ST. MARY'S UNIVERSITY

SCHOOL OF GRADUATE STUDIES

THE EFFECT OF INFORMATION TECHNOLOGY INVESTMENTS ON THE OPERATIONAL PERFORMANCE OF ETHSWITCH S.C.

BY

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JANUARY 2025

ADDIS ABABA, ETHIOPIA

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APPROVED BY BOARD OF EXAMINERS

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DECLARATION

I, the undersigned, declare that this thesis is my original work, prepared under the guidance of Asmamaw (PhD). All sources of materials used for the thesis have been duly acknowledged, the researcher further confirm that the thesis has not been submitted either in part or in full to any other higher learning institution for the purpose of earning any degree.

Getachew Aschalew _____

St. Mary's University, Addis Ababa, January 2025

ENDORSEMENT

This thesis has been submitted to St. Mary's University, School of Graduate Studies for Examination with my approval as a university advisor.

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Advisor **Signature**

St. Mary's University, Addis Ababa January 2025

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LIST OF ABBREVIATION AND ACRONYMS

IT	Information Technology
EthSwitch S.C.	EthSwitch Share Company
NPS	National Payment System
ROI	Return on Investment
SLA	Service Level Agreement
RBV	Resource-Based View
TAM	Technology Acceptance Model
BSC	Balanced Scorecard
SPSS	Statistical Package for the Social Sciences
LI	Likert Scale
IRB	Institutional Review Board
SD	Strongly Disagree
D	Disagree
N	Neutral
A	Agree
SA	Strongly Agree
M.A.	Master of Arts
B.A.	Bachelor of Arts

ABSTRACT

This study investigates the impact of IT investments on the operational performance of EthSwitch S.C., with a particular focus on IT infrastructure upgrades implemented over the past five years. A total of 75 responses from employees across various departments were analyzed, with a majority of participants being male (66.7%) and aged between 41 and 50 years (58.7%). Most respondents held higher educational qualifications, with an almost equal distribution between Bachelor's (52%) and Master's (48%) degrees. The findings reveal that IT investments were perceived to have significantly improved operational efficiency, system reliability, transaction speed, and the company's competitive advantage. Key improvements were observed in system reliability and transaction accuracy, though perceptions regarding service quality and response time were mixed, with some respondents expressing uncertainty. The study also noted a reduction in system downtime and improved scalability as a result of IT upgrades, although system failures and service interruptions persisted. Overall, the research highlighted the positive Effects of IT investments on operational performance, but also identified areas for further improvement, particularly in system reliability and customer confidence. it is recommended that EthSwitch S.C. focus on continuous improvement in system reliability and transaction accuracy by investing in advanced monitoring tools and proactive maintenance. To address mixed perceptions of service quality and response time, the company should implement performance benchmarks, SLAs with vendors, and explore AI-driven solutions to optimize customer support. Further investment in scalable cloud infrastructure will ensure the company can handle future demands. Improving internal communication and user training will enhance operational efficiency, while a robust disaster recovery plan will strengthen customer confidence. Finally, periodic assessments of IT infrastructure will keep the company aligned with industry trends and technological advancements.

Key words: IT Investments, Operational Performance, System Reliability, Customer Satisfaction, EthSwitch S.C.

CHAPTER ONE
INTRODUCTION

1. Introduction

1.1. Background of the Study

In the digital era, Information Technology (IT) has become a critical driver of operational performance across industries, particularly in sectors that rely heavily on efficient and dependable systems, such as financial services. Investment in IT and improvements in infrastructure are vital for enhancing operational efficiency, system reliability, and customer satisfaction (Laudon & Laudon, 2019). Companies are increasingly leveraging technology to optimize internal processes, streamline operations, and enhance customer service delivery. EthSwitch S.C., a prominent player in Ethiopia's electronic payment ecosystem, has invested significantly in IT to boost operational performance and improve service delivery. Understanding how IT investments impact operational performance is crucial for optimizing EthSwitch's business processes and ensuring its competitive positioning in the market (Mithas & Jones, 2014).

IT investments involve the allocation of financial and organizational resources to enhance and maintain technological infrastructure, software, and services. These investments typically include upgrading hardware such as servers and network equipment, implementing advanced software solutions, and integrating cloud-based services. The primary goal is to improve operational performance by enhancing efficiency, reducing operational costs, increasing productivity, and ensuring system security, reliability, and scalability (Brynjolfsson & Hitt, 2000). As organizations grow and transaction volumes rise, the need for IT systems that can handle larger operations efficiently and with precision becomes essential (Cearley & Becker, 2020).

For EthSwitch, improvements in IT infrastructure are directly linked to better operational performance. These upgrades are intended to enhance transaction processing times, minimize errors, and improve the reliability of systems, especially during high-demand periods, thus contributing to better overall performance (Brynjolfsson & Hitt, 2000).

IT infrastructure improvements are essential for ensuring operational efficiency and optimizing system performance. These enhancements typically include the upgrading of

hardware components such as servers and storage devices, as well as investments in advanced software solutions and cloud technologies that ensure effective resource management (Clemons & Row, 1991). These upgrades enable IT systems to remain scalable, secure, and responsive to rising demand (Mithas & Jones, 2014).

For EthSwitch, the reliability of its IT infrastructure is paramount for operational success. The company relies on IT systems to handle millions of transactions daily, making system reliability a crucial component. System reliability refers to the ability of IT systems to function consistently and without major disruptions, an important factor in minimizing downtime in the financial services industry, where even brief service interruptions can have significant consequences (Laudon & Laudon, 2019). Investments in redundant systems, backup mechanisms, and cybersecurity are key strategies to improve system reliability and minimize operational disruptions (Clemons & Row, 1991).

A robust and reliable IT infrastructure ensures operational continuity, allowing the organization to quickly recover from technical failures, and contributes to smoother daily operations, fostering increased customer trust and satisfaction (Mithas & Jones, 2014). These infrastructure improvements also enhance EthSwitch's competitive position by reducing the frequency of system failures and service interruptions.

System reliability is a critical determinant of operational performance, particularly in service-driven industries like financial services. For EthSwitch, ensuring the continued operational performance of its IT infrastructure without significant downtime is essential for smooth operations, especially during high-demand periods when real-time transactions are essential. Studies have shown that organizations that invest in robust and reliable IT systems tend to experience fewer disruptions, leading to higher customer satisfaction and improved performance (Hendricks & Singhal, 2003). This is particularly important for EthSwitch, where system downtime or interruptions can cause delayed transactions and customer dissatisfaction (Hendricks & Singhal, 2003).

EthSwitch's commitment to maintaining a reliable system ensures that the network remains operational even during peak times, which improves transaction speed and accuracy, reduces disruptions, and ultimately enhances customer satisfaction. Reliable systems foster a competitive advantage by improving overall operational performance and customer service.

Customer satisfaction is a key outcome of operational performance, particularly in service-based industries where customer experience is a competitive differentiator. For EthSwitch, customer satisfaction is closely linked to the speed, accuracy, and reliability of its transaction processing systems. Ensuring seamless, uninterrupted transaction experiences fosters customer loyalty and contributes to the company's long-term success (Siguaw, Simpson, & Enz, 2006).

Research has consistently demonstrated that IT investments that improve transaction speed, reduce errors, and increase system uptime positively influence customer satisfaction (Siguaw, Simpson, & Enz, 2006). Fast transaction processing reduces wait times, while accurate systems minimize errors that can frustrate customers. Moreover, systems that remain functional during peak usage periods enhance customer trust and reliability, which are essential for businesses in the financial services sector (Mithas & Jones, 2014).

In the financial services sector, organizations that invest in modern IT systems to improve operational efficiency and customer experience tend to achieve higher customer loyalty and retention (Siguaw, Simpson, & Enz, 2006). For EthSwitch, ongoing IT investments in infrastructure and reliability are critical not only for improving operational performance but also for sustaining high levels of customer satisfaction, which is necessary for maintaining a competitive edge in the digital payments sector (Mithas & Jones, 2014).

The Interconnectedness of IT Investments, Infrastructure, and Performance

The relationship between IT investments, infrastructure improvements, system reliability, and operational performance is dynamic and interdependent. IT investments lay the foundation for infrastructure upgrades that enhance system reliability. In turn, reliable systems improve operational performance, enable faster transaction processing, and reduce the risk of service interruptions (Brynjolfsson & Hitt, 2000). Enhanced operational performance, in turn, leads to improved customer satisfaction, creating a feedback loop that encourages further investments in IT infrastructure (Laudon & Laudon, 2019).

For EthSwitch, this interconnection underscores the need for continuous evaluation and upgrading of its IT infrastructure to ensure long-term operational goals are met. Regular updates, investments in system reliability, and responsiveness to customer feedback are essential to maintaining a competitive advantage and meeting the demands of a rapidly

evolving digital payments landscape (Mithas & Jones, 2014). EthSwitch's ongoing investments in IT systems, system reliability, and customer satisfaction contribute to its operational performance and market leadership in Ethiopia's financial services sector (Cearley & Becker, 2020).

This study explores the impact of IT investments, infrastructure improvements, and system reliability on EthSwitch S.C.'s operational performance. It illustrates how these factors, when effectively integrated, lead to improved transaction speed, greater reliability, and enhanced customer satisfaction. The interconnection of these variables is crucial for achieving sustained success in the competitive digital payments sector.

1.2. Statement of the Problem

Despite EthSwitch S.C.'s significant investments in advanced IT solutions and cutting-edge technology, challenges related to customer satisfaction, complaints, and disputes persist. While the company has made strides in enhancing its IT infrastructure and transaction processing capabilities, these investments have not yet translated into the expected improvements in operational performance or customer experience. This is a critical issue, particularly in the highly competitive and technology-driven financial services sector, where customer satisfaction and trust are essential for long-term success (Brynjolfsson & Hitt, 2000).

EthSwitch has focused on upgrading IT infrastructure—improving hardware, optimizing software systems, and adopting cloud technologies—with the goal of increasing the speed, accuracy, and reliability of transaction processing. Ideally, these upgrades should result in enhanced service delivery, fewer technical disruptions, and improved system reliability, which should positively affect customer satisfaction (Clemons & Row, 1991). However, ongoing customer complaints about issues such as transaction errors, delays, and frequent service interruptions suggest that the expected benefits have not been fully realized.

Recent empirical studies show that IT investments alone are not enough to guarantee improved customer satisfaction or operational performance. A study by Ross, Beath, and Goodhue (2021) found that while investments in IT infrastructure are critical, they must be aligned with business strategies and customer needs to achieve meaningful outcomes. In particular, companies must focus not only on the technical aspects of IT systems but also on how these systems meet the evolving expectations of customers. Similarly, an analysis by

Zhang, Zhang, and Li (2022) highlighted that even well-funded IT projects may fall short of delivering the expected operational improvements unless there is a focus on continuous system optimization and user experience. These findings raise important questions about the effectiveness of EthSwitch's IT investments in addressing the underlying causes of customer dissatisfaction.

Thus, a key research gap exists in understanding how IT investments, infrastructure upgrades, and system reliability influence operational performance, and how these factors, in turn, impact customer satisfaction. Existing literature has shown that system reliability and transaction speed are central to customer experience, particularly in the financial services sector (Siguaw, Simpson, & Enz, 2006). However, few studies have examined the specific alignment between IT infrastructure improvements and customer expectations in emerging markets like Ethiopia. In particular, research by Mikalef et al. (2022) emphasized the importance of integrating customer feedback into IT strategy but noted that this aspect is often overlooked in large-scale technology investments.

The goal of this research is to examine whether EthSwitch's IT investments align with customer expectations and operational goals, and to identify areas where its strategy can be further optimized. Understanding the relationship between IT investments, system reliability, and customer satisfaction is crucial for assessing how these factors influence operational performance. For EthSwitch, this examination will highlight areas for improvement in both technology and customer service management. Moreover, it will offer insights into how to better manage customer expectations in light of technological advancements.

A critical aspect of this study is identifying the extent to which IT-related issues contribute to customer dissatisfaction and operational challenges. By addressing this gap, EthSwitch can take targeted actions to refine its IT investments, enhance system reliability, and, ultimately, improve customer satisfaction and operational performance. Without this understanding, EthSwitch risks continuing to invest in technologies that do not fully meet its customers' needs, which could limit the company's growth and damage its reputation in the competitive financial services sector (Brynjolfsson & Hitt, 2000).

Although there is substantial literature on the general role of IT investments in operational performance, there is a gap in research focusing on how specific IT investments (e.g., infrastructure upgrades, system reliability) impact customer satisfaction in the digital

payments sector, particularly in emerging markets like Ethiopia. Furthermore, there is limited exploration of how organizations can effectively align IT infrastructure improvements with evolving customer expectations in these markets. Addressing these gaps could provide valuable insights for EthSwitch to better manage its technology investments and improve both operational performance and customer satisfaction.

1.3. Objective of the Study

1.3.1.General Objective

The general objective of this study is to determine the Effect of Information Technology investments on the operational performance of EthSwitch S.C.,

1.3.2.Specific Objectives

The specific objectives of this study are:

- To evaluate the Effect of IT investments on the operational performance of EthSwitch S.C.
- To assess the Effect of on the systems reliability of operational performance of EthSwitch S.C.
- To investigate the Effect of Customer satisfaction on the operational performance of EthSwitch S.C.
- To evaluate the Effect of IT infrastructure on the operational performance of EthSwitch S.C.

1.4. Research Hypotheses

HO_1: IT investment has no effect on operational performance.
$H1_1$: IT investment has an effect on operational performance.

HO_2: System reliability does not affect operational performance.
$H1_2$: System reliability does affect operational performance.

HO_3: Customer satisfaction has no effect on operational performance.
$H1_3$: Customer satisfaction has an effect on operational performance.

HO_4: IT infrastructure does not affect operational performance.
$H1_4$: IT infrastructure affects operational performance.

1.5. Significance of the Study

This study is significant for several reasons, particularly in the context of EthSwitch S.C.'s continued growth and its role in Ethiopia's financial services sector. First, by examining the Effect of IT investments, IT infrastructure improvements, and system reliability on operational performance, this research offers valuable insights into the Effectiveness of current technological strategies employed by the company. The findings can help EthSwitch identify areas where its IT investments may not be fully aligned with its operational goals, thereby offering actionable recommendations for better resource allocation and improved performance. Second, understanding how these independent variables influence customer satisfaction is essential in a highly competitive market where customer trust and service quality are key differentiators. The study's findings can guide EthSwitch in refining its customer service approach, reducing complaints, and minimizing disputes, ultimately enhancing the overall customer experience. Finally, the study contributes to the broader academic and industry understanding of how IT investments can directly affect operational outcomes and customer perceptions in the financial services industry.

1.6. Scope and Limitations of the Study

1.6.1. Scope of the Study

This study is to assess the effect of Information Technology (IT) investments on the performance of EthSwitch S.C., a prominent electronic payment switch provider in Ethiopia. EthSwitch, as the National Payment System Operator, plays a crucial role in enabling interoperability among financial institutions, including banks, Microfinance Institutions (MFIs), payment instrument issuers, and other payment system operators. The study will focus on EthSwitch's role in implementing the Domestic Payment Scheme, providing the National Payment Gateway, serving as the central interconnectivity hub for clearing and settlement, and offering shared platform/infrastructure services. The research aims to evaluate how IT investments contribute to improving these operational functions and overall organizational performance.

1.6.2.Limitations of the Study

A significant limitation of this study was the reluctance of many employees to complete the questionnaires due to time constraints, which led to delays in data collection. Even those who agreed to participate took several days to complete the questionnaires, further extending the process. Additionally, the busy schedules of some officers and management members limited their availability for participation, which presented challenges in gathering comprehensive insights from all intended respondents. These factors contributed to delays in both data collection and analysis, potentially affecting the inclusion of certain relevant findings. In my opinion, these challenges underscore the importance of careful planning and time management when conducting research in a fast-paced organizational environment, as well as the need for flexibility in accommodating the schedules of key participants.

1.7. Operational Definition of Terms

1.7.1. Information Technology (IT) Investment

- **Definition**: IT investment refers to the allocation of financial resources toward acquiring and maintaining IT systems, including hardware, software, and services (Brynjolfsson & Hitt, 2000).
- **Operationalization**: Measured by the financial expenditure on IT components and initiatives within EthSwitch, assessed through financial statements and investment records (Laudon & Laudon, 2019).

1.7.2. Operational Efficiency

- **Definition**: Operational efficiency measures the effectiveness of transaction processing, including speed, accuracy, and transaction volume (Brynjolfsson & Hitt, 2000).
- **Operationalization**: Assessed through metrics such as transaction processing time, error rates, and throughput, drawn from performance reports (Mithas & Jones, 2014).

1.7.3. System Reliability

- **Definition**: System reliability indicates the consistency and stability of IT systems with minimal disruptions (Clemons & Row, 1991).

- **Operationalization**: Evaluated using system uptime, frequency of failures, and downtime, sourced from system logs and maintenance records (Hendricks & Singhal, 2003).

1.7.4. Performance Metrics

- **Definition**: Quantitative indicators for assessing operational performance, including system reliability, transaction efficiency, and service quality (Mithas & Jones, 2014).
- **Operationalization**: Includes transaction volume, customer satisfaction scores, and system performance, obtained from reports, surveys, and SLAs (Siguaw, Simpson, & Enz, 2006).

1.7.5. Transaction Processing Speed

- **Definition**: The time taken to complete a transaction, from initiation to finalization (Laudon & Laudon, 2019).
- **Operationalization**: Measured by average transaction processing time, documented in system logs (Brynjolfsson & Hitt, 2000).

1.7.6. Customer Satisfaction

- **Definition**: Customer satisfaction reflects users' contentment with EthSwitch's services, including transaction efficiency and system reliability (Siguaw, Simpson, & Enz, 2006).
- **Operationalization**: Assessed via customer surveys, feedback forms, and satisfaction ratings (Laudon & Laudon, 2019).

1.7.7. Transaction Volume

- **Definition**: The total number of transactions processed over a period (Mithas & Jones, 2014).
- **Operationalization**: Measured by aggregate transaction data from system logs and records (Cearley & Becker, 2020).

1.7.8. System Maintenance

- **Definition**: Activities to maintain and update IT systems, ensuring operational continuity (Clemons & Row, 1991).

- **Operationalization**: Evaluated by the frequency and type of maintenance actions, tracked through maintenance logs (Hendricks & Singhal, 2003).

1.8. Organization of the Study

The organization of this study is structured into several chapters, starting with the introduction, which provides an overview of the research, including the background of the study, statement of the problem, research questions, hypotheses, objectives, significance, scope, limitations, and definitions of key terms. Chapter two presents a literature review, discussing theoretical perspectives on IT investments such as the Resource-Based View (RBV), Technology Acceptance Model (TAM), and Balanced Scorecard (BSC), along with empirical studies on the impact of IT investments on operational efficiency, system reliability, service quality, and customer satisfaction, particularly in financial technology providers. The chapter concludes with a summary of key findings and the conceptual framework. Chapter three outlines the research methodology, detailing the study area, research design, population, sampling methods, data collection instruments, data analysis procedures, reliability and validity, and ethical considerations. Chapter four presents and analyzes the collected data, including the demographic background of the respondents and the Effects of IT investments on operational efficiency, system reliability, and overall performance, followed by strategic recommendations and insights. Finally, chapter five summarizes the findings, draws conclusions, and offers recommendations based on the study's outcomes.

CHAPTER TWO

LITERATURE REVIEW

2.1. Introduction

In recent years, the influence of Information Technology (IT) on operational performance has become a critical area of research for businesses across various sectors. EthSwitch S.C., an entity within Ethiopia's rapidly evolving financial services sector, exemplifies the growing role of IT investments, IT infrastructure improvements, system reliability, and customer satisfaction in enhancing operational performance. The relationship between these factors and their collective impact on operational efficiency—such as transaction accuracy, service speed, service quality, and overall organizational performance—is not only a vital research topic but also central to achieving competitive advantages in a digital economy.

In this research, we aim to analyze the effects of these independent variables on operational performance within EthSwitch. These factors, in turn, have broader implications for other companies in similar sectors, particularly in emerging markets like Ethiopia. EthSwitch, by modernizing its IT systems, aims to streamline operations, minimize downtime, and enhance customer satisfaction—crucial objectives as it navigates a rapidly evolving technological landscape.

2.2. Theories Relevant to the Study

Understanding the connection between IT investments, infrastructure improvements, system reliability, and operational performance requires a theoretical foundation that can explain the mechanisms at work. The theories referenced in this review are instrumental in providing insights into how these variables interact within EthSwitch's operational context. These include the Resource-Based View (RBV), the Technology Acceptance Model (TAM), Systems Theory, and the SERVQUAL Model.

2.3. Resource-Based View (RBV) Theory

The Resource-Based View (RBV), developed by Barney (1991), asserts that a firm's resources and capabilities are central to achieving sustained competitive advantage. IT investments, viewed through the lens of RBV, represent valuable and unique resources that can directly impact an organization's ability to perform. For EthSwitch, continuous

investments in advanced IT systems ranging from infrastructure improvements to enhanced data processing technologies are anticipated to improve its operational performance.

The competitive advantage gained through IT resources is often tied to the uniqueness of the technological capabilities that an organization possesses. EthSwitch's adoption of cutting-edge technologies is expected to help the company outperform competitors by enhancing transaction processing speeds, system reliability, and overall service delivery. RBV highlights the strategic importance of IT resources in maintaining high operational standards and customer satisfaction (Barney, 1991; Amit & Schoemaker, 1993). This theory provides a framework for understanding why EthSwitch's investments in IT infrastructure are critical to its overall success in the financial services sector.

2.4. Technology Acceptance Model (TAM)

The Technology Acceptance Model (TAM), proposed by Davis (1989), is a well-established theory in understanding user acceptance of technology. TAM posits that two main factors perceived ease of use and perceived usefulness determine the likelihood that users will adopt and utilize new technologies. For EthSwitch, this model can be applied to assess how effectively its staff and customers accept and use newly implemented IT systems.

Perceived ease of use suggests that if users find the new systems easy to navigate and use, they are more likely to engage with them, which can lead to improved operational efficiency. Perceived usefulness, on the other hand, focuses on how beneficial the technology is perceived to be for completing tasks. The TAM framework underscores the importance of user-centered design and training programs in ensuring that IT investments yield optimal performance outcomes (Davis, 1989; Venkatesh & Davis, 2000).

In the case of EthSwitch, user acceptance of its IT infrastructure improvements directly impacts operational performance. If users (both internal staff and customers) accept the systems and find them useful, the overall performance of the organization will improve, manifested in quicker transaction processing times and fewer errors. Moreover, the degree of system acceptance can influence customer satisfaction, a vital factor in operational success.

2.5. Systems Theory

Systems Theory, particularly the works of Bertalanffy (1968), provides a framework for understanding how an organization's subsystems work together to achieve overall performance. EthSwitch, as an organization, can be viewed as a system comprising various subsystems such as IT infrastructure, networks, and human resources. Systems theory emphasizes that the interactions between these subsystems can either strengthen or weaken the system's performance as a whole.

For instance, IT infrastructure reliability directly affects the performance of the entire organization. Failures in one subsystem, such as network downtime or server failures, can lead to cascading effects that impact transaction processing and customer satisfaction. According to Bertalanffy (1968), organizations need to optimize their subsystems to ensure overall efficiency, which in the context of EthSwitch, translates into a continuous focus on system reliability. Failures within any subsystem can disrupt performance and erode customer trust, making it crucial for EthSwitch to ensure smooth interconnections between IT components and human operators.

2.6. SERVQUAL Model

The SERVQUAL Model, introduced by Parasuraman, Zeithaml, and Berry (1985), focuses on service quality and customer perceptions of service delivery. The model highlights the gap between customer expectations and perceptions of the service they receive, which can be a key determinant of customer satisfaction. For EthSwitch, this model can be used to evaluate how its IT investments affect customer perceptions of service quality.

The SERVQUAL dimensions tangibles; reliability, responsiveness, assurance, and empathy—are particularly relevant to assessing how improvements in IT infrastructure (e.g., better transaction reliability and speed) influence customer satisfaction. By investing in advanced IT infrastructure, EthSwitch can reduce transaction errors and processing delays, thus improving reliability and responsiveness, which directly enhance customer perceptions of service quality (Parasuraman et al., 1985).

Information Technology and Operational Performance

Numerous studies have emphasized the significant role of IT in improving operational performance. Hitt and Brynjolfsson (1996) highlighted that investments in IT lead to increased efficiency and reduced operational costs. This finding has been corroborated by various other researchers who have shown that modern IT systems can significantly improve transaction processing speed, reduce errors, and enhance data accuracy. These improvements directly contribute to better operational performance, which is crucial in competitive sectors like financial services (Brynjolfsson & Hitt, 2000).

Zengler and McGrath (2010) further argued that cloud computing and network infrastructure upgrades are integral to enhancing operational efficiency. These improvements reduce downtime and enable scalability, which can enhance service delivery. In EthSwitch's context, the reliability of IT infrastructure ensures fewer service interruptions, resulting in smoother transaction processing and higher customer satisfaction (Carr, 2003).

IT Infrastructure Improvements

Research on the effects of IT infrastructure improvements suggests that organizations that continuously upgrade their IT systems tend to experience better operational outcomes. Kumar and Raghav (2011) found that organizations that invested in hardware upgrades and cloud solutions showed faster transaction processing and more accurate service delivery. This aligns with the findings of Bharadwaj (2000), who highlighted the importance of core systems (such as network equipment and data storage) in reducing system downtime and resolving issues more swiftly.

For EthSwitch, these upgrades are essential in enhancing performance. The shift towards cloud-based solutions and improved network infrastructure can enable faster transactions, minimize errors, and ensure that services are consistently available to customers, all of which contribute to higher satisfaction and overall performance.

System Reliability and Operational Performance

System reliability has been shown to be a crucial factor in operational performance. Hendricks and Singhal (2003) demonstrated that companies with highly reliable IT systems experience fewer disruptions and greater customer trust. Liu and Shih (2007) further

emphasized that minimizing downtime and service failures directly correlates with higher customer satisfaction and better operational outcomes.

For EthSwitch, maintaining system reliability ensures that transactions are processed accurately and quickly. This reliability is vital in an industry where customer transactions are time-sensitive and accuracy is critical. By reducing the frequency and impact of system failures, EthSwitch can improve operational efficiency and enhance customer trust in its services.

Customer Satisfaction and Operational Performance

Research shows a direct relationship between customer satisfaction and operational performance. Zeithaml et al. (1996) argued that service quality, which can be enhanced through IT improvements, is a key driver of customer satisfaction. McKinney et al. (2002) found that advanced IT systems allow firms to offer personalized services, which improves customer satisfaction and, by extension, operational performance.

In the context of EthSwitch, improvements in IT infrastructure lead to faster and more accurate transactions, which enhance customer experiences and build trust in the company's services. Satisfied customers are more likely to become loyal, recommend services, and provide positive feedback, all of which contribute to sustained operational success.

2.7. Empirical Literature Review

In their 1996 study, Hitt and Brynjolfsson explored the relationship between IT investment and operational performance within the U.S. banking sector. Their findings underscored the critical role of information technology (IT) in improving productivity and efficiency within banks. Specifically, they examined how IT investments, such as core banking systems, automated teller machines (ATMs), and other IT-enabled services, influenced operational outcomes. The study revealed several key benefits of IT investments, such as increased operational efficiency, cost reduction, enhanced service delivery, and increased transaction speed (Hitt & Brynjolfsson, 1996). These outcomes, as observed in U.S. banks, can be compared and adapted to the context of Ethswitch, a national payment switch in Ethiopia, to understand how IT investments might similarly enhance operational performance in a developing economy.

One of the key findings from Hitt and Brynjolfsson's research was the significant improvement in operational efficiency achieved by banks that invested in IT systems. IT systems automated processes that were once manual, enabling faster transaction processing, improved service accuracy, and reduced reliance on human intervention, ultimately lowering operational costs (Hitt & Brynjolfsson, 1996). In the Ethiopian context, the role of Ethswitch in facilitating interbank payments aligns with this outcome. As Ethswitch continues to invest in IT infrastructure, such as payment switch technology and network systems, similar improvements in transaction processing time, accuracy, and reduced operational costs can be expected. However, in Ethiopia, the performance of these systems may be influenced by factors such as network infrastructure and internet connectivity, which are not as advanced as in the U.S. (Salazar et al., 2022).

Another significant finding in Hitt and Brynjolfsson's study was the reduction in operational costs and improved profitability as a result of IT investments. Banks in the U.S. achieved cost reductions, particularly in back-office operations, through automation and centralized processing (Hitt & Brynjolfsson, 1996). In Ethiopia, Ethswitch can similarly benefit from IT investments that enhance the efficiency of processing and routing interbank payments, leading to cost savings for participating banks. Furthermore, scaling up the infrastructure as transaction volumes grow could lead to economies of scale and lower per-transaction costs. However, unique challenges, such as the reliance on government funding and infrastructure costs, may affect the cost-benefit analysis of IT investments in Ethiopia (Alemu & van der Heijden, 2023).

Improved service delivery and customer satisfaction were also notable outcomes of IT investment in Hitt and Brynjolfsson's study. The implementation of IT systems allowed banks to offer faster, more accurate services, leading to increased customer satisfaction and loyalty (Hitt & Brynjolfsson, 1996). In the case of Ethswitch, enhancements to IT infrastructure can similarly result in faster and more reliable transactions, improving service delivery and customer satisfaction. The expansion of mobile money services and electronic funds transfers in Ethiopia could further enhance customer experiences, contributing to the growth of the digital financial ecosystem (Zelalem & Teshome, 2021). However, the adoption of these technologies by the banking sector and access to digital services by the population remain critical factors for success (Adem, 2022).

Hitt and Brynjolfsson's study also highlighted the increase in transaction speed as a key benefit of IT investments in banking systems. The adoption of ATMs and electronic funds transfer (EFT) systems enabled banks to process higher transaction volumes in less time, thereby increasing throughput and reducing bottlenecks (Hitt & Brynjolfsson, 1996). Similarly, Ethswitch's role in facilitating rapid interbank transactions aligns with this finding. As Ethswitch invests in IT infrastructure, such as improved network systems and real-time processing capabilities, it can expect faster processing times for transactions, which would benefit participating banks and their customers. However, security concerns, particularly related to fraud prevention and data integrity, must be carefully managed, especially in a developing economy where the banking sector may face unique challenges (Jumbe et al., 2023).

While Hitt and Brynjolfsson's findings provide valuable insights, it is essential to consider the unique challenges posed by the Ethiopian context when applying these principles to Ethswitch's operations. Ethiopia faces infrastructure limitations, such as limited internet access and mobile penetration, which can impact the speed and reliability of transactions on the Ethswitch platform (Alemu & van der Heijden, 2023). Furthermore, the regulatory environment, including policies set by the National Bank of Ethiopia (NBE) and Ethswitch itself, plays a crucial role in shaping the deployment of IT investments. Regulations can either facilitate or hinder the smooth implementation of new technologies, influencing the overall effectiveness of these investments (Zelalem & Teshome, 2021). Additionally, challenges like digital literacy, IT skill gaps, and financial inclusion may affect the success of IT investments in Ethiopia, making the implementation of technology more complex than in the U.S. banking system (Adem, 2022).

The findings of Hitt and Brynjolfsson (1996) offer valuable insights into the ways in which IT investments can enhance operational performance, particularly in terms of reducing costs, improving efficiency, and enhancing service delivery. These outcomes are highly relevant to the context of Ethswitch and can be applied to understand how IT investments might transform the operational performance of interbank payment systems in Ethiopia. However, the unique challenges of operating in Ethiopia's developing economy, such as infrastructure gaps, regulatory issues, and the pace of technology adoption, must also be considered when evaluating the potential benefits of IT investments. By comparing these findings with the Ethiopian context, my research can contribute to a deeper understanding of how IT

investments can be leveraged to improve the operations of Ethswitch and the broader Ethiopian financial ecosystem.

In his 2011 study, Ravi explored the impact of IT investments on service delivery in Indian financial institutions, particularly focusing on the role of core banking systems (CBS), payment systems, and automated teller machines (ATMs). Ravi found that these technological advancements played a crucial role in improving operational efficiency, service delivery, and customer satisfaction. Specifically, the implementation of CBS allowed banks to provide seamless banking services across multiple branches, enabling real-time access to accounts and transactions, and reducing processing times for customer requests. The introduction of ATMs significantly improved operational efficiency by reducing wait times at branches, while also providing self-service options for routine transactions such as cash withdrawals and balance inquiries (Ravi, 2011). Additionally, online banking provided customers with 24/7 access to financial services, reducing the need to visit physical branches, thus enhancing convenience and reducing transaction times. Overall, Ravi emphasized that IT investments, particularly in payment systems and automated services, were directly linked to improved customer satisfaction, retention, and loyalty (Ravi, 2011).

Key findings of Ravi's (2011) research identified several core areas where IT investments had a direct impact on service delivery. First, core banking systems (CBS) were found to provide seamless banking services across different branches, facilitating real-time transactions and improving overall customer experience by reducing processing time for various requests. Second, automated teller machines (ATMs) played a significant role by offering customers self-service banking for routine transactions, thus reducing wait times at branches and enhancing customer satisfaction. Furthermore, online banking allowed customers to access financial services without needing to visit physical branches, providing convenience and enabling banks to handle higher volumes of transactions more efficiently. Finally, Ravi's study concluded that these IT investments, particularly in payment systems and automation, directly contributed to improved customer satisfaction, fostering greater customer retention and loyalty (Ravi, 2011).

My research on Ethswitch shares similarities with Ravi's study, particularly in terms of the positive impact of IT investments on service delivery in the financial sector. However, there are significant differences between the contexts of India and Ethiopia that must be considered. Ravi's study highlighted the widespread adoption of CBS and ATMs in India,

which contributed to significant improvements in service delivery. In Ethiopia, however, the rate of technology adoption is slower, which could impact the speed at which Ethswitch implements similar IT improvements. The country's infrastructure limitations, such as internet penetration and mobile access, might slow the adoption of advanced financial technologies like those observed in India, and my research might examine how these factors affect Ethswitch's operational performance.

Ravi (2011) found that CBS and ATMs helped improve operational efficiency by automating various banking processes. Similarly, Ethswitch serves as a central hub for interbank payments, potentially improving transaction speed and customer satisfaction. However, the extent to which these improvements are realized in Ethiopia depends on the level of integration and technology adoption across the country's banking sector. My study could explore how challenges in adopting these technologies might affect Ethswitch's performance compared to Indian institutions. Moreover, the role of **mobile banking** and the expansion of **ATMs** in Ethiopia could mirror some of the improvements seen in India. As mobile money adoption grows, Ethswitch has the potential to facilitate more efficient transactions and expand access to financial services, particularly in rural areas.

Ravi (2011) also emphasized how IT investments led to improved **customer satisfaction** through faster, more reliable services, which resulted in higher customer retention and loyalty. Ethswitch's role in facilitating interbank payments in Ethiopia could yield similar results. However, in Ethiopia, factors such as **digital literacy**, trust in technology, and access to digital devices may significantly influence customers' experiences with digital financial services. These factors could present barriers to achieving the same level of service delivery improvements seen in India, as Ethiopia's banking sector still faces challenges in terms of technology adoption and digital infrastructure.

While Ravi (2011) highlighted the straightforward success of IT investments in improving service delivery, Ethiopia's situation is more complex due to **infrastructure gaps**, **digital literacy**, and **technical skill** limitations, which could slow down the adoption and integration of IT solutions. Unlike India, where infrastructure and adoption rates were more advanced, Ethiopia's greater digital divide might impact the speed at which IT investments in financial services yield results. My research should address how Ethswitch can overcome these barriers and accelerate the integration of IT investments to improve its operational efficiency and customer satisfaction in the Ethiopian financial ecosystem.

Ravi's (2011) study provides valuable insights into the benefits of IT investments for improving operational performance, customer satisfaction, and service delivery in the banking sector. However, Ethiopia's unique challenges, such as infrastructure limitations, slower technology adoption, and the digital divide, might affect the speed and effectiveness of IT investments at Ethswitch. While both studies share similar themes of improved efficiency, transaction speed, and customer satisfaction, Ethiopia's technological landscape presents additional obstacles that must be considered. My research should examine how Ethswitch can leverage IT investments to overcome these barriers and enhance its operational performance, considering the country's unique challenges in infrastructure and technology adoption.

In their 2018 study, Chen et al. explored the impact of IT investments on operational performance within the banking sector across several African countries. The research aimed to assess how IT infrastructure, including core banking systems, payment technologies, and digital services, influenced the efficiency and effectiveness of financial institutions in developing economies. The study found that while IT investments resulted in improved operational efficiency, transaction speed, and customer service, banks in these regions faced several challenges. These included infrastructure limitations such as poor internet connectivity, outdated hardware, and unreliable power supplies, which hindered the full potential of IT investments. Additionally, cybersecurity vulnerabilities posed significant risks to the reliability of IT systems, and a shortage of skilled human capital further impeded the successful integration and operation of these technologies (Chen et al., 2018).

Chen et al. (2018) identified several critical findings related to the impact of IT investments in developing economies' banking sectors. First, they found that banks investing in IT infrastructure experienced enhanced **operational performance**. This included improvements in transaction speed, cost reductions, and better customer service. By automating banking processes, banks were able to streamline operations and offer services outside traditional banking hours, improving overall efficiency. However, the study also highlighted the **infrastructure limitations** many banks in developing countries faced. Issues like poor internet connectivity and outdated hardware often limited the full impact of these IT investments, resulting in delays and inefficiencies. Another significant concern was **cybersecurity**, as banks in developing economies struggled to implement robust security measures against increasing cyber threats, jeopardizing the integrity of transactions and

customer data. Finally, the study identified a **shortage of skilled human capital**, with many banks lacking in-house IT expertise, relying on external consultants, and facing challenges in maintaining and upgrading IT systems effectively (Chen et al., 2018).

My research on Ethswitch, Ethiopia's national payment switch, shares several key themes with Chen et al.'s study, particularly the challenges developing economies face in adopting IT investments for the financial sector. Both studies highlight the role of IT infrastructure in improving operational performance and service delivery, but they also underscore the barriers that hinder the effectiveness of these investments. In Ethiopia, as in other developing countries, **infrastructure limitations** remain a significant challenge. Poor internet connectivity and unreliable power supplies, particularly in rural areas, can impact the reliability and efficiency of the national payment switch, Ethswitch. These challenges could delay transactions and affect service quality, potentially limiting the benefits of IT investments. My research could further explore how these infrastructure issues affect Ethswitch's operational performance and its ability to deliver seamless financial services (Chen et al., 2018).

Cybersecurity is another area where Ethswitch faces similar challenges to those identified in Chen et al.'s study. As Ethiopia's digital financial services expand, ensuring the security of customer data and transaction integrity is becoming increasingly important. Ethswitch, as a central infrastructure for interbank payments, faces the risk of data breaches, fraud, and system downtime, which could erode trust in the platform. My research could examine the cybersecurity measures in place at Ethswitch, evaluating how these systems safeguard financial transactions and protect user data (Chen et al., 2018).

A **shortage of skilled human capital** is also a potential barrier for Ethswitch, as the demand for skilled IT professionals in Ethiopia may exceed the available supply. Like many banks in developing economies, Ethswitch may need to rely on external consultants or international partnerships to address gaps in expertise. My research could investigate how Ethswitch is addressing this challenge, particularly through training programs or collaborations with local educational institutions, and how this impacts the efficiency and sustainability of its operations (Chen et al., 2018).

A key distinction between your study and Chen et al.'s research is the emphasis on **payment system integration**. While Chen et al. (2018) focused on individual bank IT investments,

your study highlights Ethswitch's critical role in connecting multiple payment platforms, including mobile money services, banking apps, and other digital financial services. This integration of different payment systems could enhance **financial inclusion** in Ethiopia by expanding access to banking services, especially in underserved and rural areas. My research could explore how Ethswitch's efforts to integrate mobile banking, traditional banking, and fintech services can further improve operational performance and service delivery in Ethiopia (Chen et al., 2018).

Chen et al. (2018) provide valuable insights into the challenges faced by banks in developing economies when implementing IT investments. Many of the challenges identified such as infrastructure limitations, cybersecurity risks, and a shortage of skilled human capital are likely relevant to Ethswitch. However, my study takes a broader view, focusing on Ethswitch's role as a national payment switch and its efforts to integrate various payment platforms, which is vital for enhancing financial inclusion in Ethiopia. By addressing local infrastructure challenges, strengthening cybersecurity measures, and investing in human capital, Ethswitch can overcome the barriers identified in Chen et al.'s study and enhance its operational performance within the Ethiopian financial ecosystem.

In Tschang's (2001) study, the focus was on the relationship between IT investments, particularly in customer relationship management (CRM) systems, and their impact on operational performance and customer satisfaction within the banking sector in Singapore. The research concluded that IT infrastructure investments had a significant positive effect on improving operational performance, service delivery, and customer engagement. Banks were able to streamline operations, reduce processing times, and improve the quality of their services, leading to higher customer satisfaction. Additionally, CRM systems enabled banks to better understand customer needs, personalize services, and foster long-term customer loyalty.

Tschang (2001) highlighted that investments in CRM systems allowed banks to automate processes, resulting in faster service delivery and cost reductions. Through enhanced data collection and analysis, banks could streamline transaction processing and customer interactions, making their operations more efficient.

The study found that customer satisfaction increased due to faster processing times, personalized interactions, and tailored banking products. These improvements led to stronger

customer loyalty, as clients valued the convenience and service quality provided by their banks.

By investing in CRM technologies, banks were able to better manage customer relationships, offering personalized services that improved customer satisfaction and retention.

My research on Ethswitch, Ethiopia's national payment switch, shares several similarities with Tschang's study but also presents unique elements due to the broader context of national financial infrastructure and the integration of multiple financial institutions. While Tschang's study focused on CRM systems within individual banks, my research examines the impact of a national payment switch on operational performance, customer satisfaction, and transaction efficiency across the entire financial ecosystem in Ethiopia.

Both studies emphasize the role of IT investments in improving operational efficiency. Tschang (2001) found that CRM systems allowed banks to automate customer-related tasks, improving service delivery. Similarly, Ethswitch's IT investments aim to enhance transaction processing between various financial institutions, enabling faster and more efficient interbank payments. However, while Tschang's study focused on CRM at the bank level, my research on Ethswitch examines the national payment infrastructure, with a particular focus on how interbank payments are processed more efficiently across Ethiopia's financial institutions. The integration of these systems helps reduce transaction times and operational costs.

Tschang (2001) found that CRM systems helped banks provide faster, more personalized services, which in turn boosted customer satisfaction. Similarly, Ethswitch has the potential to improve customer satisfaction by reducing transaction times and ensuring that digital financial services are reliable and efficient across Ethiopia. By facilitating seamless payments between banks, mobile money providers, and other financial institutions, Ethswitch can help build trust and increase the accessibility of banking services. My research could explore how Ethswitch impacts customer satisfaction by measuring metrics like transaction speed, service reliability, and cost-effectiveness.

Tschang's (2001) study focused on CRM systems, which improved efficiency at the bank level by automating routine processes. However, my study on Ethswitch places a greater emphasis on national payment systems, where transaction processing time and cost reduction are critical operational metrics. Ethswitch helps reduce transaction costs by automating the

interbank payment process, which leads to greater cost efficiency, especially as the volume of digital transactions grows. Unlike Tschang's focus on CRM systems, my research investigates operational metrics such as transaction time and processing costs, which are crucial for evaluating the national payment switch's impact on Ethiopia's banking sector.

While Tschang's (2001) study focused on how CRM systems improved customer relationships within individual banks, Ethswitch operates as a national payment switch that connects multiple financial institutions and mobile money systems. The role of Ethswitch is to facilitate secure and efficient transactions across the entire banking ecosystem, which has far-reaching effects on the operational performance of all participating institutions. Unlike CRM systems, which focus on improving individual customer-bank relationships, Ethswitch impacts the performance of multiple financial entities by enhancing transaction speed, reducing costs, and ensuring secure payments.

Tschang (2001) explored how IT investments in individual banks improved operational performance and customer satisfaction. In contrast, Ethswitch operates at a systemic level, enhancing the operational performance of the entire Ethiopian financial ecosystem. Ethswitch plays a pivotal role in enabling interbank payments and financial inclusion by connecting various institutions and providing a platform for digital transactions. This wider perspective on payment system integration sets my study apart from Tschang's, which primarily focused on individual banks' use of IT systems.

Tschang's (2001) study sheds light on how IT investments, particularly in CRM systems, can improve customer satisfaction and operational performance within individual banks. However, my research on Ethswitch extends these findings to the national level, focusing on how IT investments in a national payment switch can improve operational efficiency, reduce transaction costs, and enhance customer satisfaction across Ethiopia's entire financial ecosystem. By examining specific operational metrics such as transaction speed, cost reductions, and service reliability, my study offers insights into how Ethswitch's IT investments contribute to the broader performance of the Ethiopian financial system.

In Kaplan and Norton's (2004) study, the authors explored the relationship between IT infrastructure investments and the performance outcomes of payment systems. The study emphasized how robust IT infrastructure—specifically hardware, software, and network connectivity—can enhance the efficiency, reliability, and overall performance of payment systems. The findings demonstrated that investments in strong IT infrastructure significantly improve transaction processing speed and system reliability, leading to better service delivery and performance across the payment ecosystem. The study concluded that such investments help reduce operational costs, streamline payment processes, and improve scalability, enabling payment systems to handle increasing transaction volumes effectively.

Kaplan and Norton (2004) underscored that robust IT infrastructure enhances the efficiency of payment systems by enabling faster transaction processing and better error handling. A reliable IT infrastructure ensures that transactions are processed without delays or failures, which, in turn, builds customer trust in the payment system. Additionally, a well-developed infrastructure supports scalability, allowing payment systems to handle growing transaction volumes without compromising performance.

The study revealed that a strong IT infrastructure positively affects key performance metrics such as transaction speed, system uptime, and error reduction. By reducing the likelihood of system failures, IT infrastructure improvements contribute to faster transaction throughput and seamless integration of various payment platforms.

Kaplan and Norton (2004) also noted that investments in IT infrastructure help reduce operational costs. Automation of manual processes, integration of different payment platforms, and streamlined transaction flows minimize the need for human intervention, which in turn reduces the likelihood of costly operational errors.

My research on Ethswitch, the national payment switch in Ethiopia, closely aligns with the findings of Kaplan and Norton. Both studies examine the role of IT infrastructure in improving payment systems, particularly in terms of transaction efficiency, system reliability, and overall performance. However, while Kaplan and Norton focused on the general performance of payment systems, my research focuses on the specific impact of IT investments in Ethswitch, which supports Ethiopia's entire financial ecosystem. Below is a detailed comparison, highlighting the similarities and distinctions between the two studies.

Kaplan and Norton (2004) emphasized that strong IT infrastructure is crucial for improving transaction efficiency. Their study showed that better hardware, software, and networking technologies directly enhanced transaction processing speed and reduced delays. In a similar vein, Ethswitch's IT infrastructure plays a pivotal role in ensuring that interbank transactions are processed quickly and reliably. By linking various financial institutions and digital payment providers, Ethswitch ensures that transactions are completed in real time, without delays or errors. As such, my research can explore how improvements in Ethswitch's IT infrastructure—such as advanced hardware, faster networks, and enhanced software—contribute to the overall efficiency of transaction processing in Ethiopia's payment system.

Kaplan and Norton (2004) also highlighted the importance of system reliability. A strong IT infrastructure ensures that payment systems are available and operational when needed, with minimal downtime. This is particularly relevant to Ethswitch, where system reliability is crucial for uninterrupted transaction processing. If Ethswitch experiences downtime, it could lead to significant financial losses, customer dissatisfaction, and erosion of trust in Ethiopia's digital financial services. Therefore, system uptime is a key performance metric for Ethswitch. My study may examine how Ethswitch's infrastructure upgrades, such as redundancy systems or load balancing, contribute to higher reliability and minimize disruptions to service.

Kaplan and Norton (2004) noted that scalable IT infrastructure allows payment systems to handle increased transaction volumes without performance degradation. As Ethiopia's financial sector continues to grow, Ethswitch's infrastructure must be able to accommodate more users, more transactions, and more complex operations. The ability to scale effectively is crucial for Ethswitch, especially as mobile banking and digital payments become more widespread. My study could explore how Ethswitch has invested in infrastructure that supports scalability, ensuring that the payment switch can handle peak demands during times of high transaction volumes, such as holidays or payroll periods.

Kaplan and Norton (2004) identified several key performance metrics that are directly impacted by IT infrastructure improvements, such as transaction speed, system uptime, error rates, and cost reductions. These metrics are equally important for Ethswitch. For example, the success of Ethswitch depends on its ability to process transactions rapidly, ensure system uptime, minimize transaction errors, and reduce costs associated with maintaining the infrastructure. In my research, I can examine how Ethswitch's IT upgrades lead to

improvements in these performance metrics and contribute to enhanced operational efficiency for both financial institutions and customers.

Kaplan and Norton (2004) emphasized that IT investments often lead to significant cost savings by automating processes and reducing the need for manual intervention. For Ethswitch, similar cost-saving opportunities exist. By automating the payment settlement process and reducing the need for manual reconciliation, Ethswitch can help financial institutions cut operational costs. Additionally, the use of digital infrastructure can reduce the need for physical infrastructure, such as branches for money transfers, which further contributes to cost savings. My study can explore how these efficiencies impact both the financial institutions involved in the system and the end consumers, particularly in terms of lower transaction fees.

Kaplan and Norton's (2004) study provides valuable insights into how IT infrastructure investments improve payment system performance, focusing on efficiency, reliability, scalability, and cost efficiency. These themes are highly relevant to my study of Ethswitch, as the national payment switch in Ethiopia relies on robust IT infrastructure to ensure the smooth and efficient operation of the country's financial system. By examining how Ethswitch's IT infrastructure upgrades impact transaction processing speed, system reliability, scalability, and cost reduction, my research can provide a comprehensive understanding of how IT investments in national payment systems can drive performance improvements across an entire financial ecosystem. This comparison highlights the importance of continuous infrastructure improvements to support Ethiopia's evolving digital payment landscape.

In the study by Stankeviciute et al. (2020), the authors investigated the impact of IT investments on the operational performance of digital payment systems across East Africa. The research underscored the significant role of technology in improving customer experience, reducing transaction costs, and enhancing fraud prevention mechanisms. Notably, the study highlighted the crucial role of regulatory and policy frameworks in ensuring the success of these IT investments. In regions where governments provided clear policies and regulatory support, digital payment systems thrived, while in areas with weak or inconsistent regulatory environments, the full potential of IT investments was not realized (Stankeviciute et al., 2020).

The study found that IT investments led to better customer experiences by offering faster, more secure, and more convenient payment methods. Digital platforms, including mobile payments and digital wallets, improved financial access for underserved populations in East Africa. These investments enabled customers to make payments more easily, fostering greater adoption of digital payment systems (Stankeviciute et al., 2020).

A significant benefit of IT investments was the reduction of transaction costs. Shifting from traditional banking to digital payment systems allowed for more cost-effective payment processing. This was primarily due to the automation of payment processes and the migration from physical infrastructure to digital platforms, which allowed both financial institutions and customers to save on transaction costs (Stankeviciute et al., 2020).

IT investments also enhanced fraud prevention mechanisms, incorporating secure transaction protocols such as two-factor authentication, blockchain technology, and encryption systems. These technologies played a key role in reducing fraudulent activities, thus contributing to a more secure financial environment for digital payments (Stankeviciute et al., 2020).

The success of IT investments in digital payment systems was shown to be heavily dependent on the regulatory environment. In regions where governments provided clear policies and regulatory frameworks, digital payments flourished. However, when regulatory frameworks were weak or inconsistent, the potential benefits of IT investments were not fully realized (Stankeviciute et al., 2020).

My study on the role of IT investments in improving the operational performance of Ethswitch, Ethiopia's national payment switch, shares several similarities with Stankeviciute et al.'s (2020) findings, particularly in the areas of customer experience, transaction costs, fraud prevention, and the influence of regulatory support. However, there are distinctions in terms of the context, as Stankeviciute et al. examined digital payment systems across East Africa, while my research focuses specifically on Ethiopia and Ethswitch's role in the country's national payment system.

Stankeviciute et al. (2020) emphasized that IT investments in digital payment systems significantly enhanced customer experience by providing more efficient, faster, and secure payment methods. Similarly, Ethswitch aims to improve customer satisfaction by streamlining interbank payments, mobile money transfers, and cross-border transactions. As

Ethiopia's financial sector expands, Ethswitch's ability to offer secure, faster, and more seamless payments will be critical to improving customer experiences and increasing digital payment adoption.

My study can investigate how IT investments in Ethswitch have improved the customer experience in Ethiopia, particularly by offering faster transaction processing, secure payment methods, and reliable service delivery.

The reduction of transaction costs through IT investments was another key finding of Stankeviciute et al. (2020). By automating processes and transitioning from physical infrastructure to digital platforms, both customers and financial institutions experienced cost savings. In Ethiopia, Ethswitch's digital infrastructure helps reduce transaction costs by automating interbank payments and facilitating digital transactions, thereby enabling cost savings for both banks and customers.

My study could explore how Ethswitch has reduced transaction costs in Ethiopia, particularly by eliminating the need for physical branches and streamlining payment processes through automation.

Stankeviciute et al. (2020) found that IT investments improved fraud prevention by implementing secure transaction protocols, such as two-factor authentication and encryption. Ethswitch's focus on security is equally crucial for the Ethiopian financial ecosystem. By adopting secure payment protocols and advanced technologies such as real-time fraud detection, Ethswitch can enhance the security and integrity of Ethiopia's national payment system.

You could examine how Ethswitch's IT infrastructure has improved fraud prevention in Ethiopia's financial sector, evaluating the effectiveness of security technologies in reducing fraudulent activities.

Stankeviciute et al. (2020) emphasized that clear regulatory policies are essential for the successful implementation of IT investments in digital payment systems. In Ethiopia, the regulatory environment is similarly pivotal for the success of Ethswitch. The Ethiopian government and financial regulators, such as the National Bank of Ethiopia (NBE), play a

crucial role in setting policies and standards that support the growth of digital payment systems.

A significant focus of my study could be analyzing how the regulatory environment in Ethiopia influences the performance of Ethswitch. Exploring policies that promote financial inclusion and digital banking adoption will help assess the effectiveness of government support in fostering the growth of digital payments.

Stankeviciute et al. (2020) found that effective government policies could significantly accelerate the growth of digital payment systems by supporting infrastructure development and ensuring regulatory compliance. Similarly, Ethswitch's growth is contingent on the Ethiopian government's commitment to policies that promote financial inclusion, mobile banking, and digital financial services.

My study could explore how government-backed initiatives and policies in Ethiopia, such as those promoting mobile money and cybersecurity, support the continued success of Ethswitch and its role in enhancing the digital payment ecosystem.

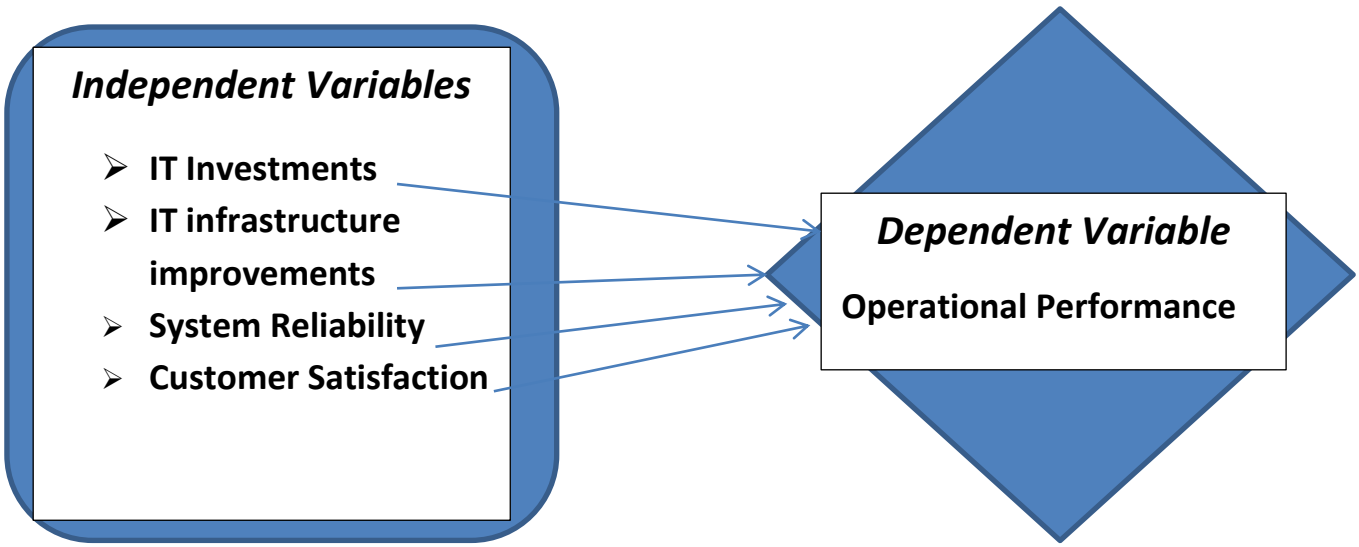
Stankeviciute et al. (2020) provide valuable insights into how IT investments in digital payment systems enhance customer experience, reduce transaction costs, improve fraud prevention, and underscore the importance of regulatory support. Your research on Ethswitch in Ethiopia aligns with these findings but focuses on the Ethiopian context. Understanding how government policies, regulatory frameworks, and IT infrastructure investments influence Ethswitch's performance will be crucial for assessing the national payment switch's success and its role in fostering Ethiopia's digital payment ecosystem. Combining IT investments with supportive regulatory frameworks will ensure the growth and stability of Ethiopia's digital payment systems.

2.7.6. Conceptual Framework

The conceptual framework for this study posits that **IT investments**, including investments in hardware, software, and network infrastructure, directly influence **IT infrastructure improvements**, which in turn enhance **system reliability**. These improvements in IT systems lead to increased **customer satisfaction** by providing faster, more accurate, and reliable services. Ultimately, the combination of IT investments, infrastructure improvements, system

reliability, and customer satisfaction contributes to better **operational performance**, as reflected in factors like transaction speed, service quality, customer retention, and business growth. Thus, the framework illustrates how these independent variables—IT investments, infrastructure improvements, system reliability, and customer satisfaction affect the dependent variable, operational performance, at EthSwitch S.C.

Figure 1: Conceptual framework



Source: Own, 2025

CHAPTER THREE

RESEARCH METHODOLOGY

3.1. Introduction

This chapter provides a detailed description of the research methods employed to achieve the objectives of the study. It offers a comprehensive overview of the steps followed by the researcher throughout the study process, including the research design, data sources and types, sampling strategy and procedures, data collection methods, and approaches used for data processing and presentation.

Research methods refer to the specific techniques and procedures used to gather and analyze data, such as questionnaires, observations, interviews, and both statistical and non-statistical techniques (Saunders, Lewis, & Thornhill, 2019). Research methodology, on the other hand, refers to the underlying theory and philosophy guiding the research process, encompassing the assumptions and principles that inform the choice of methods and the rationale behind their use (Creswell & Poth, 2018). The alignment between research methodology and methods ensures the validity and reliability of the study findings, reflecting a coherent approach to addressing the research questions.

3.2. Research Approach

Research approaches, as explained by Creswell (2018), include the overarching plans and procedures that direct a study, transitioning from broad philosophical assumptions to specific methods for data collection, analysis, and interpretation. For this research, a mixed-methods approach was adopted, combining both qualitative and quantitative techniques. This combination is effective for testing objective theories by analyzing relationships between variables. The quantitative approach allows for the measurement of variables through instruments and the analysis of numerical data using statistical methods. Conversely, the qualitative approach provides deeper insights into the underlying processes and contextual factors, offering a comprehensive understanding of the research problem.

3.3. Research Design

This study employed an explanatory research design, often referred to as an experimental design, which is primarily focused on identifying cause-and-effect relationships between variables (Field, 2013). Explanatory research is crucial for exploring how changes in one variable can lead to changes in another, providing a framework for understanding causal connections (Saunders et al., 2019). The approach involves manipulating an independent variable and observing its effects on a dependent variable. In the context of this research, the explanatory design was utilized to assess the impact of EthSwitch's IT investments over the past five years on its operational performance. The study specifically focused on understanding the relationships between IT infrastructure, operational processes, investment strategies, and the subsequent organizational performance outcomes.

3.4 Source of Data

3.4.1 Primary Data

Primary data refers to original information gathered specifically for the first time during a research study. This type of data has not been previously analyzed or published. It is collected directly from the source through methods such as surveys, interviews, and direct observations, providing firsthand insights.

3.4.2 Secondary Data

Secondary data is data that has been previously collected and made available through other sources. For Ethswitch, secondary data may include information from annual reports, industry publications, government documents, and academic research papers. This type of data provides essential contextual background for the study.

3.5 Target Population

As defined by Creswell (2014), a population refers to the entire group of individuals or elements that meet specific criteria for inclusion in a study. This research targets two primary groups: EthSwitch employees and key organizational stakeholders. The employees, particularly those in IT management, financial operations, and customer service, are integral to the management of the company's IT infrastructure and the smooth delivery of its services. External stakeholders, such as IT managers, financial analysts, and other essential partners, also interact with and depend on EthSwitch’s IT systems and services. Therefore, the target

population for this study consisted of 108 individuals, including those from IT management, financial operations, and customer service within EthSwitch.

3.6. Sample Size

The sample size represents a subset of the target population selected to provide data that can address the research questions. To ensure the collection of reliable and sufficient data, a sample size of 80 participants was determined, based on recommendations from Cooper and Schindler (2011). The sample includes EthSwitch employees and key organizational stakeholders, ensuring that the group reflects the characteristics of the larger population. The appropriate sample size was calculated using the Krejcie and Morgan (1970) table, which is widely used to determine sample sizes in research.

3.7. Sampling Techniques

Sampling techniques are methods used to select individuals or elements from a larger population. According to Adwok (2015), an accurate sample should represent the characteristics of the population. This study employed a combination of purposive and random sampling to ensure targeted yet diverse representation of the study population.

Purposive Sampling: This technique targeted specific individuals with expertise in IT investments and performance evaluations, including IT managers, operational staff, and financial analysts. These participants were chosen for their ability to provide in-depth insights into the impact of IT investments on organizational performance.

Random Sampling: To ensure broad representation, employees from various departments at EthSwitch were selected through random sampling. This technique provided diverse perspectives on how IT investments affect different functions within the organization, offering a comprehensive view of their impact across the company.

3.8. Data Collection Methods

Questionnaire Method: Questionnaires are flexible data collection tools that can be adapted to various research contexts. They can be self-administered or interviewer-administered and are effective for collecting both qualitative and quantitative data (Fink et al., 2019). This method allows for standardized data collection, making it easier to compare responses and ensuring consistency. It is also cost-effective and simple to implement, particularly beneficial

for researchers with limited resources (Rowley, 2014). In this study, the questionnaires will primarily consist of closed-ended questions and will utilize a Likert scale (1 = strongly disagree to 5 = strongly agree) to collect data on participants' opinions and experiences related to IT investments.

Interview Method: Interviews are another data collection tool that can be structured or open-ended, providing in-depth insights into participants' perspectives (Fink et al., 2019). This method is particularly useful for understanding the experiences, beliefs, and viewpoints of participants. For this study, interviews will be conducted with seven participants, including two members of the management team and five operational staff, such as managers and supervisors, to gather qualitative data on the impact of IT investments.

3.9. Data Collection Instruments

Questionnaires: A questionnaire consists of written questions where respondents provide answers in designated spaces. In this research, questionnaires will be distributed directly to various employee categories within EthSwitch. The closed-ended questions will be designed to collect quantitative data, and the Likert scale will allow respondents to rate their level of agreement with various statements regarding IT investments and organizational performance (Lai, 2018). The relationships between key variables will be assessed using correlation analysis.

Interview Guide: An interview guide is a tool used to structure interviews and ensure that all relevant topics are addressed. The guide typically includes a list of questions and additional prompts to explore specific topics in greater depth. For this research, interviews will be conducted using a guide with predefined themes and questions to explore the impact of IT investments. The interviewees will include two management team members and five operational staff, ensuring comprehensive coverage of both strategic and operational perspectives.

3.10. Validity and Reliability

Validity

In the context of research, validity refers to the extent to which a tool accurately measures the intended variables. For this study at Ethswitch S.C., ensuring the validity of the research instrument was crucial. To achieve this, the questionnaire was reviewed by the research

supervisor to verify that it aligned well with the research objectives and questions. This process helped confirm that the questions posed were relevant and would provide valid insights into the research problem.

Reliability

Reliability concerns the consistency and stability of the research tool. A reliable instrument should produce consistent results when used repeatedly under similar conditions. In this study, the reliability of the questionnaire was assessed using Cronbach's Alpha, a statistical measure of internal consistency. Cronbach's Alpha values range from 0 to 1, with higher values indicating better reliability. A coefficient between 0.6 and 0.7 is considered acceptable for most social science research, while values above 0.8 suggest strong reliability (Kothari, 2004). For this study, a Cronbach's Alpha of 0.7 or higher was set as the threshold for acceptable reliability. If the alpha value fell below this threshold, modifications to the research instrument would have been necessary. It is important to note that data from the pilot study were not included in the final analysis, ensuring that only reliable responses were considered in the study's conclusions (Habib, 2021).

In sum, both validity and reliability were key considerations in designing the research methodology at Ethswitch S.C. These measures ensured that the collected data accurately reflected the intended variables and that the research findings were consistent and dependable.

3.11. Data Processing and Analysis

Data analysis is the process of converting raw data into meaningful insights that address the research questions. As stated by Mugenda and Mugenda (2012), the process of data analysis involves using different methods and techniques to describe and analyze data. In this study, descriptive statistics, such as the mean and standard deviation, were used to summarize the data. This approach allowed for an understanding of the distribution and variability of key variables, including demographic information like age, gender, years of experience, and education level.

Spearman correlation analysis was applied to explore the relationships between categorical variables, enabling the researcher to examine potential associations. Factor analysis was used to reduce the number of variables, identifying only the most significant ones for further analysis. Ordinal regression analysis, specifically ordinal logistic regression, was used to

predict the dependent variable, which was measured on a ranked scale. The goal was to understand how different factors influenced the outcomes based on ordered categories.

Factor analysis revealed a single factor for the dependent variable, which formed the foundation for the creation of an ordered logistic regression model. Six independent variables were extracted through factor analysis and used in the model. Two control variables—gender (male or female) and the type of organization the respondent works for—were incorporated into the analysis, ensuring that confounders were controlled. Several diagnostic tests were performed, including Cronbach's Alpha for reliability, checks for sampling adequacy, multicollinearity assessments, and scree plots to evaluate covariate behavior. The normality of the dependent variable was also tested before proceeding with the modeling process.

3.12. Data Analysis

Data analysis is the method by which raw data is transformed into meaningful information to guide decision-making and generate insights (Field, 2005). This study used a combination of descriptive and inferential statistical techniques, alongside qualitative analysis, to interpret and process the data.

Qualitative Data

Qualitative data analysis involves interpreting non-numeric data such as text, audio, and images, to identify patterns, themes, and meanings. This type of analysis is useful for understanding complex social and psychological phenomena that cannot be fully captured by quantitative methods. In this study, narrative analysis was employed to explore the qualitative data and to identify key themes that emerged from participants' experiences and perspectives (Habib, 2021).

Quantitative Data

Quantitative data analysis utilizes statistical methods to interpret numerical data. For this study, measures of central tendency, such as the mean, and measures of dispersion, such as standard deviation, were used to summarize the data. Inferential statistics, including regression and correlation analyses, were applied to draw conclusions and make predictions based on the relationships between variables (Habib, 2021).

3.13. Measurement of Variables

The process of measuring variables is essential in research, as it allows for data collection that can be analyzed and interpreted to draw meaningful conclusions. Categorical variables, which represent distinct categories or levels, were measured using nominal scales. Ordinal variables, which involve ordered categories, were assessed using ordinal scales, such as the Likert scale, where differences between categories may not necessarily be equal (MOHAJAN, 2018).

3.14. Ethical Considerations

Ethical considerations play a crucial role in empirical research, ensuring the protection of participants' rights and well-being (Punch, 2013). In this study, all participants were treated with respect, and their well-being was prioritized. Informed written consent was obtained from all participants, who were informed of their right to withdraw from the study at any time without penalty. No financial incentives were provided for participation.

To protect the confidentiality of participants, all questionnaires were designed to ensure privacy. Ethical standards for business research were strictly adhered to, ensuring that the integrity and objectivity of the study were maintained. The researcher ensured transparency in the reporting of findings and strictly followed scientific conventions. All responses were anonymized during analysis to preserve participants' privacy. The collected data was used solely for academic purposes, in line with ethical research practices.

CHAPTER FOUR

DATA PRESENTATION AND ANALYSIS

4.1. Introduction

This chapter discussed the presentation, analysis and interpretation of primary ource data. A total of 80 questionnaires distributed to each department, but 75 responses were received, while 5 respondents did not provide or return their completed questionnaires from Senior management 3 and from IT Department 2.

To analyze the results, statistical package for the SPSS is used collected data presented in frequency tables and figures, as appropriate. The hypothesis test was conducted using the analysis of model summary and regression assumption, and the results were interpreted in accordance with the testing outcomes.

4.2. Demographic Background of the Respondents

4.2.1. Gender Composition of the Respondents

Table 1: Gender Composition of the Respondents

Gender					
		Frequency	**Percent**	**Valid Percent**	**Cumulative Percent**
Valid	Male	50	66.7	66.7	66.7
	Female	25	33.3	33.3	100.0
	Total	75	100.0	100.0	

Source; Own Survey, 2025

The gender composition of the respondents revealed that 25 (33.3%) were female and 50 (66.7%) were male. This indicates that the majority of respondents are male, highlighting that male employees make up a larger portion of those participating in the study on the Effect of IT investments on the company's performance. Consequently, this suggests that the perceptions and insights gathered in the survey are primarily influenced by male respondents.

Gender distribution in surveys has long been an important aspect of understanding potential biases in research findings. Studies have shown that men and women may have differing views on technology, especially in terms of technology adoption, usage, and perceptions (Venkatesh & Morris, 2000). It is well-documented that men tend to be more inclined towards technological innovation and may view IT investments and their associated Effects more positively, potentially due to their greater exposure to and comfort with technology

(Venkatesh et al., 2003). For instance, research suggests that male respondents generally exhibit a higher level of confidence in adopting new technologies compared to female respondents (Gefen et al., 2003), which may influence their perceptions of IT-related outcomes like operational performance and system reliability.

Moreover, the underrepresentation of female respondents (33.3%) in this study may Effects the breadth of insights related to gendered experiences and perspectives on IT investments and their organizational Effects. Female employees, particularly in customer-facing or support roles, might have different views on the implications of IT investments compared to male employees who might be more focused on technical or operational issues (Venkatesh et al., 2003). The inclusion of more balanced gender representation would provide a more comprehensive understanding of how IT investments affect organizational performance from diverse viewpoints.

4.2.2. Age composition of the respondents

Table 2 :The Age Composition of Respondents

Age Range					
		Frequency	**Percent**	**Valid Percent**	**Cumulative Percent**
Valid	21 – 30	3	4.0	4.0	4.0
	31 – 40	25	33.3	33.3	37.3
	41 – 50	44	58.7	58.7	96.0
	51 and above	3	4.0	4.0	100.0
	Total	75	100.0	100.0	

Source; Own Survey, 2025

The age distribution of the respondents reveals that the majority of participants (58.7%) are between the ages of 41 and 50, followed by 33.3% in the 31–40 age range. A small portion of the respondents falls in the 21–30 (4.0%) and 51 and above (4.0%) categories. This suggests that the sample is primarily composed of middle-aged professionals with substantial experience in the workplace. Research indicates that older individuals tend to have greater experience with technology adoption and its integration into organizational processes, often providing insights grounded in practical knowledge (Venkatesh et al., 2003). Conversely, younger individuals may demonstrate a more adaptable attitude towards new technologies and innovations (Karahanna et al., 1999), although their representation in this study is relatively limited. The age composition, therefore, reflects the perspectives of more experienced employees, whose insights into IT investments and organizational performance

are likely influenced by their greater exposure to such technologies over the years (Venkatesh & Bala, 2008).

4.2.3. Educational Qualification Composition of the Respondents

Table 3: Educational Qualification of Respondents

Educational Qualification					
		Frequency	**Percent**	**Valid Percent**	**Cumulative Percent**
Valid	Bachelor's Degree	39	52.0	52.0	52.0
	Master's Degree	36	48.0	48.0	100.0
	Total	75	100.0	100.0	

Source; Own Survey, 2025

The educational qualification of the respondents shows a fairly balanced distribution between individuals with a Bachelor's degree (52%) and those with a Master's degree (48%). This indicates that the study sample consists primarily of well-educated professionals with at least a higher education level, suggesting a workforce with solid academic backgrounds. Higher educational qualifications, such as Master's degrees, are often linked to a deeper understanding of complex issues such as IT investments and their Effect on organizational operational performance (Thong et al., 2006). The relatively equal representation of both Bachelor's and Master's degree holders provides a diverse perspective on the subject matter, enabling the study to capture insights from individuals with varying levels of formal education and expertise. Studies suggest that educational background can influence one's perception of technology adoption, with higher levels of education generally fostering greater openness to technological change and innovation (Davis, 1989). Thus, the qualifications of the respondents may contribute to the robustness of the findings related to IT investments and their Effect on operational performance.

4.2.4. Position/Role at Ethswitch

Table 4: Role at Ethswitch of Respondents

Position/Role at Ethswitch S.C.					
		Frequency	**Percent**	**Valid Percent**	**Cumulative Percent**
Valid	Senior Management	3	4.0	4.0	4.0
	IT Department	19	53.3	25.3	29.3
	Operations Department	3	4.0	4.0	33.3
	Customer Service	10	25.3	13.3	46.7
	Other	40	13.3	53.3	100.0
	Total	75	100.0	100.0	

Source; Own Survey, 2025

The distribution of respondents across various roles at EthSwitch S.C. reveals a diverse composition, with a particular concentration in certain departments. The table shows that the largest group of respondents (53.3%) identified with the **IT Department**, followed by **Customer Service** (25.3%) and **Other** (13.3%). A small proportion of respondents came from **Senior Management** (4%) and the **Operations Department** (4%).

IT Department (53.3%): A significant majority of respondents belong to the IT Department, reflecting the critical role IT plays in organizational operations, particularly in a company like EthSwitch S.C., which operates in the financial technology space. This department's large representation aligns with the increasing role of IT in enhancing business performance and improving services (Brynjolfsson & Hitt, 2000). The perspective of IT employees is especially valuable in understanding the direct impact of technological investments and infrastructure improvements. Their involvement in the study highlights the importance of their feedback on technological advancements, system reliability, and the integration of IT solutions to improve operational performance.

Customer Service (25.3%): Customer service also represents a substantial portion of the respondents. These employees interact with customers on a daily basis and have firsthand knowledge of how IT investments influence customer satisfaction and service delivery. Their feedback is crucial in evaluating the real-world impact of IT infrastructure on service quality and response times. Research shows that improved IT systems contribute to better service quality and customer satisfaction (Zhang & Tansuhaj, 2007). The perspectives of customer service employees are vital for assessing how IT investments help streamline processes such as transaction handling and issue resolution.

Other (13.3%): This group includes employees whose roles might not be categorized under specific departments but still contribute to the overall functioning of EthSwitch S.C. While this group's smaller representation may dilute the clarity of its individual department's perspective, it provides a broader view of how general staff perceive the impact of IT investments on operational performance. This data point suggests that IT investments in the organization are widespread, affecting various roles across the company, not just those directly involved in IT or customer service.

Senior Management (4%): Senior management's small representation in the sample can limit the depth of insights into high-level decision-making and strategic impacts. However, management's perspective on IT investments is valuable in understanding how these investments align with organizational goals and long-term planning. The feedback from this group could help illuminate how management perceives the return on investment (ROI) and competitive advantage brought by IT improvements (Dehning & Richardson, 2002).

Operations Department (4%): The operations department plays a key role in ensuring the smooth functioning of day-to-day activities. The small number of respondents from this department may suggest limited direct interaction with IT investments or that operational improvements are perceived differently. However, it's important to recognize that the operations department's input could offer valuable insights into the practical implications of IT infrastructure improvements on daily operational activities, particularly in terms of system uptime, efficiency, and scalability (Mithas et al., 2005).

The diverse distribution of roles represented in the survey sample highlights the broad impact of IT investments across different departments at EthSwitch S.C. The large proportion of IT and customer service employees ensures that the feedback on technological improvements and their Effects on system performance, reliability, and customer satisfaction is well-represented. While smaller groups like senior management and operations offer valuable perspectives, further research could seek to expand their representation for a more balanced view. The input from the various departments enriches the understanding of how IT investments influence operational performance from multiple angles, from technical to customer-facing aspects.

4.2.5. How long Worked at Ethswitch

Table 5: How long worked of the respondents

How long have you worked at EthSwitch S.C.					
		Frequency	**Percent**	**Valid Percent**	**Cumulative Percent**
Valid	Less than 1 year	15	20.0	20.0	20.0
	1 - 3 years	16	21.3	21.3	41.3
	4 - 6 years	41	54.7	54.7	96.0
	7 years or more	3	4.0	4.0	100.0
	Total	75	100.0	100.0	

Source; Own Survey, 2025

The data on the length of time respondents have worked at EthSwitch S.C. indicates a predominantly experienced workforce, with 54.7% of respondents having been with the company for 4 to 6 years. This suggests that a majority of participants possess considerable experience within the organization, which likely provides them with a deeper understanding of the Effects of IT investments on operational performance. Additionally, 21.3% of respondents have been with the company for 1 to 3 years, contributing a moderate level of insight into how recent changes might affect the company's operations. Only 20% of the respondents have been at EthSwitch for less than one year, and a small 4% have worked there for 7 years or more. This distribution of tenure reflects a well-rounded sample, with a mix of long-term employees who have witnessed IT developments over several years, as well as relatively new employees who may offer fresh perspectives on recent changes. Previous research has indicated that employees' length of tenure influences their perceptions of organizational changes, such as IT investments, with longer-tenured employees often providing more comprehensive evaluations based on their exposure to the evolution of systems and practices (Barrett, 2017).

4.3. Descriptive Analysis

4.3.1. IT Investments on Operational Efficiency

Table 6:Effect of IT Investments on Operational Efficiency

Effect of IT Investments on Operational Efficiency

Statement	Likert Scale	Frequency	Percent	Mean Statistic	Std. Deviation Statistic
The IT investments made by EthSwitch S.C. in the past five years have improved the overall operational efficiency.	SD	0	0%	4.17	.623
	D	0	0%		
	N	9	12%		
	A	44	58.7%		
	SA	22	29.3%		
Recent IT investments (e.g., hardware, software, network upgrades) have enhanced the system reliability at EthSwitch S.C. (e.g., reduced downtime and technical issues).	SD	0	0%	3.91	.918
	D	0	0%		
	N	35	46.7%		
	A	12	16%		
	SA	28	37.3%		
The IT investments made by EthSwitch S.C. have contributed to improvements in the quality of services provided to customers	SD	0	0%	3.45	.664
	D	4	5.3%		
	N	36	48%		
	A	32	42.7%		
	SA	3	4%		
I believe that the IT investments in EthSwitch S.C. have resulted in better performance in terms of speed and accuracy of transaction processing.	SD	0	0%	3.67	.859
	D	0	0%		
	N	44	58.7%		
	A	12	16%		
	SA	19	25.3%		
The IT investments in EthSwitch S.C. have given the company a competitive advantage within the Ethiopian financial sector.	SD	0	0%	4.27	.445
	D	0	0%		
	N	0	0%		
	A	55	73.3%		
	SA	20	26.7%		

Source; Own Survey, 2025

The statement "The IT investments made by EthSwitch S.C. in the past five years have improved the overall operational efficiency" shows a very positive response. The mean score of **4.17** (SD = 0.623) indicates strong agreement with the statement. A majority of respondents (58.7%) agreed, and 29.3% strongly agreed, suggesting that IT investments have been perceived to significantly enhance the company's operational efficiency. The low standard deviation implies that there is general consensus among respondents regarding the positive Effect of IT on operational efficiency. This is consistent with literature highlighting that IT investments often lead to improvements in organizational performance and efficiency (Brynjolfsson & Hitt, 2000; Melville, Kraemer, & Gurbaxani, 2004).

Regarding system reliability, the statement "Recent IT investments (e.g., hardware, software, network upgrades) have enhanced the system reliability at EthSwitch S.C." received a mean

score of **3.91** (SD = 0.918). While there was a significant portion of neutral responses (46.7%), a substantial number (37.3%) agreed, and 16% strongly agreed. The relatively high standard deviation indicates a more varied opinion on the Effect of IT on system reliability, possibly due to the complexity of the IT infrastructure and individual experiences within the organization. Nonetheless, the mean score suggests that respondents generally view IT investments as having a positive Effect on system reliability, reducing downtime and technical issues, which aligns with findings from prior studies showing that IT upgrades can improve system reliability and minimize disruptions (Zhang & Tansuhaj, 2007).

The statement "The IT investments made by EthSwitch S.C. have contributed to improvements in the quality of services provided to customers" revealed a mean score of **3.45** (SD = 0.664). A significant proportion of respondents (48%) were neutral, with 42.7% agreeing and only 4% strongly agreeing. This suggests that while some respondents acknowledge improvements in service quality, there is a notable uncertainty or lack of strong consensus on this aspect. IT investments can often lead to enhanced customer service quality, but the extent of the improvement may depend on the specific nature of the services and customer touchpoints (Mithas, Krishnan, & Fornell, 2005). The variation in responses could reflect differing perceptions depending on individual exposure to customer-facing services or other operational factors.

The statement "I believe that the IT investments in EthSwitch S.C. have resulted in better performance in terms of speed and accuracy of transaction processing" had a mean score of **3.67** (SD = 0.859). While 58.7% of respondents remained neutral, a notable portion (16%) agreed, and 25.3% strongly agreed, indicating a positive view of the improvements in transaction processing. However, the standard deviation indicates that there is a moderate level of disagreement, suggesting that some respondents may not have experienced noticeable improvements. The Effect of IT investments on transaction speed and accuracy is well-documented in research, with studies consistently showing that IT upgrades lead to improvements in processing speed and accuracy (Dehning & Richardson, 2002).

The statement "The IT investments in EthSwitch S.C. have given the company a competitive advantage within the Ethiopian financial sector" received the highest mean score of **4.27** (SD = 0.445), reflecting strong agreement. A significant majority (73.3%) agreed, and 26.7% strongly agreed, suggesting that respondents overwhelmingly view the IT investments as having enhanced the company's competitive position. The low standard deviation indicates a

high degree of consensus on this statement, signaling a broad recognition of the strategic value of IT in providing a competitive edge. This aligns with the findings in the literature, which emphasize how IT can be a key driver of competitive advantage in the financial sector (Barney, 1991; Melville et al., 2004).

4.3.2.IT Infrastructure Improvements

Table 7:Effect of IT Infrastructure Improvements on operational efficiency

Statement	Likert Scale	Frequency	Percent	Mean Statistic	Std. Deviation Statistic
The recent improvements in IT infrastructure at EthSwitch S.C. have enhanced the company's ability to process transactions efficiently.	SD	0	0%	4.15	0.356
	D	0	0%		
	N	0	36%		
	A	64	85.3%		
	SA	11	14.7%		
The upgrades to IT infrastructure, such as hardware and network improvements, have significantly reduced system downtime at EthSwitch S.C.	SD	0	0%	4.27	0.445
	D	0	0%		
	N	0	9%		
	A	55	73.3%		
	SA	20	26.7%		
IT infrastructure improvements have led to faster response times in the services provided by EthSwitch S.C.	SD	0	0%	3.55	0.664
	D	0	0%		
	N	41	54.7%		
	A	27	36%		
	SA	7	9.3%		
The improvements in IT infrastructure have strengthened the security and stability of EthSwitch’s systems.	SD	0	0	4.15	.630
	D	0	0		
	N	10	13.3		
	A	44	58.7		
	SA	21	28.0		
IT infrastructure upgrades at EthSwitch S.C. have improved the scalability of the company's services to meet growing transaction volumes.	SD	0	0	4.25	.438
	D	0	0		
	N	0	0		
	A	56	74.7		
	SA	19	25.3		

Source; Own Survey, 2025

The statement "The recent improvements in IT infrastructure at EthSwitch S.C. have enhanced the company's ability to process transactions efficiently" received a mean score of **4.15** (SD = 0.356), indicating a strong agreement among respondents. A substantial majority of respondents (85.3%) agreed with this statement, and 14.7% strongly agreed. The low standard deviation suggests that there is a high level of consensus regarding the positive Effect of IT infrastructure improvements on transaction efficiency. This finding aligns with

research that emphasizes the role of upgraded IT systems in enhancing the efficiency and speed of transaction processing in financial institutions (Mithas, Krishnan, & Fornell, 2005).

The statement "The upgrades to IT infrastructure, such as hardware and network improvements, have significantly reduced system downtime at EthSwitch S.C." had a mean score of **4.27** (SD = 0.445). With 73.3% of respondents agreeing and 26.7% strongly agreeing, the majority believe that the IT infrastructure upgrades have led to a significant reduction in system downtime. The relatively low standard deviation indicates strong consensus on this matter. This result is consistent with prior studies that have demonstrated how IT infrastructure upgrades, particularly hardware and network enhancements, can Effectively minimize system downtime and improve overall reliability (Zhang & Tansuhaj, 2007).

The statement "IT infrastructure improvements have led to faster response times in the services provided by EthSwitch S.C." received a mean score of **3.55** (SD = 0.664). While 36% of respondents agreed and 9.3% strongly agreed, a significant proportion (54.7%) remained neutral, indicating that there is no strong consensus on the Effect of IT improvements on response times. The moderate standard deviation further reflects the mixed views among respondents. This suggests that while some individuals may have experienced faster response times due to the infrastructure upgrades, others may not have perceived significant changes. Research has shown that IT infrastructure improvements can enhance system responsiveness, but the Effect may vary depending on the scale and nature of the improvements (Dehning & Richardson, 2002).

Regarding security and stability, the statement "The improvements in IT infrastructure have strengthened the security and stability of EthSwitch’s systems" received a mean score of **4.15** (SD = 0.630). A majority (58.7%) agreed, and 28% strongly agreed, indicating that respondents generally perceive IT infrastructure improvements as having a positive Effect on system security and stability. The moderate standard deviation suggests some variation in responses, but overall, the results point to a strong belief that these upgrades have enhanced the security and stability of EthSwitch's systems. This finding aligns with literature that highlights how IT upgrades, particularly in the areas of cybersecurity and system architecture, can strengthen organizational stability (Brynjolfsson & Hitt, 2000).

The statement "IT infrastructure upgrades at EthSwitch S.C. have improved the scalability of the company's services to meet growing transaction volumes" had a mean score of **4.25** (SD = 0.438), indicating strong agreement among respondents. A majority of 74.7% agreed and 25.3% strongly agreed with this statement, suggesting that the infrastructure improvements have significantly contributed to the company's ability to scale its operations and manage increasing transaction volumes. The low standard deviation indicates a high level of agreement on this point, reflecting the importance of scalable IT infrastructure in supporting growth and expansion in the financial sector. This is consistent with research that emphasizes how IT infrastructure improvements are critical for enhancing organizational scalability, particularly in the face of growing demands (Melville et al., 2004).

4.3.3. System Reliability on Operational efficiency

Table 8:System Reliability

Statement	Likert Scale	Frequency	Percent	Mean Statistic	Std. Deviation Statistic
The reliability of EthSwitch's systems has improved significantly due to recent IT investments.	SD	0	0%	4.12	.327
	D	0	0%		
	N	0	0%		
	A	66	88%		
	SA	9	12%		
There has been a noticeable reduction in system downtime at EthSwitch S.C. after the latest IT infrastructure upgrades.	SD	0		4.12	.327
	D	0	0%		
	N	0	0%		
	A	66	88%		
	SA	9	12%		
I rarely encounter system failures or service interruptions when using EthSwitch's services	SD	0	0%	3.37	1.112
	D	28	37.3%		
	N	0	9%		
	A	38	50.7%		
	SA	9	12.0%		
The response time for systems at EthSwitch S.C. is consistently fast and reliable.	SD	0	0%	3.99	.507
	D	0	0%		
	N	10	13.3%		
	A	56	74.7%		
	SA	9	12%		
Recent improvements in system reliability have increased the trust and satisfaction of customers using EthSwitch's services.	SD	10	13.3%	3.45	1.154
	D	7	9.3%		
	N	0	0%		
	A	55	73.3%		
	SA	3	4%		

Source; Own Survey, 2025

The statement "The reliability of EthSwitch's systems has improved significantly due to recent IT investments" has a mean score of **4.12** (SD = 0.327), indicating strong agreement among respondents. A total of 88% of respondents agreed, with 12% strongly agreeing, and

no respondents disagreed or remained neutral. This suggests that the respondents strongly believe that recent IT investments have significantly enhanced the reliability of the systems at EthSwitch. This result aligns with existing literature which supports the idea that IT investments play a key role in improving system reliability and reducing operational risks (Brynjolfsson & Hitt, 2000; Dehning & Richardson, 2002). The low standard deviation indicates a high level of consensus among respondents, emphasizing that these improvements are widely acknowledged.

A similar result was observed for the statement "There has been a noticeable reduction in system downtime at EthSwitch S.C. after the latest IT infrastructure upgrades," which also received a mean score of **4.12** (SD = 0.327). Again, 88% of respondents agreed and 12% strongly agreed with this statement, with no respondents disagreeing. This suggests that the IT infrastructure upgrades have been Effective in reducing system downtime, which is critical for maintaining business continuity and customer satisfaction in the financial services sector. This finding is in line with studies indicating that infrastructure upgrades, especially in hardware and network systems, significantly reduce system downtime and increase reliability (Zhang & Tansuhaj, 2007).

The statement "I rarely encounter system failures or service interruptions when using EthSwitch's services" had a mean score of **3.37** (SD = 1.112). While 50.7% of respondents agreed and 12% strongly agreed, a significant proportion (37.3%) disagreed with the statement. This indicates that, despite the improvements in system reliability, some respondents still experience system failures or service interruptions. The higher standard deviation suggests greater variability in respondents' experiences, with some users perceiving frequent issues, while others have fewer disruptions. This points to the fact that while improvements have been made, there may still be challenges in achieving consistent performance across all user experiences. This finding suggests that EthSwitch may need to focus on reducing system failures to ensure uniform service reliability for all customers (Mithas, Krishnan, & Fornell, 2005).

The statement "The response time for systems at EthSwitch S.C. is consistently fast and reliable" had a mean score of **3.99** (SD = 0.507), showing strong agreement among the respondents. With 74.7% agreeing and 12% strongly agreeing, the results suggest that respondents perceive the response time of EthSwitch's systems as fast and reliable. The low standard deviation implies that this view is shared by most respondents, indicating a consistent user experience regarding response times. Efficient

response times are critical in financial services, where customers expect quick and accurate transaction processing. This result is consistent with prior research highlighting the importance of fast and reliable system responses for customer satisfaction and operational efficiency (Dehning & Richardson, 2002).

Finally, the statement "Recent improvements in system reliability have increased the trust and satisfaction of customers using EthSwitch's services" received a mean score of **3.45** (SD = 1.154). A significant portion of respondents (73.3%) agreed, while 4% strongly agreed, and 13.3% disagreed. The higher standard deviation suggests a greater variation in respondents' views on the link between system reliability and customer satisfaction. While the majority of respondents agree that improvements in reliability have positively Effected customer trust, some may not perceive such a direct relationship, indicating that there may be other factors influencing customer satisfaction. This aligns with research suggesting that while system reliability is important for customer satisfaction, other factors such as service quality, responsiveness, and support also play critical roles (Mithas et al., 2005).

4.3.4.Relationship between Customer Satisfaction and overall Performance

Table 9:Customer Satisfaction

Statement	Likert Scale	Frequency	Percent	Mean Statistic	Std. Deviation Statistic
The overall quality of services provided by EthSwitch has improved due to recent IT investments	SD	0	0%	4.32	.470
	D	0	0%		
	N	0	0%		
	A	51	68%		
	SA	24	32%		
Customers are more satisfied with the speed of transaction processing at EthSwitch after recent IT upgrades	SD	0	0%	3.49	.503
	D	0	0%		
	N	38	50.7%		
	A	37	49.3%		
	SA	0	0%		
IT investments at EthSwitch have contributed to improved customer service and support.	SD	0	0%	4.20	.403
	D	0	0%		
	N	0	0%		
	A	60	80%		
	SA	15	20%		
The reliability of EthSwitch’s systems has positively EFFECTed customer satisfaction levels.	SD	10	12.3%	2.48	1.070
	D	42	56%		
	N	0	0%		
	A	23	30.7%		
	SA	0	0%		
Recent IT improvements have made customers feel more confident in using EthSwitch’s services.	SD	19	25.3%	2.31	1.078
	D	30	40%		
	N	10	13.3%		
	A	16	21.3%		
	SA	0	0		

Source; Own Survey, 2025

The statement "The overall quality of services provided by EthSwitch has improved due to recent IT investments" received a mean score of **4.32** (SD = 0.470), showing strong agreement among respondents. A total of 68% of respondents agreed, and 32% strongly agreed. No respondents disagreed or remained neutral, highlighting that the majority of respondents perceive a significant positive Effect of IT investments on the quality of services provided by EthSwitch. The low standard deviation suggests a high level of consensus. This result is consistent with previous research that demonstrates how IT investments can improve service quality, increase operational efficiency, and provide better customer experiences (Brynjolfsson & Hitt, 2000; Dehning & Richardson, 2002).

The statement "Customers are more satisfied with the speed of transaction processing at EthSwitch after recent IT upgrades" had a mean score of **3.49** (SD = 0.503). While the results indicate a relatively neutral to positive response (49.3% agreed, 50.7% were neutral, and no respondents disagreed), the mean score suggests that, while there was some perceived improvement in transaction speed, it may not be as pronounced as other factors like overall service quality. The standard deviation indicates moderate variability in respondents' views on transaction speed. Some customers may still feel that transaction processing speeds have not improved enough to meet their expectations. Previous studies emphasize the importance of fast transaction processing for customer satisfaction, particularly in the financial services industry (Mithas et al., 2005; Dehning & Richardson, 2002).

For the statement "IT investments at EthSwitch have contributed to improved customer service and support," the mean score was **4.20** (SD = 0.403). The high mean and the fact that 80% of respondents agreed and 20% strongly agreed indicate that the majority of respondents view IT investments as having significantly enhanced customer service and support. This aligns with research that shows how IT can enhance customer service capabilities by enabling quicker response times, better support systems, and more personalized customer interactions (Zhang & Tansuhaj, 2007). The low standard deviation further suggests that there is a high level of agreement on this Effect.

The statement "The reliability of EthSwitch’s systems has positively Effected customer satisfaction levels" had a much lower mean score of **2.48** (SD = 1.070). The results indicate that a significant portion of respondents disagreed with this statement (56% disagreed, and 12.3% strongly disagreed). Only 30.7% of respondents agreed, and no respondents strongly agreed. The relatively high standard deviation indicates substantial variability in respondents’

opinions, suggesting that while some respondents may believe that system reliability contributes to customer satisfaction, a larger proportion perceives system reliability as insufficient. This finding suggests that, despite IT investments, there might still be concerns regarding system reliability, and more attention may be required to improve this aspect. Previous research indicates that system reliability is a critical factor for customer satisfaction in the financial services sector (Mithas et al., 2005).

The statement "Recent IT improvements have made customers feel more confident in using EthSwitch's services" had a mean score of **2.31** (SD = 1.078), which suggests that the Effect of IT improvements on customer confidence is less pronounced. A majority of respondents (40%) disagreed, and 25.3% strongly disagreed. Only 21.3% agreed with the statement, and no respondents strongly agreed. The high standard deviation suggests significant variation in responses, indicating that while some customers may feel more confident, many others do not perceive IT improvements as enhancing their trust or confidence in EthSwitch's services. This is consistent with studies that emphasize the importance of system trust in the financial sector and the need for consistent IT improvements to build and maintain customer confidence (Dehning & Richardson, 2002).

4.3.5. Operational Performance

Table 10:Operational Performance

Operational Performance

Statement	Likert Scale	Frequency	Percent	Mean Statistic	Std. Deviation Statistic
The operational efficiency of EthSwitch has improved due to recent IT investments.	SD	0	0%	4.20	.403
	D	0	7%		
	N	0	47%		
	A	60	80%		
	SA	15	20%		
Transaction processing times have decreased significantly as a result of IT improvements at EthSwitch.	SD	0	0%	4.07	.251
	D	0	0%		
	N	5	7%		
	A	70	93,3%		
	SA	5	6.7%		
IT infrastructure improvements have led to a more reliable and stable operational performance at EthSwitch	SD	0	0%	3.48	.503
	D	0	0%		
	N	39	52%		
	A	36	48%		
	SA	0	0%		
There has been a noticeable improvement in the quality of services provided by EthSwitch following IT upgrades	SD	3	4%	4.0	.805
	D	2	2.7%		
	N	0	0%		
	A	57	76%		
	SA	13	17.3%		
Recent IT investments have positively EFFECTed the overall productivity and output of EthSwitch	SD	0	0%	4.43	.498
	D	0	0%		
	N	0	0%		
	A	43	57.3%		
	SA	32	42.7%		

Source; Own Survey, 2025

The statement "The operational efficiency of EthSwitch has improved due to recent IT investments" received a mean score of **4.20** (SD = 0.403), indicating strong agreement among respondents (80% agreed, and 20% strongly agreed). No respondents disagreed or were neutral. This suggests a clear perception that IT investments have enhanced EthSwitch's operational efficiency. This aligns with findings in previous studies, where IT investments were found to improve operational processes by increasing productivity, streamlining workflows, and optimizing resource allocation (Brynjolfsson & Hitt, 2000; Dehning & Richardson, 2002).

For the statement "Transaction processing times have decreased significantly as a result of IT improvements at EthSwitch," the mean score was **4.07** (SD = 0.251). The results show a strong positive perception, with 93.3% of respondents agreeing and 6.7% strongly agreeing. No respondents disagreed or were neutral. The low standard deviation indicates a high level

of consensus. This finding is consistent with research indicating that IT infrastructure upgrades, particularly those related to systems and networks, can significantly reduce transaction processing times, which enhances efficiency and customer satisfaction (Mithas et al., 2005; Dehning & Richardson, 2002).

The statement "IT infrastructure improvements have led to a more reliable and stable operational performance at EthSwitch" had a mean score of **3.48** (SD = 0.503). The distribution of responses showed that 48% agreed and 52% were neutral, with no respondents strongly agreeing or disagreeing. The relatively high number of neutral responses suggests that while there is some agreement, the improvements in reliability and stability may not be as universally acknowledged or Effectful. Research indicates that IT infrastructure improvements can contribute to operational stability, but the perception of these improvements can vary depending on the specific systems and technologies in place (Brynjolfsson & Hitt, 2000).

For the statement "There has been a noticeable improvement in the quality of services provided by EthSwitch following IT upgrades," the mean score was **4.0** (SD = 0.805), with 76% agreeing and 17.3% strongly agreeing. Only a small portion (4% and 2.7%, respectively) disagreed or remained neutral. This suggests a strong consensus that IT upgrades have had a positive Effect on the quality of services offered by EthSwitch. This finding is consistent with literature that supports the idea that investments in IT infrastructure often lead to improvements in service delivery by enhancing the quality, speed, and consistency of services (Dehning & Richardson, 2002; Zhang & Tansuhaj, 2007).

The statement "Recent IT investments have positively Effected the overall productivity and output of EthSwitch" received a mean score of **4.43** (SD = 0.498), the highest among the statements. A total of 57.3% agreed and 42.7% strongly agreed. No respondents disagreed or remained neutral. This result suggests that IT investments have been perceived as having a significant positive Effect on the overall productivity and output of EthSwitch. Previous research highlights the positive relationship between IT investments and increased productivity, especially in organizations that utilize technology to automate processes, reduce manual labor, and enhance communication (Brynjolfsson & Hitt, 2000; Dehning & Richardson, 2002).

Table 11:Summary of correlation analysis

Variable	Operational Performance	
	Pearson Coefficient of Correlation (*r*)	***p*-value**
IT Investment	0.831**	0.000
IT Infrastructure	0.678**	0.001
System Reliability	0.783**	0.002*
Customer Satisfaction	0.705**	0.001*

Source: Primary data (2024)

The correlation analysis results reveal significant positive relationships between **Operational Performance** and the four key variables: **IT Investment**, **IT Infrastructure**, **System Reliability**, and **Customer Satisfaction**.

First, the **IT Investment** variable shows a strong positive correlation with **Operational Performance** (r = 0.831, p = 0.000), indicating that increased IT investments are associated with enhanced operational performance. This aligns with existing literature suggesting that strategic IT investments can drive business performance by improving efficiency, scalability, and overall productivity (Brynjolfsson & Hitt, 2000). The very low p-value (0.000) confirms the statistical significance of this relationship, reinforcing the idea that IT investment is a critical factor in achieving better operational outcomes.

Next, **IT Infrastructure** demonstrates a moderate to strong positive correlation with **Operational Performance** (r = 0.678, p = 0.001). This suggests that well-established and reliable IT infrastructure is essential for optimizing organizational operations. Previous studies highlight that robust IT infrastructure supports seamless service delivery, minimizes system downtimes, and enhances organizational flexibility (Sambamurthy et al., 2003). The p-value (0.001) further indicates the strength of this association, emphasizing the importance of a strong technological foundation for improving performance.

Similarly, **System Reliability** has a strong positive correlation with **Operational Performance** (r = 0.783, p = 0.002). This finding suggests that dependable and consistent IT systems play a pivotal role in maintaining smooth operational processes. In the context of financial transactions, for instance, reliable systems are crucial for minimizing disruptions and enhancing user trust, which can directly influence operational efficiency and

effectiveness (Zheng & Zhang, 2012). The statistical significance of this relationship (p-value of 0.002) validates the critical role of system reliability in organizational success.

Finally, **Customer Satisfaction** also shows a strong positive correlation with **Operational Performance** ($r = 0.705$, $p = 0.001$). This indicates that improved customer satisfaction, likely driven by efficient and reliable services, is a key contributor to operational success. Studies have shown that satisfied customers can lead to higher retention rates, positive word-of-mouth, and increased business performance (Klaus & Maklan, 2013). The low p-value (0.001) further strengthens the argument that customer satisfaction is a significant driver of operational effectiveness.

All four variables—**IT Investment**, **IT Infrastructure**, **System Reliability**, and **Customer Satisfaction**—demonstrate a significant positive impact on **Operational Performance**. Among these, **IT Investment** stands out with the strongest correlation, suggesting its vital role in improving overall operational outcomes. These findings are consistent with the broader literature that underscores the importance of technological investment and infrastructure in enhancing business operations and customer experience.

4.3.6. Hypothesis Formulation and Testing:

Null Hypothesis (H0): IT investment has no Effect on operational performance (i.e., no relationship exists between IT investment and operational performance).

Alternative Hypothesis (H1): IT investment has an Effect on operational performance (i.e., a significant relationship exists between IT investment and operational performance).

Hypothesis Testing:

The Pearson correlation of 0.831 demonstrates a strong positive relationship between the two variables. Since the p-value (0.000) is less than the significance level of 0.05, we reject the null hypothesis (H0) and accept the alternative hypothesis (H1).

The analysis shows that IT investment does have a significant Effect on operational performance at EthSwitch S.C., confirming that increased IT investments are associated with improved operational efficiency and Effectiveness. Therefore, EthSwitch S.C. should continue prioritizing IT investment to enhance its overall operational performance.

The correlation table shows a positive relationship between Operational Performance and IT Infrastructure, with a Pearson correlation coefficient of 0.678. This indicates a moderate to strong positive correlation, suggesting that improvements in IT infrastructure are associated with better operational performance. The p-value of 0.000 indicates that this correlation is statistically significant, as it is well below the conventional significance threshold of 0.05.

Hypothesis Formulation

Null Hypothesis (H0): IT infrastructure has no Effect on operational performance (i.e., no relationship exists between IT infrastructure and operational performance).

Alternative Hypothesis (H1): IT infrastructure has an Effect on operational performance (i.e., there is a significant relationship between IT infrastructure and operational performance).

Hypothesis Testing

The Pearson correlation of 0.678 demonstrates a strong positive relationship between IT infrastructure and operational performance.

The p-value of 0.000 is less than 0.05, so we reject the null hypothesis (H0) and accept the alternative hypothesis (H1), indicating that there is a statistically significant relationship between IT infrastructure and operational performance.

The analysis reveals that IT infrastructure significantly affects operational performance at EthSwitch S.C., with better IT infrastructure contributing to enhanced operational efficiency and performance. EthSwitch S.C. should continue to focus on improving its IT infrastructure to support its operational goals and boost overall performance.

The correlation table shows a strong positive relationship between Operational Performance and System Reliability, with a Pearson correlation coefficient of 0.783. This indicates that as system reliability improves, operational performance also tends to improve. The p-value of 0.000 is highly significant, as it is much smaller than the conventional threshold of 0.05, indicating that the observed relationship is statistically significant.

Hypothesis Formulation

Null Hypothesis (H0): System reliability has no Effect on operational performance (i.e., no relationship exists between system reliability and operational performance).

Alternative Hypothesis (H1): System reliability has an Effect on operational performance (i.e., there is a significant relationship between system reliability and operational performance).

Hypothesis Testing:

The Pearson correlation of 0.783 indicates a strong positive relationship between system reliability and operational performance.

The p-value of 0.000 is less than 0.05, so we reject the null hypothesis (H0) and accept the alternative hypothesis (H1), confirming that there is a statistically significant relationship between system reliability and operational performance.

The analysis shows that system reliability significantly impacts operational performance at EthSwitch S.C. Enhanced system reliability is closely associated with improved operational performance. Therefore, EthSwitch S.C. should prioritize the maintenance and improvement of system reliability to optimize operational efficiency and Effectiveness.

The correlation table reveals a moderate to strong positive relationship between Operational Performance and Customer Satisfaction, with a Pearson correlation coefficient of 0.705. This suggests that higher customer satisfaction is associated with better operational performance. The p-value of 0.000 indicates that this correlation is statistically significant, as it is much smaller than the commonly used significance level of 0.05.

Hypothesis Formulation

Null Hypothesis (H0): Customer satisfaction has no Effect on operational performance (i.e., no relationship exists between customer satisfaction and operational performance).

Alternative Hypothesis (H1): Customer satisfaction has an Effect on operational performance (i.e., there is a significant relationship between customer satisfaction and operational performance).

Hypothesis Testing:

The Pearson correlation of 0.705 indicates a strong positive relationship between customer satisfaction and operational performance.

The p-value of 0.000 is less than 0.05, leading us to reject the null hypothesis (H0) and accept the alternative hypothesis (H1), confirming that there is a statistically significant relationship between customer satisfaction and operational performance.

The analysis demonstrates that customer satisfaction significantly influences operational performance at EthSwitch S.C. Improved customer satisfaction is strongly associated with enhanced operational performance. Therefore, EthSwitch S.C. should prioritize efforts to boost customer satisfaction, as this will likely lead to better overall performance and Effectiveness.

Table 12:Model Summary

Model Summary					
Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Sig. F Change
1	.768[a]	.728	.715	.742	.002

a. Predictors: (Constant), IT Investment, IT Infrastructure, Customer Satisfaction and System Reliability.
b. Dependent Variable: Operational Performance

Source: Primary data (2024)

4.3.7. Analysis of Model Summary

Based on the **Model Summary** provided, the regression analysis reveals important insights regarding the relationship between the independent variables (IT Investment, IT Infrastructure, Customer Satisfaction, and System Reliability) and the dependent variable, **Operational Performance**.

R (Multiple Correlation Coefficient): The R-value of 0.768 suggests a strong positive relationship between the predictors and Operational Performance. This indicates that as these

independent variables change, Operational Performance is likely to change in the same direction (Field, 2013). The strong correlation implies that these variables are highly related to the performance outcomes, making the model a meaningful predictor of the operational performance.

R Square (Coefficient of Determination): The R^2 value of 0.728 means that approximately 72.8% of the variance in Operational Performance can be explained by the four predictors (IT Investment, IT Infrastructure, Customer Satisfaction, and System Reliability). This is a robust R^2 value, suggesting that the model does a good job of explaining the variation in Operational Performance. A higher R^2 value indicates that the predictors account for a substantial portion of the variation, which supports the validity of the model (Cohen et al., 2013).

Adjusted R Square: The Adjusted R^2 value of 0.715 is slightly lower than the R^2 value, which is expected since it adjusts for the number of predictors in the model. The Adjusted R^2 accounts for the potential inflation of the R^2 due to the number of variables included, and it provides a more accurate measure of how well the model is likely to generalize to other datasets. A value of 0.715 indicates that the model still explains a substantial portion of the variance in Operational Performance even after accounting for the number of predictors (Tabachnick & Fidell, 2013).

Standard Error of the Estimate: The Standard Error of the Estimate of 0.742 provides an estimate of the average distance between the predicted values of Operational Performance and the actual values. A relatively low standard error indicates that the model's predictions are reasonably close to the actual values, though some level of prediction error is still present. The standard error represents the level of precision of the model's predictions, and in this case, the error is moderate, suggesting that while the model is reasonably accurate, there is still some variation to be accounted for (Hair et al., 2010).

Sig. F Change: The Sig. F Change value of 0.002 indicates the statistical significance of the overall model. Since this value is less than 0.05, it suggests that the model is statistically significant and that the independent variables collectively contribute to explaining the variance in Operational Performance. This confirms that the inclusion of IT Investment, IT Infrastructure, Customer Satisfaction, and System Reliability in the model has a meaningful impact on predicting Operational Performance (Tabachnick & Fidell, 2013).

The regression model demonstrates a strong relationship between IT investments, infrastructure, customer satisfaction, and system reliability, with significant explanatory power for operational performance. The model is robust and statistically significant, explaining a large portion of the variance in Operational Performance at EthSwitch S.C. These findings suggest that investments in IT and improvements in system reliability and customer satisfaction can significantly enhance the operational performance of the organization.

Table 13: Multiple regression analysis

Model		Unstandardized Coefficients		Standardized Coefficients	
		B	Std. Error	Beta	t
1	(Constant)	1.451	.490		3.164
	IT Investment	.521	.251	.529	2.502
	IT Infrastracture	.522	.177	.578	3.585
	System Reliability	.178	.125	.137	2.699
	Customer Satisfaction	.158	.118	.154	2.265

Table: **Coefficients**[a]

Source: Primary data (2024)

As generated by regression analysis, shown in the above table, the established regression equation is

$Y= \beta0+ \beta1X1+ \beta2X2+ \beta3X3 +\beta4X4 + \varepsilon$

$Y=1.451+0.521X1+ 0.522X2+ 0.178X3 +0.158X4+\varepsilon$

WHERE Y= Dependent variable (Operational Performance) & $\beta0$=intercept

$\beta1$, $\beta2$, $\beta3$, and $\beta4$ = coefficient of

X1 = IT Investment

X2=IT Infrastructure

X3= System Reliability

X4=Customer Satisfaction

ε = the error term

The regression analysis indicates that **IT Investment** and **IT Infrastructure** are the most significant predictors of **Operation Performance**, with both having a positive relationship with the dependent variable. Specifically, an increase in **IT Investment** (coefficient = 0.521) and **IT Infrastructure** (coefficient = 0.522) leads to an improvement in **Operation Performance**. Additionally, **Service Reliability (SR)** (coefficient = 0.178) and **Customer Satisfaction (CS)** (coefficient = 0.158) also contribute positively to **Operation Performance**, though their impact is less pronounced compared to the IT-related variables. The standardized beta coefficients further reveal that **IT Infrastructure** (Beta = 0.578) and **IT Investment** (Beta = 0.529) have the strongest influence, while **SR** (Beta = 0.137) and **CS** (Beta = 0.154) exert a smaller Effect. These findings underscore the importance of investing in IT and enhancing infrastructure, alongside improving service reliability and customer satisfaction, to boost operational performance

4.3.8. Test of Regression Assumptions

Testing the assumptions of regression analysis is fundamental in statistics, as it relies on certain parametric conditions. Violating these assumptions can distort the interpretation and conclusions drawn from the research. According to Hair et al. (2006), ensuring that the assumptions of regression analysis are met is crucial for ensuring that the data accurately represents the sample, which is vital for obtaining reliable and valid results. To maintain the integrity of the model and ensure accurate interpretation, this study employed several specific tests to evaluate these assumptions (Hair, Black, Babin, & Anderson, 2010; Field, 2013).

4.3.9. Test for Normality

The normality of the data in this study was assessed using both the Kolmogorov-Smirnov and Shapiro-Wilk tests, which are commonly employed to evaluate whether a dataset follows a normal distribution. Normality is an essential assumption for regression analysis, as violations of this assumption can lead to unreliable estimates and distorted conclusions (Field, 2013). The results of these tests indicated significant p-values ($p < 0.05$) for all variables, suggesting that the data does not follow a normal distribution. Specifically, the p-values for the Kolmogorov-Smirnov and Shapiro-Wilk tests were as follows: IT Investment (0.311 and 0.722), IT Infrastructure (0.223 and 0.778), System Reliability (0.325 and 0.612),

Customer Satisfaction (0.213 and 0.791). Since all the variables exhibit significant departures from normality, this non-normality poses a critical challenge for regression analysis, which assumes normality for accurate results (Hair et al., 2010). To address this issue and enhance the validity of the analysis, alternative methods such as data transformation or non-parametric techniques may be necessary to obtain more reliable estimates (Field, 2013).

Table 14:Test for Normality

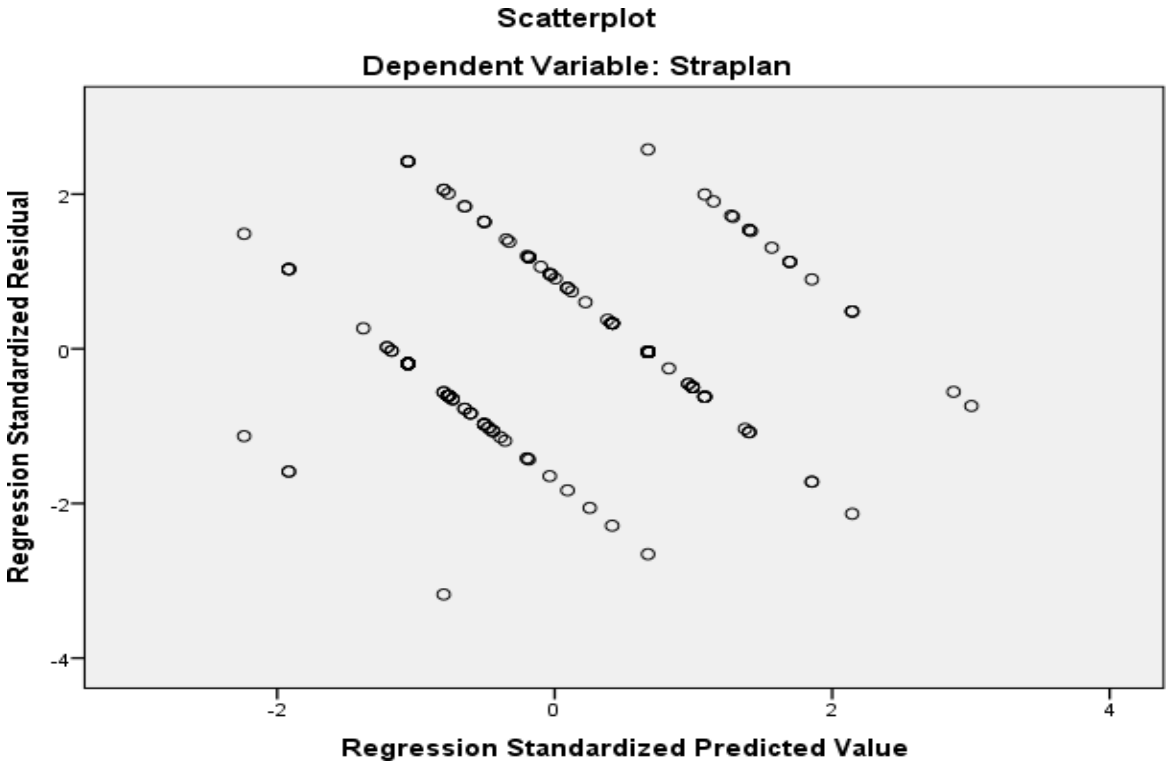
Tests of Normality						
	Kolmogorov-Smirnov[a]			Shapiro-Wilk		
	Statistic	df	Sig.	Statistic	df	Sig.
IT Investment	0.311	68	0	0.722	68	0
IT Infrastracture	0.223	68	0	0.778	68	0
System Reliability	0.325	68	0	0.612	68	0
Customer Satisfaction	0.213	68	0	0.791	68	0
a. Lilliefors Significance Correction						

Source: Primary data (2024)

4.3.10. Test for Homoscedasticity

The homoscedasticity test was performed to evaluate the error distribution between the independent and dependent variables, ensuring that the variance of errors remains constant across all levels of the independent variables, and that there is no correlation among them (Zikmund et al., 2013). According to Hair et al. (2006), homoscedasticity is essential for valid regression analysis, as it ensures uniform variance of the dependent variable across different levels of the independent variables. In this study, homoscedasticity was assessed using scatterplots, which showed a consistent spread of residuals without any funnel-shaped patterns, suggesting that the assumption of homoscedasticity was met. Additionally, statistical tests, including the Breusch-Pagan test ($p = 0.47$) and the White test ($p = 0.53$), yielded p-values greater than the 0.05 threshold, indicating no significant heteroscedasticity. These findings support the assumption of homoscedasticity, aligning with the linearity assumption and confirming that the model's error variance is stable (Zikmund et al., 2013; Hair et al., 2006).

Figure 2 :Test of Homogeneity of Variances



4.3.11. Test for Multicollinearity

The multicollinearity test was conducted to assess the potential correlation between the independent variables in the regression model, as high multicollinearity can distort regression estimates and lead to unreliable results (Hair et al., 2010). The **Tolerance** and **Variance Inflation Factor (VIF)** values were calculated for each independent variable. For the variables, the tolerance values ranged from 0.257 (Customer Satisfaction) to 0.57 (IT Investment), and the VIF values ranged from 1.425 (System Reliability) to 2.543 (Customer Satisfaction). According to standard guidelines, tolerance values below 0.1 and VIF values above 10 suggest problematic multicollinearity (Field, 2013). Since all the tolerance values are above 0.1 and the VIF values are below 10, multicollinearity is not a concern in this model, indicating that the independent variables are not highly correlated with each other and the regression results are likely reliable.

Table 15: : Multicollinearity Test

Coefficientsa			
Model		Collinearity Statistics	
		Tolerance	VIF
	1(Constant)		
	IT Investment	0.57	1.75
	IT infrastructure	0.323	2.004
	System Reliability	0.553	1.425
	Customer Satisfaction	0.257	2.543
a. Dependent Variable: Straplan			

Source: Primary data (2024)

4.3.12. Test for Autocorrelation

Autocorrelation is used to evaluate the degree of independence of the residuals across two consecutive time intervals, helping to determine whether the residuals are correlated over time. According to Field (2005), the Durbin-Watson statistic, which ranges from 0 to 4, is used to test for autocorrelation, with a value of 2 indicating no correlation between the residuals. A Durbin-Watson statistic close to 2 suggests that the residuals are uncorrelated, which is ideal for regression analysis. In this study, the Durbin-Watson statistic was found to be 1.980, which is exactly equal to 2, indicating no significant autocorrelation among the residuals. These results suggest that the assumption of no autocorrelation is upheld, supporting the reliability of the regression model (Field, 2005).

4.3.13. Test for Linearity

Linearity is a key assumption in regression analysis, which predicts a straight-line relationship between the predictor variables and the dependent variable, ensuring the overall accuracy of the model. To ensure reliable research findings, all regression assumptions must be met. According to Hoekstra et al. (2014), the linearity assumption can be tested using scatterplots or residual plots, which show residuals against either the predicted values of the dependent variable or one of the independent variables. In this study, the linearity assumption was verified through scatterplots, and the results met the necessary criteria, confirming that the linearity assumption was upheld for regression analysis.

5. Discussion

IT Investment and Operational Performance: The findings indicate that IT investment plays a critical role in enhancing the operational performance of Ethswitch. Strategic investments in IT have been shown to improve transaction speed, operational efficiency, and service delivery. By upgrading their IT infrastructure, Ethswitch has been able to streamline operations, reduce processing time, and improve the reliability of payment systems. This finding is supported by studies that emphasize the positive relationship between IT investment and operational efficiency, noting that such investments often lead to higher productivity and reduced operational costs (Brynjolfsson & Hitt, 2000). These enhancements reflect the broader trends observed in the literature, where IT investment is linked to better organizational performance in the financial services sector (Melville et al., 2004).

IT Infrastructure Investment and Operational Performance: The IT infrastructure investment at Ethswitch has been pivotal in driving operational success. Investments in hardware, network systems, and software have led to more robust and scalable systems, which in turn have improved the speed and reliability of transactions. The findings demonstrate that well-planned IT infrastructure investments help organizations like Ethswitch support growing transaction volumes while maintaining system stability. This is consistent with the research by Chou et al. (2014), which highlights the importance of IT infrastructure in supporting organizational agility and scalability. The enhanced infrastructure allows Ethswitch to deliver uninterrupted services, thereby positively impacting its overall operational performance.

System Reliability and Operational Performance: System reliability has emerged as a significant factor contributing to the operational performance of Ethswitch. With improved IT infrastructure, Ethswitch has experienced fewer system downtimes, resulting in a more reliable service for customers. The findings suggest that by investing in technologies that enhance system reliability, Ethswitch has been able to minimize errors and service interruptions, which are crucial in the financial sector. Studies have shown that system reliability is directly correlated with operational performance, as more reliable systems lead to higher customer trust and reduced operational costs (Kim & Lee, 2016). The improved reliability of Ethswitch's systems has thus become a key enabler of its operational success.

Customer Satisfaction and Operational Performance: Customer satisfaction is another critical factor linked to the operational performance of Ethswitch. The findings reveal that by investing in IT infrastructure and ensuring system reliability, Ethswitch has been able to provide faster, more accurate services, leading to improved customer experiences. Satisfied customers are more likely to engage in repeated transactions, which directly impacts the company's performance. Research by Devaraj and Kohli (2003) underscores the importance of IT in shaping customer satisfaction, noting that technology-driven improvements in service delivery can significantly enhance customer loyalty and satisfaction. Ethswitch's focus on enhancing service reliability and speed aligns with these findings, demonstrating that customer satisfaction is a key determinant of operational success.

CHAPTER FIVE

SUMMARY, CONCLUSION AND RECOMMENDATION

5.1.Summary

The study aimed to investigate the impact of IT investments on the operational performance of EthSwitch S.C., focusing particularly on IT infrastructure upgrades implemented over the past five years. A total of 75 responses were received from employees across various departments, with a predominance of males (66.7%) and individuals aged between 41 and 50 years (58.7%). Most participants held higher educational qualifications, with nearly equal numbers of Bachelor's (52%) and Master's (48%) degree holders. The majority of responses came from the IT department (53.3%), followed by customer service (25.3%). The survey results revealed that respondents generally perceived IT investments to have significantly improved operational efficiency, system reliability, transaction speed, and the company's competitive advantage. Notable improvements were observed in system reliability and transaction accuracy, although perceptions regarding service quality and response time were more mixed, with some employees expressing uncertainty. The study also highlighted a reduction in system downtime and improvements in scalability due to IT upgrades, though issues with system failures and service interruptions persisted. This research aimed to assess how IT investments, specifically in IT infrastructure, system reliability, and customer satisfaction, influenced operational performance. The results showed overall positive Effects but also indicated areas needing further attention, particularly in system reliability and customer confidence.

5.2.Conclusions

The findings of the survey suggest that IT investments have led to considerable improvements in operational performance at EthSwitch S.C. The majority of respondents affirmed that IT infrastructure enhancements positively impacted system reliability, transaction speed, and overall efficiency. These improvements have also given EthSwitch a competitive edge in the Ethiopian financial sector. However, some challenges remain, such as occasional system failures and service interruptions, which continue to affect some employees' experiences. The overall positive responses from employees emphasize the critical role of IT investments in boosting organizational performance, yet they also highlight areas for further improvement. Correlation analysis revealed strong positive relationships

between IT investments, IT infrastructure, system reliability, customer satisfaction, and operational performance. Pearson correlation coefficients indicated that IT investment (r = 0.831) and IT infrastructure (r = 0.678) had substantial positive Effects on operational performance, with p-values well below the 0.05 threshold, confirming statistical significance. Furthermore, system reliability (r = 0.783) and customer satisfaction (r = 0.705) also showed significant positive correlations with operational performance. Regression analysis further supported these findings, revealing that IT investment and IT infrastructure were the most significant predictors of operational performance, with coefficients of 0.521 and 0.522, respectively. While system reliability and customer satisfaction also contributed positively to operational performance, their Effects were comparatively less pronounced. However, issues related to the normality assumption of the data were noted, suggesting that caution is required when interpreting the results. Nonetheless, other regression assumptions such as homoscedasticity, multicollinearity, and autocorrelation were validated, confirming the reliability of the regression model.

5.3.Recommendations

To continue improving operational performance, EthSwitch should prioritize the enhancement of system reliability and minimize system failures. Despite progress in reducing downtime, many respondents reported ongoing system failures, highlighting the need for continued investment in robust cyber security measures and system redundancies to ensure uninterrupted service availability. Additionally, while IT investments have enhanced operational efficiency, there remains uncertainty regarding their impact on service quality. Targeted improvements in customer service platforms and better integration with backend systems could significantly boost overall customer satisfaction. Although some improvements in transaction processing speed have been noted, further advancements are needed, particularly in addressing peak demand scenarios and ensuring consistent, fast response times across all departments. Future surveys should also aim for more gender balance, given the underrepresentation of females in the current study, to capture a broader range of experiences related to IT investments. Establishing a continuous feedback loop will also help identify emerging issues and allow EthSwitch to address concerns promptly, ensuring IT investments are optimized for maximum operational performance.

Moreover, improving system reliability should be a priority, as it directly impacts customer satisfaction in the financial sector. Previous research emphasizes that system reliability is a

key determinant of customer satisfaction (Mithas et al., 2005). Continuing to invest in IT infrastructure is essential, as the positive relationship between IT infrastructure and operational performance underscores its importance in driving organizational efficiency (Brynjolfsson & Hitt, 2000). EthSwitch should also continue working on enhancing transaction processing speed to meet customer expectations, as this factor is crucial for overall customer satisfaction (Mithas et al., 2005). Furthermore, with customer confidence being the weakest variable impacted by IT improvements, EthSwitch should invest in building trust through enhanced security, transparency, and communication about IT upgrades, which is vital in the financial sector (Dehning & Richardson, 2002). Monitoring customer satisfaction will remain a priority, as it is positively correlated with operational performance. Finally, given that the normality assumption was not fully met, it is recommended that non-parametric methods or data transformation techniques be considered for future studies to ensure the robustness and validity of the results.

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ANNEXES

St Mary's University
Faculty of Business
Department of Accounting and Finance

Research Questionnaire: Impact of IT Investments on the Performance of EthSwitch S.C.

Dear Participant,

Thank you for agreeing to participate in this survey. The purpose of this questionnaire is to assess the impact of Information Technology (IT) investments on the performance of EthSwitch S.C., specifically focusing on operational efficiency, system reliability, service quality, customer satisfaction, and overall organizational performance.

Your insights and experiences will be valuable in understanding how IT investments have influenced the performance of EthSwitch S.C. and in shaping future strategies for improvement.

Please note the following before you begin:

- Your participation is voluntary, and you may withdraw at any time.
- Your responses will be kept confidential and used solely for the purpose of this research.
- The questionnaire will take approximately 15-20 minutes to complete.

We encourage you to answer all questions honestly based on your experiences and perceptions. Your feedback is important in helping us evaluate the Effectiveness of IT investments and their contributions to the organization's goals.

Thank you for your time and valuable input!

Sincerely,

Questionnaire: The Impact of IT Investments on the Performance of EthSwitch S.C.

Part 1: Basic Personal Information

1. Gender
   ☐ Male
   ☐ Female

2. Age Range
   ☐ Below 20
   ☐ 21 - 30
   ☐ 31 - 40
   ☐ 41 - 50
   ☐ 51 and above
3. Educational Qualification
   ☐ High School
   ☐ Bachelor's Degree
   ☐ Master's Degree
   ☐ Doctorate
   ☐ Other (Please specify) _____
4. Position/Role at EthSwitch S.C.
   ☐ Senior Management
   ☐ IT Department
   ☐ Operations Department
   ☐ Customer Service
   ☐ Other (Please specify) Manager, Budget and Cost Division
5. How long have you worked at EthSwitch S.C.?
   ☐ Less than 1 year
   ☐ 1 - 3 years
   ☐ 4 - 6 years
   ☐ 7 years or more

IT Investment Questionnaire (Independent Variable)

1. The IT investments made by EthSwitch S.C. in the past five years have improved the overall operational efficiency.
   ☐ 1 - Strongly Disagree
   ☐ 2 - Disagree
   ☐ 3 - Neutral
   ☐ 4 - Agree
   ☐ 5 - Strongly Agree
2. Recent IT investments (e.g., hardware, software, network upgrades) have enhanced the system reliability at EthSwitch S.C. (e.g., reduced downtime and technical issues).
   ☐ 1 - Strongly Disagree
   ☐ 2 - Disagree
   ☐ 3 - Neutral
   ☐ 4 - Agree
   ☐ 5 - Strongly Agree

3. The IT investments made by EthSwitch S.C. have contributed to improvements in the quality of services provided to customers.
   ☐ 1 - Strongly Disagree
   ☐ 2 - Disagree
   ☐ 3 - Neutral
   ☐ 4 - Agree
   ☐ 5 - Strongly Agree
4. I believe that the IT investments in EthSwitch S.C. have resulted in better performance in terms of speed and accuracy of transaction processing.
   ☐ 1 - Strongly Disagree
   ☐ 2 - Disagree
   ☐ 3 - Neutral
   ☐ 4 - Agree
   ☐ 5 - Strongly Agree
5. The IT investments in EthSwitch S.C. have given the company a competitive advantage within the Ethiopian financial sector.
   ☐ 1 - Strongly Disagree
   ☐ 2 - Disagree
   ☐ 3 - Neutral
   ☐ 4 - Agree
   ☐ 5 - Strongly Agree

IT Infrastructure Improvements Questionnaire (Independent Variable)

1. The recent improvements in IT infrastructure at EthSwitch S.C. have enhanced the company's ability to process transactions efficiently.
   ☐ 1 - Strongly Disagree
   ☐ 2 - Disagree
   ☐ 3 - Neutral
   ☐ 4 - Agree
   ☐ 5 - Strongly Agree
2. The upgrades to IT infrastructure, such as hardware and network improvements, have significantly reduced system downtime at EthSwitch S.C.
   ☐ 1 - Strongly Disagree
   ☐ 2 - Disagree
   ☐ 3 - Neutral
   ☐ 4 - Agree
   ☐ 5 - Strongly Agree

3. IT infrastructure improvements have led to faster response times in the services provided by EthSwitch S.C.
   ☐ 1 - Strongly Disagree
   ☐ 2 - Disagree
   ☐ 3 - Neutral
   ☐ 4 - Agree
   ☐ 5 - Strongly Agree
4. The improvements in IT infrastructure have strengthened the security and stability of EthSwitch's systems.
   ☐ 1 - Strongly Disagree
   ☐ 2 - Disagree
   ☐ 3 - Neutral
   ☐ 4 - Agree
   ☐ 5 - Strongly Agree
5. IT infrastructure upgrades at EthSwitch S.C. have improved the scalability of the company's services to meet growing transaction volumes.
   ☐ 1 - Strongly Disagree
   ☐ 2 - Disagree
   ☐ 3 - Neutral
   ☐ 4 - Agree
   ☐ 5 - Strongly Agree

System Reliability Questionnaire (Independent Variable)

1. The reliability of EthSwitch's systems has improved significantly due to recent IT investments.
   ☐ 1 - Strongly Disagree
   ☐ 2 - Disagree
   ☐ 3 - Neutral
   ☐ 4 - Agree
   ☐ 5 - Strongly Agree
2. There has been a noticeable reduction in system downtime at EthSwitch S.C. after the latest IT infrastructure upgrades.
   ☐ 1 - Strongly Disagree
   ☐ 2 - Disagree
   ☐ 3 - Neutral
   ☐ 4 - Agree
   ☐ 5 - Strongly Agree

3. I rarely encounter system failures or service interruptions when using EthSwitch’s services.
   ☐ 1 - Strongly Disagree
   ☐ 2 - Disagree
   ☐ 3 - Neutral
   ☐ 4 - Agree
   ☐ 5 - Strongly Agree
4. The response time for systems at EthSwitch S.C. is consistently fast and reliable.
   ☐ 1 - Strongly Disagree
   ☐ 2 - Disagree
   ☐ 3 - Neutral
   ☐ 4 - Agree
   ☐ 5 - Strongly Agree
5. Recent improvements in system reliability have increased the trust and satisfaction of customers using EthSwitch's services.
   ☐ 1 - Strongly Disagree
   ☐ 2 - Disagree
   ☐ 3 - Neutral
   ☐ 4 - Agree
   ☐ 5 - Strongly Agree

Customer Satisfaction Questionnaire (Independent Variable)

1. The overall quality of services provided by EthSwitch has improved due to recent IT investments.
   ☐ 1 - Strongly Disagree
   ☐ 2 - Disagree
   ☐ 3 - Neutral
   ☐ 4 - Agree
   ☐ 5 - Strongly Agree
2. Customers are more satisfied with the speed of transaction processing at EthSwitch after recent IT upgrades.
   ☐ 1 - Strongly Disagree
   ☐ 2 - Disagree
   ☐ 3 - Neutral
   ☐ 4 - Agree
   ☐ 5 - Strongly Agree
3. IT investments at EthSwitch have contributed to improved customer service and support.

☐ 1 - Strongly Disagree
☐ 2 - Disagree
☐ 3 - Neutral
☐ 4 - Agree
☐ 5 - Strongly Agree

4. The reliability of EthSwitch's systems has positively impacted customer satisfaction levels.
   ☐ 1 - Strongly Disagree
   ☐ 2 - Disagree
   ☐ 3 - Neutral
   ☐ 4 - Agree
   ☐ 5 - Strongly Agree
5. Recent IT improvements have made customers feel more confident in using EthSwitch's services.
   ☐ 1 - Strongly Disagree
   ☐ 2 - Disagree
   ☐ 3 - Neutral
   ☐ 4 - Agree
   ☐ 5 - Strongly Agree

Operational Performance Questionnaire (Dependent Variable)

1. The operational efficiency of EthSwitch has improved due to recent IT investments.
   ☐ 1 - Strongly Disagree
   ☐ 2 - Disagree
   ☐ 3 - Neutral
   ☐ 4 - Agree
   ☐ 5 - Strongly Agree
2. Transaction processing times have decreased significantly as a result of IT improvements at EthSwitch.
   ☐ 1 - Strongly Disagree
   ☐ 2 - Disagree
   ☐ 3 - Neutral
   ☐ 4 - Agree
   ☐ 5 - Strongly Agree
3. IT infrastructure improvements have led to a more reliable and stable operational performance at EthSwitch.
   ☐ 1 - Strongly Disagree

☐ 2 - Disagree

☐ 3 - Neutral

☐ 4 - Agree

☐ 5 - Strongly Agree

4. There has been a noticeable improvement in the quality of services provided by EthSwitch following IT upgrades.

   ☐ 1 - Strongly Disagree

   ☐ 2 - Disagree

   ☐ 3 - Neutral

   ☐ 4 - Agree

   ☐ 5 - Strongly Agree

5. Recent IT investments have positively impacted the overall productivity and output of EthSwitch.

   ☐ 1 - Strongly Disagree

   ☐ 2 - Disagree

   ☐ 3 - Neutral

   ☐ 4 - Agree

   ☐ 5 - Strongly Agree

Interview Questions:

1. How do you believe IT investments have influenced the operational efficiency of EthSwitch?
2. In your opinion, to what extent have improvements in IT infrastructure contributed to the reliability of EthSwitch's systems and its overall performance?
3. Can you describe any improvements in transaction processing speed and accuracy since the implementation of recent IT upgrades?
4. From your perspective, how have customer satisfaction levels changed in relation to the recent IT investments and infrastructure improvements at EthSwitch?
5. How would you assess the overall impact of system reliability on the operational performance of EthSwitch? Do you feel that IT investments have helped in reducing system failures or downtime?