

**AKENTEN APPIAH-MENKA UNIVERSITY OF SKILLS TRAINING AND
ENTREPRENEURIAL DEVELOPMENT**

**ASSESSMENT OF TECHNOLOGY ADOPTION AMONG SMALL AND
MEDIUM-SCALE FASHION ENTERPRISES IN THE KUMASI METROPOLIS**

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MPHIL FASHION DESIGN AND TEXTILES

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**ASSESSING TECHNOLOGY ADOPTION AMONG SMALL AND MEDIUM
SCALE FASHION ENTERPRISES: A CASE OF KUMASI METROPOLIS**

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**A THESIS SUBMITTED TO THE SCHOOL OF GRADUATE STUDIES,
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DECLARATION

STUDENT'S DECLARATION

I, ADUKWEI SEMPE GLOVER declare that this thesis, with the exception of quotations and references contained in published works which have all been identified and duly acknowledged, is part or whole, for another degree elsewhere.

SIGNATURE:

DATE:

SUPERVISOR'S DECLARATION

I hereby declare that the preparation and presentation of this work was supervised in accordance with the guidelines for supervision of thesis/dissertation/project as laid down by the Akenten Appiah-Menka University of Skills Training and Entrepreneurial Development.

DR. NINETTE AFI APPIAH

SIGNATURE:

DATE:

DEDICATION

This thesis is dedicated to God Almighty and my parents (Mr. and Mrs Glover) for the immense support they offered me during the course of the study.

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ABSTRACT

The goal of this study was to assess the extent to which SMEs in Ghana's fashion industry are using technology by looking at the Kumasi metropolis. For this study, quantitative research design was used. Participants in the study were registered fashion houses from the Ghana National Association of Garment Makers (GNAGM) and the Ghana National Tailors and Dressmakers Association (GNTDA). Using the random sampling technique, a total of 278 members from the population were chosen partake in the study. Questionnaire was the main method of data collection in this study. The analysis of the data was both descriptive and inferential. The study discovered that hardware technology for instance high speed sewing machine and software technology like Computer aided design's adoption are low in the fashion industry in the metropolis, especially among Small and Medium-scale Fashion Enterprises SMSFEs. Also, factors related to technology do not make SMSFEs in the Kumasi metropolis more likely to adopt and use technology in their processes. On the other hand, it was found that organisational factors had a positive effect on how technology was used. It is recommended that policymakers and industry stakeholders like government and Industry association should work together to raise awareness of the benefits of advanced technologies like computer-aided design and automated material handling systems.

CHAPTER ONE

INTRODUCTION

1.1 Background to the Study

Human society has been transformed by technology (Afenya, Aphu, Abdul-Rahaman, Asime, Amezado & Gyan-Acquah, 2019). Large-scale production, the continuation of the internet, and the worldwide web have made information transmission swift and broad. The advent of technology has created a new economic environment in which businesses can operate seamlessly. As a result, as more consumers spend more time online, businesses must employ strategies such as interactive communications to influence consumers directly at all phases of the consumer decision processes while strengthening offline marketing efforts.

In this study, 'technology' is specifically defined in the context of digital and manufacturing technologies relevant to small and medium-scale fashion enterprises in the Kumasi Metropolis. This encompasses high-speed sewing machines, computer-aided design (CAD) software, digital marketing tools, and e-commerce platforms (Ocloo, Xuhua, Akaba, Shi & Worwui-Brown, 2020). These technologies are essential within the fashion industry as they directly impact production processes, design capabilities, market engagement, and overall business growth. The focus on such technologies is particularly pertinent to SMEs, as they represent both opportunities and challenges for these enterprises in terms of enhancing competitiveness and facilitating innovation in a digital and globalized marketplace (Davis, 1989). The adoption and utilization of these technologies by SMEs in the fashion sector form the core of this study, examining how these tools are integrated into their operations and the extent to which they contribute to their business development and market presence.

In this study, technology adoption is defined as the process whereby Small and Medium-sized Enterprises (SMEs) in the Kumasi Metropolis fashion industry accept and integrate both hardware and software solutions into their business operations, management, and decision-making processes. This definition aligns with the observations of Martínez-Torres et al. (2008) that the initial step in this process is the acceptance of technology, which is crucial for initial learning and integration. However, the long-term success of this adoption is contingent upon sustained use or utilization of these technologies. Additionally, following Nazir and Zhu (2018), technology adoption in SMEs is conceptualized as encompassing a range of digital tools and physical equipment that collectively support and enhance the operational, managerial, and decision-making capabilities of these enterprises.

SMEs are increasingly adopting relevant technologies to enhance their internal operations, boost product quality, expedite communication with clients, and more effectively market and distribute their offerings (Barba-Sánchez & Jimenez-Zarco, 2007). The adoption of technology profoundly impacts the contemporary business landscape. Its extensive use across businesses is reshaping global production, workplace and business practices, trade, and the consumption behaviours of both enterprises and consumers (Apulu & Latham, 2010). By leveraging technology, SMEs can significantly enhance their competitive edge, opening up numerous avenues to compete on par with larger companies.

The garment manufacturing business is labour-intensive and production-oriented, with many manually operated machines. According to Joseph-Armstrong (2006), garment companies survived by doing everything by hand, from design to finish. However, this strategy has proven inefficient for those wishing to compete in the global market. Large

garment companies have faced reality and converted their production processes to more computerised and innovative systems, which are more efficient, more accurate, and take less time to complete an idea from concept to consumer (Barba-Sánchez & Jimenez-Zarco, 2007).

Most industrialised countries, like France, Italy, China, England, Germany, and the United States, developed their economies primarily through large-scale garment manufacturing industries when they developed highly sophisticated technology systems to boost production (Li, 2018; Gereffi & Memedovic, 2003). Adopting modern forms of technology is critical for garment manufacturing companies and fashion designers to compete in the global fashion industry. Cost minimisation, increased production and improved quality remain the primary factors to consider when sourcing and manufacturing clothing decisions (Wen, Choi & Chung, 2019). This is due to the apparel industry's high labour intensity, requiring numerous labour-intensive techniques and materials (Park-Poaps & Rees, 2010). As a result, the apparel sector has become one of the most globalised, with industries always looking for low labour costs worldwide.

Numerous businesses from higher-income nations engage in overseas investment in emerging economies to satisfy the demands for lower-priced products from consumers in developed countries (Rasiah & Myint, 2013). Due to escalating labor expenses, sophisticated techniques in garment manufacturing have been adopted to enhance efficiency, allowing for the production of superior quality products in larger quantities, more rapidly, and at reduced costs (Varukolu, 2007). For many years, the apparel manufacturing sector has been a pathway for initiating industrialization in developing nations. Consequently, the garment industry has played a vital role in the economic advancement of numerous developing countries (Myint, Raisah & Singaravello, 2015).

Technological Adoption (TA) has become a key factor in maintaining competitiveness; an increasing number of manufacturers from both the least developed and developing countries are vying in the apparel market, significantly boosting global garment production and consumption (Sun, Aragon-Camarasa, Rogers, Stolkin & Siebert, 2017; Kapelko & Oude, 2015).

Most previous studies on the condition and prognosis of Bangladeshi apparel manufacturers indicated that they needed to improve quality and services while hiring skilled employees (Alam, Selvanathan & Selvanathan, 2017; Islam, Rakib & Adnan 2016). However, it is unlikely to occur in the absence of pricing systems that support such upgrading. Furthermore, the increased costs or prices may have an immediate negative impact on the viability of industries. The United Nations (UN), in its 2019 economic reclassification, still maintained Ghana as a lower-middle-income country due to its remarkable economic growth during the past decade. It has overcome extreme poverty and effectively stepped into industrialisation since the 1990s.

It is somewhat interesting that, while developed economies are progressing and improving with their garment production methods, Ghanaian businesses are instead folding up because productions are not meeting the expected results. The garment industry has the potential to help reduce Ghana's rising unemployment rate but unfortunately, in Ghana, most garment producers appear distanced from accepting contemporary forms of technology, which would instead boost their production activities; as previously stated, technology adoption is influenced by an industry's internal factors (Oppong, Antiaye & Biney-Aidoo 2014).

Salam, Hafeez, Mahmood, Iqbal and Akbar (2019) inferred that technologies are interconnected with technical knowledge, making the technology useful and generating

financial returns from its adoption. As the world economy integrates and reduces trade barriers, some of the most significant opportunities for small and medium businesses will be derived from adopting contemporary or modern technology to boost their operations (Ramdani, Kawalek & Lorenzo, 2009).

Furthermore, recent global trade data indicates that developing nations like Ghana have sustained a significant presence in manufacturing and production, thanks to its continuously growing private sector, predominantly made up of diverse small to medium-sized businesses. Among several developing countries engaged in the textiles and apparel sector, Ghana's fashion industry shows considerable potential for expansion in the international market, attributed to its low production costs, abundant raw materials, and skilled workforce. Therefore, for Ghanaian small and mid-sized fashion businesses to stay competitive and thrive, embracing modern technologies and adapting to the challenges brought by intense competition is essential. Although most textiles and apparel literature originates from developed countries, it's generally acknowledged that the provision and training in Technical Skills (TS) are key to an industry's textiles and apparel capabilities and its influence on productivity (Jifeng, Ming & Han, 2016; Wignaraja, 2008).

Studies have shown that, labour costs continue to be the most dominant source of competitiveness in the garment industry, particularly in this increasingly open trade era (Alam et al., 2017; Kapelko & Oude, 2015; Abraham and Sasikumar, 2011). Economic returns have been proven to be inversely associated with technological innovation and investment, particularly in developing countries (Salam et al., 2019). While technology adoption has emerged as an essential indicator of competitiveness, research on the technology adoption of garment manufacturing enterprises and understanding of what

encourages their technology adoption is limited, particularly in developing nations such as Ghana.

An SME in Ghana would be defined as having an annual turnover of between \$23,700 and \$2,370,000 (Gibson & Vander, 2008). The Ghana Statistical Service considers industries with fewer than ten employees as small-scale enterprises and their counterparts with more than ten employees as medium and large-scale enterprises. Ironically, the Ghana Statistical Service, in its national accounts, considers companies with up to 9 employees as SMEs (Kayanuala & Quartey, 2000). The significant contribution made by the small and medium-sized enterprise (SME) community worldwide to employment, regional development and innovation is well established. Unfortunately, SMEs are also subject to high rates of business failure, and such rates are likely to exacerbate due to the current global economic hardships. SMEs play a major role in economic development through employment creation and income generation. SMEs are the most important source of job creation in the US economy, as it is reported that nearly 98 percent of all businesses are classified as SMEs (Neumark et al., 2011).

Small enterprises are considered vital for fostering entrepreneurial growth, transforming the conventional sector into a contemporary one, generating jobs, diminishing migration from rural to urban areas, and acting as a platform for developing managerial skills (Akande, 2013). Despite the rapid advancement of technology in SMEs, their rate of embracing technology has stayed comparatively modest (Mac-Gregor & Vrazalic, 2005). This results in SMEs typically having restricted market access and consequently a smaller market share, impacting their market performance.

Research indicates that while large organizations typically possess the capacity to integrate technology (Kaur, 2023; Austria, 2023; Santini et al., 2022), Small and

Medium-sized Enterprises (SMEs), eager to adopt similar technologies, often face constraints due to limited financial and human resources, yet aim to enhance their competitive edge. Currently, both sizable corporations and SMEs are exploring strategies to strengthen their competitive stance and boost their efficiency (Al-Zagheer et al., 2022; Premkumar, 2003).

1.2 Statement of the Problem

The information age has revolutionized various industries, including trade, agriculture, and government services. However, the clothing industry, particularly in Ghana, lags in adopting technology to keep pace with the global economy (Amankwah-Amoah, 2015; Grant, 2009). Despite the availability of both traditional and modern technologies in clothing production, the sector is not seen as technologically intensive (Tyler, 2008). Research in this area includes studies on the impact of global technological changes in Bangladesh (Islam, 2016) and technology adoption in Indian apparel manufacturing (Varukolu & Park-Poaps, 2009; Varukolu, 2007). Further, studies have been conducted on DPT diffusion in the U.S. (Yu et al., 2021) and technology adoption in the Chinese textile and apparel industry (Wang et al., 2020).

Research in the apparel industry identifies key theoretical frameworks and trends, providing policy guidelines and identifying research gaps (Hoque et al., 2021). The relationship between garment production and computer technology has also been explored (Oppong et al., 2014). However, there is a noted lack of research on technology adoption in developing countries, especially in the Ghanaian garment manufacturing industry (Shaikh & Karjaluo, 2015). Most studies focus on ICT in various sectors, with limited attention to other technologies (Alwahaishi & Snásel, 2013). Although there has been substantial research within sectors such as agriculture, telecommunication,

automotive, and SMEs, as evidenced by studies from Afenya et al. (2019), Awiagah, Kang & Lim (2016), Yengoh, Ato & Svensson (2009), and Adeoti (2008), these inquiries have not specifically addressed the fashion industry, which remains a largely unexplored area in terms of technology adoption research.

This study aims to provide empirical evidence on the status, activities, and factors influencing technology adoption in small and medium-scale fashion enterprises in Kumasi Metropolis. It responds to calls for more research on technology adoption in such enterprises, particularly in a developing country context like Ghana.

1.3 Purpose of the Study

The purpose of this study was to assess the status of technology adoption among SMEs in the Ghanaian fashion industry.

1.4 Research Objectives

1. To evaluate the technology adoption status among small and medium-scale fashion enterprises (SMSFEs) in Kumasi Metropolis.
2. To assess the organizational factors and challenges influencing technology adoption amongst SMSFEs and its effects on their performance in Kumasi Metropolis.
3. To examine the competitive environment in which SMSFEs operate and amidst their technology adoption practices.
4. To develop a framework that SMSFEs can use to evaluate their competitive strategies in relation to technology adoption.

1.5 Research Questions

1. What is the current status of technology adoption among small and medium-scale fashion enterprises in Kumasi Metropolis?
2. What factors influence technology adoption among SMSFEs in Kumasi Metropolis?
3. To what extent do the factors influencing technology adoption affect the performance of SMSFEs in the Kumasi Metropolis?
4. What challenges or barriers do SMFEs in the Kumasi Metropolis face relative to technology adoption practices?
5. How does the competitive environment in Kumasi Metropolis shape the technology adoption practices of SMSFEs?
6. What framework can be developed for SMSFEs in Kumasi Metropolis to evaluate and enhance their competitive strategies in relation to technology adoption?

1.6 Hypothesis

The study was guided by the following hypothesis:

H₁: Technological factors positively influence technology adoption in an enterprise.

H₂: SMSFEs' Organisational factors positively influence technology adoption.

H₃: An SMSFEs' competitive environment positively influences technology adoption.

H₄: The level of an enterprise's adoption of technology positively influences its performance.

1.7 Significance of the Study

The study is significant for a number of reasons as evidenced below;

First, the study is of great practical relevance to small and medium-scale fashion enterprises, the primary stakeholders. It illuminates various beneficial technologies that

these businesses can adopt to enhance their operations and production efficiency. This understanding enables these enterprises to make informed decisions that bolster their competitiveness and operational efficiency.

Moreover, the findings hold substantial implications for policymakers and government officials. Providing insights into the current state of technology adoption in the fashion industry, the study aids in the formulation of policies and strategies. Such informed policymaking is essential to support the growth of the industry, contributing to the economic development of the region.

From an academic perspective, the study significantly contributes by filling a literature gap on technology adoption in SMEs within the fashion industry, especially in developing countries like Ghana. This contribution not only enriches the existing body of knowledge but also lays a foundation for further research in this area.

Furthermore, the study has a broader socio-economic impact. It underscores the role of technology in enhancing the capabilities of SMEs in the fashion industry. This can lead to job creation, economic diversification, and heightened competitiveness in global markets, emphasizing the importance of understanding both the barriers and facilitators of technology adoption for sustainable industrial growth.

Finally, the research provides practical insights for various industry stakeholders, including business owners, technology providers, and investors. It identifies key areas where technology implementation can optimize production, marketing, and management processes within the fashion industry. Although focused on the Kumasi Metropolis, these findings can have international relevance, facilitating cross-regional learning and collaboration in the fashion industry's technology adoption and implementation.

1.8 Limitations of the Study

Since the study will use a quantitative approach for the primary data collection, issues of validity and reliability may arise. Even though quantitative data collection occurs in natural settings, it may be difficult to replicate the study's findings. Secondly, because data were collected from a single metropolis, region, and country, the findings may differ from those obtained in other jurisdictions regarding technology adoption by small and medium-scale fashion enterprises. Therefore, results cannot be generalised to locations not included in the scope. The sample size is a small fraction of the total population of small and medium-scale fashion enterprises in Ghana and, therefore, produce 'narrow results.'

1.9 Delimitation

The study opted for a quantitative research approach with the aim to gather structured and measurable data, specifically targeting technology adoption trends and patterns within the fashion industry. Geographically, the study was deliberately confined to the Kumasi Metropolis in Ghana. This focused geographical scope was intended to provide a detailed understanding of the technology adoption landscape in a significant urban center in a developing country context.

Furthermore, the study narrowed its industry focus to SMSFEs, aiming to unearth the specific challenges and opportunities they face in adopting technology. This industry-specific concentration allowed the researcher to delve into the distinct dynamics of the fashion sector, offering insights that are directly relevant and applicable to these businesses. Additionally, the study defined its boundaries through a carefully chosen sample size from the total population of small and medium-scale fashion enterprises in

Ghana. This selection is made to ensure the study's feasibility and meaningfulness, taking into account the available resources and timeframe.

1.10 Definition of terms

- **Small and Medium Scale Fashion Enterprises:** The National Board for Small Scale Industries (NBSSI) classified SMEs as follows: Small enterprise (6 – 29) employees and medium enterprise (30 – 99) employees (Abor & Quartey 2010). In this study, an SMSFE in Ghana would be defined as industries with 6 - 99 employees.
- **Technology Adoption:** Technology adoption refers to the process by which individuals or organizations accept and integrate new technological innovations into their existing systems, practices, or behaviours (Taherdoost, 2018)
- **Technology Acceptance:** Technology acceptance in this study describes how consumers come to accept and use technology (Martínez-Torres et al., 2008).
- **Technological change:** In this study, technological change is interpreted and applied as the ability of fashion enterprises to adapt and apply new forms of technology to a more advanced operating environment than they were using before (Islam & Swierczek, 2018).
- **Technology Utilisation:** According to Nazir and Zhu, (2018), technology utilisation is the sustained use of technology; therefore, this study uses the concept of technology utilisation as proficiency in applying technological resources in a fashion enterprise.
- **Least Developed Countries:** According to the United Nations Department of Economic and Social Affairs (2020), least developed countries are low-income countries that face significant structural constraints to long-term development.

These countries are extremely vulnerable to economic and environmental shocks and have finite human capital.

- **A developing country:** A developing country, as defined by the United Nations (Department of Economic and Social Affairs, 2020), is one with a low standard of living, an underdeveloped industrial base, and a moderate to low Human Development Index (HDI).

1.11 Organisation of the Study

This study is organised into six chapters. Chapter One encompasses the introduction, background of the study, statement of the problem, the purpose of the study, research questions and significance of the study. Others are limitations of the study as well as the organisation of the study. Chapter Two deals with the review of relevant literature, including empirical review, theoretical framework of the study and conceptual framework of the study. Chapter Three considers the study's methodology: introduction, research design, population and sampling, data collection instruments, intervention design and implementation, data collection procedures and data analysis.

Chapter Four deals with data analysis and hypothesis testing. Chapter Five discusses the results. Chapter Six, the final chapter of this research, deals with the summary of findings, conclusions, recommendations and suggestions for further research.

CHAPTER TWO

REVIEW OF RELATED LITERATURE

2.1 Introduction

This chapter reviews the literature related to technology adoption among small and medium-scale enterprises in Ghana's fashion industry. The global textiles and apparel trade over the past decade was reviewed however much focus was on the fashion industry, particularly garment production and trade in Ghana. Also, Small and Medium Scale Enterprises in Ghana and the role of technology in garment manufacturing will be addressed. Finally, empirical review, theoretical models and conceptual framework were reviewed.

2.2 Global Textiles and Apparel Trade

2.2.1 Overview of Textiles and Apparel Trade in the World

The contemporary history of textile and garment industries began in the United Kingdom (UK) (Sanderson, 2018). The UK's textile and garment industries were thriving; however, the highly competitive Japanese overtook them after World War I. With its lower cost structure, Japan started to replace Britain as the world's top exporter of textiles in the 1930s. Around that time, Japanese exports surpassed those of the United States (US) and the old British textile and garment industries. Japan agreed to self-imposed export restrictions in 1936 in response to protests from the US and the UK. This was known as the initial voluntary export restraint (VER) (Tewari, 2005). In 1937, the US and Japan agreed to codify these restrictions in Osaka.

Afterwards, Japan and the US negotiated an agreement in December 1956 in which Japan promised to limit its exports for five years while setting an overall ceiling that would

apply to all of its exports of cotton textiles (Sanderson, 2018). With certain revisions, this restrictive structure served as the framework for subsequent bilateral agreements, which have persisted ever since. The UK later obtained agreements with three Commonwealth nations, namely; India, Hong Kong, and Pakistan, to restrict their exports of cotton-related goods for a period of three years commencing in February 1959 for Hong Kong and January 1960 for India and Pakistan, respectively. The US sought multilateral solutions through the General Agreement on Tariffs and Trade (GATT) arrangement after it attempted to negotiate a bilateral agreement with Hong Kong that would have been similar to the one it had agreed with Japan failed (Varukolu, 2007).

Afterwards a new structure for overseeing garments and trade began materialising. Parallel negotiations among states proceeded to reshape the growing system of bilateral agreements in 1960 during the Dillon round of trade talks in Geneva. In the end, “the Short-term Arrangement regarding International Trade in Cotton Textiles” was established (Hayashi, 2005).

2.2.2 The Global Fashion Industry

The global fashion industry, employing 60–70 million people, is primarily based in developing Asian nations (ILO, 2015). This study, focusing on the adoption of technology in small and medium-scale fashion enterprises in Kumasi Metropolis, finds relevance in understanding the industry's dynamics. Large profits in fashion companies, as seen in brands like Zara and H&M, arise from the disparity between production costs and wholesale pricing, with technology playing a pivotal role in maximizing efficiency and profit margins (Weishaar, 2019).

Despite the low retail price share for garment workers, competition in developing countries keeps wages low, affecting around 80% of female workers in the industry (Better Work, 2019). This study explores whether technology adoption can enhance operational efficiencies in such a context, potentially influencing wage structures and working conditions. The challenge for garment factories to reduce production costs, despite already low labor costs, by using cheaper raw materials and optimizing delivery costs (Nayak & Padhye, 2015), raises questions about the potential role of technology in balancing cost reduction and ethical production practices.

The diverse segments of the fashion sector, including luxury goods, menswear, womenswear, and sports footwear, contribute significantly to global trade (Fashion United, 2018; Posner, 2015). This study examines if and how technology adoption in small and medium fashion enterprises in Kumasi could tap into these lucrative segments, thus contributing to global trade.

Countries view garment production as an entry point to the global economy due to low entry barriers and the industry's labor-intensive nature (Rogerson, 2018; Kucera, 2020). This study assesses how technological advancements can elevate the garment industry in developing countries from basic manufacturing to more advanced, skill-intensive production. The shift in Asian countries from low-skill manufacturing to technologically advanced production (Akyüz, Chang & Kozul-Wright, 2020) provides a framework for understanding potential pathways for Ghana's fashion industry.

The link between the industry's growth and national economic development, as seen in Bangladesh's FDI increase (Mahmud, 2019), is particularly relevant to this study. It investigates whether similar growth and foreign investment attraction can be achieved in Ghana through technology adoption in the fashion sector. Additionally, the reciprocal

benefits of foreign investment, technology transfer, and infrastructural development observed in China (OEC, 2017; Were, 2015) offer insights into the possible impacts of technological advancement on the development of Ghana's fashion industry.

2.3 Outlook of the Fashion Industry in Ghana

The informal sector dominates Ghana's garment manufacturing industry, which has a low concentration of businesses (Ghana Statistical Service, 2016; JICA, 2008). Because it is relatively easy to get into the industry and requires little to no capital and little expertise since it is a low-concentration area of business (International Labour Organization, 2015). As a result, one only needs a flair for design, specialised sewing abilities, and a small amount of money to get started in the garment manufacturing industry in Ghana. Since it is a less concentrated business area, the garment industry in Ghana has more manufacturing establishments than any other industry in the country (Nyanyi, 2020; JICA, 2008).

There has been a noticeable decline in the size of Ghana's fashion and apparel industry growth during the last few years. Strategic efforts are being implemented to ensure that the sector grows at a significant rate (Madichie & Saeed, 2010). The African Fashion Fund (AFF) recently established a new official relationship with the Parsons School of Design in the United States to build their first long-term presence in Africa, which Ghana is expected to gain from, in order to improve prospects in the sector (Akpah, 2018).

Ghana has the opportunity to strengthen the fashion and garment industry and reverse the previous negative growth rates due to the implementation of the African Continental Free Trade Area (AfCFTA) agreement and a significant boost in the industry. There has been a decline from 15.1 percent growth in Ghana's fashion and apparel industry in 2008

to just 0.8% in 2014 and 0.3% in 2015. As a result, in 2016, the industry reported a negative 32 percent, of -1.4 percent (Essel, 2019). This suggests that the industry has been in decline during what appears to be a continuous recession.

According to McKinsey and Company, the global fashion market will increase significantly in 2019 (Ho, Poh, Zhou & Zipser, 2019). The \$2.5 trillion global fashion business was predicted to increase between 4% and 5% in 2017, however, this projection calls for growth between 3.5 percent and 4.5 percent, which is slightly below 2018 levels. The current projected worth of the global fashion sector is US\$2.6 trillion, growing at a rate of 5.5 percent per year. Africa only contributes below 5% of this total, while Asia and the USA account for 80% of the market (Colucci et al., 2020; Czekala et al., 2019). In addition to the work of Colucci et al. (2020) and Czekala et al. (2019), young people are coming up with innovative ideas to use Ghanaian fabrics as a way to meet new and emerging demands as the population increases by creating employment.

The Ghanaian fashion business has developed over the years, and young people are now learning innovative ways to find jobs for themselves in a competitive atmosphere through apprenticeships. A new generation of Ghanaian fashion designers in the nation is gradually positioning themselves to take advantage of the prospects in the sector with the adoption of the African Continental Free Trade Area agreement due to the relative surge of opportunities in the fashion industry (Gathii, 2019; Davis, 2017). Since there is so much competition in the global fashion market, modern fashion now depends on culture, which is steadily exerting more and more of a significant impact on the business. Although the fashion sector has the potential to provide substantial money, there seems to be little support for efforts to increase production (Amankwah-Amoah, 2015).

2.3.2 Garment Production and Trade in Ghana

The research by JICA (2008) indicated that in Ghana, the garment market predominantly comprises sales to individual customers, followed by various other channels like open-market vendors, private companies, governmental organisations, and more. Notably, only seven garment manufacturing companies with Free Zone Status are authorized for mass export of clothing (Ghana Free Zones Board, 2017). This aspect is particularly relevant to the current study, as it highlights the limited scope of Ghana's garment export market, emphasizing the need for broadening export capabilities among more local enterprises.

The consistent demand for traditional fabrics for occasions like funerals and churches, and daily use, is a critical aspect of the domestic market. The production process, often taking a week or more, indicates a reliance on tailor-made garments (JICA, 2008). This reliance is a significant factor for the study, as it underscores the potential for technology adoption to streamline production processes in the Ghanaian garment industry.

The study further draws attention to the challenges posed by imported and second-hand items, a consequence of liberalisation policies from the 1990s (Asiedu, 2010; Rodgers, 2016). This influx has led to a decrease in local production and affected the overall value of garment manufacturing in the national economy, with the sector contributing only a minimal percentage to industrial value-addition despite having a considerable number of businesses and workers (Quartey, 2006).

2.3.3 Challenges of the Ghana Fashion Industry

Like most small and medium-sized enterprises (SMEs) in the manufacturing sector, Ghana's garment industry faces numerous obstacles that limit its ability to compete

globally and grow sales and profits while increasing employment and generating greater financial value. Additionally, there is a shortage of government funding, as well as a shortage of competence (JICA, 2008).

This is a shift from when Ghana's government had policies to help businesses grow from micro to medium or large-sized businesses by providing resources, training workers, and facilitating growth (Ghana News Agency, 2016). For example, vocational training centres were established under the UNIDO and PSI programmes to improve the industry's technical know-how. Accra North's Textile Garment Trading Center was one of the training facilities that took advantage of the AGOA and other favourable trade agreements that the government had acquired for Ghana (Ghana News Agency, 2012). That resulted in some new businesses being formed and private partnership agreements being signed, and there are currently seven significant companies functioning in the Export Free Zone (Ghana Free Zones Board, 2017).

Despite significant development, the vast majority of businesses are still small or micro-sized, and the minority that are medium or large-sized lack the essential labour division that distinguishes businesses around the world. According to Sa rokin (2017), the division of labour enables businesses to boost production since it effectively allocates a worker's skills to a given task and minimises the transition between activities. Therefore, it is undeniably true that the lack of a labour division has decreased production in the apparel industry. Also, some of these challenges are related to skills shortage and gaps, lack of government support and others (Figure 2.1).

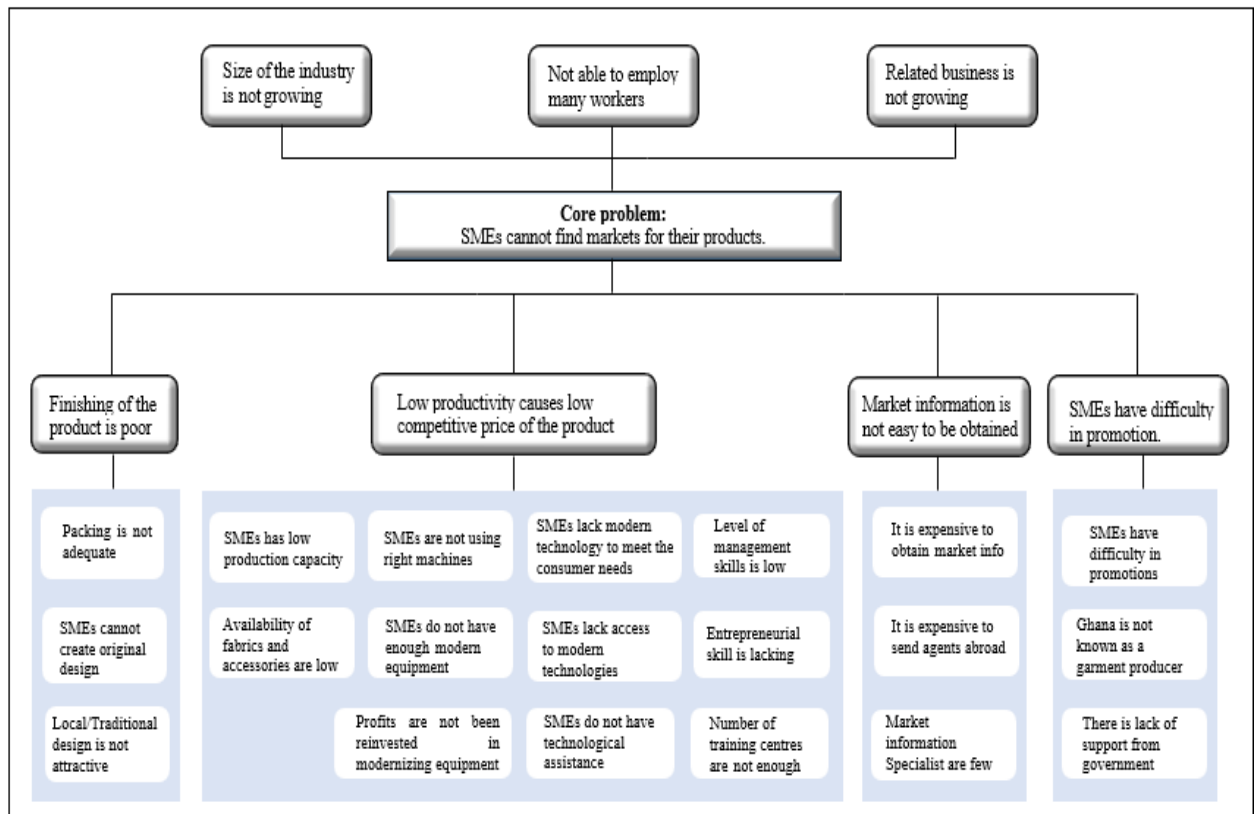


Figure 2.1 Core challenges of the garment industry

Source: JICA (2008)

2.4 Small and Medium-Scale Enterprises in Ghana

According to Hung et al. (2011), Small and Medium-scale Enterprises (SMEs) are an economic definition that has been defined in various aspects. The authors concluded that quantitative perceptions of the word are based mostly on turnover or assets and the number of people. At the same time, qualitative judgments are dependent on how the enterprise is organised.

The term “Small and Medium Enterprises” does not have a unified definition (Storey, 1994). However, we will utilise the definition provided in 2016 by the Ghana Export Promotion Council (GEPC), Association of Ghana Industries (AGI), and National Board for Small-Scale Industries (NBSSI) in this study. According to this definition, small

enterprises are companies with fixed asset values over \$10,000 and a workforce of up to 29 employees (including micro-enterprises with 1–5 employees). To them, medium-sized enterprises have fixed asset values worth \$100,000 with employees from 29 to 99.

According to Offei, Kissi and Nani (2019), Small and Medium Enterprises (SMEs) in Ghana account for a larger proportion of the country's economy. Still, they have trouble obtaining initial capital due to low-income levels and difficulty accumulating savings (Offei et al., 2019). Most small and medium-sized enterprises in Ghana are family-owned, making it difficult to find trained personnel. Additionally, there is an issue with access to modern technology. Numerous businesses rely on outdated equipment and have trouble locating replacement components and varying regional access to funding (Tagoe et al., 2005).

A key deduction is that the conceptual definition of Small and Medium-scale Enterprises (SMEs) in Ghana is multifaceted and not universally standardized. The study adopts a specific definition as provided by the Ghana Export Promotion Council (GEPC), Association of Ghana Industries (AGI), and National Board for Small-Scale Industries (NBSSI), which categorizes SMEs based on their fixed asset values and workforce size. This definition underscores the quantitative aspects of SMEs, delineating small enterprises as those with assets over \$10,000 and up to 29 employees, and medium-sized enterprises as those with assets worth \$100,000 and employee numbers ranging from 29 to 99.

This diverse and non-unified understanding of what constitutes an SME in Ghana reflects the complexity and variability inherent in the sector. The definition employed in the study is crucial as it sets the parameters for identifying and understanding the specific businesses that fall under the SME category within the Ghanaian context.

2.4.1 Definitions and Categorisations of Small and Medium-Scale Enterprises

Small and medium enterprises are defined differently by different authors in various countries based on the appropriate conditions in each environment. There is no single definition of small business that is universally recognised. This is so because a small company in one industry is distinct from another in a different industry. The sectoral requirements for these small firms vary. The different definitions that have been proposed and used generally depend on the number of employees, levels of turnover, capital base, fixed asset prices, and formalisation.

According to Nkonoli (2015), criteria that are objective in nature take into account sizes, such as sales, profitability, and net worth at the sector level, indicating that in some industries, there are no enterprises that are classified as small. Small enterprise's definition then becomes "a problematic and persistent challenge." However, what distinguishes small businesses from large ones and what they have in common are other less obvious characteristics that are more challenging or perhaps impossible to assess. In accordance with Saffu et al. (2008), the Small Business Act of 1953's section 3 defines an SME as a company owned and operated solely by its owners and does not hold a dominating position in its industry. A more quantitative approach was used in Britain, where the UK defines an SME as having fewer than 50 employees and not being an affiliate of any other company (Hajiha et al., 2010).

In addition, other scholars have also seen SMEs as ones where one or two people are expected to make all of the crucial decisions (such as those pertaining to finances, accounting, personnel, inventory, manufacturing, servicing, marketing, and selling decisions) without the assistance of specialists and with entrepreneurs having specific knowledge in one or two major functional areas of management (Hajli & Bugshan, 2012;

Huang & Qin, 2011; Turban et al., 2010). Not only do different countries and circumstances have varied definitions of SMEs, but there are also different perspectives on their characteristics.

A general definition of SMEs based on the traits has been attempted in numerous research. The finding that many of the approaches successfully used in large industries have not produced similar results when applied to SMEs stands out among all these research (Cragg et al., 2011; Ghobakhloo et al., 2011). However, according to Ghobakhloo et al. (2011), SMEs are a different and unique collection of organisations compared to major industries and are not “small-large industries.” According to Cragg et al. (2011), a borderless global economy was starting to take shape, as is expected in the case of the European Union (EU), where a shift towards a global market is currently taking place. This has important implications for company operations, customer services, supply chains, and fierce competitive environments.

Based on their ownership structure, high labour intensity, imbalanced development, and balanced dominant areas, small and medium-sized enterprises (SMEs) are generally grouped. Small and medium-sized enterprises (SMEs) are also sensitive and adaptable to environmental changes (Yao, Song, Yu & Guo, 2021). Entrepreneurs that work in small businesses are less regulated, more agile in making decisions, more willing to take chances, and more likely to specialise in one area of expertise (Christensen, Olesen, & Kjaer, 2005). Because of their adaptability, small and medium-sized businesses (SMEs) can grow and innovate even when faced with constraints (Ussman, Almeida, Ferrira, Mendes & Franco, 2001).

For the purposes of this research, small enterprises in the fashion industry of the Kumasi Metropolis will be defined as those with a workforce of up to 29 employees, including

micro-enterprises that have 1–5 employees. This categorization is particularly relevant because many fashion enterprises in Ghana operate on a scale where their fixed asset values are significantly lower than the \$10,000 threshold typically used in broader definitions. Consequently, assessing these enterprises based on their staff strength provides a more accurate and realistic representation of their scale and operational scope.

Medium-sized enterprises, within the context of this study, will be defined as those employing between 30 and 99 individuals. This staff-based definition is more reflective of the actual operational scale of medium-sized fashion enterprises in the Kumasi Metropolis, especially considering that many such businesses may not meet the higher fixed asset value criteria but still play a significant role in the industry.

2.4.2 SME Competitive Environment

Small to medium-sized enterprises (SMEs) are fundamental to many global economies, particularly in developing countries where they are often the backbone of economic expansion, job creation, and human advancement (Appiah, Possumah, Ahmar & Sanusi, 2018). In the African context, SMEs represent over 90% of all businesses and contribute around 50% of the gross domestic product (Kamunge, Njeru & Tirimba, 2014; Fjose, Grünfeld & Green, 2010). Moreover, in the Sub-Saharan African region, SMEs make up over 95% of all enterprises (Fjose et al., 2010; Kauffman, 2006).

SMEs play a larger role in Ghana than in other countries, where they make up 92% of formal enterprises, account for 70% of GDP, and provide over 80% of all jobs for Ghanaians (Quartey, Turkson, Abor & Iddrisu, 2017; Abor & Quartey, 2010).

In many nations, the existence of SMEs is essential for economic progress (Yao et al., 2021; Albar & Hoque, 2019). Nevertheless, the environment includes factors like

globalisation, intense competition, and the information revolution (Sani, Nawangtyas, Budiyantara and Wiliani, 2020). Small and medium-sized enterprises (SMEs) dominate the industrial landscape of Ghana, and they have a lot of significance for accelerating economic growth and eradicating poverty (Frempong, 2007).

Nevertheless, the clothing business has relatively low concentration and minimal entry barriers, making it a competitive sector. Kunz and Myrna (2011) assert that practically every nation engages in some commerce in the apparel industry. As a result, there is a proliferation of products in global markets. The technology for making textiles, affordable labour, supportive international trade policies, and automation in some production processes, among other factors, have all contributed to increased product proliferation (ILO, 2015; U.S. Council on Competitiveness, 2016).

A low-cost approach and product differentiation have been the key strategies used by producers and retailers in the garment sector (Kunz & Myrna, 2011; USITC, 2004). Sourcing goods and services from the most cost-effective locations to keep retail prices lower than competitors is a low-cost approach. Research by IBISWorld Inc. in 2009 found that wages were one of the areas where companies could save money. The cost of wages indeed dropped from 21% to 18% worldwide as corporations continued to look for manufacturers in nations with cheap labour costs (IBISWorld Inc., 2009).

Product differentiation is a second common method employed by clothing companies to get an advantage over their competitors. As described by Porter (1990), product differentiation is an endeavour to create a product or service that is viewed by the customer or the industry as unique and has superior attributes of value to the consumer. Differentiating a company's goods and services from its competitors is generally accomplished via a combination of services and strategies.

According to Liu and Atuahene-Gima (2018), branding is often used in the clothing sector to enhance product differentiation techniques. The approaches for differentiating products could include product qualities, relationships between enterprises, time, place, product mix, connections with others, and reputation (Barney, 2007). Branding, as opposed to the low-cost strategy, has several benefits, such as enhanced brand expansion prospects, favourable licensing options, larger margins, and a loyal customer base (Kumar, Anand & Song, 2017).

Whatever competitive strategy a clothing firm chooses, the ability to launch, maintain, and implement it successfully is crucial. The capabilities and competitiveness of businesses are significantly impacted by the availability or otherwise of trained labour. In addition, the availability of skilled labour has an impact on a company's capacity to achieve maximum productivity, which implies that without it, firms will be less able to innovate in response to shifting market conditions, which is a crucial lever for firms looking to compete and expand. The productivity and profitability of businesses in the 21st century have been strongly impacted by competition and a skilled labour supply, which has in turn driven the changes in the organisational structures of businesses covered by the term "globalisation" (ILO, 2015).

From the foregoing it could be deduced that the fashion industry, is marked by low entry barriers and intense global competition. This has led to an abundance of products in the market, creating a highly competitive environment. SMEs in this sector predominantly use two strategies to remain competitive: a low-cost approach and product differentiation. The low-cost approach involves minimizing production expenses, often achieved by sourcing from countries with lower labor costs. On the other hand, product

differentiation, often realized through effective branding and unique product features, allows companies to distinguish themselves in the crowded marketplace.

2.5 Technology Adoption

2.5.1 The Role of Technology in Fashion Manufacturing

The extent to which manufacturing technology is used and its integration into corporate processes determine how quickly an industry can adapt to compete in the global market (Crnjac, Veža & Banduka, 2017; Mechling et al., 1995). Because enterprises may maintain quick and flexible answers to market demand by employing technologies, constant innovation and adoption of new technology become crucial for competitive advantage in the global market (Naushad & Sulphey, 2020; Cooper, 1996; Mechling et al., 1995). Although capital-intensiveness prevents developing countries from producing and exporting modern technologies, adopting the technologies can boost the performance of their manufacturing enterprises (Degefa, 2017).

Park-Poaps, Bari and Sarker, 2020 identified two manufacturing technology categories. Hardware technology is the first category, followed by software technology. Hardware technologies often include robots, programmable production controllers, automated identification stations, automated inspection stations, automated material handling devices, computer-aided design workstations, and computerised numerical control machine tools (Park-Poaps et al., 2020). Software technologies include engineering data management, local area networks, statistical process control, production planning/inventory management software, computer-aided process planning, computer-aided manufacturing, computer-aided engineering, statistical process control, and group technology (Park-Poaps et al., 2020).

High technology and Research and Development initiatives have historically received less attention in the clothing manufacturing sector (Gazzola, Pavione, Pezzetti & Grechi, 2020). Islam & Swierczek (2018) asserted that the three fundamental processes that drive the industry are cutting, sewing, and pressing/finishing. While the standard production process involves various general or specialised equipment that is operated by manual, mechanical, or electronic devices by skilled and unskilled personnel of varied organisational production activities (Goffee & Scase, 2015; Bhavani & Tendulkar, 2001). However, using manual labour to operate equipment and assemble materials for automated systems is expected in production. Automation is limited since the material needs to be adequately fed through the machinery (Goffee & Scase, 2015). As a result, there has not been much technological advancement or usage in the business; instead, mass production has been the primary emphasis of technology adoption.

Clothing producers try to stay up with the rapid changes in fashion trends by speeding up their product design, production, and delivery (Ozdamar, Ertekin & Atik, 2015). One of the most important ways to compete in this environment was through the advancement of technology to meet these demands. When demand for manufacturing soared, the sector began focusing on cutting-edge technology to meet the needs of increasing production, speed, and quality to compete internationally. Yunus and Yamagata (2012) found that these are just a few of the recent technological changes in the garment and textile manufacturing business, such as the development of robotics for automating garment assembly lines, high-speed sewing machines, unique pressing and fusing techniques, and computer-aided design, manufacturing, and marketing in textile manufacturing. These technologies may be utilized singly or in tandem with others to realize the targeted economic efficiencies.

2.5.2 Organizational Factors Influencing Technology Adoption of an Industry

Across countries, industries, and sectors, the adoption of new technology and information varies greatly (Raguseo, 2018; Gopalakrishnan & Damanpour, 1994). It has been argued that at the industry level, technology adoption activities vary depending on the industry's capabilities (Raguseo, 2018). The following sections examine various organisational elements that may influence an industry's technology adoption level.

2.5.2.1 Industry Size

According to accepted theory in the literature, the industry's size influences its innovation and performance. An industry's size positively impacts an organisation's technological innovation and adoption capacity. Despite the fact that small enterprises have some benefits over larger sectors in terms of informality, adoptability and flexibility, the size of an industry has a positive impact on its technological activities. A new technology's adoption is more likely in larger sectors than in smaller ones, yet smaller enterprises have a higher technological intensity (Rossini, Costa, Tortorella & Portioli-Staudacher, 2019).

Large industries, on the other hand, are much keener to learn and use new technologies than smaller companies (Bettiol, Capestro, De Marchi & Di Maria, 2020). Small businesses rarely engage in the Research & Development process; therefore, adopting new technologies is frequently incremental or imitative. As a result, huge corporations are better equipped to invest in new technology and are financially secure (Bettiol et al., 2020). Due to the fact that they have the financial resources, major corporations have an advantage over small ones when it comes to technology adoption.

2.5.2.2 Presence in International Markets

An industry's expansion into international markets is driven by a variety of factors, including a desire to leave the fiercely competitive domestic market, a desire to catch up with or even outperform competitors, an improvement in business opportunities, and the ability to realise economies of scale (Sun et al., 2018). Factors such as a company's willingness to take risks and its understanding of international affairs are critical in determining whether or not a company can successfully enter the global market (Hitt, Ireland & Hoskisson, 2016). Studies have also shown that the willingness of firms to enter the international market is a key component in organisations' propensity to adopt new forms of technologies (Park-Poaps et al., 2020). Technology development and promotion programmes have been launched as a major economic stimulant to help companies better compete internationally (Racela & Thourunroje, 2020).

Similarly, it has been discovered that an industry's adoption of modern manufacturing technology is positively connected with the industry's performance on the international market (Prasanna, 2019). Depending on whether they are involved in domestic or international markets, different industries have different goals (such as flexibility, competition, and cost savings). As a result, different industries adopt different advanced technologies to compete successfully in their respective markets (Prasanna, 2019). Hence, adopting technologies may be influenced by an industry's participation in the international market. It appears that adopting new technologies has become crucial for an industry's focus on exports. Accordingly, Varukolu (2007) hypothesised that export orientation has a favourable impact on an industry's rate of technological adoption.

2.5.2.3 Top Management's Commitment

According to Díaz-Fernández, González-Rodríguez and Simonetti (2015), the extent of support for adopting new technology depends on the top management's vision for their application. As a result, top-management commitments to technology are likely to influence the industry's level of technology adoption as well as the activities or policies surrounding it. The degree to which top management's attitudes and perspectives are supportive of and receptive to technology adoption is referred to as top management's commitment to technology (Díaz-Fernández et al., 2015; Useem, 1993, p.422).

Beyond production management, top management is in charge of an entire industry. An industry's top management is responsible for overseeing external relations and the ongoing development and advancement of the sector (Wrede & Dauth, 2020; Carpenter et al., 2004). Managerial and professional employees in the industry are likely to make the majority of the strategic decisions on design and development, planning and production, innovation, and exporting.

Although people at higher management levels have more influence over decisions and, because the decisions are strategic, the top management's decisions and actions are likely to affect organisational transformation, growth, and development (Díaz-Fernández et al., 2015; Carpenter et al., 2004). As a result, it is anticipated that the level of technology adoption will be higher in industries with top management commitment to technology than in those without.

2.5.2.4 Cost of Capital

The quality of an industry's capital stock and its ability to innovate have a crucial role in its success (Colombo, Cumming & Vismara, 2016;). The amount of anticipated capital

investment and the ability of the industry to access finance for technology adoption are critical factors in the adoption of new technologies. As a result, capital is expected to facilitate the industry's ability to adopt new technologies. Regarding technology investment and adoption, the cost of capital is an issue that many sectors face. The term "cost of capital" describes "the overall cost-related issues related to the adoption of advanced technology, the cost of technology acquisition, the cost of equipment purchasing, and the cost of research and maintenance charges" (Baldwin & Lin, 2002, p.6).

2.5.2.5 Availability of Technical Skills.

The significance of human resources for fostering diversity and innovation has been emphasised by scholars (Liu, 2017). Similarly, as technology develops and is adopted, so does the demand for human assistance. Today's technology-based production places a growing emphasis on appropriate and efficient employee procedures. Changes in skill requirements must accompany many technological implementations, particularly the adoption of new production technologies (Veile et al., 2019). Even when an industry's technology operations are restricted to the adoption of already-existing technologies, they nevertheless require the services of highly skilled engineers and technicians in order to locate and utilise technology (Corò & Volpe, 2020).

Due to a lack of knowledge regarding the technical aspects, capabilities, and equipment utilisation, installing newer technology is hindered (Lam, 2000). One of the key factors in expanding small and medium-sized businesses has been identified as skilled labour, which is likely to facilitate the adoption of new technologies (Lin & Lai, 2021). Because technical skills are readily available, industries with a competent labour force that can support modern technology are more likely to be proactive in adopting technologies.

2.5.2.6 Competitive Advantage

Companies may be compelled to seek out new technology as a result of competition or environmental change. Industries in highly competitive markets must constantly assess and incorporate technological innovations in order to acquire a competitive advantage. It has been discovered that competitive advantage is the most important motivation for determining the level of technology adoption and implementation in an industry as one of the environmental variables that affect its strategy (Skordoulis et al., 2020). Therefore, enterprises are more willing to adopt new technology if they believe they can obtain a competitive advantage from doing so. Adoption of modern technology takes several forms, each of which is determined by the organisation's objectives (Varukolu & Park-Poaps, 2009).

For the most apparent reason, new technologies are needed better to serve the demands and desires of the industry. An enterprise's need to improve product and process flexibility, as well as specific manufacturing issues, may further drive technological advancement. In order to achieve a competitive advantage, modern technologies appear to be focused on creating better products and services at lower prices. Industry can obtain a competitive edge and expand due to the acceptance and application of new technology. Since the firm is expected to adopt sophisticated technology to preserve or acquire a competitive advantage, garment manufacturing is likely to do the same.

2.5.3 Effects of Technology Adoption on performance in the Fashion Industry

Technology is often seen as a strategic investment for businesses seeking a competitive advantage (Afenya et al., 2019). Furthermore, the spread of innovative technologies can profoundly influence various sectors of a country, contributing to economic expansion and development (Kossai & Piget, 2013). It is essential for Small and Medium

Enterprises (SMEs) to integrate technology into their operational processes. The adoption of technology can provide businesses with a distinct competitive edge against rivals (Andaregie & Astatkie, 2021).

Economic globalization presents an opportunity for both developed and developing nations to enhance their economic prosperity through increased participation in global trade (World Trade Report, 2016). A nation's global market competitiveness plays a crucial role in determining the extent of economic benefits gained from international trade participation or the survival of industries during the era of globalization. The 2016 World Trade Report by the World Trade Organization, focusing on “Leveling the Trading Field for SMEs,” point out the significance of SMEs in international trade. It examines the evolving global landscape for SMEs and the potential role of the multilateral trading system in fostering more dynamic and inclusive SME involvement in international markets (World Trade Report, 2016).

The 2005 World Development Report highlights the significant role of SMEs in economic growth. Recognized as key contributors to sustainable development in both developed and developing countries (World Trade Report, 2016; IBRD, 2005), SMEs address various developmental challenges, particularly in less developed nations. They are vital for social inclusion, tackling issues like poverty, inequality, unemployment among women and youth, limited industrial capabilities, and economic innovation. Furthermore, SMEs help in overcoming slow rural economic expansion and diversifying the export basket with essential product types, leading to more balanced, dynamic, and consistent growth (World Trade Report, 2016; Asare et al., 2015).

Ayyagari et al. (2014) stated that SMEs account for over 50% of employment in developing nations and 2/3 of formal non-agricultural private employment. According to

one theory, SMEs, which are a vital component of the economies of emerging countries, are one of the sectors that are most vulnerable to economic globalisation because of how competitive the difficulties are (World Trade Report, 2016; Asare et al., 2015). Large corporations, particularly Multinational Corporations (MNCs) and Transnational Corporations (TNCs), have a significant impact on small and medium-sized enterprises (SMEs), as they increasingly play a competitive role in the economies of developing nations and produce commodities primarily with competitive prices for the global market (Asare et al., 2015).

While theoretically addressing the limited market issue, the WTO trade regime's elimination of trade barriers and promotion of free trade has posed significant sustainability challenges for SMEs in developing countries. These entities often struggle with competitive pressures due to lesser capabilities. Surveys indicate that a considerable number of micro and small enterprises in developing nations close down soon after inception (World Trade Report, 2016). The research identifies several factors - managerial, social, economic, technological, cultural, and environmental - that influence the rapid failure of SMEs (Asare, 2015; Atalay, Anafarta, Sarvan, 2013), hindering their effective global market competition. Segarra and Callejon (2002) highlighted that in the globalized era, technology is a crucial factor in determining the longevity of SMEs.

In evaluating the success of SMEs, Duygulu et al. (2016) identified three mission-related factors: (1) survival, growth, and profit; (2) philosophy and value; and (3) public image. The improvement of industrial revenue, the creation of jobs, the acceleration of export growth, and the improvement of productivity are all examples of how the greater performance of SMEs might benefit the economy (Doh & Kim, 2014).

2.6 Empirical Review of Technology Adoption among SMEs

Varukolu's 2007 study in the Indian apparel sector focused on assessing the impact of organizational factors on technology adoption levels. The research specifically scrutinized elements like the size of the company, its export orientation, commitment from senior management, capital costs, technical skills, and competitive edge. A survey method was employed to collect data, and random sampling was used to select companies engaged in garment production and manufacturing. The findings indicated that larger firms tend to adopt technology more, whereas export orientation surprisingly showed a negative correlation. Additionally, competitive advantage was only slightly influential. Intriguingly, export orientation's negative impact was found to be interlinked with other organizational aspects. The study also found that the technology adoption level was not significantly influenced by senior management commitment, cost of capital, or technical capabilities.

Ghanaian SMEs in the Non-Traditional Fruit Exporters (NTFEs) sector have adopted E-commerce and internet adoption, according to a study by Acheampong and Gyawu (2011). Using data from four cases, researchers were able to determine how these organisations employed the Internet and E-commerce in their business operations, the benefits they gained, and the obstacles and hurdles they faced in reaching their goals. For SME-NTFEs in Ghana, internet use has become an important method of competing in the global market, according to findings from the research project.

Akomea-Bonsu and Sampong (2012) surveyed small and medium-sized businesses in the Kumasi Metropolis to learn about the influence of Information and Communication Technologies (ICT). The study examined whether the internet has altered business practices, whether ICT has contributed to the growth of ICT-adopting SMEs, and

whether or not the internet is essential for finding new contracts and expanding the market for businesses. It finds that the implementation of ICT has increased productivity in SMEs. The study sheds light on the obstacles that prevent the widespread use of ICT. A questionnaire was used to gather information from 40 small and medium-sized businesses about various aspects of information and communications technology (ICT). The study's findings indicate that few SMEs in Kumasi are aware of the advantages of using ICT. The vast majority of companies that utilise the internet mostly use it to identify customers and contracts, general business information, and e-mail rather than to get raw commodities. SME owners using ICT in their operations cite improved productivity and other advantages. ICT adoption was hindered by internal capacities, lack of financial assistance, lack of infrastructure, and personal reasons.

Kamau (2012) studied how widely Computer-Aided Design (CAD) technology is used in apparel design courses and training. The study aimed to determine whether selected public institutions' clothing CAD programmes sufficiently addressed Kenya's evolving labour needs, new demands on the global garment industry, and Kenya Vision 2030. The results showed that the mean values calculated for the understanding of apparel CAD among industries, students, and lecturers did not reveal any statistically significant variance. As a result, they all agreed that the graduates' training in CAD technology did not sufficiently prepare them for the demands of the apparel industry. In order to build curricula, train academic staff and students in computer-aided design (CAD), and provide CAD teaching and learning tools, collaboration between universities and the garment industry should be encouraged.

Abdullah et al (2013) undertook research to understand how internal, external factors, and unique traits of SMEs intertwine to highlight key facilitators significantly

influencing technology uptake in Malaysian SMEs. An initial investigation featuring detailed interviews was conducted, leading to the development and validation of a technology adoption model for SMEs, focusing on the effects of both internal and external elements and the attributes of SME owner-managers. This study employed a variety of case studies as its research methodology, with in-depth interviews as the primary data collection tool. Thematic analysis was applied to the gathered data to identify recurring themes across the cases. The findings revealed that both internal factors and the traits of SME owner-managers played a crucial role in the adoption of technology in SMEs, irrespective of the specific technologies used by these businesses.

Nguyen's 2019 study focused on the adoption of technology in small and medium-sized enterprises (SMEs) by examining and comparing recent literature. This research illuminated the facilitators and obstacles influencing the adoption process. It employed a literature review methodology, incorporating case studies and empirical findings on IT adoption from diverse sources such as Business Premier, Science Direct, JStor, and Emerald Insight. The research uncovered that SMEs embrace IT due to a variety of factors. Generally, a combination of internal and external pressures drives most of these transformations. The study developed a conceptual framework that integrates these different viewpoints, relevant to understanding IT adoption in SMEs.

According to Nazir and Zhu (2018), the study's primary goal was to further our understanding of the characteristics that influence e-commerce adoption in small and medium-sized enterprises (SMEs). The study evaluated the theory according to Tornatzky and Fleischer (1990). The TOE framework was enhanced by incorporating a particular context. Moreover, a case study was used as the research design for a

qualitative interpretive approach with a primary focus on epistemology and methodology as the guiding philosophical principles.

The study identified several key factors impacting the adoption of e-commerce among Pakistani SMEs, based on existing literature and gathered data, especially concerning the broadened individual context. These include the current state and efficacy of ICT infrastructure, the country's readiness for online operations, internet speed, the security of online transactions and data privacy measures, frequent power disruptions, the size and structure of the organization, the presence of a website and the simplicity of its payment process, a shortage of financial and ICT skills in human resources, conventional methods of conducting business, customers' preference for cash on delivery, and a general lack of consumer awareness about online purchasing options.

2.7 Theoretical Review

Technology adoption by individuals is described by the Technology Adoption Model (TAM), which focuses on two main constructs: perceived usefulness and ease of use (Davis, Bagozzi & Warshaw, 1989). The theory of planned behaviour (TPB) by Ajzen was also adopted (Wang, Lu, Hu, Gao, Asce & Pishdad-Bozorgi, 2020). TPB, a foundational theory, tests and predicts judgments incorporating three aspects: attitude, subjective norms, and perceived control (Harrison, Mykytyn & Riemenschneider, 1997).

Another study examined new technology innovation adoption using the TOE (technological, organisational, and environmental) framework. According to Albert and Hoque (2019), the TOE framework comprises three constructs: technological, organisational, and environmental contexts of the industry (Jere and Ngidi, 2020: Oliveira & Martins, 2011). Consequently, in Afenya et al. (2019), earlier studies have also used the Innovation Diffusion Theory (Athapaththu & Nishantha, 2018).

Actor-network theory (ANT) is the other theory used as a foundation in earlier works. According to ANT, an actor is a person who helps bring about a change or a distinction (Quaye, Onumah, Tortoe, Akonor & Buckman, 2018). The Dynamic Capabilities Hypothesis is another prevalent theory (Eze & Chinedu-Eze, 2018). According to the perspective of dynamic capabilities, a sector can enhance, adapt, adjust, reconfigure, refresh, and renew a business process more effectively than its competitors (Kim, 2011).

Previous studies have utilized a broader form of the unified theory of acceptance and use of technology for organizations (UTAUT2). This model incorporates four key elements—performance expectancy, effort expectancy, social influence, and facilitating conditions—to determine IT goals (Yao et al., 2021; Amril & Sari, 2019). Andaregie and Astatkie's investigation applies the modern theory of MSE development, originating in the 1980s, characterized by three aspects: adaptable specialization, elevated innovation competition, and extensive collaboration (Andaregie & Astatkie, 2021).

There are also some other theories adopted in previous research, namely, Upper Echelon Theory (UET) (Eze et al., 2021), incorporating organisational learning culture (OLC) (Wang et al. 2020), The Communications-for-Development (C4D) framework (Hoque et al., 2016), Management theory and the technological determination theory (Ardjouman, 2014), Technology Readiness theory (Astuti & Nasution, 2014), Behavioural and information technology adoption framework (Wright et al., 2013) and Theories of innovation and the organisational foundations (Kossai & Piget, 2014). Some studies also incorporated multiple theories to create their frameworks, such as Vu and Nguyen's study on innovation persistence, which combined the success-breeds-success theory, the accumulative knowledge theory, and the sunk cost theory (Vu & Nguyen, 2021).

2.7.1 The Technology Acceptance Model (TAM)

The Technology Acceptance Model (TAM), introduced by Davis in 1986, is a widely recognized framework for explaining user acceptance behaviour. This model is rooted in the Theory of Reasoned Action (TRA) and broader social psychology theories (Fishbein & Azjen, 1975). TRA posits that beliefs shape attitudes, which then inform intentions and ultimately drive behaviour. In the initial TAM model, Davis (1986; 1989) identified key constructs: perceived usefulness (PU), perceived ease of use (PEOU), attitude, and behavioural intention to use (refer to Figure 2.2). Notably, PU and PEOU are the primary beliefs about technology that lead to an overall attitude towards it, influencing its eventual adoption.

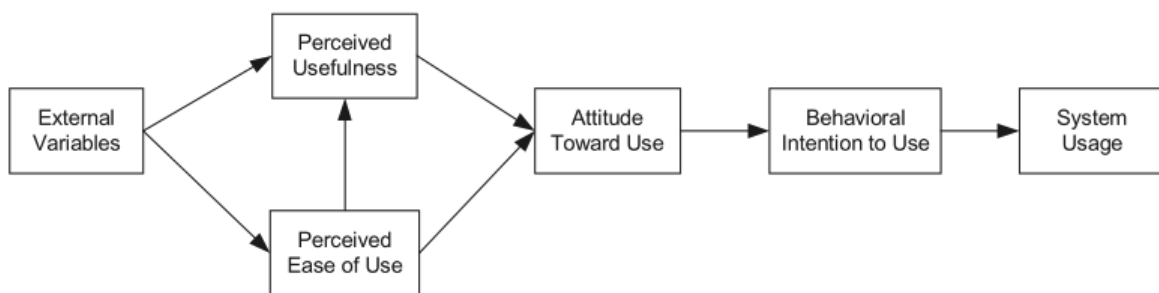


Figure 2.2: The Original Technology Acceptance Model

Source: Davis (1989)

Using PEOU and PU as two independent variables and the system used as the dependent variable, Davis (1989) carried out multiple studies to confirm TAM. His research revealed a significant correlation between PU and both self-reported current consumption and self-predicted future usage. PEOU was also strongly correlated with both present and anticipated consumption. Overall, he discovered that PU and system usage were significantly more correlated with each other than with PEOU. According to additional regression analysis, PEOU may be an antecedent of PU rather than a direct result of

system utilisation. To put it another way, PEOU directly influences TA through PU. The TAM, as shown in Figure 2.3 is validated.

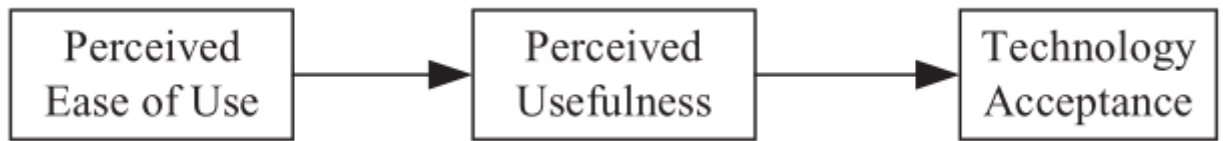


Figure 2.3: A Validated Technology Acceptance Model

Source: Davis (1989)

2.7.2 Diffusion of Innovations Theory (DOI)

The Diffusion of Innovation (DOI) Theory, introduced by E.M. Rogers in 1962, stands as one of the initial theories in social science. Initially used in communication, it explains the process through which an idea or product gains traction and spreads across a specific population or social system over a period. This spread leads to the eventual adoption of a new idea, habit, or product within a social system. Adoption signifies a change in behaviour, such as buying or using a novel product, or incorporating and executing a new behaviour. This theory explores the acquisition of new abilities, insights, and technological advancements by individuals when they become part of the system (Miller, 2015). It's essential for individuals to view concepts, actions, technology, and products as fresh and creative, stemming from innovative learning processes (Miller, 2015). The adoption hinges on one's capacity to perceive these elements as unique or creative, paving the way for widespread distribution.

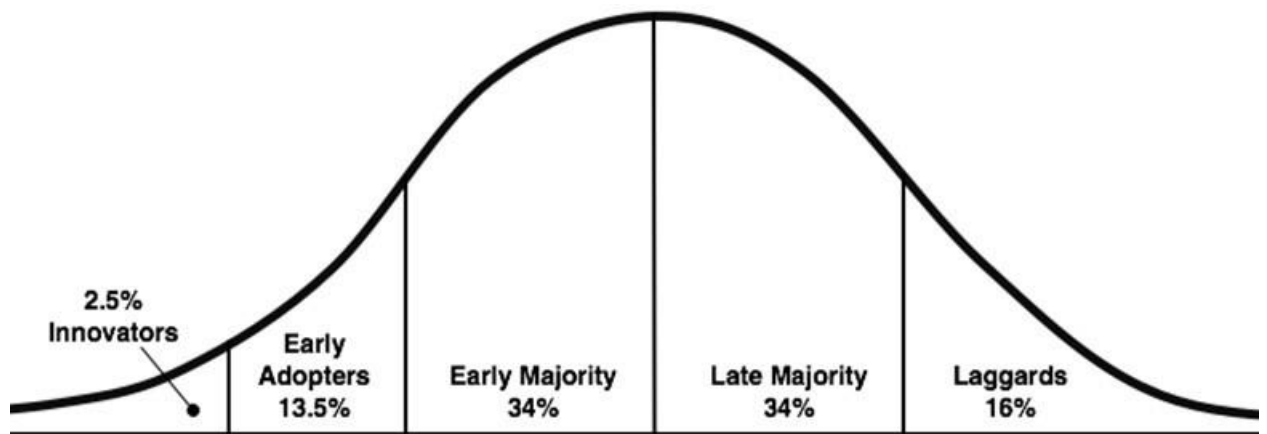


Figure 2. 4: Diffusion of Innovations Theory (DOI)

Source: Rogers (1962)

2.7.3 The Theory of Reasoned Action (TRA)

Research in social psychology on the connection between attitudes and behaviors led to the creation of the Theory of Reasoned Action (TRA), as proposed by Ajzen and Fishbein in 1980. This theory posits that most socially significant actions, including those related to health, are under volitional control, implying that individuals feel capable of performing the behavior when motivated. The theory further suggests that intention is influenced by two key elements: the individual's attitude towards the behavior (their overall evaluation of performing the action) and subjective norm (the perceived expectations of influential people regarding the individual's engagement in the behavior). Generally, if individuals have a positive view of the action and believe that key people in their lives think they should perform it, they are likely to have strong intentions to do so. However, the importance of these two factors can vary based on habits and demographic factors.

It is believed that attitude reflects a person's key behavioural assumptions about the possible adverse impact of their activity (Rossmann, 2021). For instance, a person will have a positive attitude toward the conduct if they believe that engaging in the behaviour

would have primarily positive personal outcomes. Attitude is considered a result of an individual's prominent behavioral beliefs, with each belief being influenced by their evaluation of the action's outcome, all summed up. One can derive an indirect measure of attitude based on beliefs by calculating the product of each behavioral belief and its associated outcome evaluation, and then summing these products together.

Similarly, according to Rossmann (2021), an individual's perception of what specific people or groups believe about them has an influence on their decision to engage or not engage in certain conduct. If individuals believe that the most important norms expect them to behave in a certain way, they may feel social pressure to comply. This approach suggests that the subjective norm is determined by the individual's salient normative views towards each referent, with each view being weighted by their motivation to conform (Fishbein & Ajzen, 2010). By calculating the sum of the normative beliefs multiplied by the corresponding motivation to conform for each referent, it becomes possible to indirectly measure the subjective norm.

The theory of planned behaviour (TPB), introduced by Ajzen in 1991, aimed to expand the scope of the theory of reasoned action (TRA) to incorporate actions that require knowledge, resources, opportunities, or collaboration in order to achieve success. This broader perspective was necessary to cover behaviors beyond voluntary control, such as quitting smoking or using a condom. Ajzen's modification to the TRA included a new variable called perceived behavioral control, which accounted for the perceived ease or difficulty of performing the behavior. This variable was believed to encompass past experiences and potential obstacles (Conner & Sparks, 2015).

Just as subjective norm stems from normative beliefs, Ajzen proposes that perceived behavioral control originates from control beliefs, likely impacting intentions directly. Higher perceived behavioral control typically leads to firmer intentions towards chosen actions. Perceived behavioral control can also forecast behavior directly through two distinct routes. Firstly, without altering intent, an individual with greater perceived behavioral control tends to exert more effort and persist longer compared to one with lesser control. Second, people’s judgments of their level of control over their conduct might be true (Montano & Kasprzyk, 2015).

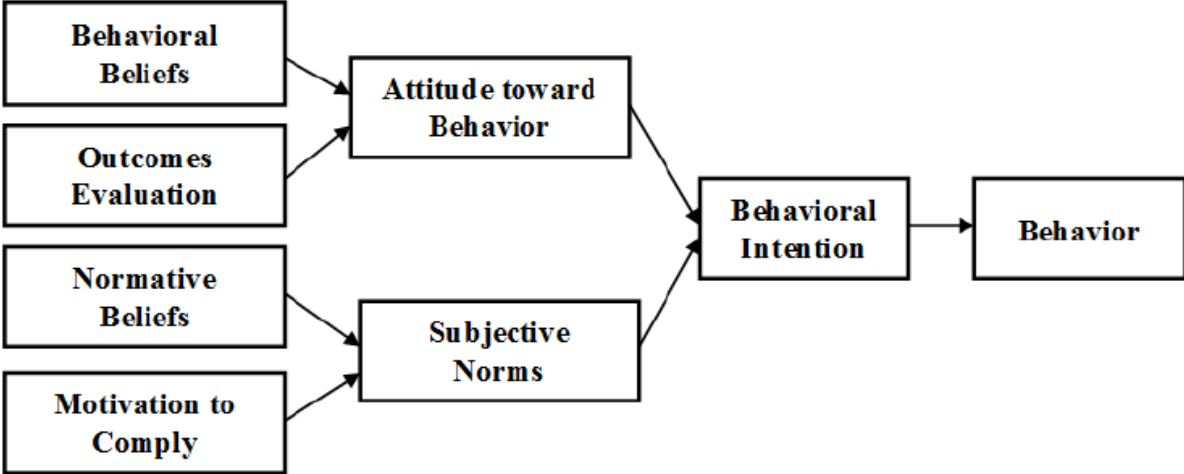


Figure 2. 5: Theory of Reasoned Action (TRA)

Source: Ajzen & Fishbein (1980)

2.7.4 Theory of Planned Behaviour (TPB)

The Theory of Planned Behaviour, an advancement of the Theory of Reasoned Action created by Fishbein in 1967, aims to forecast behaviors that individuals can control. This earlier theory, also by Fishbein, is based on an expectancy-value framework. Here, a person's attitudes towards an object or action stem from specific expectations or beliefs about that object or action, coupled with an assessment of these expectations or beliefs (Montano & Kasprzyk, 2015).

The Theory of Planned Behaviour posits that the central determinant of a person's decision to engage or abstain from a behaviour is their intention (Ajzen, 2005). Ajzen (2005) identifies three primary factors shaping this intention: (a) attitude towards the behaviour, (b) subjective norms, and (c) perceived behavioural control. As per Ajzen (1991), attitude towards the behaviour is shaped by one's beliefs about potential outcomes and their evaluations, termed behavioural beliefs. Subjective norms encompass beliefs regarding others' normative expectations and the desire to adhere to these expectations, highlighting the role of societal influence on specific behaviours.

Perceived behavioural control involves beliefs regarding one's capability to manage the behaviour's execution. The propensity to act is accurately forecasted by one's attitude towards the behaviour, the subjective norms surrounding it, and their perceived behavioural control over the specific behaviour (Ajzen, 2020). Since behaviour is determined by behavioural intention, and behavioural intention itself is influenced by attitudes towards the behaviour, subjective norms, and perceived behavioural control, it fundamentally implies that all four elements within the Theory of Planned Behaviour predict behaviour.

The Theory of Planned Behaviour (Ajzen & Kruglanski, 2019) serves as a universal model for behavioural prediction, validated empirically across various actions such as exercise, voting, blood donation, healthcare workers' glove usage, dental flossing, traffic violations, condom application, among other behaviours. This theory (Meng & Choi, 2019) is utilised to rationalise an individual's reasoned process in deciding on a prospective behaviour. Ajzen (2005) suggested this theory indicates that an individual may hold divergent attitudes towards a behaviour, which, in turn, influences their social norms and perceived behavioural control, altering the likelihood of engaging in the

behaviour. The Theory of Planned Behaviour (Ajzen, 1991) is illustrated in figure (2.4) below.

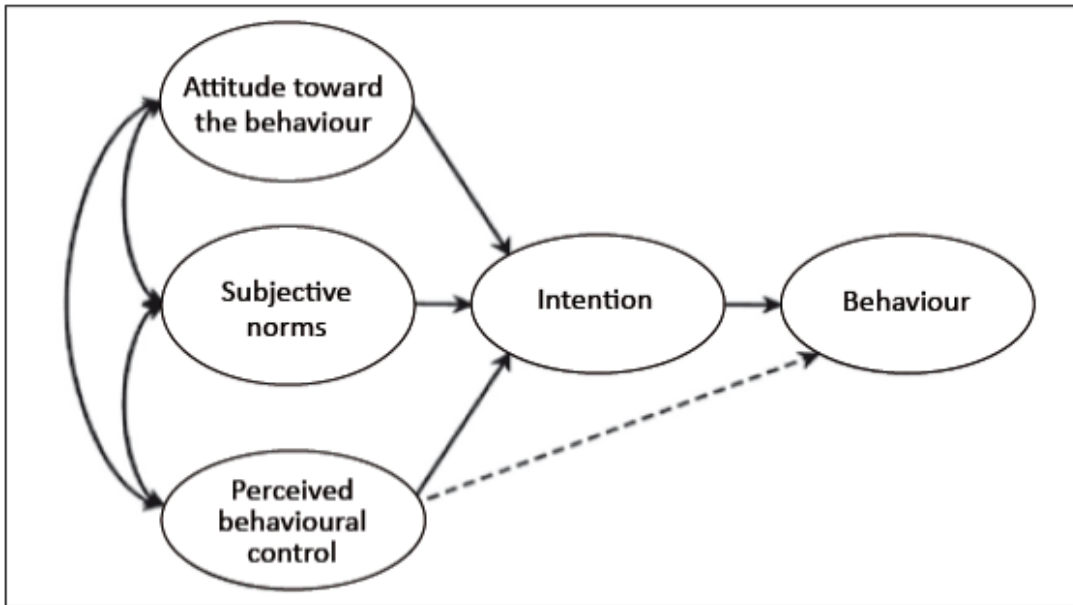


Figure 2. 6: Theory of Planned behaviour

Source: Ajzen (1991)

2.7.5 Technology-Organization-Environment Framework (TOE)

Originally developed by Tornatzky and Fleischer in 1990, the TOE framework was designed to examine the adoption of diverse information technology products and services at the organizational level. Since its inception, scholars examining technology adoption have increasingly adopted the TOE framework as a primary theoretical lens. This adoption has enabled researchers to assess and confirm the superiority of the TOE framework over other adoption models in terms of their effectiveness for technology utilisation, adoption, and the value generated in the SMEs sector through technological innovation (Hamad, Elbeltagi, Jone & ElGohary, 2015; Ramdani, Kawalek & Lorenzo, 2009). This is achievable through the integration of various unique elements, including

technological, organisational, and environmental aspects. The TOE framework is favoured for several reasons, encompassing user adoption of ICT, its impact on value chain activities, implementation, diffusion across organisations post-adoption, prediction of challenges, the capability to enhance organisational competencies via technology, and other factors influencing business decisions concerning innovation-adoption.

The TOE Framework offers a more comprehensive viewpoint on how technology adoption is conducted and examines the entire technology adoption process at the organisational level (Lippert & Ph, 2006). According to Tornatzky and Fleischer (1990), all three settings of the TOE framework impact how technical innovations adopt the framework and how it is put into practice. The three settings of the Technological, Organizational, and Environmental (TOE) framework are briefly described in the sections below;

Technological Context:

According to Claycomb, Iyer and Germain (2005), the technological context is made up of several factors that have an impact on how individuals, organisations, and industries adopt new technologies. It was further separated into five innovation attributes by Dedrick and West (2003) that affect the likelihood of adoption. The adoption depends on numerous technologies, both inside and outside the company, according to a thorough understanding of the technological context. Additionally, it depends on the application's perceived comparative advantage, learning curve difficulty, observability (imitation), compatibility (organisational as well as technical), and trialability (experimentation).

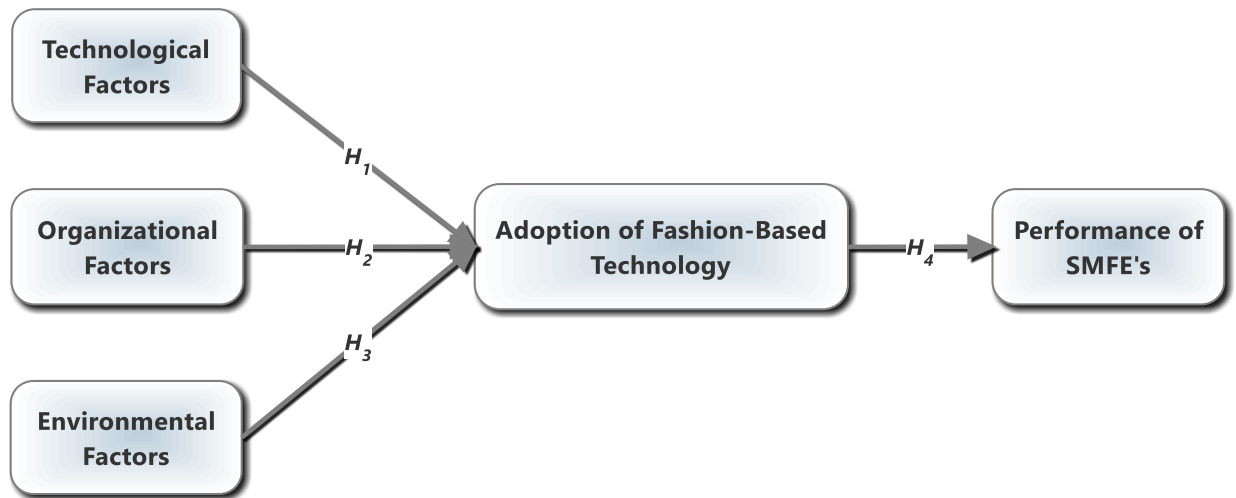
Organisational Context:

The organisational context looks at how the company's formal and informal structures interact with one another (Tornatzky & Fleischer 1990). Also, it relates to how the company perceives the availability of organisational resources to adopt related technology. Organizational readiness (Acheampong & Moyaid, 2016), top-level management support (Ahmad & Siraj, 2018), data management (Puklavec et al., 2018), company's culture, corporate goals, prior ICT experience, owner innovation, information intensity, cost, and size are all cited as major variables within the organisational environment, for the adoption process of new technologies inside organisations (Albar & Hoque, 2019).

Environmental Context:

Environmental Context relates to how the company perceives pressure from outside the company that encourages the company to adopt related technology (Kuan & Chau, 2001; Lippert & Ph, 2006). This category involves components that either speed up or slow down areas of operation. Albar and Hoque (2019) have identified a number of important factors, such as the need to outperform competitors, socio-cultural concerns, the readiness of business partners, government support and encouragement, and infrastructures for supporting technology.

2.8 Conceptual Framework and Hypothesis Development



Model Adapted from Tornatzky & Fleischer (1990)

2.8.1 Nexus between Technological Factors and technology adoption

The technological context, according to Musawa and Wahab (2012), is made up of a number of elements that affect how people, organizations, and industries adopt new technologies. Straub (2009) further subdivided it into five innovative attributes that influence the chance of technology adoption. This means that the adoption of new technology is highly dependent on a variety of internal and external factors, depending on how well the technological context is understood.

Additionally, Amin and Hussin (2014) succinctly asserted that it depends on the application's perceived comparative advantage, the complexity of its learning curve, its observability (imagination), organizational and technical compatibility, and trialability (experimentation). The emphasis of this study was the compatibility and relative advantage of the technology within the setting of the garment manufacturing business. Since the fashion sector is the focus of this study, adaptable technologies must be

compatible with the established processes of garment manufacture and provide a competitive advantage over rival enterprises.

Nonetheless, Tajudeen et al. (2018) found that the technological context (utilised, accessible, and emerging technologies), organisational context (extent, magnitude, and managerial backing), and environmental context (sector, rivals, and commercial environment) of a firm shape and elucidate the adoption of technology. Generally, the findings indicated that the adoption and application of technology positively affect an organisation's tendency to use technology in support of its operations.

For instance, Khan and Ali (2018) investigated retailers' adoption of mobile payment systems; based on an enhanced model of the TOE framework, eleven criteria were proposed to characterize retailers' acceptance of mobile payment systems. Compatibility and comparative advantages were determined to be the most influential determinants of mobile payment system adoption intent. Based on previous studies, it is therefore hypothesized that:

Hypothesis 1: Technological factors positively influence technology adoption in an enterprise.

2.8.2 Relationship between SMSFEs' Organizational Factors and Technology Adoption

The organizational factors include the internal characteristics of the firm, such as employees, turnover, managerial structure, and related issues. This study employed top management support (Owners and Managers of Fashion Houses) and employee readiness as a proxy for organizational factors. Although, there are many others (i.e., entrepreneurial orientation, facilitating condition, technological competency). Most prior

studies mainly focused on top management (Ahmad et al., 2019) as the agency for changing organisations' norms, values, and culture. They can build an encouraging environment to enable the adoption of technology by developing an idea of how the adoption of technology will benefit the firms (Olanrewaju et al., 2020). Notably, Qalati, Yuan, Khan and Anwar (2021) found a positive association between top management support and the adoption of technology among SMEs operating in the UAE and Malaysia.

Recently, Khan and Ali (2018) found the positive effects of top management support on the behavioural intention to adopt technology among Chinese firms. This study also includes employee readiness as one of the proxies for organizational factors. It is one of the crucial factors in the context related to the adoption of technologies. Ahmed et al. (2019) used the TAM from an employee's user perspective. It addresses those factors that form employee readiness for e-business and enable their intention to use e-business technologies. It focuses on technology-intensive firms while combining Davis' technology acceptance.

More specifically, the results demonstrate that the four EREB model dimensions account for 50.2% of the variance in perceived usefulness and 58.2% of the variance in perceived ease of use. Together, perceived utility and perceived ease of use fully mediate the association between higher-order EREB construct and desire to use technology, accounting for 51.8% of the variance in intention to use. From the above, the researcher maintains that employee readiness similarly can be related to the case of workers engaged in working in a Fashion House since they play a key role in the adoption of technology in SMSFEs. Based on the above literature, it is hypothesized as follows:

Hypothesis 2: Organisational factors positively influence technology Adoption in an enterprise.

2.8.3 Relationship between SMSFEs' Environmental Factors and Technology Adoption

Environmental factors relate to how organizations interact with their customers, the government, rival businesses, and suppliers. It includes the industry's structure and size, the regulatory environment, the competition, and the macroeconomic environment (Hung et al., 2016). This study focused on competitive forces because it was concerned with SMSFEs. The term "competitive pressure" describes how much an organization is affected by its rivals in the market (Chau et al., 2020). It is seen as a key factor in SMEs' adoption of technology (Olanrewaju et al., 2020). When more industrial participants adopt technologies, the demand for SMEs increases (Khan & Ali, 2018; Tajudeen et al., 2018). It is possible to apply the relationship between competitive pressure and technology adoption to the apparel manufacturing sector (Chau et al., 2020). Most businesses adopt technology after realizing their rivals do. Additionally, businesses use it widely to gain a competitive advantage (Shankar & Datta, 2018).

Previous research by Chau et al. (2020) and Tajudeen et al. (2018) also revealed that more competition led to a greater use of social media and mobile commerce. According to Oliveira et al. (2016), this shows how external forces like the rivalry between businesses can affect technology adoption if they are seen as profitable. Furthermore, it was one of the aspects of extraneous influence used by Liébana-Cabanillas et al. (2014). Several studies conducted in the recent past discovered a positive correlation between industrial competitiveness and the likelihood of technological adoption (Park et al., 2019). Therefore, based on the aforementioned arguments, the researcher proposes that:

Hypothesis 3: An enterprise's competitive environment positively influences technology adoption.

2.8.4 Relationship between Technology Adoption and SMSFEs Performance

Besides identifying the antecedents of SMEs' adoption of technology, this study also assessed the effects of technology adoption on the performance of SMSFEs. Empirical studies have consistently shown that technology adoption can lead to significant improvements in various aspects of enterprise performance, such as productivity, efficiency, and competitiveness. A study by Chou, Chuang & Shao (2014) found that the adoption of information technology (IT) can lead to significant increases in productivity and efficiency. The study analyzed data from a sample of US firms and found that firms that adopted IT experienced productivity growth that was, on average, 2-3% higher than firms that did not adopt IT. Similarly, a study by Loebbecke and Picot (2015) found that the adoption of IT led to a reduction in costs and an increase in efficiency in the manufacturing sector.

Another study by Prasanna et al. (2019) found that technology adoption can lead to improvements in competitiveness. The study analyzed data from a sample of US manufacturing firms and found that firms that adopted new technologies had a higher market share and profitability than firms that did not adopt new technologies. Additionally, a study by Usai et al. (2021) revealed that technology adoption can lead to improved innovation performance in firms. The study analyzed data from a sample of Finnish firms and found that firms that adopted new technologies had a higher level of innovation than firms that did not adopt new technologies.

Previous studies have found a positive relationship between the adoption of technology and SME performance (Khayer et al., 2020; Talom & Tengeh, 2020; Ahmad et al., 2019). In the context of garment manufacturing or the fashion industry, very few studies were conducted to investigate the effects of technology adoption on their performance. Further, existing literature claims that technology can significantly influence firms in terms of productivity, cost and general efficiency (Talom & Tengeh, 2020; Zumanu, 2019). Therefore, when SMEs adopt technology, it will decrease their process time, increase sales, speed up the buying process, and enable them to relate well with their customers.

In conclusion, empirical studies have consistently shown that technology adoption can lead to significant improvements in various aspects of enterprise performance, such as productivity, efficiency, competitiveness, and innovation performance. From the review of the adoption of technology and its effects on SMSFEs performance, the hypothesis below is proposed:

Hypothesis 4: The level of an enterprise's adoption of technology positively influences its performance.

CHAPTER THREE

METHODOLOGY

3.1 Introduction

This chapter of the study provides a detailed description of the research design, including the geographic scope, data gathering and analysis procedures, the population being studied, and the sampling method. It also highlights the instruments that were used in the study. Furthermore, the chapter addresses the ethical considerations involved in data collection in Kumasi Metropolis, which is the study's area of focus.

3.2 Research design

A good research design reduces the potential for error in data collection and analysis; examples include descriptive, exploratory, explanatory, and experimental research. Given the focus of this study, the descriptive research design was deemed suitable. Akhtar (2016) advances the view that descriptive research, sometimes called statistical research, provides a detailed account of a situation in its actual form. It is employed to locate and collect data on a specified community, group, or persons. Thus, one might argue that studies of this nature provide descriptions of social phenomena, social organisation, and social contexts. What, who, where, how, and when are all questions that can be addressed through descriptive research. This design is employed in order to analyse the existing situation.

The researcher chose a quantitative approach for their study, as advocated by Kobiruzzaman (2022), due to its focus on collecting, analyzing, and generalizing numerical data for making conclusions. This approach, known for utilizing statistical data to support or refute research hypotheses, is considered a robust research

methodology. The adoption of this approach is justified by its numerous advantages: it relies on concrete, verifiable data, allows for a larger sample size, enables quick data collection, ensures participant anonymity, facilitates remote study execution, and generates reusable information.

3.3 Population for the Study

The purpose of the study provides a proper definition of the population to be examined, in terms of location and restriction to a specific age group, sex, or occupation, when selecting a population for study (Spector, 2021). In the same way, the population must be thoroughly specified so that individuals who are to be included and excluded are spelt out (inclusion and exclusion criteria). Also, the target population is a group of individuals from whom the researcher intends to conduct research and draw conclusions (Malvoti et al., 2021). In Ghana, Fashion Houses are the main category of businesses that fall under SMEs in the garment industry, so the researcher used registered fashion houses from the database obtained from the secretariat of the Ghana National Association of Garment Makers (GNAGM) and Ghana National Tailors and Dressmakers Association (GNTDA). Data from the GNAGM secretariat suggests that the association has over 9,500 members all over Ghana and more than 1000 members in the Ashanti region. About 500 members are in Kumasi, with 331 being managers or owners of Fashion Houses in the Kumasi Metropolis.

In addition, data from the GNTDA secretariat also indicates that the association has over 10,000 members all over Ghana and more than 1200 members in the Ashanti Region. About 820 members are in Kumasi, with 670 being managers or owners of Fashion Houses in the Kumasi Metropolis. Therefore, the total population for the study stands at 1001. The target population details are shown in Table 3.1.

Tables 3.1 Distribution of Fashion House Managers/ Owner’s Population

Group	GNTDA	GNAGM	TOTAL
Members	670	331	1001

Source: Secretariat of GNTDA & GNAGM, 2022

3.4 Sampling Techniques

The main function of the sample is to allow the researcher to conduct the study on selected samples from the population so that the results of the study can be used to derive conclusions that will apply to the entire population (Bhardwaj, 2019). The sample frame for this study includes small and medium-sized fashion enterprises in Kumasi. A list of all GNTDA and GNAGM registered members in Kumasi was randomly selected from the associations’ database with their contact details and locations.

3.5 Sample Size

A sample is a small proportion of the population selected for the study and collects data for analysis (Bhardwaj, 2019). The sample size of every study is subject to the nature of the population, the kind of data to be collected, the type of analysis to be carried out, and the availability of funds for the study. The reason sampling is utilised in research studies is that it would be extremely expensive and time-consuming to survey the entire population. Also, sampling makes it possible to calculate sampling errors (Bhardwaj, 2019).

The ever-increasing need for a representative statistical sample in empirical research such as this has created the demand for an effective method of determining sample size. This study adopted Yamane, (1967) formula for sample determination to determine the appropriate sample for the study. The formula is defined below;

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

Where n is the sample

N is the population and

e is the error term

$$n = \frac{1001}{1 + 1001(0.05)^2} = 286 \approx 290 \text{ target sample}$$

Considering the population of the study was drawn from two groups, ratio and proportion was used to determine the samples to be drawn from each group. The formula is given as “ $A/B \times C$ ”, where A is the Group Population, B is the Total Population, and C is the Target Sample. For instance, to determine the sample for GNTDA is given as $670/1001 \times 290 = 193$. The same approach was used to determine the sample for GNAGM.

Table 3.2 shows the sample size determination for each target group selected to respond to self-administered questionnaires for the data collection.

Tables 3.2 Sample Size Determination

Respondents	Population	Sample size
GNTDA	670	194
GNAGM	331	96
Total	1005	290

Source: Fieldwork, 2022

3.6 Data Collection Instruments

This study employed a quantitative approach to data collection; hence, a self-administered questionnaire was used. The term “questionnaire”, according to Annum (2020), refers to a standardised form or document with a predetermined set of questions

meant to elicit responses from respondents or research participants for the purpose of data or information collection. Questionnaires can be useful for gathering information, but only if they are designed and administered properly, distributed in an appropriate format, and retrieved from responders (Testa & Simonson, 2017). The reliability and precision of the information gathered compromised these methods. The researcher used an online survey that made it easy and quick to gather information online.

This data collection instrument was used because the questionnaires can cover every aspect of a topic, are inexpensive, and provide a means to collect large amounts of data on any subject (Heap & Waters, 2019). Once more, using the questionnaire will ensure that responses are consistent, uniform, and stable. Using it allows respondents to take the survey at their convenience and will further protect their identity. There will be both closed-ended and open-ended questions. Moreover, it determines the limits of the present technology, chooses whether or not to adopt new technology, assesses the wants and requirements of employees and evaluates the adoption of new technology readiness of organisations.

To respond to the study questions, descriptive data interpretation (frequencies, mean, and standard deviation) was used. Agreement with the item statement is indicated by a mean of 3.1 or higher, while disagreement is indicated by a mean of 2.99 or lower. Additionally, data will be examined using inferential statistical methods such as regression and correlation.

3.7 Validity and Reliability

The instruments used to test the validity and reliability of the study included a structured questionnaire. In order to choose the right descriptive statistics tool, the researcher

needed to consider the type and number of variables used as well as the objective of the analysis. For this study, the reliability of the data collected through the questionnaire schedules was determined through the pretesting that was carried out. The data collected was found to be valid and reliable through the reliability analysis. Validity and reliability are important aspects of any research. Because of the difference between them, validity and reliability can be addressed in different ways.

3.7.1 Validity

In any research, 'validity' is an important concept to keep in mind. If research has low validity, it is worthless (Cohen, et al., 2005). The study used a content validity technique to assess the validity of the research instruments. This technique refers to the extent to which a measure or instrument adequately covers the topic it is supposed to cover under the study (Kothari, 2004). The technique ensured that the variables, stated in the objectives, measured appropriately. Expert advice was sought from supervisors, and their suggestions were used to make necessary corrections in the instruments. Content validity was ensured through well-constructed items and well-edited statements to suit the level of understanding of the respondents. Basically, it is a metric for determining whether or not a questionnaire or test adequately reflects the depth of data or behaviour that it is meant to evaluate. Experts in the field were approached to assess the items in the measure and give input on whether or not the measure was an accurate representation of the construct or topic in question.

3.7.2 Reliability

Nicolas (2022) defined reliability as the consistency of the measurement instrument. Furthermore, reliability demonstrates how reliable the test result is. The information is credible if the obtained data yields consistent results when examined using different

methodologies and sample groups. Reliability is another important measure of sound measurement. To ensure high internal consistency in the study, a reliable test was conducted using the Cronbach alpha technique. According to Santos (1999), Cronbach's Alpha correlation coefficient may be used to describe the reliability of factors from multi-point formulated questionnaires or scales.

Cronbach's alpha is a statistical method for evaluating the reliability of a multi-item scale used in a study or survey (Ravinder & Saraswathi, 2020). For any given scale or test, a higher alpha value indicates that the elements are more consistent with one another. The higher the alpha, the more likely it is that the scale's items all measure the same underlying concept. A significance level of .7 or higher is commonly accepted for scientific studies, indicating that the instrument is very reliable.

3.8 Ethical Considerations

This study aims to give empirical information about the status, activities, and organisational factors that affect the level of technology adoption in small and medium-sized fashion firms in the Kumasi Metropolis. This gives the study justification; thus, it is critical to respect respondents and get their informed consent.

The participants were free to accept or decline the offer to take part in the study at their discretion. Participants were given enough information about the study's objectives and purpose, the nature of the survey itself, how their responses would be used, the ultimate audience for the study's findings, the participants' rights as research subjects, and where they could go to learn more about these topics before deciding whether or not to take part. As a result, the researcher was able to secure the subjects' informed permission. It was entirely up to each individual to decide whether or not to take part.

Relatedly, the study dealt with the ethical concerns of anonymity and confidentiality, understanding that any data collected from or about a participant in a study should be kept private. Due to this, respondent anonymity was ensured. Participants were not required to provide their identities or the names of their respective organisations to maintain their anonymity. In addition, the researcher assured participants that their information would be treated confidentially and used only for the thesis.

3.9 Data Analysis

The data was first entered into a Microsoft Excel spreadsheet which was then cleaned. And then, a file was created in the Statistical Package for Social Sciences (SPSS) Software version 26. The coding was done, and then data was transferred from the excel spreadsheet onto the SPSS file. Having the data in SPSS allowed the researcher to analyse the data. Data analysis was presented in the form of tables and charts. The data analysis was both descriptive and inferential in nature.

The descriptive analysis took the form of descriptive statistics tables specifying the measures of central tendency, whereas the inferential statistics took the form of regression analysis. The full details of the data analysis are presented in the next chapter of this research report.

CHAPTER FOUR

DATA PRESENTATION AND ANALYSES

4.1 Introduction

The aim of this study was to evaluate the level of technology adoption among SMEs in the fashion industry in Ghana. This chapter presents the findings obtained from the data analysis. A total of 290 questionnaires were distributed to managers and owners of fashion houses in the Kumasi metropolis. Out of the 290 questionnaires distributed, 278 representing approximately 96% valid response rate were collected. The researcher could not retrieve the remaining 12 questionnaires as the respondents could not be located.

4.2 Demographic Profile of respondents

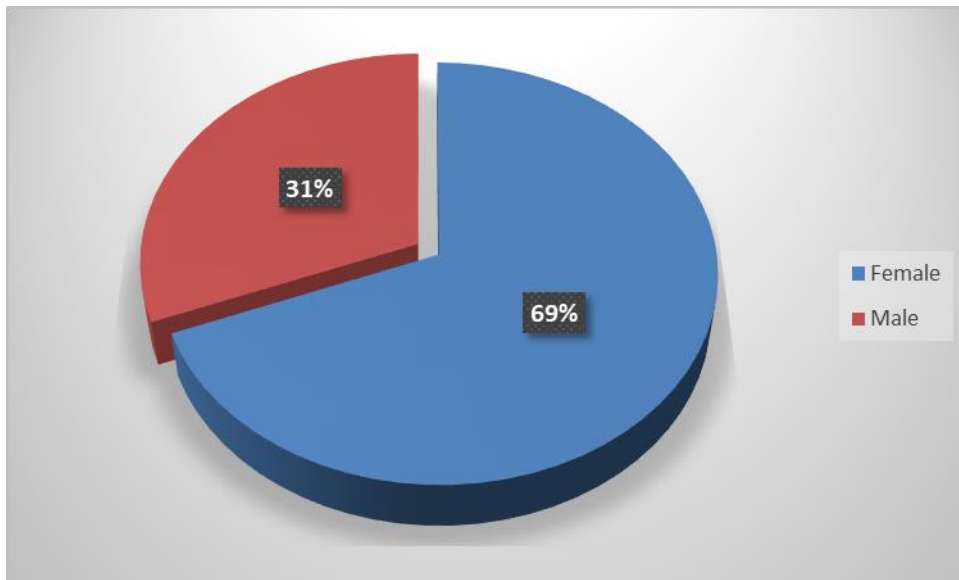


Figure 4.1 Gender distribution of respondents

Source: Fieldwork (2023)

Figure 4.1 displays the gender distribution of the respondents who took part in the study. The figure reveals that the majority of the participants were females (n=192, 69%), while

males accounted for 86 respondents, representing 31% of the study population. These findings indicate that the fashion industry in Kumasi is predominantly female-dominated. These results have significant implications for the fashion industry in Kumasi. Firstly, it suggests that there is a need for gender-sensitive policies that promote equal representation and opportunities for both males and females in the industry. Secondly, it highlights the potential for increased female empowerment and entrepreneurship in the sector. Finally, the results underscore the importance of addressing gender disparities in the fashion industry and the broader society.

Table 4.1 Age of Respondents

Age range	Frequency (<i>n</i>)	Percent (%)
21 - 30 yrs.	84	30.2
31 - 40 yrs.	82	29.5
41 - 50 yrs.	72	25.9
50 yrs & above	40	14.4
Total	278	100.0

Source: Fieldwork (2023)

Table 4.1 presents the age distribution of the respondents who participated in the study. A total of 278 participants were surveyed. The data shows that the largest age group was respondents between the ages of 21 to 30 years old, with a frequency of 84, representing 30.2% of the total participants. The second largest age group was respondents between the ages of 31 to 40 years old, with a frequency of 82, accounting for 29.5% of the participants.

In the 41 to 50 years old age group, there were 72 participants, representing 25.9% of the total participants. Finally, the group of respondents aged 50 years and above had a frequency of 40, accounting for 14.4% of the total participants.

The results emphasize the diversity of age groups within the fashion industry in Kumasi. This information is valuable for understanding the characteristics and needs of different age groups within the industry and can inform policies and strategies for targeting and engaging with different segments of the industry.

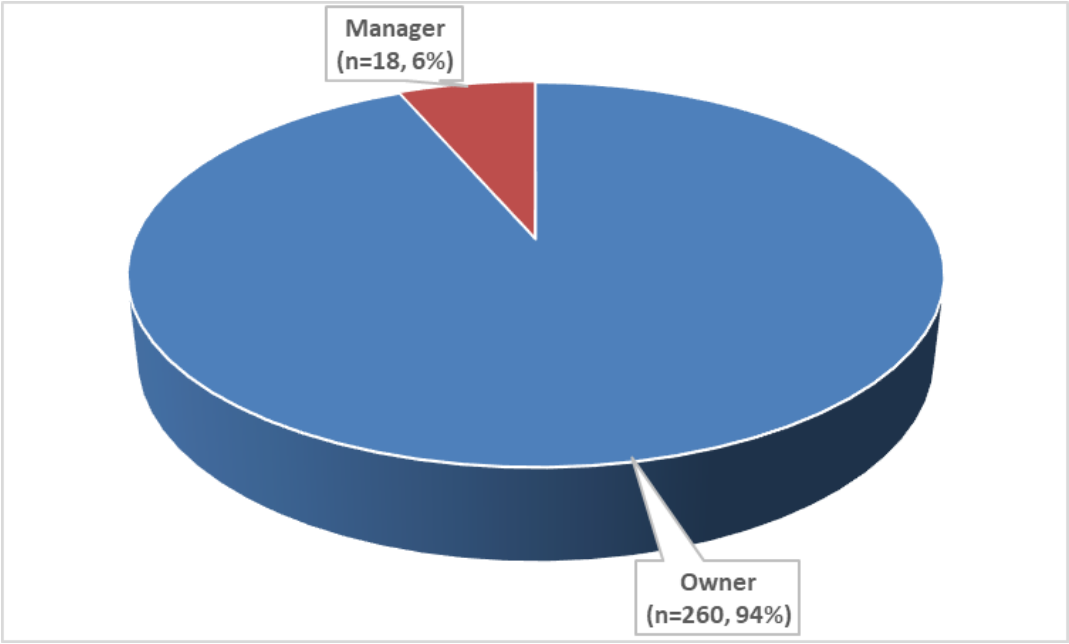


Figure 4.2 Status of respondents

Source: Fieldwork (2023)

Figure 4.2 shows the status of respondents who participated in the survey. The output evidences that overwhelming majority of the respondents were fashion house owners (n=260, 94%) whereas less than 20% of the respondents were managers in their respective fashion houses. Practically, this holds true and represents a fair reflection of industry trend where most apprentices transition into setting up their own fashion enterprises after graduation. It is worth noting that rarely do the owners relegate their businesses for others to manage for them.

Additionally, the results have important implications for policymakers and stakeholders in the fashion industry as it underscores the importance of providing training and support

for business management and leadership skills for fashion house owners. Finally, the findings suggest that there may be limited opportunities for career advancement within the industry for those interested in management positions.

Table 4.2 Educational qualification of Respondents

Educational level	Frequency (<i>n</i>)	Percent (%)
No Formal Education	4	1.4
Primary/JHS	138	49.6
SHS/Voc/Tech	59	21.2
Certificate/Diploma	34	12.2
Degree/Postgraduate	43	15.5
Total	278	100.0

Source: Fieldwork (2023)

Table 4.2 displays the educational qualifications of the respondents who participated in the study. The data indicates that the majority of the respondents had completed primary or junior high school education, with a frequency of 138, representing 49.6% of the total participants. The second largest group of respondents had completed senior high school or vocational/technical education, with a frequency of 59, accounting for 21.2% of the total participants.

A total of 34 respondents had completed a certificate or diploma programme, representing 12.2% of the total participants. A smaller group of respondents had completed a degree or postgraduate programme, with a frequency of 43, representing 15.5% of the total participants.

The results implies that while many fashion industry workers in Kumasi may not have formal higher education qualifications, they have acquired skills and knowledge through other means such as vocational training and apprenticeships. Furthermore, the results

underscore the importance of recognizing and valuing informal education and skills training in the industry.

Table 4.3 Number of years in business

Years in business	Frequency (<i>n</i>)	Percent (%)
< 1 year	8	2.9
1 – 5 years	80	28.8
6 – 10 years	58	20.9
11 – 15 years	26	9.4
> 15 years	106	38.1
Total	278	100

Source: Fieldwork (2023)

Table 4.3 presents the number of years that respondents have been in the fashion business. The results shows that the largest group of respondents had been in business for more than 15 years, with a frequency of 106, accounting for 38.1% of the total participants. The second largest group of respondents had been in business for 1 to 5 years, with a frequency of 80, representing 28.8% of the total participants. Respondents who had been in business for 6 to 10 years and 11 to 15 years had frequencies of 58 and 26 respectively, representing 20.9% and 9.4% of the total participants. Finally, a small number of respondents had been in business for less than one year, with a frequency of 8, accounting for 2.9% of the total participants.

This finding suggests that the fashion industry in Kumasi is composed of a mix of established businesses and newer enterprises. The mix of established and newer enterprises in the fashion industry in Kumasi has implications for the competitiveness of the industry. Established businesses may have more resources and market power, which could limit the growth of newer businesses and reduce competition in the industry.

However, newer enterprises bring innovation and new perspectives that can drive competitiveness and support the growth of the industry.

Table 4.4 Number of staff

Number of staff	Frequency (<i>n</i>)	Percent (%)
1 – 5	194	69.8
6 – 10	62	22.3
11 – 15	16	5.8
16 – 20	4	1.4
Above 20	2	.7
Total	278	100.0

Source: Fieldwork (2023)

Table 4.4 displays the number of staff employed by the respondents' fashion businesses. The output in the table indicates that the majority of the respondents employed between 1 to 5 staff, with a frequency of 194, representing 69.8% of the total respondents. The second largest group of respondents employed between 6 to 10 staff (n=62, 22.3%) of the total participants.

Respondents who employed between 11 to 15 staff had a frequency of 16, representing 5.8% of the total participants. A smaller group of respondents employed between 16 to 20 staff, with a frequency of 4, accounting for 1.4% of the total participants. Finally, only two respondents had fashion businesses with more than 20 staff, representing 0.7% of the total participants.

The findings from Table 4.4 highlight that the majority of fashion businesses in Kumasi operate on a small-scale. This is significant because it implies that these businesses may have limited capacity for large-scale production, which could be a barrier to their competitiveness in the industry. Small-scale fashion businesses may face challenges in

terms of access to finance, technology, and resources, which can limit their ability to expand and grow.

Table 4.5 Monthly Revenue

Revenue	Frequency (<i>n</i>)	Percent (%)
Less than GH ₵1,000	116	41.7
GH ₵ 1,001 - GH ₵ 2, 000	134	48.2
GH ₵ 2,001- GH ₵ 3,000	20	7.2
GH ₵ 3,001- GH ₵4, 000	6	2.2
> GH ₵ 5,000	2	.7
Total	278	100.0

Source: Fieldwork (2023)

Table 4.5 presents the monthly revenue of fashion businesses in Kumasi, as reported by the study participants. From the table it could be observed that the largest group of respondents reported monthly revenues of less than GH₵1,000, with a frequency of 116, representing 41.7% of the total participants. The second largest group of respondents reported monthly revenues between GH₵1,001 and GH₵2,000, (n=134, 48.2%) of the total participants. A smaller number of respondents reported monthly revenues between GH₵2,001 and GH₵ 3,000 (n=20, 7.2%) and GH₵3,001 and GH₵4,000 (n=6, 2.2%) of the total respondents. Only two respondents reported monthly revenues of more than GH₵5,000.

These findings suggest that the fashion industry in Kumasi is characterized by businesses with relatively low monthly revenues. This could be attributed to a variety of factors, including limited access to finance, low consumer demand, and competition from cheaper imports. Moreover, improving the monthly revenue of fashion businesses in Kumasi could have broader implications for economic development and job creation in

the region. Increased revenue and profitability could enable businesses to expand, hire more employees, and contribute to the local economy.

The demographic results provide insights into the characteristics of the industry. The majority of the respondents were females, and the industry is dominated by small-scale businesses, most of which are owned by the participants. The industry comprises of workers with diverse educational backgrounds and varying levels of experience. Additionally, the industry faces challenges in generating high levels of revenue, which has implications for policies and programmes aimed at improving the profitability and competitiveness of the sector. The results suggest the need for policies and programmes that support entrepreneurship, business management and leadership skills, and access to education and training for individuals interested in pursuing careers in the fashion industry in Kumasi.

4.3 Descriptive Statistics

4.4 Status of technology adoption among SMSFES in Kumasi

Table 4.6 Status of technology adoption among SMSFES in Kumasi Metropolis

Statement	N	Min	Max	Mean	±SD
With the level of technology adopted in our operations we are able to quickly adopt to industry practices	278	1	5	4.50	.629
With our level of technology, we are able to maintain quick and flexible response to market demand	278	1	5	4.46	.592
With the level of technology adopted in our operations we are able to innovate our processes	278	1	5	4.42	.623
Our technology aids our business effectively	278	1	5	4.52	.628
Our level of technology enables us to reach out to our customers	278	1	5	4.50	.725
We are motivated to adopt new forms of technology because it gives us the edge over our rivals	278	1	5	4.40	.747

Source: Fieldwork (2023)

The opinions of those surveyed on the current state of technology adoption within Kumasi Metropolis's SMSFES are summarised in Table 4.6. Respondents were asked to rate their agreement with the statement on a scale from 1-Strongly Disagree, 2-Disagree, 3-Not Sure, 4-Agree, and 5-Strongly Agree).

Based on the results, it could be observed that the vast majority of respondents agreed that the level of technology adopted in their operations has helped them quickly adapt to industry practices (M=4.50, ±SD=.629), efficiently helped their business (M=4.52, ±SD=.628), and successfully reach their customers (M=4.50, ±SD=.725). Despite this, the vast majority of respondents also agreed that they can quickly and flexibly respond

to market demand with their current level of technology (M=4.46, \pm SD=.592), that they can innovate their processes (M=4.42, \pm SD=.623), and that they are motivated to adopt new forms of technology because it gives them an edge over rivals (M=4.40, \pm SD=.747).

The results imply that technology adoption is seen as an important factor in the competitiveness of the fashion industry in Kumasi. By adopting technology, SMSFEs can improve their processes, respond more quickly to market demand, and better reach and serve their customers, which can enhance their competitiveness and contribute to the growth and sustainability of the industry.

4.5 Hardware Technologies Adopted

Table 4.7 Hardware technologies installed fashion shop

Statement	N	Min	Max	Mean	\pm SD
High Speed Sewing Machine- HSSM	278	1	5	1.43	.977
Modern Fusing and Pressing Machine- MFPM	278	1	5	2.19	1.286
Pick/Place Robot- PPR	278	1	5	3.27	.768
Electric Fabric Cutter- EFC	278	1	5	3.04	1.143
Digital Embroidery Machine- DEM	278	1	5	2.74	1.345
Composite Score	278	1	5	2.53	1.104

Source: Fieldwork (2023)

The analysis of Table 4.7, which outlines the installation status of various hardware technologies in fashion shops, reveals some interesting insights into the adoption of technology in the fashion industry. The table includes data on five different types of hardware technologies, with a sample size (N) of 278 for each technology. The scale for assessing the installation status ranges from 1 (Installed) to 5 (To be Installed in the Future).

The High-Speed Sewing Machine (HSSM) shows the lowest mean score of 1.43, indicating that this technology is the most commonly installed, as a lower mean score implies greater installation prevalence. The mean score is accompanied by a standard deviation (SD) of 0.977, suggesting some variability in its installation status across different shops.

The Modern Fusing and Pressing Machine (MFPM) has a higher mean score of 2.19 with an SD of 1.286, indicating it is less commonly installed than the HSSM but still relatively prevalent. Pick/Place Robots (PPR) and Electric Fabric Cutters (EFC) have mean scores of 3.27 and 3.04, respectively, indicating that these technologies are generally not installed in most shops, with PPR being the least installed. The Digital Embroidery Machine (DEM) has a mean score of 2.74, suggesting a moderate level of installation.

Overall, the composite score for all technologies stands at 2.53 with an SD of 1.104, reflecting a moderate level of technology adoption across the surveyed fashion shops. This composite score suggests that while some technologies like the HSSM are quite common, others like the PPR are not widely adopted, indicating a varied landscape of technology adoption in the fashion industry.

4.6 Frequent Usage of Hardware Technologies

Table 4.8 Utilization frequency of various forms of hardware technology

Statement	N	Min	Max	Mean	±SD
High Speed Sewing Machine - HSSM	278	1	5	1.73	1.456
Modern Fusing and Pressing Machine - MFPM	278	1	5	3.16	1.893
Pick/Place Robot – PPR	278	1	5	4.81	.675
Electric Fabric Cutter – EFC	278	1	5	4.49	1.186
Digital Embroidery Machine – DEM	278	1	5	3.41	1.520
Composite score	278	1	5	3.52	1.346

Source: Fieldwork (2023)

Table 4.8 provides information into the utilization frequency of various hardware technologies in the fashion industry, based on a sample of 278 respondents. The scale for assessing utilization frequency ranges from 1 (Frequent) to 5 (Never).

The High-Speed Sewing Machine (HSSM) shows the highest frequency of use with a mean score of 1.73 and a relatively high standard deviation (SD) of 1.456, indicating that while it is frequently used in many shops, there is considerable variability in its usage across different shops. The Modern Fusing and Pressing Machine (MFPM) has a mean score of 3.16 with an SD of 1.893, suggesting it is used less often, with a wide variance in its usage frequency.

The utilization of the Pick/Place Robot (PPR) and Electric Fabric Cutter (EFC) is considerably lower, as indicated by their higher mean scores of 4.81 and 4.49, respectively. The low SD for PPR (0.675) suggests a more consistent pattern of rare usage across the sample, while the EFC's higher SD (1.186) indicates more variability. The Digital Embroidery Machine (DEM) has a mean score of 3.41 with an SD of 1.520, suggesting a moderate frequency of use with considerable variability.

In conclusion, the composite score for all technologies stands at 3.52 with an SD of 1.346, indicating that on average, the utilization of these technologies is closer to 'sometimes' on the frequency scale. This composite score reflects a general trend of moderate to low utilization frequency for the various forms of hardware technology in the fashion industry, with a significant degree of variability in how often different technologies are used.

4.7 Software Technologies Adopted

Table 4.9 Software technologies installed in fashion shop

Statement	N	Min	Max	Mean	±SD
Computer Aided Design – CAD	278	1	5	3.14	1.129
Automated Inspection – AIN	278	1	5	3.29	.774
Automated Material Handling Device - AMHD	278	1	5	3.28	.806
Production Planning and/or inventory management software - PPIC	278	1	5	3.20	.780
Internet – IT	278	1	5	1.47	.993
Communication (Telephone and mobile phone)- CM	278	1	5	1.14	.591
Composite Score	278	1	5	2.59	0.846

Source: Fieldwork (2023)

The descriptive statistics of the respondents' level of technological adoption for software technologies installed in their fashion enterprises can be found in Table 4.9. These respondents are located in the Kumasi Metropolis. We collected the responses using a scale that went from 1 (Installed) to 2 (On order), 3 (Not installed), 4 (Out of Order), and 5 (Install in the future).

The table shows that the majority of the respondents use Mobile Phones in their operation to reach more customers (M=1.14, \pm SD=.993) and the Internet (M=1.47, \pm SD=.993); however, other technologies which were not installed include the following: computer-aided design (M=3.14, SD=1.129), production planning and/or inventory management software (M=3.20, \pm SD=.780), automated material handling device (M=3.28, \pm SD=.806), and automated inspection (M=3.29, \pm SD=.774).

From the results it can be concluded that fashion enterprises in the Kumasi metropolis mostly use Communication tools such as the Internet and Mobile phones in their operations. These results suggest that fashion enterprises in the Kumasi have low level of adoption of software technologies in their operations, which means there is still room for improvement in terms of the adoption of these technologies. Ultimately, the results highlights the need for fashion enterprises in the Kumasi Metropolis to continue to invest in software technologies to remain competitive.

4.8 Frequent usage of Software technologies

Table 4.10 Utilization rate of various forms of software technology

Statement	N	Min	Max	Mean	\pmSD
Computer Aided Design- CAD	278	1	5	4.47	1.251
Automated Inspection- AIN	278	1	5	4.87	.587
Automated Material Handling Device- AMHD	278	1	5	4.86	.545
Production Planning and/or inventory management software- PPIC	278	1	5	4.82	.639
Internet- IT	278	1	5	1.88	1.474
Communication (Telephone, mobile phone)- CM	278	1	5	1.34	.904
Composite Score	278	1	5	3.71	0.900

Source: Fieldwork (2023)

Table 4.10 provides information on the frequency of usage of software technologies installed in fashion businesses, as reported by respondents. The scale used in the survey ranged from 1 (frequently) to 5 (never).

The results suggest that communication software (CM) and internet software (IT) were the most commonly used technologies, with mean scores of 1.34 and 1.88, respectively. This indicates that respondents frequently use these technologies in their operations, likely for communication with customers and suppliers and for online sales. In contrast, computer-aided design (CAD) had the highest mean score of 4.47, indicating that it was rarely used by respondents. This suggests that many fashion businesses may not have the necessary resources or expertise to utilize this technology effectively.

Furthermore, respondents reported that they never used production planning and/or inventory management software (PPIC), automated material handling device (AMHD), or automated inspection system (AIN). This indicates that these technologies are not widely adopted among fashion businesses, which could limit their ability to manage inventory and production processes effectively.

The results implies that fashion businesses in the Kumasi Metropolis have a high utilization of communication tools such as the internet and mobile phones, indicating an understanding of the importance of this type of technology in promoting their brands. However, the low adoption and usage of advanced technologies such as computer-aided design, production planning, inventory management software, and automated material handling and inspection systems suggest missed opportunities for improving operational efficiency and productivity. This may be due to cost, lack of technical expertise, and limited understanding of benefits. Investment in advanced software technologies can lead to improved efficiency, productivity, and profitability. Fashion businesses that do not

adopt these technologies risk falling behind competitors who are likely using technology to streamline their operations and gain a competitive advantage.

4.9 Factors that influence technology adoption

Table 4.11 Industry Size

Statement	N	Min	Max	Mean	±SD
Due to the industry size, our fashion house is able to innovate and adopt technology.	278	1	5	4.19	.935
Our Fashion House can afford to invest in new technology.	278	1	5	4.01	.915
Due to our industry size, we have high technological intensity.	278	1	5	3.60	1.163
The industry size gives us a lot of advantage to adopt technology.	278	1	5	4.00	.923
Composite Score	278	1	5	3.95	0.984

Source: Fieldwork (2023)

Table 4.11 provides data on the industry size and its relationship with the ability of a fashion house to innovate and adopt technology. The table shows the responses of participants to four statements related to enterprise size and technology adoption.

Based on the data, it can be observed that the respondents generally agreed that their fashion houses are able to innovate and adopt technology due to their enterprise size (Mean = 4.19, ±SD = .935). The respondents also indicated that their fashion houses can afford to invest in new technology (Mean = 4.01, ±SD = .915) and that their enterprise size gives them a lot of advantage to adopt technology (Mean = 4.00, ±SD = .923). However, the respondents are more divided on the statement related to high technological intensity due to enterprise size, as indicated by the lower mean score (Mean = 3.60, ±SD = 1.163).

The composite score of 3.95 suggests that respondents generally perceive industry size as a significant influence of technology adoption among enterprises. From the results it can be concluded that data suggests that the size of the fashion industry positively influences the ability of the fashion houses to innovate and adopt technology.

Table 4.12 Top Management Commitment

Statement	N	Min	Max	Mean	±SD
Management enthusiastically supports the adoption of advanced technologies.	278	1	5	4.06	1.173
Management has allocated enough resources for adoption of advanced technologies.	278	1	5	3.40	1.181
Management actively encourages employees to use the new technologies in their daily tasks	278	1	5	3.94	1.157
Management fully supports initiatives to adopt technology to improve our operations	278	1	5	4.02	1.124
Composite Score	278	1	5	3.86	1.159

Source: Fieldwork (2023)

Table 4.12 provides statistics of respondent opinions regarding the effect of top management commitment on technology adoption. The responses were measured using a five-point Likert scale ranging from 1 (strongly disagree) to 5 (strongly agree).

Based on the data, it can be observed that the respondents generally agree that management enthusiastically supports the adoption of advanced technologies (Mean = 4.06, ±SD = 1.173). The respondents also indicate that management fully supports initiatives to adopt technology to improve operations (Mean = 4.02, ±SD = 1.124) and actively encourages employees to use new technologies in their daily tasks (Mean = 3.94, ±SD = 1.157). However, the respondents are more divided on the statement related to

management’s allocation of enough resources for technology adoption, as indicated by the lower mean score (Mean = 3.40, \pm SD = 1.181).

The composite score, which is the average of all four statements, was 3.86, indicating a moderate level of top management commitment to technology adoption in the organization. Fashion enterprises in the metropolis may need to take steps to further enhance management support for technology adoption, such as providing additional resources, increasing employee training and awareness, and developing a clear technology adoption strategy.

Table 4.13 Cost of Capital

Statement	N	Min	Max	Mean	\pmSD
The cost of adopting technology sometimes hinders our initiative to adopt.	278	1	5	4.17	1.252
Access to finance is a major challenge to technology adoption in our enterprise	278	1	5	4.04	1.201
Composite Score	278	1	5	4.11	1.227

Source: Fieldwork (2023)

The descriptive statistics of the respondents’ viewpoints regarding the relationship between top management commitment and technology adoption are presented in Table 4.13. The responses were scored using a Likert scale with five points: 1 for strongly disagreeing, 2 for disagreeing, 3 for not sure, 4 for agreeing, and 5 for strongly agreeing.

It can be observed that the respondents generally agree that the cost of adopting technology sometimes hinders their initiative to adopt (Mean = 4.17, \pm SD = 1.252). The respondents also indicate that access to finance is a major challenge to technology adoption in their enterprise (Mean = 4.04, \pm SD = 1.201).

The fashion industry is known for being dynamic and constantly evolving. Fashion designers and manufacturers must remain up-to-date with the latest trends and technologies to remain competitive in the industry. However, the adoption of new technologies can be costly, and this cost can be a significant barrier to technology adoption. Furthermore, the cost of capital can impact the industry's ability to invest in innovation and research and development, which can be crucial to improving efficiency, quality, and competitiveness. The lack of investment in innovation can also lead to a lack of differentiation between competitors and a decline in consumer interest.

From the composite score of 4.11, it can be concluded that the respondents perceive the cost of capital as a significant factor that influence technology adoption in their enterprise. This is suggestive that fashion enterprises particularly those in the Kumasi metropolis must explore alternative funding sources and cost-effective technologies to remain competitive and ensure its long-term success. By investing in innovation, the industry can improve efficiency, quality, and competitiveness, leading to a better customer experience and increased profitability.

Table 4.14 Technical Skills

Statement	N	Min	Max	Mean	±SD
Our enterprise is short on adopting technology due to the unavailability of skilled personnel	278	1	5	3.73	1.326
Our enterprise has a positive view relative to staff with technical skills	278	1	5	4.08	.859
Specialized instructions and education for new technologies are available to employees	278	1	5	3.94	.925
Technical guidance is available in the selection of hardware, software, printers, and other equipment	278	1	5	3.73	1.252
The presence of skilled technical personnel in the industry motivates us to adopt new forms of technologies	278	1	5	4.11	1.045
Composite Score	278	1	5	3.92	1.081

Source: Fieldwork (2023)

The outcomes of our survey on the discussion of technical skills and its effect on technology adoption are displayed in Table 4.14. On a scale from 1 (strongly disagree), 2 (disagree), 3 (not sure), 4 (agree), to 5 (strongly agree), the responses were tallied.

The results showed that the respondents generally agreed that the availability of skilled personnel is a barrier to technology adoption in the fashion industry (Mean = 3.73, ±SD = 1.326). However, the respondents also indicate a positive view of staff with technical skills (Mean = 4.08, ±SD = 0.859), and that specialized instructions and education for new technologies are available to employees (Mean = 3.94, ±SD = 0.925).

On the other hand, the data suggests that technical guidance is not as readily available in the selection of hardware, software, printers, and other equipment (Mean = 3.73, \pm SD = 1.252). The respondents also indicate that the presence of skilled technical personnel in the industry motivates them to adopt new forms of technology (Mean = 4.11, \pm SD = 1.045).

The results suggests that the availability of skilled personnel and technical guidance can be significant barriers to technology adoption in the fashion industry. However, the positive view of staff with technical skills and the availability of specialized instructions and education suggests that there is an opportunity to invest in employee training and development to overcome these barriers. Furthermore, the presence of skilled technical personnel in the industry can serve as a motivator to adopt new forms of technology.

Reference to the composite score 3.92 suggests that respondents consider the availability of fashion workers with the technical skills remains a factor that influence technology adoption among enterprises in the fashion industry. Since the availability of skilled technical personnel in the industry can also serve as a motivator to adopt new forms of technology. The outcome of the results points to the direction that investing in employee training and development could be a valuable strategy for the fashion industry to overcome barriers related to technical skills and technology adoption.

Table 4.15 Competitive Advantage

Statement	N	Min	Max	Mean	±SD
We will lose customers to our competitors if we do not adopt these new technologies	278	1	5	3.63	1.525
It is an essential to use advanced technologies to compete in the marketplace	278	1	5	4.35	.823
Our customers require the use of these technologies for doing business with them	278	1	5	4.42	.759
Our enterprise has adopted technology because it will give our enterprise an advantage over our competitors.	278	1	5	4.40	.839
Composite Score	278	1	5	3.92	1.081

Source: Fieldwork (2023)

Table 4.15 displays descriptive statistics regarding how competitive advantage influences technology adoption, as perceived by respondents. The responses were measured using a five-point Likert scale ranging from 1 (strongly disagree) to 5 (strongly agree).

The table shows the responses of participants to four statements related to competitive advantage and technology adoption. From the results it could be noted that the respondents generally agreed that using advanced technologies is essential to compete in the marketplace (Mean = 4.35, ±SD = 0.823). The respondents also strongly agreed that their customers require the use of these technologies for doing business with them (Mean = 4.42, ±SD = 0.759).

However, the respondents are less convinced that they will lose customers to their competitors if they do not adopt new technologies (Mean = 3.63, ±SD = 1.525). Nevertheless, the respondents strongly agreed that their enterprise has adopted

technology because it will give them an advantage over their competitors (Mean = 4.40, \pm SD = 0.839).

The composite score for all statements is 3.92 with an SD of 1.081, indicating an overall tendency towards agreement that technology adoption is linked to competitive advantage. This composite score suggests that the respondents generally perceive a strong connection between technology adoption and maintaining a competitive edge in the marketplace, although there is some variability in how strongly they feel about this connection.

4.10 Challenges Encountered in Technology Adoption Amongst SMSFES

Table 4.16 Challenges that affect technology adoption amongst SMSFES

Statement	N	Min	Max	Mean	\pmSD
Lack of support from the government	278	1	5	4.49	1.022
Shortage of highly qualified technical personnel	278	1	5	4.02	1.044
Lack of labour division has reduced garment productivity.	278	1	5	3.54	1.387
There are not enough training facilities.	278	1	5	3.47	1.393
Individuals' technical skills do not meet the industry's needs.	278	1	5	3.02	1.335
Insufficient materials and resources	278	1	5	3.42	1.282
Composite Score	278	1	5	3.66	1.244

Source: Fieldwork (2023)

Table 4.16 presents the data on technology adoption among SMSFES. Responses were measured on a scale of 1 (strongly disagree), 2 (disagree), 3 (not sure), 4 (agree), and 5 (strongly agree).

Reference to the data shows the respondents identified lack of support from the government as the most significant challenge affecting technology adoption (Mean = 4.49, \pm SD = 1.022). The shortage of highly qualified technical personnel was also identified as a significant challenge (Mean = 4.02, \pm SD = 1.044).

On the other hand, the respondents considered the individual's technical skills not meeting the industry's needs as the least significant challenge (Mean = 3.02, \pm SD = 1.335). Insufficient materials and resources (Mean = 3.42, \pm SD = 1.282) and lack of labour division reducing garment productivity (Mean = 3.54, \pm SD = 1.387) were identified as moderately significant challenges. The data suggests that the lack of government support and the shortage of highly qualified technical personnel are the most significant challenges faced by SMSFEs in adopting technology. The limited availability of training facilities and insufficient materials and resources are also significant challenges that need to be addressed.

These findings have important implications for policymakers and industry stakeholders. Policymakers need to provide support to SMSFEs in the form of funding, training, and other resources to help them adopt technology. Industry stakeholders can also play a crucial role in addressing these challenges by collaborating with the government and investing in training programmes to develop a skilled workforce that can meet the industry's needs.

The results therefore highlights the significant challenges faced by SMSFEs in adopting technology, including the lack of government support, shortage of highly qualified technical personnel, insufficient training facilities. Addressing these challenges requires a collaborative effort from policymakers and industry stakeholders to provide the necessary resources and support to promote technology adoption in the fashion industry.

4.11 Competitive Environment in Which SMSFEs Operate

Table 4.17 Competitive environment in which SMSFEs operate

Statement	N	Min	Max	Mean	±SD
It is very easy for people to enter into the fashion business in the Kumasi Metropolis	278	1	5	4.49	1.022
Fashion enterprises in the Kumasi Metropolis produce high quality products.	278	1	5	4.02	1.044
Consumers of fashion products in the Kumasi Metropolis have high standards of expectations.	278	1	5	3.02	1.335
It is very difficult to launch and sustain a brand in this industry.	278	1	5	3.42	1.282
The state of the economic environment makes the industry a competitive one to operate in.	278	1	5	3.54	1.387
The level of technology available for use in the industry has made it highly competitive.	278	1	5	3.47	1.393
Composite score	278	1	5	3.66	1.244

Source: Fieldwork (2023)

Table 4.17 presents data on the competitive environment of Small and Medium Scale Fashion Enterprises (SMSFEs) operating in the Kumasi Metropolis. The data was measured on a scale of 1 (strongly disagree) to 5 (strongly agree).

From the mean scores, one could realise that the respondents agreed that it is easy for people to enter into the fashion business in the Kumasi Metropolis (Mean = 4.49, ±SD = 1.022). However, they were neutral on the statement that fashion enterprises in the Kumasi Metropolis produce high quality products (Mean = 4.02, ±SD = 1.044). The respondents also appeared to be neutral on the statement that consumers of fashion products in the Kumasi Metropolis have high standards of expectations (Mean = 3.02, ±SD = 1.335). Regarding the statement that it is difficult to launch and sustain a brand in the fashion industry, the respondents leaned towards agreeing with the statement (Mean

= 3.42, \pm SD = 1.282). They also agreed that the state of the economic environment makes the fashion industry a competitive one to operate in (Mean = 3.54, \pm SD = 1.387). The respondents were neutral on the statement that the level of technology available for use in the industry has made it highly competitive (Mean = 3.47, \pm SD = 1.393).

From the analysis it can be concluded that the fashion industry in the Kumasi Metropolis is highly competitive, which is evidenced by the difficulty in launching and sustaining a brand, as well as the competitiveness of the economic environment. However, there is some disagreement on the quality of products produced by fashion enterprises in the area, and the level of technology available for use in the industry. Based on the analysis of the data presented it can be concluded that the fashion industry in the Kumasi Metropolis is highly competitive, as perceived by the respondents.

4.12 Performance of SMSFES

Table 4.18 Performance of SMSFES

Statement	N	Min	Max	Mean	\pmSD
Using technology has given us advantage over our competitors	278	1	5	4.40	.936
The technologies adopted in our enterprise has increased our sales	278	1	5	4.60	.608
The technologies adopted in our enterprise has improved our product quality	278	1	5	4.50	.673
The technologies adopted in our enterprise has given improved our general operations	278	1	5	4.40	.609
The technologies adopted in our enterprise have increased our level of profitability	278	1	5	4.55	.733
Composite Score	278	1	5	4.49	0.712

Source: Fieldwork (2023)

The descriptive statistics of the respondents' perspectives on the performance of SMSFEs are presented in Table 4.18. The responses were scored using a Likert scale with five points: 1 for strongly disagreeing, 2 for disagreeing, 3 for not sure, 4 for agreeing, and 5 for strongly agreeing.

In the explanation of the table, the majority of respondents strongly agreed that the technologies adopted in their enterprise have increased their sales ($M=4.60, \pm SD=.608$), that the technologies adopted in their enterprise have increased their level of profitability ($M=4.55, \pm SD=.733$), that the technologies adopted in their enterprise has improved their product quality, ($M=4.50, \pm SD=.673$), and that in addition, a significant number of study participants agreed that using technology has given us an advantage over our competitors.

The composite score, 4.49, indicating a high level of perceived performance improvements following technology adoption in SMSFEs. These high mean scores indicate that the respondents perceived a strong positive impact of technology adoption on the performance of their SMSFEs, with a particular emphasis on increased sales, profitability, and improved product quality.

In conclusion, the results highlight the positive impact of technology adoption on the performance of Small and Medium Scale Fashion Enterprises (SMSFEs) in the Kumasi Metropolis, as perceived by the respondents. The high mean scores for each statement indicate that technology adoption has led to increased sales, profitability, and improved product quality.

Nonetheless, the findings of this study have important implications for policymakers and industry stakeholders, emphasizing the need for investment in technology to support the growth and competitiveness of SMSFEs. As such, policies and programmes aimed at promoting technology adoption and providing the necessary resources and support to

facilitate this adoption could play a critical role in driving sustainable growth in the fashion industry in the Kumasi Metropolis.

4.13 Hypothesis Testing

4.13.1 Impact of factors on Technology Adoption

Table 4.19 Model Summary

Model	R	Std. ErrorChange Statistics							
		R Square	Adjusted Rof Square	Estimate	theR Change	Square	F Changedf1	df2	Sig. F Change
1	.379 ^a	.144	.135	.40766	.144	15.367	3	274	.000

a. Predictors: (Constant), Environmental Factors, Technological Factors, Organisational Factors

Source: Fieldwork (2023)

Table 4.19 presents a summary of a regression model that aims to analyze the relationship between two variables and in this case the factors that influence technology adoption among small and medium scale fashion enterprises in Ghana. This version of the table only includes one model (Model 1), with three predictors: Environmental Factors, Technological Factors, and Organizational Factors.

The *R* value is .379, indicating a moderate positive correlation between the predictors also known as the factors (Environmental Factors, Technological Factors, and Organizational Factors) and technology adoption. The *R* Square value is .144, meaning that the model explains 14.4% of the variance in technology adoption. The Adjusted *R* Square value is .135, which adjusts for the number of predictors in the model and is quite close to the *R* Square value. This indicates that the three predictors together account for

approximately 13.5% of the variability in technology adoption when considering the number of predictors in the model.

The Std. Error of the Estimate is .40766, which represents the standard deviation of the residuals. This provides an estimate of how far the observed values deviate from the predicted values generated by the model. A lower value for the Std. Error of the Estimate indicates better accuracy in the predictions.

The Change Statistics section of the table provides information on the significance of the model. The F Change value is 15.367, indicating the model’s overall significance in explaining the relationship between the predictors and technology adoption. The Sig. F Change value is .000, which is below the standard threshold of .05, confirming the statistical significance of the model.

In conclusion, the analysis of Table 4.19 suggests that there is a significant relationship between the predictors (Environmental Factors, Technological Factors, and Organizational Factors) and technology adoption among small and medium scale fashion enterprises in Ghana. However, the model explains only a modest portion of the variance in technology adoption (14.4%). This indicates that other factors not included in the model might also play a role in technology adoption in this context.

Table 4.20 ANOVA

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	7.661	3	2.554	15.367	.000 ^b
	Residual	45.535	274	.166		
	Total	53.196	277			

a. Dependent Variable: Tech_Adoption

b. Predictors: (Constant), Environment Factors, Technological Factors, Organisational Factors

Source: Fieldwork (2023)

Table 4.20 presents the ANOVA (Analysis of Variance) results for the regression model that aims to analyze the relationship between various factors and technology adoption among small and medium scale fashion enterprises in Ghana. This table provides information on the significance of the overall model, which includes three predictors: Environmental Factors, Technological Factors, and Organizational Factors.

The table is divided into three parts: Regression, Residual, and Total. The Regression part represents the variation in the dependent variable (Tech_Adoption) that can be explained by the predictors in the model. The Residual part represents the unexplained variation in the dependent variable, while the Total part shows the sum of both explained and unexplained variation.

The Sum of Squares column provides the total amount of variation for each part. The Regression Sum of Squares is 7.661, while the Residual Sum of Squares is 45.535. The Total Sum of Squares is 53.196, which is the sum of the Regression and Residual Sum of Squares. The degrees of freedom (*df*) for the Regression part is 3, corresponding to the number of predictors in the model. The Mean Square values are calculated by dividing the Sum of Squares by the corresponding *df*. For the Regression part, the Mean Square is 2.554. For the Residual part, the Mean Square is .166.

The F statistic is calculated by dividing the Regression Mean Square by the Residual Mean Square ($2.554/.166$). The resulting F value is 15.367, which measures the overall significance of the model. The Sig. (significance) value associated with the F statistic is .000, which is below the standard threshold of .05. This indicates that the overall model is statistically significant and that there is a significant relationship between the predictors (Environmental Factors, Technological Factors, and Organizational Factors) and technology adoption among small and medium scale fashion enterprises in Ghana.

From the results it can be concluded that the ANOVA results confirm that the regression model is significant, and the predictors (Environmental Factors, Technological Factors, and Organizational Factors) contribute to the explanation of technology adoption in the context of small and medium scale fashion enterprises in Ghana. However, as mentioned in the previous analysis, the model explains only a modest portion of the variance in technology adoption, suggesting that other factors not included in the model might also be important.

Table 4.21 Coefficients^a

Model		Unstandardized Coefficients		Standardized Coefficients		95.0% Confidence Interval for B		
		B	Std. Error	Beta	t	Sig.	Lower Bound	Upper Bound
1	(Constant)	3.836	.242		15.853	.000	3.359	4.312
	Technological Factors	-.106	.048	-.123	-2.192	.029	-.201	-.011
	Organisational Factors	.066	.042	.093	1.565	.019	.149	.017
	Environment Factors	.284	.045	.373	6.250	.000	.195	.374

a. Dependent Variable: Tech_Adoption

Source: Fieldwork (2023)

Table 4.21 presents the coefficients of the regression model that aims to analyze the relationship between various factors and technology adoption among small and medium scale fashion enterprises in Ghana. This table provides information about the individual contribution of each predictor to the model. The predictors included in the model are Technological Factors, Organizational Factors, and Environmental Factors. The dependent variable is Tech_Adoption.

The Unstandardized Coefficients (B) column shows the direct effect of each predictor on the dependent variable, holding all other predictors constant. The Standardized

Coefficients (Beta) column represents the relative importance of each predictor in the model, allowing for comparisons among predictors.

For Technological Factors, the unstandardized coefficient B is .106, indicating that a one-unit increase in Technological Factors is associated with a .106 unit decrease in Tech_Adoption, holding other factors constant. The standardized coefficient Beta is -.123, suggesting a negative relationship between Technological Factors and Tech_Adoption. The t-value is -2.192, and the Sig. (significance) value is .029, which is below the standard threshold of .05, indicating that the relationship between Technological Factors and Tech_Adoption is not statistically significant, hence hypothesis one was not supported by the data hence rejected.

For Organizational Factors, the unstandardized coefficient Beta is .066, and the standardized coefficient Beta is .093, both indicating a negative relationship with Tech_Adoption. The t-value is 1.565, and the Sig. value is .019, which is above the standard threshold of .05. This suggests that the relationship between Organizational Factors and Tech_Adoption is statistically significant. This implies that hypothesis 2 is supported and thus accepted.

For Environmental Factors, the unstandardized coefficient B is .284, and the standardized coefficient Beta is .373, both suggesting a positive relationship with Tech_Adoption. The t-value is 6.250, and the Sig. value is .000, which is below the standard threshold of .05, indicating that the relationship between Environmental Factors and Tech_Adoption is statistically significant. This shows that the data supports the hypothesis hence hypothesis 3 is accepted

The 95.0% Confidence Interval for B provides a range within which the true population coefficient is likely to fall. For example, for Technological Factors, the lower bound is -

.201, and the upper bound is -.011, indicating that we can be 95% confident that the true population coefficient lies within this range.

In conclusion, the analysis of Table 4.21 suggests that Environmental Factors have a significant positive relationship with technology adoption, while Technological Factors have a significant negative relationship. Organizational Factors, on the other hand, do not have a statistically significant relationship with technology adoption among small and medium scale fashion enterprises in Ghana.

4.13.2 Impact of technology adoption on the performance of SMSFEs

Table 4.22 Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.434 ^a	.188	.185	.45001

a. Predictors: (Constant), Tech_Adopt

Source: Fieldwork (2023)

Table 4.22 analyzes the impact of technology adoption on the performance of small and medium scale fashion enterprises (SMSFEs) in Ghana. The model shows a moderate positive correlation between technology adoption and performance, with technology adoption accounting for 18.5% of the variability in performance. However, the model explains only 18.8% of the variance in performance, indicating that other factors not included in the model may also influence SMSFEs’ performance in Ghana.

Table 4.23 ANOVA

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	12.943	1	12.943	63.915	.000 ^b
	Residual	55.892	276	.203		
	Total	68.836	277			

a. Dependent Variable: Performance

b. Predictors: (Constant), Tech_Adopt

Source: Fieldwork (2023)

Table 4.23 presents the ANOVA (Analysis of Variance) results for the regression model that examines the impact of technology adoption (Tech_Adopt) on the performance of small and medium scale fashion enterprises (SMSFEs) in Ghana. The results provide information on the significance of the model and the overall fit. The model has an F statistic of 63.915 and a Sig. value of .000, which is below the standard threshold of .05. These figures indicate that the model is statistically significant, demonstrating that technology adoption has a significant impact on the performance of these enterprises.

Table 4.24 Coefficients^a

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	2.289	.277		8.270	.000
	Tech_Adopt	.493	.062	.434	7.995	.000

a. Dependent Variable: Performance

Source: Fieldwork (2023)

Table 4.24 presents the coefficients of a regression model that analyzes the impact of technology adoption on the performance of small and medium scale fashion enterprises (SMSFEs) in Ghana. It offers insights into the direction, magnitude, and significance of

the relationship between the predictor variable, technology adoption (Tech_Adopt), and the dependent variable, performance.

The Unstandardized Coefficients B are used to understand the change in the dependent variable when there is a one-unit change in the predictor variable, holding all other variables constant. In this case, the B coefficient for Tech_Adopt is .493, which implies that for every one-unit increase in technology adoption, the performance of SMSFEs in Ghana is expected to increase by .493 units, on average.

The Standardized Coefficients Beta demonstrate the relative importance of the predictor variable in the model. A higher value of Beta indicates a stronger relationship between the predictor and dependent variables. In this case, the Beta value of .434 suggests that technology adoption has a positive impact on the performance of SMSFEs in Ghana.

The t statistic (7.995) is utilized to test the null hypothesis that the predictor variable has no influence on the dependent variable. The Sig. (significance) value is .000, which falls below the standard threshold of .05. This result indicates that the null hypothesis can be rejected, and therefore, there is a statistically significant relationship between technology adoption and the performance of SMSFEs in Ghana.

Table 4.25 Summary of Hypothesis Results

Hypo.	Statement	Outcome		Decision
		Beta	Sig.	
H 1	Technological factors positively influence technology adoption in an enterprise.	-.106	.029	Rejected
H 2	Organisational factors positively influence technology adoption in an enterprise.	.066	.019	Accepted
H 3	An enterprise's competitive environment positively influences technology adoption.	.284	.000	Accepted
H 4	The level of an enterprise's adoption of technology positively influences its performance.	.493	.000	Accepted

Source: Fieldwork 2023

Hypothesis 1 sought to test whether Technological factors positively influence technology adoption among SMF enterprises. The analysis of Hypothesis 1 suggests that technological factors do not positively influence technology adoption in the given context. This is evident from the negative Beta value (.106) and the p-value of .029, which falls below the standard threshold of .05, leading to the rejection of this hypothesis. This finding indicates that technological factors may not be the primary drivers of technology adoption among enterprises.

Hypothesis 2 focused on assessing whether Organisational factors positively influence technology adoption in fashion enterprises in the Kumasi metropolis. The results for Hypothesis 2 demonstrate that organizational factors do have a positive impact on technology adoption, as indicated by the positive Beta value (.066) and the p-value of .019, which is above the threshold of .05. As a result, this hypothesis is accepted.

Hypothesis 3 measured whether an enterprise's competitive environment positively influences technology adoption. From the Table it could be observed that there is a

positive relationship between an enterprise's competitive environment and technology adoption. The positive Beta value (.284) and the p-value of .000, which falls below the threshold of .05, support this hypothesis. This finding indicates that enterprises operating in a competitive environment are more likely to adopt technology, which can enhance their competitiveness and growth.

Hypothesis 4 sought to test how the level of an enterprise's adoption of technology positively influences its performance. From the results it can be reckoned that there is a positive relationship between the level of technology adoption and enterprise performance. The positive Beta value (.493) and the p-value of .000 provide evidence for this relationship, leading to the acceptance of this hypothesis. This finding suggests that enterprises that adopt technology at higher levels can achieve better performance, emphasizing the importance of technology adoption in driving business success.

4.14 Proposed Framework

The proposed stakeholder framework presents a strategic proposition for enhancing technology adoption among Small and Medium-Scale Fashion Enterprises (SMSFEs) in the Kumasi metropolis, illustrating the interconnected roles and collaborative potential of key actors in the industry's ecosystem.

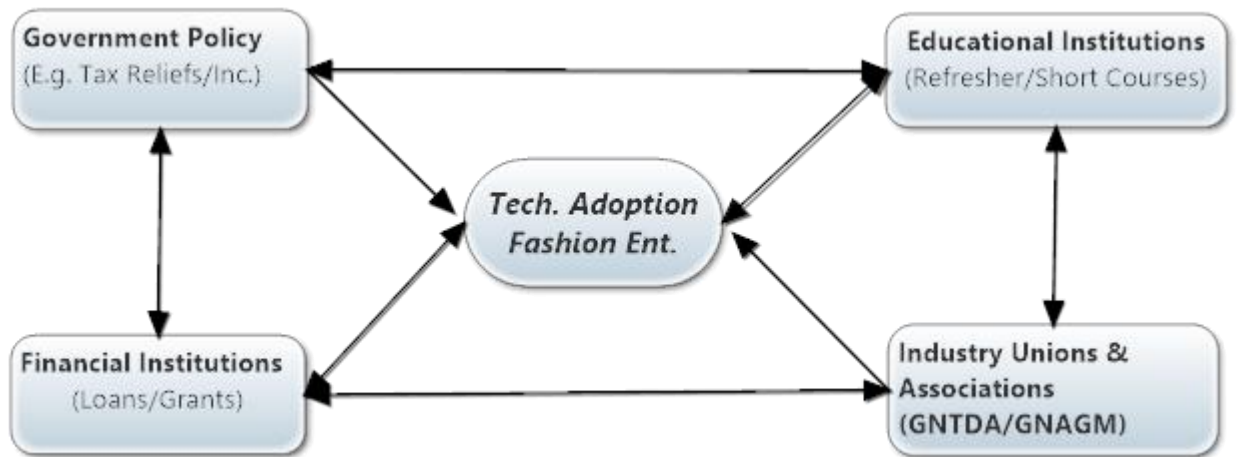


Figure 4.3 Proposed Framework

4.14.1 Government Role

In the proposed stakeholder framework, the role of government is pivotal in shaping the landscape for technology adoption among Small and Medium-Scale Fashion Enterprises (SMSFEs). Government policy is not just an enabler but a proactive driver of change. By instituting favorable policies such as tax reliefs, grants, and incentives targeted at technology acquisition and upgrading, the government can effectively reduce financial constraints that often impede SMEs from embracing new technologies. These policy measures are crucial as they can significantly lower the cost of technology implementation, making it more accessible and attractive for SMSFEs to invest in innovation.

Furthermore, the government can play a role in simplifying the process of technology adoption through streamlined regulations and support programs. Creating an environment where technology vendors are encouraged to collaborate with SMSFEs can lead to more customized technological solutions that cater to the specific needs of the fashion industry. Additionally, the government can initiate or sponsor research and

development activities that foster the creation of new technologies tailored for the local context, ensuring that SMSFEs have access to relevant and impactful innovations.

With Financial Institutions, the Government's role involves not only creating favorable policies but also facilitate partnerships and programs that enable these institutions to provide targeted financial products. For example, the Government might offer guarantees or subsidies to reduce the risks associated with lending to SMEs investing in new technologies. This can encourage banks and other financial bodies to offer loans with more favorable terms, such as lower interest rates or longer repayment periods, specifically tailored for technology investments. Additionally, the Government can work with financial institutions to develop grant programs that support technology adoption, ensuring that financial constraints do not stifle innovation.

When it comes to Educational Institutions, the Government's interaction is focused on aligning educational programs with the technological needs of the fashion industry. This could involve funding for the development of curricula that incorporate the latest technological trends and skills relevant to the fashion industry, ensuring that the workforce is well-equipped to handle new technologies. The Government can also incentivize Educational Institutions to partner with industry players to provide practical, hands-on training, internships, and workshops that reflect the real-world application of technology in the fashion sector.

4.14.2 Financial Institutions

Financial Institutions are envisioned as key enablers in the stakeholder framework, providing the critical financial underpinning required for Small and Medium-Scale Fashion Enterprises (SMSFEs) to adopt advanced technologies. They are positioned to

create and administer specialized financial products such as loans, grants, and perhaps even venture capital funding, specifically designed to support technology investments in the fashion sector. These financial instruments can be structured to align with government incentives, such as matching grants or interest subsidies, which can significantly lower the cost burden of acquiring new technologies for SMSFEs.

The framework proposes that these institutions could introduce flexible financing options tailored to the unique cash flow patterns of SMEs in the fashion industry. For instance, repayment terms could be adjusted to accommodate the cyclical nature of fashion sales, providing seasonal moratoriums or scaled repayment plans. In addition to direct financing, financial institutions might offer financial advisory services to help SMEs make informed decisions about technology investments, manage risks, and optimize returns on their investments. By actively participating in this ecosystem, financial institutions not only contribute to the technological upliftment of the fashion industry but also stand to benefit from the potential growth and expansion of these enterprises. As SMSFEs grow and become more profitable through technology-driven efficiencies, their increased financial robustness can translate into more business and lower risk profiles for the lending institutions.

Furthermore, Financial Institutions can partner with Industry Unions and Associations to organize financial literacy workshops and training programs for SME owners. These programs can help demystify the process of securing funding for technology adoption and equip SMEs with the knowledge to manage their finances effectively, including how to apply for loans, manage credit, and maximize the return on their technology investments.

Financial Institutions, collaboration with Industry Unions and Associations allows for a deeper understanding of the sector's technological needs and the financial barriers to adoption. This insight can guide the development of financial products and services that are truly aligned with the market demand. Moreover, through these collaborations, Financial Institutions can tap into an aggregated client base, reducing marketing costs and increasing the outreach of their financial products targeted at SMEs.

4.14.3 Educational Institutions

Educational Institutions play a crucial role in the proposed stakeholder framework, acting as the bridge over the skills gap which frequently hampers the effective adoption and utilization of new technologies within Small and Medium-Scale Fashion Enterprises (SMSFEs). The framework emphasizes the importance of these institutions in developing and delivering tailored training programs that are closely aligned with the evolving technological landscape of the fashion industry. Such programs are designed not just to impart knowledge, but to equip students with practical skills that can be immediately applied within the industry.

These educational programs should be dynamic, incorporating the latest technological advancements in fashion design and manufacturing. They should offer a blend of theoretical understanding and practical hands-on experience with new technologies such as digital fabric printing, computer-aided design (CAD), and automated cutting and sewing machines. The involvement of industry practitioners in curriculum development and as guest lecturers can provide students with insights into real-world applications and the specific technological demands of the sector.

Collaboration with Industry Associations is essential for ensuring that educational offerings are industry-relevant and meet the actual needs of fashion enterprises. Such partnerships can facilitate internship opportunities, allowing students to gain valuable on-the-job experience and understand the practical challenges of technology implementation in the workplace. Moreover, these associations can provide feedback to Educational Institutions on the effectiveness of their programs and the readiness of graduates to contribute productively to the industry.

In addition to technical skills, Educational Institutions should also focus on fostering a mindset of innovation and continuous learning among students. This is important for creating a workforce that is not only skilled in current technologies but also adaptable to future advancements. Graduates from these institutions should be able to drive technological adoption within SMEs, championing innovation and improvement processes.

The success of this approach hinges on creating a feedback loop between Educational Institutions, Industry Associations, and SMEs. This ensures that the training programs remain responsive to the industry's needs, and graduates are primed to meet the demands of the modern fashion business environment. By filling the skills gap, Educational Institutions play a pivotal role in enabling SMSFEs to leverage technology for competitive advantage and growth.

4.14.4 Industry Unions and Associations

Industry Unions and Associations, exemplified by the Ghana National Tailors and Dressmakers Association (GNTDA) and the Ghana National Association of Garment Makers (GNAGM), are envisioned as central players in the ecosystem supporting

technology adoption among Small and Medium-Scale Fashion Enterprises (SMSFEs). These organizations are posited to serve as vital connectors among various stakeholders, effectively translating policy initiatives into practical action and ensuring that financial and educational services are attuned to the industry's needs.

As intermediaries, these associations have the capacity to effectively communicate and clarify government policies related to technology enhancement, such as tax incentives or grants, to their members. This role is crucial because it can significantly enhance the SMEs' understanding and utilization of available resources for technology adoption. Moreover, they can act as advocates, voicing the collective interests of their members to financial institutions, thus influencing the creation of financial products that are bespoke to the needs of the fashion industry.

Collaboration with educational institutions is another critical function of these industry bodies. They can provide valuable insights to shape training programs that are directly relevant to the sector's technological needs, ensuring that the curriculum is not only current but also forward-looking, preparing students for the impending technological shifts in the fashion industry. By voicing the industry's feedback, these unions and associations play a pivotal role in curating an education that is industry-ready and responsive to market changes.

In their intermediary role, these associations collect and consolidate feedback from their members, which encompasses the pain points, challenges, and aspirations related to technology adoption. This feedback becomes a powerful tool for guiding policymakers and financial institutions, helping them to understand the ground realities of technology implementation within the fashion industry. It ensures that the strategies and services

they develop are pragmatic, impactful, and conducive to fostering innovation and technological advancement within the sector.

CHAPTER FIVE

DISCUSSIONS OF RESULTS

5.1 Introduction

The primary objective of this study is to evaluate the level of technology adoption among small and medium-sized enterprises (SMEs) in the fashion industry of Ghana. In this section of the research report, the researcher presents the findings and contextualizes the meanings of the various outcomes of the study. The results are discussed in alignment with the research objectives to provide a comprehensive understanding of the current status of technology adoption in the Ghanaian fashion industry.

5.2 Status of technology adoption among SMSFEs

The findings of this study, when compared with the literature, provide valuable insights into the status of technology adoption among fashion businesses in Kumasi, Ghana, as well as their theoretical and practical implications. The results of the study highlight the low adoption rate of technology among fashion businesses, particularly SMSFEs, in the Kumasi metropolis. This finding is consistent with previous studies that indicate that SMSFEs in developing countries have low propensity in adopting and utilizing new technologies (UNCTAD, 2021) to which Asamoah et al. (2020) found that financial resources and technical expertise are key hindrances to technology adoption among SMEs in the Ghanaian fashion industry.

Furthermore, the study discovered that communication tools, such as the internet and mobile phones, are the most commonly used technologies among fashion businesses in Kumasi. This result is consistent with Bhavani and Tendulkar's (2001) observation that using manual labour to operate equipment and assemble materials for automated systems

is common in clothing production. The study also found that hardware technologies, such as pick/place robots and electric fabric cutters, have a low adoption rate. This suggests that there may be opportunities for SMEs to adopt and benefit from newer hardware technologies, as noted by Wiarda (1987).

The study's findings on the low technology adoption rate among Small and Medium-Scale Fashion Enterprises (SMSFEs) in Kumasi, Ghana, carry significant implications. Financial constraints and lack of technical expertise are identified as primary barriers, suggesting a need for focused financial and technical support measures. The prevalent use of basic digital communication tools like the internet and mobile phones indicates an existing digital engagement that could be leveraged to introduce more sophisticated technologies. There is a clear opportunity for industry transformation through the adoption of advanced hardware technologies, which could enhance operational efficiency, product quality, and market competitiveness. These results highlight the necessity for policy interventions and educational programs aimed at facilitating technology integration in the fashion sector. Addressing these challenges can lead to substantial advancements, potentially transforming the fashion industry in the region both economically and operationally.

Additionally, the study found that software technology is rarely utilized in the fashion industry in Kumasi. The low utilization rate for high-speed sewing machines and modern fusing and pressing machines suggests that there may be opportunities for SMEs to further adopt and benefit from software technologies. The low adoption rate of software technologies is consistent with Adobor and Nyarko's (2020) finding that the high cost of acquiring and maintaining technology is a hindrance to technology adoption in the Ghanaian fashion industry.

Furthermore, the results indicate that technology adoption is an important factor for competitiveness in the fashion industry in Kumasi, a finding that aligns with the literature on the significance of constant innovation and adoption of new technology for competitive advantage in the global market (Naushad & Sulphrey, 2020; Cooper, 1996; Mechling et al., 1995). The findings strengthen the understanding of the relationship between technology adoption and competitiveness in the fashion industry, particularly in developing countries like Ghana.

Additionally, the study found that software technology is rarely utilized in the fashion industry in Kumasi. The low utilization rate for high-speed sewing machines and modern fusing and pressing machines suggests that there may be opportunities for SMEs to further adopt and benefit from software technologies. The low adoption rate of software technologies is consistent with Adobor and Nyarko's (2020) finding that the high cost of acquiring and maintaining technology is a hindrance to technology adoption in the Ghanaian fashion industry.

In conclusion, the study's findings indicate that technology adoption among fashion businesses in Kumasi is low. The low adoption rate of hardware and software technologies suggests missed opportunities for improving operational efficiency and productivity. This highlights the need for fashion businesses to invest in technology to remain competitive.

5.3 Organisational factors that influence the adoption of technology amongst SMSFEs

Relative to the organisational factors that influence the adoption of technology among SMSFEs in the Kumasi metropolis the study found that respondents generally perceive industry size as a significant influence of technology adoption among enterprises.

The findings of this study suggest that top management commitment to technology adoption is moderately present in fashion enterprises in the Kumasi metropolis. This result is consistent with the literature that suggests that top management's attitudes and perspectives play a crucial role in an organization's transformation, growth, and development (Carpenter et al., 2004). These measures are consistent with the literature that suggests that top management's commitment to technology is likely to influence an industry's level of technology adoption (Useem, 1993).

The study also found that the cost of capital is a significant factor influencing technology adoption in fashion enterprises in the Kumasi metropolis. This result is consistent with the literature that suggests that capital is critical in facilitating an industry's ability to adopt new technologies (Baldwin & Lin, 2002). This finding has practical implications for fashion enterprises in Ghana, as it highlights the need for access to affordable capital to foster technology adoption and innovation in the industry.

The availability of fashion workers with technical skills was also found to be a factor influencing technology adoption among fashion enterprises in the Kumasi metropolis. This result is consistent with the literature that highlights the significance of human resources in fostering diversity and innovation (Co et al., 1998). This finding has practical implications for fashion enterprises in Ghana, as it highlights the need to develop a skilled labour force to support technology adoption and utilization in the industry.

The study also found that respondents have a positive perception of the competitive advantages of technology adoption in the organization. This result is consistent with the literature that suggests that technology adoption is crucial for an industry's focus on exports (Varukolu, 2007). The practical implications of this finding suggest that fashion enterprises in Ghana should focus on adopting technology as a strategy to compete in the marketplace and meet customer demands.

The theoretical implications of the study suggest that factors such as top management commitment to technology adoption, the cost of capital, availability of technical skills, and the competitive advantages of technology adoption are significant factors influencing technology adoption in the fashion industry. These factors can provide a theoretical basis for further research in the field. Additionally, the findings practical implications suggest that fashion enterprises should focus on enhancing top management support for technology adoption, exploring alternative funding sources and cost-effective technologies, investing in employee training and development, and adopting new technologies to improve efficiency, quality, and competitiveness in the marketplace.

5.4 Challenges influencing the adoption of technology amongst SMSFEs

The results of this study suggest that small and medium-sized enterprises (SMEs) in Ghana's garment industry face significant challenges in adopting technology. These challenges include the lack of government support, shortage of highly qualified technical personnel, and insufficient training facilities. These findings are consistent with the literature that highlights the challenges faced by Ghana's garment industry, including the shortage of government funding and competence, and the lack of essential labour division (Sarokin, 2017). These findings suggest that Ghana's government needs to prioritize the development of the garment industry by providing the necessary resources and support

to overcome the challenges faced by SMEs. The government can provide funding for vocational training centres and establish programmes that can help SMEs to access highly qualified technical personnel. Theoretical implications suggest that factors such as government support and the availability of highly qualified technical personnel are critical in technology adoption and innovation in the garment industry.

Additionally, the study highlights the importance of addressing the skills shortage and gaps in the garment industry. This finding is consistent with the literature that emphasizes the significance of human resources in fostering diversity and innovation (Co et al., 1998). The study recommends that the government should invest in employee training and development to overcome barriers related to technical skills and technology adoption. By developing a skilled labour force, SMEs in the garment industry can become more proactive in adopting technology, which can enhance their competitiveness and improve their productivity.

Furthermore, the findings of the study suggest that SMEs in Ghana's garment industry need to improve their labour division to boost production. This finding is consistent with the literature that highlights the benefits of the division of labour in enhancing production (Sarokin, 2017). By effectively allocating workers' skills to specific tasks, SMEs in the garment industry can minimize the transition between activities, which can improve their productivity and efficiency.

5.5 Competitive environment in which SMSFEs operate

The results of the study indicate that the fashion industry in the Kumasi Metropolis is highly competitive (Table 4.17), which corroborates with Kunz & Myrna (2011) and USITC (2004) which highlighted the competitive nature of the clothing industry.

Consistent with the reasons advanced by Kunz and Myrna (2011), this high level of competition could be attributed to the low concentration and minimal entry barriers in the clothing industry. The study also found that the availability of skilled labour plays a significant role in the competitiveness of the industry, which is consistent with the literature that emphasizes the importance of a skilled labour supply for the productivity and profitability of businesses in the 21st century (ILO, 2015). This highlights the need for fashion enterprises to invest in the development of their workforce to remain competitive.

The study further revealed a disagreement among respondents regarding the quality of products produced by fashion enterprises in the area, which could be a factor affecting their competitiveness. This finding suggests that fashion enterprises in the Kumasi Metropolis need to focus on enhancing the quality of their products to meet the demands of the highly competitive market.

Additionally, the study found a discrepancy in the level of technology available for use in the industry, which is in line with the literature that points out the impact of technology adoption on the competitiveness of businesses (Mechling et al., 1995). This underscores the need for fashion enterprises in the Kumasi Metropolis to invest in and adopt appropriate technologies to remain competitive in the industry.

The implications of the study's findings suggest that fashion enterprises in the Kumasi Metropolis need to prioritize investment in the development of their workforce, enhancing the quality of their products, and adopting appropriate technologies to remain competitive in the highly competitive fashion industry. Moreover, policymakers need to create a favourable economic environment that enables fashion enterprises to thrive and compete effectively with other players in the industry. Overall, these findings can inform

strategic decisions aimed at improving the competitiveness of fashion enterprises in the Kumasi Metropolis and by extension, the Ghanaian fashion industry.

5.6 Effects of factors that influence technology adoption among SMSFEs in Ghana

The study's findings suggest that technological factors do not positively influence enterprise technology adoption, which is consistent with the findings of Varukolu (2007). This implies that the mere presence of technological infrastructure or innovation does not necessarily influence the performance of small and medium-sized enterprises (SMEs). This finding is unique as it defies the norm however, reasoning could be advanced to the effect that the practices in the fashion industry in the metropolis is very basic and traditional in nature. The level of conservatist mentality in the industry are likely to make it difficult for players in the industry to adopt contemporary forms of technology. Also, factors such as industry, location, size, and target market could play a role in determining the relationship between technological factors and technology adoption.

In addition, it was found that organizational factors, as opposed to technological factors, play a more significant role in influencing enterprise's propensity to adopt technology. Factors such as top management commitment, technical capabilities, competitive advantage, and firm size were positively associated with technology adoption. This finding aligns with previous research conducted by Abdullah et al. (2013) and Nguyen (2019), who also identified the importance of organizational factors in driving enterprise success.

This finding highlights the relative importance of top management commitment, technical capabilities, competitive advantage, and firm size in influencing enterprise

performance. Committed top management fosters a culture of innovation, while investing in employees' skills boosts a firm's ability to adopt new technologies. Identifying and leveraging competitive advantage helps organizations outperform rivals, and firms of any size can excel by focusing on their unique strengths. By prioritizing these organizational factors, companies can improve their performance and competitiveness in the market.

Moreover, the study reveals a positive relationship between an enterprise's competitive environment and their propensity to adopt technology in their business, which corroborates the works of Sani et al. (2020) who emphasized the role of the competitive environment in shaping the decisions of firms to adopt technology. The study also found that the level of an enterprise's adoption of technology positively its ability to adopt and use various forms of technologies in their operations, which supports the findings of Acheampong and Gyawu (2011) and Akomea-Bonsu and Sampong (2012) regarding the benefits of ICT adoption for SMEs in Ghana.

5.7 Impact of technology adoption on the performance of SMSFEs

The results of the study indicate that there is a positive relationship between the level of technology adoption and enterprise performance in the fashion industry in Ghana (See Table 4.24). This finding is consistent with previous research that suggests that the adoption of technology can have a significant impact on the performance of SMEs, particularly in terms of productivity, cost and efficiency (Ahmad et al., 2019; Khayer et al., 2020; Talom & Tengeh, 2020).

This finding highlights the importance of technology adoption in driving business success, particularly in the context of globalization and increasing competition in the fashion industry. SMSFEs that adopt technology can gain a competitive advantage over

their competitors, which is crucial for survival in today's globalised economy (Afenya et al., 2019; Andaregie & Astatkie, 2021). It can be observed that the findings have broader implications as it has been established that suggests that technology adoption is essential for these enterprises to achieve better performance, which can lead to improvements in revenue, job creation, and productivity. Therefore, SMEs in the fashion industry should consider investing in technology to gain a competitive advantage and improve their overall business performance.

CHAPTER SIX

SUMMARY OF FINDINGS, CONCLUSIONS AND RECOMMENDATIONS

6.1 Introduction

This study aimed to investigate the status of technology adoption among small and medium-scale fashion enterprises (SMSFEs) in Kumasi, Ghana. This chapter presents the summary of the findings, conclusions, and recommendations and further makes suggestions for future research.

6.2 Summary of Findings

The findings of this research reveal that the adoption of hardware and software technology in the Kumasi fashion industry is low, particularly among SMSFEs. However, communication tools such as the Internet and mobile phones are widely used in the fashion industry in Kumasi. Despite this, the study also revealed that the adoption of advanced technologies like computer-aided design and automated material handling systems remains low among SMSFEs, indicating missed opportunities for improving operational efficiency, productivity, and competitiveness.

Furthermore, the study established that adopting technology is an important factor for competitiveness in the fashion industry in Kumasi. By adopting new technologies, SMSFEs can improve their processes, respond more quickly to market demand, and better reach and serve their customers.

Interestingly, the study found that in the case of SMSFEs in the Kumasi metropolis, technologically related factors, such as the adoption and frequency of use of available forms of technology, do not positively influence enterprises to adopt and integrate

technologies into their processes. On the other hand, organizational factors such as top management commitment, technical skills, cost of capital, and competitive advantage were found to have a positive impact on technology adoption.

Additionally, the study revealed that an enterprise's competitive environment has a positive effect on the extent to which enterprises adopt technology into their processes in their business.

Ultimately, the study demonstrated that the level of an enterprise's adoption of technology positively influences its performance, indicating a positive influence of technology on the performance of fashion enterprises in Ghana, specifically in the Kumasi metropolis.

6.3 Conclusions

Based on the findings, the following conclusions can be drawn:

1. The adoption of hardware and software technology within the Kumasi fashion industry appears to be limited, particularly among small and medium fashion enterprises (SMSFEs). Although communication tools such as the internet and mobile phones are prevalent, advanced technologies remain underutilized.
2. That technology adoption is essential for maintain competitiveness in the Kumasi fashion industry. By embracing innovative technologies, SMSFEs can potentially streamline their processes, become more responsive to market demands and improve their customer reach and satisfaction.
3. That technological factors do not seem to be the primary drivers of technology adoption and integration among SMSFEs in the Kumasi metropolis.

4. That organisational factor such as top management commitment, technical skills, cost of capital and competitive advantage play a more significant role in encouraging technology adoption among SMSFEs.
5. That an enterprise's competitive environment positively influences the degree to which businesses adopt technology in their processes.
6. That the degree of technology adoption positively impacts enterprise performance, emphasizing the importance of technology adoption for fashion enterprises in Ghana, especially in the Kumasi metropolis.

6.4 Recommendations

Based on the conclusions, the following recommendations are proposed:

1. To increase technology adoption, policy makers and industry stakeholders should work together to raise awareness of the benefits of advanced technologies such as computer-aided design and automated material handling systems. This can be achieved through workshops, seminars, and training programmes tailored to the needs of SMSFEs.
2. Policy makers should formulate and implement policies and regulations that encourage technology adoption and innovation in the fashion industry. This may include tax incentives, subsidies, or grants for businesses investing in new technologies, as well as policies that protect intellectual property rights and promote research and development.
3. Policy makers should establish funding programmes, low-interest loans, or credit facilities specifically tailored for SMSFEs seeking to invest in advanced technologies. This will help reduce financial barriers to technology adoption and encourage more enterprises to invest in innovative solutions.

4. SMSFEs can benefit from forming strategic partnerships with technology providers, research institutions, and other industry players to gain access to cutting-edge technology and knowledge. These partnerships can lead to joint projects, shared resources, and the exchange of expertise, ultimately boosting technology adoption and innovation capacity.
5. To ensure the effectiveness of technology adoption initiatives, SMSFEs should regularly monitor and evaluate their progress. This can be done by setting clear performance indicators, collecting data on technology adoption rates, and assessing the impact of adopted technologies on productivity, efficiency, and competitiveness. This information can be used to make informed decisions and adjust strategies as needed.

6.5 Suggestions for future studies

1. Future research can explore technology adoption and its impact on enterprise performance in different regions, comparing findings with the results of this study. Such comparative analysis can help identify best practices, success factors, and common challenges in technology adoption, which can be applied to support SMSFEs in the fashion industry and other sectors.
2. Future studies can examine the effectiveness of existing government policies, support programmes, and incentives aimed at promoting technology adoption among SMSFEs in Ghana. This research can identify gaps, opportunities, and potential areas for improvement in policy design and implementation, which can inform more effective interventions to encourage technology adoption and drive enterprise performance.

3. Future researchers may consider investigating the underlying factors that contribute to the limited influence of technological factors on technology adoption among SMSFEs in the Kumasi metropolis.

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APPENDIX
QUESTIONNAIRE FOR OWNERS/MANAGERS OF FASHION
ENTERPRISES

INTRODUCTION

The researcher is an MPhil student at AKENTEN APPIAH-MENKA UNIVERSITY OF SKILLS TRAINING AND ENTREPRENEURIAL DEVELOPMENT undertaking research on the topic: Assessment of technology adoption among small and medium size fashion enterprises: a study conducted of the Kumasi Metropolitan area.

I respectfully request your participation in this research by completing the attached questionnaire. This study is only meant for academic purposes; thus, the findings will only be used to improve our understanding of the factors that influences the adoption of technology in the context of the fashion industry in the Kumasi Metropolis.

Your answers to the questions on this form will be kept confidential. If an item has multiple possible answers, you can mark them all with a [] sign. However, provide brief explanation to the open-ended questions.

Thank you for your cooperation.

SECTION A: DEMOGRAPHY OF RESPONDENTS

Gender: Female [] Male []

Age: Below 20 years [] 21-30 years [] 31-40 years [] 41-50 years []
50 & above years []

Location of

Establishment _____

Your position in the industry. Fashion House Owner [] Fashion House
Manager [] others specify _____

Educational Qualification: No formal education [] Primary education [] JHS
[] SHS\ Vocational [] Certificate [] Diploma [] Degree []
Postgraduate []

How long have you been in business? less than a year [] 1 -5 years [] 6-10
years [] 11-15 years [] more than 15 years []

Number of staff: 1 -5 [] 6-10 [] 11-15 [] 16-20 [] above 20 []

How much is your approximated monthly level of revenue? Less than GH ₵1,000 []
GH ₵ 1,001 - GH ₵ 2, 000 [] GH ₵ 2,001- GH ₵ 3,000 []
GH ₵ 3,001- GH ₵4, 000 [] more than GH ₵ 5,000 []

SECTION B: STATUS OF TECHNOLOGY ADOPTION AMONG SMSFES IN KUMASI

Please indicate your degree of agreement by responding to the questions as truthfully as possible with a tick.

Key: SA=Strongly Disagree; D= Disagree; NS=Not sure; A=Agree; SA=Strongly Agree

Indicate the extent to which you agree with the following statements	SD	D	NS	A	SA
With the level of technology adopted in our operations we are able to quickly adopt to industry practices					
With our level of technology, we are able to maintain quick and flexible response to market demand					
With the level of technology adopted in our operations we are able to innovate our processes					
Our technology aids our business effectively					
Our level of technology enables us to reach out to our customers					
We are motivated to adopt new forms of technology because it gives us the edge over our rivals					

HARDWARE TECHNOLOGIES ADOPTED

Indicate the hardware technologies installed in your fashion shop	Installed	On order	Not installed	Out of Order	Install in future
High Speed Sewing Machine- HSSM					
Modern Fusing and Pressing Machine- MFPM					
Pick/Place Robot- PPR					
Electric Fabric Cutter- EFC					
Digital Embroidery Machine- DEM					

How often do you use these technologies	Frequently 1	Often 2	Sometimes 3	Rare 4	Never 5
High Speed Sewing Machine- HSSM					
Modern Fusing and Pressing Machine- MFPM					
Pick/Place Robot- PPR					
Electric Fabric Cutter- EFC					
Digital Embroidery Machine- DEM					

SOFTWARE TECHNOLOGIES ADOPTED

Indicate the Software technologies installed in your fashion shop	Installed	On order	Not installed	Out of Order	Install in future
Computer Aided Design- CAD					
Automated Inspection- AIN					
Automated Material Handling Device- AMHD					
Production Planning and/or Inventory Management Software- PPIC					
Internet- IT					
Communication (Telephone, mobile phone, pagers and Fax)- CM					

How often do you use these technologies	Frequently 1	Often 2	Sometimes 3	Rare 4	Never 5
Computer Aided Design - CAD					
Automated Inspection - AIN					
Automated Material Handling Device – AMHD					

Production Planning and/or Inventory Management Software – PPIC					
Internet – IT					
Communication (Telephone, mobile phone, pagers and Fax) - CM					

SECTION C: FIRM FACTORS THAT INFLUENCE TECHNOLOGY ADOPTION

This section of the questionnaire seeks to assess factors in your enterprise that influences the extent to which you adopt technologies in the operations of your business.

Please indicate your degree of agreement by responding to the questions as truthfully as possible with a tick.

Key: *SD=Strongly Disagree; D= Disagree; NS=Not sure; A=Agree; SA=Strongly Agree*

Factors that influence technology adoption	SD	D	NS	A	SA
Industry Size					
Due to our enterprise size, our fashion house is able to innovate and adopt technology.					
Our Fashion House can afford to invest in new technology.					
Due to our enterprise size, we have high technological intensity.					
Our enterprise size gives us a lot of advantage to adopt technology.					
Top Management Commitment					
Management enthusiastically supports the adoption of advanced technologies.					

Management has allocated enough resources for adoption of advanced technologies					
Management actively encourages employees to use the new technologies in their daily tasks					
Management fully supports initiatives to adopt technology to improve our operations					
Cost of Capital					
The cost of adopting technology sometimes hinders our initiative to adopt					
Access to finance is a major challenge to technology adoption in our enterprise					
Technical Skills					
Our enterprise is short on adopting technology due to the unavailability of skilled personnel					
Our enterprise has a positive view relative to staff with technical skills					
Specialized instructions and education for new technologies are available to employees					
Technical guidance is available in the selection of hardware, software, printers, and other equipment					
The presence of skilled technical personnel in the industry motivates us to adopt new forms of technologies					
Competitive Advantage					
We will lose customers to our competitors if we do not adopt these new technologies					
It is a essential to use advanced technologies to compete in the marketplace					
Our customers require the use of these technologies for doing business with them					
Our enterprise has adopted technology because it will give our enterprise an advantage over our competitors.					

SECTION D: CHALLENGES ENCOUNTERED IN TECHNOLOGY ADOPTION AMONGST SMSFEs

This section of the questionnaire measures the challenges your enterprise encounters in its efforts to adopt technology.

Please indicate your degree of agreement by responding to the questions as truthfully as possible with a tick.

Key: *SD=Strongly Disagree; D= Disagree; NS=Not sure; A=Agree; SA=Strongly Agree*

Challenges that affect technology adoption amongst SMSFEs	SD	D	NS	A	SA
Lack of support from the government					
Shortage of highly qualified technical personnel					
Individuals' technical skills do not meet the industry's needs.					
Insufficient materials and resources					
Lack of labour division has reduced garment productivity.					
There are not enough training facilities.					

SECTION E: COMPETITIVE ENVIRONMENT IN WHICH SMSFEs OPERATE

This aspect of the questionnaire seeks to obtain information on the competitive environment in which small and medium scale fashion enterprises operation in the metropolis.

Please indicate your degree of agreement by responding to the questions as truthfully as possible with a tick.

Key: *SD=Strongly Disagree; D= Disagree; NS=Not sure; A=Agree; SA=Strongly Agree*

Competitive environment in which SMSFEs operate	SD	D	NS	A	SA
It is very easy for people to enter into the fashion business in the Kumasi Metropolis					
Fashion enterprises in the Kumasi Metropolis produce high quality products.					

Consumers of fashion products in the Kumasi Metropolis have high standards of expectations.					
It is very difficult to launch and sustain a brand in this industry.					
The state of the economic environment makes the industry a competitive one to operate in.					
The level of technology available for use in the industry has made it highly competitive.					

SECTION F: PERFORMANCE OF SMSFEs

This portion of the questionnaire seeks to measure the performance of your enterprise in the last three years of operations.

Please indicate your degree of agreement by responding to the questions as truthfully as possible with a tick.

Key: SD=Strongly Disagree; D= Disagree; NS=Not sure; A=Agree; SA=Strongly Agree

Indicate the extent to which you agree or otherwise with the following statements	SD	D	NS	A	SA
Using technology has given us advantage over our competitors					
The technologies adopted in our enterprise has increased our sales					
The technologies adopted in our enterprise has improved our product quality					
The technologies adopted in our enterprise has given improved our general operations					
The technologies adopted in our enterprise has increased our level of profitability					

Thank you for your time.