Analysis of Factors Affecting E-commerce Adoption In Agricultural Cooperatives of Cameroon

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DECLARATION

I declare that this work has not been previously submitted and approved for the award of a degree by this or any other University. To the best of my knowledge and belief, the research thesis contains no material previously published or written by another person except where due reference is made in the thesis itself.

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05th June 2023

Approval

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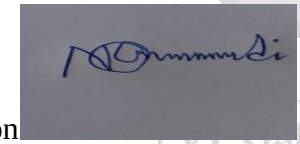

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ABSTRACT

E-commerce holds immense potential as a transformative solution for addressing challenges within agricultural cooperatives in Cameroon, offering unprecedented opportunities for smallholder farmers to access markets and augment their incomes. Despite this potential, the adoption of e-commerce by agricultural cooperatives in the Centre region of Cameroon remains nascent, hindered by multifaceted barriers. This research endeavors to meticulously identify and comprehend the influential factors shaping e-commerce adoption among these cooperatives, focusing on technological, organizational, external environmental, and sociocultural contexts. The study unveils using a semi-structured questionnaire administered face to face to 115 agricultural cooperatives randomly chosen, a complex landscape, highlighting cultural hesitancy as a significant barrier, particularly entrenched in cooperatives with a decade-long operational history. Older leadership within such cooperatives, characterized by a lack of awareness and resistance to change, further compounds the challenge. Paradoxically, newer cooperatives led by dynamic personnel display a more proactive engagement with e-commerce, yet face their own set of challenges. Despite a 60% prevalence of technology access, underutilization persists, while concerns over fraud and security in e-transactions inhibit approximately 90% of cooperatives. In response to these findings, the dissertation proposes a comprehensive set of recommendations aimed at fostering e-commerce adoption among agricultural cooperatives in the Centre region of Cameroon. These recommendations are structured into five key areas. Firstly, it advocates for government intervention through comprehensive policies and regulatory bodies dedicated to the unique challenges of agricultural cooperatives. Capacity-building initiatives are proposed, emphasizing targeted training programs and the establishment of resource centers. Cultural awareness programs targeting older leadership and initiatives to enhance technological literacy form additional pillars of the proposed strategy. The utilization of technology is encouraged, with a focus on optimizing existing resources and fostering a secure environment for e-commerce. Lastly, the recommendations emphasize addressing environmental concerns, promoting innovation in older cooperatives, and improving infrastructure to enhance accessibility.

Keywords: e-commerce adoption, factors of adoption, agricultural cooperatives, Centre Cameroon, digital transformation, sociocultural Dynamics.

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ABBREVIATIONS AND ACRONYMS

ANOVA	Analysis of variance
DOI	Diffusion of Innovation
DWMS	Document Workflow Management System
EC	E-Commerce
GDPR	General Data Protection Regulation
GDP	Gross Domestic Product
ICT	Information and communication technology
ISP	Independent Study Project
IT	Information technology
MINADER	Ministry of Agriculture and Rural Development
SMEs	Small-and medium-sized enterprises
SPSS	Statistical package for social science
TOE	Technology, Organization, and Environment
UNCTAD	United Nations Conference on Trade and Development

DEDICATION

I dedicate this Master's thesis to my family for their unwavering love, support, and encouragement throughout this academic journey. Your sacrifices, understanding, and belief in my abilities have been my greatest motivation. My Advisors Dr Noah Omondi, for their guidance, expertise, and valuable insights that have shaped the trajectory of my research. Your mentorship has been instrumental in the successful completion of this thesis. My Friends and Colleagues, for the camaraderie, shared experiences, and the countless discussions that enriched my understanding of the subject matter. Your friendship made the academic challenges more manageable.

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CHAPTER ONE: INTRODUCTION

1.1 Introduction

This chapter provide the concept, context of the study, the problem of interest, the objective, the scope and the significance of the study.

1.2 Background of the study

The current business environment is getting more competitive. In order for firms to stay competitive in the marketplace domestically and internationally, businesses have always strived to improve themselves by creating better ways to meet their customers' needs (Ahmad, 2010). Information and communication technology (ICT) is radically transforming the way individuals, organizations, and businesses work (Christian Mbayo Kabango, 2015). The swift proliferation of the Internet and other sophisticated information technologies has led to the emergence of electronic commerce (e-commerce). While there is no unanimous agreement on the definition of e-commerce (EC), it is commonly described as the activity involving the purchase, sale, transfer, or exchange of products, services, and/or information using computer networks, predominantly over the Internet and intranets (Turban, 2010; Kutz, 2016).

In recent times, electronic commerce (EC) networks have become the backbone of global connectivity, linking nations, individuals, and organizations of all scales (Kimana, 2020). While EC may seem like a modern phenomenon, its origins can be traced back to the 1960s when advancements in technology paved the way for electronic information sharing. However, it was during the late 1970s that these technological improvements gained prominence, enabling businesses to electronically exchange commercial documents. Nevertheless, access to such technologies remained limited to large corporations and financial institutions (Laudon, 2017).

The widespread popularity of the Internet and the emergence of the World Wide Web revolutionized the scenario, granting public and commercial entities broader access to the Internet (Vanessa Kimana, 2020). This newfound accessibility allowed numerous organizations to embrace EC applications within their operations. Consequently, the adoption of EC has witnessed significant growth over time, with an increasing number of companies establishing communication channels with their customers to foster stronger trade relationships (Villa, 2018).

EC is considered a powerful concept that has fundamentally transformed business processes

in a good number of enterprises worldwide (Wanzu, 2019). Problems related to sales, such as the unsatisfactory sales of agricultural products and single-channel distribution, severely restrict the growth of agricultural cooperatives and affect their operating income and market competitiveness, which in turn affects their survival and development (Tian, 2016; Zhang J. Z., 2016) . Fortunately, the advent of the internet has opened up new avenues for the distribution of agricultural products, including the use of e-commerce. By embracing e-commerce platforms, agricultural cooperatives have the opportunity to broaden their market reach, eliminate or minimize intermediaries, and reduce transportation expenses (Tan, 2016). This enables them to expand their business beyond traditional boundaries, tap into the service sector, transform their value-creation processes, and unlock the untapped value-added potential of their agricultural products (Zhang Y. F., 2016).

In the context of Cameroon the agricultural sector is among the main occupations for over 70% of Cameroonians and contributes enormously to the country's economy (Abia WA, 2016) and accounts for 22.9% of the Gross Domestic Product (GDP) (Ball, 2016). Since 2015 the government of Cameroon has challenged stakeholders nationwide to move toward a network economy also known as the digital economy; aiming to foster the development of the country (Etoundi, 2016). However, despite the growing interest in e-commerce among farmers and cooperatives, driven by its potential benefits, the adoption by agricultural cooperatives in Cameroon is still at an early stage, with limited adoption (Njikam, 2019).

The Centre region of Cameroon is located in the central part of the country and is one of the ten administrative regions. It is home to the capital city, Yaoundé, which serves as the political and administrative center of Cameroon (Ministry of Agriculture and Rural Development, Agricultural Sector Development Strategy Paper, 2018). The Centre Region is known for its diverse agricultural activities and plays a significant role in the country's agricultural sector. It holds particular importance, characterized by a range of agricultural cooperatives that contribute to the development and growth of the agricultural sector. These cooperatives can be single or multiple-purpose, focusing on various areas such as agricultural input supply, marketing, credit, machinery, and livestock production. However, the region faces specific challenges related to e-commerce adoption, such as limited technological infrastructure, organizational barriers, environmental constraints, and socio-cultural factors (United Nations, 2019). These challenges hinder the full

utilization of e-commerce platforms among agricultural cooperatives in the region, limiting their competitiveness in the digital marketplace (Emini, 2015).

Despite the importance of e-commerce adoption for agricultural cooperatives, there is a research gap regarding the factors that influence its adoption in the Centre region of Cameroon (Ndambi, 2017; United Nations, 2019). Existing studies have primarily focused on general e-commerce adoption or specific industries, neglecting the unique context and challenges faced by agricultural cooperatives in the region (Nnadi, 2015; Emini, 2015; Ndambi, 2017). Therefore, a comprehensive analysis of the factors affecting e-commerce adoption among agricultural cooperatives in the Centre region is needed to bridge this research gap.

1.2 Statement of the problem

Agricultural cooperatives have played a critical role in the development of the agricultural sector in Cameroon, providing smallholder farmers with access to essential resources such as credit, inputs, and markets (Tumenta, 2021). However, the sector faces significant challenges, including limited access to markets and low productivity (Amougou, 2016). E-commerce has the potential to address these challenges by facilitating direct access to markets, reducing transaction costs, enhancing supply chain efficiency, and enabling value-added services for agricultural cooperatives (Simbua, 2019; Nkongolo-Bakenda, 2020). Despite the growing significance of e-commerce in the global marketplace, agricultural cooperatives in Cameroon face challenges in effectively adopting and utilizing e-commerce platforms to enhance their competitiveness (Abang, 2018; Tchouakeu, 2019). Limited research exists on the specific factors that influence the adoption of e-commerce by agricultural cooperatives in Cameroon (Mofor, 2020; Tchouakeu, 2019). Therefore, there is a need to investigate and understand the factors that may impede or enable the successful adoption of e-commerce within these agricultural cooperatives in Cameroon. By identifying and understanding these factors, potential barriers can be addressed, and appropriate strategies can be developed to promote successful e-commerce adoption among agricultural cooperatives, thereby improving their market reach, efficiency, and overall sustainability. This study aims to identify and understand the factors affecting e-commerce adoption among agricultural cooperatives in Cameroon and to provide recommendations for promoting adoption.

1.4 Research Objectives

1.4.1 General Objective

The main objective of the thesis on factors affecting the adoption of e-commerce among agricultural cooperatives in Cameroon is to identify and analyze the factors that influence the adoption of e-commerce in the agricultural sector, with a focus on agricultural cooperatives.

1.4.2 Specific Objectives

The specific objectives of the thesis are:

i. To examine the current state of e-commerce adoption among agricultural cooperatives in Cameroon.
ii. To identify and assess the technological, organizational, environmental, and socio-cultural factors that affect the adoption of e-commerce among agricultural cooperatives in Cameroon.
iii. To evaluate the perceived risks and benefits of e-commerce adoption among agricultural cooperatives in Cameroon.

1.5. Research questions

i. What is the current state of e-commerce adoption among agricultural cooperatives in Cameroon?
ii. What are the technological, organizational, environmental, and socio-cultural factors that influence the adoption of e-commerce among agricultural cooperatives in Cameroon?
iii. What are the perceived risks and benefits of e-commerce adoption among agricultural cooperatives in Cameroon?

1.6. Scope of the Study

The study will involve three (3) months of collecting and analyzing data from agricultural cooperatives in the Centre region starting in mid-November 2023, this was through appropriate research methods. It examined the technological, organizational, environmental, and socio-cultural factors that affect e-commerce adoption within these cooperatives. By focusing on the Centre region, the study provides a localized perspective on e-commerce adoption within agricultural cooperatives, taking into account this specific region's unique characteristics and dynamics. The findings and conclusions drawn from this study can be applicable to agricultural cooperatives in the Centre region of Cameroon. It is important to note that the study's scope is limited to the Centre region and may not capture the full diversity and complexity of factors affecting e-commerce adoption across all agricultural cooperatives in Cameroon. Therefore, the findings should be interpreted within the context of the Centre region and may not be fully generalizable to other regions or countries.

1.7. Significance of the study

By achieving these objectives, the thesis aims to provide insights into the challenges and opportunities of e-commerce adoption in the agricultural sector, particularly among agricultural cooperatives in Cameroon. The study holds significant importance for various stakeholders and contributes to the existing knowledge in several ways, Practical Implications: The study provides valuable insights into the factors influencing the adoption of e-commerce by agricultural cooperatives in the Centre region. The findings can inform policymakers, cooperative leaders, and other relevant stakeholders about the specific challenges and opportunities related to e-commerce adoption in the agricultural sector. This information can guide the development of targeted interventions, policies, and support mechanisms to promote the effective integration of e-commerce platforms in agricultural cooperatives. The present study can help cooperatives identify areas for improvement, such as technological infrastructure, organizational readiness, or socio-cultural factors, which can be addressed to optimize their adoption of e-commerce. This, in turn, can improve market access, increase efficiency, and open up new opportunities for agricultural

cooperatives to thrive in the digital economy. The findings and recommendations of the study can contribute to the development of policies and strategies that promote the adoption of e-commerce and support the growth and sustainability of the agricultural sector in Cameroon.

CHAPTER TWO: LITERATURE REVIEW

2.1 Introduction

This chapter sought to critically review the literature related to the constructs of the research. The chapter focused on a review of relevant theories to study themes, a review of empirical Studies, the gaps in the research, and the conceptual framework depicting the interaction between the study variables.

2.2 Theoretical Review

This section provides an overview of the theories adopted by the researcher. The section focused on the diffusion of innovations theory, developed by Everett Rogers, and the technology organization environment theory contemplated in 1990.

2.2.1 Diffusion of Innovations Theory

The Diffusion of Innovation (DOI) Theory as first discussed historically in 1903 by the French sociologist Gabriel Tarde and later popularized by Everett Rogers' current theory (June Kaminski, 2011), defining innovation diffusion as the process by which an innovation is communicated through certain channels over time among the members of a social system. A social system is defined as "a set of interrelated units that are engaged in a joint problem solving to accomplish a common goal.' It can be made up of individuals or groups such as the agricultural cooperative of Cameroon (Rogers, Diffusion of innovations. , 2010). The diffusion theory aims to explain why and how new technologies are adopted over a long period. According to Rogers' DOI theory, an organization's decision about innovation is not an immediate act but a process that occurs over time, consisting of a series of actions (Abdulhakeem, 2017). The adoption of this technology involves information gathering and analyzing the innovation's benefit compared to its associated cost (Feder G., 1985). Roger's advanced in 2010 that the newness of an idea is determined by the

individual's perception, his/her knowledge, persuasion, and decision to adopt it and not necessarily the fact that it has not existed or been used before. Based on this definition EC is considered innovation. Rogers (2010) postulates that relative advantage is how the new technology will create some prestige for the organization and add economic profitability to be competitive, as product-providing firms: agricultural cooperatives need to evaluate the return of investment of the EC in comparison to the existing method. Therefore, the rate of adoption of technologies differs based on the technology's characteristics. These characteristics are outlined as relative advantage, compatibility, complexity, triability, and observability (Rogers, Diffusion of innovations. , 2010).

Relative Advantage refers to the degree to which an innovation is seen as better than the idea, program, or product it replaces. Compatibility is how consistent the innovation is with the values, experiences, and needs of the potential adopters. Complexity corresponds to how difficult the innovation is to understand and/or use. Triability is the extent to which the innovation can be tested or experimented with before a commitment to adopt is made. And observability refers to the extent to which the innovation provides tangible results, the achievement made by the technology can be manifested through a reduction in resistance to change when it comes to system implementation. Whenever the system being implemented portrays signs of success, with positive results and a perfectly functioning system, there is a likelihood that adoption will succeed (LaMorte, 2022; Mutshewa, 2016). The chances of adapting to new technology all depend on the effort asserted in trying the technology; the lesser the investment, the easier it is to adopt. The users of the systems will ensure there is a successful implementation of this technology and observable results (Sahin, 2006)

The diffusion of innovation theory has been widely used in adoption studies. It has received praise for its robustness in explaining some concepts, especially relating to complex and networked information technology (IT) solutions such as EC. This study aims to examine the factors influencing the adoption of EC among agricultural cooperatives in Cameroon which will be of more relevance through the use of the DOI theory.

2.2.2 Technology Organization Environment Framework

This theory was developed by Tornatzky and Fleischer (1990) to explain the factors that affect a firm's decision to adopt innovation. The framework posits that technological innovation in organizations is influenced by three factors specifically playing a key role in determining the extent of technological adoption in firms (Abdulhakeem, 2017) specifically: the technological factors, organizational factors, and environmental (external to the organization) factors (Sila, 2013). The management of an organization's strategy execution process normally entails building and strengthening strategy-supporting resources and competitive capabilities. Ample resources must be allocated to the activities to facilitate the realization of the strategic objectives of the organization (Oliveira, Literature Review of Information Technology Adoption Models at Firm Level. , 2011). The technological factors consist of internal and external competencies relevant to the organization, including current practices and equipment owned by the organization and the composition of technologies that the organization can own but have not yet incorporated (Hage, 1980) . These factors play a significant role in the firm's adoption decision as it determines the ability of the firm to benefit from e-business initiatives (Cinnie Liu, 2019). In our study, the technological factors will refer to the ICT systems themselves and the ICT infrastructure available to facilitate EC adoption among agricultural cooperatives in Cameroon. n. Organizational factors refer to descriptive measures about the organization such as scope, size, organizational structure (communication process), financial support, managerial beliefs, and top management support (Cinnie Liu, 2019; Abdulhakeem, 2017). Environmental factors determining technological adoption include the industry, competitors, and government policies that influence how an organization will behave (Tornatzky, The Process of Technological Innovation. , 1990). In the study, the environmental factors will be addressed by studying the government factor that influenced the EC adoption by agricultural cooperatives. The Technology, Organization, and Environment (TOE) framework is a key analytical framework that can be adopted when attempting to explain factors contributing to the adoption and use of different types of innovation in technology. TOE has been used in studies related to e-commerce adoption in SMEs (Abdulhakeem, 2017). Rogers (2002) notes that this theory emphasizes both the internal and external characteristics of the organization as the main drivers for innovation within an institution. The Technology, Organization, and Environment framework, as formulated by Tornatzky and Fleischer (1990), was considered very important for the current study as it informs the main barriers to EC adoption by agricultural cooperatives in Cameroon grouped into technological

factors, organization factors, and environmental factors. Hence this framework was ideal in this study in anchoring the main barriers to EC adoption by agricultural cooperatives in Cameroon.

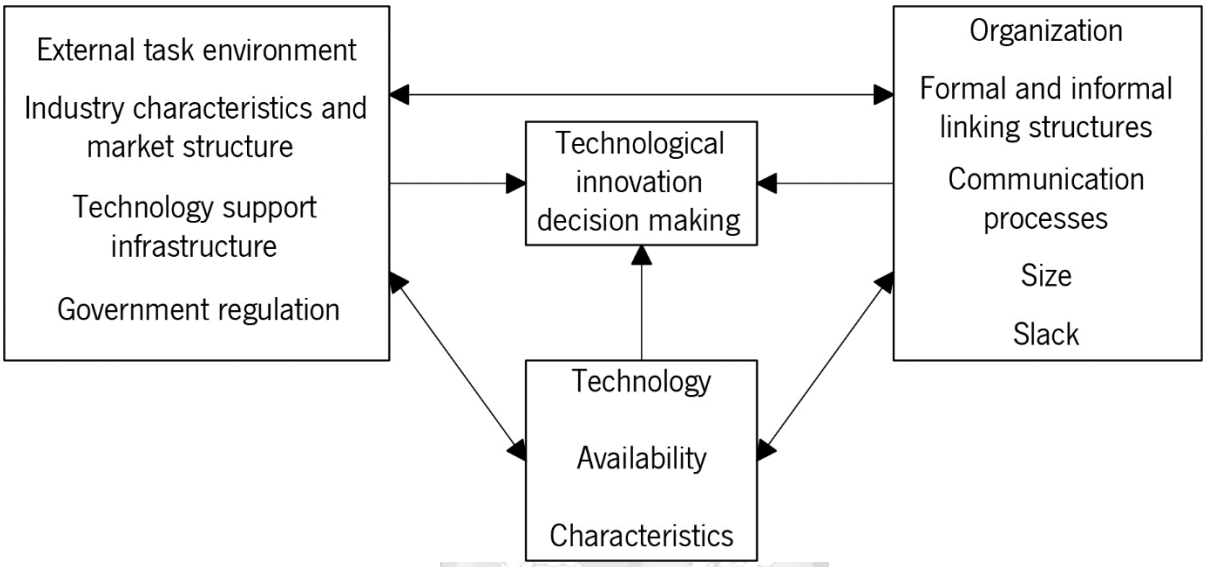


Figure 2.1: The TOE framework for technological innovation

Source: (Oliveira, 2010)

2.3 Empirical Review

This section is based on a systematic review of literature related to e-commerce adoption in agricultural cooperatives. Presenting first the state of e-commerce adoption, the effect of factors affecting the adoption, and the perceived risk and benefit by agricultural cooperatives. Secondly the research gap and finally the conceptual framework guiding our study.

2.3.1. E-Commerce Adoption among Agricultural Cooperatives

E-commerce adoption for agricultural cooperatives refers to the process by which these cooperatives incorporate electronic platforms and technologies into their business operations to

facilitate online buying, selling, and exchange of agricultural products and services. Li and Huang (2017)argue that understanding the current state of e-commerce adoption provides a foundation for identifying the specific challenges, barriers, and opportunities faced by agricultural cooperatives in adopting e-commerce. A literature review explores the current state of e-commerce adoption by agricultural cooperatives and found it limited, with factors such as a lack of technological infrastructure, limited resources, and concerns about security and trust acting as barriers (Zeng, 2018). A study by Mgonja, J. E., et al. (2019), in Tanzania, examines the current state of e-commerce adoption and highlights the low level of e-commerce adoption among smallholder farmers' cooperatives. A case study conducted by Oyeleke (2020) examines the current state of e-commerce adoption among agricultural cooperatives in Ogun State, Nigeria. The research reveals a low level of e-commerce adoption, primarily due to challenges such as inadequate internet infrastructure, limited knowledge and skills, and insufficient funding. These studies focus on the adoption of e-commerce by agricultural cooperatives, while our research focuses on the analysis of that adoption in the specific case of the Centre region of Cameroon.

2.3.2 Effect of Factors in the Adoption of EC.

2.3.2.1 Effect of technological factors

Technological factors encompass the availability and accessibility of digital infrastructure, internet connectivity, hardware, software, and technical support. The quality and reliability of technology infrastructure significantly impact the adoption of e-commerce by agricultural cooperatives (Bhattacherjee, 2000).In their study on E-commerce adoption among SMEs in Bangladesh (2023), Billal Hossain et al posited that technological factors are important to any organization, and their role is indispensable in business. And that electronic commerce is being widely adopted in Bangladesh during the time of covid pandemic 19 as a result of Information and communication adoption, Internet connectivity enhancement.

An exploratory study by Mbah et al. (2019) revealed that access to technology infrastructure and the availability of reliable internet connectivity significantly influence the adoption of e-

commerce. The findings emphasize the need for cooperative members to be familiar with e-commerce platforms and tools to effectively utilize technology for their business operations. Smith et al. (2018)explored the influence of technological factors on e-commerce adoption in agricultural cooperatives, and the findings indicate that the availability of technology infrastructure, such as computers and internet connectivity, positively affects the adoption of e-commerce. Their study also highlights the importance of technological capabilities and their role in facilitating efficient transactions and enhancing competitiveness in the market (Smith, 2018).

2.3.2.2 Effect of organizational factors.

According to Gouiaa et al. (2021), organizational factors relate to the internal characteristics of cooperatives, including their size, structure, resources, and management capabilities. The readiness of cooperatives to invest in e-commerce technology and the presence of competent human resources impact adoption. Zhang, Huang, and Yang (2017) investigated the organizational factors that influence e-commerce adoption in agricultural cooperatives and found that the size of the cooperative, the allocation of dedicated resources for e-commerce adoption, and the level of cooperation and collaboration among members and stakeholders significantly impact e-commerce adoption. Their study emphasizes the importance of organizational support and coordination in facilitating successful e-commerce adoption. A study revealed that the availability of resources, such as budget and personnel, dedicated to e-commerce adoption positively influences adoption rates in developing countries and also highlights the importance of effective communication and collaboration within the cooperative to overcome challenges and facilitate e-commerce adoption (Li X. W., 2019). A journal article employed a mixed-methods approach to understanding organizational factors affecting e-commerce adoption in agricultural cooperatives and the results showed that the presence of a supportive organizational culture, effective leadership, and the availability of training programs significantly influence e-commerce adoption (Chen, Understanding Organizational Factors for E-commerce Adoption in Agricultural Cooperatives: A Mixed-Methods Approach", 2020). Gouiaa (2021) found that the size and age of agricultural cooperatives were significant predictors of e-commerce adoption in Cameroon.

2.3.2.3. Effect of Environmental factors.

Environmental factors include economic, political, and regulatory conditions. Economic stability and supportive government policies play a crucial role in facilitating e-commerce adoption (Bolum, 2021). Moreover, the availability and affordability of financial services and logistics infrastructure also influence the adoption of e-commerce; a favorable environmental context significantly influences e-commerce adoption by agricultural cooperatives. A supportive ecosystem is key to successful e-commerce adoption (Johnson, 2019). Kim et al. (2022), examined the relationship between environmental factors and e-commerce adoption in agricultural cooperatives and identified the availability of technology infrastructure, access to financial services, and the presence of supportive government policies as key environmental factors that significantly impact e-commerce adoption. Their findings emphasize the need for a supportive environment that fosters technological advancements and provides necessary resources for successful e-commerce adoption. Infrastructure limitations, such as transportation and logistics, government policies, and regulations may hinder or facilitate e-commerce adoption by agricultural cooperatives (Mbah, 2021).

2.3.2.4. Effect of Socio-cultural factors

Socio-cultural factors, such as attitudes, beliefs, and values, also play a crucial role in e-commerce adoption by agricultural cooperatives (Mbatchou, 2021). Chen et al. (2018), identified various socio-cultural factors, including trust, perceived risk, cultural norms, and social influence. They found that trust plays a critical role in facilitating e-commerce adoption, while perceived risk may hinder adoption. Cultural norms and social influence also influence the willingness of individuals and organizations to adopt e-commerce. A study by Mbatchou et al. (2021) found that trust in online transactions and cultural preferences for face-to-face interactions were significant barriers to e-commerce adoption by agricultural cooperatives in Cameroon. Additionally, the level of education and digital literacy among members of agricultural cooperatives can affect their willingness and ability to adopt e-commerce. Ahmed et al. (2020), explored the sociocultural factors influencing e-commerce adoption in agricultural cooperatives in developing countries and

highlighted the influence of trust, perceived security, social norms, and social support on e-commerce adoption. They suggest that building trust among cooperative members and providing social support can enhance their willingness to adopt e-commerce. Findings reveal that trust and perceived usefulness positively influence adoption, while cultural values and social norms may act as barriers, emphasizing the need for tailored strategies that consider the socio-cultural context to promote e-commerce adoption (Liu, 2021). These studies posits that trust and security are crucial for the successful adoption of e-commerce and cultural attitudes toward technology can influence the adoption of e-commerce among agricultural cooperative.

2.3.3. Perceived risks and benefits of e-commerce adoption among agricultural cooperatives

Luo et al. (2012)defines perceived risks as the potential negative consequences and uncertainties that businesses associate with e-commerce adoption, and perceived benefits as the expected positive outcomes and advantages that businesses anticipate from e-commerce adoption. A study by Ma et al. (2019), investigates the perceived risks and benefits of e-commerce adoption among agricultural cooperatives in China, the research highlights risks such as security concerns, data privacy, and financial risks. It also identifies benefits such as increased market access, improved operational efficiency, and cost reduction. The findings emphasize the need to address perceived risks and promote awareness of the benefits to facilitate e-commerce adoption. Research highlights perceived risks such as trust, security, legal issue, system reliability, and lack of technical expertise and benefits such as improved market access, reduced transaction costs, and enhanced supply chain management by agricultural cooperatives in Turkey and the United States (Lai, 2018; Akkucuk, 2020). Ahmed et al. (2020), findings from their investigation on the perceived risks and benefits of e-commerce adoption in agricultural cooperatives in developing countries, emphasize the need to address perceived risks and communicate the benefits to encourage e-commerce adoption. Perceived risks and benefits of e-commerce can impact the decision making process of the agricultural cooperatives.

2.4. Research Gap

Several studies constituting the backbone of our study have examined the factors influencing e-commerce adoption in various contexts, some are shown in the table below along with their findings:

Table 2.1: researches and findings summary to illustrate the Gap

Author	Title	findings
(Mbah, 2019)	Exploring the Determinants of E-commerce Adoption in Developing Countries: Evidence from Agricultural Cooperatives	The study found that technological, environmental, and organizational contexts are key in the adoption of e-commerce in agricultural cooperatives in developing countries
Okello, (2020)	The Adoption of E-commerce in Developing Countries: Evidence from the Agricultural Sector	Found that there is a low rate of e-commerce adoption in the agricultural context in developing countries.
Nkendah, (2019)	E-commerce Adoption by Small and Medium-sized Enterprises in Developing Countries: Evidence from Cameroon	The study identifies factors such as limited internet connectivity, lack of ICT skills, and high initial investment costs as barriers to e-commerce adoption. It also highlights the importance of trust, security, and government support as facilitators of e-commerce adoption.

Yaya, (2019)	E-commerce Adoption in Cameroon: The Case of Online Retailing	The research identifies factors such as inadequate logistics and transportation infrastructure, limited consumer trust, and low digital literacy as barriers to e-commerce adoption
Tchankam(2014)	Exploring E-commerce Adoption in Cameroon: A Study of SMEs	The research reveals that factors such as lack of trust, limited ICT infrastructure, and perceived security risks are significant barriers to e-commerce adoption.

There is a noticeable research gap in understanding the specific factors affecting e-commerce adoption by agricultural cooperatives in Cameroon. Although some studies have explored e-commerce adoption in developing countries, including agricultural settings, there is a need for more focused research that specifically addresses the factors influencing e-commerce adoption within the unique socio-economic and cultural context of agricultural cooperatives in Cameroon.

2.5. Conceptual Framework

The Technology-Organization-Environment (TOE) framework is a comprehensive analytical tool widely utilized in studies examining the adoption of technological innovations within organizational contexts. This framework integrates various factors that influence technology adoption, including socio-cultural, technological, organizational, and environmental aspects. In the context of our study on the analysis of factors affecting e-commerce adoption in agricultural

cooperatives in Cameroon, the TOE framework provides a structured approach to understanding the complexities involved.

The socio-cultural dimension of the TOE framework emphasizes the significance of social and cultural factors in shaping attitudes, beliefs, and behaviors towards technology adoption. Within agricultural cooperatives in Cameroon, factors such as cultural norms, values, and generational differences may influence the willingness of members to embrace e-commerce practices. Understanding these socio-cultural dynamics is crucial for developing targeted strategies to promote e-commerce adoption. The technological dimension focuses on the technological readiness and infrastructure available to agricultural cooperatives. This includes factors such as access to digital devices, internet connectivity, and technical expertise. Assessing the technological capabilities of cooperatives enables researchers to identify barriers and opportunities for integrating e-commerce into their operations effectively. The organizational dimension examines the internal structures, processes, and capabilities of agricultural cooperatives. Factors such as leadership styles, decision-making processes, and organizational culture play a pivotal role in determining the receptiveness to technological innovations like e-commerce. Analyzing these organizational factors helps in designing interventions that align with the cooperative's goals and values. Lastly, the environmental dimension encompasses external factors such as regulatory policies, market dynamics, and competitive forces. In the context of e-commerce adoption in agricultural cooperatives, environmental factors may include government regulations related to online transactions, market demand for digital services, and the prevalence of cyber threats. Understanding the external environment helps in identifying opportunities for collaboration, advocacy, and risk mitigation. By employing the TOE framework, our study aims to provide a holistic understanding of the factors influencing e-commerce adoption in agricultural cooperatives in Cameroon. By examining socio-cultural, technological, organizational, and environmental factors, we seek to identify actionable insights and recommendations to support the successful integration of e-commerce practices in this context

Independent variables

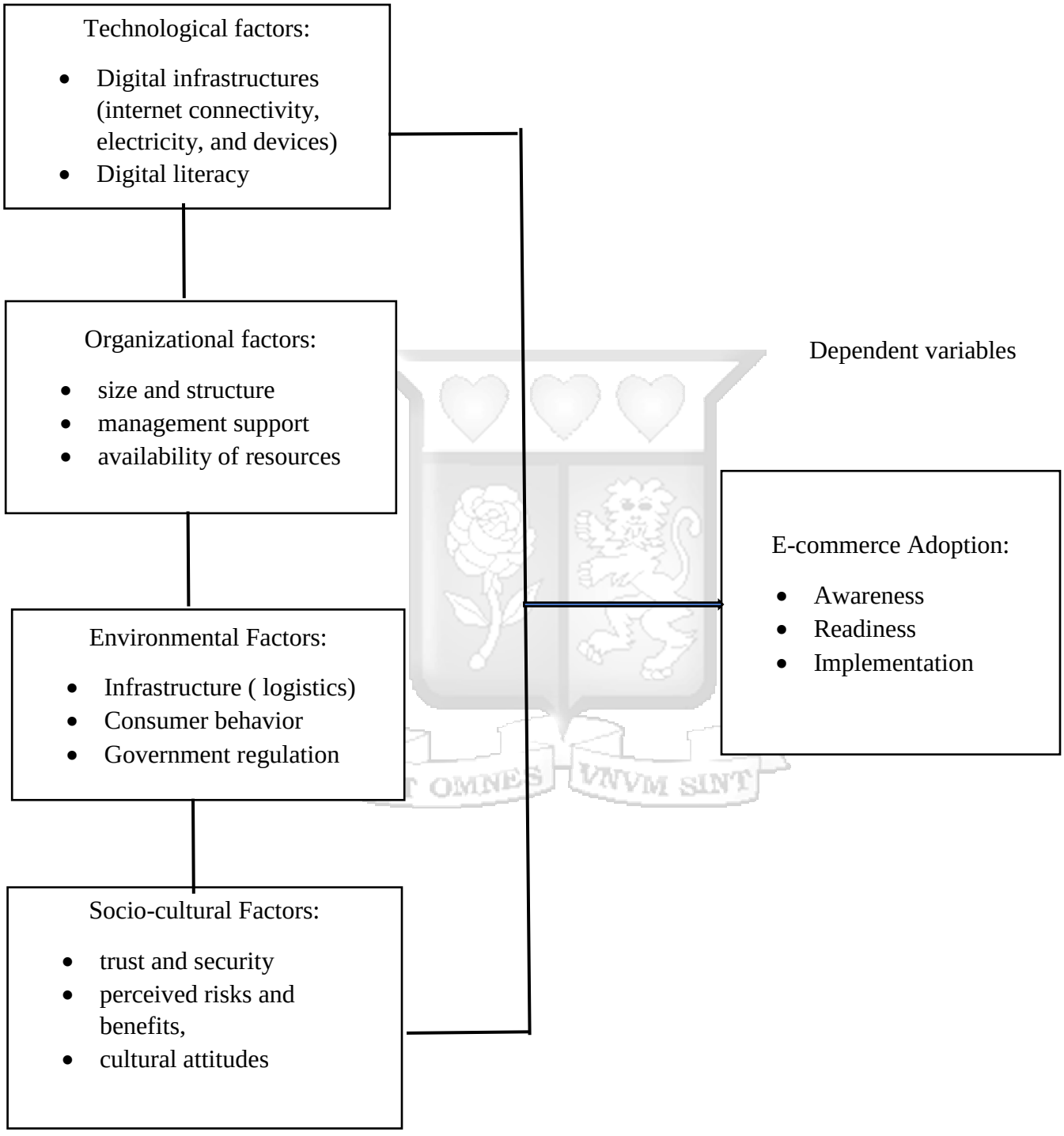


Figure 2.2: conceptual framework

Source: Researcher

2.5.1 Operationalization of the Variables

According to Baddie (2016), operationalization of variables in research refers to the process of defining and measuring variables in a way that they can be observed, measured, and analyzed. It involves transforming abstract concepts or constructs into concrete, measurable indicators or variables. For the present study, the following operationalization system has been supported by many researchers such as Chong et al. (2014), Mukasa and Katongole (2014) and Vanessa Kimana (2020):

Dependent Variable:

E-commerce Adoption: the extent to which agricultural cooperatives in the Centre region of Cameroon have adopted e-commerce practices.

Measurement: A Likert scale ranging from 1 (No adoption) to 5 (Full adoption) based on the level of e-commerce integration in cooperative activities, including online marketing, purchasing, and payment systems.

Independent Variables:

Technological Factors:

Will be measure considering; the presence of computers, electricity, and internet access in agricultural cooperatives (Yes/No). The level of technological skills and digital literacy among cooperative members (Likert scale). The perceived importance of technological factors (Likert scale).

Organizational Factors:

This consist of the internal organizational characteristics and support for e-commerce adoption within agricultural cooperatives and will be measured considering; the organizational structure hindering or facilitating the e-commerce adoption (Yes/No). The leadership support for e-commerce adoption (Likert scale). The existence of a clear strategy or plan for integrating e-commerce into cooperative operations (Yes/No).

External Environmental Factors:

These factors refer to the external factors in the environment that may influence e-commerce adoption in agricultural cooperatives and will be looked at through the presence of logistic infrastructure to facilitate e-commerce adoption (Yes/No). The perceived demand for agricultural products/services through e-commerce in the market (Likert scale). The government policies or regulations hindering or facilitating e-commerce adoption in the agricultural sector (Yes/No).

Socio-cultural Factors:

The socio-cultural influences that may affect the adoption of e-commerce practices in agricultural cooperatives.

Measurement:

Perception of trust and security in online transactions (Likert scale).

Perceived risk and benefit of e-commerce (Likert scale)

Attitudes towards the use of technology in business and cooperative settings (Likert scale).

CHAPTER THREE: RESEARCH METHODOLOGY

3.1 Introduction

This chapter provides a clear and detailed description of the methods and procedures used to conduct the research. This chapter aims to address the research philosophy, design, research population and sampling, data collection and analysis procedure, and research quality.

3.2 Research Philosophy

Kothari (2017) explains that the research philosophy refers to the underlying beliefs and principles guiding the collection, analysis, and utilization of data related to a particular phenomenon. The author further suggests that there are four primary research philosophies: positivism, pragmatism, realism, and interpretivism having a distinct approach and perspective. With regards to that, the study relies on a pragmatism philosophy. According to Tashakkori (2003) , pragmatism is a research philosophy that emphasizes practicality, flexibility, and the use of multiple research methods to answer research questions. It recognizes the importance of both qualitative and quantitative approaches and focuses on obtaining useful and actionable knowledge. In the context of studying e-commerce adoption by agricultural cooperatives, pragmatism allows the study to combine quantitative data on adoption rates and patterns with qualitative insights into the underlying factors and dynamics at play. It values the practical implications of research findings and emphasizes the importance of addressing real-world challenges (David L. Morgan, 2014). By adopting a pragmatic research philosophy, the study aims to generate comprehensive and meaningful insights that can inform policy-making, interventions, and strategies to promote e-commerce adoption by agricultural cooperatives in the Centre Region of Cameroon.

3.3 Research Design

Paul Vogt et al. (2012) posited, research design is the master category, referring to the basic method of collecting evidence. The choice of research design depends on the nature of the research objectives, the research questions being addressed (Leedy, 2019).The aim of this study is to identify and analyze the factors that influence the adoption of e-commerce in agricultural

cooperatives. Align with this, the convergent parallel method appears to be appropriate. It involves conducting both quantitative and qualitative data collection and analysis concurrently, and then merging or comparing the findings to gain a comprehensive understanding of the research topic (Creswell J. W., 2017). In this method, according to Creswell et al. (2018), the quantitative data collection can involve surveys or questionnaires administered to participants to gather numerical data on the level of e-commerce adoption and various factors influencing it. Simultaneously, the qualitative data collection can involve interviews, focus groups, or observations t to gather in-depth insights into the experiences, perceptions, and motivations of participants. The convergent parallel method enabled the researcher to gather diverse perspectives, validate findings across different methods, and provide a more comprehensive analysis of the factors influencing e-commerce adoption among agricultural cooperatives in the Centre region of Cameroon.

3.4 Population and Sampling

3.4.1. Target population

The target population of the study refers to the entire group of individuals or entities that are the focus of investigation (Jha, 2014). It encompasses a collection of items, events, households, people, elements, or services that are studied to draw conclusions or generalizations (Kombo D. K., 2014). In this particular study, the target population consisted of agricultural cooperatives located in the Centre region of Cameroon. As stated by the Ministry of Agriculture and Rural Development (MINADER) (2011), there are a total of 894 registered agricultural cooperatives in the Centre region, and these cooperatives formed the population for this study.

3.4.2 Sample Design and Size

According to Shona McCombes (2023), the sample is the group of individuals who will actually participate in the research. She elaborated by saying, to draw valid conclusions from your results, you have to carefully decide how you will select a sample that is representative of the group as a whole. This is called sample design or sampling method. In the present study, considering that

researcher want to include cooperatives from all 10 the departments in the Centre region of Cameroon to the analysis of factors affecting e-commerce adoption among agricultural cooperatives, and does not have information about the distribution of cooperatives across the departments, the suitable sampling method appear to be the stratified random sampling. This approach will allow the study to ensure representation from each department while maintaining the benefits of random sampling (Cochran, 1977; Kothari, 2004). For this study, the sampling was performed as follow:

First the determination of the desired sample size. Secondly we will divide disproportionately the population of 894 cooperatives into 10 strata, one for each department in the Centre region.

Determination the sample size for each stratum using the formula: Sample Size (per stratum) (Ss) = (Number of cooperatives in the stratum / Total number of cooperatives) x Desired sample size (Cochran, 1977). Finally a random selection of cooperatives from each stratum to reach the calculated sample size for each department. You can use a random number generator or a systematic sampling approach within each stratum.

3.4.2.1 Sample size

The sample size refers to the number of individuals, units, or observations selected from a population to be included in a research study or survey. It is a critical aspect of research design as it directly influences the reliability and generalizability of the study findings (Krejcie, 1970; Cochran, 1977).

- For the present study, the sample size was be ddetermined using the formula from Yamane (1967):

n = (N * Z^2 * p * q) / [(N-1) * E^2 + Z^2 * p * q]

Where:

n: Sample size

N: Total population size

Z: Z-score corresponding to the desired confidence level

p: Estimated population proportion

q: Complement of p (1 - p)

E: Margin of error

Using the finite population formula, the sample size (n) for the study of a population of 894, considering a z-score of 1.96, an error margin of 5% (0.05), and a population proportion of 50% (0.5) was calculated as follows:

n = (N * Z^2 * p * q) / [(N-1) * E^2 + Z^2 * p * q]

n = (894 * 1.96^2 * 0.5 * 0.5) / [(894-1) * 0.05^2 + 1.96^2 * 0.5 * 0.5]

n = (894 * 3.8416 * 0.25) / [893 * 0.0025 + 3.8416 * 0.25]

n = 868.3488 / [2.2325 + 0.9604]

n = 868.3488 / 3.1929

n ≈ 272

The sample size for the present study was 115 cooperatives of the Centre region.

For a disproportionate distribution, the study will consider 89 cooperatives per Stratum

he sample size per stratum according to the above formula will be :

Ss = (89/894) * 115

Ss ≈ 11.44

The sample for the study was 11 cooperatives per department in the Centre region of Cameroon.

3.5 Data Collection Methods

A data collection method refers to the specific approach or technique used to gather data or information for research or study purposes (Creswell J. W., 2014). It involves systematically

collecting, organizing, and documenting data in a structured manner to address research objectives or answer research questions (Creswell J. W., 2014; Babbie, 2016). There are various data collection methods available, including but not limited to interviews, surveys, observations, experiments, focus groups, and document analysis (Neuman, 2016; Babbie, 2016). For this research study, semi-structured to administer to participant was adopted. Semi-structured questionnaires offer a balance between flexibility and structure (Bernard, 2017). They enable researchers to delve deeper into the research topic by including open-ended questions. These questions allow participants to provide detailed explanations, insights, and personal experiences (Creswell J. W., 2017) related to the factors influencing e-commerce adoption. The study aims to gain a deeper understanding of the participants' perspectives and uncover nuanced factors that may not be captured by another method alone as posited by Bernard and Creswell (2017; 2017) in their books as an advantage of Semi-structured questionnaires. Participants were members of agricultural cooperatives randomly selected who were be given a face-to-face semi-structured questionnaire, to ensure the reliability of the response and to save time. The study also received a research permit from the MINADER before conducting data collection. This study ensured that all the research participants were notified of their rights to participate in this research.

3.6 Data Analysis

Data analysis in research refers to the process of examining and interpreting collected data to derive meaningful insights, draw conclusions, and make inferences. It involves transforming raw data into organized and structured information that can be used to address research objectives or test hypotheses (Creswell J. W., 2017). In our research, data analysis played a crucial role in uncovering insights and patterns related to factors affecting e-commerce adoption in agricultural cooperatives in Cameroon. We employed a multi-faceted approach encompassing both quantitative and qualitative methods to ensure a comprehensive exploration of the research objectives. Here's a detailed explanation of the data analysis methods utilized:

Quantitative Analysis; likert Scale Analysis: Responses to likert scale questions were analyzed using Microsoft Excel. Descriptive statistics such as mean and frequency distributions were computed to summarize the data and understand the central tendencies and variability of responses.

Yes/No Responses: A similar Excel-based descriptive analysis was applied to Yes/No responses, enabling us to quantify the prevalence of specific attitudes or behaviors among respondents. A Relationship Analysis was conducted, and advanced statistical techniques were employed using R programming to explore relationships between variables. Scatter plots were utilized to visualize the relationships between different variables, while regression analysis was conducted to assess the significance and nature of these relationships. Additionally, an analysis of variance (ANOVA) was performed to examine potential variations among groups and identify any significant differences.

Qualitative Analysis:

Thematic Analysis: For qualitative data analysis, we adopted a thematic analysis approach. Responses from open-ended questions were transcribed, coded, and organized into themes based on recurring patterns and conceptual categories related to factors influencing e-commerce adoption. This process involved systematically identifying, analyzing, and interpreting themes to gain a deeper understanding of the qualitative data.

Integration of Findings; following the individual analyses of quantitative and qualitative data, findings from both approaches were integrated to provide a comprehensive understanding of the factors influencing e-commerce adoption in agricultural cooperatives. This integration allowed for triangulation of results, enhancing the validity and reliability of our findings.

Overall, our data analysis methodology was designed to facilitate a rigorous and systematic examination of the research questions, enabling us to derive meaningful insights, draw conclusions, and make informed recommendations for policymakers, stakeholders, and practitioners in the field of agricultural cooperatives and e-commerce adoption.

3.7 Research Quality

Methodological Rigor: This refers to the research design, sampling methods, data collection procedures, and data analysis techniques that should be well-planned and appropriate for the research objectives. The study should demonstrate a strong theoretical framework and adhere to established research standards. (Bryman, 2019).

To ensure the quality and validity of our research, we conducted a pilot data collection phase involving seven agricultural cooperatives in Centre Cameroon. During this phase, semi-structured questionnaires were administered to gather preliminary insights into the factors influencing e-commerce adoption within the target population. The pilot phase allowed us to refine the questionnaire design, identify any ambiguities or inconsistencies, and assess the feasibility of data collection procedures. Furthermore, to enhance the robustness of our study, we employed a mixed-method approach, specifically a convergent parallel design. This approach enabled us to gather both quantitative and qualitative data concurrently, providing a more comprehensive understanding of the research topic. By triangulating data from multiple sources, we could cross-validate findings and gain deeper insights into the complex dynamics of e-commerce adoption in agricultural cooperatives. Moreover, the selection of a stratified random sampling method was instrumental in ensuring the representativeness of our sample. By stratifying the population of agricultural cooperatives in Centre Cameroon based on relevant criteria such as size, age, and geographical location, we aimed to capture the diversity of cooperatives and minimize sampling bias. This approach enabled us to draw statistically sound conclusions and generalize findings to the broader population with greater confidence

Validity: it ensures that the study measures what it intends to measure and that the conclusions drawn from the data are valid (Creswell J. W., 2014). The use of a semi-structured questionnaire enables capturing both quantitative and qualitative data, allowing for in-depth exploration of factors affecting e-commerce adoption. Validity was ensured by employing established measurement scales and techniques, such as Likert scales for quantitative data and thematic analysis for qualitative data.

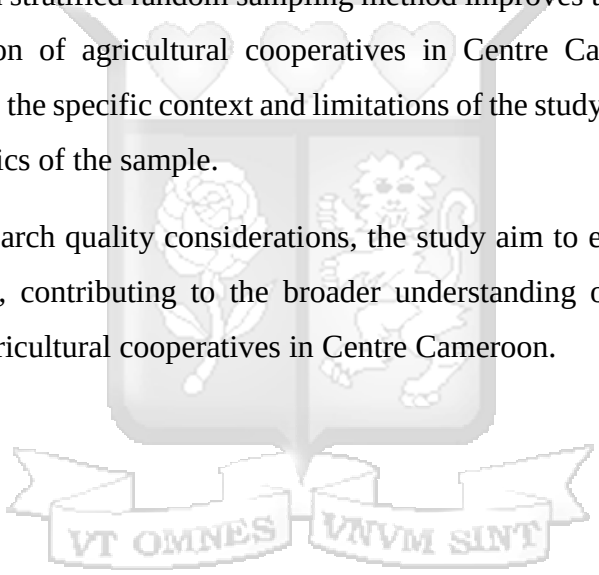
Reliability: Reliability data is an indication of how the data being used is free from any errors and able to provide consistency (Kirk, 2015). To ensure reliability, the research study used a face –to-face questionnaire for data collection procedures and maintain consistency in the application of the chosen methods. This includes training interviewers for data collection and ensuring inter-rater reliability in coding qualitative data. The use of descriptive analysis allows for the examination of the characteristics and patterns of the collected data. ANOVA analysis can help identify significant differences between groups or factors affecting e-commerce adoption. Thematic analysis is

appropriate for exploring qualitative data to identify themes and patterns related to the factors affecting e-commerce adoption.

Credibility: In accord with Creswell (2014) , transparency in reporting the research process, including the description of the sampling procedure, data collection methods, and analysis techniques, ensured the credibility of this study. Furthermore, ensuring participant anonymity and confidentiality contributes to the trustworthiness of the research.

Generalizability: It refers to the extent to which the findings of a study can be applied or generalized to a larger population or other settings. It depends on the representativeness and diversity of the sample and the compatibility of the research context with the target population (Polit, 2017). The use of a stratified random sampling method improves the generalizability of the findings to the population of agricultural cooperatives in Centre Cameroon. However, it is important to acknowledge the specific context and limitations of the study in terms of geographical coverage and characteristics of the sample.

By adhering to these research quality considerations, the study aim to ensure the credibility and reliability of its findings, contributing to the broader understanding of factors influencing e-commerce adoption in agricultural cooperatives in Centre Cameroon.



CHAPTER 4: PRESENTATION OF THE RESEARCH FINDINGS

4.1 INTRODUCTION

The fourth chapter of this research serves as a critical juncture in our exploration of the intricate landscape surrounding the adoption of e-commerce within agricultural cooperatives in the central region of Cameroon. With the backdrop of increasing global digitalization, this chapter unveils the empirical results obtained from an in-depth analysis of various factors influencing e-commerce adoption. The focal point of our investigation is the multifaceted interplay of technological, organizational, environmental, and sociocultural elements, which collectively shape the readiness and receptivity of agricultural cooperatives to engage with e-commerce platforms.

4.2. E-commerce status of adoption in the Centre region

The objective here was to assess the extent of e-commerce adoption within the cooperative, specifically in online marketing, purchasing, and payment systems. The Participants use a Likert scale to express their awareness and involvement in e-commerce activities within their cooperative. The figures 4.1 and 4.2 , represent the state of e-commerce adoption in agricultural cooperatives, with 1 and 100% representing a full adoption.

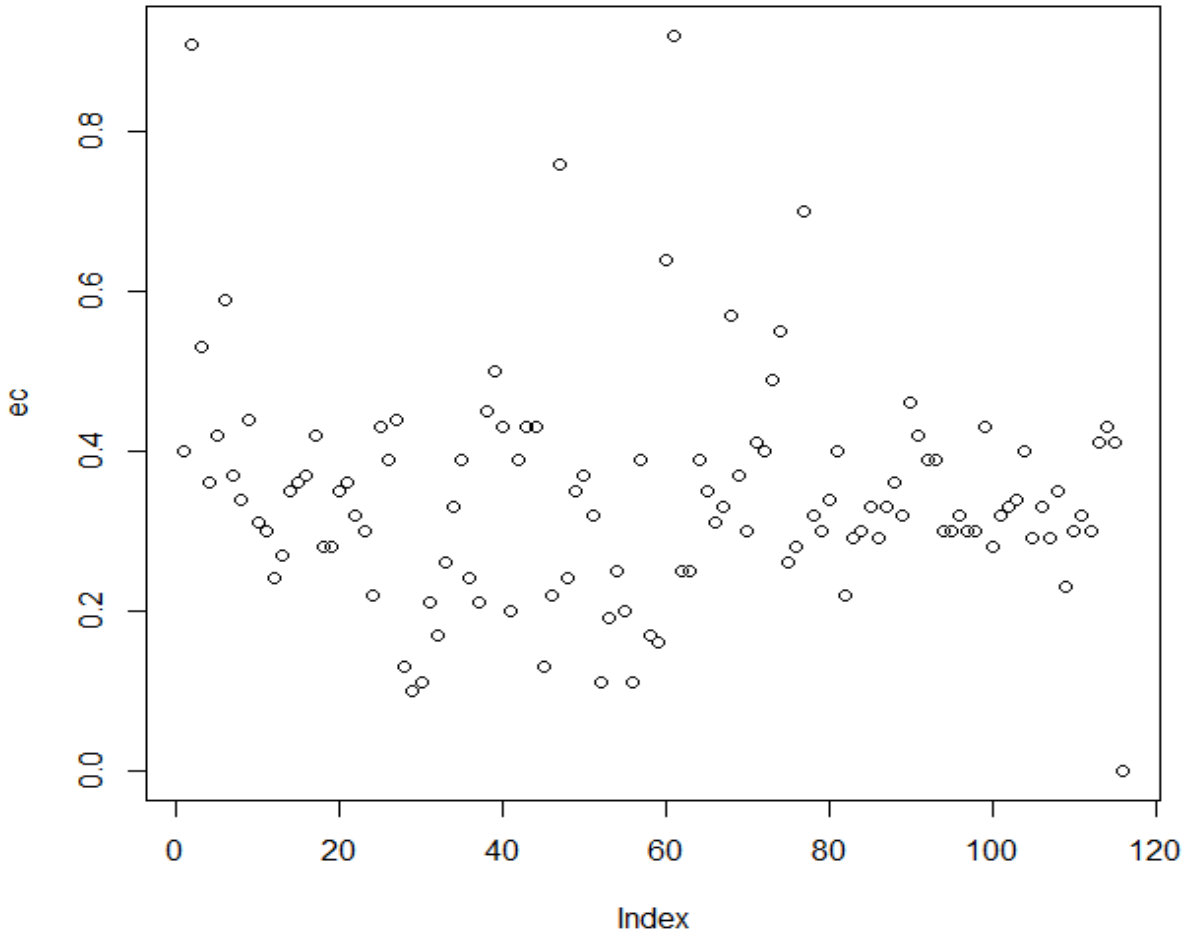


Figure 4.1: e-commerce adoption in Centre region of Cameroon scatter plot

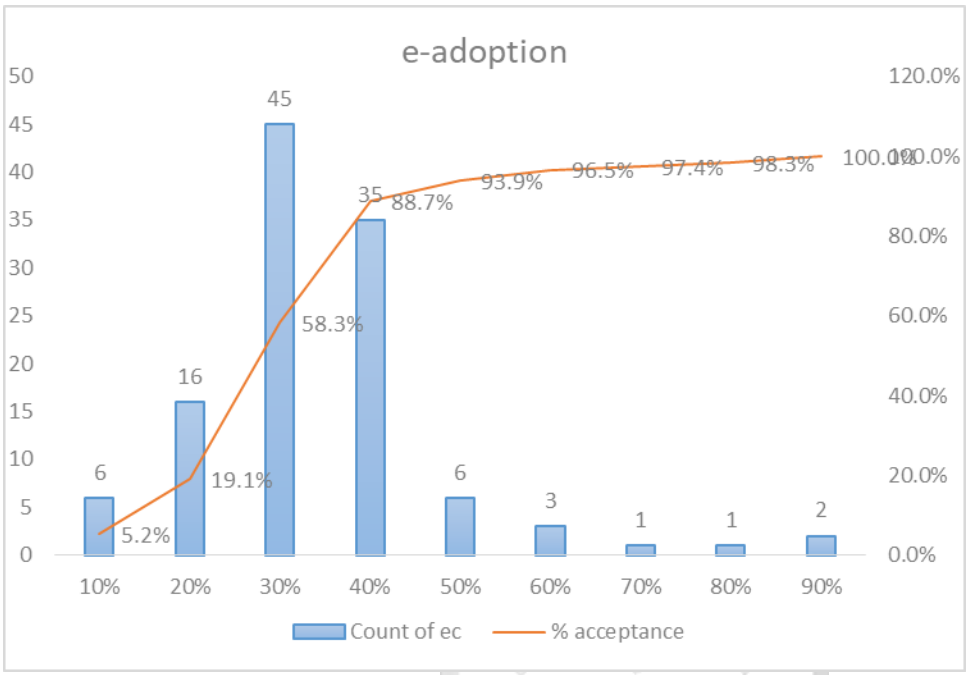


Figure 4.2. E-commerce State of adoption in agricultural cooperatives in centre region of Cameroon

The findings revealed that a significant 88% of agricultural cooperatives demonstrated a lack of interest in integrating their operations with e-commerce. Merely 2% have actively embraced e-commerce, while 10% are still somewhat indifferent to incorporating it into their activities. This phenomenon may be attributed to the age of agricultural cooperatives in the region, with a majority exceeding 10 years. The boards of these cooperatives are often dominated by older generations, impeding the acceptance of new technologies.

Furthermore, the geographical location of cooperative headquarters in areas with limited energy supply and low or no network coverage poses a challenge. This hindrance makes it difficult to generate the necessary awareness and interest required to involve these cooperatives in the e-commerce landscape. Additionally, the absence of regulatory bodies to oversee and facilitate the integration and utilization of e-transactions serves as a setback. The spread of rumors regarding the insecurity and fraudulent nature of e-transactions within the participant communities (both buyers and sellers) acts as a formidable barrier against the widespread adoption of e-commerce

4.3 Factors assessment

4.3.1 Technological factors and e-commerce adoption in agricultural cooperatives

The point here was for the study to determine the presence of technological resources (computers, internet access, and electricity). Assess the level of technological skills and digital literacy among cooperative members. And understand the importance of technological factors in e-commerce adoption. The Participants provide information on the technological infrastructure and skills within their cooperative. The figure 4.3, represent the level of technological resources for e-commerce adoption in agricultural cooperatives, with 100% representing a full presence.

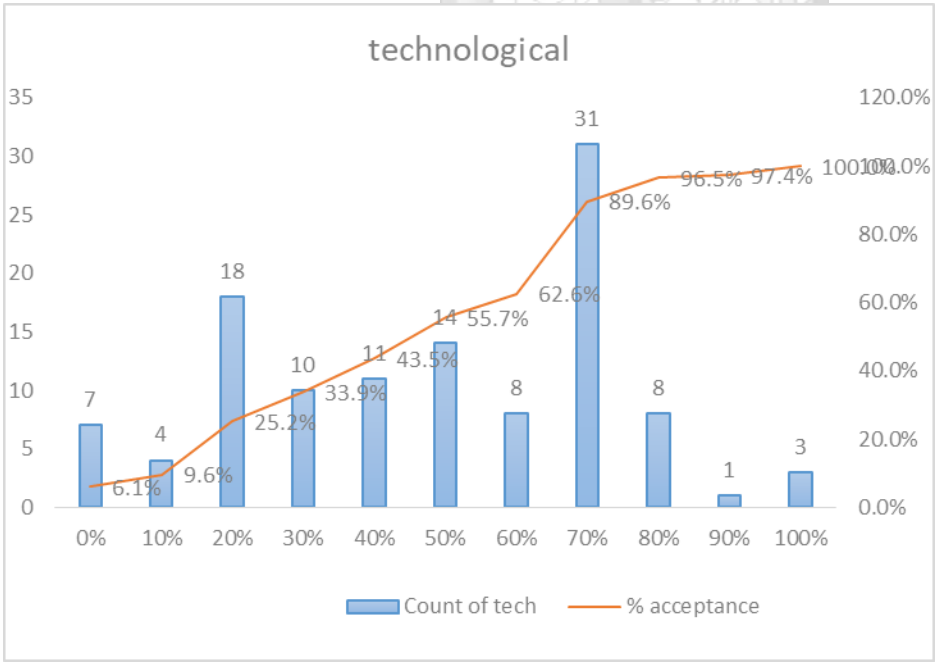


Figure 4.3: Technological Landscape in Agricultural Cooperatives

The backbone of e-commerce lies in the presence of technology. For successful adoption, the widespread accessibility of technology becomes crucial. In this context, approximately 60% of cooperatives possess devices such as desktops, Androids, or other means to connect to the internet essential for active participation in the e-commerce realm. However, it's noteworthy that these powerful devices are often underutilized for this purpose.

From the insights gathered in the current survey, a striking revelation is that less than 50%, specifically around 44% of respondents, lack the essential materials and skills required to embrace and incorporate e-commerce into their activities. On the flip side, over 50% of respondents affirm having some of the vital materials and/or skills necessary for integrating e-commerce into their respective areas of expertise. This positive shift may be attributed to government policies facilitating the import of electronic devices, making them more affordable, and the proliferation of ICT institutions throughout the territory, enhancing accessibility to the requisite skills.

4.3.2 . Organizational factors and e-commerce adoption in agricultural cooperative

The research aimed to evaluate the impact of communication models and cooperative culture on e-commerce adoption. Assess leadership support and the presence of a clear strategy for e-commerce integration. And Understand decision-making processes regarding technology adoption. Participants rate organizational factors influencing e-commerce adoption within their cooperative. Figure 4.4, represents the state of the organizational environment for e-commerce inclusion in agricultural cooperatives, with 100% representing an ideal environment.

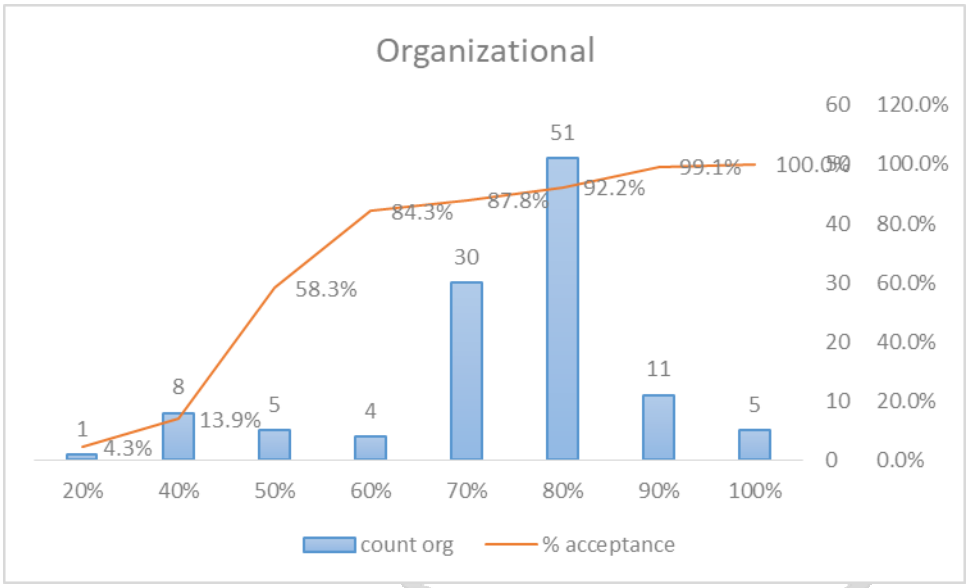


Figure 4.4: Organizational Dynamics and E-commerce Adoption

The findings indicate that over 85% of agricultural cooperatives in the central region of Cameroon lack organization and management conducive to adopting or supporting e-commerce in their operations. Approximately 12% make minimal efforts to incorporate technology into their activities, and less than 1% of cooperatives in the entire area have established organizational links with e-commerce. Structurally, a majority (around 80%) of these cooperatives have headquarters in rural areas with limited or no access to power supply (electricity and network coverage).

These cooperatives typically maintain activity records on paper, which is not conducive to the adoption of technology, particularly e-commerce. Notably, cooperatives that are over 15 years old exhibit the most resistance, despite the presence of a few younger members. Introducing new ideas related to e-commerce adoption becomes challenging, as they often face rejection from the established structure governed by older staff members.

4.3.3. Environmental factors and e-commerce adoption

At this point the research objective is to examine access to transport infrastructures facilitating e-commerce adoption. Explore perceptions of market demand and legal/regulatory requirements.

And identify external resources or partnerships affecting technology adoption. Participants were asked to provide insights into external factors influencing e-commerce adoption in their cooperative. The figure 4.5, represent the state of environmental conductivity for e-commerce adoption in agricultural cooperatives, with 100% representing a full conductivity.

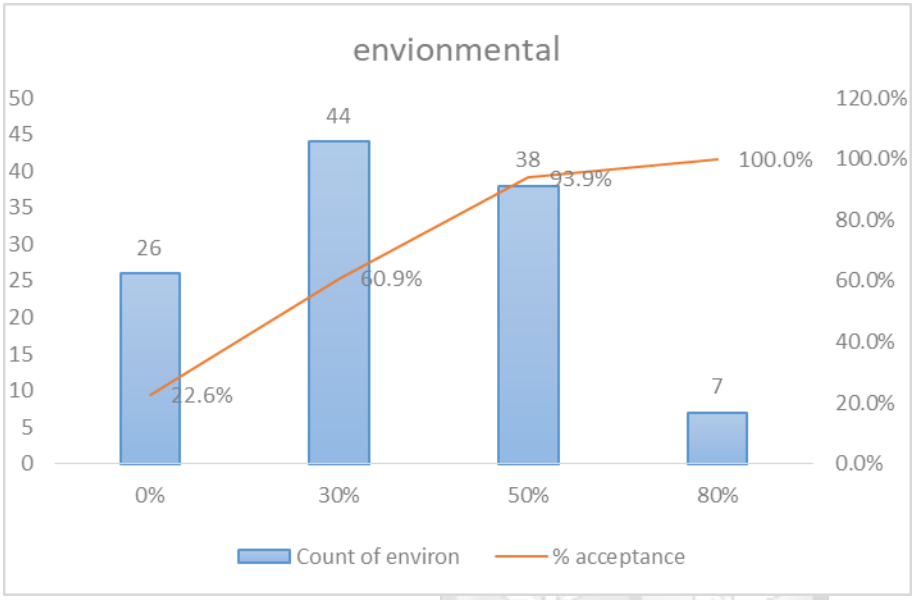


Figure 4.5: External Environnemental Influences on E-commerce Adoption

Based on the findings of this study, approximately 90% of agricultural cooperatives express reservations about the current environmental conditions, deeming them unfavorable for integrating e-commerce into their operations. Their reluctance stems from concerns about fraud, impersonation, and scams associated with e-transactions. Consequently, these cooperatives prefer traditional or physical transactions, citing a lack of trust in the security of electronic transactions.

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4.3.4. Socio-cultural factors and e-commerce adoption in agricultural cooperatives

The study in this section aimed to assess the socio-cultural impact on communication and collaboration in technology implementation and evaluate trust, perceptions of risks and benefits, and attitudes toward technology. 115 agricultural cooperatives participants were to express their

socio-cultural perspectives and attitudes toward e-commerce adoption. Figure 4.6, represents the state of cultural and sociological acceptance of e-commerce in agricultural cooperatives, with 100% (blue) representing a full adoption and % orange the accurate degree of acceptance or non-acceptance of e-commerce.

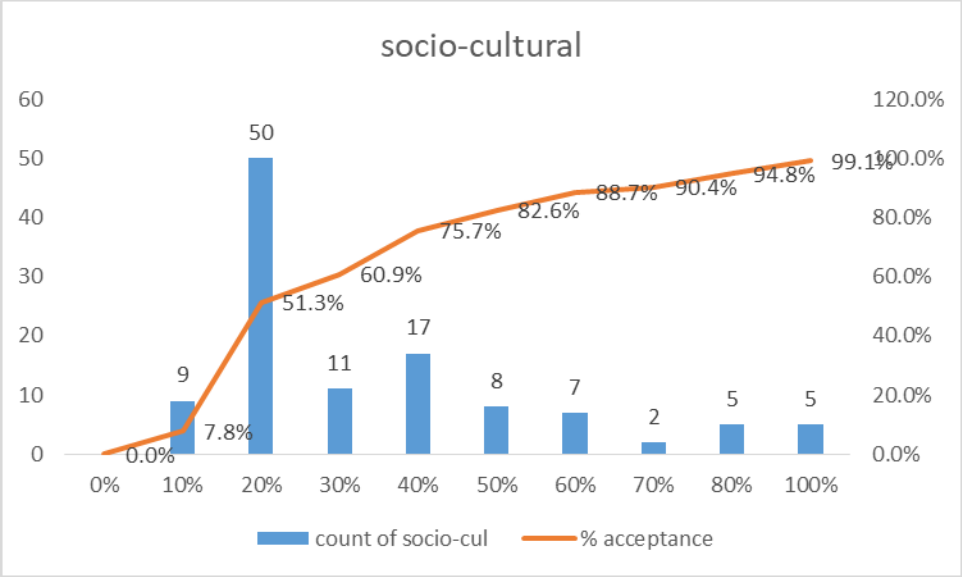

Figure 4.6: Socio-cultural Factors Shaping E-commerce Adoption

According to the study results, it appears that about 75% of agricultural cooperatives are culturally hesitant to fully or occasionally embrace e-commerce in their operations. Conversely, 25% express an interest in exploring e-commerce for their business. Culturally, the majority of agricultural cooperatives operating for over 10 years are led by older individuals who may not fully comprehend the potential demand from buyers on e-platforms. This lack of awareness creates rigidity in their attempts to offer e-services. However, this pattern doesn't hold for newer cooperatives with less than 5 years of existence, as they actively engage in e-commerce. This trend could be attributed to the presence of young and dynamic staff members in these newer cooperatives.

4.3.5. Relationship of the factors with the adoption of e-commerce

The table 4.1, shows the relationship of e-commerce adoption and the different factors done using R programming, based on the above model, where the dependent variable is e-commerce adoption and the independent variables are technological, organizational, environmental and sociocultural factors. The results are described in the table 4.1.

Table 4.1: regression analysis showing the relationship of the different variables

	Estimate	Std.	Error	t value	Pr(>|t|)
(Intercept)	0.05794	0.01218	4.757	5.94E-06	***
tech	0.22884	0.0242	9.457	6.39E-16	***
org	0.22708	0.03897	5.827	5.61E-08	***
environ	0.12789	0.02823	4.531	1.49E-05	***
socio	0.23426	0.02586	9.057	5.27E-15	***

From those results, we observed dependent variable is explained about 85% by the independent variables as stated by R-squared. In addition, all the independent variables are significant at 99% confidence interval. Based on the result the socio-cultural variable is the most impactful with a coefficient of 0.23, expressing the willing -fullness of more and more cooperatives to link e-commerce to their activities and this is more possible through the existence of technologies that multiplies platforms for them to perform in the various departments of their activities express through the technological impact of 0.2. Youth appeared to be more pro-ecommerce, thus cooperatives tend be organized in such a way that youngsters are the ones to occupy those technological oriented positions this justify the organizational impact which is 0.2. However, the

environmental variable appeared to be less impactful to the adoption of e-commerce with a coefficient of 0.12 despite being of great significance.

4.4. Perceived Risks and Benefits of E-commerce Adoption among Agricultural Cooperatives in Cameroon:

The figure 4.7, represent the state of cultural and sociological acceptance of e-commerce in agricultural cooperatives, with 100% representing a full adoption. Alone and in contrast with the age of the cooperative.

Ages	Count age
1	1
2	4
3	2
4	5
5	8
6	3
7	3
8	7
9	4
10	10
11	4
12	13
13	1
14	18
15	6
16	1
17	4
18	2
19	2
20	2
21	3
22	9
23	2
26	1
Grand Total	115

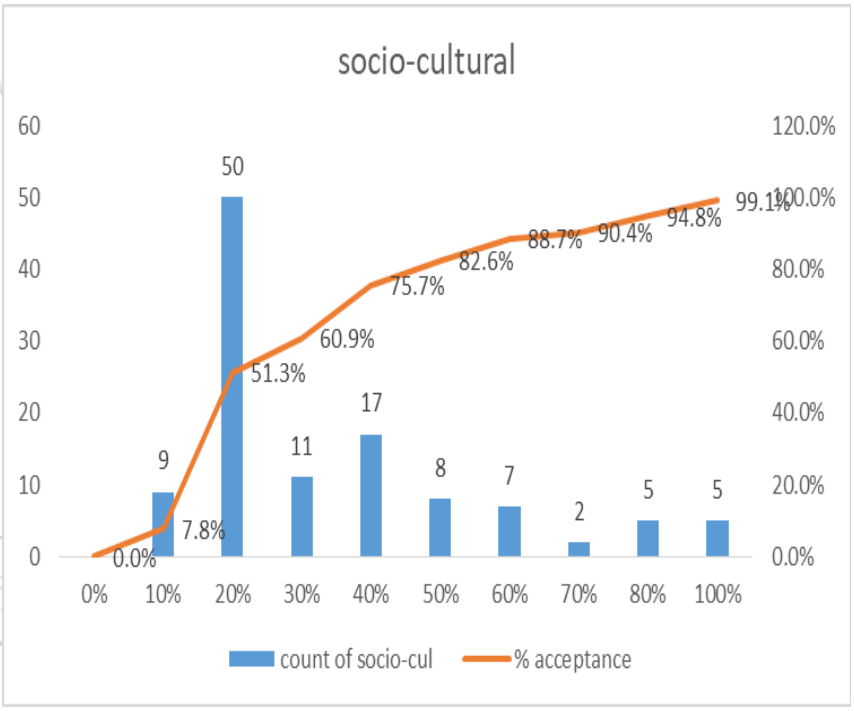

Figure 4.7: Ages and Sociocultural influence in E-commerce adoption

The findings shed light on the intriguing dynamics surrounding the perceived risks and benefits of e-commerce adoption among agricultural cooperatives in Cameroon. The cultural hesitancy observed in 75% of cooperatives suggests a prevalent resistance to fully or occasionally integrating e-commerce into their activities. This resistance is particularly pronounced in well-established cooperatives with over a decade of existence, where older individuals predominantly lead, forming a significant cultural barrier.

4.4.1. Perceived Risks

The cultural inertia and resistance were observed, and older cooperatives display resistance, indicating a cultural inertia and a reluctance to embrace the transformative potential of e-commerce. This resistance may stem from a lack of awareness regarding the changing demands of buyers on e-platforms. Secondly, the potential loss of control: Hesitancy in offering e-services suggests a perceived loss of control over traditional methods, accompanied by apprehension about uncertainties associated with navigating the digital landscape. Lastly, the fear of Technological Complexity and cultural resistance may be rooted in a fear of the perceived complexity of e-commerce technologies, acting as a barrier to adoption.

4.4.2. Perceived Benefits

Agility and Adaptability: Newer cooperatives, operating for less than 5 years, emerge as active participants in e-commerce, reflecting a dynamic mindset among younger leadership. This suggests enhanced adaptability and agility in embracing e-commerce. The enhanced market reach: Active engagement of new cooperatives in e-commerce indicates an understanding of potential benefits, such as reaching a broader market through online platforms, and transcending geographical constraints. The efficiency and innovation**,** observed in younger staff members in new cooperatives leverage e-commerce for streamlined operations and innovative approaches. The technology-savvy nature of these cooperatives enables improved efficiency and innovative solutions.

In summary, the juxtaposition of cultural hesitancy and the dynamic engagement of newer cooperatives underscores the challenges and opportunities in e-commerce adoption. Addressing perceived risks, especially among well-established cooperatives, and leveraging the agility and innovation potential of younger leadership can pave the way for a more widespread acceptance of e-commerce in the agricultural cooperative sector in Cameroon

CHAPTER 5: DISCUSSION, CONCLUSION AND RECOMMENDATIONS

5.1 Introduction

In this final chapter, we delve into a comprehensive discussion of the findings from our study on the analysis of factors affecting e-commerce adoption in agricultural cooperatives in the central region of Cameroon. Throughout this research endeavor, we have explored the multifaceted landscape of e-commerce adoption within agricultural cooperatives, examining various factors ranging from sociocultural influences to technological readiness and environmental conditions. This chapter aims to synthesize and critically analyze the key findings, draw meaningful conclusions, and provide actionable recommendations for policymakers, stakeholders, and future researchers interested in promoting e-commerce integration within this context.

We begin by revisiting the research objectives and outlining the structure of this chapter. Subsequently, we delve into a detailed discussion of the factors influencing e-commerce adoption, drawing upon empirical evidence and existing literature to provide context and insights. Following the discussion, we present a concise yet insightful conclusion that encapsulates the main findings of our study. Finally, we offer practical recommendations aimed at fostering a conducive environment for e-commerce adoption in agricultural cooperatives in the central region of Cameroon, based on the insights gained from our research

5.2 Discussion and conclusion

The findings from the research shed light on multiple factors influencing e-commerce adoption in agricultural cooperatives in the central region of Cameroon. A comprehensive understanding of these factors provides insights into the challenges and opportunities for integrating e-commerce into their operations.

5.2.1 Current State of E-Commerce Adoption:

Our investigation revealed that a substantial 88% of agricultural cooperatives in the central region of Cameroon demonstrated a lack of interest in integrating e-commerce into their operations. Merely 2% actively embraced e-commerce, while 10% remained indifferent. This pattern is

attributed to the age of cooperatives, with those exceeding 10 years exhibiting more resistance, influenced by the older generation dominating the leadership.

The R-squared value of 85% indicates that the model explains a substantial proportion (85%) of the variability in e-commerce adoption among agricultural cooperatives. This high R-squared value suggests that the selected independent variables collectively contribute significantly to explaining the variance in the dependent variable, e-commerce adoption (Hair, 2017). Additionally, the significance of all independent variables at a 99% confidence interval underscores the robustness of the model.

5.2.2 Sociocultural Impact

The most impactful variable in the model is the sociocultural factor, with a coefficient of 0.23. This implies that sociocultural considerations play a crucial role in influencing the willingness of cooperatives to link e-commerce to their activities. This aligns with existing research highlighting the significance of social and cultural factors in technology adoption (Gupta, 2010). The cultural context, attitudes, and values within cooperatives shape their readiness to embrace e-commerce practices.

The cultural hesitancy observed in 75% of agricultural cooperatives aligns with existing literature on the influence of cultural factors on technology adoption (Rogers, 2003). Older cooperatives, led by individuals over 10 years, exhibit resistance due to a lack of awareness about the potential demand for e-platforms, leading to rigidity in offering e-services. In contrast, newer cooperatives with younger leadership actively engage in e-commerce, underscoring the impact of generational differences (Gupta, 2010).

5.2.3 Technological Impact:

The technological factor also demonstrates substantial impact, with a coefficient of 0.2. This emphasizes the role of technology in facilitating e-commerce adoption, especially in creating platforms for cooperatives to perform various activities. This finding aligns with the established understanding that technological readiness and infrastructure are essential drivers for successful e-commerce implementation (Li Y. , 2017).

While technology is recognized as the backbone of e-commerce, the underutilization of powerful devices in 60% of cooperatives suggests a gap between possession and effective use (Li Y. , 2017). The positive shift observed in over 50% of respondents having essential materials and skills is indicative of the impact of government policies on device affordability and the rise of ICT institutions, facilitating accessibility (Dutta, 2009).

5.2.4 Environmental Impact:

Interestingly, the environmental variable, while still significant, appears to have a comparatively lesser impact on e-commerce adoption, with a coefficient of 0.12. This indicates that despite the perceived significance of environmental concerns, they play a less influential role in shaping cooperatives' decisions to adopt e-commerce. This finding underscores the need for a more targeted examination of the specific environmental factors impacting e-commerce adoption in this context

The reluctance of 90% of cooperatives due to environmental conditions, citing concerns about fraud and scams, underscores the significance of trust in e-commerce adoption (Palvia, 2015). The absence of a well-defined regulatory framework underscores the necessity for government intervention to create a secure environment, aligning with prior research on the government's role in regulating e-commerce. (Cao et al., 2005).

5.2.5 Organizational Impact:

The organizational factor, with a coefficient of 0.2, reinforces the influence of organizational structures on e-commerce adoption. The model suggests that cooperatives tend to organize in a way that positions youth, who are more pro-e-commerce, in technological-oriented roles. This organizational flexibility is crucial in adapting to technological advancements and fostering an environment conducive to e-commerce integration (Tornatzky, 1990).

The organizational hurdles faced by over 85% of cooperatives, particularly those over 15 years old, reflect the resistance to change within established structures (Tornatzky, 1990). The rejection

of new ideas related to e-commerce adoption by older staff members illustrates the challenges in organizational adaptation.

In conclusion, the study highlights a complex interplay of cultural, technological, and environmental factors influencing e-commerce adoption in agricultural cooperatives in the central region of Cameroon. The dichotomy between older and newer cooperatives suggests that age and leadership dynamics play a pivotal role in shaping attitudes toward technology adoption. The underutilization of available technology emphasizes the importance of addressing not just access but also effective integration. Additionally, the apprehensions surrounding environmental factors call for immediate governmental intervention to create a secure and conducive atmosphere for e-commerce.

5.3. Recommendations

Government Intervention: The government should play a pivotal role in formulating policies, regulations, and establishing regulatory bodies to enhance the security and reliability of e-transactions. This includes measures to protect the interests of both buyers and sellers. Policy Formulation: Collaborate with government bodies to create comprehensive policies and regulations specifically tailored to the agricultural sector, addressing the unique challenges and requirements of cooperatives in the center region. Regulatory Bodies: Establish regulatory bodies dedicated to overseeing e-transactions, ensuring compliance, and mitigating potential fraud. These bodies should actively engage with cooperatives to address concerns and provide guidance. Example: The government can take inspiration from successful e-commerce regulatory frameworks in other countries, such as the General Data Protection Regulation (GDPR) of the European Union or the Personal Data Protection Act of Singapore. These models emphasize the protection of user data and transaction security, providing a robust foundation for trust in e-commerce. Implementation: Establish a dedicated regulatory body responsible for overseeing e-commerce activities, ensuring compliance with standards, and addressing any fraudulent practices. Implement clear policies that protect both buyers and sellers, fostering a secure and reliable e-commerce environment.

Capacity Building: Initiatives for training and capacity-building programs should be implemented to equip cooperatives with the necessary materials and skills for successful e-commerce adoption. Training Programs: Develop and implement targeted training programs focusing on e-commerce fundamentals, covering both the technical aspects and strategic planning for integration into cooperative activities. Resource Centers: Establish resource centers equipped with necessary materials, tools, and skilled personnel to provide ongoing support and training to cooperatives in their journey towards e-commerce adoption. Example: Look to successful capacity-building programs in other developing countries, such as the Digital Literacy Program in Kenya, which focuses on equipping individuals with the necessary digital skills. Implementation: Collaborate with existing educational institutions and ICT training centers to develop targeted training programs for cooperative members. These programs should cover essential e-commerce skills, including online transaction management, digital marketing, and data security.

Cultural Awareness Programs: Targeted awareness programs should be developed to educate older leadership in well-established cooperatives about the potential demand and benefits of e-platforms. Customized Workshops: Organize workshops and seminars specifically designed for older leadership in well-established cooperatives, emphasizing the benefits and potential demand associated with e-platforms. Peer Mentoring: Facilitate peer mentoring programs, where cooperatives with successful e-commerce integration share their experiences and best practices with those hesitant to embrace the change. Example: Emulate awareness campaigns that have effectively changed cultural perceptions, such as India's "Digital India" initiative, which successfully promoted digital literacy and technology adoption

.

5.4. Research Limitations

While this study aimed to comprehensively analyze the factors influencing e-commerce adoption in agricultural cooperatives within the Centre region of Cameroon, it is crucial to acknowledge certain limitations that may impact the generalizability and robustness of the findings. These limitations encompass challenges encountered during the data collection process, specifically in terms of sample representation and access to participants.

Sample Representation:

One notable limitation is associated with the sample size and reachability of agricultural cooperatives. Out of the intended sample of 272 cooperatives, only 115 cooperatives were accessible and willing to participate in the interviews. This may introduce a potential selection bias, as those who participated may not be fully representative of the entire population of agricultural cooperatives in the region. Consequently, caution should be exercised when generalizing the study's findings to the broader cooperative landscape.

Connectivity Issues:

Another significant limitation arises from the prevalent low connectivity in the areas where many cooperatives are situated. This posed a challenge in terms of communication and coordination with potential respondents. Despite attempts to reach participants via phone, the majority of them could not be contacted through this means. To overcome this hurdle, the researcher personally visited different departments to locate and interview participants. However, this approach may have inadvertently introduced biases, as cooperatives in areas with better connectivity might be overrepresented in the study.

These limitations underscore the need for careful interpretation of the results, recognizing that the findings may not be universally applicable to all agricultural cooperatives in the Centre region. Additionally, the challenges in participant reachability and communication

may impact the depth and breadth of the insights gathered. Notwithstanding these constraints, the research offers valuable perspectives on the factors that impact e-commerce adoption in agricultural cooperatives within the Centre region of Cameroon.

Future research endeavors in this domain should aim for a more extensive and representative sample, employing diverse communication methods to mitigate connectivity challenges and enhance the study's overall validity.

5.5. Further Studies Suggestions

1. Longitudinal Studies: Explore the evolution of e-commerce adoption trends over time within cooperatives, considering factors such as changing leadership and technological advancements.

2. Cross-Regional Comparisons: Conduct comparative studies to identify region-specific challenges and opportunities influencing e-commerce adoption

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APPENDICES

APPENDIX 1 Letter of introduction

APPENDIX 2: Research questionnaire guide

Section 1: Introduction

1.1 Introduction and Consent

This questionnaire is part of an academic research to analyze the factors affecting e-commerce adoption in agricultural cooperatives in the Centre region of Cameroon. Your responses will enable me to understand this issue and your decision to take part in this survey is completely voluntary. If you agree to participate, the questionnaire should take you approximately 10 minutes to complete. Please answer the questions in the spaces provided and feel free to give any additional comments. I assure you that the information you provide will be used for academic purposes only and will be treated with utmost confidence. Your responses together with others will be used as the main data set for my research project for my Master of Management in Agribusiness (MMA) at Strathmore Business School. I hope that you enjoy completing the questionnaire. If you have any questions or would like further information, you can reach me 0n 0112846297/ 654282434 or email me teclaire.imandi@strathmore.edu

Thank you

Teclaire Imandi

Section 1: Demographic and Participant Information

What is the name of your agricultural cooperative?

How long has your cooperative been in operation?

What is your role or position within the cooperative?

How many members do your cooperative has?

What is the annual revenue of the cooperative?

Section 2: E-commerce Adoption

Please rate the following statements based on the extent of e-commerce adoption within your agricultural cooperative, using a Likert scale ranging from 1. (Unaware), to 2. (Aware), 3. (Observing the benefits), 4. (Trial/ sometimes), 5. (adoption)

Question	**1**	**2**	**3**	**4**	**5**
Online marketing:					
Promotion and selling of its agricultural products/services online.					
a. Use of digital marketing strategies to reach a wider customer base.					
Purchasing: a. Sourcing agricultural inputs or equipment through online platforms.					
b. Established partnerships with online suppliers for easy procurement.					
Payment systems:					
a. Accept online payments from customers for products/services.					
b. Provides multiple options for online payment to customers.					

Section 3: Technological Factors

a) Please indicate Yes or No for the following statements:

- Does your cooperative have computers, tablets, or mobile phones?
  - Yes
  - No
- Does your cooperative have internet access?
  - Yes
  - No
- Does your cooperative have access to reliable electricity?
  - Yes
  - No

b) On a scale of 1 (Low) to 5 (High), rate the level of technological skills and digital literacy among cooperative members.

- 1. None
- 2. Low
- 3. Average
- 4. Good
- 5. High

c) What challenges do you face in improving digital literacy skills?

d) How important do members perceive technological factors to be in the adoption of e-commerce in your cooperative? (1 = Not important, 5 = Extremely important).

- 1. Not at all Important
- 2. Slightly Importance
- 3. Important
- 4. Fairly Important
- 5. Extremely important

Section 4: Organizational Factors

a) Please rate the following statements based on your perception, using a Likert scale ranging from 1 = strongly agree, 2 = agree, 3 = neutral, 4 = disagree, and 5 = strongly disagree.

Questions	**1**	**2**	**3**	**4**	**5**
The communication model and the culture of our cooperative hinder e-commerce adoption.					
The communication model and the culture of our cooperative facilitate e-commerce adoption.					
Our cooperative's leadership actively supports the adoption of e-commerce practices. (training, self-development encouragement)					
Our cooperative has a clear strategy or plan for integrating e-commerce into our operations.					

b) How does the organization typically make decisions regarding the adoption of new technologies?

Section 5: External Environmental Factors

a) Please indicate Yes or No for the following statements:

Question	**Yes**	**No**
Does your cooperative have access to transport infrastructures that facilitates e-commerce adoption? (road, vehicles)		
Do you perceive a market demand for agricultural products/services through e-commerce?		
Are there any legal or regulatory requirements that need to be considered in the e-commerce adoption process?		

b) Are there any specific external resources (access to reliable internet connectivity, access to reliable electricity, access to transportation) or partnerships that could facilitate or hinder the technology adoption?

Section 6: Socio-cultural Factors

a) How does the socio-cultural context impact the communication and collaboration processes when implementing new technologies?

b) Please rate the following statements based on your perception, using a Likert scale ranging from 1 = strongly agree, 2 = agree, 3 = neutral, 4 = disagree, and 5 = strongly disagree.

Questions	**1**	**2**	**3**	**4**	**5**
I trust the security of online transactions for our cooperative's operations.					
I perceive the risks associated with e-commerce adoption in our cooperative.					
I perceive the benefits associated with e-commerce adoption in our cooperative.					
Cooperative members have positive attitudes toward the use of technology in business settings.					

c) How would you describe the risks and/or benefits you perceive with e-commerce adoption in your adoption?

Section 7: Additional comment:

a) What is your cooperative's most challenging factor (s) associated with e-commerce adoption? Why?

b) Please provide any additional comments, experiences, or suggestions related to the factors affecting e-commerce adoption in agricultural cooperatives.

Thank you for your participation! Your responses will help to improve our understanding of the factors influencing e-commerce adoption in agricultural cooperatives in Cameroon.

APPENDIX 3: MINADER Research Authorization

REPUBLIQUE DU CAMEROUN
Paix – Travail – Patrie
MINISTERE DE L'AGRICULTURE ET DU DEVELOPPEMENT RURAL
DELEGATION REGIONALE DU CENTRE
SERVICE REGIONAL DU REGISTRE DES COOPERATIVES
BP : 492 Yaoundé, Tel : 222 31 12 89

REPUBLIC OF CAMEROON
Peace – Work – Fatherland
MINISTRY OF AGRICULTURE AND RURAL DEVELOPMENT
REGIONAL DELEGATION FOR CENTRE
REGIONAL SERVICE OF COOPERATIVES REGISTRY'S
PO BOX: 492 Yaoundé, Tel: 222 31 12 89

N°354/12/23/MINADER/SG/DRADER-CE/SRCOOP-GIC/BAR Yaoundé, le 06 OCT 2023

LE CHEF DE SERVICE REGIONAL DU REGISTRE DES COOP/GIC DU CENTRE
AU
STRATTHMORE UNIVERSITY OF NAIROBI

Objet : Autorisation de recherche

Madame, Monsieur

Je viens en ma qualité de chef de service du registre COOP/GIC du Centre attester que Mademoiselle IMANDI TECLAIRE AMADONIQUE étudiante en Master in Management of Agriculture in the STRATHMORE UNIVERSITY of Nairobi (KENYA) a été autorisé à effectuer une recherche académique sur le thème « **ANALYSIS OF FACTORS AFFECTING E-COMMERCE ADOPTION IN AGRICULTURAL COOPERATIVES IN THE CENTRE REGION OF CAMEROON** » dans la région du Centre Cameroun.

Nous vous serons gré chers coopérateurs de votre coopération et vous remercions de l'accueil que vous voudriez bien lui réserver.

Veuillez agréer chers coopérateurs, l'expression de nos considérations distinguées.

Le Chef de Service

Nestor Ngouambe, Ing
Agroeconomiste

APPENDIX 4: Ethical Review authorization Letter

Strathmore UNIVERSITY

22nd June 2023

Ms Imandi Teclaire Amadonique,
teclaire.imandi@strathmore.edu

Dear Ms Imandi,

RE: Analysis of Factors Affecting E-Commerce Adoption in Agricultural Cooperatives in the Centre Region of Cameroon

This is to inform you that SU-ISERC has reviewed and **approved** your above **SU-masters** research proposal. Your application reference number is **SU-ISERC1796/23.** The approval period is from **22nd June 2023 to 21st June 2024.**

This approval is subject to compliance with the following requirements:

i. Only approved documents including (informed consents, study instruments, MTA) will be used.
ii. All changes including (amendments, deviations, and violations) are submitted for review and approval by SU-ISERC.
iii. Death and life-threatening problems and serious adverse events or unexpected adverse events whether related or unrelated to the study must be reported to SU-ISERC within 72 hours of notification.
iv. Any changes anticipated or otherwise that may increase the risks or affected safety or welfare of study participants and others or affect the integrity of the research must be reported to SU-ISERC within 72 hours.
v. Clearance for the export of biological specimens must be obtained from relevant institutions.
vi. Submission of a request for renewal of approval at least 60 days prior to the expiry of the approval period. Attach a comprehensive progress report to support the renewal.
vii. Submission of an executive summary report within 90 days of completion of the study to SU-ISERC.

Before commencing your study, you will be expected to obtain a research license from National Commission for Science, Technology, and Innovation (NACOSTI) https://research-portal.nacosti.go.ke/ and obtain other clearances needed.

Yours sincerely,

for: **Mr Ambrose Rachier,**
Chairperson; SU-ISERC

STRATHMORE UNIVERSITY INSTITUTIONAL SCIENTIFIC AND ETHICAL REVIEW COMMITTEE
(SU-ISERC)
22-Jun-2023
Email:ethicsreview@strathmore.edu
P.O BOX 59857-00200
NAIROBI-KENYA

APPENDIX 5: Carte of Centre Region of Cameroon with departments

VT OMNES
VNVM SINT