



**DETERMINANTS OF DIGITAL PRINTING TECHNOLOGY ADOPTION IN
ETHIOPIAN PRINTING INDUSTRY: A CASE OF BERHANENA SELAM PRINTING
ENTERPRISE**

**A RESEARCH PROJECT SUBMITTED TO ADDIS ABABA UNIVERSITY SCHOOL
OF COMMERCE IN PARTIAL FULFILLMENT OF THE REQUIREMENTS FOR THE
DEGREE OF MASTERS OF ART IN BUSINESS LEADERSHIP**

BY: DEREJE TIGIST

ADVISOR: Dr. WASIHUN M.

JUNE, 2022

ADDIS ABABA, ETHIOPIA

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Declaration

I, Dereje Tigist, declare that this research project has been prepared solely by myself. It has not been submitted, in whole or in part, to any award of any other Degree, Diploma, or other similar titles of any other university or institution. Except where otherwise stated by reference or acknowledgment, the work presented is entirely mine.

Dereje Tigist

Signature: _____

Date: _____

Statement of Certification

This is to certify that the project work entitled “Determinants of Digital Printing Technology Adoption in Ethiopian Printing Industry: A Case of Berhanena Selam Printing Enterprise” under taken by Dereje Tigist for the partial fulfillment of the degree of master of art in Business Leadership at the Addis Ababa University, to the best of my knowledge, is an original work and not submitted for any degree at this university or in any other university.

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Date: _____

Dr. Wasihun Mohammed

Research project advisor

Statement of Certification

This is to certify that the research project prepared by Dereje Tigist entitled “Determinants of Digital Printing Technology Adoption in Ethiopian Printing Industry: A Case of Berhanena Selam Printing Enterprise” and submitted in partial fulfillment of the requirement for the degree of master of art in Business Leadership complies with the regulations of the university and meets the accepted standards with respect to originality and quality.

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External Examiner: _____ Signature _____ Date _____

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Advisor: _____ Signature _____ Date _____

Chair of Department of Graduate Program Coordinator

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Acronyms

DOI – diffusion of innovations

TOE- Technology- Organization –Environment Framework

RA- relative advantage

CM- compatibility

CX-Complexity

TR- Technological readiness

AC-Adoption cost

TS-Top management support

HR- quality of human resource

CP- competitive Pressure

GS-Governmental support

PA- Plan to Adopt

Abstract

The objective of this study is to examine the determinants of digital printing technology adoption in the Ethiopian printing industry in the case of Berhanena Selam Printing Enterprise. This study combines two known technology adoption theories, diffusion of innovation theory (DOI) and Technological-Organizational-Environmental framework (TOE). Based on these two theories, factors that determine the adoption of digital printing are relative advantage, compatibility, complexity, technological readiness, adoption cost, top management support, quality of the human resource, competitive pressure, and government support. The study employed a mixed researcher design and quantitative research approach. The survey questionnaire was used to collect primary data. In total, 175 questionnaires were distributed to respondents, of which 154 were analyzed. The respondents were selected by using the simple random sampling technique. The data were analyzed using a statistical method, descriptive statistics, correlations, and regression using Statistical Package for Social Science software. The study finding reveals that compatibility and top management support have significant factors influencing the adoption of digital printing technology. Relative advantage, technological readiness, and government support have a significant negative influence on the adoption of digital printing technology. The quality of human resources and competitive pressure has a statistically insignificant positive relation to the adoption of digital printing technology. Complexity and adoption cost have a statistically insignificant negative relation to the adoption of digital printing technology. Based on the finding, the study forward some recommendation the Enterprise should enhance its employee technical and managerial skills, improve its technological infrastructure and organizational culture, create awareness about digital printing and develop a digital printing adoption plan.

Keywords: digital printing technology, adoption, relative advantage, compatibility, complexity, technological readiness, adoption cost, top management support, competitive pressure, government support, the plan to adopt digital printing

CHAPTER ONE

INTRODUCTION

This chapter presents the background, statement of the problems, objective of the study, research questions, significance of the study, scope of the study, the limitation of the study, definition of terms and organization of the paper.

1.1. Background of the study

Printing was first conceived in China between the 6th and 9th century, where images and text were carved into woodblocks and, with use of paint, transferred onto paper. It is said that Bi Sheng invented the movable type printing technology (Romano et al., 1999), but it was not until the middle of the 15th century that the technology was popularized when Johann Gutenberg constructed the first real printing press. Since then many different printing technologies have been introduced (Mejtoft, 2006).

Today two types of printing technology exist. These are traditional/analog and Digital printing. Traditional printing technologies like offset, flexography and gravure printing have all something in common; they need a static master to transfer the image onto the substrate. The master, most often a printing plate, is usually quite expensive to produce, which makes it necessary to print many copies before recovering the fixed cost of the printing plate (Mejtoft, 2006). Digital printing technologies are, in contrast to traditional printing, “printing technologies that do not require a solid printing plate (master) with a fixed image and that can basically produce successive pages with different printed images” (Kipphan, 2001). Digital Print rely on digital data to create images (Akshat, 2016).

Currently, Digital Printing is state-of-the-art technology in the printing industry. Digital printing refers to methods of printing from a digitally based image directly to a variety of media (Whitbread, 2009). The main innovative characteristics of digital printing over traditional printing are digital printing allows for on-demand printing (POD), short turnaround time, and even a modification of the image (variable data) used for each impression (Kasdorf, 2003). Digital printing technology began being used in 1993. The digital printing process enabled printing to be more effective, efficient, and fast. This happens because digital printing eliminates

the need for a darkroom camera, manual working of film and plate, and prepress input materials and chemicals (Vincent et al.2013). Digital printing is speedily replacing conventional or analogue printing technology. According to the National Association of Printing Leadership (NAPL, 2010, as cited in Vincent et al.2013), digital printing is more efficient, productive, and profitable than convention printing technology.

The printing industry is undergoing fundamental change due to digital printing technology usage (Saturious, 2000, as cited in Vincent et al.2013), but the level of digital printing adoption differs among companies and countries. Study findings indicate that the US and European have a high rate of digital printing technologies adoption, and developing countries are at a low stage of adoption (Drupa, 2014, as cited in Akshat, 2016). Studies show that the use of digital printing has increased from time to time. In 2017, digital printing accounts for 16.2% of the global print market value and 2.9% of the volume. This is up from 2.1% of the volume in 2012, and the transition is accelerating to 3.9% of volume by 2022, according to the research from (Pira, 2017 as cited in Smyth, 2017).

More than a century has passed since Ethiopia began using the modern printing press. But, its current status indicates the printing industry is a relatively underdeveloped industry compared to other countries, even some African countries. A number of factors influenced the development and competitiveness of the Ethiopian printing industry. In addition to other factors, the low adoption of the state of technology also contributes to its underdevelopment. The sector needs to adopt updated technologies and working methods to develop and become more competitive globally. Printing is a technology-oriented industry (Liudmila, 2019). Any company that wants to achieve competitiveness and development needs to adopt advanced technology and innovation. The Ethiopian printing industry needs to change its current state of technology usage from offset to digital to reap the benefits of digital technology and achieve its competitiveness. This research project aims to identify factors that affect the adoption of digital technology in Ethiopia in the case of Berhanena Selam Printing Enterprise.

1.2. Statement of the Problem

The printing industry has been undergoing rapid transformation and is facing challenges. The main challenges faced by the printing industry have been caused by the widespread usage of digital technologies. The widespread use of the internet and digital devices such as smartphones, tablets, and laptops, has decreased the demand for printed products, such as books, newspapers, magazines, etc. The global print market has been declining. A survey of over 300 company owners and managers revealed that the global print market has declined by 20% in less than 20 years (EPICOMM 2014, as cited in Akshat, 2016). Digital technologies continue to replace print products, and the demand for print products is decreasing. This situation creates a fear that 'printing is dying'. The phrase 'printing is dying' is one indication that the industry has faced a challenge (Akshat, 2016).

The adoption of digital printing has been taken as one alternative solution to cope with the challenge faced by the printing industry. Advanced countries have been benefiting from the widespread usage of digital printing technologies, but Developing countries like Ethiopia are not benefitting from the advantage of digital printing technologies. Still, most Ethiopian printing Companies use outdated printing technologies. Because of this, the industry is unable to satisfy the print demand of the country in terms of volume, quality, cost, and delivery time. Because of this, Ethiopia spends a large amount of foreign currency on printing and importing books, magazines, agendas, labels, passports, bulletins, and other printing products. Import of printed products is happening because there is a large gap between supply and demand for local print. Currently, local printing capacity can meet only 20 to 30 percent of the security print demand [Getnet, 2022].

Berhanena Selam has been providing printing services to Ethiopia since 1921 (1914 E.C.). It has played a role in the social and economic change in Ethiopia. This is achieved by making information and knowledge easily accessible to society. Concerning security printing, Berhanena Selam Printing Enterprise is the only company that provides security printing services in Ethiopia. Many government and private organizations have worked with Berhanena Selam for a long time. The Enterprise has accumulated a wealth of experience by maintaining successful relations with its customers for a long time. A few of the long-term Berhanena Selam customers

include the Ethiopian Press Agency for 81 years, the National Lottery Administration for 60 years, the Commercial Bank of Ethiopia for 75 years, the National Educational Assessment and Examinations Agency, Anbessa City Bus Service Enterprise for 75 years, Media and Communication Center for 26 years (Reporter-Newspaper publisher), and the Ministry of Education (Mengstu, 2022).

Data collected from these long-term customers indicate that Berhanena Selam needs to improve its product and quality of service to satisfy the growing demand from its customers. For the one hundred anniversary of the Enterprise, data was collected from six long-term customers. All the six interviewed customers indicated that Berhanena Selam lagged behind the adoption of state-of-the-art technologies. According to Abere Adamu of the Ethiopian press agency, Berhanena Selam and other Ethiopian printing companies cannot compete with neighboring Kenya printing. Ethiopian printing is less advanced in quality, volume of product and technology usage than Kenya. If Berhanena Selam wants to be competitive in this digital age, it must equip itself with state-of-the-art technology and upgrade its employee knowledge and skills. According to Mr. Tewodros from the National Lottery Administration, Berhanena Selam must address four problems. These are insufficient printing capacity, a low-quality security design, a lack of technology for printing scratch-off lottery tickets, and accreditation for security printing. Berhanena selam should modernize itself to remain competitive, says Mr. Redy from the Ministry of Education. According to Mr. Mandefro from anbessa bus, the demand for bus tickets is growing every day, yet this demand is not met on time by Berhanena Selma Side. Due to this, we are facing problems with the company's daily transport services. Mr. Yeabsera from the Commercial Bank of Ethiopia indicates the need to upgrade and digitize the service. Quality problem and delivery time delays are the two problems that face and need to be solved indicated by a reporter newspaper, Mr. Endalkachew (Mengstu, 2022).

As indicated by the customers, to stay in the business of printing and continue its competitiveness and profitability, Berhanena Selam requires state-of-the-art printing technology adoption. But the rate of new technology adoption is slow and unsatisfying. So, it is worth identifying deterrents of digital printing technology adoption. This research has initiated to identify factors influencing the adoption of digital printing technologies in Berhanena Selam.

1.3. General Objectives

The general objective of this research is to examine determinants of digital printing technology adoption at Berhanena Selam Printing Enterprise.

1.3.1. Specific objectives

This study has the following specific objectives:

- ❖ To evaluate the influence of the relative advantage of technology on digital print Adoption
- ❖ To examine the influence of technology complexity on the adoption of digital printing
- ❖ To evaluate how the compatibility of technology influences the adoption of digital printing
- ❖ To evaluate the effect of technological factors for the adoption of digital printing
- ❖ To examine the how organizational factors influence the adoption of digital printing
- ❖ To examine the environmental factors affect the adoption of digital printing

1.4. Research Questions

This study tries to answer the following questions:

- i. To what extent does the relative advantage of technology influence the adoption of digital printing at Berhanena Selam?
- ii. To what extent the complexity of technology influence the adoption of digital printing at Berhanena Selam?
- iii. Is compatibility of technology a determinant for digital print adoption?
- iv. Is an organizational factor influence the adoption of digital printing?
- v. To what extent do technological factors influence the adoption of digital printing?
- vi. Are environmental factors influence the adoption of digital printing?

1.5. Significance of the study

Doing this study will have multi-fold benefits for different stakeholders. First of all, doing this study will benefit the researcher. It allows for applying theories learned and knowledge acquired from courses to solve problems. The skills and knowledge gained in doing this study will help advance my career.

Secondly, the findings will benefit the management of Berhanena Selam. It helps to identify determinants of digital printing adoption and develop effective strategies to adopt digital printing technology to improve its product quality and service. In addition, the study benefits scholars and researchers by adding new insight to existing theories and literature on the adoption of digital printing technology and other technology innovations. Furthermore, the study will recommend future research areas.

1.6. Scope of the Study

This study has geographical and content scope.

A. Geographical scope

This study was carried out in Berhanena Selam Printing Enterprise, which is in Addis Ababa. This means the study is geographically limited to Addis Ababa city. Berhanena Selam Printing was selected as a case company for two reasons. The first one is it is the pioneering and largest printing company in Ethiopia. The second one is the researcher currently working in berhanena Selam knows closely the strength and problems of the company.

B. Content Scope

The study examines determinants of digital printing technology adoption in Berhanena Selam Printing Enterprise and integrates two well-known technology adoption models to achieve this objective. These are the Diffusion of innovation theory and the Technological–organizational–environmental framework. Based on the integration of the two technology adoption models, nine determinant factors were examined that influence adoption of digital printing technology. The scope of the study is limited to these nine factors. These are relative advantage, compatibility, complexity, technological readiness, adoption cost, top management support, Quality of human resources, competitive pressure, and government support.

1.7. Limitation of the study

One limitation of this study is the sample size is small the finding cannot be generalized to the industry level. The second limitation of this study is factors affecting the adoption of digital printing technology are pre-specified. The third limitation of this study is there are few studies available on determinants of digital printing adoption (Schroeder, 2014). Specifically, In Ethiopia, the researcher did not find any past studies on the determinants of digital printing technology adoption. As a result, there is a limited opportunity to compare the findings of this study with similar studies findings from previous studies. So, the findings of this study were compared and contrasted with other industries'.

1.8. Definition of Terms

Adoption- is a decision of full use of an innovation as the best course of action available (Rogers, 2003)

Innovation - is an idea, practice, or project that is perceived as new by an individual or other unit of adoption” (Rogers, 2003)

Diffusion -the process in which an innovation is communicated thorough certain channels over time among the members of a social system (Rogers, 2003).

Technology -a technology is a design for instrumental action that reduces the uncertainty in the cause-effect relationships involved in achieving a desired outcome (Rogers, 2003).

Digital printing- refers to methods of printing from a digitally based image directly to a variety of media (Whitbread, 2009).

1.9. Organization of the paper

This study was organized into five chapters. Chapter one deals with the introduction, contain the background of the study, statement of the problems, research questions, objectives of the study, significance of the study, the scope of the study, limitations of the study, and organization of the study. The second chapter discusses the theoretical and empirical literature reviews as well as the theoretical framework and hypotheses of the study. Chapter three presented the research methodology, includes the research design, research approach, data collection method, and data

analysis method. Chapter four deals with data analysis and interpretation. The final chapter presents the researcher's summary, conclusion, and recommendation of the study.

CHAPTER TWO: LITERATURE REVIEW

This chapter presents the theoretical foundation and empirical review of technology adoption, conceptual framework and hypotheses.

2.1. Digital Printing Technology

Digital Printing evolves from the Gutenberg's analog system of printing that was practiced by many centuries ago. Advances in technology have made it possible to change from analog reproduction to digital reproduction system called 'digital printing technology (Gotar,2015).

Digital printing refers to methods of printing from a digitally based image directly to a variety of media (Whitbread, 2009). Romano (1997) defines digital printing as "printing with dots from digital data." Digital printing often refers to professional printing where small-run jobs from desktop publishing and other digital sources are printed using large-format and/or high-volume electrophotography or inkjet printers. Digital printing is also known with the name Non-impact printing (NIP). The NIP is a Master-less (no printing plates or master image carrier) printing technique which differentiates it from the conventional printing process having master image carrier for production of many copies (Gotar,2015).

Digital printing generally has a higher cost per page than conventional offset printing methods. But this higher cost is offset by avoiding the cost of making printing plates and the ability to print on-demand to avoid inventory storage cost (Akshat, 2016). Furthermore, it also allows for shorter turnaround times and the possibility of the customization of the image used for each impression (Kasdorf, 2002). The savings in labor and the ever-increasing capability of digital presses means that digital printing is reaching the point where it can match or supersede offset printing technology's ability to produce larger print runs of several thousand sheets at a low price (Akshat, 2016).

Pira (2015) presents a cost comparator model to compare digital and analog printing systems for several categories of output in various applications. Figure1 is developed by Pira (2015) to compare analog vs digital printing. As seen, digital printing has a flat cost structure whereas the cost per piece declines with longer runs in offset printing. The run length crossover point is

around 1,500 (Smyth, 2015). However, with higher productivity and speed of inkjet printers, this run length crossover point is increasing and competing with offset printing. As their cost per page continues to decline, digital presses will supplant offset presses for more and more print jobs.

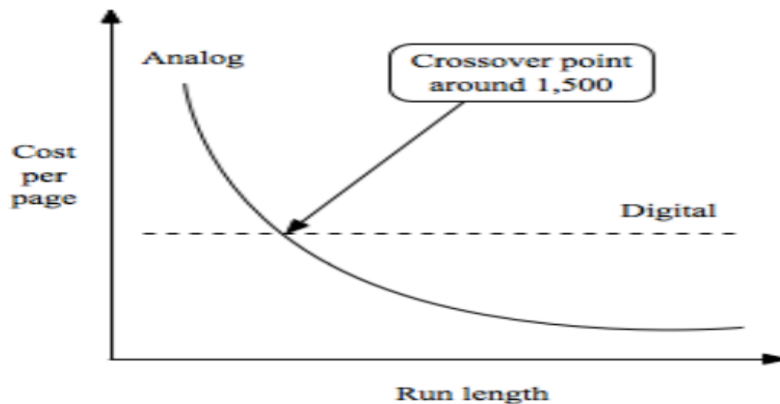


Figure 1. : Analog vs Digital run-length crossover point

2.1.1. Advantages of Digital Printing Technology

Digital printing, according to Peng (2021), has several advantages over analog printing. First, improve production efficiency. Digital printing uses the digital way to generate the layout without plate making, which simplifies the printing process cycle. It only needs to connect the printing and post press equipment to start the assembly line work. The operation is simple and efficient, and it can automatically start to execute after setting tasks. The efficiency of digital printing four-color labels can reach 9,000 sheets per hour, which can fully meet the needs of large-scale production.

Second, reduce production costs. Compared with traditional printing technology, digital printing consumes less materials and has lower production cost. At the same time, the digital printing is controlled by the computer, the printing accuracy is higher, the yield is higher, the material loss can be reduced, and the production cost can be greatly reduced.

Third, personalization. Digital printing uses digital way to generate electronic layout, which can meet the personalized needs of customers and is more flexible than traditional printing.

Fourth, a wide selection of printing materials. The material of digital printing is not limited to paper and paperboard, which can be used as the carrier of printing.

2.1.2. Rise of Digital Printing

The market for digital printing is growing at a faster rate than that of the overall print market. According to Allied market research the global digital printing market size was valued at \$25.74 billion in 2019, and is projected to reach \$35.71 billion by 2028, registering a CAGR of 3.7% from 2021 to 2028 (Allied market research, 2021). The digital printing industry is expected to witness growth during the forecast period, owing to rapid adoption of laser and inkjet printing solution across packaging and paper sector due to flexible and cost-efficient feature. The market for global digital printing is expected to be driven by surge in adoption of IoT and AI-based technologies. Moreover, increase in use of digital printing in consumer electronics is expected to boost the demand for smart thermostats. Considering these factors, the global digital printing market is estimated to experience a steep growth in the future.

Surge in sustainable printing solution in pharmaceutical, healthcare, packaging, and label industries coupled with demand for cost-efficient printing methods are some of the drivers of the global digital printing market growth. However, high initial investment for digital printing plants in developing countries acts as a major challenge for this market. Further, innovation in printing technology for small- and medium-sized companies provides lucrative opportunities for the global digital printing market (Allied market research, 2021).

2.1.3. Trends in the Digital Printing Market

Trends that have emerged in the digital printing market include (Anne Evans and LeMaire, 2006):

- **Short run:** Short run lengths are the secret to success and financial viability in digital printing. The capability to bring run lengths down to just one impression differentiates digital from offset printing. A product can be customized, produced, and fulfilled immediately when requested (Romano, 2003). Digital printing can produce prints with no make-ready and no waste; therefore it's a cost effective process for very short runs (Romano, 2001).

- **Print-on-demand:** Quick turnaround and responsiveness to customer needs are the driving forces behind the success of on-demand printing. This is enabled by electronic file submission and low levels of make-ready. The first print out is often saleable. Inline finishing extends the capabilities to print complete products in one pass when, where, and how the customer demands.

- **Variable data printing (VDP):** Digital printing allows printed materials to include information elements (images, graphs, charts) that change for each impression. Dynamic fields are inserted amidst static regions that are the same for all impressions. The variable content may be a simple name, graphics may be linked to a database of information driving the selection, and in some cases the entire impression is uniquely tailored to the individual recipient. (Romano, 2001).

- **Distribute and print:** Distribution of the electronic file and printing close to point of need reduces postal and other distribution costs by moving the point of production closer to the point of delivery (Romano, 2003). In traditional printing, the client purchases a quantity of printed material, which is generally printed centrally and delivered to a specified site. This is known as the “print and distribute” workflow. With digital printing, a file can be electronically distributed to a number of different digital printers at different locations. Using this “distribute and print” workflow, a file is printed and distributed locally, dramatically reducing the costs associated with shipping, warehousing and distribution. (Romano, 2001).

- **Online procurement:** The relationship between buyer, seller, and end user is facilitated by the Internet. In the printing industry, e-commerce capabilities are broadly defined as a “value-added service” rather than as product procurement (Goldberg & Romano, 2001). Today, e-commerce services in the printing industry entail anything from electronic file submission to remote printing, online job tracking, or simple electronic bill payment.

- **Customer relationship management (CRM):** Building customer loyalty or securing long term relationships with customers is key to the success of any business. An important aspect of CRM is its ability to personalize communications targeted to a specific audience. Digital printing provides the capability to personalize, which greatly increases the effectiveness of the marketing piece (GATF World, 2003).

- **Digital asset management (DAM):** Trends in the area of digital asset management include web-to-print, e-commerce marketing, versioning, and color print-on-demand. Understanding the

value of asset management and setting up processes to manage this function is a current trend (Frey, Williams-Allen, Vogl, & Chandra, 2004).

- **Workflow:** Changes in digital workflows and industry standards such as job definition format (JDF) and the International Cooperation for Integration of Processes in Prepress, Press and Post press, or CIP4 are essential to the flow of information. The industry is working with standards for integrating inline finishing systems into digital presses, opening up the market for specialized manufacturers.

2.2. Theoretical literature review

Scholars have developed various theories and models for studying the adoption of new technology in different sectors. Some of the common models and theories are the diffusion of innovations theory (DOI) (Rogers, 2003), the Technology, Organization, and Environment (TOE) Framework (Tornatzky and Fleischer, 1990), the technology acceptance model (TAM) (Davis, 1989), the theory of reasoned action (TRA) (Ajzen & Fishbein, 1980), the theory of planned behavior (TPB) (Ajzen, 1985), and the unified theory of acceptance and use of technology (UTAUT) (Venkatesh et al., 2003). Hoti (2015) points out that the literature review on technological innovation confirms that the majority of empirical studies refer to the “Diffusion of Innovation” or the DOI theory of Rogers and the TOE framework. This study uses the integration of diffusion of theory (DOI) and Technology–organization and environment (TOE) framework. So, the theoretical and empirical review focuses on these two models.

2.2.1. Diffusion of innovations theory (DOI)

The diffusion of innovation theory was developed in 1962 by Everett Rogers. Rogers identified five innovation characteristics that influence the adoption of technology. The five innovation characteristics are relative advantage, complexity, compatibility, trialability, and observability (Rogers, 2003). Theory of Diffusion of Innovation (DOI) is originated from six different disciplines anthropology, early sociology, rural sociology, education, industrial sociology and medical sociology; which were predominantly from sociology discipline (Rogers, 2003). Rogers defines innovations as “any idea, practice, or object that is perceived as new by an individual or another unit of adoption”. Diffusion is defined by Rogers as “the process by which an

innovation is communicated through certain channels over time among the members of a social system". Rogers define the five factors as follows:

- Relative advantage- "the degree to which an innovation is perceived as being better than the idea it supersedes and is often expressed economically as profits".
- Compatibility- "the degree to which an innovation is perceived as consistent with the existing socio-cultural values and beliefs, past experiences, and needs of potential adopters".
- Complexity- "the degree to which an innovation is perceived as relatively difficult to understand and use"
- . Trialability "the degree to which an innovation may be experimented with on a limited basis, under one's own conditions".
- Observability "the degree to which the results of an innovation are visible to others" (Rogers, 2003).

DOI is predominantly based on the characteristics of the technology and the users' perceptions of the innovation (Oliveira, 2014). The objective of this theory is to define why one innovation successfully diffuses in a society, while another does not (Tehrani, 2013). Roger identified factors influencing the speed of innovation diffusions. These factors are innovation characteristics, the nature of social system, communication channels and change agents characteristic. DOI is a widely used technology adoption model (Bhardwa et al. 2021, Pan et al.2019).

Rogers identify five steps of the innovation-decision process. He define " innovation-decision process is the process through which an individual (or other decision-making unit)passes from first knowledge of an innovation, to the formation of an attitude toward the innovation, to a decision to adopt or reject, to implementation and use of the new idea, and to confirmation of this decision"(Rogers, 2003). These five steps are (1) knowledge, (2) persuasion, (3) decision, (4) implementation, and (5) confirmation.

1. Knowledge is gained when an individual (or other decision-making unit) learns of the innovation's existence and gains some understanding of how it functions.

2. Persuasion takes place when an individual forms a favorable or unfavorable attitude toward the innovation.

3. Decision occurs when an individual engages in activities that lead to a choice to adopt or reject the innovation.

4. Implementation takes place when an individual puts an innovation into use. Re-invention is especially likely to occur at the implementation stage.

5. Confirmation occurs when an individual seeks reinforcement of an innovation-decision that has already been made, but he or she may reverse this previous decision if exposed to conflicting messages about the innovation

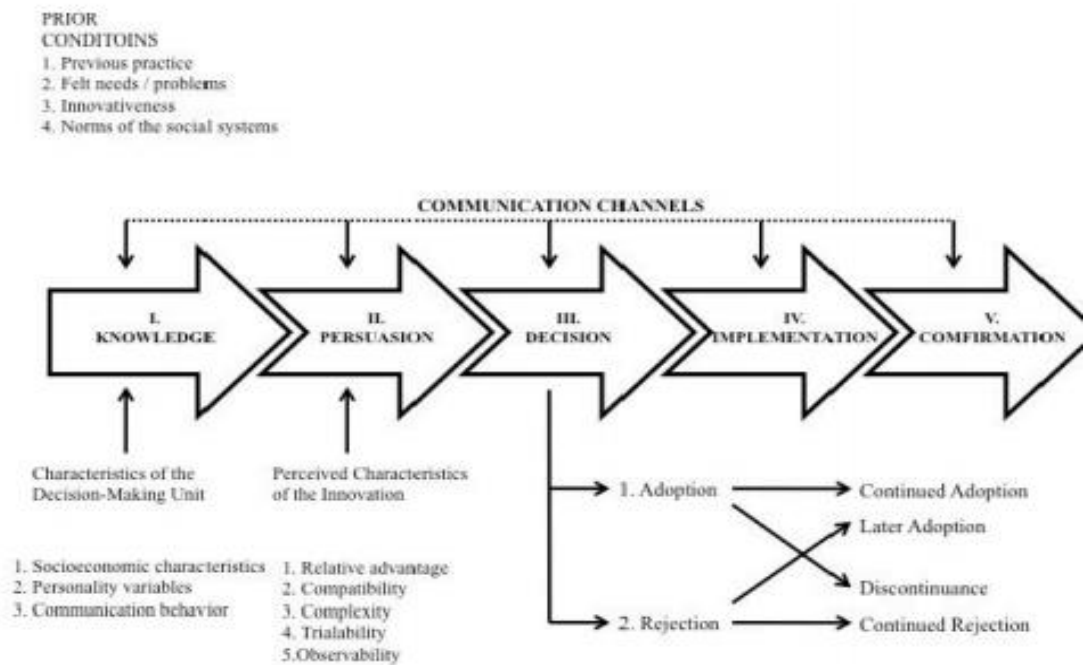


Figure 2: A Model of Five Stages in the Innovation-Decision Process (Rogers, 2003)

2.2.2. Technological-Organizational-Environmental (TOE) Framework

Technology, organization, and environmental framework was developed in 1990 by Tornatzky and Fleischer and identified three factors that influence technology adoption. The three factors are organizational factors, technological factors, and environmental factors. The technological factor considers the available and characteristics of the technologies. Both internal and external technologies are considered important to the firm. According to TOE, technologies that are currently in use by the firm and technologies which are in the market but not in use by the firm influence the adoption decision. Technologies that are currently in use by the firm influence the adoption decision, because they define the scope and limit of the technological change that the firm can accept. On the other hand the technologies that are in the market but not in use by the firm influence the adoption decision, because they indicate how firms can evolve by adopting new technologies (Tehrani, 2013).

The organizational factor is defined in terms of resources available to support the acceptance of the innovation. These criteria include firm size and scope; the centralization, formalization, interconnectedness, and complexity of the managerial structure; and the quality and availability of the firm's human resources. The environmental factors represents the setting in which the firm conducts business, and influenced by the industry itself, its competitors, the firm's ability to access resources supplied by others, and interactions with the government (Lippert& Chittibabu ,2006). Oliveira and Martins (2011) suggest TOE framework is appropriate in the context of innovation adoption by organizations and has been used in many studies.

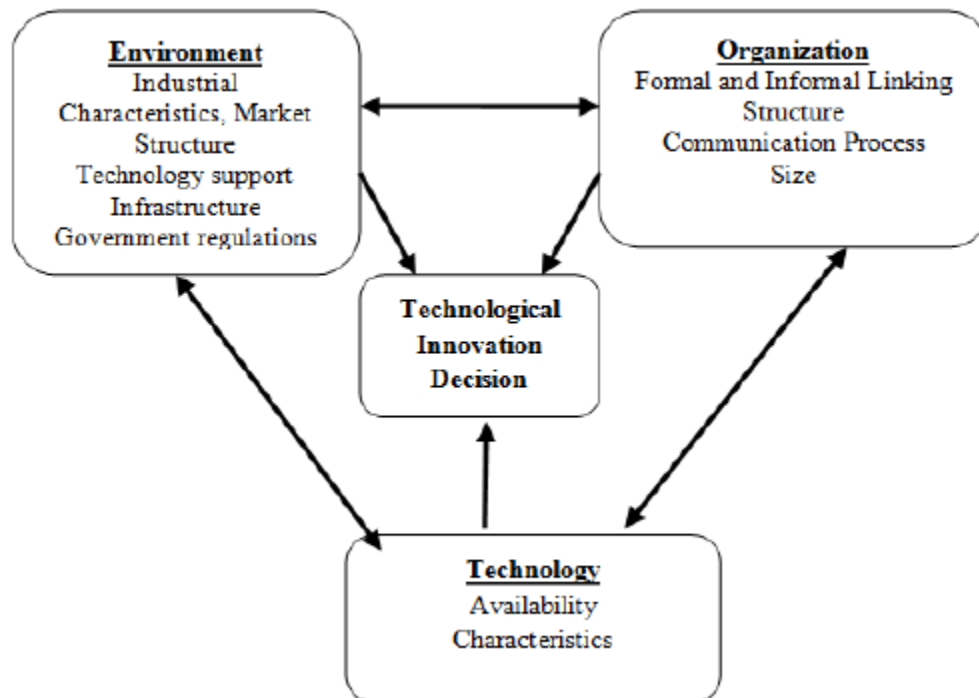


Figure 3: TOE framework (Tornatzky and Fleischer, 1990)

2.3. Empirical Literature Review

Researchers have used different models and theories to identify factors influencing technology adoption in diverse sectors. Literature review shows that researchers either used a single Theory or a combination of two or more Theories for analyzing factors influencing technology adoption.

Diffusion of innovation theory has been used extensively by researchers to predict technology adoption in different fields (Akshat, 2016, Tehrani, 2013). Majority of the studies aim to either confirm the validity of the model; or they used the constructs to interrogate the diffusion of an innovation (Tehrani, 2013). Some of the studies that used Diffusion of innovation theory presented below. Al-Gahtani (2003) used DOI theory to analyze Computer technology adoption in Saudi Arabia. Research findings reveal that relative advantage, compatibility, trialability, and observability have positive influences on the adoption of computer technology in Saudi Arabia. Complexity significantly influences the adoption of computer technology negatively. Al-Jabri and Sohail (2012) analyzed factors influencing the adoption of mobile banking by using DOI theory in Saudi Arabia. Research findings show that relative advantage, compatibility, and

observability have a positive impact on mobile banking adoption. However, trialability and complexity have no significant effect on the adoption of mobile banking. He et al. (2006) used the DOI theory to examine online E-payment adoption by Chinese Companies. The study result indicates that compatibility has a significant positive effect on the adoption of online E-payment in Chinese companies. Relative advantage, complexity, trialability, and observability have no significant impact on the adoption of online E-payment.

Rogers's diffusion of innovations theory is widely used in research on information technology adoption (Chiu et al., 2017). Beatty et al. (2001) used the DOI theory to analyze factors influence website adoption. To identify factors influencing the adoption of ERP systems, Brandford and Florin (2006) employed the DOI theory. Similarly, (Hussin & Noor, 2005, Limthongchai & Speece, 2003) used diffusion of innovation theory in the E-commerce adoption of SMEs.

The TOE framework is also widely used by researchers in different sectors to identify factors that influence technology adoption, similar to the diffusion of innovation theory. Low et al. (2011) analyzed determinates of cloud computing adoption using the TOE framework. The study examined eight factors belonging to three contexts, technology, organization, and environment. These are relative advantage, complexity, compatibility, top management support, firm size, technology readiness, competitive pressure, and trading partner pressure. The result of the study indicates that five factors, relative advantage, top management support, firm size, competitive pressure, and trading partner pressure, significantly influence the adoption of cloud computing. Premkumar & Roberts (1999) used the TOE framework to identify factors influencing the adoption of new information technologies in rural small businesses. The research used ten independent variables under three broad categories innovation, technology, and environment. The independent variables are relative advantage, complexity, cost, compatibility, top management support, company size, IT expert ,competitive pressure , external support and vertical linkage. Research finding reveal that relative advantage, top management support, organizational size, external pressure and competitive pressure have significant positive influence adoption. Lertwongsatien & Wongpinunwatana (2003) used TOE frame work to examine the factors influencing e-commerce adoption decisions in SMEs in Thailand. Three factors influencing adoption identified are technology, organizational and environmental factors.

Many researchers used the TOE framework to analyze factors influencing technology adoption, including Kuan and Chau (2001) in Electronic Data Interchange (EDI), Martins and Oliveira (2009) in E-Commerce, Pan and Jang (2008) in Enterprise Resource Planning (ERP).

So far there are few studies explore the adoption of digital printing technology. Akshat (2016) used a combination of DOI and TAM models to assess the factors affecting the adoption of production digital printing technologies by commercial printers in India. The study examined seven factors belonging to the two models combined. Five factors are: relative advantage, complexity, compatibility, trialability, and observability selected from DOI theory, and two factors are: perceived usefulness (PU) and perceived ease-of-use (PEU) from TAM model used. Study findings reveal that relative advantage has strong positive effects on Digital print adoption; complexity has a strong negative effect on adoption. Compatibility, observability, and perceived ease of use were other significant factors positively affecting the adoption. Trialability and perceived usefulness were found to be insignificant.

2.4. Integrating DOI theory and TOE framework

Many researchers indicated the need to use the combination of theories and models to understand adoption new technologies (Oliveira et al.2014). This study focuses the determinants of digital printing technology adoption at the organizational level. Technology adoption decisions at the organization level should be comprehensive to understand better the factors influencing technology adoptions (Oliveira et al.2014). The integration of DOI theory and the TOE framework is widely used in previous studies by many scholars (Tehrani, 2013, Oliveira et al. 2014, Saygine & Ercan, 2020, Piaralal et al.2015). The findings indicate the integration of these two theories is appropriate to study new technology adoption at the organizational level.

Scholars indicate that the DOI theory and TOE frameworks have similarities and differences. One of the similarities between the TOE framework and the innovation characteristics model identified by Rogers is the two overlap. A TOE framework technological factor is implicitly the same idea as diffusion of innovation theory. DOI's internal and external organizational characteristics include the same measures as TOE's organization context (Oliveira et al.2014). There are differences between the two theories. DOI explains the innovation adoption at both individual and firm-level, whereas TOE focuses on firm-level adoption decisions. The main

difference between DOI and TOE is that TOE framework considers environmental aspects as well (Tehrani, 2013). TOE improves DOI's ability to explain the intra-firm innovation diffusion (Hsu et al. 2006). The short coming of DOI is improved by integrating with TOE. These two theories complement each other and provide compressive perspectives for adoption of digital printing including technology, organizations and environments.

Based on the above argument in this study, the integration of DOI and TOE will be used. Oliveira et al. (2014) used the integration of DOI and TOE framework to assess determinants of cloud computing adoptions. The researcher identified and examined ten factors grouped in to four categories. The factors are relative advantage, complexity, compatibility, security concern, cost-saving, top management support and company size, technology readiness completeive pressure and regulatory Support. Findings reveal that relative advantage has a positive influence on cloud computing adoption. Compatibility, technological readiness, cost-saving, and top management support are facilitators of cloud computing adoption. Complexity is an inhibitor of Cloud computing adoption. Competitive pressure and regulatory Support are insignificant in the adoption of cloud computing.

Zhu et al (2006) used the integration of DOI and TOE to study the determinants of post-adoption stages of innovation diffusion, using enterprise digital transformation. The findings reveal that relative advantage, compatibility, technology competence, competitive pressure and partner readiness have significant and positive influence. Cost, security concern and organization size have significant and negative influence.

Saygine & Ercan (2018) used the combination of DOI and TOE to explore cloud computing adoption in private Hospitals in India. The researchers identify seven factors categories in four contexts. The four contexts are innovation context, technological context, organisational context and environmental context. The seven specific factors include relative advantage, complexity, compatibility, technological readiness, top management support, company size, and competitive pressure. Findings reveal that all factors have a significant relationship with the adoption of cloud computing.

Alkhalil (2020) used the integration of DOI and TOE for the Adoption of Big-Data Analytics in Higher Education Systems. The study identified 13 factors categorized under four contexts. The

findings reveal that relative advantage, data volume, Organizational readiness, the impact on internal networks, the impact of external networks, and top management have significant positive effects on the decision to adopt big data. Complexity, perceived risk, compatibility, complexity, information source, and regulation have a significant negative influence on the adoption of big data. The remaining two factors selecting the service provider and trialability have no significant effect on the adoption of big data.

Despite the integration of DOI and TOE being used by many researchers in different sectors to identify factors influencing technology adoption, there is a lack of research on the use of this model in digital printing technology adoption. However, the success of this model (combination of DOI and TOE framework) in identifying factors influencing technology adoption at the organizational level in past research motivated this study to use this model.

2.5. Conceptual Framework

This study proposed a research model by integrating DOI theory (Rogers, 2003) and the TOE framework (Tornatzky and Fleischer, 1990) to investigate the determinants of digital printing technology adoption. According to this proposed model, nine factors influence the adoption of digital printing technology. The nine factors are (1) Relative advantage, (2) complexity, (3) compatibility, (4) technological readiness, (5) Adoption cost, (6) quality of human resources, (7) top management support, (8) competitive pressure and (9) government support. Adoption cost and complexity have negative influences, but all the other factors have positive influence on the adoption of digital printing. Nine identified factors are grouped into four categories. Innovation characteristics, technological context, organizational context, and environmental context are four groups of variables which influence the adoption of digital printing technology. These four factors are derived from diffusion of innovation theory and Technological–Organizational–Environmental Framework.

Innovation characteristics influence the adoption of new technologies. Rogers (2003) identified five factors. Among the five DOI factors, three innovation characteristics are applicable for digital printing adoption. They are relative advantages, complexity, and compatibility. In their study Tornatzky and Klein (1982) reveal that relative advantage, complexity, and compatibility are characteristics of innovation that have the most influence on the adoption of an innovation.

In this conceptual framework, technology readiness and adoption cost are technological contexts. Organizational factors are characteristics of the organization which influence the adoption decision (Teharni, 2013). Top management support and quality of human resources are organizational factors in this conceptual framework. Environmental factors are those factors that are external to the organization. They may influence the decision to adopt new technologies (Teharni, 2013). In this conceptual framework, competitive pressure and government support are environmental contexts.

The proposed conceptual framework, figure 4 below, will be used to investigate the determinants of digital printing technology adoption.

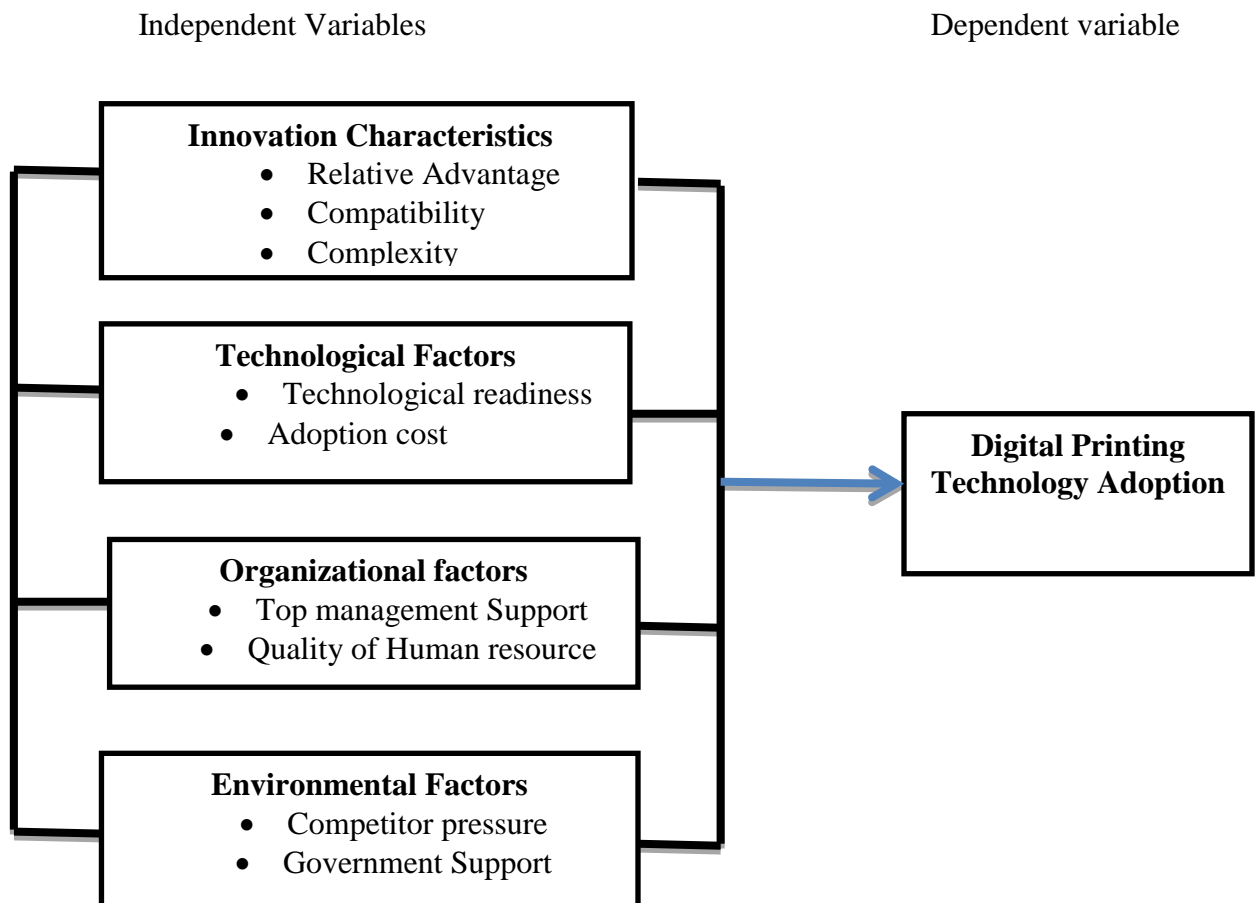


Figure 4 : Conceptual Framework of the study (own source, Developed based on DOI theory and TOE frame work)

2.5. Research Hypotheses

In this section of the study, each factor is explained in more detail. Then hypothesis for each variable is presented.

2.5.1. Relative advantage

Rogers (2003) defined relative advantage as “the degree to which an innovation is perceived as being better than the idea it supersedes”. Economic profitability, social prestige, and benefits of technology are expressed as the degree of relative advantage. Many studies which investigated the diffusion process of innovations have found relative advantage to be a significant determinant; therefore it is crucial to study this concept in the context of digital printing technology. Technology, which is believed to be advantageous, enables organizations to perform task quickly, easily, and more efficiently. Additionally, it improves quality, productivity and performance of the organizations. If the new technologies provide more benefits and advantage than the existing technologies, than it will have a positive influence for adoption (Dash, 2018). Therefore, the following hypothesis is proposed:

H1: Relative advantage will positively influence digital printing adoption.

2.5.2. Compatibility

Rogers (2003) defined Compatibility as “the degree to which an innovation is perceived as being consistent with the existing values, experiences, and needs of the firms”. Compatibility is relevant to digital printing technology adoptions. Prior studies indicate that if new technologies are compatible with the company’s current technology will be adopted by companies easily (Al-Jabri and Sohail, 2012, Al-Gahtani, 2003, Akshat, 2016). Therefore, the following hypothesis is proposed:

H2: Compatibility will positively influence digital printing adoption

2.5.3. Complexity

Complexity is the degree to which an innovation is perceived to be relatively difficult to understand and use. It will increase the difficulty in knowledge transfer and innovation diffusion (Rogers, 2003). Scholars usually hypothesize that complexity relates negatively to innovation adoption (Ho&Lin, 2014). Therefore, the following hypothesis is proposed:

H3: Complexity will negatively influence digital printing adoption.

2.5.4. The Technological Context

The technology context refers to the technological characteristics available in the organization for the adoption of technology. It includes both the structural aspects and the specialized human resources. Technological context concerns with increasing the amount of organizational productivity (Saygine & Ercan, 2020). In this study, two factors are examined for their influence on new technology adoption. They are technological readiness and adoption cost.

2.5.4.1. Technological readiness

Technology readiness of an organization includes the availability of the required hardware, software, and specialized manpower to enable the adoption of new technology. The organization should be sufficiently prepared with technological knowledge, training, expertise, and skillset to implement the new technology (Bhardwaj, 2021). Organizations with a higher degree of technology readiness are better positioned for the adoption of new technologies. Therefore, the following hypothesis is proposed:

H4: Technology Readiness will positively influence digital printing adoption.

2.5.4.2. Adoption cost

Adoption costs include the required financial and human resources in implementing and using digital printing. Costs have been long posited as a barrier for the adoption of innovations (Rogers, 2003, Ho et al.2014). Therefore, the following hypothesis is proposed:

H5: Adoption cost will negatively influence digital printing adoption

2.5.5. The Organizational Context

The organizational context implies the processes and attributes that constrain or facilitate technical innovation. Several studies have discussed the influences of a variety of organizational characteristic variables such as quality of human resources, top management's leadership skills, organizational support, organizational culture and organizational size on technical innovation (Ho&Lin, 2012). This study focuses on the quality of human resources and top management support. These two factors were selected because of widely used in the previous studies (Ho et al.2014, Piaralal et al. (2015), Lin & Ho, 2011).

2.5.5.1. Top Management support

Top Management Support is defined as “the decision-makers who influence the adoption of innovation” (Lai, Lin, & Tseng, 2014). Top management support can be explained as the degree to which top management comprehends the significance of new technology and is involved in the technology adoption process (Ooi et al.2018). The allocation of adequate human, financial, and infrastructural resources by top management plays a significant role in the adoption of new technology (Hsu, et al. 2019). Therefore, the following hypothesis is proposed:

H6: Top management support will positively influence digital printing adoption

2.5.5.2. Quality of Human resources

According to Tornatzky & Fleischer (1990) the quality of human resources is an essential factor influencing technical innovation. Qualified human resources are helpful to adopt innovations because of their competent learning and innovative capabilities (Ho&Lin, 2012). Organization who has qualified human resource can easily adopt new technologies. Therefore, the following hypothesis is proposed:

H7: Quality of human resource will positively influence digital printing adoption

2.5.6. The Environmental context

The environment context is the setting in which the firm conducts its business, and is influenced by the nature of the industry, the firm’s competitors, access to resources supplied by others, and interactions with the government (Oliveira, 2014). In this study, two factors, including competitive pressure and governmental factors were examined for their influence on new technology adoption.

2.5.6.1. Competitive pressure

Competitive pressure has long been recognized in the innovation diffusion literature as an important driver for technology diffusion. It refers to the pressure felt by the firm from industry competitors. Adopting new technology is often a strategic necessity to compete in the market place (Oliveira, 2014). Adopting digital printing technology will benefit the organization by increasing operational efficiency. Therefore, the following hypothesis is proposed:

H8: Competitive pressure will positively influence digital printing adoption

2.5.6.2. Government support

Support from the government is important in promoting the adoption of new technologies. The perception of a lack of backing by the government in the form of finance or supportive policies discourages firms from considering adopting the technology (Choi, 2020). Therefore, the following hypothesis is proposed:

H9: Government support will positively influence digital printing adoption

CHAPTER THREE

RESEARCH METHODOLOGY

This chapter presents the research methodology used in the study. It discusses the research design, population and sample size of the study, research approach, source of data and data collection tools, data collection procedure, and data analysis in detail.

3.1. Research Design

Creswell & Plano Clark (2017) defined a research design as the procedures for collecting, analyzing, interpreting, and reporting data in research studies. Robson (2002) explained three forms of research design: exploratory, descriptive and explanatory. Exploratory research is conducted when enough is not known about a phenomenon and a problem that has not been clearly defined (Saunders et al., 2007). It does not aim to provide the final and conclusive answers to the research questions, but merely explores the research topic with varying levels of depth. Descriptive research studies are those studies which are concerned with describing the characteristics of a particular individual, or of a group. The main characteristic of this method is that the researcher has no control over the variables; he/she can only report what has happened or what is happening (Kothari, 2004).

According to Grey (2014) explanatory studies seek to ask ‘why’ and ‘how’ questions. . Explanatory research looks for causes and relationship. Explanatory studies are characterized by research hypotheses that specify the nature and direction of the relationships between or among variables being studied. Research design is selected, based on the purpose of the study (Boru, 2017).

The purpose of this study is to investigate the determinants of digital printing technology adoption. Therefore, both descriptive and explanatory research design is selected for this study. The purpose of a descriptive study is to provide a picture of a situation, person or event or show how things are related to each other and as it naturally occurs (Blumberg, Cooper and Schindler, 2005). Explanatory research looks for causes and reasons and provides evidence

to support or refute an explanation or prediction. It is conducted to discover and report some relationships among different aspects of the phenomenon under study (Boru, 2017).

3.2. Research approach

This study used quantitative research approach. According to Van der Merwe (1996), Quantitative research, is a research approach aimed at testing theories, determining facts, demonstrating relationships between variables, and predicting outcomes. Quantitative research is the process of collecting and analyzing numerical data. It can be used to find patterns and averages, make predictions, test causal relationships, and generalize results to wider populations (Bhandari, 2021)

3.3. Population of the study

According to Kotahri (2004), all items in any field of inquiry constitute a ‘Universe’ or ‘Population. The population of the study is 1,181 Berhanena Selam Employees. However, due to time and other resource constraints, it will not be possible to include all employees to participate in the study. In the next section, the target population and the reason for selecting the target population will discuss.

3.4. Sample Size Determination and Sampling Technique

The total population of this study is finite (known). There are several formulas for calculating the sample size from the known population. This study used Yamane's (1967) formula to calculate the sample size.

$$n = \frac{N}{1 + N(e)^2}$$

Where, N = the population size,

n = is sample size and

e = the level of precision.

In this case N=1,181

e=0.07

$$n = \frac{1,181}{1+1,181(.07)^2} = 175.1602$$

n= 175

Based on the formula used above, the sample size required for this study is 175 employees of Berhanena Selam Printing enterprises. Simple random sampling technique was employed to select the sample. A simple random sample technique was used in this study because, in this sampling method, each member of the population has an exactly equal chance of being selected. This method is the most straightforward of all the probability sampling methods, since it only involves a single random selection and requires little advance knowledge about the population. Because it uses randomization, any research performed on this sample should have high internal and external validity.

3.5. Source of data and Data Collection Tools

The study used primary data sources. Primary data was collected from berhanena selam printing enterprise employees using a questionnaire instrument. The questionnaire was prepared in two parts. The first part of the questionnaire looked at the demographic characteristics of respondents in terms of gender, education level, current working position, and Work Experience. The second part of the questionnaire focused on the variables that influence the adoption of digital printing technology, innovation characteristics, technological context, organizational contexts, and environmental contexts. Questionnaires were developed from the priory studies.

The study variables were measured using five points Likert scale of 1 to 5, where; 1= represents strongly disagree, 2= disagree, 3= represents neutral, 4= agree, and 5=represents strongly agree. The annual Performance Report of berhanena selam printing enterprise was used as a secondary data source. (The Questionnaires used in this study are shown in the Appendix).

3.6. Data Collection procedure

First, the questionnaire was prepared with the required introduction and instructions in the English language. Then the questionnaire was translated into the Amharic language. The translation was made to enhance the clearness of the questions for respondents. The questionnaire was distributed to respondents by using the drop and pick method. In order to increase the response rate, an explanation was given to the respondents about the study. Data collection was takes place from May 23, 2022 to May 30, 2022.

3.7. Data Analysis

The collected data were first converted into numerical codes. Then the Statistical Package of Social Sciences (SPSS) software version 20.0 was used to analyze quantitative data. In this study, both descriptive and inferential statistics were applied. Descriptive statistics such as frequency, percentage, mean and standard deviation are used. Descriptive statistics used mainly to understand the respondent demographic characteristics. Summarized descriptive data were presented in the form of a frequency table, cumulative percent, percentage, and charts bar.

The study also used correlation and multiple regressions data analysis tools. The Pearson Correlations coefficient analysis method was used to examine the relationship between explanatory variables such as relative advantage, complexity, compatibility, technology readiness, adoption cost, top management support, quality of the human resource, competitive pressure, and government support and explained variable, the plan to adopt digital printing technology. Multiple regression analysis was used to test the research hypothesis and investigate the impact of independent variables on the dependent variable.

Regression function

The multiple regression equation was based on two variables. These are independent and dependent variables.

Table 1: summary of multiple regression variables

Independent variable	Dependent variable
Relative advantage (X_1)	Plan to adopt digital printing (Y)
Compatibility (X_2)	
Complexity (X_3)	
Technological readiness (X_4)	
Adoption cost (X_5)	
Top management support (X_6)	
Quality of human resource (X_7)	
Competitive pressure (X_8)	
Government support(X_9)	

Proposed multiple regression model

$$Y = \beta_0 + \beta_1 X_1 + \beta_2 X_2 + \beta_3 X_3 + \beta_4 X_4 + \beta_5 X_5 + \beta_6 X_6 + \beta_7 X_7 + \beta_8 X_8 + \beta_9 X_9$$

Where Y is the dependent variable plan to adopt digital printing

$X_1, X_2, X_3, X_4, X_5, X_6, X_7, X_8$ and X_9 are the explanatory variables

$\beta_0, \beta_1, \beta_2, \beta_3, \beta_4, \beta_5, \beta_6, \beta_7, \beta_8$ and β_9 refer to the coefficient of their respective independent variables.

3.8. Validity and Reliability

3.8.1. Validity

Validity is often defined as the extent to which an instrument measures what it asserts to measure (Blumberg et al., 2005). To ensure content validity of the scales, the items chosen for the constructs were adapted from prior research on technology adoption (Akshat, 2016; Bhardwaj et al. 2021; Ho et al.2014, Oliveira et.la. 2014. Independent variables and measurement items are shown in the below table 2.

Table 2: Measurement items

Independent variables	Measurement items	Sources
Relative advantage	Digital printing technology adoption can provide our company with a competitive advantage in the industry.	Akshat (2016) , Ho et al.2014
	Digital printing technology adoption can enable our company to reduce costs and increase profit.	
	Digital printing technology adoption can enhance our company's reputation	
Compatibility	The use of digital printing technology consistent with our company's culture and values	Bhardwaj et al. 2021, Akshat (2016)
	Our current technological infrastructure can be compatible with digital printing technology.	
	The change introduced by digital printing technology is consistent with the existing practice in our company	
Complexity	Digital printing technology is complex to use in our company	Bhardwaj et al. 2021, Akshat (2016)
	Digital printing technology adoption requires a more advanced skillful workforce.	
	The skill needed for adopt digital printing technology are too complex for our employee	
Cost of adoption	Digital printing technology adoption requires high hardware and software facility costs	(Bhardwaj et al., 2021).
	Digital printing technology adoption requires a high cost of training and recruiting	
	Digital printing technology adoption requires high up-front investment costs	
Technology readiness	Within the company there are necessary skills to implement digital print	Bhardwaj et al., 2021 Oliveira et.la. 2014
	Our company dedicated to acquiring the required managerial and technical skills for implementation of digital printing	
Top management supports	Top management supports the implementation of digital printing technology	Bhardwaj et al., 2021
	Top management is ready to provide the necessary resources for the introduction of digital printing technology	
	Top management is willing to take the possible risks involved in the adoption of digital printing technology	
Quality of human resources	Employees are capable of using new technologies to solve problems	Ho et al.2014
	Employees are capable of learning new technologies easily	
	Employees are capable of sharing knowledge with each other	
Competitive pressure	Our company is under pressure from competitor to adopt digital printing	Oliveira et.la. 2014
	Some of our competitors have already started using digital printing	

Government Support	Government provide financial support for adopting digital printing	Ho et al.2014
	Government provide technical assistance for adopting digital printing	
	(The plan to adopt digital printing)	
Dependent variable	Our organization plan to adopt digital printing in the next 1-3 years	Bhardwaj et al., 2021
	No planning to use digital printing in the near future	

3.8.2. Reliability

The reliability refers to a measurement that supplies consistent results with equal values (Blumberg et al., 2005). The reliability test will assess by calculating Cronbach's alpha. Alpha was developed by Lee Cronbach (1951) to measure the internal consistency. The Value alpha coefficient fall between 0 and 1, one indicates perfect reliability equaling 1, and no reliability equaling 0. A value above 0.7 for Cronbach's Alpha Coefficient is acceptable (Zikmund et al. 2010).

3.9. Ethical consideration

Researchers must always follow a certain code of conduct when collecting data from others. In this study ethical consideration was followed. Respondents' ' voluntary participation, informed consent, anonymity, and confidentiality were all considered in this study. In addition, all the research and authors whose work is used in this study were acknowledged.

CHAPTER FOUR

DATA ANALYSIS AND PRESENTATION

This chapter presents the data analysis and presentations of the study. The following are discussed in detail the Response rate, demographic characteristic, reliability test, descriptive analysis, correlational analysis, and multiple regressions analysis.

4.1. Response Rate

A total of 175 questionnaires were distributed to respondents, 161 questionnaires were collected, but only 154 questionnaires were used for analysis, yielding a response rate of 88 %. This response rate was satisfactory for analysis.

4.2. Demographic Characteristics

Table 3: Demographic characteristics of respondents

Demographic Variables	Categories	Frequency	Percent (%)
Gender	Male	118	76.6
	Female	36	23.4
	Total	154	100.0
Age	Below 30 Years	36	23.4
	31-40 Years	59	38.3
	41-50 Years	27	17.5
	More Than 51 Years	32	20.8
	Total	154	100.0
Work Experience	Less Than 5 Years	51	33.1
	5 – 10 Years	39	25.3
	11– 15 Years	30	19.5
	More Than 15 Years	34	22.1
	Total	154	100.0
Educational Status	Secondary Education	11	7.1
	Diploma	53	34.4
	First Degree	58	37.7
	Masters	32	20.8
	Total	154	100.0

Job Position	Management Member	10	6.5
	Team Leader	22	14.3
	Coordinator/Supervisor	7	4.5
	Expert	65	42.2
	Operator	27	17.5
	Other	23	14.9
	Total	154	100.0

Source: own survey, 2022

The table shows the demographic information of the respondents. The demographic information includes gender, age, education level, work experience, and job position. The data analysis presented in the table reveals that male respondents account for 76.6%, while female respondents were 23.4%. This indicates that more male employees participated in the study than female employees. The second demographic characteristic analyzed was the respondent's age. 23.4 % of the respondents were between 30 years of age, 38.3 % were between 31-40 years of age, 17.5 % were between 41- 50 years of age, and 20.8 % were above 51 years of age.

As indicated in the table, the third analyzed demographic characteristics were the work experience of the respondents. The analysis reveals that 33.1% of the respondents were less than five years of work experience in the printing industry, 25.3% were between 5 to 10 years of work experience, 19.5% were between 11 to 15 years of work experience, and 22.1 % were more than 15 years of work experience. The educational status of respondents' data analysis reveals that 7.1 % of the respondents have a secondary education level, 34.4 % have diploma level education, 37.7 % have first-degree level education, and 20.8 % have maters-degree level education. Concerning the respondent's job position, the data analysis reveals that 6.5 % of the respondents were management members, 14.3 % were team leaders, 4.5 % were Coordinator/Supervisor, 42.2 % were experts, 17.5 % were operators, and 14.9 % were others.

4.3. Reliability Analysis

Table 4: Reliability Test (Cronbach's Alpha)

	Construct	Number of Item	Cronbach's alpha
1	Relative Advantage	3	0.899
2	Compatibility	3	0.741
3	Complexity	3	0.718
4	Technological readiness	2	0.710
5	Adoption cost	3	0.827
6	Top Management support	3	0.921
7	Quality of human resources	3	0.864
8	Competitive pressure	2	0.709
9	Government support	2	0.901

Source: own survey, 2022

A reliability test result above 0.9 is excellent, between 0.8 and 0.89 is good, and between 0.7 and 0.79 is an adequate result. Based on these classifications, we can understand that the above table 4 indicates that government support and top management support have excellent reliability result. From this one, one can understand that the respondents have given a similar answer to these two questions. The reliability test result of the three independent variables, Relative advantage, adoption cost, and quality of human resources, is classified as good. Independent Variables Compatibility, complexity, technological readiness, and competitive pressure have adequate reliability results. The low-reliability result indicates that the respondent has given inconsistent answers to these four variables.

4.4. Descriptive Analysis

In this section, the variable was analyzed and discussed in detail using descriptive analysis. Frequency, percent, mean and standard deviation are used to describe in detail each variable.

Relative advantage

Three questions are used to measure the relative advantage of digital printing technology. The first one is digital printing adoption provides a competitive advantage in the industry. The second one is the adoption of digital printing can enable the company to reduce costs and increase profit. The last one is digital printing adoption can enhance a company's reputation. Table 5 summarizes the descriptive analysis questions measuring the relative advantages of digital printing. Data analysis reveals that 72.7 % of respondents strongly agree that adopting digital printing will provide a competitive advantage, whereas 21.4% agreed.58.4% of the respondents strongly agreed that the adoption of digital printing reduces costs and increases their profits and 32.5% agreed. 67.5% of the respondents strongly agreed that the adoption of digital printing enhances the company’s reputation, whereas 25.4% agreed. The majority of respondents agree that adopting digital printing has relative advantages.

Table 5: Descriptive statistics for relative advantage

	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree	Mean	Std. Deviation
Digital printing technology adoption can provide our company with a competitive advantage in the industry	4 (2.6 %)	3(1.9%)	2 (1.9%)	33 (21.4%)	112(72.7 %)	4.60	.836
Digital printing technology adoption can enable our company to reduce costs and increase profit	4 (2.6 %)	1(0.6%)	9 (5.8%)	50 (32.5%)	90(58.4 %)	4.44	.847
Digital printing technology adoption can enhance our company’s reputation	5(2.6 %)	5(3.2 %)	2 (1.3%)	39 (25.3%)	104 (67.5%)	4.52	.887

Source: own survey, 2022

Compatibility

Digital printing consistency with the company’s culture and values, technological infrastructure compatibility, and change introduced by digital printing consistency with the existing company practice are three items used to measure the compatibility of digital printing technology. Table 6 summarizes the descriptive analysis questions measuring the compatibility of digital printing. Data analysis reveals that 41.6 % of respondents agree that digital printing is consistent with the

company culture and values, and 31.2% neutral. 34.4% of the respondents agreed that the current technology of infrastructure of the company is compatible with digital printing, whereas 26% were neutral, 20.8 % of the respondents disagreed, and 13% strongly disagreed. 36.4% of the respondents agreed that the change introduced by digital printing technology is consistent with the existing practice in the company, whereas 20.1% were neutral, 20.8 % disagreed, and 14.3% strongly disagreed. The result of the data analysis indicates that respondents have different views on the compatibility of the company technology infrastructure with digital printing technology. Generally, 40.2 % of the respondents agreed that the current technological infrastructure of the company is compatible with digital printing, whereas 33.8 % disagreed, and 26 % were neutral.

Table 6: Descriptive statistics for Compatibility

	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree	Mean	Std. Deviation
The use of digital printing technology consistent with our company's culture and values	10 (6.5 %)	18(11.7%)	48 (31.2%)	64 (41.6%)	14(9.1%)	3.35	1.020
Our current technological infrastructure can be compatible with digital printing	20 (13 %)	32(20.8%)	40 (26%)	53 (34.4%)	9(5.8%)	2.99	1.146
The change introduced by digital printing technology is consistent with the existing practice in our company	22(14.3 %)	32 (20.8 %)	31 (20.1%)	56 (36.4%)	13 (8.4%)	3.04	1.220

Source: own survey, 2022

Complexity

Digital printing is complex to use, adoption requires a more advanced skillful workforce, and the skill required to use digital printing is complex for our operators are three items used to measure the complexity of digital printing technology. Table7 summarizes the descriptive analysis questions measuring the complexity of digital printing. Data analysis reveals that 33.1% of respondents agree that digital printing is complex to use in the company, whereas 18.8% strongly agree, 22.7 % were neutral, 24 disagreed, and 1.3 % strongly disagreed. 38.3% of the respondents strongly agree that digital printing adoption requires a more advanced skillful

workforce, whereas 29.9 % agreed, 18.2 % of the respondent's neutral, and 13.6 % strongly disagreed. 31.8% of the respondents were neutral on the skill required for using digital printing are complex for our operators, whereas 24.7% disagreed, 24 % agreed, 16.2 % strongly agreed, and 3.2% strongly disagreed. This indicates that digital printing is complex to use in the berhanena selam printing enterprise. Digital printing technology requires an advanced skillful workforce, and the skill required for using digital printing is difficult for berhanena Selam operators.

Table 7: Descriptive statistics for Complexity

	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree	Mean	Std. Deviation
Digital printing is complex to use in our company	2(1.3 %)	37(24%)	35 (22.7%)	51 (33.1%)	29(18.8%)	3.44	1.091
Digital printing adoption requires a more advanced skillful workforce.	-	21(13.6%)	28 (18.2%)	46 (29.9%)	59(38.3%)	3.93	1.055
The skill required for using digital printing is complex for our operators	5(3.2 %)	38 (24.7 %)	49 (31.8%)	37 (24%)	25 (16.2%)	3.25	1.100

Source: own survey, 2022

Technological readiness

Concerning technological readiness, the respondents were asked two questions. Table 8 summarizes the descriptive analysis questions measuring technological readiness. Data analysis reveals that 29.9% of respondents agree that there are the necessary skills to implement digital printing in berhanena selam, whereas 29.9% disagree, 20.8 % were neutral, 10.4 % strongly disagreed, and 9.1 % strongly agreed. 35.1% of the respondents agreed that the company is dedicated to acquiring the required managerial and technical skills for digital printing, whereas 26.6 % were neutral, 18.8 % disagreed, 15.6 % strongly agreed, and 3.9% strongly disagreed. The analysis shows that berhanena selam lacks the necessary skills to adopt digital printing. But the management is dedicated to acquiring managerial and technical skills.

Table 8: Descriptive statistics for technological readiness

	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree	Mean	Std. Deviation
Within the company there are necessary skills to implement digital printing	16 (10.4%)	46(29.9%)	32(20.8%)	46 (29.9%)	14(9.1%)	2.97	1.177
Our company dedicated to acquiring the required managerial and technical skills for implementation of digital printing	6 (3.9%)	29(18.8%)	41(26.6%)	54 (35.1%)	24(15.6%)	3.40	1.081

Source: own survey, 2022

Adoption cost

Adoption cost is one variable included on the factors that determine the adoption of digital printing technology. Table9 summarizes the descriptive analysis questions measuring adoption costs. It is noted that the majority of the respondents believe that digital printing technology adoption requires high costs. Data analysis reveals that 43.5% of respondents agree that Digital printing adoption requires high hardware and software facility costs, whereas 35.1% strongly agreed, 18.2 % were neutral, 1.9 disagreed, and 1.3 % strongly disagreed. 46.8% of the respondents strongly agreed that digital printing adoption requires a high cost of training and recruiting, whereas 24.7 % were neutral, 16.2 % strongly agreed, 11% disagreed, and 1.3 % strongly disagreed. 45.5% of the respondents agreed that digital printing adoption requires high up-front investment costs, whereas 27.9% strongly agreed, 18.8 % were neutral, 4.5 % strongly disagreed, and 3.2% disagreed. The analysis shows that digital printing adoption requires a high investment cost. High investment costs may be one of the reasons that the company is not adopting digital printing technology so far.

Table 9: Descriptive statistics for adoption cost

	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree	Mean	Std. Deviation
Digital printing adoption requires high hardware and software facility costs	2(1.3 %)	3(1.9%)	28 (18.2%)	67 (43.5%)	54(35.1 %)	4.09	.851
Digital printing adoption requires a high cost of training and recruiting	2(1.3 %)	17(11%)	38 (24.7%)	72(46.8 %)	25(16.2 %)	3.66	.924
Digital printing adoption requires high up-front investment costs	7(4.5%)	5 (3.2%)	29 (18.8%)	70 (45.5%)	43(27.9 %)	3.89	1.000

Source: own survey, 2022

Top management support

Table 10 summarizes the items that measure the top management support and their descriptive statistics. Data analysis reveals that 34.4% of respondents agree that top management supports the adoption of digital printing technology, whereas 26.6% were neutral, 22.7 % strongly agreed, 12.3 % disagreed, and 3.9 % strongly disagreed. 36.4% of the respondents were neutral on top management ready to provide the necessary resources for digital printing technology adoption, whereas 26 % agreed, 19.5 % strongly agreed, 13% disagreed, and 5.2 % strongly disagreed. 30.5% of the respondents were neutral on Top management willing to take the possible risks involved in the digital printing technology adoption, whereas 26% agreed, 22.1 % disagreed, 13% strongly agreed, and 8.4% strongly disagreed. The data analysis indicates that top management does not have the required commitment to adopt digital printing technology.

Table 10: Descriptive statistics for Top management support

	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree	Mean	Std. Deviation
Top management supports the implementation of digital printing technology	6(3.9 %)	19(12.3%)	41(26.6%)	53 (34.4%)	35(22.7%)	3.60	1.088
Top management is ready to provide the necessary resources for the introduction of digital printing techno	8(5.2 %)	20 (13 %)	56 (36.4%)	40(26%)	30(19.5%)	3.42	1.101
Top management is willing to take the possible risks involved in the adoption of digital printing technology	13(8.4%)	34 (22.1%)	47 (30.5%)	40 (26%)	20(13. %)	3.13	1.153

Source: own survey, 2022

Quality of human resource

Employee capability to use new technologies to solve problems, the capacity to learn new technologies, and sharing of knowledge are items used to measure the quality of the human resource. Table 11 summarizes the descriptive analysis questions measuring Quality of human resource. Data analysis reveals that 40.9% of respondents agreed that Employees use new technologies to solve problems, whereas 26% were neutral, 13 % disagreed, 11.7 % strongly agreed, and 8.4 % strongly disagreed. 35.1 % of the respondents agreed that employees learn new technology, whereas 22.7 % were neutral, 21.4 % strongly agreed, 16.2 % disagreed, and 4.5% strongly disagreed. 46.8% of the respondents agreed that employees are capable of sharing knowledge, whereas 16.2 %were neutral, 14.9 % strongly agreed, 14.9 % disagreed, and 7.1 % strongly disagreed. The above data analysis shows that employees can use new technologies and adopt them.

Table 11: Descriptive statistics for Quality of human resource

	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree	Mean	Std. Deviation
Employees are capable of using new technologies to solve problems	13(8.4 %)	20(13%)	40(26%)	63 (40.9 %)	18(11.7%)	3.34	1.111
Employees are capable of learning new technologies easily	7(4.5 %)	25 (16.2 %)	35(22.7%)	54(35.1%)	33(21.4%)	3.53	1.133
Employees are capable of sharing knowledge with each other	11(7.1%)	23 (14.9%)	25 (16.2 %)	72 (46.8 %)	23(14.9%)	3.47	1.133

Source: own survey, 2022

Competitive pressure

Table 12 summarizes the descriptive analysis questions measuring competitive pressure. The table presented two questions and their descriptive statistics analysis. Table 12 summarizes the descriptive analysis questions measuring competitive pressure. Data analysis reveals that 50 % of respondents agreed that their company is under competitor's pressure to adopt digital printing, whereas 30.5 % strongly agreed, 15.6 % were neutral, and 3.9% disagreed. 45.5 % of the respondents agreed that some of their competitors have already started using digital printing, whereas 28.6 % strongly agreed, 22.1 % were neutral, 3.2 % disagreed, and 0.6 % strongly disagreed. The above data analysis indicated that Berhanena selam printing is under pressure from competitors to adopt digital printing. Additionally, some of berhanena Selam's competitors started using digital printing.

Table 12: Descriptive statistics for competitive pressure

	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree	Mean	Std. Deviation
Our company is under pressure from competitors to adopt digital printing		6(3.9 %)	24(15.6 %)	77 (50%)	47(30.5%)	4.07	.785
Some of our competitors have already started using digital printing	1(0.6 %)	5 (3.2 %)	34 (22.1%)	70(45.5 %)	44(28.6%)	3.98	.836

Source: own survey, 2022

Government support

Financial and technical supports are two items used to measure the support government. Table 13 summarizes the descriptive analysis questions measuring government support. Descriptive data analysis reveals that 50% of the respondents were neutral about the financial support provided by the government for adopting digital printing technology, whereas 22.1 % disagreed, 16.2% agreed, 9.1% strongly disagreed, and 2.6 % strongly agreed. Concerning technical support of the government, 46.8% of the respondents were neutral, 27.3 % disagreed, 15.6% agreed, 9.1% strongly disagreed, and 1.3 % strongly agreed. The above data analysis shows that the government is not supporting berhanena selam both financially and technically in adopting digital printing technology. Support from the government is needed digital printing technology for the adoption because Berhanena selam printing is one of the public printing companies.

Table 13: Descriptive statistics for Government support

	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree	Mean	Std. Deviation
Government provides financial support for adopting digital printing	14(9.1 %)	34(22.1 %)	77(50%)	25(16.2%)	4(2.6%)	2.81	.906
Government provides technical assistance for adopting digital printing	14(9.1 %)	42(27.3 %)	72(46.8 %)	24(15.6%)	2(1.3%)	2.73	.880

Source: own survey, 2022

The plan to adopt digital printing technology

Two items were developed and asked the respondents to measure the plan to adopt digital printing technology in the future. Table 14 summarizes the descriptive analysis questions that measure the planning to adopt digital printing technology. Data analysis shows that 40.9 % of the respondents were neutral about organizations' intentions to adopt digital printing in the next 1-3 years, 35.7 % agreed, 11.7% strongly agreed, 8.4% strongly disagreed, and 3.2% disagreed. Concerning no planning to use digital printing in near future, 35.7% of the respondents were neutral, 37 % disagreed, 20.8% strongly disagreed, 4.5 % agreed and 1.9 % strongly agreed. The above data analysis reveals that only some employee knows about the adoption of digital printing. The company has not developed a plan for digital printing technology adoption and has not communicated well with the employee. So, Berhanena Selam needed to prepare a clear digital printing adoption plan and communicate with the employees.

Table 14: Descriptive statistics for the plan to adopt digital printing

	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree	Mean	Std. Deviation
Our organizations intends to adopt digital printing in the next 1-3 years	13(8.4 %)	5(3.2 %)	63(40.9%)	55(35.7%)	18(11.7%)	3.39	1.025
No planning to use digital printing in the near future	32(20.8 %)	57(37 %)	55(35.7%)	7(4.5%)	3(1.9%)	2.30	.916

Source: own survey, 2022

In our above analysis, we have analyzed each independent variable independently. Now we compare the mean of all variables. Table 15 summarizes the mean and standard deviation of independent variables. As indicated in Table 15, relative advantage has the highest mean score of 4.52, followed by competitive pressure at 4.03. Adoption cost, complexity, quality of the human resource, and top management support have scored a mean 3.88, 3.54, 3.45, and 3.38, respectively. Technological readiness and compatibility have a mean of 3.19 and 3.13. Of all independent variables, government support has the lowest mean score of 2.77. The mean of the independent variables indicated above has its meaning and interpretations. The relative

advantage has a 4.52 mean value this indicates that employees have awareness of digital printing technology. The awareness of employees may help to cooperate positively and to reduce resistance to the adoption of digital printing technology. This is favorable condition for the company. The mean value of competitive pressure is 4.03. This value implies that employees are aware of the current fierce competition in the printing sector. The adoption cost has a mean value of 3.88. This indicates that Berhanena Selam employees realize that adopting digital printing requires a high investment. To utilize digital printing technology, Berhanena Selam needs to be willing to invest in high costs.

Concerning the complexity of digital printing to be used in the future at the berhanena selam printing enterprise, the study does not give conclusive evidence. The respondents have neutral on these factors of technology adoption. Similarly, concerning the current human resource capability to use digital printing, the study has no supporting or opposing evidence. The study wants to know what roles the top management has in the digital printing technology adoption. The descriptive data analysis above does not show whether top management has neither a supporting nor opposing in the digital printing adoption. The study also raised the question of how the current technological readiness of the Berhanena selam enables it to adopt digital printing technology. As the mean value of technological readiness is 3.19, the respondents have a neutral view. This study does not have clear answers to the question the current technological readiness of Berhanena Selam enables to adopt digital print technology. As the mean value of compatibility is 3.13, the respondents have a neutral view. In this study, no clear answers have been found to the question of whether Berhanena Selam's current value and practice are compatible with digital printing. According to the descriptive data analysis, the government does not provide any technical or financial support for the adoption of digital printing at Berhanena Selam.

Table 15: Mean and standard deviation of variables

No	Variables	N	Mean	Std. Deviation
1.	Relative Advantage	154	4.52	.782
2.	Compatibility	154	3.13	.919
3.	Complexity	154	3.54	.865
4.	Technological Readiness	154	3.19	.995
5.	Adoption Cost	154	3.88	.799

6.	Top Management Support	154	3.38	1.036
7.	Quality of Human Resource	154	3.45	.998
8.	Competitive Pressure	154	4.03	.714
9.	Government Support	154	2.77	.852
	Valid N (list wise)	154		

Source: own survey, 2022

4.5. Correlations analysis

The correlation coefficient describes the strength of the linear relationship between dependent and independent variables. In this study, correlation analysis was used to describe the relationship between determinant factors of digital printing technology adoption and the plan to adopt digital printing. Table 16 summarizes the correlation matrix of dependent and independent variables. As can be observed from table 16, three variables, compatibility, top management support, and government support, have a relationship with the plan to adopt digital printing.

The Top management support has a positive correlation coefficient with the plan to adopt digital printing is 0.393 at a $p < 0.01$ level of significance. The result indicates that the support of top management has a positive effect on the adoption of digital printing. Also, Compatibility has a positive correlation coefficient with the plan to adopt digital printing is 0.216 at a $p < 0.01$ level of significance. Compatibility has a positive role in the adoption of digital printing. The Government support has a negative correlation coefficient with the plan to adopt is -0.245 at a $p < 0.01$ level of significance.

Table 16: Correlation Matrix

		The Plan to adopt Digital Printing
The Plan to adopt digital printing	Pearson Correlation	1
	Sig. (2-tailed)	
	N	154
Relative Advantage	Pearson Correlation	-.013
	Sig. (2-tailed)	.875
	N	154
Compatibility	Pearson Correlation	.216**
	Sig. (2-tailed)	.007
	N	154

Complexity	Pearson Correlation	-.140
	Sig. (2-tailed)	.083
	N	154
Technological readiness	Pearson Correlation	.037
	Sig. (2-tailed)	.652
	N	154
Adoption Cost	Pearson Correlation	.018
	Sig. (2-tailed)	.825
	N	154
Top Management Support	Pearson Correlation	.393**
	Sig. (2-tailed)	.000
	N	154
Quality Of Human resource	Pearson Correlation	.084
	Sig. (2-tailed)	.298
	N	154
Competitive Pressure	Pearson Correlation	.115
	Sig. (2-tailed)	.156
	N	154
Government Support	Pearson Correlation	-.245**
	Sig. (2-tailed)	.002
	N	154

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

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

4.6. Multiple Regression Analysis

Normality Test

A normality test is used to Measure the collected data normally distributed. The normality test can be checked by using either graphical or statistical methods. This study used the statistical methods of the skewness and kurtosis value.

The value of skewness and kurtosis must be between -2 and +2. Except for the Relative advantage variable, all other variables are within the given span.

Table 17: Skewness and kurtosis analysis result

Statistics										
		RA	CM	CX	TR	AC	TS	HR	CP	GS
N	Valid	154	154	154	154	154	154	154	154	154
	Missing	0	0	0	0	0	0	0	0	0
Skewness		- 2.722	-.395	-.105	-.085	-.908	-.271	-.602	-.544	- .184
Std. Error of Skewness		.195	.195	.195	.195	.195	.195	.195	.195	.195
Kurtosis		9.163	-.707	-.858	-.584	1.497	-.413	-.066	.258	.083
Std. Error of Kurtosis		.389	.389	.389	.389	.389	.389	.389	.389	.389

Multi-Collinearity Test

Multi-Collinearity occurs when independent variables are highly related. The tolerance test and Variance Inflation Factor–VIF (inverse of the tolerance) are used to test the multi-Collinearity. If the value of the tolerance test is less than one (1) and the VIF value is less than Ten (10), it indicates the absence of multi-Collinearity. Table 18 shows that both tolerance test and VIF values are within the given range so that the data is free of multi Multi-Collinearity.

Table 18: multi-Collinearity test

Coefficients ^a								
Model		Unstandardized Coefficients		Standardized Coefficients	T	Sig.	Collinearity Statistics	
		B	Std. Error	Beta			Tolerance	VIF
1	(Constant)	3.527	0.614		5.742	0		
	Relative Advantage	-0.166	0.081	-0.154	-2.061	0.041	0.878	1.14
	Compatibility	0.166	0.073	0.181	2.281	0.024	0.778	1.286
	Complexity	-0.069	0.071	-0.071	-0.972	0.333	0.925	1.082
	Technological readiness	-0.161	0.071	-0.19	-2.285	0.024	0.709	1.411
	Adoption cost	-0.006	0.079	-0.005	-0.071	0.943	0.886	1.129
	Top Management support	0.358	0.067	0.44	5.384	0	0.736	1.359
	Quality of human resources	0.076	0.067	0.089	1.122	0.264	0.775	1.29
	Competitive pressure	0.06	0.087	0.051	0.692	0.49	0.915	1.092
	Government support	-0.247	0.075	-0.249	-3.282	0.001	0.852	1.174

a. Dependent Variable: The plan to adopt digital printing

Linearity Test

Table 19 below shows the linearity test result. As noted from the table19, compatibility, top management support, and governmental support have a linear relationship with the plan to adopt digital printing technology.

Table 19: linearity test result

ANOVA Table

			Sum of Squares	df	Mean Square	F	Sig.
PA * RA	Between Groups	(Combined)	1.668	7	.238	.325	.942
		Linearity	.018	1	.018	.024	.877
		Deviation from Linearity	1.650	6	.275	.375	.894
	Within Groups		107.014	146	.733		
	Total		108.682	153			
PA * CM	Between Groups	(Combined)	30.788	12	2.566	4.644	.000
		Linearity	5.077	1	5.077	9.189	.003
		Deviation from Linearity	25.711	11	2.337	4.231	.000
	Within Groups		77.894	141	.552		
	Total		108.682	153			
PA * CX	Between Groups	(Combined)	9.199	9	1.022	1.480	.161
		Linearity	2.132	1	2.132	3.086	.081
		Deviation from Linearity	7.067	8	.883	1.279	.259
	Within Groups		99.483	144	.691		
	Total		108.682	153			
PA * TR	Between Groups	(Combined)	5.301	8	.663	.929	.494
		Linearity	.146	1	.146	.205	.651
		Deviation from Linearity	5.155	7	.736	1.033	.411
	Within Groups		103.381	145	.713		
	Total		108.682	153			
PA * AC	Between Groups	(Combined)	18.345	9	2.038	3.249	.001
		Linearity	.035	1	.035	.056	.814
		Deviation from Linearity	18.310	8	2.289	3.648	.001
	Within Groups		90.337	144	.627		
	Total		108.682	153			
PA * TS	Between Groups	(Combined)	29.728	12	2.477	4.424	.000
		Linearity	16.797	1	16.797	29.996	.000
		Deviation from Linearity	12.931	11	1.176	2.099	.024
	Within Groups		78.954	141	.560		
	Total		108.682	153			

PA * HR	Between Groups	(Combined)	12.215	11	1.110	1.635	.095
		Linearity	.775	1	.775	1.141	.287
		Deviation from Linearity	11.440	10	1.144	1.684	.090
	Within Groups		96.467	142	.679		
	Total		108.682	153			
PA * CP	Between Groups	(Combined)	7.058	6	1.176	1.702	.125
		Linearity	1.434	1	1.434	2.074	.152
		Deviation from Linearity	5.624	5	1.125	1.627	.156
	Within Groups		101.624	147	.691		
	Total		108.682	153			
PA * GS	Between Groups	(Combined)	10.494	8	1.312	1.937	.059
		Linearity	6.508	1	6.508	9.612	.002
		Deviation from Linearity	3.986	7	.569	.841	.555
	Within Groups		98.188	145	.677		
	Total		108.682	153			

Homoscedasticity Test

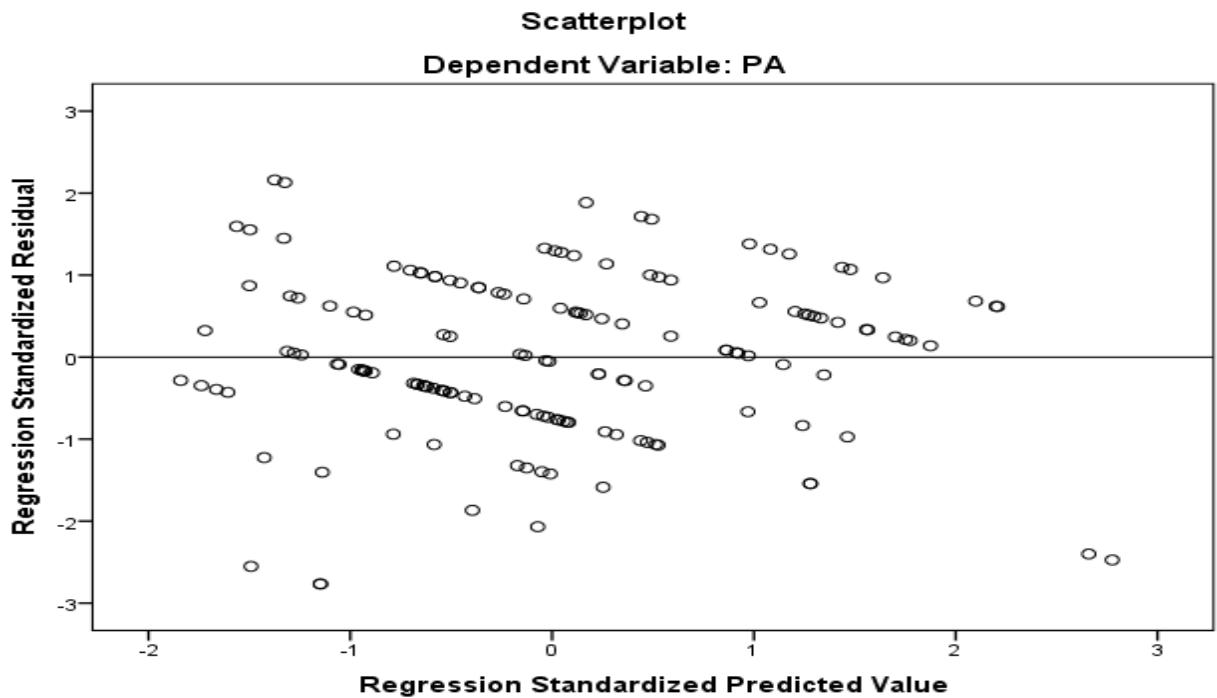


Figure 5: Homoscedasticity Test Result

Multiple Regression Analysis

Multiple regression analysis was used to examine the relationship between the single dependent variable (the plan to adopt digital printing technology) and several independent variables.

Table 19 shows the values of R, and R-square, whereas R represents multiple coefficients of correlation between the dependent variable and independent variables. R-square indicates the variation of the dependent variable. As shown in table19, the R-square is 29.2%, which means variation dependent variables explained nine independent variables, and 69.8 % variation of digital printing technology adoption was influenced by other factors, which are not included in this study. Table 20 shows regression model significance. The value of ANOVA is less than the level of $P < .05$ overall, the model is a statistically significant effect in predicting the adoption of digital printing technology.

Table 20: Regression model summary

Model Summary				
Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.540 ^a	.292	.247	.73124

a. Predictors: (Constant), Government Support, Relative Advantage, Complexity, Compatibility, Competitive Pressure, Adoption cost, Technological Readiness, Human Resource quality, Top management Support

Table 21: Regression model significance

ANOVA ^a						
Model		Sum of Squares	Df	Mean Square	F	Sig.
1	Regression	31.683	9	3.520	6.584	.000 ^b
	Residual	76.999	144	.535		
	Total	108.682	153			

a. Dependent Variable: PA

b. Predictors: (Constant), Government Support, Relative Advantage, Complexity, Compatibility, Competitive Pressure, Adoption cost, Technological Readiness, Human Resource quality, Top management Support

Table 22: Regression coefficients summary

Model	Unstandardized Coefficients		Standardized Coefficients	T	Sig.
	B	Std. Error	Beta		
(Constant)	3.527	0.614		5.742	.000
Relative Advantage(RA)	-0.166	0.081	-0.154	-2.061	0.041
Compatibility (CM)	0.166	0.073	0.181	2.281	0.024
Complexity (CX)	-0.069	0.071	-0.071	-0.972	0.333
Technological readiness (TR)	-0.161	0.071	-0.19	-2.285	0.024
Adoption cost (AC)	-0.006	0.079	-0.005	-0.071	0.943
Top Management support(TS)	0.358	0.067	0.44	5.384	.000
Quality of human resources(HR)	0.076	0.067	0.089	1.122	0.264
Competitive pressure(CP)	0.06	0.087	0.051	0.692	0.49
Government support(GS)	-0.247	0.075	-0.249	-3.282	0.001

a. Dependent Variable: The plan to adopt digital printing

4.7. Hypothesis Testing Using Regression Analysis

This section discussed the relationship between the independent variables and dependent variables.

H1: Relative advantage will positively influence digital printing adoption.

Data analysis from table 21 showed that the coefficient B and p-value of relative advantage were negative and significant (B =- 0.166, $p < 0.05$). Thus, Relative advantage has a negative and significant effect on the adoption of digital printing technology. The Researcher rejected the hypothesis; the result is inconsistent with the previous research (Dash, 2018, Akshat, 2016, Al-Gahtani, 2003, Bhardwaj, 2021)

H2: Compatibility will positively influence digital printing adoption

The result of multiple regression analysis, as indicated in Table 21, is that Compatibility has a positive and significant relationship with the adoption of digital printing technology (B=0.166 $p < 0.05$). The finding supports the hypothesis the result is consistent with the previous study (Al-Jabri and Sohail, 2012, Al-Gahtani, 2003, Akshat, 2016).

H3: Complexity will negatively influence digital printing adoption.

As indicated in Table 21 above, complexity has a negative relationship with the adoption of digital printing technology, but it is not insignificant ($B=-0.069$ $p>0.05$). The finding does not support the hypothesis.

H4: Technology Readiness will positively influence digital printing adoption

Multiple regression analysis results showed that technological readiness has a coefficient of B and the p-value was negative and significant ($B=-0.161$, $p<0.05$). The finding does not support the hypothesis; the result is inconsistent with the previous study (Bhardwaj, 2021).

H5: Adoption cost will negatively influence digital printing adoption

The coefficient of B and the p-value of the adoption cost were negative and insignificant ($B=-0.006$ $p>0.05$). The finding does not support the hypothesis; the result is inconsistent with the previous study (Bhardwaj, 2021, Ho et al., 2014).

H6: Top management support will positively influence digital printing adoption

The above Table 21 regression analysis result showed that the coefficient B and p-value of Top management support were positive and significant ($B =0.356$, $p< 0.05$). Thus, Top management support has a positive and significant effect on the adoption of digital printing technology. The finding supports the hypothesis the result is consistent with the previous study Ho et al., 2014, Hsu, et al. 2019, Lin & Ho, 2011).

H7: Quality of human resource will positively influence digital printing adoption

The coefficient of B and the p-value of the Quality of human resource were positive and insignificant ($B=0.076$ $p<0.05$). The finding does not support the hypothesis; the result is inconsistent with the previous study (Ho & Lin, 2012)

H8: Competitive pressure will positively influence digital printing adoption

The coefficient of B and the p-value of the competitive pressure were positive and insignificant ($B= 0.06$ $p>0.05$). Thus, competitive pressure has a positive and not significant effect on the adoption of digital printing technology. The finding does not support the hypothesis; the result is inconsistent with the previous study (Oliveira, 2014).

H9: Government support will positively influence digital printing adoption

The result of multiple regression analysis, as indicated in Table 21, is that Government support has a negative and significant relationship with the adoption of digital printing technology ($B = -0.247$ $p < 0.05$). The finding do not supports the hypothesis the result is not consistent with the previous study (Choi, 2020).

Table 23: Summary of hypothesis

Research Hypotheses	Result
H1: Relative advantage will positively influence digital printing adoption.	Rejected
H2: Compatibility will positively influence digital printing adoption	Supported
H3: Complexity will negatively influence digital printing adoption	Rejected
H4: Technology Readiness will positively influence digital printing adoption	Rejected
H5: Adoption cost will negatively influence digital printing adoption	Rejected
H6: Top management support will positively influence digital printing adoption	Supported
H7: Quality of human resource will positively influence digital printing adoption	Rejected
H8: Competitive pressure will positively influence digital printing adoption	Rejected
H9: Government support will positively influence digital printing adoption	Rejected

CHAPTER FIVE

SUMMARY, CONCLUSIONS AND RECOMMENDATIONS

This chapter presents the summary of the finding, conclusion and recommendation of the study.

5.1. The summary of the finding

Demographic analyses showed that the majority of the respondents were male. In terms of age, the majority of the respondents in the company are between 31-50 years of age. The majority of the respondents have less than ten years of printing industry work experience. In terms of education status majority of the respondents have a diploma and first-degree educational level. Concerning the job position of the respondents, experts and operators take the majority of the respondents.

Data analysis on the determinants of digital printing technology adoption indicates that respondents strongly agreed that adopting digital printing has a relative advantage. The analysis result showed that respondents agreed (mean=4.03) that the company is under competitive pressure to adopt digital printing technology. The respondents agreed that the adoption cost of digital printing is high (Mean=3.88) and slightly agreed with the complexity of digital printing technology to use in the company (mean=3.54). Respondents have neutral views regarding the following four factors the quality of the human resource (mean=3.45), top management support (mean=3.38), technological readiness (mean=3.19), and compatibility (mean=3.13). Regarding government support (mean=2.77), respondents disagreed with the government supporting the adoption of digital printing. The majority of the Respondents are neutral (Mean=3.39) about the intention to adopt digital printing technology in the next 1-3 years.

Correlation analysis showed that only three variables have a significant relationship with the adoption of digital printing technology. Compatibility has a positive and a significant relationship (Pearson Correlation = .216** P<.05). The top management has a positive Pearson correlation with the adoption plan of digital printing technology (Pearson Correlation = .393** P<.05). The last variable that has relation to the adoption plan of digital technology is government support. The relationship is negative and significant (Pearson Correlation = -.246** P<.05).

Regression analysis showed the following results. Compatibility has a statistically significant and positive relationship with the adoption of digital printing technology. Between Top management support and the adoption of digital printing technology, positive and statistically significant relationship exists.

5.2. Conclusion of the study

We are in the advanced technological era that has transformed almost every aspect of life and industry. The printing industry has also benefited from the advancement of this technology. As a result of technological development, the industry has fundamentally changed. Digital printing technology is the state of the art technology in the printing sector. The adoption of digital printing technology is not similar across continents, countries, and companies. Research findings showed that, in advanced western countries, the adoption rate of digital printing technology is high, whereas, in developing countries, the adoption rate of digital printing technology is low.

This study was motivated by the low adoption and started to study factors that affect the adoption of digital printing technology. The study aimed to examine the determinants of digital printing technology in the Ethiopian printing industry case of Berhanena Salem Printing Enterprise. A model was developed by combining two technology adoption models, diffusion of innovations (DOI), theory, and Technological-Organizational-Environment framework (TOE), to achieve the aim of the study.

The study reveals that only two variables, compatibility, and top management support, have a positive and significant influence on the adoption of digital printing technology. And three variables, technological readiness, relative advantage, and government support have a negative and significant influence on the adoption of digital printing technology. Complexity, Adoption cost, human resource quality, and competitive pressure have no significance on the adoption of digital printing technology.

5.3. Recommendation of the study

The majority of the Respondents are neutral (Mean=3.39) about the intention to adopt digital printing technology in the next 1-3 years. Based on the finding above, the researcher recommends the following to improve the adoption of digital printing technology at Berhanena Selam Printing Enterprise.

- The top management of the Enterprise should give due attention for the adoption of digital printing technology
- The top management should develop a plan for digital printing technology adoption and create awareness among all employees about Plan.
- Enhance the technical and managerial skills of the employees to facilitate the adoption of digital printing.
- The management has to create awareness about the digital printing technology benefits to get financial and technical assistance from the government. And work closely with Public Enterprise holding and administration agency which supervise and control the enterprise.

5.4. Future research area

This study adds some value to the limited available research on the adoption of digital printing technology. The main objective of this research is to identify the determinants of digital printing technology adoption. But, this study is limited to a single company Berhanena Selam printing Enterprise. I recommend a future researcher study determinants of digital printing technology at the industry level to increase the research quality and generalizability of the finding.

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APPENDIX



ADDIS ABABA UNIVERSITY

SCHOOL OF COMMERCE

Research Questionnaire

Dear respondents,

I am a graduate student at Addis Ababa University School of commerce undertaking a degree of Master in Business Leadership. I am conducting a research on the **Determinants of Digital Printing Technology Adoption in the Ethiopian Printing Industry: A Case of Berhanena Selam Printing Enterprise**. This questionnaire is designed to collect data on factors influencing the adoption of digital printing. I kindly ask you to give me a few minutes of your time to answer the questions. The information you will provide will be treated with utmost confidentiality and will only be used for academic purposes. **Thank you in advance for your cooperation.**

Thank you.

Dereje Tigist

0912001575

General Instructions

- You do not need to write your name
- use tick mark (✓) to answer the questions on the space provided

PART 1: Demographic Characteristics

1. Gender	Male	Female

2. Age

Less than 30 years	31- 40 years	41-50 years	More than 51 years

3. How many years of printing work experience do you have?

Less than 5 years	5 – 10 years	11– 15 years	More than 15 years

4. Educational Status

Secondary Education complete	Diploma	First Degree	Master Degree	Other

5. Your current Job position in the organization

Management member	Team leader	Coordinator/Supervisor	Expert	Operator	Other

PART Two: Factors influencing adoption of digital printing

Please indicate the extent of your level of agreement and disagreement with the following statement. Please tick (√) your appropriate answer based on the following rating.

1= strongly disagree 2 = Disagree 3 = Neutral 4 = Agree 5= `strongly agree

Factors influencing adoption of digital printing		Rating point				
		1	2	3	4	5
Relative Advantage						
1	Digital printing technology adoption can provide our company with a competitive advantage in the industry					
2	Digital printing technology adoption can enable our company to reduce costs and increase profit					
3	Digital printing technology adoption can enhance our company’s reputation					

Compatibility		1	2	3	4	5
1	The use of digital printing technology consistent with our company's culture and values					
2	Our current technological infrastructure can be compatible with digital printing					
3	The change introduced by digital printing technology is consistent with the existing practice in our company					
Complexity		1	2	3	4	5
1	Digital printing is complex to use in our company					
2	Digital printing adoption requires a more advanced skillful workforce.					
3	The skill required for using digital printing is complex for our operators					
Technological readiness		1	2	3	4	5
1	Within the company there are necessary skills to implement digital print					
2	Our company dedicated to acquiring the required managerial and technical skills for implementation of digital printing					
Adoption cost		1	2	3	4	5
1	Digital printing adoption requires high hardware and software facility costs					
2	Digital printing adoption requires a high cost of training and recruiting					
3	Digital printing adoption requires high up-front investment costs					
Top Management support		1	2	3	4	5
1	Top management supports the implementation of digital printing technology					
2	Top management is ready to provide the necessary resources for the introduction of digital printing technology					
3	Top management is willing to take the possible risks involved in the adoption of digital printing technology					
Quality of human resources		1	2	3	4	5
1	Employees are capable of using new technologies to solve problems					
2	Employees are capable of learning new technologies easily					
3	Employees are capable of sharing knowledge with each other					
Competitive pressure		1	2	3	4	5
1	Our company is under pressure from competitors to adopt digital printing					
2	Some of our competitors have already started using digital printing					

Government support		1	2	3	4	5
1	Government provides financial support for adopting digital printing technology					
2	Government provides technical assistance for adopting digital printing technology					

PART THREE: The Plan to Adopt Digital Printing

Please indicate the extent of your level of agreement and disagreement with the following statement. Please tick (✓) your appropriate answer based on the following rating. 1= strongly disagree 2 = Disagree 3 = Neutral 4 = Agree 5= `strongly agree

The Plan to Adopt Digital printing		1	2	3	4	5
1.	Our organizations intends to adopt digital printing in the next 1-3 years					
2.	No planning to use digital printing in the near future					

አዲስ አበባ ዩኒቨርሲቲ
የንግድ ሥራ ትምህርት ቤት
የጥናት መጠይቅ

ውድ የዚህ ጥናት ተሳታፊ፤

ስሜ ደረጃ ትዕግስት ይባላል። በአዲስ አበባ ዩኒቨርሲቲ የንግድ ሥራ ትምህርት ቤት በቢዝነስ ሊደርሺፕ ሁለተኛ ዲግሪ እየተማርኩ እገኛለሁ። በአሁኑ ወቅት የመመሪያ ጥናት እየሰራሁ ሲሆን የጥናቱ ርዕስ Determinants Of Digital Printing Technology Adoption In The Ethiopian Printing Industry: A Case Of Berhanena Selam Printing Enterprise የሚል ነው። ይህ መጠይቅ የተዘጋጀው የዲጂታል ህትመትን ተግባራዊ ለማድረግ ተፅዕኖ የሚያሳድሩ ሁኔታዎች ላይ መረጃዎችን ለመስጠት ነው። ስለሆነም ለዚህ ጥያቄዎች መልስ ለመስጠት ጥቂት ደቂቃዎች እንዲሰጡኝ በአክብሮት እጠይቃለሁ። እርሶ የሚሰጡት መረጃ በከፍተኛ ሚስጥር የሚያዝ እና ለትምህርት ዓላማ ብቻ ጥቅም ላይ የሚውል መሆኑን በቅድሚያ አረጋግጥሎታለሁ። ለትብብርዎ በቅድሚያ አመሰግናለሁ።

ማንኛውም ጥያቄ ካልዎት በዚህ ስልክ -0912001575 ያገኙኛል።

አጠቃላይ መመሪያ፤

- ስም መጻፍ አያስፈልግም
- መልስ ለመስጠት (✓) ምልክትን ይጠቀሙ።

ከፍል አንድ ፡ አጠቃላይ መረጃዎች

- መልስ ለመስጠት (✓) ምልክትን ይጠቀሙ።

1. ፆታ	ወንድ	ሴት

2. እድሜ

ከ30 ዓመት በታች	ከ31- 40 ዓመት	ከ41-50 ዓመት	ከ51 ዓመት በላይ

3. በህትመት ኢንዱስትሪ ውስጥ ያለዎት የሥራ ልምድ

ከ5 ዓመታት በታች	ከ5-10 ዓመታት	11-15 ዓመታት	ከ15 ዓመታት በላይ

3. የትምህርት ደረጃ

ሁለተኛ ደረጃ ያጠናቀቀ	ዲፕሎማ	የመጀመሪያ ዲግሪ	ሁለተኛ ዲግሪ	ሌላ

4. በድርጅቱ ውስጥ ያልታዩ የሥራ ድርሻ

የማኔጅመንት አባል	የቡድን መሪ	አስተባባሪ/ሱፐርቫይዘር	ባለሞያ	አፕሬተር	ሌላ

ክፍል 2: የዲጂታል ህትመትን ተግባራዊ ለማድረግ ተፅዕኖ የሚያሳድሩ ምክንያቶች

ከዚህ በታች የቀረቡትን ጥያቄዎች ከአነበቡ በኋላ ትክክል ብለው የሚያምኑበትን ምልክት (✓) በማድረግ መልስ ይስጡ። በሰንጠረዥ ውስጥ የተመለከቱት ምርጫዎች የሚወክሉት።

1=በጭራሽ አልስማማም 2= አልስማማም 3= ገለልተኛ 4=አስማማለሁ 5= በጣም አስማማለሁ

ተ.ቁ.	ጥያቄ	አማራጭ				
		1	2	3	4	5
	የፈጠራ አንጻራዊ ጥቅም (Relative Advantage)					
1.	የዲጂታል ህትመት ቴክኖሎጂ ተግባራዊ ማድረግ ድርጅታችን በህትመት ኢንዱስትሪ ውስጥ ያለውን ተወዳዳሪነት ያሳድገዋል።					
2.	የዲጂታል ህትመት ቴክኖሎጂ ተግባራዊ ማድረግ ድርጅታችን ወጪዎችን እንዲቀንስ እና ትርፋማነቱን እንዲያሳድግ ያስችለዋል።					
3.	የዲጂታል ህትመት ቴክኖሎጂ ተግባራዊ ማድረግ የድርጅታችን መልካም ስም /ብራንድ/ ሊያሻሽለው ይችላል።					
	ተስማሚነት (Compatibility)	1	2	3	4	5
1.	የዲጂታል ህትመት አጠቃቀም ከድርጅታችን ባህል እና አሴት ጋር የሚጣጣም ነው።					
2.	ድርጅታችን አሁን ያለው የቴክኖሎጂ መሰረተ ልማት ከዲጂታል ህትመት ጋር ሊጣጣም ይችላል።					
3.	በዲጂታል ህትመት ቴክኖሎጂ የተፈጠረው አዳዲስ ለውጥ ብርሃንና ሰላም ውስጥ ካለው አሰራር ጋር የሚስማማ ነው።					
	ውስብስብነት(Complexity)	1	2	3	4	5
1.	የዲጂታል ህትመት ቴክኖሎጂን ብርሃንና ሰላም ውስጥ ለመጠቀም ውስብስብ ነው።					
2.	የዲጂታል ህትመት ቴክኖሎጂን ለመጠቀም ከፍተኛ የሆነ ሞያ ያለው የሰው ኃይል ይፈልጋል።					
3.	የዲጂታል ህትመትን ለመጠቀም የሚያስፈልገው ክህሎት ለድርጅቱ					

አታሚዎች /አፕራተሮች/ ውስብስብ ነው።					
የቴክኖሎጂ ዝግጁነት (Technological readiness)					
1.	በድርጅታችን ውስጥ የዲጂታል ህትመትን ለመተግበር አስፈላጊው ክህሎት አለ።				
2.	ድርጅታችን የዲጂታል ህትመትን ተግባራዊ ለማድረግ አስፈላጊውን የሥራ አመራር እና የቴክኒክ ክህሎቶችን ለማዳበር ቁርጠኝነቱ አለው።				
ዲጂታል ህትመትን ተግባራዊ ለማድረግ የሚያስፈልግ ወጪ (Adoption cost)					
1.	የዲጂታል ህትመትን ተግባራዊ ለማድረግ ከፍተኛ የሆነ የሃርድ እና ሶፍት ዌር ወጪዎችን ይፈልጋል።				
2.	የዲጂታል ህትመትን ተግባራዊ ለማድረግ ከፍተኛ የስልጠና እና የቅጥር ወጪ ይጠይቃል።				
3.	የዲጂታል ህትመትን ተግባራዊ ለማድረግ ከፍተኛ የሆነ የኢንቨስትመንት ወጪዎች ይጠይቃል።				
የከፍተኛ አመራሩ ድጋፍ (Top Management support)					
1.	የድርጅታችን ከፍተኛ አመራር የዲጂታል ህትመት ቴክኖሎጂን ተግባራዊ ለማድረግ ይደግፋል።				
2.	የድርጅታችን ከፍተኛ አመራር የዲጂታል ህትመት ቴክኖሎጂን ተግባራዊ ለማድረግ አስፈላጊውን ግብዓት ለማቅረብ ዝግጁ ነው።				
3.	የድርጅታችን ከፍተኛ አመራር የዲጂታል ህትመት ቴክኖሎጂን ተግባራዊ ለማድረግ በማድረግ ሂደት የሚፈጠሩ አደጋዎችን ለመቀበል ፈቃደኛ ነው።				
ብቁ የሰው ኃይል (Quality of human resources)					
1.	የድርጅታችን ሰራተኞች ችግሮችን ለመፍታት አዳዲስ ቴክኖሎጂዎችን መጠቀም ይችላሉ።				
2.	የድርጅታችን ሰራተኞች አዳዲስ ቴክኖሎጂዎችን በቀላሉ መማር ይችላሉ።				
3.	የድርጅታችን ሰራተኞች እርስ በርስ መማማር እና እውቀትን ለመለዋወጥ ይችላሉ።				
የተወዳዳሪዎች ጫና (Competitive pressure)					
1.	ድርጅታችን የዲጂታል ህትመትን ተግባራዊ ለማድረግ በተወዳዳሪዎች በኩል ግፊት እየተደረገበት ነው።				
2.	አንድ አንድ ተጭካሪዎቻችን የዲጂታል ህትመትን መጠቀም ጀምረዋል።				
የመንግስት ድጋፍ (Government support)					
1.	መንግስት የዲጂታል ህትመትን ቴክኖሎጂን ተግባራዊ ለማድረግ የገንዘብ ድጋፍ ያደርጋል።				
2.	መንግስት የዲጂታል ህትመትን ቴክኖሎጂን ተግባራዊ ለማድረግ የቴክኒክ ድጋፍ ያደርጋል።				

ክፍል ሦስት፡ የዲጂታል ህትመትን ተግባራዊ ለማድረግ ያለ ዕቅድ

ከዚህ በታች የቀረቡትን ጥያቄዎች ከአነበቡ በኋላ ትክክል ብለው የሚያምኑበትን ምልክት (✓) በማድረግ መልስ ይስጡ። በሰንጠረዥ ውስጥ የተመለከቱት ምርጫዎች የሚወክሉት።

1= በጭራሽ አልስማማም 2= አልስማማም 3= ገለልተኛ 4= እስማማለሁ 5= በጣም እስማማለሁ

ተ. ቁ	ዲጂታል ህትመትን ተግባራዊ ለማድረግ ያለ ዕቅድ	አማራጭ				
		1	2	3	4	5
1.	ድርጅታችን በሚቀጥሉት ከ1-3 ዓመታት ውስጥ ዲጂታል ህትመትን ተግባራዊ ለማድረግ አቅዷል።					
2.	ድርጅታችን በቅርብ ጊዜ ውስጥ ዲጂታል ህትመትን ተግባራዊ ለማድረግ ዕቅድ የለውም።					