Extended Technology Acceptance Model (TAM3)

Fred Davis (1989) introduced the TAM in 1989 as a way to describe the acceptance and use of technology. The model centered on Perceived Usefulness and Perceived Ease of Use as major determinants of the attitudes and intentions related with Use Behavior.

Venkatesh and Bala (2008) updated the TAM from version two to TAM 3, focusing on expanding the number of determinants that affect Perceived Usefulness and Perceived Ease of Use of an innovation, producing a positive Behavioral Intention followed by Use Behavior. Factors that influence Perceived Usefulness are Subjective Norm, Image, Job Relevance, Output Quality, and Result Demonstrability. Perceived Ease of Use is influenced by anchor variables (Computer Self-Efficacy, Perceptions of External Control, Computer Anxiety, and Computer Playfulness) and adjustment

variables (Perceived Enjoyment and Objective Usability). Figure 2.3 illustrates the TAM3 modeled by Venkatesh and Bala (2008).

Jeffrey (2015) carried out a detailed analysis on the Technology Acceptance Model 3 (TAM 3). There Jeffery evaluated the factors that influence the use of the LMS employed in a university by using the TAM 3. Analysis found, factors including Subjective Norm, Image, Computer Self-Efficacy, Computer Anxiety, Computer Playfulness, Perceived Enjoyment, Objective Usability, and Experience did not significantly affect the present model.

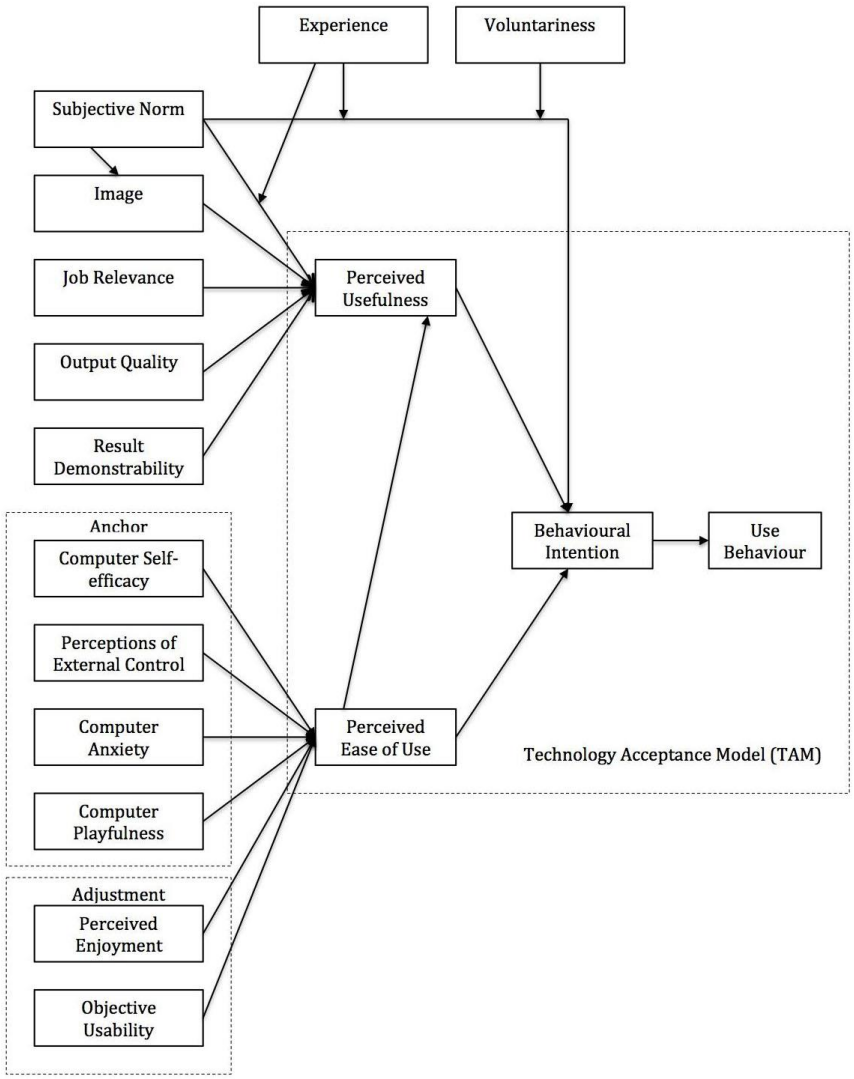


Figure 2.3: TAM3 model

Source: (Venkatesh & Bala, 2008).

2.1.3 Unified Theory of Acceptance and Use of Technology (UTAUT) Model

The Unified Theory of Acceptance and Use of Technology (UTAUT) aims to explain user intentions to use an IS and subsequent usage behavior. The theory holds that four key constructs, namely performance expectancy, effort expectancy, social influence, and facilitating conditions, are direct determinants of usage intention and behavior (Venkatesh et al., 2003). Gender, age, experience, and voluntariness of use are posited to mediate the impact of the four key constructs on usage intention and behavior (Venkatesh et al., 2003).

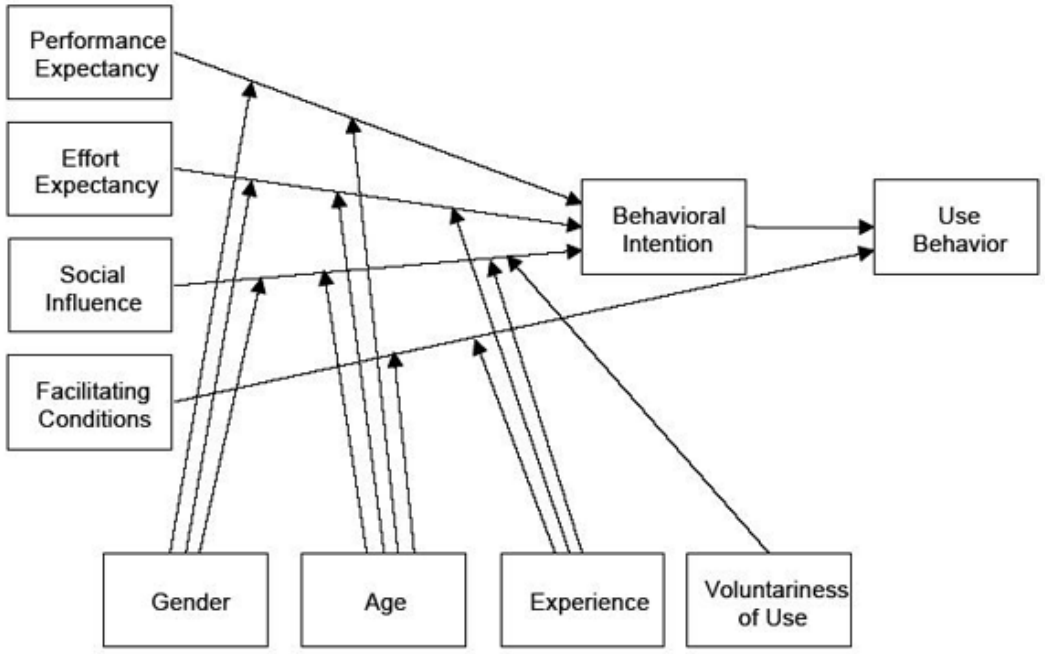


Figure 2.4: Key constructs of UTAUT model
Source: (Venkatesh et al., 2003).

UTAUT seen in Figure 2.4 was formulated by Venkatesh et al (2003), which consists of four main concepts: Performance Expectancy (PE), Effort Expectancy (EE), Social Influence (SI), and Facilitating Conditions (FC) (see Table 2.3 for definitions). These four main concepts are independent variables, which influence dependent variables, behavioral and usage. Gender, age, experience, and volunteers of system use have indirectly influenced the dependent variables via the four main concepts. Behavioral intention is seen as a critical predictor of technology use (Venkatesh et al., 2003).

Table 2.3: UTAUT four main concepts.

Concept	Definition
Performance Expectancy (PE)	The degree to which an individual believes that using the system will help him or her to attain gains in job performance (Venkatesh et al., 2003).
Effort Expectancy (EE)	The degree of ease associated with the use of the system (Venkatesh et al., 2003).
Social Influence (SI)	"The degree to which an individual perceives that important others believe he or she should use the new system" (Venkatesh et al., 2003).
Facilitating Conditions (FC)	The degree to which an individual believes that an organizational and technical infrastructure exists to support use of the system (Venkatesh et al., 2003).

2.1.4 Unified Theory of Acceptance and Use of Technology 2 (UTAUT2) Model

Venkatesh, Thong, and Xu (2012) carried out a research on consumer acceptance and use of information technology. In this effort, they extended the Unified Theory of Acceptance and Use of Technology (UTAUT) to study acceptance and use of technology in a consumer context. They proposed UTAUT2 incorporates three constructs into UTAUT, namely hedonic motivation, price value, and habit. They argued that compared to UTAUT, the extensions proposed in UTAUT2 produced a substantial improvement in the variance explained in behavioral intention. Figure 2.5 illustrates the UTAUT2 proposed by Venkatesh et al. (2012).

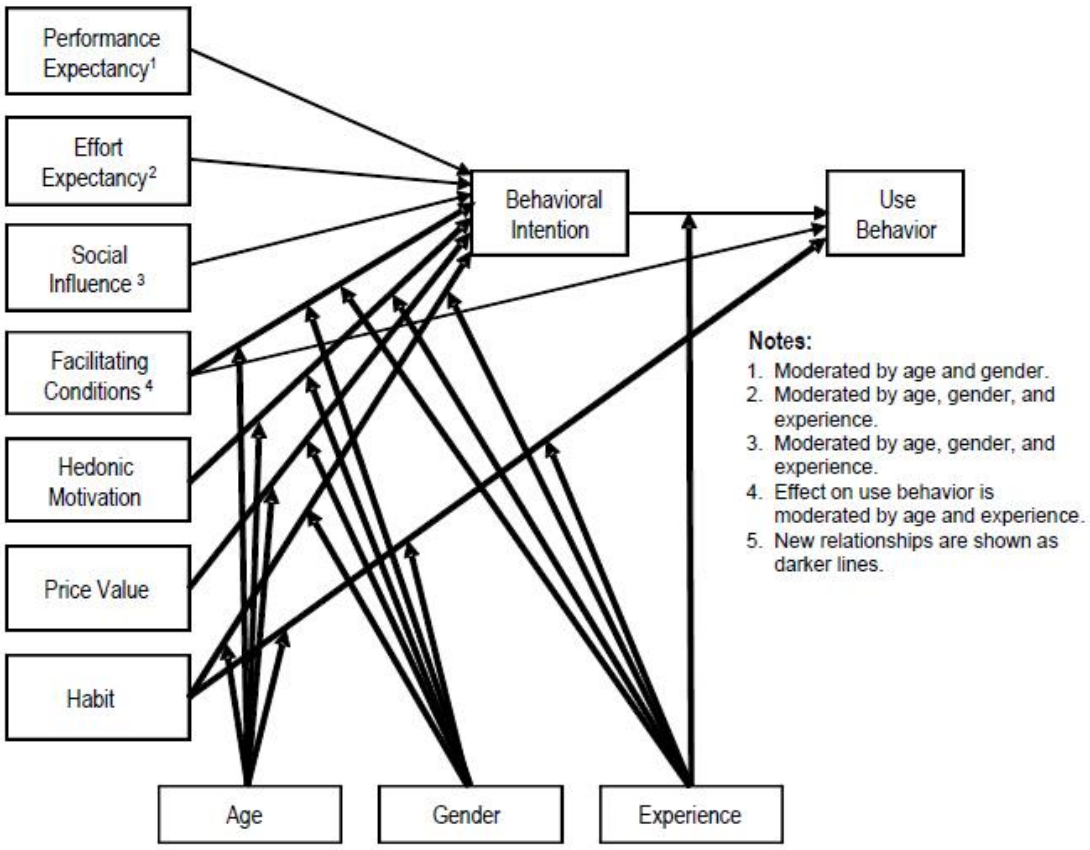


Figure 2.5: Unified Theory of Acceptance and Use of Technology 2 (UTAUT2) model

Source: (Venkatesh et al., 2012).

2.1.5 Task-Technology Fit (TTF) Model

Another model for technology adoption, the Task Technology Fit (TTF) model, extends the TAM by considering how the task affects use (Klopping & Mckinney, 2004). More specifically, the TTF model suggests that technology adoption depends in part, on how well the new technology fits the requirements of a particular task. A technology will be adopted if it is "… a good fit with the task it supports" (Goodhue & Thompson, 1995, p. 213). The TTF model has recently been applied successfully to predicting group decision support system acceptance (Zigurs, Buckland, Connolly, & Wilson, 1999) and to system adoption for accounting decision-making (Benford & Hunton, 2000).

Klopping and McKinney (2004) used extended version TAM to describe the technology adaptation in e-Commerce technology integration with the existing procedures. In e-commerce, use may be related to how well the consumer feels web technology fits the task. Most of the studies, the TTF is used as a combined model with the TAM.

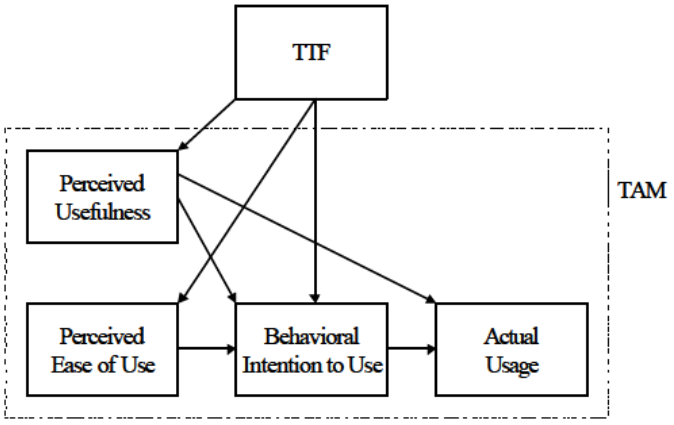


Figure 2.6: Combined Model: TAM and TTF (Task-Technology Fit) model
Source: (Klopping & McKinney, 2004).

Dishaw and Strong (1999) have demonstrated the efficacy of using a combined TAM and TTF model for workplace technology adoption. According to this combined model (see Figure 2.5), a construct called TTF model is a measure of the fit between the task and the technology (Goodhue & Thompson, 1995). TTF measure affects both the precursors of use and of productivity. Precursors of use in the TAM would be perceived ease of use, perceived usefulness, and the intention to use (Klopping & McKinney, 2004).

Furthermore, D'Ambra, Wilson, and Akter (2013) explained the benefits of TTF model throughout their research. According to them, TTF is an established theoretical framework in IS research that enables the investigation of issues of fit of technology to tasks as well as performance. One significant focus of TTF has been on individuals to assess and explain information systems success and impact on individual performance (Goodhue & Thompson, 1995). Goodhue and Thompson propose the technology-to-performance chain where characteristics of IT, tasks, and individual

users explain information system use and individual performance. Empirical results suggested that TTF and usage together create a better explanation on the impact of IT on individual task performance than usage alone.

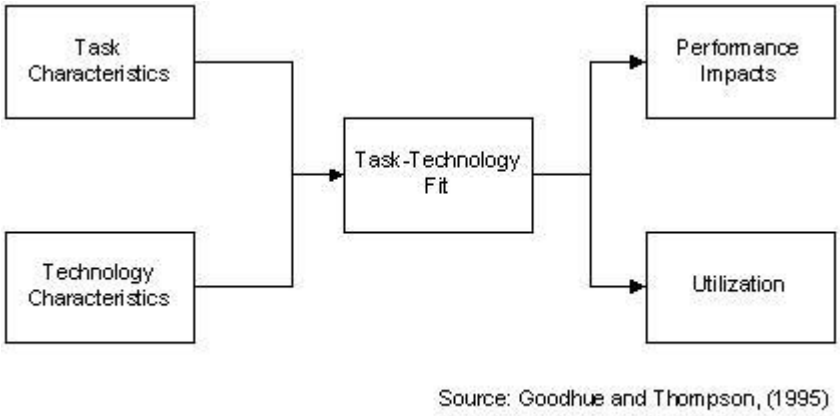


Figure 2.7: TTF (Task-Technology Fit) model
Source: (Goodhue & Thompson, 1995).

Further studies have demonstrated the efficacy of the TTF construct to measure the value of an IT (Goodhue & Thompson, 1995) and to predict performance (Goodhue, Klein, & March, 2000). TTF relationships can inform the associations between tasks and technology use from a number of perspectives: improved performance (Carswell et al., 2000); altered user perceptions (Wenger & Carlson, 1995) or increased user utilization (Kim & Malhotra, 2005; Ngai, Poon, & Chan, 2007; Venkatesh et al., 2003). From an education perspective, McGill, Klobas, and Renzi (2011) used the TTF model to demonstrate "that the better the fit of an LMS (Learning Management System) to the skills of an instructor and the tasks that the instructor must complete, the more positive its effect on their performance is likely to be". Raven, Leeds, and Park (2010) applied a TTF model to the use of digital video tools for oral presentation in the classroom; they found "a significant fit between digital video tools (technology) and improvement of oral presentation skills (task)".

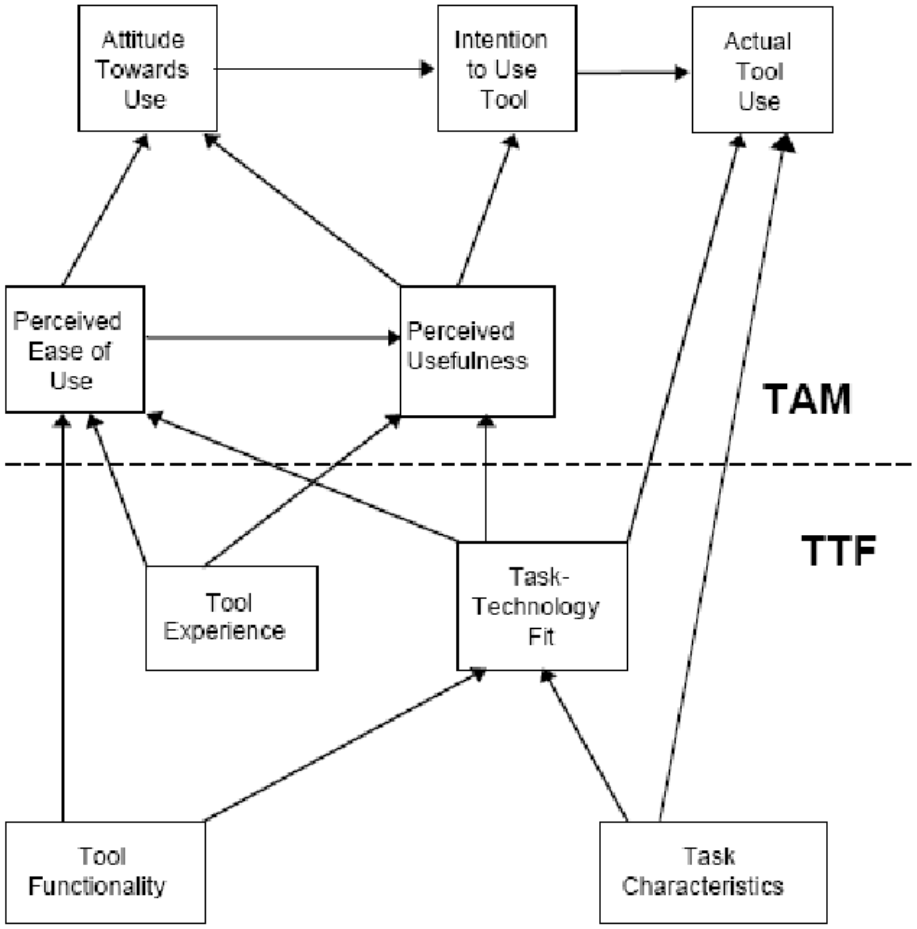


Figure 2.8: Combined Model: TAM and TTF (Task-Technology Fit) model
Source: (Klopping & McKinney, 2004).

DeLone and Mclean (1992) exposed the relationship between user satisfaction and system success, which has long been linked to usefulness, after an extensive literature review on 180 empirical studies. DeLone and Mclean classified dimensions of IS success into six categories; System Quality, Information Quality, Service Quality, Perceived usefulness, User Satisfaction, and Net Benefits, which has been considered a suitable foundation for further empirical and theoretical research, and has met with general acceptance. Later, DeLone and Mclean have updated their original success model (DeLone & Mclean, 2003).

2.2 Factors Affecting Customers Embracing New Technologies

We were unable to identify any related work on factors affecting the new technologies in the online printing and online shopping for print products. Therefore, related work on dynamics of technology adaption and its drivers on the online service industries were considered.

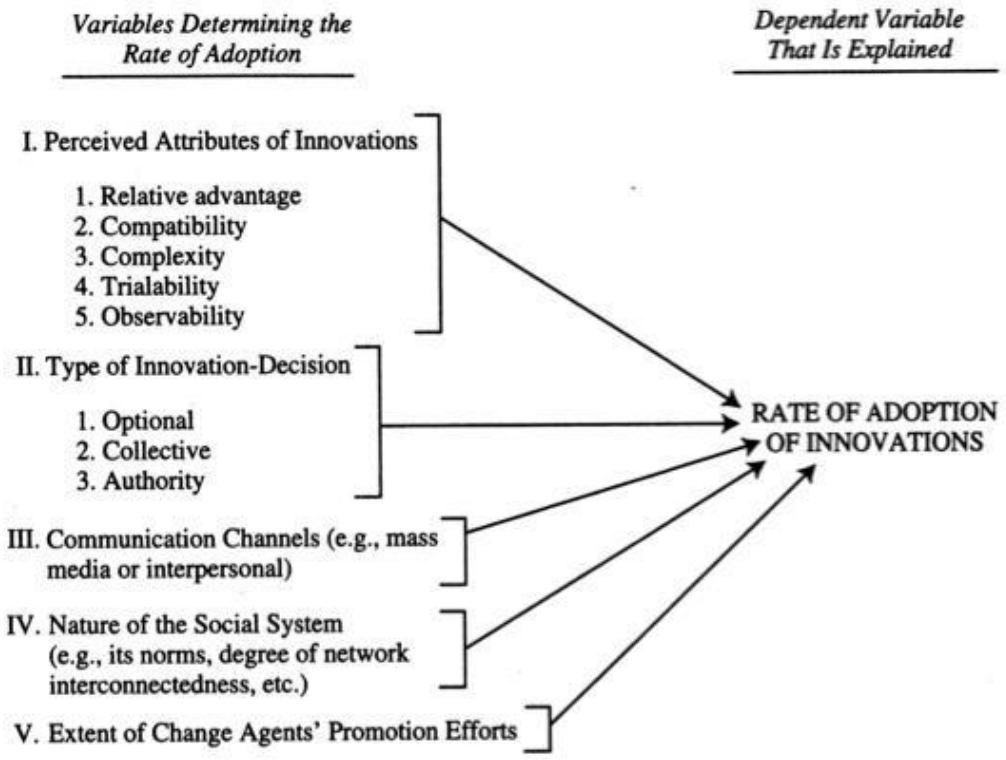


Figure 2.9: Variables affecting innovation and adoption
Source: (Rogers, 1995).

Rogers (1995) outlined several variables that affect technological innovation and adoption. He found that those variables would determine the rate of adoption of innovations and technological changes. As illustrated in the Figure 2.9, factors affecting the adoption of technologies include the adoption speed for that innovation and ability to recognize its benefits on the long run. If they have the ability to fulfill those requirements, user will capitalize on those benefits and start to use them.

Dennison (2014) has used those factors, when he searched for the critical success factors of technological innovation and diffusion in higher education.

Using the Rogers's (1995) innovation and adoption model, Dennsion (2014) listed following as the critical success factors of technological innovation and diffusion in higher education:

1. Willing to invest the time and energy in the adoption process
2. Time and effort needed to explore and scrutinize many different technologies before finding one that is deemed viable for long-term use
3. Speed in which they adopt new technological innovations

Lee (2006) carried out an empirical investigation into factors influencing the adoption of an e-learning system at the Institute of Communication Management, National Sun Yat-Sen University, Taiwan. He has used the original TAM by Davis (1989) as base model and developed an extended TAM version for the e-learning systems (see Figure 2.10). His findings suggested the extended model of TAM for the e-learning system (ELS).

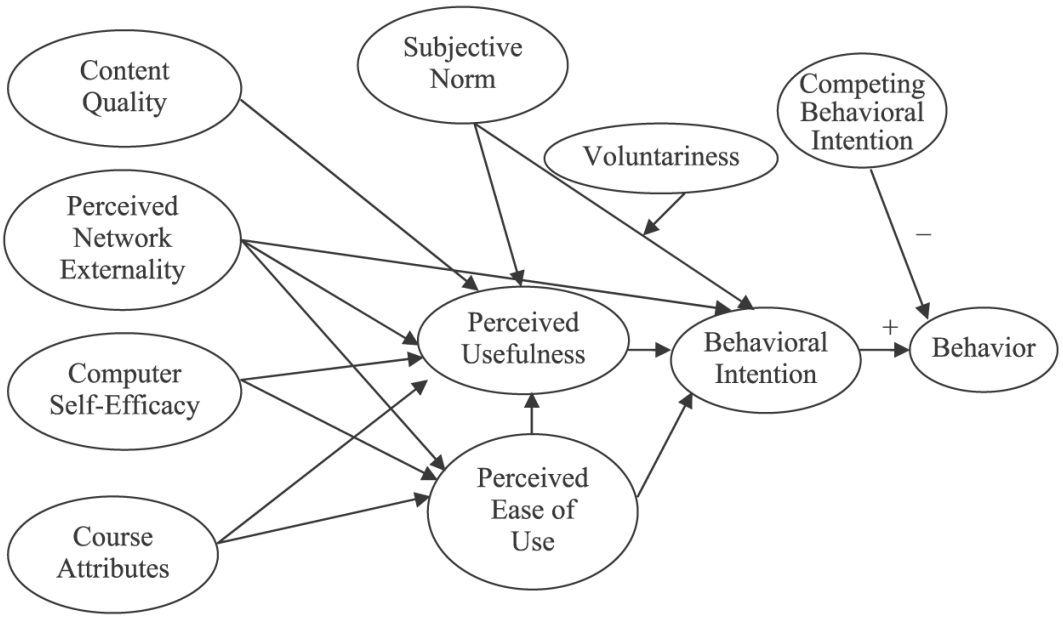


Figure 2.10: Extended TAM version for the e-learning system
Source: (Lee, 2006).

Lee found that the following factors have a major influence in the adoption for the e-learning system (ELS):

1. Web-creation skills
2. Previous computing experience
3. Group collaboration
4. Input of time

Chang, Cheung, and Lai, 2004 carried out a literature derived reference models for the adoption on online shopping by referencing 45 relevant articles. The aim of the authors was to identify areas that would aid in developing a better understanding of the dynamics of a customer's decision to shop online. Referring to previous studies, they have categorized the variables in to four major groups as follows:

1. Product perceptions
2. Shopping experience
3. Customer service
4. Consumer risk

Using the above categorization, they built a reference model summarizing the antecedents of online shopping. Then build a relationship amongst antecedents of the determinants of online shopping. Figure 2.11 illustrates the reference model summarizing the antecedents of online shopping as they have identified by Chang et al. (2004). Chang, Cheung, and Lai, 2004 split the identified sub factors in to three major categories as (1) perceived characteristics of the web as a sale channel, (2) characteristics of the customers, and (3) characteristics of the website or products.

1. Perceived characteristics of the web as a sale channel
    a. Perceived risk of online shopping
    b. Relative advantage of online shopping
    c. Online shopping experience
    d. Service quality
    e. Trust

2. Characteristics of the customers
    a. Consumer shopping orientations
    b. Consumer demographics
    c. Consumer computer/internet experience
    d. Consumer innovativeness
    e. Social psychological variables

3. Characteristics of the website or products
    a. Risk reduction measures
    b. Product characteristics

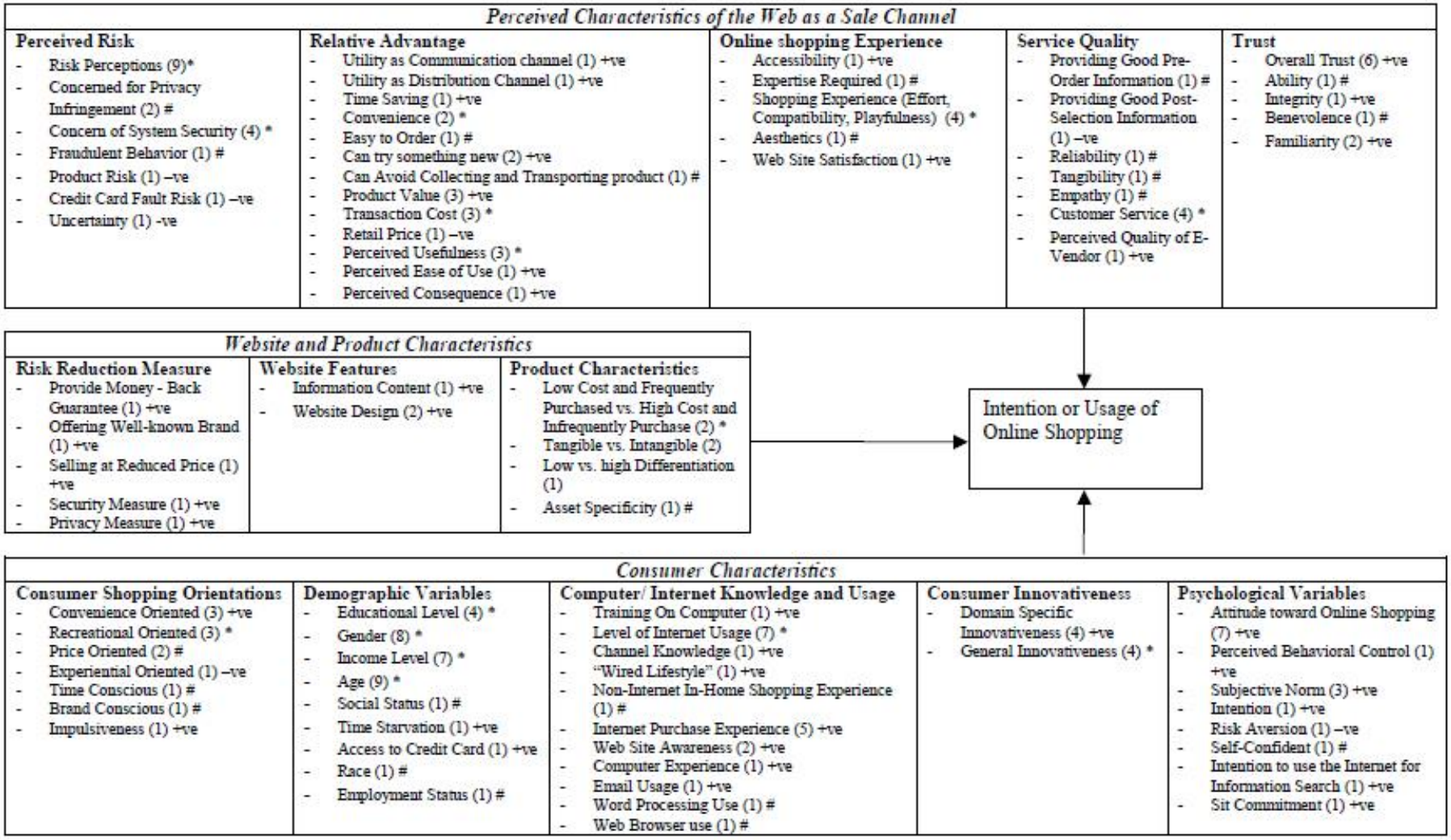


Figure 2.11: Reference model summarizing the antecedents of online shopping

Source: (Chang, Cheung, & Lai, 2004).

Dange and Kumar (2012) conducted a study on factors affecting online buying behavior of consumers and tried to build a conceptual model on that. In their study, they have examined the key factors, which affect buying motives of consumers for online buying or e-shopping. To determine the consumer behavior in an e-commerce environment, they have used the Li and Zhang's (2002) taxonomy as the base model. According to Li and Zhang's taxonomy that developed based on their analysis, there are ten impacts of relevant factors on online consumer behaviors. These ten factors could be categorized into five independent variables (external environment, demographics, personal characteristics, vendor/service/product characteristics, and web site quality) and five dependent variables (attitude toward online shopping, intention to shop online, decision making, online purchasing, and consumer satisfaction).

From there, five independent variables are identified as antecedents, which directly determine attitudes towards online shopping. In the antecedents, the vendor/service/product characteristics and website quality are directly impact on consumer satisfaction. The figure shows that the antecedents, attitude, intention, decision-making, and online purchasing are series of processing stage. Consumer satisfaction is separated and occurs among at all possible stages depending on the consumer's involvement during the Internet shopping process, and this two ways relationship could influence each reciprocally (Dange & Kumar, 2012).

After examining the 35 empirical studies, Li and Zang (2002) identified the same ten interrelated factors and build a model of consumers' online shopping attitudes and behavior. Figure 2.12 illustrates the model of consumers' online shopping attitudes and behavior, with the ten factors, namely external environment, demographics, personal characteristics, vender/service/product characteristics, attitude towards online shopping, intention to shop online, online shopping decision-making, online purchasing, and consumer satisfaction.

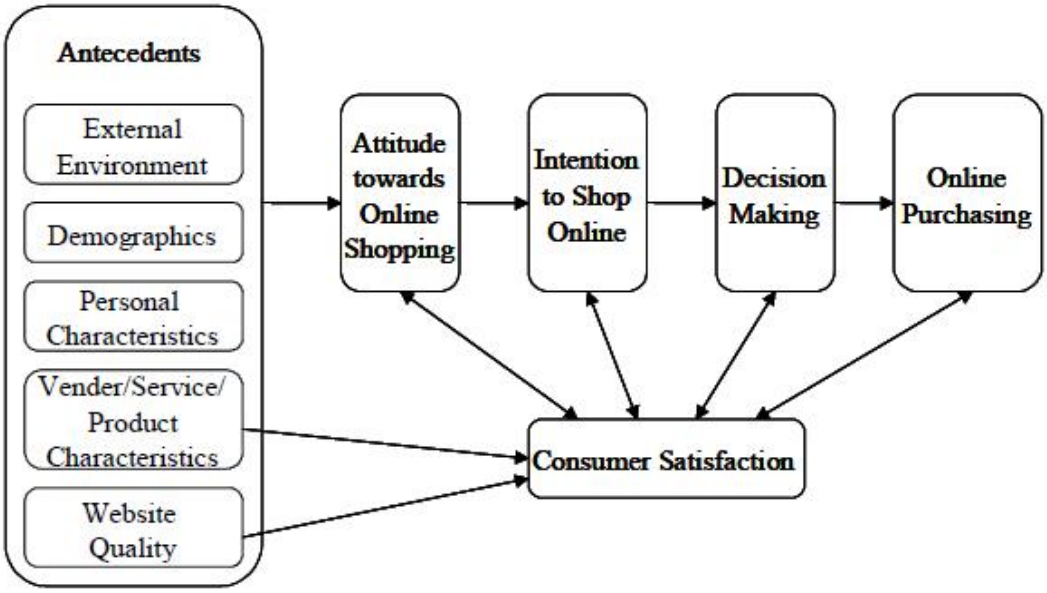


Figure 2.12: Consumers' online shopping attitudes and behavior model

Source: (Li & Zhang, 2002); (Dange & Kumar, 2012).

From the above ten factors, Five (external environment, demographics, personal characteristics, vendor/service/product characteristics, and website quality) are found to be ordinarily independent and five (attitude toward online shopping, intention to shop online, decision making, online purchasing, and consumer satisfaction) are ordinarily dependent variables in the empirical literature.

Table 2.4: Factors in consumers' online shopping attitudes and behavior model.

Variable Types	Factors
Independent	External environment
Independent	Demographics
Independent	Personal characteristics
Independent	Vendor/service/product characteristics
Independent	Website quality
Dependent	Attitude towards online shopping
Dependent	Intention to online shopping
Dependent	Decision making/info seeking
Dependent	Online purchasing
Dependent	Consumer satisfaction

Source: (Li & Zhang, 2002).

Rashid and Al-Qirim (2001) found that four factors, namely technological (innovation) factors, organizational factors, environmental factors and individual factors, would represent the major drivers in e-commerce (EC) adoption. Summing up the four contexts along with their factors, Authors built a framework for EC technology adoption by Small to Medium Size Enterprises (SMEs) in their study. Authors developed this framework based on a study on e-commerce technology adoption framework by New Zealand Small to Medium Size Enterprises (SMEs). As shown in the Figure 2.13, the environmental factor, such as "market and competitors" are be identified for this research.

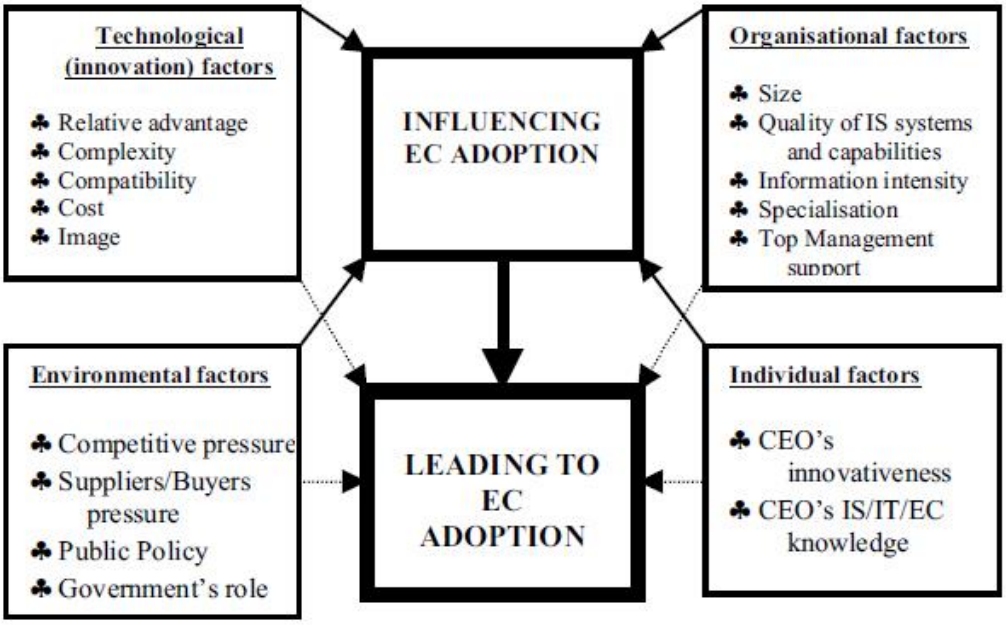


Figure 2.13: Framework for EC technology adoption by SMEs

Source: (Rashid & Al-Qirim, 2001).

When trying to build an online consumer behavior framework, Dange and Kumar (2012) studied two previous models done by Fishbein (1967) and Oliver (1980). By integrating Fishbein's attitudinal theoretical model (Fishbein, 1967) and the expectation-confirmation model (Oliver, 1980), they attempted to associate the three elements together and form a base model called Model of Intention, Adoption, and Continuance (MIAC) for the development of an online consumer behavior framework.

According to this model seen in Figure 2.14, behavior is predominantly determined by intention. Other factors like attitudes, subjective norms, and perceived behavioral control are also shown to be related to an appropriate set of salient behavioral, normative, and control beliefs about the behavior (Dange & Kumar, 2012).

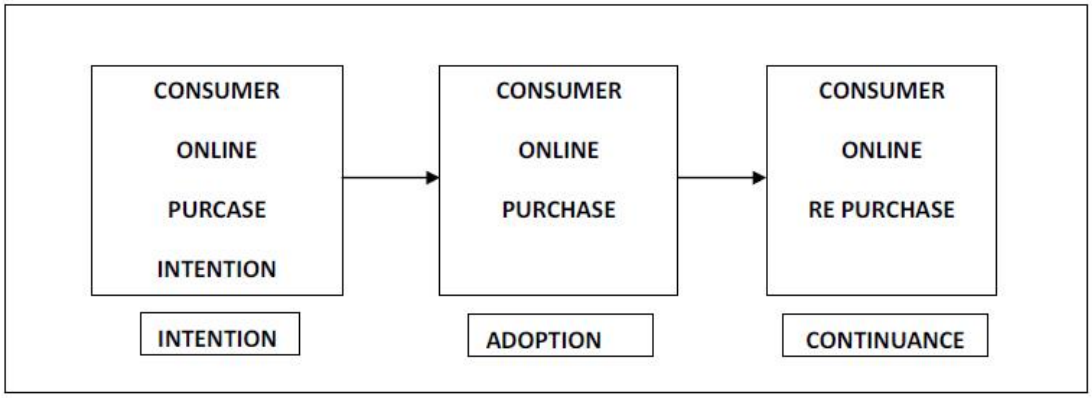


Figure 2.14: Model of Intention, Adoption, and Continuance (MIAC)
Source: (Dange & Kumar, 2012).

Further, in the study, they have studied the work done by Hoffman and Novak (1996) and Lohse and Spiller (1998) and used their key attributes and features of online stores. These studies provided them with a better insight into the study of online merchant and intermediary characteristics. They have included factors like service quality, privacy and security control, brand/reputation, delivery/logistic, after sales services and incentive in our framework of online consumer behavior. These five domain areas were integrated into their base model (MIAC) to form a framework for the study of online consumer behavior. This proposed framework not only provides a cohesive view of online consumer behavior, but also serves as a salient guidance for researchers in this research area. The base version MIAC was extended by integrating those five domain areas and created a framework for the online consumer behavior by Dange and Kumar (2012). Figure 2.15 illustrates the extended version of MIAC as the framework of online consumer behavior.

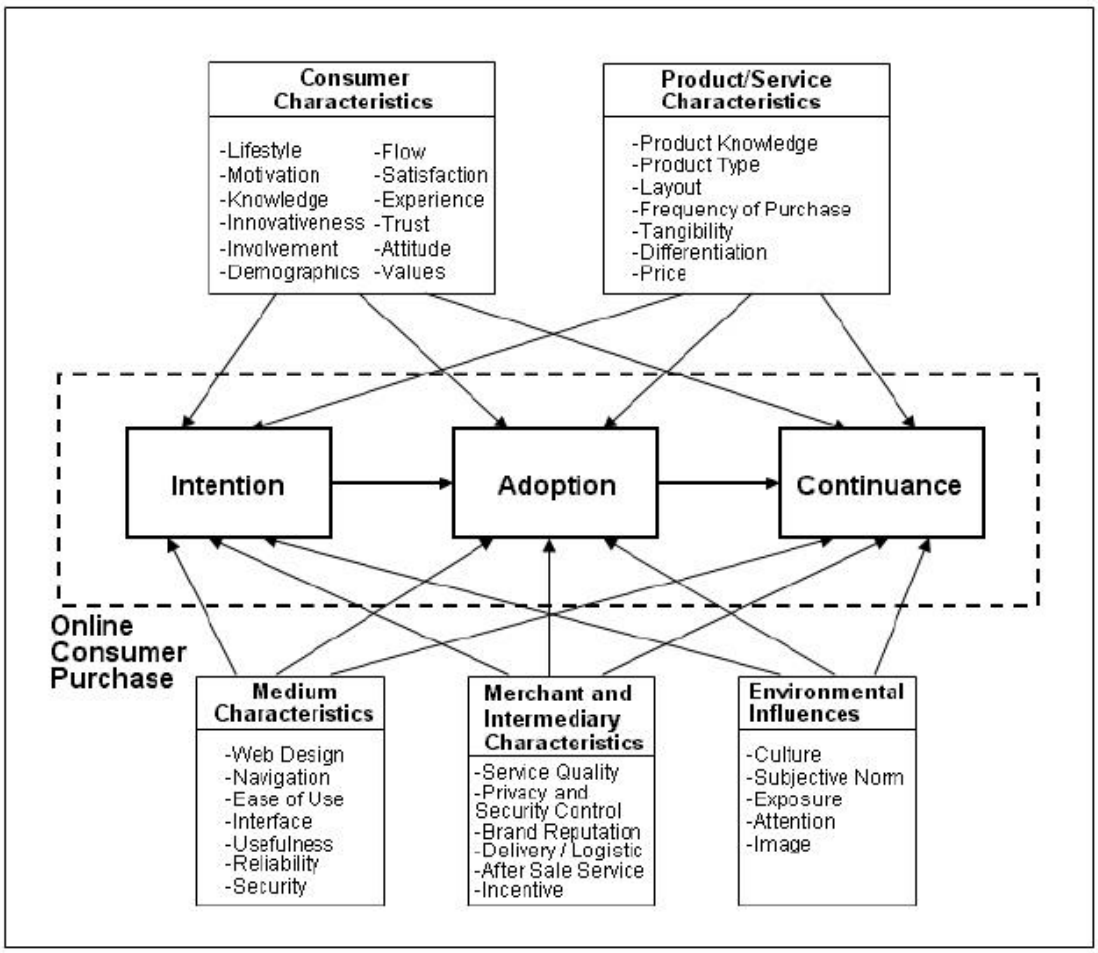


Figure 2.15: Framework of online consumer behavior

Source: (Dange & Kumar, 2012).

Monsuwe, Dellaert, and Ruyter, 2004 carried out a literature review study on, what drives consumers to shop online. In there they have used the TAM model as the base and developed an extended framework top on that. The framework uses the constructs of the TAM as a basis, extended by exogenous factors and applies it to the online shopping context. The review shows that attitudes toward online shopping and intention to shop online are not only affected by ease of use, usefulness, and enjoyment, but also by exogenous factors like consumer traits, situational factors, product characteristics, previous online shopping experiences, and trust in online shopping (Monsuwe et al., 2004).

For developing an in-depth understanding of consumers' attitudes toward online shopping and their intentions to shop on the Internet, they built up a framework (see Figure 2.16), based on previous researches on consumer adoption of new technologies and services. In this framework, "online shopping" is defined as the use of online stores by the consumers up until the transactional stage of purchasing and logistics. The core constructs of our framework are adapted from the Technology Acceptance Model (TAM) by Davis (1989), an influential research model in the information systems field.

They have added the external variables to the original TAM model and a new entity called "Enjoyment" alongside with the existed "Usefulness" and "Ease of Use". In TAM, behavioral intention to use a new technology is determined by the individual's attitude toward using this technology. To this, TAM originally identifies two, conceptually independent, determinants of a person's attitude toward using a new technology. The first determinant is "usefulness", and refers to the degree to which a person believes using the new technology will improve his/her performance or productivity. TAM also identifies a second determinant, "ease of use", referring to the extent to which a person believes that using the new technology will be free of effort. While "usefulness" refers to consumers' perceptions regarding the outcome of the experience, "ease of use" refers to their perceptions regarding the process leading to the final outcome (Monsuwe et al., 2004).

A more recent addition to the technology acceptance model is the "enjoyment" construct, or the extent to which the activity of using the new technology is perceived to provide reinforcement in its own right, apart from any performance consequences that may be anticipated (Davis et al., 1992). Thus, within the TAM framework, both utilitarian and hedonic aspects are considered to act as determinants of consumers' attitude toward using a new technology. Understanding the determinants of consumers' attitude, it is argued that this attitude has a strong, direct, and positive effect on consumers' intentions to actually use the new technology or system (Bobbitt & Dabholkar, 2001; Davis, 1993).

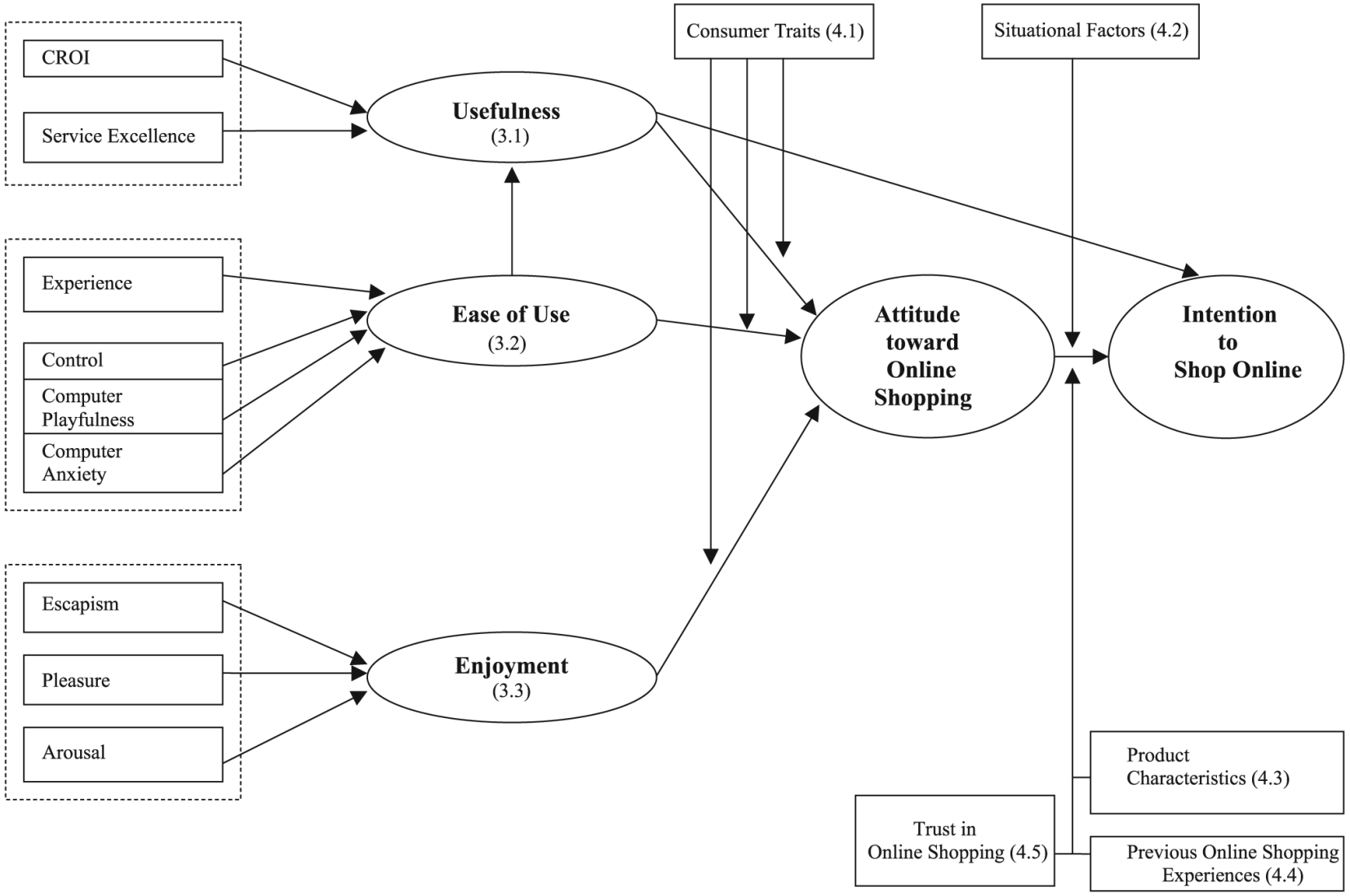
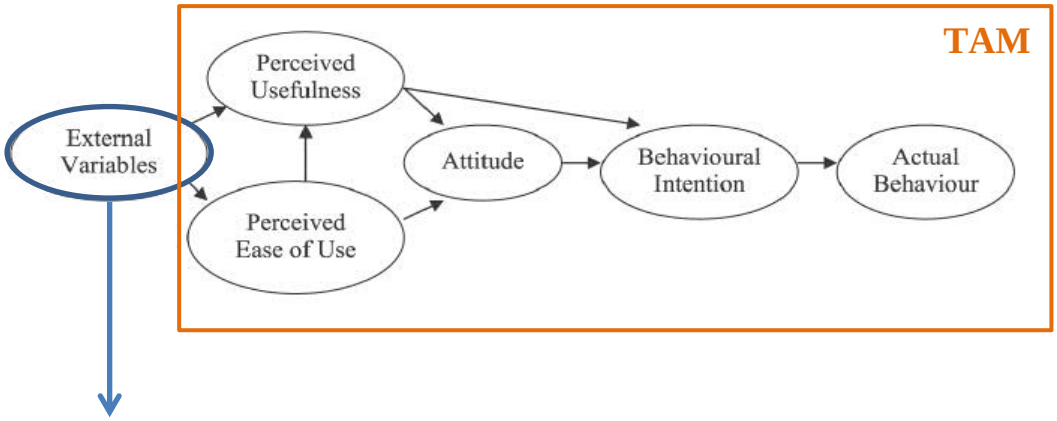


Figure 2.16: Framework for consumers' intentions to shop online

Source: (Monsuwe, Dellaert, & Ruyter, 2004).

By referring the previous literatures related to the study, we have identified four key contexts along with their factors. Then used the TAM and use those four key contexts as the external variables to the TAM (as shown in the Figure 2.17).



- Consumer Characteristics
- Product Characteristics
- Medium (Website) Characteristics
- Environmental Characteristics

Figure 2.17: Extended version of the TAM for the research.

Table 2.5 lists the identified independent variables for the study.

Table 2.5: Independent variables for the study.

External Variables	
Consumer Characteristics	**Product Characteristics**
Age Gender Income Level Credit Card Usage Internet Purchase Experience Experience in using PC + Internet Attitude	Product Price Product Type / Product Value Tangibility Personalization Product Knowledge
Medium (Website) Characteristics	**Environmental Characteristics**
Website Design Trust (Overall) Risk (Privacy infringement, Credit card fraud) System Security Customer Service	IT Infrastructure / Computer Literacy Internet Service Prices Market & Competitors

3 RESEARCH METHODOLOGY

This chapter presents the research methodology that is applied to determine the critical success factors. Section 3.1 presents the research approach, research framework, conceptual model, a detailed description about all independent and dependent variables, hypothesis development and questionnaire development. Section 3.2 covers the hypothesis development for the study. Section 3.3 covers the questionnaire while target sample for the research is presented in Section 3.4.

3.1 Theoretical Framework

Based on the related work, a theoretical model was developed to capture the inbound and outbound particulars. Figure 3.1 represents the theoretical represented model, which is interested to be tested and analyzed. The proposed hypothesis and their relationships are denoted by the direction of arrows there. Next, both the independent and dependent variable selection and relationship are presented in detail.

Due to lack of related work on evaluating factors specifically related to the printing industry, during the literature review, it was focused on identifying the important dynamics in the service-driven industries as a substitute. Thus, the factors having influences to the Small to Medium size Enterprises (SMEs), Internet banking, e-learning systems, and healthcare sectors were considered as similar influence in the same capacity as service driven industries to their consumers.

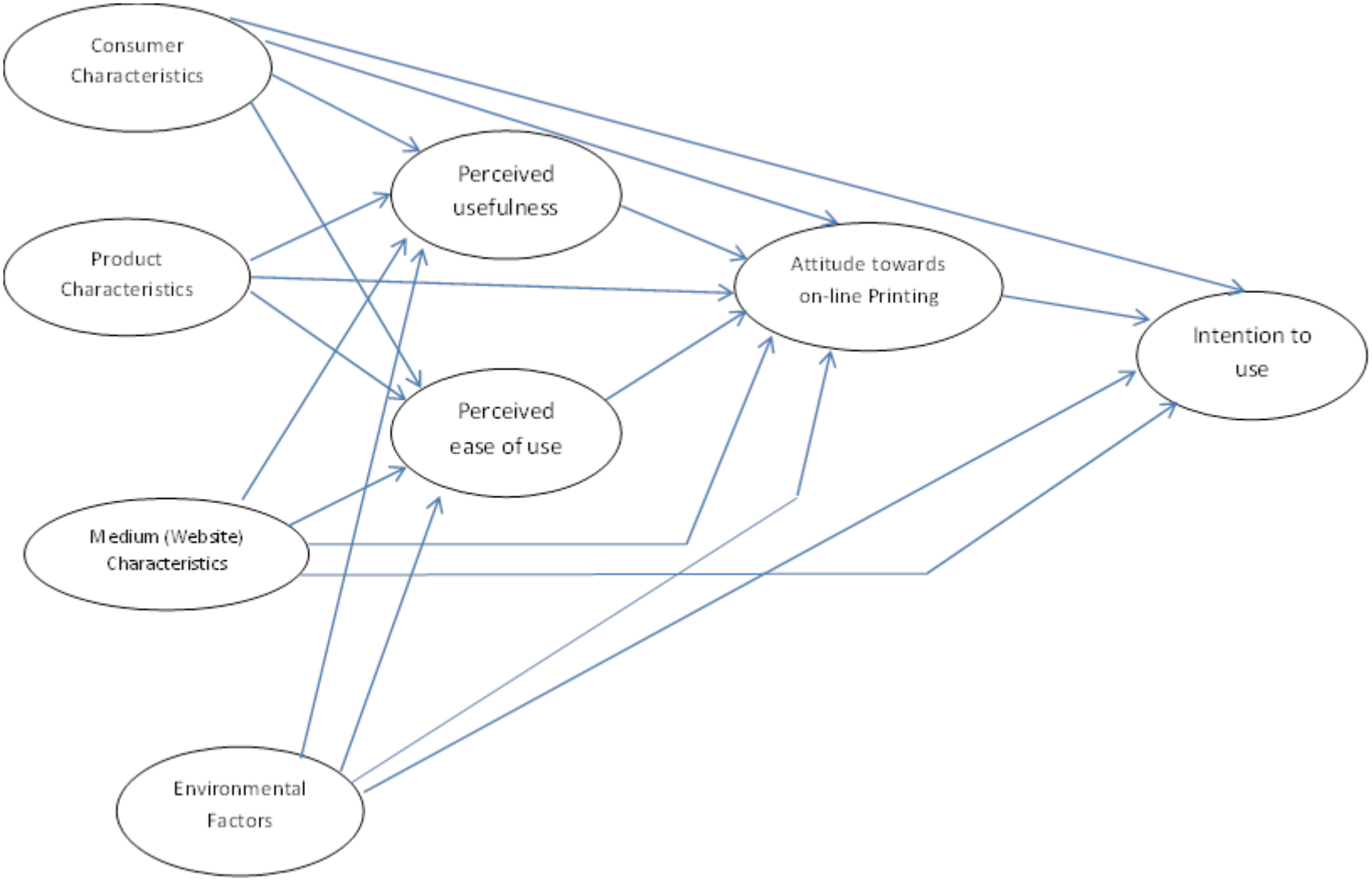


Figure 3.1: Conceptual framework.

3.1.1 Independent Variables

Table 3.1 lists the independent variables for consumer characteristics. It also lists the literature sources that helped in identification of those factors. Table 3.2 lists the identified independent variables for product characteristics. Variables for medium (website) and environmental characteristics listed in Table 3.3 and 3.4, respectively.

Table 3.1: Consumer characteristics – Independent variables.

Variable	Related Work
Age	(Bhatnagar, Misra, & Rao, 2000); (Blake, Neuendorf, & Valdiserri, 2003); (Donthu & Garcia, 1999); (Goldsmith & Goldsmith, 2002); (Kuo & Russell, 1999); (Mathwick, Malhotra, & Rigdon, 2001); (Miyazaki & Fernandez, 2000); (Raijas & Tuunainen, 2001); (Sin & Tse, 2002)
Gender	(Blake, Neuendorf, & Valdiserri, 2003); (Burroughs & Sabherwal, 2001); (Donthu & Garcia, 1999); (R.E. Goldsmith & Goldsmith, 2002); (Kuo & Russell, 1999); (Raijas & Tuunainen, 2001); (Sin & Tse, 2002); (Slyke, 1999)
Income Level	(Burroughs & Sabherwal, 2001); (Donthu & Garcia, 1999); (Kuo & Russell, 1999); (Mathwick, Malhotra, & Rigdon, 2001); (Miyazaki & Fernandez, 2000); (Raijas & Tuunainen, 2001); (Sin & Tse, 2002)
Credit Card Usage	(Slyke, 1999)
Internet Purchase Experience	(Foucault & Scheufele, 2002); (Gefen, 2002); (R.E. Goldsmith & Goldsmith, 2002); (Goldsmith, 2002); (Shim, Eastlick, Lotz, & Warrington, 2001); (Yang & Lester, 2004)
Experience in using PC + Internet	(Bhatnagar, Misra, & Rao, 2000); (Blake, Neuendorf, & Valdiserri, 2003); (Burroughs & Sabherwal, 2001); (Citrin, Sprott, Silverman, & Stem, 2000); (R.E. Goldsmith & Goldsmith, 2002); (Liao & Cheung, 2001); (Sin & Tse, 2002); (Liao & Cheung, 2001); (Slyke, 1999); (Miyazaki & Fernandez, 2001)
Attitude	(Goldsmith, 2002); (Grazioli & Jarvenpaa, 2000); (Jarvenpaa, Tractinsky, Saarinen, & Vitale, 1999); (Jarvenpaa, Tractinsky, & Vitale, 2000); (Limayem, Khalifa, & Frini, 2000); (van der Heijden, Verhagen, & Creemers, 2003)

Table 3.2: Product characteristics – Independent variables.

Variable	Related Work
Product Price	(Phau & Poon, 2000); (Vijayasarathy, 2002)
Product Type / Product Value	(Phau & Poon, 2000); (Vijayasarathy, 2002)
Tangibility	(Phau & Poon, 2000); (Vijayasarathy, 2002); (Vijayasarathy & Jones, 2000)
Personalization	(Raijas & Tuunainen, 2001); (Sin & Tse, 2002); (Janda et al., 2002); (Yang & Jun, 2002); (Santos, 2003)
Product Knowledge	(Phau & Poon, 2000); (Vijayasarathy, 2002)

Table 3.3: Medium (Website) characteristics – Independent variables.

Variable	Related Work
Website Design	(Liang & Lai, 2002); (Ranganathan & Ganapathy, 2002); (Dange & Kumar, 2012)
Trust (Overall)	(Jarvenpaa, Tractinsky, Saarinen, & Vitale, 1999); (Jarvenpaa, Tractinsky, & Vitale, 2000); (Kimery & McCord, 2002); (van der Heijden, Verhagen, & Creemers, 2003)
Risk	(Jarvenpaa, Tractinsky, Saarinen, & Vitale, 1999); (Jarvenpaa, Tractinsky, & Vitale, 2000); (Kimery & McCord, 2002); (Liao & Cheung, 2001); (McKnight, Choudhury, & Kacmar, 2002); (Miyazaki & Fernandez, 2001); (Ranganathan & Ganapathy, 2002); (Vijayasarathy & Jones, 2000)
System Security	(Burroughs & Sabherwal, 2001); (Miyazaki & Fernandez, 2001); (Ranganathan & Ganapathy, 2002); (Sin & Tse, 2002); (Dange & Kumar, 2012)
Customer Service	(Burroughs & Sabherwal, 2001); (Jarvenpaa & Todd, 1997); (Mathwick, Malhotra, & Rigdon, 2001)

Table 3.4: Environmental characteristics – Independent variables.

Variable	Related Work
IT Infrastructure / Computer Literacy	(Bhatnagar, Misra, & Rao, 2000); (Blake, Neuendorf, & Valdiserri, 2003); (Burroughs & Sabherwal, 2001); (Citrin, Sprott, Silverman, & Stem, 2000); (R.E. Goldsmith & Goldsmith, 2002); (Liao & Cheung, 2001); (Sin & Tse, 2002); (Liao & Cheung, 2001); (Slyke, 1999); (Miyazaki & Fernandez, 2001)
Internet Service Prices	(Bhatnagar, Misra, & Rao, 2000); (Blake, Neuendorf, & Valdiserri, 2003); (Burroughs & Sabherwal, 2001); (Citrin, Sprott, Silverman, & Stem, 2000); (R.E. Goldsmith & Goldsmith, 2002); (Liao & Cheung, 2001); (Sin & Tse, 2002); (Liao & Cheung, 2001); (Slyke, 1999); (Miyazaki & Fernandez, 2001)
Market & Competitors	(Rashid & Al-Qirim, 2001)

3.2 Hypothesis Development

To find out whether the relationships theorized in the conceptual research framework hold true, following hypotheses are drawn:

Let;

H_A: Alternate Hypothesis
H_0: Null Hypothesis

Hypothesis 1

$H1_A$: Customers' behavioral intention to use online printing is positively affected by their attitude towards online printing, perceived usefulness, perceived ease of use, consumer characteristics, product characteristics, medium (website) characteristics, and environmental factors.

$H1_0$: Customers' behavioral intention to use online printing has no affect by their attitude towards online printing, perceived usefulness, perceived ease of use, consumer characteristics, product characteristics, medium (website) characteristics, and environmental factors.

Hypothesis 2

$H2_A$: Customers' attitude towards online printing is positively affected by their perceived usefulness, perceived ease of use, consumer characteristics, product characteristics, medium (website) characteristics, and environmental factors.

$H2_0$: Customers' attitude towards online printing has no affect by their perceived usefulness, perceived ease of use, consumer characteristics, product characteristics, medium (website) characteristics, and environmental factors.

Hypothesis 3

$H3_A$: Customers' perceived usefulness of online printing is positively affected by their perceived ease of use, consumer characteristics, product characteristics, medium (website) characteristics, and environmental factors.

$H3_0$: Customers' perceived usefulness of online printing has no affect by their perceived ease of use, consumer characteristics, product characteristics, medium (website) characteristics, and environmental factors.

Hypothesis 4

$H4_A$: Customers' perceived ease of use of online printing is positively affected by their consumer characteristics, product characteristics, medium (website) characteristics, and environmental factors.

$H4_0$: Customers' perceived ease of use of online printing has no affect by their consumer characteristics, product characteristics, medium (website) characteristics, and environmental factors.

3.3 Dimensions of Variables and Taking Measurements

3.3.1 Measurement Device

According to the operational definitions, a questionnaire instrument (see Appendix A) is designed to measure the independent variables presented in Table 3.1, 3.2, 3.3, and 3.4, as well as their relationship to the dependent variable.

Both demographic and inferential questions were included in the questionnaire instrument. Tables 3.5-3.8 illustrate the independent variables, dimensions, and measures designed to capture data from customers. Table 3.9 demonstrates the instrument measures for each construct, which used in the theoretically interested model in Figure 3.1.

Table 3.5: Instrument measures of consumer characteristics independent variables.

Variable	Dimension	Question	Scale
Age	Consumer Characteristics	Q8	Six Point Single Choice Question
Gender	Consumer Characteristics	Q9	Two Point Single Choice Question
Income Level	Consumer Characteristics	Q10	Five Point Single Choice Question
Credit Card Usage	Consumer Characteristics	Q4 (11)	Five Point Likert Scale (Strongly agree → Strongly disagree)
Internet Purchase Experience	Consumer Characteristics	Q11	Five Point Single Choice Question
		Q14	Short Answer (Value Input - %)
Experience in using PC + Internet	Consumer Characteristics	Q7	Five Point Single Choice Question
		Q4 (4)	Five Point Likert Scale (Strongly agree → Strongly disagree)
Attitudes	Consumer Characteristics	Q4 (1)	Five Point Likert Scale (Strongly agree → Strongly disagree)
		Q4 (8)	Five Point Likert Scale (Strongly agree → Strongly disagree)
		Q4 (7)	Five Point Likert Scale (Strongly agree → Strongly disagree)

Consumer acceptance of online shopping may vary when shopping for different products (Zhou et al. 2004). For example, consumers perceived different risks with different products (Bhatnagar and Ghose 2004b; Bhatnagar et al., 2000; Pires et al., 2004). Therefore, product type, product value, product price, and product knowledge variables are used to capture those variations in online customers' shopping behavior in ordering the print products.

Table 3.6: Instrument measures of product characteristics independent variables.

Variable	Dimension	Question	Scale
Product Price	Product Characteristics	Q1	Six Point Single Choice Question
Product Type / Product Value	Product Characteristics	Q2	Six Point Multiple Choice Question
Tangibility	Product Characteristics	Q4 (1)	Five Point Likert Scale (Strongly agree→Strongly disagree)
		Q4 (8)	Five Point Likert Scale (Strongly agree→Strongly disagree)
Personalization	Product Characteristics	Q3	Five Point Single Choice Question
Product Knowledge	Product Characteristics	Q4 (9)	Five Point Likert Scale (Strongly agree→Strongly disagree)
		Q4 (10)	Five Point Likert Scale (Strongly agree→Strongly disagree)

Table 3.7: Instrument measures of website characteristics independent variables.

Variable	Dimension	Question	Scale
Website Design	Website Characteristics	Q4 (2)	Five Point Likert Scale (Strongly agree→Strongly disagree)
Trust	Website Characteristics	Q5	Eight Point Multiple Choice Question
		Q4 (3)	Five Point Likert Scale (Strongly agree→Strongly disagree)
		Q4 (11)	Five Point Likert Scale (Strongly agree→Strongly disagree)
Risk	Website Characteristics	Q4 (7)	Five Point Likert Scale (Strongly agree→Strongly disagree)
		Q4 (11)	Five Point Likert Scale (Strongly agree→Strongly disagree)
		Q5	Eight Point Multiple Choice Question
System Security	Website Characteristics	Q4 (3)	Five Point Likert Scale (Strongly agree→Strongly disagree)
Customer Service	Website Characteristics	Q6	Eight Point Multiple Choice Question

Table 3.8: Instrument measures of environmental characteristics independent variables.

Variable	Dimension	Question	Scale
IT Infrastructure / Computer Literacy	Environmental Characteristics	Q7	Five Point Single Choice Question
		Q4 (4)	Five Point Likert Scale (Strongly agree→Strongly disagree)
Internet Service Charges	Environmental Characteristics	Q4 (4)	Five Point Likert Scale (Strongly agree→Strongly disagree)
Market & Competitors	Environmental Characteristics	Q4 (5)	Five Point Likert Scale (Strongly agree→Strongly disagree)

Table 3.9: Instrument measures of construct.

Construct	Measurement Instrument	Question
Perceived Ease of use (PE)	I am comfortable in ordering a tangible product, just by seeing a product image or preview through the website	Q4 (1)
	What Customer Service features do you expect from an online store?	Q6
Perceived Usefulness (PU)	Online printing services help me to save my time and money	Q4 (6)
Attitude towards online Printing (A)	When I order/buy something first time, I prefer to do it at the store	Q4 (9)
	When I order/buy something repeatedly, I prefer to do it at online	Q4 (10)
	I am reluctant to order online print services, as I am worried about the quality of the final outcome	Q4 (7)
Behavioral Intension (BI) to use	How often do you perform printing orders?	Q13
	From those orders, which fraction of orders is placed online?	Q14
	When I order/buy something repeatedly, I prefer to do it at online	Q4 (10)

3.4 Population and Sampling

The target population for this research is the customers who currently place print orders with their reputed print vendors. Currently they may use the in-store method, the online solutions, or the both options. They may use those channels to do their personal printings or the cooperate printing, which they do on behalf of their company or the both.

3.4.1 Identification of Population and Characteristics

Customers doing their personal printing are targeted as the main core for the sample to gain the portion of personal printing and its effectiveness in the related subject scope. For the cooperate clients, there are several contact personals that place orders with their linked vendors. Furthermore, the company size with regard to the number of print orders per year was not taken as a deciding factor for the population, because both small and large companies can be placed print orders with their reputed vendor irrespective of the company size.

The statistics for total number of printing companies in Sri Lanka or their customer base was not available as there is no central point of established data collection on Sri Lankan printing industry. However, a list of printing companies was created based on various sources such as Sri Lanka Print magazine, Sri Lanka Association of Printers (SLAP), www.slap.lk website and Sri Lanka Institute of Printing (SLIP). According to Mr. Sisira Baranage, CEO, Sri Lanka Institute of Printing (SLIP), there are about 10,000 printers in Sri Lanka, but only about 400 among them had registered with the SLIP as members (Baranage, 2016). Local search facts indicate, that population size is small due to the existence of lesser number of online solution providers for print activities in Sri Lanka. Therefore, population size is unknown and moderate. Thus, the most suitable way was to approach as many print clients as possible in the sample to obtain a representative sample.

Therefore, if you think about the population it should be people, who use the Internet for shopping. According to Internet Live Stats (www.InternetLiveStat.com), there are 6,087,164 Internet users in Sri Lanka in 2016. That is 29.3% of the Sri Lanka population (see Figure 3.2, Table 3.10 and 3.11). However, we could not find any statistics regarding number of online shoppers from those Internet users in the Sri Lankan context.

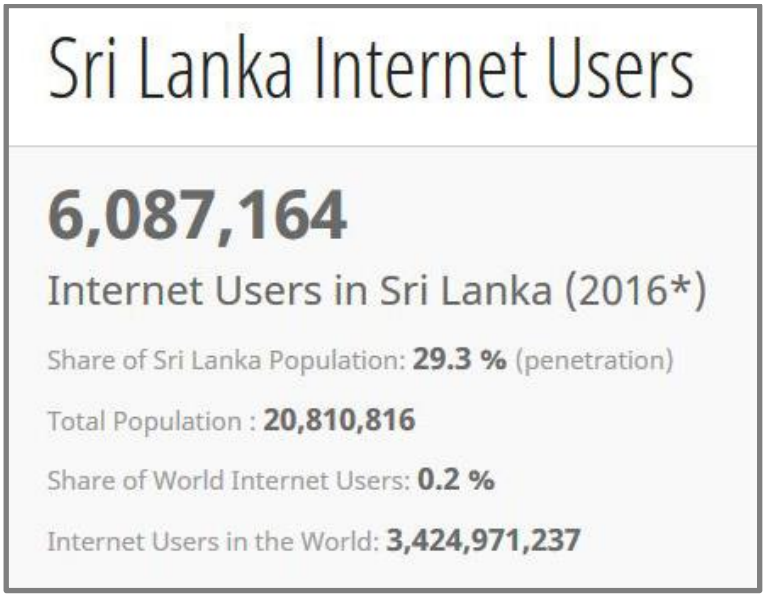


Figure 3.2: Sri Lanka Internet users in 2016

Source: (Internet Live Stats: www.InternetLiveStat.com).

According to Internetlivestats.com, currently Sri Lanka has 6,087,164 internet users, and it is 29.3% of the total population. It is a share of 0.2% out of 3,424,971,237 internet users worldwide. We can see a huge growth if we compare the stats with the year 2011. The reasons behind the growth of the internet penetration Sri Lanka are smartphone usage, the popularity of social media channels, the growth of e-commerce, the growth of academic systems, the growth of digital marketing efforts, gaming, online jobs, and the industrial and commercial factors.

Table 3.10: Sri Lankan Internet usage and population statistics.

Year	Users	Population	% Pen.	GDP p.c.*
2000	121,500	19,630,230	0.5%	N/A
2007	428,000	19,796,874	2.2%	US$ 1,623
2008	771,700	21,128,773	3.7%	US$ 1,972
2009	1,163,500	21,324,791	5.5%	US$ 2,041
2010	1,776,200	21,513,990	8.3%	US$ 1,807
2016	6,087,164	22,235,000	27.4%	US$ 3,800

Note: Per Capita GDP in US Dollars, Source: International Monetary Fund.

Table 3.11: Evolution of Sri Lanka Internet users from 2000-2016.

Year	Internet Users**	Penetration (% of Pop)	Total Population	Non-Users (Internetless)	1Y User Change	1Y User Change	Population Change
2016*	**6,087,164**	29.3 %	20,810,816	14,723,652	4.2 %	247,259	0.46 %
2015*	**5,839,905**	28.2 %	20,715,010	14,875,105	9.8 %	520,205	0.47 %
2014	**5,319,700**	25.8 %	20,618,991	15,299,291	18.4 %	825,391	0.47 %
2013	**4,494,309**	21.9 %	20,521,959	16,027,650	20.4 %	760,090	0.49 %
2012	**3,734,219**	18.3 %	20,421,862	16,687,643	22.5 %	686,868	0.52 %
2011	**3,047,351**	15 %	20,315,673	17,268,322	25.7 %	623,194	0.57 %
2010	**2,424,157**	12 %	20,201,312	17,777,155	37.5 %	661,232	0.61 %
2009	**1,762,925**	8.8 %	20,078,873	18,315,948	52.4 %	605,851	0.65 %
2008	**1,157,074**	5.8 %	19,949,553	18,792,479	50.5 %	388,298	0.69 %
2007	**768,776**	3.9 %	19,813,816	19,045,040	54 %	269,575	0.72 %
2006	**499,201**	2.5 %	19,672,418	19,173,217	42.7 %	149,278	0.75 %
2005	**349,922**	1.8 %	19,526,406	19,176,484	24.9 %	69,739	0.79 %
2004	**280,183**	1.4 %	19,374,281	19,094,098	-0 %	-113	0.82 %
2003	**280,296**	1.5 %	19,217,032	18,936,736	40 %	80,074	0.82 %
2002	**200,222**	1.1 %	19,061,066	18,860,844	33.3 %	50,071	0.77 %
2001	**150,150**	0.8 %	18,914,866	18,764,716	23.5 %	28,542	0.7 %
2000	**121,608**	0.6 %	18,783,745	18,662,137	86.9 %	56,556	0.6 %

* estimate for July 1, 2016

** **Internet User** = individual who can access the Internet at home, via any device type and connection. More details.

Source: ***Internet Live Stats*** (www.InternetLiveStats.com)
Elaboration of data by *International Telecommunication Union (ITU), World Bank, and United Nations Population Division.*

However, for other countries, they have the statistics about the percentage of Internet users who do the shopping online. For example, according to the 2014 MasterCard

online shopping behavior study about online shopping in the Middle East, they found that 35% of Internet users access the Internet to do the shopping. The lack of statistics regarding the Sri Lankan context raises a drawback for online shopping related studies, when identifying the population.

3.4.2 Identification of Sample Size

Unlike an individual-based research, this research is focused on online printing strategy. Thus, the sample should reflect the user groups who already use online print solutions, users who are planning to use online printing methods and users who are not using online channel, but uses the in-store option. For example, if gathered data in the sample demonstrates more than 50% is using online print solutions, it can be assumed that sample represents more exposure and experience in the web-to-print solutions, which is respectable for the analysis. Hence, it was focused on ensuring a representative sample of the Sri Lankan online printing Industry rather than numbers to perform a meaningful analysis.

Therefore, for this study as the population count is very large, we can go for a standard largest number for any population above 20,000. Then the sample should be around 398 or 400. So having a 360 sample can be justified as a sufficient number according to sample calculation theories.

3.5 Method Adopted

Questionnaire was developed using Google forms, and was distributed among the potential clients through e-mails. Clients, who place print orders through the online media, as well as the customers who place their orders at the store also targeted to the desired sample. Questionnaire was also published on the social media such as Facebook and the Twitter to get a much larger audience and familiar accessibility. Furthermore, the quiz was published on social groups such as FB help groups: Online Help; The Third Eye..., Elakiri online community, UoM CSE-MBA/IT 2012-2013

Alumni Group, Sri Lanka Institute of Printing (SLIP) FB page, Sri Lanka Association of Printers (SLAP) FB page, and Ingrin Institute of Printing and Graphics FB page.

3.6 Summary

The focus of this research is evaluating factors affecting the online printing services in Sri Lanka and find out the ways of how consumers can be pushed towards the e-commerce solutions in the printing industry. The research design, that we proposed to identify those drivers and pillars, was discussed in this chapter.

A theoretical framework was designed based on the variables identified through previous work reviewed in Chapter 2. Based on the theoretical framework four hypotheses were formulated. According to the operational definitions, a questionnaire instrument was designed. The target population for this research is the online shoppers, who perform e-commerce transactions through the Internet. The approach chosen to conduct this research was using quantitative method. Quantitative approach was chosen to reach a larger sample to gather data to find the impact of online shopping behaviors. The next chapter discusses data analysis and findings of the survey done using the questionnaire instrument.

4 DATA ANALYSIS AND FINDINGS

This chapter represents data analysis of the study to determine the relationships between constructs in the proposed framework. Section 4.1 performs the reliability analysis to validate the internal consistency for the identified variables. Section 4.2 covers the validating the questionnaire to place the trustworthiness of its output before sending them to analysis process. Section 4.3 carries out a detailed analysis on demographic findings verses customers' behavioral outcomes. Finally, in Section 4.4 hypothesis testing is carried out with the objectives with aid of the correlation analysis.

4.1 Reliability Analysis

The Reliability Test is used to check the reliability of the questionnaire instrument. Main objective of this step was to validate the understandability of questions and check for the internal consistency for the variables. The reliability study checks whether the questions asked under each area supported each other. Cronbach's Alpha Coefficient (Sekaran, 2006) is used to test the reliability, as it can be used for multi-point scaled items used in the survey.

IBM SPSS version 24 was used for Cronbach's Alpha Coefficient calculation. A value above 0.7 for Cronbach's Alpha Coefficient is acceptable. Table 4.1 displays the Cronbach's Alpha Coefficient values for each variable. While the Alpha coefficient is below 0.7, value above 0.6 is also considered as acceptable in many studies (Sekaran, 2003, 2006; Sekaran & Bougie, 2010). Nevertheless, to get a reliable value greater than 0.7 for the Cronbach's Alpha Coefficient we decide to drop the item Question 4 – (7) and measured it again.

Selected item to drop:

Question 4 – (7): I am reluctant to order online print services, as I am worried about the quality of the final outcome.

Question 4 – (7):

I am reluctant to order online print services, as I am worried about the quality of the final outcome.

- Strongly Agree
- Agree
- Neutral
- Disagree
- Strongly Disagree

Resulting Coefficient value is given in Table 4.5.

Table 4.1: Reliability analysis for all variables.

Case Processing Summary

		N	%
Cases	Valid	360	100.0
	Excluded[a]	0	.0
	Total	360	100.0

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

Reliability Statistics

Cronbach's Alpha	Cronbach's Alpha Based on Standardized Items	N of Items
.676	.691	11

Table 4.2: Item statistics for all variables.

Item Statistics

	Mean	Std. Deviation	N
Q4_1 Tangible Product	2.17	.983	360
Q4_2 Website Design	1.84	.773	360
Q4_3 Security Features	1.96	.832	360
Q4_4 Internet Service Price	2.38	1.085	360
Q4_5 Product Type Knowledge	1.88	.806	360
Q4_6 Perceived Usefulness	1.84	.760	360
Q4_7 Product Risk	2.70	1.075	360
Q4_8 Uncertainty	2.38	.842	360
Q4_9 First Time Store	2.03	1.030	360
Q4_10 Repeat Order Online	1.75	.797	360
Q4_11 Credit Card Usage	2.02	.896	360

Table 4.3: Item-total statistics for all variables.

Item-Total Statistics

	Scale Mean if Item Deleted	Scale Variance if Item Deleted	Corrected Item-Total Correlation	Squared Multiple Correlation	Cronbach's Alpha if Item Deleted
Q4_1 Tangible Product	20.77	20.388	.229	.156	.672
Q4_2 Website Design	21.10	20.588	.314	.170	.656
Q4_3 Security Features	20.98	19.632	.415	.304	.640
Q4_4 Internet Service Price	20.57	19.321	.303	.250	.660
Q4_5 Product Type Knowledge	21.06	20.423	.318	.218	.656
Q4_6 Perceived Usefulness	21.11	20.279	.370	.263	.648
Q4_7 Product Risk	20.24	21.575	.066	.217	.706
Q4_8 Uncertainty	20.56	19.951	.362	.258	.648
Q4_9 First Time Store	20.91	18.354	.450	.305	.629
Q4_10 Repeat Order Online	21.19	19.528	.458	.404	.634
Q4_11 Credit Card Usage	20.93	19.462	.395	.253	.642

Table 4.4: Scale statistics for all variables.

Scale Statistics

Mean	Variance	Std. Deviation	N of Items
22.94	23.387	4.836	11

Table 4.5: Reliability analysis for if Q4 (7) item dropped.

Case Processing Summary

		N	%
Cases	Valid	360	100.0
	Excluded[a]	0	.0
	Total	360	100.0

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

Reliability Statistics

Cronbach's Alpha	Cronbach's Alpha Based on Standardized Items	N of Items
.706	.712	10

Table 4.6: Item statistics for if Q4 (7) item dropped.

Item Statistics			
	Mean	Std. Deviation	N
Q4_1 Tangible Product	2.17	.983	360
Q4_2 Website Design	1.84	.773	360
Q4_3 Security Features	1.96	.832	360
Q4_4 Internet Service Price	2.38	1.085	360
Q4_5 Product Type Knowledge	1.88	.806	360
Q4_6 Perceived Usefulness	1.84	.760	360
Q4_8 Uncertainty	2.38	.842	360
Q4_9 First Time Store	2.03	1.030	360
Q4_10 Repeat Order Online	1.75	.797	360
Q4_11 Credit Card Usage	2.02	.896	360

Table 4.7: Item-total statistics for if Q4 (7) item dropped.

Item-Total Statistics					
	Scale Mean if Item Deleted	Scale Variance if Item Deleted	Corrected Item-Total Correlation	Squared Multiple Correlation	Cronbach's Alpha if Item Deleted
Q4_1 Tangible Product	18.07	18.260	.280	.128	.700
Q4_2 Website Design	18.40	18.831	.320	.167	.691
Q4_3 Security Features	18.28	18.350	.355	.264	.685
Q4_4 Internet Service Price	17.86	17.511	.318	.250	.695
Q4_5 Product Type Knowledge	18.36	18.876	.293	.210	.695
Q4_6 Perceived Usefulness	18.40	18.269	.420	.257	.676
Q4_8 Uncertainty	17.86	18.365	.346	.248	.687
Q4_9 First Time Store	18.21	16.617	.464	.304	.664
Q4_10 Repeat Order Online	18.49	17.454	.524	.363	.659
Q4_11 Credit Card Usage	18.22	17.934	.374	.224	.682

Table 4.8: Scale statistics for if Q4 (7) item dropped.

Scale Statistics			
Mean	Variance	Std. Deviation	N of Items
20.24	21.575	4.645	10

4.2 Validating Questionnaire

As proof to validate the questionnaire, I have used a real-world figure to compare with the statistics received from the user feedbacks. The similarity between two figures gathered from practical web-to-print solution and the user feed data, is illustrated below to justify the realistic data capture capability of the used questionnaire.

The second question in the web-based online questionnaire (see Figure 4.1) asked, "What print product types are you willing to order online without much hesitation about the final outcome?" Actually, this question tries to get ideas about users' mindset about the product types, product value, and the risk they incur while using the online solution. Therefore, that question will be the most suitable pick to compare the output of the questionnaire with the real world web-store example.

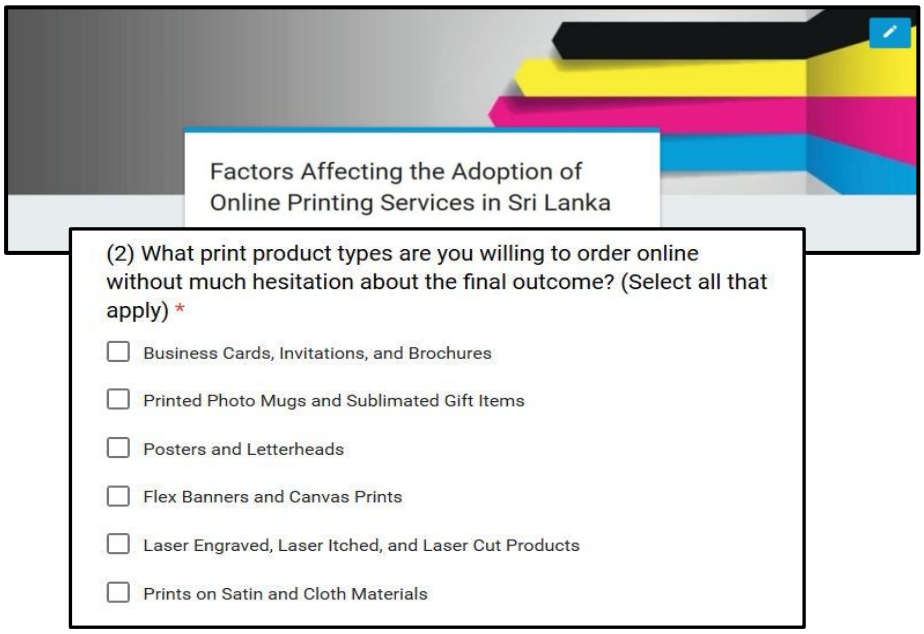


Figure 4.1: Questionnaire validation – Q2.

If you summarized the submitted data for the online questionnaire form, you can see a similar output as the actual situation. The actual web-store recorded the highest product selling for the business cards and the personalized photo mugs. As same as, in the questionnaire also most users voted that, they have much more intention to order products like "Business Cards, Invitations" and "Printed Photo Mugs and Sublimated Gift Items" through the online print goods purchasing (see Figure 4.2).

Therefore, we can conclude that the represented sample as express their view and thoughts much more similar to the actual situation. So this can be used as verified evidence to validate the questionnaire and as a proof to empathize that, the users have put the answers in much realistic and acceptable way, similar to the real-life scenario.

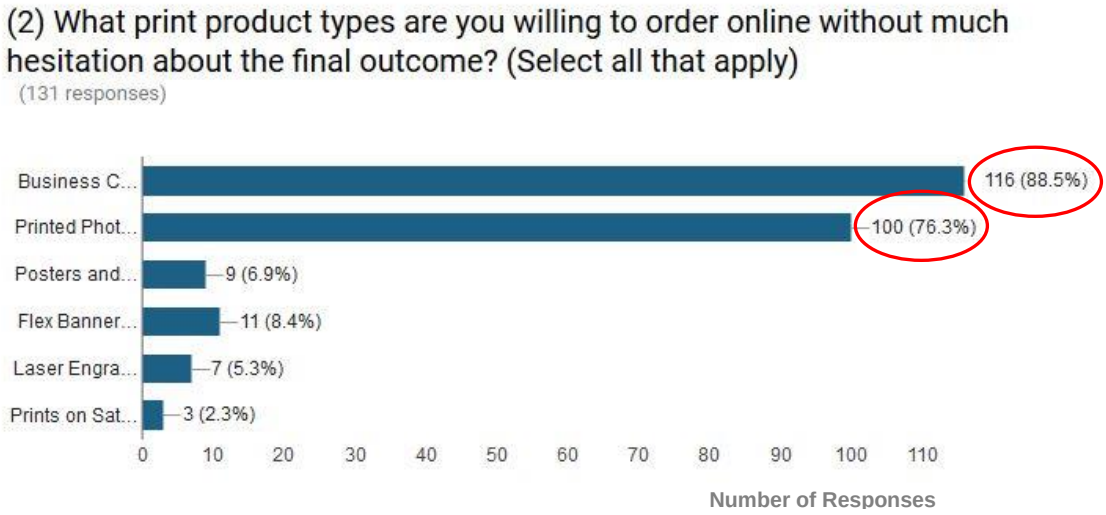


Figure 4.2: Questionnaire validation – User responses for Q2.

Figure 4.3 shows the number of responses over time. Facebook, LinkedIn, Twitter, email and phone call campaigns were conducted to reach the sample. While the calculated sample size was 398, the researcher was able to collect only 360 responses due to time constraints. From those 360 samples, all 360 responses were considered as valid.

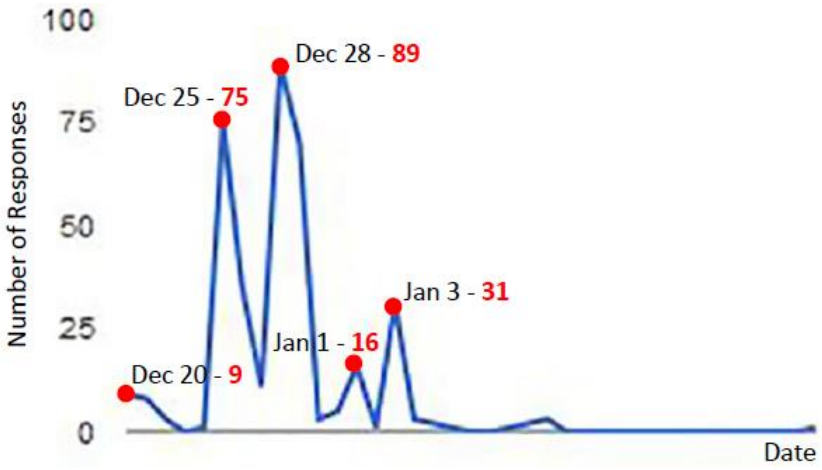


Figure 4.3: Variation of the number of responses over time.

4.3 Demographic and Customer Behavior Analysis

Table 4.9 represents the demographic profile of the sample.

Table 4.9: Demographic information of the sample.

Variables	Number (N)	Percentage (%)
Age		
Under 20	22	6.10
Between 20-30	194	53.90
Between 30-40	111	30.80
Between 40-50	25	6.90
Between 50-60	7	1.90
Over 60	1	0.30
Gender		
Male	247	68.60
Female	113	31.40
Monthly Income Level		
Below Rs.10,000/=	31	8.60
Between Rs.10,000/= - 25,000/=	113	31.40
Between Rs.25,000/= - 50,000/=	106	29.40
Between Rs.50,000/= - 100,000/=	53	14.70
Above Rs.100,000/=	57	15.80
Number of online purchases through the Internet per year		
Below 2 purchases per year	79	21.90
2 to 5 purchases per year	125	34.70
5 to 10 purchases per year	76	21.10
10 to 20 purchases per year	36	10.00
More than 20 purchases per year	44	12.20
Prefer ability to use the credit cards for online transactions		
Strongly Agree	94	26.11
Agree	203	56.39
Neutral	36	10.00
Disagree	17	4.72
Strongly Disagree	10	2.78
Knowledge and usage of computers and Internet (Computer Literacy)		
Expert	71	19.70

Professional	194	53.90
Normal User	82	22.80
Novice	10	2.80
No Experience	3	0.80
Frequency of performing printing orders per year		
Never	64	17.80
1 to 5 orders per year	182	50.60
6 to 10 orders per year	76	21.10
11 to 20 orders per year	26	7.20
21 to 50 orders per year	5	1.40
More than 50 orders per year	7	1.90
Total	360	100.00

4.3.1 Customers' Age vs. Focus on Online Printing

Table 4.10 and Figure 4.4 illustrate the age distribution among survey respondents. The sample contains the participants from all age groups and it indicates the questionnaire was distributed to all possible sources through the distributed channels. 85% of the sampled population is within the age range between 20-30 and 30-40 (see Table 4.11 for cumulative percentage values). Typically, the people in age range 20 to 40 have more tendencies towards online shopping and that stands for the online printing as well.

Table 4.10: Demographic information of the sample: Age distribution.

Variables	**Number (N)**	**Percentage (%)**
Age		
Under 20	22	6.10
Between 20-30	194	53.90
Between 30-40	111	30.80
Between 40-50	25	6.90
Between 50-60	7	1.90
Over 60	1	0.30
Total	360	100.00

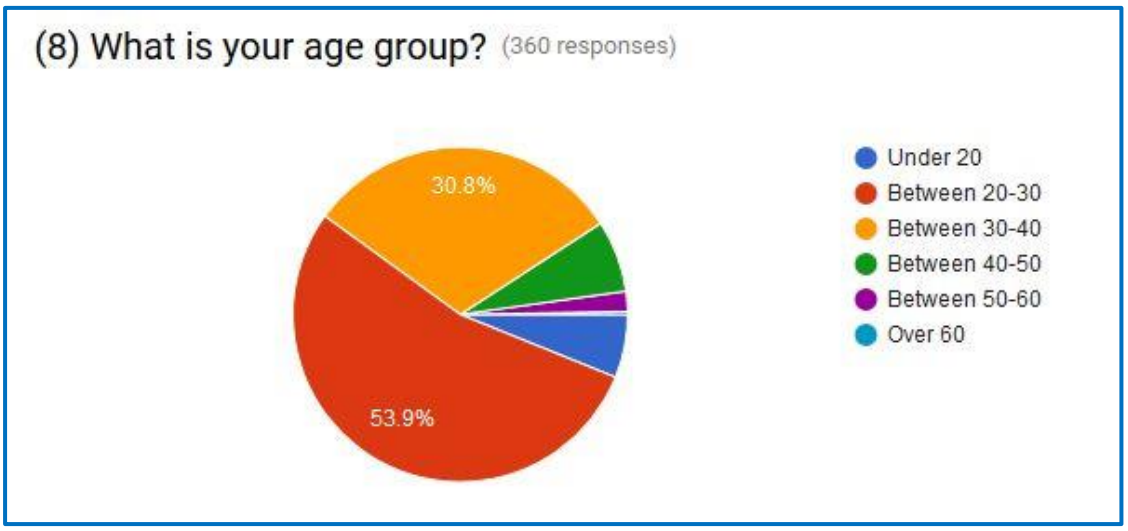


Figure 4.4: Demographic information of the sample: Age distribution.

Table 4.11: SPSS frequency table for age group.

Age

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Between 20-30	194	53.9	53.9	53.9
	Between 30-40	111	30.8	30.8	84.7
	Between 40-50	25	6.9	6.9	91.7
	Between 50-60	7	1.9	1.9	93.6
	Over 60	1	.3	.3	93.9
	Under 20	22	6.1	6.1	100.0
	Total	360	100.0	100.0	

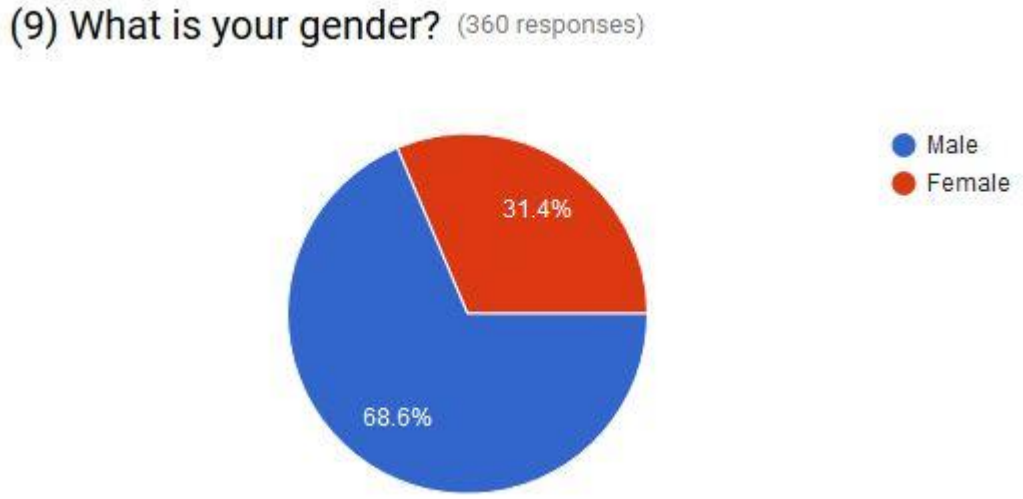
While 20-40 age group has more interest over online printing, participants from age over 50 have interested least about the ongoing survey. Though we have sent this to a whole client base in a printing company, that age group did not pay much attention about the online solutions we proposed. That indicates that, they like the way they are dealing now, as they go to the store, work with a designer and collect the print from there.

4.3.2 Customers' Gender vs. Focus on Online Printing

Table 4.12 lists the gender distribution among the survey participants. 68.6% of the participants are males; hence, majority in the responded group fall into the male category. It is accepted norm that, mostly males prefer to do the shop online, rather than visiting a physical store. Alternatively, women much preferred to visit the store and check the product and its quality. These figures are equivalent to the statistics of the survey done in Middle East considering e-commerce trends there in 2015.

Table 4.12: Demographic information of the sample: Gender distribution.

Variables	Number (N)	Percentage (%)
Gender		
Male	247	68.60
Female	113	31.40
Total	360	100.00

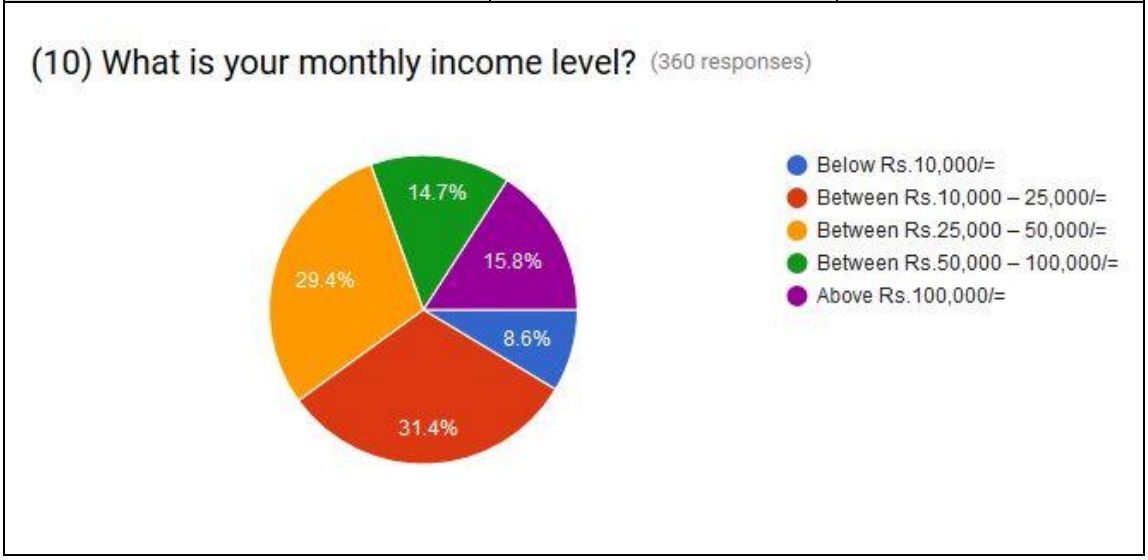


4.3.3 Customers' Monthly Income Level vs. Focus on Online Printing

The monthly income level of the participants mostly hover around the LKR 10,000/= to LKR 50,000/= mark. That group represents over 60% of the sample. Another 30% represents the monthly salary of over LKR 50,000/=. Therefore, we can get an idea that their monthly income plays a major role in their online shopping behaviors. Participants with the income of below LKR 10,000/= or the people who does not get any monthly pay or wage does not pay much attention about the survey. That diagnose that, specific group does not have much interest on online shopping, more specifically on online printing and its related technologies due to their lack of financial strength.

Table 4.13: Demographic information of the sample: Customers' monthly income distribution.

Variables	Number (N)	Percentage (%)
Monthly Income Level		
Below Rs.10,000/=	31	8.60
Between Rs.10,000/= - 25,000/=	113	31.40
Between Rs.25,000/= - 50,000/=	106	29.40
Between Rs.50,000/= - 100,000/=	53	14.70
Above Rs.100,000/=	57	15.80
Total	360	100.00

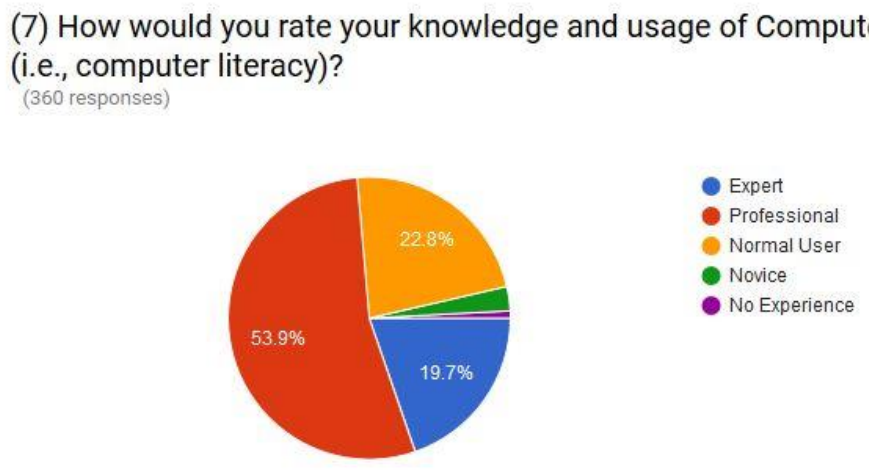


4.3.4 Customers' Computer Literacy vs. Focus on Online Printing

Among the 360 participants, 194 participants have mark their computer literacy is in the professional mark. Another 71 said they are experts in the computer and Internet related activities. According those figures, 77% said that they are much higher level in the computer knowledge and Internet usage. Depending on the Sri Lankan Internet user penetration, we can accept those figures with reasons to the recent infrastructure developments related to the information technology and Internet service developments in Sri Lanka. Another 23% voted that they are falling in to the normal users in Internet related activities. Therefore, these figures certify that computer knowledge and Internet usage plays a key role in the online shopping related activities.

Table 4.14: Demographic information of the sample: Customers' Knowledge and usage of computers and Internet.

Variables	Number (N)	Percentage (%)
Knowledge and usage of computers and Internet (Computer Literacy)		
Expert	71	19.70
Professional	194	53.90
Normal User	82	22.80
Novice	10	2.80
No Experience	3	0.80
Total	360	100.00

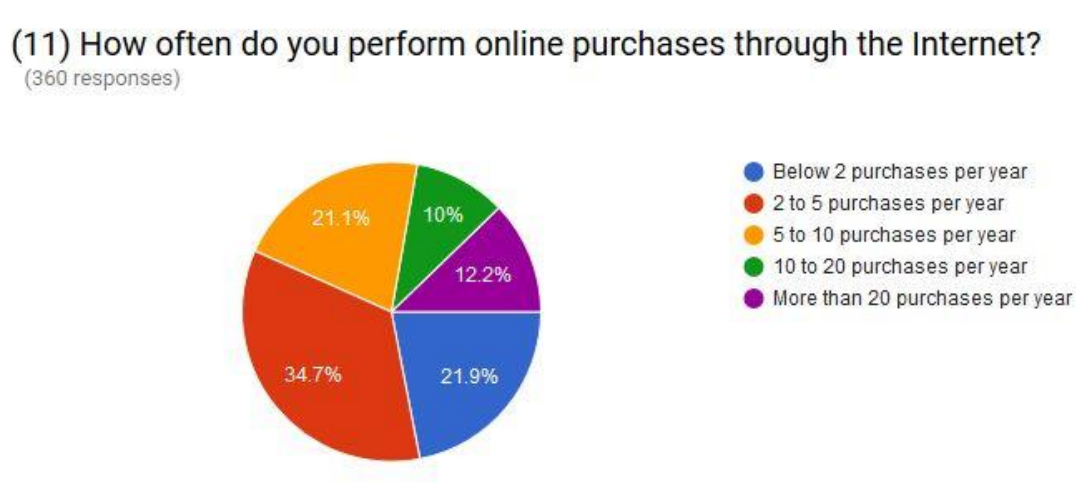


4.3.5 Customers' Online Purchase Frequency vs. Focus on Online Printing

To capture the Internet purchase experience of the sample, we have added this demographic question to the survey questionnaire. Depending on the results, we can decide that probability of online purchases count remains in much lower level in Sri Lanka. However, computer literacy is much higher than most other Asian countries, people reluctant and hesitant to perform the online purchases in Sri Lanka. Their trust and attitudes are overcast by the less knowledge about online vendors and service providers.

Table 4.15: Demographic information of the sample: Customers' online purchase frequency per year.

Variables	Number (N)	Percentage (%)
Number of online purchases through the Internet per year		
Below 2 purchases per year	79	21.90
2 to 5 purchases per year	125	34.70
5 to 10 purchases per year	76	21.10
10 to 20 purchases per year	36	10.00
More than 20 purchases per year	44	12.20
Total	360	100.00



According to the responses we received, 35% of the participants perform just two to five online purchases per year. Another 21% perform five to ten purchases per year. Therefore, if we sum up those two groups, almost 56% of the participants perform less than ten purchases per year through the Internet. Another 22% will do less than two online purchases per year and could include the consumers who do not perform any online purchases or transactions. They are always using the in-store approach, though there are many benefits to be offered if they go online. It may be depends on their knowledge on cyber space or their traditional attitudes and beliefs about the e-commerce activities. If we compare these numbers to some of the other countries who are more active in online purchases, there is huge market potential to capture, if we are trying digitalized our economy in future.

4.3.6 Customers' Credit Card Usage vs. Focus on Online Printing

In variable identification process, under the consumer characteristics we have selected an independent variable called "Credit Card Usage". Therefore, depending on the above stats that variable has a significant positive impact towards the Perceived Usefulness (PU) and Perceived Ease of Use (PE). Over 82% of the participants have conveyed that they prefer to use the credit card for the online transactions.

Table 4.16: Demographic information of the sample: Customers' credit card usage.

Variables	Number (N)	Percentage (%)
Prefer ability to use the credit cards for online transactions		
Strongly Agree	94	26.11
Agree	203	56.39
Neutral	36	10.00
Disagree	17	4.72
Strongly Disagree	10	2.78
Total	360	100.00

However, these figures may contradict with results in Table 4.15. There we decided that consumers' knowledge on cyber space and their traditional attitudes and beliefs about the e-commerce activities, will holding their backs from reaching digitalized market environment. Nevertheless, it seems that they are willing to use the credit cards without much worry. Then we decide that the knowledge and the expertise to do the online purchasing activities will hold them back from doing it online.

4.4 Hypothesis Testing

In line with the study objective, correlation analysis was conducted to examine the relationship between the variables used within this study, and therefore to empirically decide whether to accept or reject the null hypotheses (Alharbi & Drew, 2014).

Hypothesis 1

From the correlation analysis result in Table 4.17, it can be observed that, customers' behavioral intention to use online printing is positively affected by their attitude towards online printing, perceived usefulness, perceived ease of use, consumer characteristics, product characteristics, medium (website) characteristics, and environmental factors. Therefore, **$H1_A$** is weakly supported (see Figure 4.5 and 4.6).

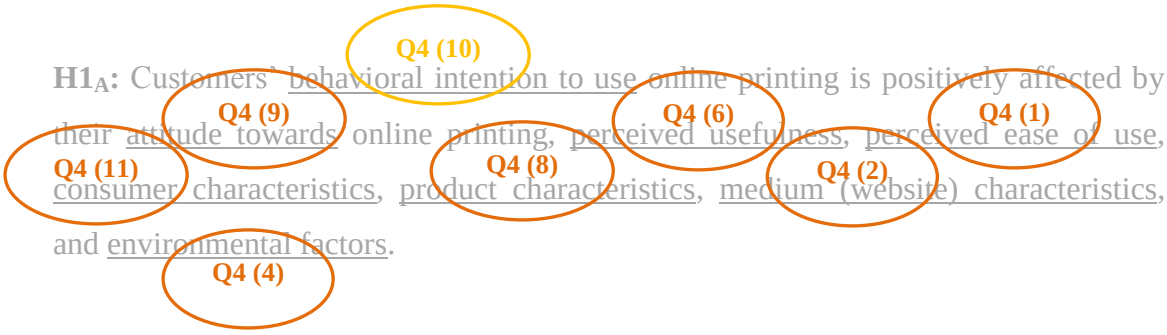


Figure 4.5: Question numbers related to each variable, used to determine the construct BI.

Table 4.17: Correlations matrix for hypothesis 1.

Correlations

		Q4_10 Repeat Order Online	Q4_9 First Time Store	Q4_6 Perceived Usefulness	Q4_1 Tangible Product	Q4_11 Credit Card Usage	Q4_8 Uncertainty	Q4_2 Website Design	Q4_4 Internet Service Price
Q4_10 Repeat Order Online	Pearson Correlation	1	.379**	.437**	.183**	.373**	.184**	.264**	.155**
	Sig. (2-tailed)		.000	.000	.000	.000	.000	.000	.003
	N	360	360	360	360	360	360	360	360
Q4_9 First Time Store	Pearson Correlation	.379**	1	.195**	.152**	.253**	.343**	.129*	.384**
	Sig. (2-tailed)	.000		.000	.004	.000	.000	.015	.000
	N	360	360	360	360	360	360	360	360
Q4_6 Perceived Usefulness	Pearson Correlation	.437**	.195**	1	.213**	.254**	.180**	.249**	.230**
	Sig. (2-tailed)	.000	.000		.000	.000	.001	.000	.000
	N	360	360	360	360	360	360	360	360
Q4_1 Tangible Product	Pearson Correlation	.183**	.152**	.213**	1	.193**	.074	.282**	.147**
	Sig. (2-tailed)	.000	.004	.000		.000	.162	.000	.005
	N	360	360	360	360	360	360	360	360
Q4_2 Website Design	Pearson Correlation	.264**	.129*	.249**	.282**	.165**	.107*	1	.042
	Sig. (2-tailed)	.000	.015	.000	.000	.002	.043		.423
	N	360	360	360	360	360	360	360	360
Q4_4 Internet Service Price	Pearson Correlation	.155**	.384**	.230**	.147**	.074	.384**	.042	1
	Sig. (2-tailed)	.003	.000	.000	.005	.162	.000	.423	
	N	360	360	360	360	360	360	360	360

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

*. Correlation is significant at the 0.05 level (2-tailed).

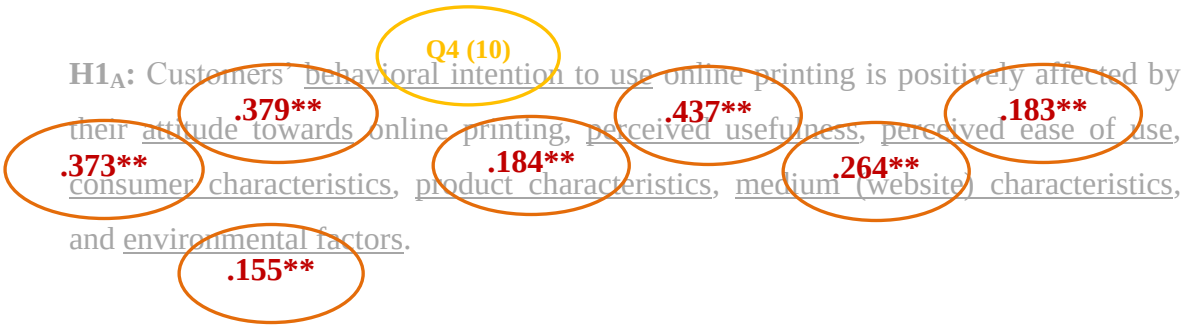


Figure 4.6: Corresponding Pearson Correlation value for each variable against construct BI.

Hypothesis 2

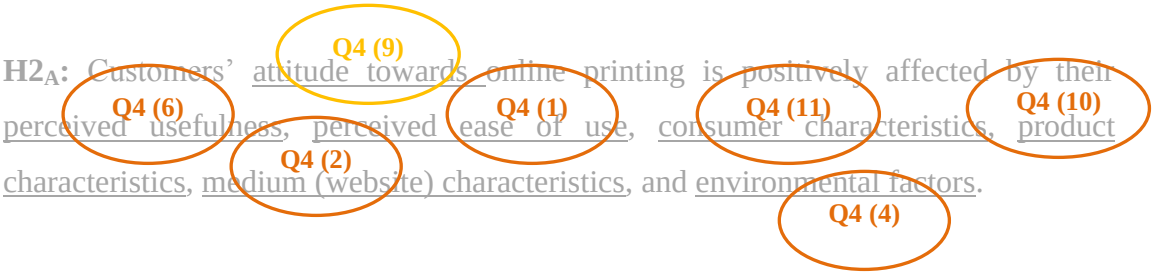


Figure 4.7: Question numbers related to each variable, used to determine the construct A.

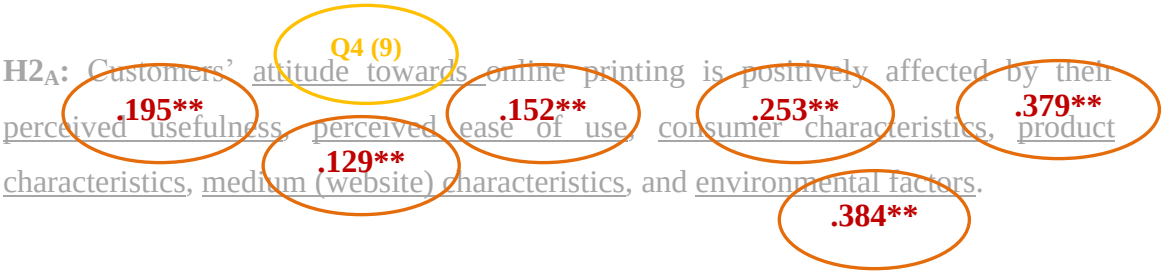


Figure 4.8: Corresponding Pearson Correlation value for each variable against construct A.

From the correlation analysis result in Table 4.18, it can be observed that, customers' attitude towards online printing is positively affected by their perceived usefulness, perceived ease of use, consumer characteristics, product characteristics, medium (website) characteristics, and environmental factors. Therefore, **$H2_A$** is weakly supported (see Figure 4.7 and 4.8).

Table 4.18: Correlations matrix for hypothesis 2.

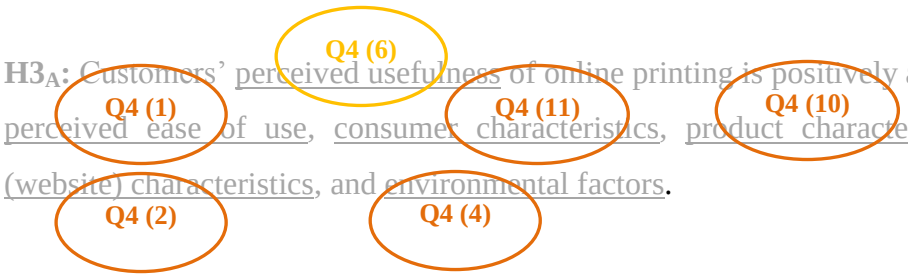
Correlations

		Q4_9 First Time Store	Q4_6 Perceived Usefulness	Q4_1 Tangible Product	Q4_11 Credit Card Usage	Q4_10 Repeat Order Online	Q4_2 Website Design	Q4_4 Internet Service Price
Q4_9 First Time Store	Pearson Correlation	1	.195**	.152**	.253**	.379**	.129*	.384**
	Sig. (2-tailed)		.000	.004	.000	.000	.015	.000
	N	360	360	360	360	360	360	360
Q4_6 Perceived Usefulness	Pearson Correlation	.195**	1	.213**	.254**	.437**	.249**	.230**
	Sig. (2-tailed)	.000		.000	.000	.000	.000	.000
	N	360	360	360	360	360	360	360
Q4_1 Tangible Product	Pearson Correlation	.152**	.213**	1	.193**	.183**	.282**	.147**
	Sig. (2-tailed)	.004	.000		.000	.000	.000	.005
	N	360	360	360	360	360	360	360
Q4_11 Credit Card Usage	Pearson Correlation	.253**	.254**	.193**	1	.373**	.165**	.074
	Sig. (2-tailed)	.000	.000	.000		.000	.002	.162
	N	360	360	360	360	360	360	360
Q4_10 Repeat Order Online	Pearson Correlation	.379**	.437**	.183**	.373**	1	.264**	.155**
	Sig. (2-tailed)	.000	.000	.000	.000		.000	.003
	N	360	360	360	360	360	360	360
Q4_2 Website Design	Pearson Correlation	.129*	.249**	.282**	.165**	.264**	1	.042
	Sig. (2-tailed)	.015	.000	.000	.002	.000		.423
	N	360	360	360	360	360	360	360
Q4_4 Internet Service Price	Pearson Correlation	.384**	.230**	.147**	.074	.155**	.042	1
	Sig. (2-tailed)	.000	.000	.005	.162	.003	.423	
	N	360	360	360	360	360	360	360

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

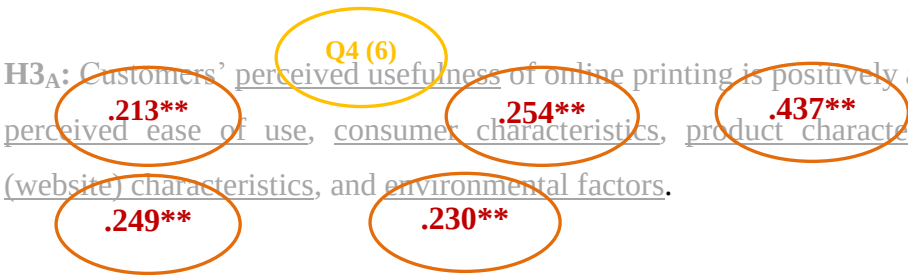
*. Correlation is significant at the 0.05 level (2-tailed).

Hypothesis 3



$H3_A$: Customers' perceived usefulness of online printing is positively affected by their perceived ease of use, consumer characteristics, product characteristics, medium (website) characteristics, and environmental factors.

Figure 4.9: Question numbers related to each variable, used to determine the construct PU.



$H3_A$: Customers' perceived usefulness of online printing is positively affected by their perceived ease of use, consumer characteristics, product characteristics, medium (website) characteristics, and environmental factors.

Figure 4.10: Corresponding Pearson Correlation value for each variable against construct PU.

From the correlation analysis result in Table 4.19, it can be observed that, customers' perceived usefulness (PU) of online printing is positively affected by their perceived ease of use (PE), consumer characteristics, product characteristics, medium (website) characteristics, and environmental factors. Therefore, **$H3_A$** is weakly supported (see Figure 4.9 and 4.10).

Table 4.19: Correlations matrix for hypothesis 3.

Correlations

		Q4_6 Perceived Usefulness	Q4_1 Tangible Product	Q4_11 Credit Card Usage	Q4_10 Repeat Order Online	Q4_2 Website Design	Q4_4 Internet Service Price
Q4_6 Perceived Usefulness	Pearson Correlation	1	.213**	.254**	.437**	.249**	.230**
	Sig. (2-tailed)		.000	.000	.000	.000	.000
	N	360	360	360	360	360	360
Q4_1 Tangible Product	Pearson Correlation	.213**	1	.193**	.183**	.282**	.147**
	Sig. (2-tailed)	.000		.000	.000	.000	.005
	N	360	360	360	360	360	360
Q4_11 Credit Card Usage	Pearson Correlation	.254**	.193**	1	.373**	.165**	.074
	Sig. (2-tailed)	.000	.000		.000	.002	.162
	N	360	360	360	360	360	360
Q4_10 Repeat Order Online	Pearson Correlation	.437**	.183**	.373**	1	.264**	.155**
	Sig. (2-tailed)	.000	.000	.000		.000	.003
	N	360	360	360	360	360	360
Q4_2 Website Design	Pearson Correlation	.249**	.282**	.165**	.264**	1	.042
	Sig. (2-tailed)	.000	.000	.002	.000		.423
	N	360	360	360	360	360	360
Q4_4 Internet Service Price	Pearson Correlation	.230**	.147**	.074	.155**	.042	1
	Sig. (2-tailed)	.000	.005	.162	.003	.423	
	N	360	360	360	360	360	360

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

Hypothesis 4

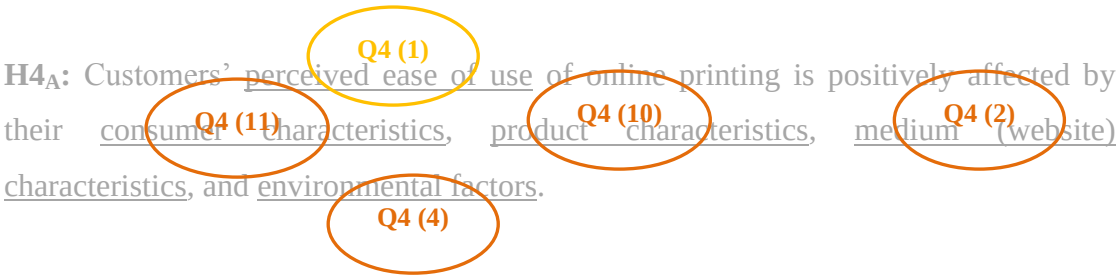


Figure 4.11: Question numbers related to each variable, used to determine the construct PE.

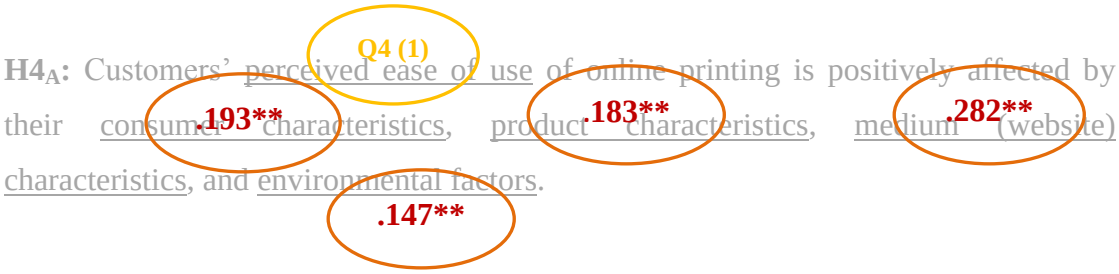


Figure 4.12: Corresponding Pearson Correlation value for each variable against construct PE.

From the correlation analysis result in Table 4.20, it can be observed that, customers' perceived ease of use of online printing is not affected by their consumer characteristics, product characteristics, medium (website) characteristics, and environmental factors. Therefore, **$H4_A$** is not supported (see Figure 4.11 and 4.12).

Table 4.20: Correlations matrix for hypothesis 4.

Correlations

		Q4_1 Tangible Product	Q4_11 Credit Card Usage	Q4_10 Repeat Order Online	Q4_2 Website Design	Q4_4 Internet Service Price
Q4_1 Tangible Product	Pearson Correlation	1	.193**	.183**	.282**	.147**
	Sig. (2-tailed)		.000	.000	.000	.005
	N	360	360	360	360	360
Q4_11 Credit Card Usage	Pearson Correlation	.193**	1	.373**	.165**	.074
	Sig. (2-tailed)	.000		.000	.002	.162
	N	360	360	360	360	360
Q4_10 Repeat Order Online	Pearson Correlation	.183**	.373**	1	.264**	.155**
	Sig. (2-tailed)	.000	.000		.000	.003
	N	360	360	360	360	360
Q4_2 Website Design	Pearson Correlation	.282**	.165**	.264**	1	.042
	Sig. (2-tailed)	.000	.002	.000		.423
	N	360	360	360	360	360
Q4_4 Internet Service Price	Pearson Correlation	.147**	.074	.155**	.042	1
	Sig. (2-tailed)	.005	.162	.003	.423	
	N	360	360	360	360	360

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

Table 4.21: Hypothesis summary.

Hypothesis	Statement	Result
H1	Customers' behavioral intention to use online printing is positively affected by their attitude towards online printing, perceived usefulness, perceived ease of use, consumer characteristics, product characteristics, medium (website) characteristics, and environmental factors.	Weakly Supported
H2	Customers' attitude towards online printing is positively affected by their perceived usefulness, perceived ease of use, consumer characteristics, product characteristics, medium (website) characteristics, and environmental factors.	Weakly Supported
H3	Customers' perceived usefulness of online printing is positively affected by their perceived ease of use, consumer characteristics, product characteristics, medium (website) characteristics, and environmental factors.	Weakly Supported
H4	Customers' perceived ease of use of online printing is positively affected by their consumer characteristics, product characteristics, medium (website) characteristics, and environmental factors.	Not Supported

4.5 Other Findings from the Study

4.5.1 Hot Selling Products through an Online Print Portal

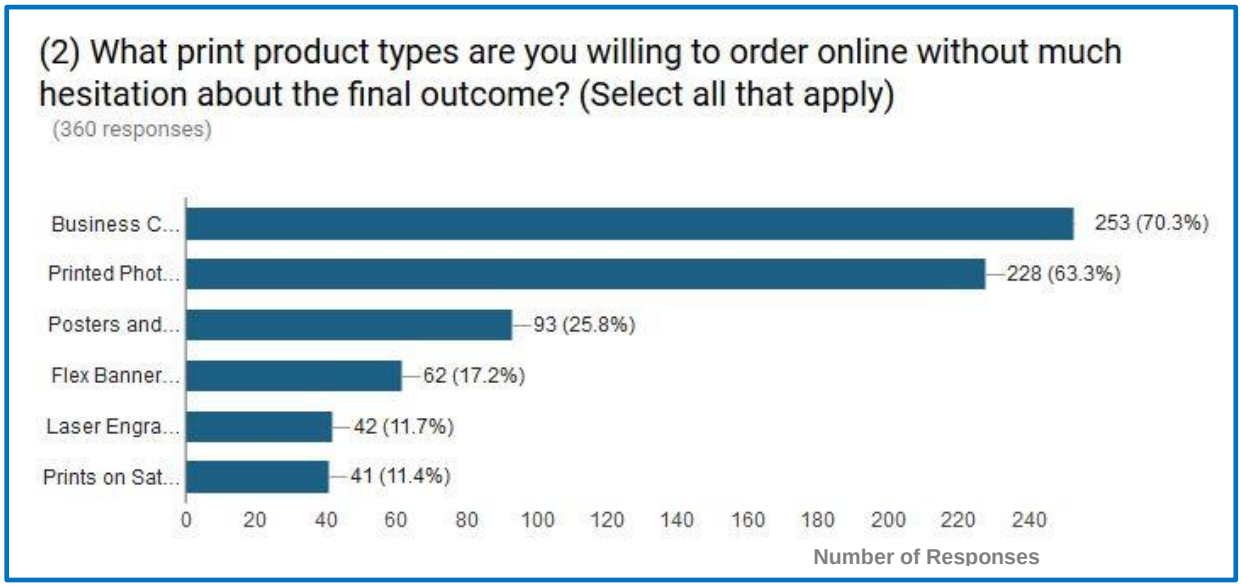


Figure 4.13: Survey responses for Q2.

As seen in Figure 4.13, we can get an idea that most of the participants like to purchase following print services online:

(1) Business Cards, Invitations, and Brochures – 70.3%
(2) Printed Photo Mugs and Sublimated Gift Items – 63.3%
(3) Posters and Letterheads – 25.8%

If you compare these statistics with actual web-to-print solutions, the outcomes are same to the survey findings. These facts confirm that online print service consumers in Sri Lanka does not worry much when they are ordering the products in lower price ranges. They are willing to take that risk with those times, whether they may receive the quality they expected or not. That intension of the customers can be verified when we compare these results with the responses we got for the Q1 in the survey questionnaire.

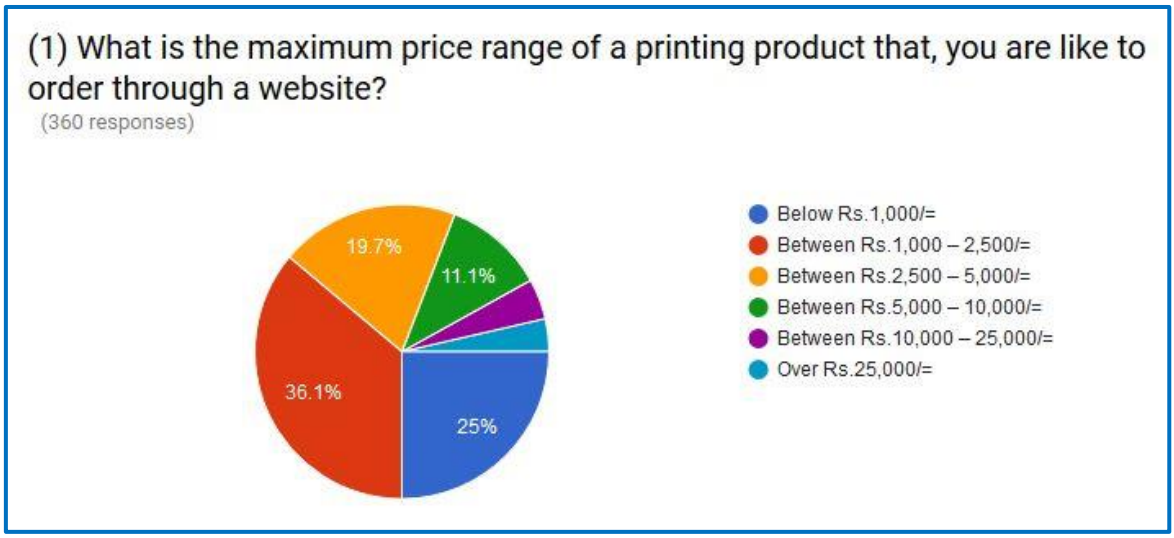


Figure 4.14: Survey responses for Q1.

According to Figure 4.14, we can identified that majority of the participants do not like to take that risk of ordering high value print products online. If the print product value is high, they like to stay with traditional in-store method, where they go to the physical store, discuss it with a designer, check the available materials, and then

confirm the order at store. By looking at the Figure 4.14, we can notice that almost 81% would like to order a print product, which cost them less than LKR 5,000/=.

4.5.2 Customer Service Features Expected from an Online Store

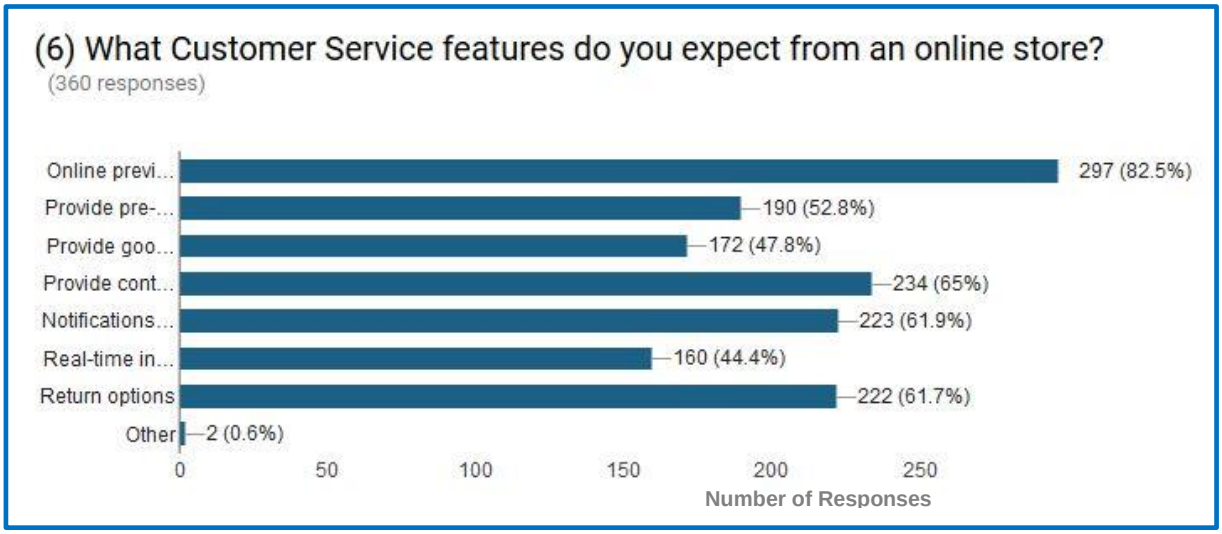


Figure 4.15: Survey responses for Q6.

Customer service features have being presented as an eight point multiple-choice question in the survey questionnaire. Most participants have expected following features to be offered regularly for them when they performing the online print orders (see Figure 4.15),

(1) Online preview before placing an order - 82.5%
(2) Provide contact information and details about the responsible personal - 65%
(3) Notifications about the order status from time to time (e-mails, SMS, Order info update on the website, etc.) - 61.9%
(4) Return options - 61.7%

4.5.3 Customer Concerns while Ordering a Product Online

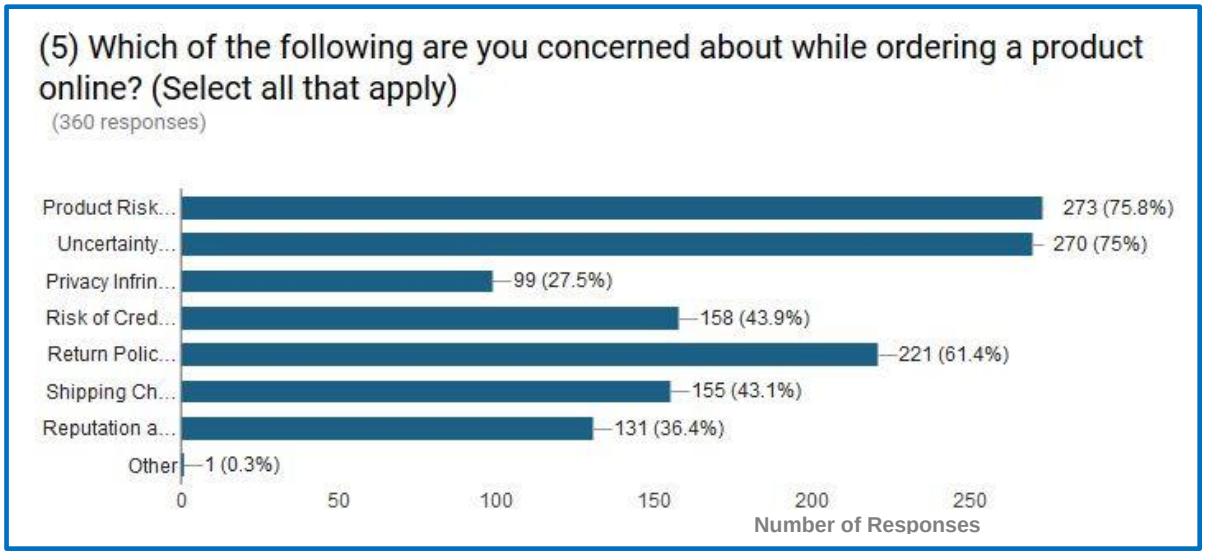


Figure 4.16: Survey responses for Q5.

While analyzing the responses, we found that product risk, uncertainty about the outcome, and doubts with return policies are major concerns for the consumers when they order product online (see Figure 4.16). If any vendor can addresses those issues and concerns, people will more focus on the Internet markets and online shopping as they normally do with the physical in-store shopping.

Following main concerns about ordering a product online was identified:

(1) Product Risk (e.g., Standard Print Size, Product Size, Product Quality) – 75.8%
(2) Uncertainty of final outcome (e.g., Screen Color vs. Actual Color, Print Quality, Material Quality, Texture Effects, etc.) – 75%
(3) Return Policy (e.g., Money-Back Guarantee, Next Order Incentives) – 61.4%
(4) Risk of Credit Card Fraud – 43.9%
(5) Shipping Charges (e.g., Free Shipping, Express Delivery, etc.) – 43.1%
(6) Reputation and Trust of the Product Vendor – 36.4%
(7) Privacy Infringement – 27.5%

Table 4.22: Summery of means, and standard deviations.

Construct	Measurement Instrument	Mean (STD)
Perceived ease of use (PE)	I am comfortable in ordering a tangible product, just by seeing a product image or preview through the website	2.17 (0.983)
	What Customer Service features do you expect from an online store?	
Perceived usefulness (PU)	Online printing services help me to save my time and money	1.84 (0.760)
Attitude towards online printing	When I order/buy something first time, I prefer to do it at the store	2.03 (1.030)
	When I order/buy something repeatedly, I prefer to do it at online	1.75 (0.797)
	~~I am reluctant to order online print services, as I am worried about the quality of the final outcome~~	~~2.70 (1.075)~~
Behavioral intension (BI) to use	How often do you perform printing orders?	
	From those orders, which fraction of orders is placed online?	
	When I order/buy something repeatedly, I prefer to do it at online	1.75 (0.797)
Consumer Characteristics	What is your age group?	
	What is your gender?	
	What is your monthly income level?	
	I prefer to use credit cards for online transactions?	2.02 (0.896)
	How often do you perform online purchases through the Internet?	
	From those orders, which fraction of orders are placed online (give a number between 0% and 100%)?	
	How would you rate your knowledge and usage of Computers and Internet (i.e., computer literacy)?	
	Recent Internet services' price hikes reduced my day today Internet usage?	2.38 (1.085)
	I am comfortable in ordering a tangible product, just by seeing a product image or preview through the website	2.17 (0.983)
	~~I am reluctant to order online print services, as I am worried about the quality of the final outcome~~	~~2.70 (1.075)~~

	Ordering online print services limit the ability to have a creative solution as I am unable to touch and feel the material and interact with designers	2.38 (0.842)
Product Characteristics	What is the maximum price range of a printing product that, you are like to order through a website?	
	What print products types are you willing to order online without much hesitation about the final outcome?	
	I am comfortable in ordering a tangible product, just by seeing a product image or preview through the website	2.17 (0.983)
	Ordering online print services limit the ability to have a creative solution as I am unable to touch and feel the material and interact with designers	2.38 (0.842)
	Level of personalization you expect while ordering a product though the Internet?	
	When I order something first time I prefer to do it at the store	2.03 (1.030)
	When I order something repeatedly I prefer to do it at online	1.75 (0.797)
Website Characteristics	I do considering about the website design, features, and information content while deciding to order a product online?	1.84 (0.773)
	Which of the following are you concerned about while ordering a product online?	
	I often check security features available on a website (e.g., SSL Certificates, verified certificates and logos) before purchasing an item through that website?	1.96 (0.832)
	I prefer to use credit cards for online transactions?	2.02 (0896)
	~~I am reluctant to order online print services, as I am worried about the quality of the final outcome~~	~~2.70 (1.075)~~
	What Customer Service features do you expect from an online store?	
Environmental Characteristics	How would you rate your knowledge and usage of Computers and Internet (i.e., computer literacy)?	
	Recent Internet services' price hikes reduced my day today Internet usage?	2.38 (1.085)
	Before ordering a product through an on-line website, I compare the other available options either at the same web store or competitor websites?	1.88 (0.806)

5 CONCLUSIONS AND RECOMMENDATIONS

With the progress of information and communication technology, digital economy has penetrated to the each end of the globe. This creates many digital consumers and cyber users while transcending boundaries of traditional business. Therefore, the market is continuously expanding, if sellers or service providers are willing to go online. The firms that identified this continually growing market place will promote and enhance their good and services through various channels. While, consumers need to change their shopping behaviors from the traditional mode to online shopping strategies, it creates a greater challenge for service providers consumers' shopping behavioral transformation is an unavoidable trend. Thus, they need to change their marketing strategies to capture and announce that growing demand.

In Sri Lanka, most users are reluctant to perform online purchases due to the fear of performing online payments. Privacy infringement and risk of credit card fraud play key role in pulling up most of the consumers from the online shopping desires.

5.1 Research Findings

Similar to earlier studies (Lee, Cheung, & Chen, 2005; Saadé, Nebebe, & Tan, 2007), this study confirmed that Technology Acceptance Model (TAM) to be a useful theoretical model in helping to understand and explain behavioral intention to use the new technologies. Results of the present research led to the conclusion that model well represented the collected data (Park, 2009).

In the research, we have used four constructs as external variables, namely consumer characteristics, product characteristics, medium (website) characteristics, and environmental (infrastructure) characteristics. We then examined their relationships with TAM default constructs, namely Perceived Ease of Use (PE), Perceived Usefulness (PU), Attitude towards online printing (A), and Behavioral Intention (BI) to use online printing technologies. Based on the findings, all four constructs have very weak positive relationship with TAM default constructs. If we segmented each construct, to identify the connections in the independent variable level, we can get an

idea about how each behaves and motivates the consumers to the online printing technologies and its acceptance.

First, we discussed the consumer characteristics and its impact on the acceptance of new technologies in online print market. Mainly males between age ranges from 20 to 40 have high interest in these online printing solutions. It is being common to any online shopping study that this specific group very tentative to the market changes in the cyber space. When considering the monthly income level of the participants, we identified that there is a base limit to start the online shopping.

Second construct focused on the print product characteristics and its effects to the online printing acceptance of the customers. While print vendors add their complete print product catalog to the online sites, consumers frequently order the same product categories all the time. Printers need to pay much attention regarding this, because customers are more likely to order business cards, invitations, and printed photo mugs rather than the laser engraved, laser cut products, flex banners, or fabric prints. For those products customers seems to be uncertain about the outcome and they seems to feel that it is safe to come to the physical store and check the materials and samples before ordering the product. They want to print a sample and clarify that actual colors and quality is there. Another observation seems to be that, customers tend to do the initial printing at the store, confirm what they expect, and then do the repeat orders online without much hazel. Print vendors also can build on this approach. For example, if a customer is placing a bulk order through online, printer could print a sample and send to the customers for approval, instead of doing the whole bulk.

In customers' perspective, they seem to worry about the uncertainty of outcome. In addition, they are concerned about the return policies, if the things go other way round. This brings another headache to the print vendor to comply with return policies but also deal with false complains to get refunds.

When considering the website characteristics, website design, system security, and customer services offered through the channel have a significant impact on customers' perception towards using that system. Simple and user-friendly designer canvases help to grab much customer attention rather than the function-filled, complex sites.

Security features on the website, create much secure mindset to consumers to perform the online shopping in much clear mind without worrying about the possible vulnerabilities. Therefore, Internet users much tend to use a website, which consisted with Transport Layer Security (TLS) and Secure Socket Layer (SSL) authentication protocol, verified certificates, and certified security logos. In addition, the customer services offered through that web channel have significant positive impact on customers to embrace it as a valid and trustworthy service provider.

Internet service charges, IT infrastructure, market, and competitors are identified as significant environmental factors during the literature survey stage. Higher computer literacy rate in Sri Lanka can be considered a major plus point to deliver such online services in the future. However, recent price hike in the Internet services can cause an unfavorable resistance to those developments. If we check the online print market and competitors, there are only a limited numbers of vendors to be identified as active competitors. Currently in Sri Lanka, only two print vendors are maintaining their own web-to-print online solution with parallel to their physical business place. If the online trend creates more customer base, others also may interest about it. If it increases the number of available online storefronts, customers are the ultimate beneficiaries of that due to competitive advantage between the suppliers.

5.2 Management Guidelines: W2P Implementation

By using the findings in the study, we listed a set of guidelines for the print company managers to focus on while implementing a W2P solution for their company. We believed that following guidelines would help them to evaluate the internal readiness of a company, before invest such a solution in the future. Moreover, these identified steps will help them to avoid the typical obstacles in the implementation process:

1) Perform an internal need analysis based on your company's major applications, process bottlenecks, quality control issues, and predicted growth of the company in the future.
2) Involve customers in the process and get their feedback early and more often.

3) Beta test it with selected customers, request feedback, and implement changes.
4) Identify customer attitudes towards online printing. For the first time users promote in-store method and encourage them to use the online channels for the repeat orders.
5) Promote repeatable, low risk products in the initial stage of the system launch. At the preliminary stage, promote less complex, low risk products like business cards, printed photo mugs, letterheads, certificates, etc., for the online product catalog.
6) Provide well-detailed online previews to reduce the uncertainty about the final output.
7) Clearly state the return policies, shipping charges, and estimated delivery time for each product for possible destinations.
8) Target the potential user groups with coupons, promotional offers, vouchers, and discounts. Through our research findings, we identified that males age range between 20 to 40 have more potential to go online and place online print orders. Therefore, we can target that group with promoting valentine gifts, items for inter-school big matches, international cricket matches, party items, Mothers' Day – Fathers' Day gifts, New Year – Christmas gifts, etc.
9) Provide mandatory security features to protect customers' sensitive information like user information, personalized customers' designs and templates, and credit card usage.
10) Simple and clear user interfaces for users from novice to professional. Less complex and clear website design are proven to increase the website conversion. According to the research studies, 75% of web users make judgements on the credibility of a company based on its site design (Fogg, B.J., 2016).

5.3 Research Limitations

Following limitations of the research study can be identified, each of which are discussed next.

1. Socio-cultural differences

This study has been conducted based on the data acquired from the online buyers in Sri Lanka. Therefore, the findings may not be applicable to other countries, or the statistics may not be completely tally with the figures with the Western countries due to the socio-cultural differences. Then the result of this study may have lack of generalizability to other countries.

2. No previous studies regarding online printing

There is no any previous work done regarding the online printing or web-based printing solutions in Sri Lanka or the rest. Some researchers and web solution providers have conducted case study based approaches regarding their own solutions, but up to this point this subject area not being touched by anyone in the world. Until now, no research was conducted on this subject. So this would be the first such a work done on online printing and its related factors. Therefore, we do not had anything to be followed as the previous work and have to rely on the existing studies done on the online service industries as a starting point to this research work.

3. Continuous buying behaviors (repurchase) not considered

In this research effort, when developing the conceptual framework, original TAM is used as the base model. Most studies using the TAM specifically focus on the behavioral intension to use the specific technology and then actual use of it. Most studies investigated intention and adoption of online shopping using the TAM, but continuance behavior (repurchase) is still under-researched.

4. Sample characteristics

One potential limitation is that the characteristics of the sample may change once more consumers begin shopping online, in our case once consumers begin placing

print orders online. Another limitation is that respondents were customers of mostly a single online retailer within a single industry. Future research should focus on extending these findings to other industries (Rohm & Swaminathan, 2004).

5. Not all the influencing factors are discussed here

There are so many factors affecting on online shopping behavior. However, in this study because of time constraints we did not examined all the factors influencing on online shopping behavior.

6. Rigid questionnaire

Because of using questionnaire as data gathering tools, the respondents may not answer the questions exactly according to what they think and behave (Javadi et al., 2012). They have being enforced to select one of the answers we have given there. Therefore, the outcome would not totally reflect what they intent to express regarding the questions.

7. Use only online version of the questionnaire

The use of an online survey limits us to a pool of Internet users. Hence, the results may not be generalizable to non-Internet users. In this case we want to get feedbacks from the offline in-store users as well, to identify why they reluctant to use the online printing. Same as that, they may have difficulties on go online and work there. By using, only an online survey will limit their feedbacks as well. Therefore, we have to have a printed version of the questionnaire to be distributed among such customers.

8. Target sample is much skewed to tech-savvy

The samples of Internet users for this study were mostly those who tend to be more knowledgeable about the Internet and are thus experienced Internet users. The sample of respondents may be skewed toward more experienced Internet users. This may also restrict the generalizability of the findings.

5.4 Recommendations for Future Research

1. Identify the management perception towards the introducing new technologies

In the study, we consider only the consumers' perception towards online print technology adoption in the printing industry. Alternatively, we have to focus on the management point of view regarding the same topic. We can have a qualitative approach with interview questioned based study to identify the factors that print service managers should look at before bringing such technology to their firm. Change management issues also need to be considered there (Provide Management Toolkit or set of guidelines for management, on how to use, when to use, and what ways to use these new technologies). While we have mainly focused on the consumers' characteristics and factors in this research, there can be other system, product, service, and vendor-related factors, which could be important predictors for consumers' acceptance of online printing.

2. Drifting the web solutions to mobile e-commerce platforms

Use of mobile devices has being increased in great degree over the last decade or so. Customers will spend more time on their mobile devices, rather than sitting in front of their desktop computer or the laptop. Evolution of the social media clearly forced that transformation and people tend to be online all the time because of that. As mobile commerce grows to be an alternative shopping channel to traditional e-commerce, print vendors have to move to the mobile App versions to stay competitive with growing demands. If not they have make their web-2-print web storefronts more responsive to the mobile devices. Print vendors can send the instant notifications about daily deals or flash sales directly to consumers' mobiles if they connected through the mobile e-commerce.

Many consumers connect to shopping activities through social media, with a certain percent reporting they discover new products and items on social media sites. Facebook is the most influential channel nowadays, but shoppers also embrace visually oriented sites such as Pinterest.

Currently, the main concern for the mobile version of storefronts and online designer Apps is unavailability of mobile checkouts (Mobile version of payment gateways). Most of the Internet Payment Gateways (IPGs) still have not had their mobile versions. They just load their normal web page in to the mobile screen at the moment.

3. Concentrate on different shopping mechanisms

In the study we solely consider about the search online – buy online purchase mechanism. However, there can be other combinations as well, like search online – order online – in-store pickup. Therefore, we need to focus on the how purchases are made and get customers' perception on what suits them the best. It may vary depending on the industry, product, and channel characteristics. Therefore, that would be another variable, which should include in such a research.

4. Include globalization effect on online shopping as a parameter

There has been an accelerating trend in international or cross border e-commerce. Stats about online shopping found that small niche online retailers are now doing 10 - 20% of their sales outside of their own country. Therefore, in future research efforts need to focus on the globalization effect and customers' cross-country mindset and their attitudes as well.

5. Measuring the customer loyalty

There is a need for a better understanding of how to improve consumer loyalty. We required a scale to measure the customer's loyalty to understand whether we have retained that customer or just a one-time user of the system. Learning about the influential factors for retaining consumers might be one of the best long-term strategies for online retailers. In addition, a meta-analysis to handle similar and contradictory results of surveyed studies could be carried out in future (Zhou et al., 2007).

5.5 Summary

Online printing, which includes web-to-print solutions, mobile print apps, print storefronts, white label solutions (B2B version of W2P), are considered as the next level of printing. The advantages of web-to-print are undeniable. Customers appreciate that they can order at their convenience and monitor the progress of their placed order more closely by refereeing order status notifications from the automated system. However, in Sri Lankan context only handful of print vendors accepted that challenge.

Because, online printing is a quite new subject to the Sri Lanka; it does not contain any set standards. This can be count as an advantage as well as a disadvantage. As an advantage, there is more room for experiments. However, as a disadvantage, there has been very little usability testing done on what consumers like and dislike. Therefore, while printer's website content might be great, website's layout could chase the visitors away, and vice versa. It is still a volatile situation without any standards to rely on. No any previous work to look at it, raise major concerns to the printers when they are accepting that challenge.

Through this study, we recommend that print service providers need to concentrate on the consumer characteristics, product characteristics, website characteristics, and external infrastructure characteristics before eyeing such solution. The key findings include males between age ranges 20 to 40 are regular users of online print solutions, repeatable products with low risk have more demand through the online print portals, simple website design with more security features and more customer service features are proven to increase website conversions. We introduced set of guidelines for the print company managers to follow and evaluate their company's readiness for such online solution to help avoid the typical obstacles in the implementation process.

At glance, through this research effort we are trying to build a stable stronghold, for the print vendors, which they can refer and get an idea about what to expect with such solution and what are the factors they should eye on to promote it to the Sri Lankan customers.

References

Agarwal, R., & Prasad, J. (1998a). A conceptual and operational definition of personal innovativeness in the domain of information technology. *Information System Research, 9*(2), 204-215.

Agarwal, R., & Prasad, J. (1998b). The antecedents and consequents of user perceptions in information technology adoption. *Decision Support Systems, 22*(1), 15-29.

Agarwal, R., & Karahanna, E. (2000), Time flies when you're having fun: Cognitive absorption and beliefs about information technology usage. *MIS Quarterly, 24*(4), 665-694.

Alharbi, S., & Drew, S. (2014). Using the Technology Acceptance Model in Understanding Academics' Behavioural Intention to Use Learning Management Systems. *International Journal of Advanced Computer Science and Applications (IJACSA), 5*(1), 143-155.

Baranage, S. (2016). Attracting Younger Employees to Industry. *Sri Lanka Print, 1*(4), 4-6.

Benford, T. L., & Hunton, J. E. (2000). Incorporating information technology considerations into an expanded model of judgment and decision making in accounting. *International Journal of Accounting Information Systems, 1*(1), 54-65.

Bhatnagar, A., & Ghose, S. (2004a). A Latent Class Segmentation Analysis of E-Shoppers. *Journal of Business Research*, 57, 758-767.

Bhatnagar, A., & Ghose, S. (2004b). Segmenting Consumers Based on the Benefits and Risks of Internet Shopping. *Journal of Business Research*, 57, 1352-1360.

Bhatnagar, A., Misra, S., & Rao, H.R. (2000). On risk, convenience, and internet shopping behavior—why some consumers are online shoppers while others are not. *Communications of the ACM, 43*(11), 98–105.

Blake, B.F., Neuendorf, K.A., & Valdiserri, C.M. (2003). Innovativeness and variety of internet shopping. *Internet Research-Electronic Networking Applications and Policy, 13*(3), 156–169.

Burroughs, R.E., & Sabherwal, R. (2001). Determinants of retail electronic purchasing: a multi-period investigation. *Journal of Information System Operation Research, 40*(1), 35–56.

Burroughs, R.E., & Sabherwal, R. (2001). Determinants of retail electronic purchasing: a multi-period investigation. *Journal of Information System Operation Research, 40*(1), 35–56.

Carswell, L., Thomas, P., Petre, M., Price, B., & Richards, M. (2000). Distance education via the Internet: The student experience. *British Journal of Educational Technology*, *31*(1), 29–46.

Chang, J. (2015). Online Shopping: Advantages over the Offline Alternative.

Chang, M. K., Cheung, W., & Lai, V. S. (2004). Literature derived reference models for the adoption of online shopping. *Information & Management 42*(2005), 543–559.

Chau, P., & Hu, P. (2001). Information Technology Acceptance by Individual Professionals: A Model of Comparison Approach. *Decision Sciences, 32*(4), 699-719.

Chau, P.Y.K. (1996). An empirical assessment of a modified technology acceptance model. *Journal of Management Information Systems, 13,* 185-204.

Chau, P.Y.K., & Hu, P.J.H. (2002a). Examining a model of information technology acceptance by individual professionals: An exploratory study. *Journal of Management Information Systems, 18*(4), 191-229.

Cheeseman, N. & Breddin, R. (1995). Food Retailing in Australia. *Agribusiness Marketing Services Information Series Q195012, Queensland Department Primary Industries.*

Citrin, A.V., Sprott, D.E., Silverman, S.N., & Stem, D.E. (2000). Adoption of internet shopping: the role of consumer innovativeness. *Industrial Management and Data Systems, 100*(7), 294–300.

D'Ambra, J., Wilson, C., & Akter, S. (2013). Application of the task-technology fit model to structure and evaluate the adoption of E-books by academics. *Journal of the American Society for Information Science and Technology, 64* (1), 48-64.

Dange, U., & Kumar, V. (2012). A study of factors affecting online buying behavior: A conceptual model.

Davies, G. (1995). Bringing Stores to Shoppers - Not Shoppers to Stores. *International Journal of Retail and Distribution Management, 23*(1), 18-23.

Davis Jr, F. D. (1986). A technology acceptance model for empirically testing new end-user information systems: Theory and results. *Massachusetts Institute of Technology*.

Davis, F. D. (1986). A technology acceptance model for empirically testing new end-user information systems: Theory and results. *Doctoral dissertation. Cambridge, MA: MIT Sloan School of Management.*

Davis, F. D. (1989). Perceived Usefulness, Perceived Ease of Use, and User Acceptance of Information Technology. *MIS Quarterly, 13*(3), 319-339.

Davis, F.D., & Warshaw, P.R. (1992). Extrinsic and Intrinsic Motivation to Use Computers in the Workplace. *Journal of Applied Social Psychology, 22*(14), 1111-1132.

Davis, F.D., Bagozzi, P. R., & Warshaw, P. (1989). User acceptance of computer technology: A comparison of two theoretical models. *Management Science, 35*, 982-1003.

DeLone, W.H., & McLean, E.R. (1992), Information systems success: The quest for the dependent variable. *Information Systems Research, 3*(1), 60-95.

DeLone, W.H., & McLean, E.R. (2003), The DeLone and McLean model of information systems success: A ten-year update. *Journal of Management Information Systems, 19*(4), 9-30.

DeLone, W.H., & McLean, E.R. (2004). Measuring e-commerce success: applying the DeLone & McLean Information systems success mode. *International Journal of Electronic Commerce, 9*(1), 31-47.

Dennison, T. (2014). Critical Success Factors of Technological Innovation and Diffusion in Higher Education. *Dissertation, Georgia State University*.

Dishaw, M. T., & Strong, D. M. (1999). Extending the technology acceptance model with task-technology fit constructs. *Information & Management, 36*(1), 9-21.

Dishaw, M.T., & Strong, D.M. (1999). Extending the Technology Acceptance Model with Task-Technology Fit Constructs. *Information & Management 36*(1), 9-21.

Donthu, N., & Garcia, A. (1999). The internet shopper. *Journal of Advertising Research, 39*(3), 52–58.

Fenton, H. (2010). *Three Critical Success Factors of Print Leaders: Three Critical Success Factors of Print Leaders*

Fishbein, M. (1963). An investigation of the relationship between beliefs about an object and the attitude toward that object. *Human Relations, 16*, 233-240.

Fishbein, M. (1967). A behavior theory approach to the relations between beliefs about an object and the attitude toward the object. *In M. Fishbein (Ed.), Readings in attitude theory and measurement, New York: Wiley*, 389-400.

Fishbein, M. (1973). The prediction of behavior from attitudinal variables. *In CD. Mortensen & K.K. Sereno (Eds.), Advances in communication research*, 3-31.

Fogg, B.J. (2016). The blueprint of a successful online ecommerce solution. *Standford Guidelines for Web Credibility.*

Foucault, B.E., & Scheufele, D.A. (2002). Web versus campus store? Why students buy textbook online. *Journal of Consumer Marketing, 19*(5), 409–423.

Gefen, D. (2002). Reflections on the dimensions of trust and trustworthiness among online customers. *ACM SIGMIS Database, 33*(3), 38–53.

Goldsmith, R.E. (2002). Explaining and predicting consumer intention to purchase over the internet: an exploratory study. *Journal of Marketing Theory and Practice, 10*(2), 22–28.

Goldsmith, R.E. (2002). Explaining and predicting consumer intention to purchase over the internet: an exploratory study. *Journal of Marketing Theory and Practice, 10*(2), 22–28.

Goldsmith, R.E., & Goldsmith, E.B. (2002). Buying apparel over the internet. *Journal of Product and Brand Management, 11*(2), 89–102.

Goldsmith, R.E., & Goldsmith, E.B. (2002). Buying apparel over the internet. *Journal of Product and Brand Management, 11*(2), 89–102.

Goodhue, D.L., & Thompson, R.L. (1995). Task-Technology Fit and Individual Performance. *MIS Quarterly 19*(2), 213-236.

Goodhue, D.L., Klein, B.D., & March, S. T. (2000). User evaluations of IS as surrogates for objective performance. *Information & Management, 38,* 87–101.

Grazioli, S., & Jarvenpaa, S.L. (2000). Perils of internet fraud: an empirical investigation of deception and trust with experienced internet consumers. *IEEE Transactions on Systems Man and Cybernetics Part A-Systems and Humans, 30*(4), 395–410.

Heijden, H.V.D., Verhagen, T., & Creemers, M. (2003). Understanding online purchase intentions: contributions from technology and trust perspectives. *European Journal of Information Systems, 12*(1), 41.

Hoffman, D., & Novak, T. (1996). A new marketing paradigm for electronic commerce. *The Information Society, special issue on electronic commerce, 13*(January-March), 43-54.

Hoffman, D., & Novak, T. (1996). Marketing in a hypermedia computer mediated environments: conceptual foundations. *Journal of Marketing, 60*(July), 50-68.

Jarvenpaa, S.L., & Todd, P.A. (1997). Is there a future for retailing on the internet?. *in: R.A. Peterson (Ed.), Electronic Marketing and the Consumer, Sage Publications,* 139–154.

Jarvenpaa, S.L., Tractinsky, N., & Vitale, M. (2000). Consumer trust in an internet store. *Information Technology and Management, 1*(1–2), 45–71.

Jarvenpaa, S.L., Tractinsky, N., Saarinen, L., & Vitale, M. (1999). Consumer Trust in an internet store: a cross-cultural validation. *Journal of Computer-Mediated Communication, 5*(2) (online).

Javadi, M. H. M., Dolatabadi, H. R., Nourbakhsh, M., Poursaeedi, A., & Asadollahi, A. R. (2012). An analysis of factors affecting on online shopping behavior of consumers. *International Journal of Marketing Studies, 4*(5), 81-98.

Jeffrey, D. A. (2015). Testing the Technology Acceptance Model 3 (TAM 3) with the Inclusion of Change Fatigue and Overload, in the Context of Faculty from Seventh-day Adventist Universities : A Revised Model. *Dissertations. Paper 1581.*

Kim, S.S., & Malhotra, N.K. (2005). A longitudinal model of continued IS use: An integrative view of four mechanisms underlying post-adoption phenomena. *Management Sciences, 51*(5), 741–755.

Kimery, K.M., & McCord, M. (2002). Third-party assurances: mapping the road to trust in e-retailing. *Journal of Information Technology Theory and Application, 4*(2), 63–81.

Klloppiing, I. M., & McKiinneyy, E. (2004). Extending the Technology Acceptance Model and the Task-Technology Fit Model to Consumer E-Commerce. *Information Technology, Learning, and Performance Journal, 22*(1).

Kumar, V & Dange, U. (2012). A Study of Factors Affecting Online Buying Behavior: A Conceptual Model. *Retrieved from http://ssrn.com/abstract=2285350*

Kuo, H. Li, C., & Russell, M.G. (1999). The impact of perceived channel utilities, shopping orientations, and demographics on the consumer's online buying behavior. *Journal of Computer-Mediated Communication, 5*(2), online.

Lee, M. K. O., Cheung, C. M. K. & Chen, Z. (2005). Acceptance of internet-based learning medium: The role of extrinsic and intrinsic motivation. *Information & Management, 42*, 1095–1104.

Lee, M.C. (2009). Factors influencing the adoption of internet banking: An integration of TAM and TPB with perceived risk and perceived benefit. *Electronic Commerce Research and Applications, 8*(3), 130-141.

Lee, Y.C. (2006). An empirical investigation into factors influencing the adoption of an e-learning system. *Emerald Group Publishing Limited, 30*(5), 517-541.

Legris, P., Ingham, J., & Collerette, P. (2003). Why do people use information technology? A critical review of the technology acceptance model. *Information & Management, 40,* 191–204.

Li, N., & Zhang, P. (2002). Consumer online shopping attitudes and behavior: an assessment of research. *Eighth Americas Conference on Information Systems,* 508-517.

Liang, T.-P., & Lai, H.-J. (2002). Effect of store design on consumer purchases: van empirical study of online bookstores. *Information and Management, 39,* 431–444.

Liao, Z., & Cheung, M.T. (2001). Internet-based e-shopping and consumer attitudes: an empirical study. *Information and Management, 38*(5), 299–306.

Limayem, M., Khalifa, M., & Frini, A. (2000). What makes consumers buy from internet? A longitudinal study of online shopping. *IEEE Transactions on Systems Man and Cybernetics Part A-Systems and Humans, 30*(4), 421–432.

Lohse, G. L., & Spiller, P. (1998). Electronic shopping. *Communications of ACM 41*(7), 81-87.

Lohse, G. L., & Spiller, P. (1998). Quantifying the effect of user interface design features on cyberstore traffic and sales: chapter in J. Coutaz and J. Karat (Eds.). *CHI.98 Conference Proceedings, Los Angeles, CA. Los Alamitos, CA: ACM Press.* April, 18-23.

Mathwick, C., Malhotra, N., & Rigdon, E. (2001). Experiential value: conceptualization, measurement and application in the catalog and internet shopping environment. *Journal of Retailing,* 77, 39–56.

McGill, T.J., Klobas, J.E., & Renzi, S. (2011). LMS use and instructor performance: The Role of Task-technology fit. *International Journal on E-Learning, 10*(1), 43–62.

McKnight, D.H., Choudhury, V., & Kacmar, C. (2002). The impact of initial consumer trust on intentions to transact with a website: a trust building model. *Journal of Strategic Information Systems, 11*(3–4), 297–323.

Miyazaki, A.D., & Fernandez, A. (2000). Internet privacy and security: an examination of online retailer disclosures. *Journal of Public Policy and Marketing, 19*(1), 54–61.

Miyazaki, A.D., & Fernandez, A. (2001). Consumer perceptions of privacy and security risks for online shopping. *The Journal of Consumer Affairs, 35*(1), 27–44.

Monsuwe, Perea y, T., Dellaert, B., & de Ruyter, K. (2004). What Drives Consumers to Shop Online? A Literature Review. *International Journal of Service Industry Management, 15*(1), 102-122.

Moon, J. W., & Kim, Y. G. (2001). Extending the TAM for a World-Wide-Web context. *Information & Management, 38*, 217–230.
Moon, J., & Kim, Y. (2001). Extending the TAM for a world-wide-web context. *Information & Management, 38*(4), 217-230.

Ngai, E.W.T., Poon, J., & Chan, T.H.C. (2007). Empirical examination of the adoption of WebCT using TAM. *Computers & Education, 48*(2), 250–267.

Oliver, R.L. (1980), A Cognitive Model of the Antecedents and Consequences of Satisfaction Decisions. *Journal of Marketing Research, 17*(4), 460-469.

Oliver, R.L. (1981), Measurement and Evaluation of Satisfaction Processes in retail Settings. *Journal of Retailing, 57*, 25-48.

Park, S. Y. (2009). An Analysis of the Technology Acceptance Model in Understanding University Students' Behavioral Intention to Use e-Learning. *Educational Technology & Society, 12*(3), 150–162.

Phau, I., & Poon, S.M. (2000). Factors influencing the types of products and services purchased over the internet. *Internet Research-Electronic Networking Applications and Policy, 10*(2), 102–113.

Pires, G., Stanton, J. & Eckford, A. (2004). Influences on the Perceived Risk of Purchasing Online. *Journal of Consumer Behaviour, 4*(2), 118-131.

Raijas, A., & Tuunainen, V.K. (2001). Critical factors in electronic grocery shopping. *International Review of Retail Distribution and Consumer Research, 11*(3), 255–265.

Ranganathan, C., & Ganapathy, S. (2002). Key dimensions of businessto-consumer websites. *Information and Management, 39*, 457–465.

Rashid, M. A., & Al-Qirim, N. A. (2001). E-Commerce Technology Adoption Framework by New Zealand Small to Medium Size Enterprises. *Res. Lett. Inf. Math. Sci.*.2, 63-70.

Raven, A., Leeds, E., & Park, C.W. (2010). Digital video presentation and student performance: A task technology fit perspective. *International Journal of Information and Communication Technology Education, 6*(1), 17–29.

Regan, K. (2002, May). Is the best shopping deal really online?. *E-Commerce Times.* [Online] Available from :
http://www.ecommercetimes.com/perl/story/17690.html

Rogers, E. M. (1995). Diffusion of innovations (4th Ed.). *New York, NY: The Free Press.*

Rogers, P. L. (2000). Barriers to adopting emerging technologies in education. *Journal of Educational Computing Research, 22*(4), 455-472.

Rohm, A. J. & Swaminathan, V. (2004). A Typology of Online Shoppers Based on Shopping Motivations. *Journal of Business Research, 57*(7), 748-758.

Saadé, R. & Kira, D. (2006). The emotional state of technology acceptance. *Informing Science and Information Technology, 3*.

Saadé, R. G. (2003). Web-based education information system for enhanced learning, EISL: Student assessment. *Journal of Information Technology Education, 2*, 267–277.

Saadé, R. G., Nebebe, F., & Tan, W. (2007). Viability of the technology acceptance model in multimedia learning environments: Comparative study. *Interdisciplinary Journal of Knowledge and Learning Objects, 37*, 175–184.

Sanchez-Franco, M., & Roldan, J. (2005). Web acceptance and usage model: A comparison between goal-directed and experiential web users. *Internet Research, 15*(1), 21-48.

Sekaran, U. (2003). Research Methods for Business: A Skill Building Approach (4th Ed.). *New Jersey: John Wiley and Sons*.

Sekaran, U. (2006). Research Methods for Business: A Skill Building Approach (4th Ed.). *Wiley India Pvt. Limited.*

Sekaran, U., & Bougie, R. (2010). Research Methods for Business: A Skill Building Approach (5th Ed.). *New Jersey: John Wiley and Sons*.

Shim, S., Eastlick, M.A., Lotz, S.L., & Warrington, P. (2001). An online prepurchase intentions model: the role of intention to search. *Journal of Retailing, 77*, 397–416.

Sin, L., & Tse, A. (2002). Profiling internet shoppers in Hong Kong: demographic, psychographic, attitudinal and experiential factors. *Journal of Interactive Marketing, 15*(1), 7–29.

Slyke, C.V. (2002). Gender differences in perceptions of web-based shopping. *Communications of the ACM, 47*(7), 82–86.

Sun, H., & Zhang, P. (2003). A new perspective to analyze user technology acceptance. *Working Paper, Syracuse University.*

Surendran, P. (2012). Technology Acceptance Model: A Survey of Literature. 175-178.

van der Heijden, H. (2000). Using the technology acceptance model to predict website usage: Extensions and Empirical Test. *Serie Research Memoranda.*

Venkatesh, V. & Davis, F. D. (2000). A theoretical extension of the technology acceptance model: Four longitudinal field studies. *Management Science*, *46*(2), 186-204.

Venkatesh, V., & Bala, H. (2008). Technology acceptance model 3 and a research agenda on interventions. *Decision Sciences, 39*(2), 273-315.

Venkatesh, V., & Davis, F. D. (1996). A model of the antecedents of perceived ease of use: Development and test. *Decision Sciences, 27*, 451–481.

Venkatesh, V., & Davis, F. D. (2000). A theoretical extension of the technology acceptance model: Four longitudinal filed studies. *Management Science, 46*, 186–204.

Venkatesh, V., Morris, M. G., Davis, G. B., & Davis, F. D. (2003). User Acceptance of Information Technology: Toward a Unified View. *MIS Quarterly, 27*, 425–478.

Venkatesh, V., Morris, M.G., Davis, G.B., & Davis, F.D. (2003). User acceptance of information technology: Toward a unified view. *MIS Quarterly, 27*(3), 425–478.

Vijayasarathy, L.R. (2002). Product characteristics and internet shopping intentions. *International Research: Electronic Networking Applications and Policy, 12*(5), 411–426.

Vijayasarathy, L.R., & Jones, J.M. (2000). Print and internet catalog shopping: assessing attitudes and intentions. *Internet Research-Electronic Networking Applications and Policy, 10*(3), 191–202.

Wenger, J.L., & Carlson, R.A. (1995). Learning and coordination of sequential information. *Journal of Experimental Psychology: Human Perception and Performance, 21*(1), 170–182.

Yang, B. & Lester, D. (2004). Attitudes Toward Buying Online. *Cyberpsychology & Behavior*, *7*(1), 85-92.

Zigurs, I., Buckland, B. K., Connolly, J. R., & Wilson, E.V. (1999). A test of task-technology fit theory for group support systems. *ACM SIGMIS Database*, *30*(3-4), 34-50.

Zhou, L., Chiang, W. Y., & Zhang, D. (2004). Discovering Rules for Predicting Customers' Attitude Toward Internet Retailers. *Journal of Electronic Commerce Research,* 5(4), 228-238.

Zhou, L., Dai, L., & Zhang, D. (2007). Online shopping acceptance model - a critical survey of consumer factors in online shopping. *Journal of Electronic Commerce Research, 8*(1), 41-62.

Appendix A: Questionnaire Instrument

Factors Affecting the Adoption of Online Printing Services in Sri Lanka

---

Dear Sir/Madam,

We are conducting a research study to identify the "Factors Affecting Online Printing Adoption by the Sri Lankan Printing Industry". This study plans to identify the important factors that contribute towards the use of online printing. This research study is conducted as part of the MBA in Information Technology (IT) postgraduate degree program conducted by the Department of Computer Science Engineering, University of Moratuwa.

As a user of printing services, we are inviting you to participate in this study by completing the following survey. It will take about ~15 minutes to complete the survey.

This survey is stipulated confidential and anonymous. Your responses will not be identified with you personally and all findings will appear in aggregated form.

Your participation in the research would be greatly appreciated. If you have any queries or wish to know more, please feel free to contact us using the details provided below.

Thank you very much for your time and help in making this study possible.

Sincerely,

Charitha Weerasinghe	Dr. Dilum Bandara
MBA Student	Research Supervisor
0773041715	0712082071
charitha.13@uomcse.lk	dilumb@cse.mrt.ac.lk

Department of Computer Science and Engineering,

University of Moratuwa

1. What is the maximum price range of a printing product that, you are like to order through a website?

    - Below Rs.1,000/=
    - Between Rs.1,000 – 2,500/=
    - Between Rs.2,500 – 5,000/=
    - Between Rs.5,000 – 10,000/=
    - Between Rs.10,000 – 25,000/=
    - Over Rs.25,000/=

2. What print product types are you willing to order online without much hesitation about the final outcome? (Select all that apply)

    - ☐ Business Cards, Invitations, and Brochures
    - ☐ Printed Photo Mugs and Sublimated Gift Items
    - ☐ Posters and Letterheads
    - ☐ Flex Banners and Canvas Prints
    - ☐ Laser Engraved, Laser Itched, and Laser Cut Products
    - ☐ Prints on Satin and Cloth Materials

3. What level of personalization do you expect while ordering a product though the Internet?

    - 100% Predefined, 0% Personalized
    - 80% Predefined, 20% Personalized
    - 50% Predefined, 50% Personalized
    - 20% Predefined, 80% Personalized
    - 100% Personalized

4. To what extent do you agree with the following statements?

    a. I am comfortable in ordering a tangible product, just by seeing a product image or preview through the website.

        - Strongly Agree
        - Agree
        - Neutral
        - Disagree
        - Strongly Disagree

    b. I do consider about website design, features, and information content while deciding to order a product online.

        - Strongly Agree
        - Agree
        - Neutral
        - Disagree
        - Strongly Disagree

    c. I often check security features available on a website (e.g., SSL certificates, verified certificates, and logos) before purchasing an item through that website.

        - Strongly Agree
        - Agree
        - Neutral
        - Disagree
        - Strongly Disagree

d. Recent Internet services' price hike reduced my day today Internet usage.

- Strongly Agree
- Agree
- Neutral
- Disagree
- Strongly Disagree

e. Before ordering a product through a website, I compare the other available options either at the same website or competitor websites.

- Strongly Agree
- Agree
- Neutral
- Disagree
- Strongly Disagree

f. Online printing services help me to save my time and money.

- Strongly Agree
- Agree
- Neutral
- Disagree
- Strongly Disagree

g. I am reluctant to order online print services, as I am worried about the quality of the final outcome. Item dropped in the analysis

- Strongly Agree
- Agree
- Neutral

- Disagree
- Strongly Disagree

h. Ordering online print services limit the ability to have a creative solution as I am unable to touch and feel the material and interact with designers.

- Strongly Agree
- Agree
- Neutral
- Disagree
- Strongly Disagree

i. When I order/buy something first time, I prefer to do it at the store.

- Strongly Agree
- Agree
- Neutral
- Disagree
- Strongly Disagree

j. When I order/buy something repeatedly I prefer to do it at online.

- Strongly Agree
- Agree
- Neutral
- Disagree
- Strongly Disagree

k. I prefer to use credit cards for online transactions.

- Strongly Agree
- Agree

- Neutral
- Disagree
- Strongly Disagree

5. Which of the following are you concerned about while ordering a product online? (Select all that apply)

   ☐ Product Risk (e.g., Standard Print Size, Product Size, Product Quality, etc.)
   ☐ Uncertainty of final outcome (e.g., Screen Color vs. Actual Color, Print Quality, Material Quality, Texture Effects, etc.)
   ☐ Privacy Infringement
   ☐ Risk of Credit Card Fraud
   ☐ Return Policy (e.g., Money-Back Guarantee, Next Order Incentives, etc.)
   ☐ Shipping Charges (e.g., Free Shipping, Express Delivery, etc.)
   ☐ Reputation and Trust of the product Vendor

6. What Customer Service features do you expect from an online store?

   ☐ Online preview before placing an order
   ☐ Provide pre-order information
   ☐ Provide good post-order tracking mechanism
   ☐ Provide contact information and details about the responsible personal
   ☐ Notifications about the order status from time to time (e-mails, SMS, Order info update, etc.)
   ☐ Real-time inquiry system through telephone, chat, SMSs, etc.
   ☐ Return options

7. How would you rate your knowledge and usage of Computers and Internet (i.e., computer literacy)?

    - Expert
    - Professional
    - Normal User
    - Novice
    - No Experience

8. What is your age group?

    - Under 20
    - Between 20-30
    - Between 30-40
    - Between 40-50
    - Between 50-60
    - Over 60

9. What is your gender?

    - Male
    - Female

10. What is your monthly income level?

    - Below Rs.10,000/=
    - Between Rs.10,000 – 25,000/=
    - Between Rs.25,000 – 50,000/=
    - Between Rs.50,000 – 100,000/=
    - Above Rs.100,000/=

11. How often do you perform online purchases through the Internet?

- Below 2 purchases per year
- to 5 purchases per year
- 5 to 10 purchases per year
- 10 to 20 purchases per year
- More than 20 purchases per year

12. How do you categorized your printing orders?

- Personal Printing
- Cooperate Printing (Prints done behalf of your company)
- Both Personal Printing + Cooperate Printing

13. How often do you perform printing orders?

- Never
- 1 to 5 orders per year
- 6 to 10 orders per year
- 11 to 20 orders per year
- 21 to 50 orders per year
- More than 50 orders per year

14. From those orders, which fraction of orders are placed online (give a number between 0% and 100%)?

---

15. Comments: Please share anything other feedback on online printing services.

Thank You for Completing Our Survey,

Thank you for taking time out to participate in our survey. We truly value the information you have provided.

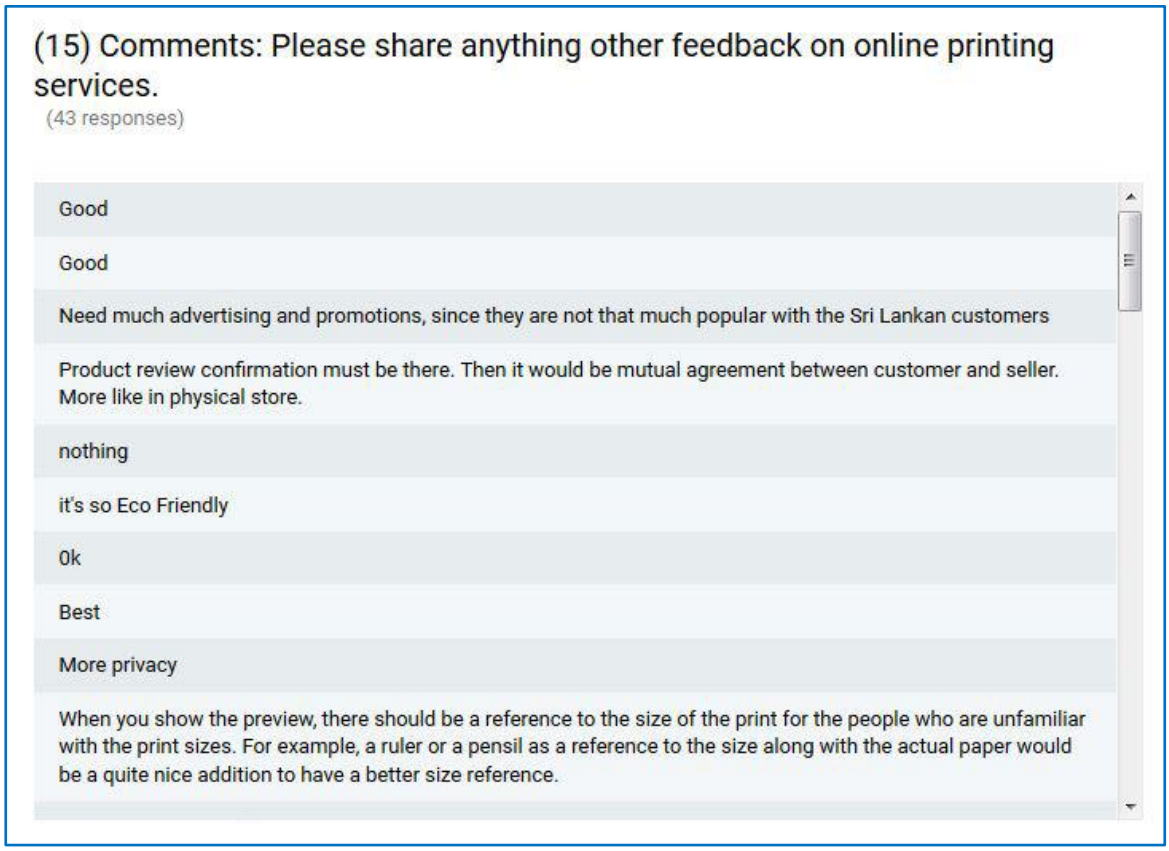
Many Thanks,

Dr. Dilum Bandara & Charitha Weerasinghe

Department of Computer Science and Engineering,

University of Moratuwa.

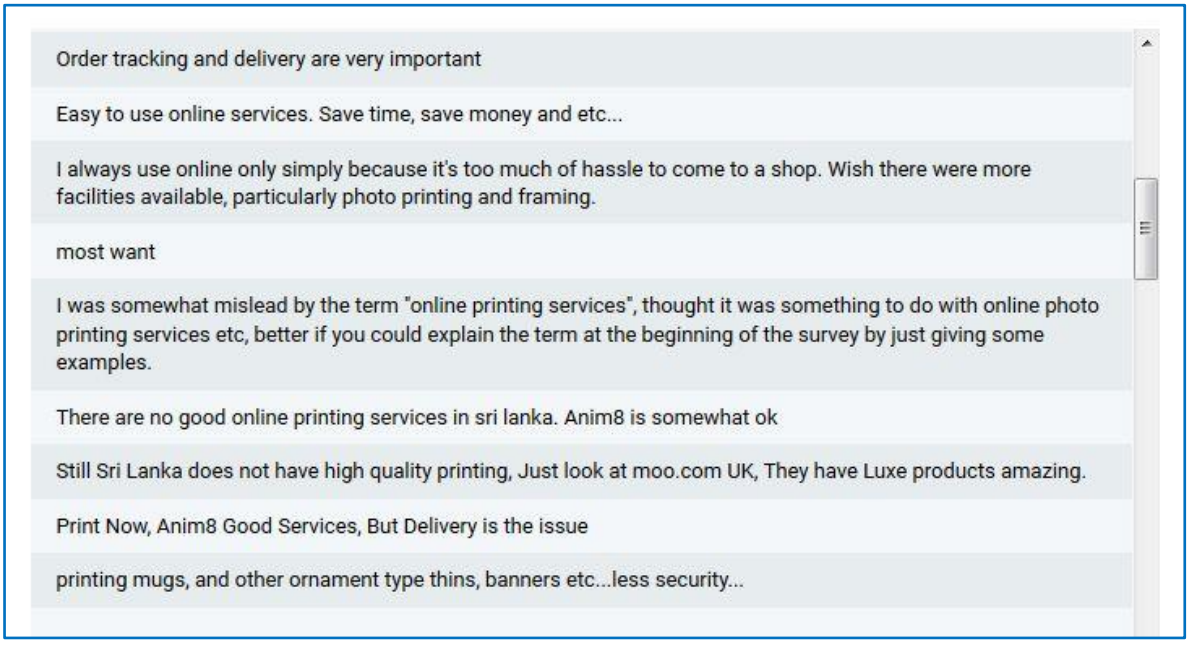
Appendix B: Responses for Question 15 – Feedback on online printing services



(15) Comments: Please share anything other feedback on online printing services.

(43 responses)

Good
Good
Need much advertising and promotions, since they are not that much popular with the Sri Lankan customers
Product review confirmation must be there. Then it would be mutual agreement between customer and seller. More like in physical store.
nothing
it's so Eco Friendly
0k
Best
More privacy
When you show the preview, there should be a reference to the size of the print for the people who are unfamiliar with the print sizes. For example, a ruler or a pensil as a reference to the size along with the actual paper would be a quite nice addition to have a better size reference.



Order tracking and delivery are very important
Easy to use online services. Save time, save money and etc...
I always use online only simply because it's too much of hassle to come to a shop. Wish there were more facilities available, particularly photo printing and framing.
most want
I was somewhat mislead by the term "online printing services", thought it was something to do with online photo printing services etc, better if you could explain the term at the beginning of the survey by just giving some examples.
There are no good online printing services in sri lanka. Anim8 is somewhat ok
Still Sri Lanka does not have high quality printing, Just look at moo.com UK, They have Luxe products amazing.
Print Now, Anim8 Good Services, But Delivery is the issue
printing mugs, and other ornament type thins, banners etc...less security...

(15) Comments: Please share anything other feedback on online printing services.

Need to provide our design with required configurations.

Seller review,county are most important factors as my view

I wish to do the online printing

Highly consider about the security of credit card details and tracking system due to most of current online marketing web sites are not trusted.

Even though i have marked the answers, i have a few concerns about this.
Sorry about that. But i feel i should share my honest opinions.

Have couple of thoughts regarding this project. First is, the term you have used "Online Printing" is it the correct term to use? As a person who see this for the first time, i had a feeling what this Online printing is about.

Second thought is, It's not like buying through E-Bay, as they have ratings and people can comment on the goods. But here you need to have that sort of a feature.
Third, this will definitely limit the creativity. As if you go the printer and tell your requirement, they have many options which you can select.
And Brochures, flex, and all the materials you have mentioned above, we need to make sure we select the best material to get the best look and feel. That only you can do once you touch the material and getting the consultation from the printer.

And Brochures, flex, and all the materials you have mentioned above, we need to make sure we select the best material to get the best look and feel. That only you can do once you touch the material and getting the consultation from the printer.

Online -Printing is fine, if you have visited the place and you have seen the materials, and you have a better understand on the quality you want.

Another point is, not all the art works are printable exactly, we need to alter, and resize, so many things involve.

So i prefer before you find the factors, do a small research on Printing.

It's very helpful

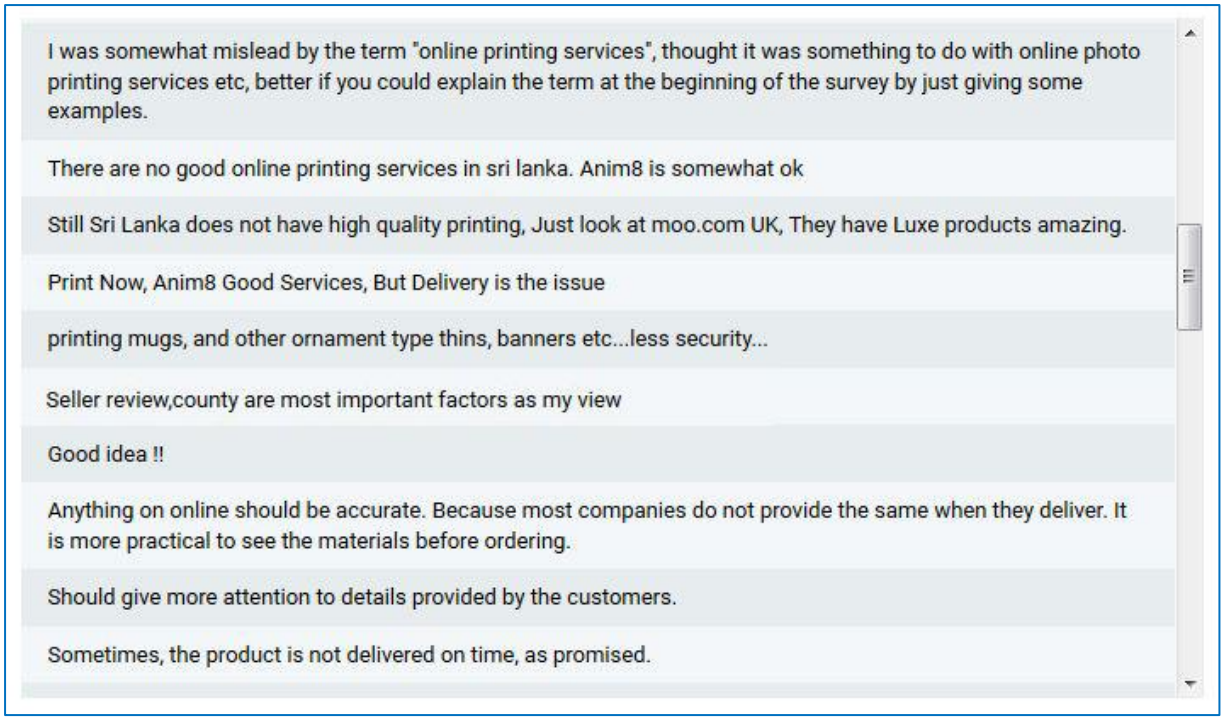
I have no any idea about online printing

good If we can improve this among everyone.

that was a great service always to me

Online printing has it drawback, as the screen color and actual print quality could have variation due to the CMYK limitations. But, if its a routine document or promotional product its okay to go with online basis. But, in Sri Lanka it has a long way to travel.

(15) Comments: Please share anything other feedback on online printing services.



I was somewhat mislead by the term "online printing services", thought it was something to do with online photo printing services etc, better if you could explain the term at the beginning of the survey by just giving some examples.

There are no good online printing services in sri lanka. Anim8 is somewhat ok

Still Sri Lanka does not have high quality printing, Just look at moo.com UK, They have Luxe products amazing.

Print Now, Anim8 Good Services, But Delivery is the issue

printing mugs, and other ornament type thins, banners etc...less security...

Seller review,county are most important factors as my view

Good idea !!

Anything on online should be accurate. Because most companies do not provide the same when they deliver. It is more practical to see the materials before ordering.

Should give more attention to details provided by the customers.

Sometimes, the product is not delivered on time, as promised.