

MAKERERE UNIVERSITY

MAKERERE UNIVERSITY BUSINESS SCHOOL

**FIRM CAPABILITIES, COLLABORATION AND EFFECTIVENESS OF DIGITAL
STAMPING SYSTEM OF TRACKING: A CASE OF SELECTED FIRMS IN CENTRAL
REGION, UGANDA**

BY

NASSUNA EVELYN SSERWADDA

2017/HD10/1724U

+256-706423025/ 787082180

evelynnassuna2013@gmail.com

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PLAN 'A'

APRIL, 2022

DECLARATION

I, **Nassuna Evelyn Sserwadda** hereby declare to the best of my knowledge that this dissertation titled **"Firm Capabilities, Collaboration and Effectiveness of Digital Stamping System of Tracking: A Case of Selected Firms in Central Region, Uganda"** is truly my original work and has never been submitted to Makerere University Business School or any other institution of higher learning for any award.

Sign: 

Date: 19/4/2022

Nassuna Evelyn Sserwadda

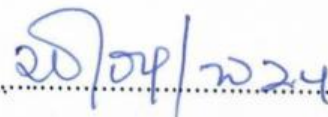
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APPROVAL

This is to certify that this dissertation, written under our supervision is now ready to be submitted to Makerere University Business School in partial fulfillment of the requirement for the award of a Master of Business Administration, with our approval as supervisors.

Signed: 

Dr. Robert Kyeyune (PhD)

Date: 

Signed: 

Ms. Ruqqaiya Naluwooza

Date: 

DEDICATION

I, **Nassuna Evelyn Sserwadda** dedicate this dissertation to my parents, family, supervisors and all my friends. Truly I wouldn't have achieved my dream without their presence and support.

ACKNOWLEDGEMENT

First and foremost, I extend my thanks to the Almighty God for giving me life, strength and blessings to complete this piece of work successfully.

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ACRONYMS/ ABBREVIATIONS

DC – Dynamic Capabilities

DCT – Dynamic Capability Theory

OECD – Organization for Economic Cooperation and Development

SMEs – Small and Medium Enterprises

SPSS – Statistical Package for Social Sciences

UNBS – Uganda National Bureau of Standards

URA – Uganda Revenue Authority

ABSTRACT

The purpose of the study was to ascertain the relationship between firm capabilities, collaboration and effectiveness of digital stamping system of tracking. The ineffectiveness in the use of the stamps among some various segments of the business fraternity was a prime motivation for this study. A cross-sectional quantitative design was used in the study with a sample of 144 firms, but responses were obtained from only 124 firms. The reliability and validity of the data collection instrument were established using a Cronbach Alpha coefficient and a content validity index respectively. Data were analyzed using SPSS version 23 software with a focus on descriptive statistics, Pearson correlation and regression analyses, and SMART-PLS for mediation analysis. The Pearson correlation coefficients confirmed a positive and statistically significant relationship between firm capabilities, collaboration and effectiveness of digital stamping system of tracking. Also, a partial mediation effect of collaboration in the relationship between firm capabilities and effectiveness of digital stamping system of tracking was established. Further, the regression analysis results indicated that both firm capabilities and collaboration are statistically significant predictors of effectiveness of digital stamping system of tracking, accounting for 27.3%. It was therefore concluded that firm capabilities and collaboration among firms result in the effectiveness of digital stamping system of tracking. Recommendations were suggested including: the firms need to develop capabilities necessary for their operations and transformational purposes; need by the firms to demonstrate ability to improve their business processes and respond rapidly to shifts in business priority; need by the firms to put in place appropriate information system that facilitates information dissemination; and finally, need by the firms to collaborate with the tax authorities by complying with the policies and regulations governing their operations.

CHAPTER ONE

INTRODUCTION

This chapter discusses the background to the study, statement of the problem, purpose of the study, objectives of the study, research questions, scope of the study, theoretical framework, significance of the study and conceptual framework as below.

1.1 Background to the Study

The provision of public goods, services and infrastructure is a basic function of governments in all countries around the world. But the ability of a government to provide adequate public goods largely depends on tax revenue mobilization (Rakner, 2001). Yet, this has been a challenging exercise in many countries in the world including the Sub-Saharan Africa where Uganda is part and parcel. To meet this challenge for example tax authorities are turning to digital led solutions like digital tax stamp (Flossy et al., 2017). Digital tax stamps are physical paper stamps applied to goods or their packaging containing among other things, security features to prevent counterfeiting, tracking capabilities that aid Authority's monitoring of compliance of the product in order to curb tax evasion and increase revenue collection (URA, 2019). According to Gideon and Alouis (2013), an efficient national revenue collection system is the hub of every public administration system and the cornerstone of sound fiscal management. It enables governments to finance budget deficits from domestic sources, thus dissuading recourse to offshore sourcing (Flossy et al., 2017). However, in Uganda even with the introduction of the digital stamping system of tracking, there have been several reports about continuous tax evasion and counterfeit products supplied by manufacturers and importers in the market. One reason for this could be the inadequacy of capabilities (dynamic capabilities) among firms.

The theory of Dynamic Capability therefore comes in play and it stresses the role of business processes in linking the firm to the external environment. Capability refers to the capacity to utilize resources to perform a task or an activity, against the opposition of circumstance (Teece, 2014). It is associated with the actions, processes, systems and relationships that the company can carry out with its own resources (Sanchez, 2011). The theory, states that firms should have the ability to integrate, build, and reconfigure internal and external competences to address rapidly changing environments (Teece et al., 1997). Wang and Ahmed (2007) suggest three major component factors of dynamic capabilities which are correlated but different in concepts and these include; adaptive capability, absorptive capability and innovative capability. As such, firm capabilities in terms of absorptive, innovative and adaptive are key for achieving innovation in joint (collaborative) efforts. Therefore, organizations utilize external knowledge, adapt to business opportunities and innovate accordingly. To this extent, the dynamic capability theory is relevant in explaining the effectiveness of digital stamping system of tracking. Not only do firm capabilities influence the effectiveness of digital stamping system of tracking but they become even more important with the practice of collaboration.

Collaboration according to Fawcett et al. (2008) is the ability to work across organizational boundaries to build and manage unique value-added processes to better meet stakeholders' needs. It involves information sharing, decision synchronization and incentive alignment (Simatupang & Sridharan, 2008). Therefore, firm capabilities linked to collaboration can result in performance improvement (effectiveness of digital stamping system of tracking). However, lack of these elements fosters resistance as evidenced in the reports where some manufacturers resisted the initiative saying that they have a high cost burden (URA, 2020; UNBS, 2020).

According to Uganda National Bureau of Standards (UNBS, 2015), nearly 54 per cent of products on the Ugandan market are either faked or counterfeited. Also, the Ugandan Financial Intelligence Authority claimed that the government loses as much as 45 percent in tax revenue in every financial year. As a call off for this kind of behaviour, URA as a government revenue collection agency introduced a digital tax stamp, a solution sought to enable manufacturers, distributors, retailers and consumers to conveniently verify and trace all specified goods throughout the distribution chain. This started with firms trading in items such as Spirits, Beer, Wine, Mineral water, Soda and Tobacco products, both locally manufactured and imported, to be affixed with digital tax stamp. However, questions about the effectiveness of the digital stamp system rose up shortly eliciting mixed reactions, with some notable companies opposing the tax body's initiative. Others even went ahead to continue operation without a stamp while others faked the stamps, hoping that it is more profitable than getting the products stamped. Speaking in a telephone interview, Mr. Kasaija told Daily Monitor that manufacturers cannot be happy because now government "knows what they are doing". Also, reporting in the Independent paper (March 10, 2021), several manufacturers have resorted to distributing their products at night and in unbranded delivery vehicles, to beat the enforcement of the Digital Tracking Solution (DTS). Such behaviours could affect the revenue earnings of the government, hence questioning the effectiveness of the system (Owiny & Ashaba, 2019; Uganda Manufacturers Association report, 2019; URA, 2019/2020).

Because tax stamps offer additional benefits – which are important in the fight against the growing global problem of illicit trade, the issue of tax stamp use has now become the subject of international policy (Sudan, 2015). Yet, in the local scene especially a developing country like Uganda, it is still daunting as efforts to push it are still futile. In addition, not many studies have

examined the link between firm capabilities, collaboration and effectiveness of digital stamping system of tracking in a developing context like Uganda, a reason for this study.

1.2 Statement of the Problem

To boost revenues, address illicit trade, counterfeit product and unfair competition on the market, institutions require digital tracking solutions (Telstra annual report, 2019). As a response, Uganda Revenue Authority (URA) embarked on sensitization of taxpayers (both manufacturers and importers), secured supplier(s) and installed technology, got regulations approved and rolled out digital stamping (URA, 2019). Despite their efforts coupled with the significance of this innovation, there have been continuous questions about the effectiveness of the stamps among some various segments of the business fraternity as some accuse URA of increasing their costs of production and reducing their productivity levels. Also, the tax stamping turned out to be too manual and prone to forgery leaving many questioning its effectiveness (Uganda Manufacturers Association report, 2019; URA, 2020). Further, some manufacturers started operating at night making deliveries in unbranded vehicles prompting continuous apprehension and confiscation of their products by the authorities (The Independent, March 10, 2021). Such tendencies have put affected URA's process of collecting revenue raising concern about the effectiveness of the stamp system. These have also made the stamps appear as if they are difficult to use. The concern about the effectiveness in the use of the stamps may be attributed to inadequate capabilities among firms as well as unwillingness to collaborate with the authority(s) (URA, 2020). Not many empirical studies have been conducted about the relationship between firm capabilities, collaboration and effectiveness of digital stamping system of tracking in a developing context like Uganda, hence a reason for this study.

1.3 Purpose of the Study

To examine the relationship between firm capabilities, collaboration and effectiveness of digital stamping system of tracking in selected firms in central region, Uganda.

1.4 Objectives of the Study

- 1.4.1 To examine the relationship between firm capabilities and effectiveness of digital stamping system of tracking in selected firms in central region.
- 1.4.2 To examine the relationship between collaboration and effectiveness of digital stamping system of tracking in selected firms in central region.
- 1.4.3 To examine the mediating role of collaboration in the relationship between firm capabilities and effectiveness of digital stamping system of tracking in selected firms in central region.

1.5 Research Questions

- 1.5.1 What is the relationship between firm capabilities and effectiveness of digital stamping system of tracking in selected firms in central region?
- 1.5.2 What is the relationship between collaboration and effectiveness of digital stamping system of tracking in selected firms in central region?
- 1.5.3 What is the mediating role of collaboration in the relationship between firm capabilities and effectiveness of digital stamping system of tracking in selected firms in central region?

1.6 Scope of the Study

This includes the content scope, geographical scope and time scope as discussed below;

1.6.1 Content scope

The study focused on the relationship between firm capabilities, collaboration and effectiveness of digital stamping system of tracking. Effectiveness of digital stamping system is the dependent variable while firm capabilities are the independent variable of the study. Collaboration featured in as the mediating variable of the study. The need for this study is fueled by the concerns about the effectiveness of the digital stamping system of tracking in Uganda.

1.6.2 Geographical scope

The study covered selected firms (both manufacturers and importers) in central region including Kampala, Mukono, Wakiso and Entebbe. Central region was chosen because it centers many firms with a lot of businesses.

1.7 Theoretical Framework

The study adapted the Dynamic Capability Theory (DCT) as a potential candidate to explain the phenomena under examination. This is because of the instability in the business environment coupled with the ever changing technology which calls for flexibility among firms if they are to remain strong in the market.

1.8 Significance of the Study

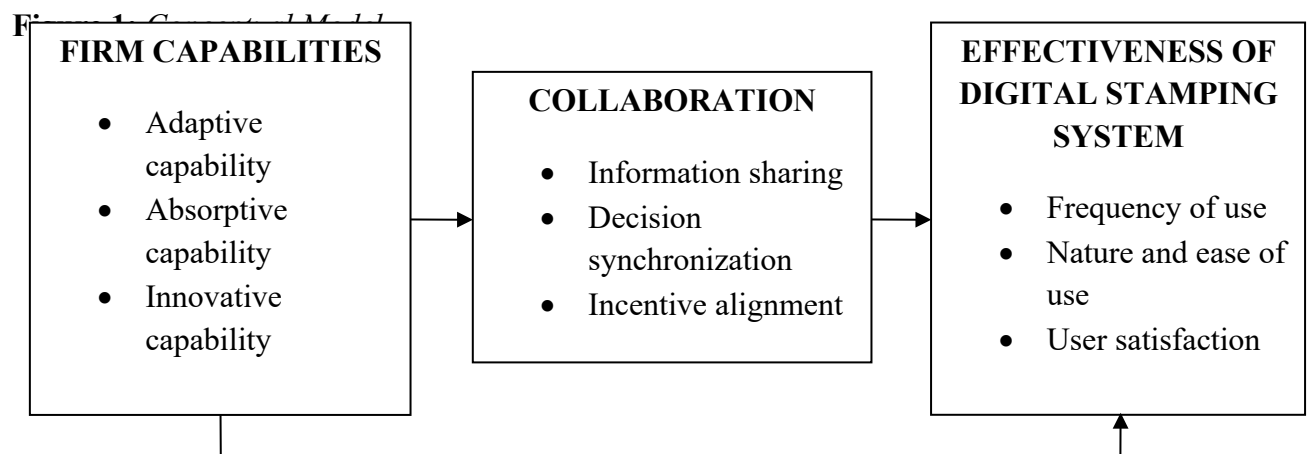
The findings of the study will create an insight and better understanding to the board of URA about the importance and ways of improving tax compliance among the different business segments. Similarly, it will draw attention of firms/businesses to understand the importance of building good relationship and paying taxes to the tax authority.

The study will provide hope and a clear understanding to URA clients about their responsibilities regarding taxes as well as the benefits of complying with the tax laws set by the tax authorities.

The study will help policy makers in both private and public sectors to strengthen and design appropriate policies necessary to create favourable grounds for doing business as well as managing taxes without having conflict of interests. This will help to build good relationship between businesses and the tax authorities, improve trade efficiency and tax collection.

The study will provide up-to-date literature to the social science scholars or researchers interested in carrying out more research in the area of firm capabilities, collaboration and effectiveness of digital stamping system of tracking.

1.9 Conceptual Framework



Source: Modified from Literature by Teece et al. (1997); Green, 2001; Simatupang and Sridharan (2008); Wang and Ahmed (2007).

Explanation of the Model

The model above shows the relationship between firm capabilities, collaboration and effectiveness of digital stamping system. The dependent variable of the study is effectiveness of digital stamping system with dimensions such as frequency of use, nature and ease of use and user satisfaction while the independent variable is firm capabilities based on dimensions of adaptive capability, absorptive capability and innovative capability. Collaboration in the model, with measurement indicators such as information sharing, decision synchronization and incentive alignment is the mediating variable mediating the relationship between firm capabilities and effectiveness of digital stamping system. A review of the literature shows that firm capabilities may be linked to collaboration and effectiveness of digital stamping system and collaboration may also influence effectiveness of digital stamping system. Further, the literature review shows that collaboration may mediate the relationship between firm capabilities and effectiveness of digital stamping system. The links between the variables are represented by the flow of arrows in the model above.

CHAPTER TWO

LITERATURE REVIEW

2.0 Introduction

This chapter covers the review of literatures including the theoretical literature, conceptual literature and literature regarding the relationships between the study variables (i.e. firm capabilities, collaboration and effectiveness of digital stamping system of tracking). It is based on studies by previous scholars obtained from mainly published journals, books, reports, which all act as basis for this study.

2.1 Theoretical Review – Dynamic Capability Theory (DCT)

Dynamic capabilities (DC) are a particular type of organizational capability having special weight for gaining competitive advantage in unstable environments. It has attracted attention from different scholars in the past years with emergence of many definitions (Di Stefano et al., 2010). Although it has been criticized on different theoretical grounds, its concept still presents an ambiguous definition (Wang & Ahmed, 2007). In fact, the theory stresses the significance of revising resources (information and knowledge) as a response to changes in the business environment. Teece et al. (1997) provide the most cited definition. According to them, DC is the firm's ability to integrate, build, and reconfigure internal and external competences to address rapidly changing environments. On the other hand, Helfat et al. (2007) defines DC as “the capacity of a firm to purposefully create, extend, or modify its resource base”. The two definitions focus mainly on the ability (Di Stefano et al., 2010). These views are consistent with the idea developed by Augier and Teece (2009) that a firm with many attributes is seen as a storehouse of capabilities. These capabilities (adaptive, absorptive and innovative) make firms develop confidence to

collaborate with the authority(s) easily hence ensuring effectiveness of the digital stamping system of tracking.

According to Wang and Ahmed (2007), Adaptive capability refers to the firm's ability to timely adapt itself by aligning resources and capabilities with environmental changes. Absorptive capability takes external knowledge combines it with internal knowledge and absorb it for internal usage. Innovative capability is the ability to develop new changes by aligning strategic innovative orientation with innovative behaviours and processes. However, dynamic capabilities theory has been criticized for its lack of precise definition, empirical grounding, and measurement (Williamson, 1999). The poor understanding of DC and the lack of a measurable model makes it difficult to study how it can be used in actionable managerial decision making (Pavlou & El Sawy, 2011). The lack of universally accepted definition is due to its explanation in form of theoretical underpinnings which has created difficulty in measurements (Williamson, 1999). Despite the inconsistencies in literature and criticisms, the concept of dynamic capabilities has been widely used in different scenarios in both academic and practical fields. In other words, firms need to develop these capabilities to ease their operations and respond to the changing technologies and advancement in business environment. This dynamism will facilitate collaboration between firms and the tax authorities resulting in effective tracking through digital stamping system.

2.2 Effectiveness of Digital Stamping System of Tracking

Digitalization has allowed governments to implement electronic tracking of business activity. For example, tracking of sales through the use of e-invoices has facilitated more efficient administration of indirect taxes, a common area of fraud and revenue leakage. Digital systems such as tax stamps present new roles for consumers and third parties in facilitating enhanced compliance

(OECD, 2015). Tax stamps and marks are considered to be effective in the face of all types of illicit trade, and are a “high potential” solution, as they allow easier product identification and authentication (OECD, 2013; Sudan, 2015). Digital Tax Stamps are measures taken by tax authority(s) aimed at enhancing tax compliance while enabling consumers to use genuine products (URA, 2020).

According to Sudan (2015) and OECD (2013), more tax stamps are produced every year than any other security-printed item except banknotes. Known by a variety of names (excise stamps, duty stamps, tax seals, banderoles), these are the “weapon of choice” for many governments around the world to secure the valuable revenue derived from customs and excise duty on certain products, acting both as a record of payment and a barrier to the distribution of illicit products, whether in the form of contraband or counterfeits. Increasingly, the key functions of any tax stamp, whatever form it takes, is to provide fiscal verification (i.e. that tax has been paid), as well as supply chain visibility and product authentication (OECD, 2013; Sudan, 2015). Therefore, in order to digitally administer tax payment systems, governments must ensure that as many individuals and businesses as possible are able to access the digital world and are taking up digital technology (OECD, 2015).

2.3 Firm Capabilities

There is no consensus among the scholars on the meaning of firm capability as several scholars perceive the concept differently. Krammer et al. (2018) view firm capability as actions, processes, and systems and associations’ businesses may undertake using its available resources. According to Tuan and Yoshi (2010), firm capabilities are foundation of competitive advantage that translates into sales and market share growth. Wang and Ahmed (2007) defines firm capabilities as a firm’s capacity to deploy resources, usually in combination, and encapsulate both explicit processes and

those tacit elements (such as know-how and leadership) embedded in the processes. As such, Barney and Arikan (2001) assert that firm capability includes factors that enhance small business' awareness of strategic prospects/threat and its ability to undertake strategies. Weinstein and Azoulay (1999) add that firm capability involves the efficiency of a business in solving problems in specific operational areas. In this study, firm capability entails adaptive capability, absorptive capability and innovative capability which are components of dynamic capabilities.

2.4 Collaboration

Boughzala and De Vreede (2015) defined collaboration in management as a process of exchanging information, sharing and enhancing capacity for mutual benefits and common goals. In management, a significant number of organizations use collaborative work practices to help achieve success. Bedwell et al. (2012) defined collaboration as 'an evolving process where two or more social entities actively and reciprocally engage in joint activities aimed at achieving at least one shared goal'. The definition gives the most critical attributes of collaboration, namely, process, two or more entities, active and reciprocal engagement and shared goals. In business dictionary by Collin (2006), collaboration is described as an agreement between two or more partners to share knowledge or resources which could be beneficial. It is an act of working together on a project. Dorner et al. (2001) defined collaboration as a process of shared creation. Individuals with complementary skills interact to 'create a shared understanding that none had previously possessed or could have come to on their own'. These authors also indicate that collaboration requires that all parties are working towards a common goal. Roschelle and Teasley (1995) as cited in Emily (2011) defined collaboration more specifically as "mutual engagement of participants in a coordinated effort to solve a problem together".

2.5 Firm Capabilities and Effectiveness of Digital Stamping System of Tracking

The ability to trace a product to a particular site or retailer allows enforcement officials to gather information on common distribution routes and practices and the role that manufacturers play in the smuggling network. Tax stamps have moderate potential here, given that they do not always disclose the place of manufacture or distribution points, unless enhanced with a tracking code (Sudan, 2015). But for this to be effective, it needs support of the manufacturers or firms. This means that they should be capable enough to embrace the innovation. Previous studies indicate various predictors of performance (Eniola & Entebang, 2016; Adomako & Danso, 2014; Harash et al., 2014). According to Mulyono (2013), performance (effectiveness) is dependent on the resources and the capabilities that these businesses control. Nangoli et al. (2013) also reveal that the failure of businesses could be a result of inadequate supervision, insufficient managerial skills, high competition, poor financial discipline, high taxes and limited commitment to running the business. Furthermore, Vijay and Ajay (2011) reveal that capabilities are vital in enabling businesses to interact effectively with both the internal and external environment to achieve desired outcome. Relatedly, firm capability is a source of superior performance (effectiveness) and may result in sustainability (Ambrosini et al., 2009). Barney (2001) reports that capabilities accumulated over time may act as a driving force for businesses to undertake several opportunities (Vijay & Ajay, 2011). As such, businesses with capabilities are likely to perform better and support any development or initiatives.

An understanding of capabilities can help economists begin to fill in important gaps. The basic argument is that firms differentiate themselves through learning, entrepreneurship, innovation, and astute decision making; in short, firms are differentiated by their capabilities, especially their capabilities to decide, to innovate, and to change (Teece, 2019). Capabilities arise in part from

learning, from combining resources, and from exploiting complementary assets. Many capabilities become embedded in routines, and some reside with the top management team (Teece, 2019). Within a business framework, innovation can be identified as embedded in different capabilities such as the ability to absorb, adapt and transform a given technology into specific managerial, operational and transactional routines that can lead a firm or organization to achieve its goals effectively (Paulo et al., 2013). For instance, tax stamps as key elements used in combination with other measures such as strengthened enforcement, have led to good results for governments and other stakeholders, results which have in turn driven their continued growth and technological development (Sudan, 2015).

To exist and respond to business changes, every firm must have some specific capabilities. As noted, firm capabilities help enable an enterprise to profitably build and renew resources, reconfiguring them as needed to innovate and respond to (or bring about) changes in the market and in the business environment more generally (Pisano & Teece, 2007; Teece et al., 1997). They allow the enterprise and its top management to develop conjectures about the evolution of consumer preferences, business problems, and technology; validate and fine-tune them; and then act on them by realigning assets and activities. Strong firm capabilities support high performance (effectiveness) based on new product (and process) development, a change-oriented organizational culture, and a prescient assessment of the business environment and technological opportunities (Teece, 2019). These capabilities also help firms to learn quickly, integrate new knowledge and transform and implement this new knowledge in their business routines and processes to increase effectiveness and competitiveness (Jones, 2006; Daghfous, 2004). For instance, according to Sudan (2015), enhanced tax stamps, particularly those with track and trace mechanisms, are

important to maintain an accurate and objective measure of what has been produced by each manufacturer based on their capabilities (Sudan, 2015).

Literature as discussed above shows that firm capabilities is significant in ensuring effectiveness of the digital stamping system of tracking. However, what was unknown is the extent to which firm capabilities predict effectiveness of digital stamping system of tracking. For this reason, a study was sought to examine the relationship between firm capabilities and effectiveness of digital stamping system of tracking.

2.6 Collaboration and Effectiveness of Digital Stamping System of Tracking

In business management, collaboration can be found both inter- and intra-organizationally (Eisingerich & Bell, 2008) and ranges from the simplicity of a partnership and crowd funding to the complexity of a multinational corporation. Collaboration between team members allows better communication within an organization and throughout the supply chains. It is a way of coordinating different ideas from numerous people to generate a wide variety of knowledge (Eisingerich et al., 2009). It is this communication and knowledge that result in effectiveness of systems. For instance, every year, about 170 billion tax stamps are used in over 80 countries. The combined forces of population and consumption growth continue to push these figures up, but other factors in the growth of tax stamps include their adoption by both manufacturers and suppliers through a collaborative relationship with the authority, and the extension of existing stamp programmes to new products. Communication in collaborative work underpins how people understand each other and how knowledge is transferred (Patel et al., 2012; Horwath & Morrison, 2007). Communication should be open to enable informal and formal exchange of tasks and contextual information to support collaboration (Cheng et al., 2016; Dorner et al., 2001). Open,

frequent, balanced, two-way, multilevel communication is generally an indication of close collaboration and result in effectiveness of systems (Cao & Zhang, 2011; Horwarth & Morrison, 2007).

Tax authorities are increasingly gaining access to the vast amount of information held by the private sector through the use of digital systems, standardized reporting formats, and electronic interfaces. Systems for sharing information have also improved (OECD, 2015). According to Venkatesh et al. (2003), to adopt a technology to improve performance, it should in first place, be accepted by the users. The performance and satisfaction resulting from the usage of an information system depend largely on the user acceptance of the particular system or platform. This collaboration would result to have quicker product development processes, reduced development costs, greater technological improvements, and/or enhanced product quality (Walter, 2003) in dynamic market conditions. There is a greater need for the businesses to be dynamic and responsive to add value for the customers in the form of extended business organization and comply with the tax authorities. The business goal might seem to be difficult to achieve by individual organizations, but can be easily achieved through collaborative relationships. Hence, collaborative behavior and activities in business environment gained considerable importance (Manoj et al., 2014).

Collaborative relationship between organizations has received considerable attention in recent times (Samaddar & Kadiyala, 2006). This is because it results in performance improvement (effectiveness) in the chain (Vereecke & Muylle, 2006). Hence there is a need to have tight integration of businesses/organizations to achieve effectiveness (Vereecke & Muylle, 2006). Firms are building collaborative relationships with their partners in order to achieve efficiencies and

effectiveness (Nyaga et al., 2010). Dyer and Singh (1998) as cited in Manoj et al. (2014) argued that collaborating firms can generate relational rents through relation-specific assets, knowledge-sharing routines, complementary resource endowments, and effective governance. However, collaboration has been defined in different ways by different authors. To ensure effectiveness of tax systems, authorities demand that manufacturers or suppliers implement common processes which often require the sharing of information (Cheng, 2011). Information sharing significantly affects in reducing costs, and achieving set goals (Cheng, 2011; Jain et al., 2009). Today's market is electronically connected and dynamic in nature. Therefore, companies are trying to improve their agility level with the objective of being flexible and responsive to meet the changing market requirements. In an effort to achieve this, many companies have embraced new innovations and technology (Jain et al., 2009). Information is seen as the “glue” that holds together the business structures that allow them to respond to the changing environment (Sanders & Premus, 2002) resulting in effective adoption and implementation of systems.

Although the above literature shows that there is a relationship between collaboration and effectiveness of digital stamping system of tracking (see for example, OECD, 2015; Cao & Zhang, 2011; Venkatesh et al., 2003; Walter, 2003, among others), the link between them has not been given significant attention by most scholars and practitioners, hence a reason for this study.

2.7 The Mediating Role of Collaboration in the Relationship between Firm Capabilities and Effectiveness of Digital Stamping System of Tracking

With new information and new capabilities, a wide range of collaborative possibilities emerge for enhanced implementation of digitalized systems. Wachira and Kihui (2012) reveal that capabilities create pressures on institutions or businesses to provide reasonable benefits. Furthermore, access to

third-party information has allowed governments increasingly to “prepopulate” tax returns, easing the compliance burden even further, with taxpayers simply having to verify the information they are presented with. And access to additional information sources and capabilities to link existing information in various government systems is helping tax authorities to better detect evasion or avoidance (OECD, 2015) hence effectiveness of the system. Therefore, advanced digital channels are required to encourage collaborative activities in the business process. Furthermore, different researchers have reconsidered digital tools as a facilitator of collaboration among business partners, which can be a challenging pursuit, one that often requires adaptations and new business models (Foltean et al., 2019; Nath et al., 2010).

The increased digitalization of companies’ operating environments provides possibilities for digital innovation to occur. As related to business processes, real-time activities and automated production processes (Fichman et al., 2014), for example, continuously affect the approach to development and innovation. New types of digital solutions provide broadened opportunities for data gathering, and assist companies and their employees and managers in decision making (Jarrahi, 2018). This development of digital solutions creates circumstances in which different governments increase options for generating digital innovations and affecting the business processes of companies. Richter et al. (2018) further highlighted that, in the context of digital work design, companies must cultivate the understanding of which work practices allow work to be more autonomous while at the same time allowing employees to learn and collaborate with each other. However, an organization’s absorptive capacity is not simply the sum of the individuals’ capabilities. It is also affected by other organizational factors (Cohen & Levinthal, 1990). The combination of systems capabilities (adaptive, absorptive and innovative) determines how well the

company can integrate and collaborate with other organizations (Teece, 2019; Wang & Ahmed, 2007; Linsu, 2004).

There is also a lot of evidence that an effective knowledge and technology transfer is important for a successful collaboration (Philbin, 2010). An intense transfer can foster innovation performance (Mingji & Ping, 2014), improve the technology novelty (Guan et al., 2005) or enhance product development (George et al., 2002). This holds true particularly for knowledge-intensive business services (Fernandes & Ferreira, 2013). According to Porter and Heppelmann (2015), making products and services smarter widens opportunities for companies' capabilities to, for example, monitor products and services and personalize product functioning. Human capabilities are needed to integrate organizations' core competitive advantages and knowledge with these widened opportunities to generate successful digital innovations that can leverage market offerings. These capabilities enable companies to respond quickly to digital transformation and to thereby exploit digital innovation (Fichman et al., 2014; Kohli & Mekville, 2019; Nambisan et al., 2017). Successful digital innovation greatly depends on how capabilities are understood and, subsequently, how such capabilities are adapted with regard to innovation outcomes, processes, and related markets (Nambisan et al., 2017; Nylén & Holmström, 2015). Moreover, digital innovation is incorporated into the continuous matching of digital-related capabilities with traditional market offerings (Nambisan et al., 2017).

Digitalization provides many ideal opportunities, particularly for small and medium-sized enterprises (SMEs), and the interplay between companies' different types of capabilities and innovation in digitalizing business is of growing interest to both academics and practitioners (Bednar & Welch, 2019; Mikalef et al., 2018). Even though most companies realize that external

collaboration will be essential, companies have difficulties establishing these relationships (Muller, 2019). As previously mentioned, data-sharing is one major issue and additionally, the ownership of specific data is often unclear, and some companies consider it risky to become dependent on other companies (Constantinides et al., 2018; Muller, 2019; Singh et al., 2018). The collaboration is further complicated by the fact that digital platforms within the manufacturing industry often involve large investments which need to be compensated by the obtained value. In the big picture, digital transformation requires companies of all sizes to rethink and innovate their businesses, yet SMEs may have little time and few resources for experimenting with their businesses or for implementing new strategies (Bouwman et al., 2019). Recent research has investigated how SMEs with inadequate capabilities and limited resources drive digital transformation (Li et al., 2018) and has further demonstrated the lack of understanding of the capabilities of SMEs with respect to different aspects of digital transformation.

Despite a wide research conducted by different scholars on each of the study variables (that is to say; firm capabilities, collaboration and effectiveness of digital stamping system of tracking), the joint link between them especially with a bias on mediation has not been given significant attention in a developing context like Uganda. It is against such a backdrop that this study sought to examine the mediating role of collaboration in a relationship between firm capabilities and effectiveness of digital stamping system of tracking.

CHAPTER THREE

RESEARCH METHODOLOGY

3.0 Introduction

This describes the methods that were used in the study including, the research design, study population, sample size, sampling procedure/technique, sources of data, data collection instrument, measurement of variables, validity and reliability of the instrument, data analysis and presentation, and ethical consideration.

3.1 Research Design

The study was cross-sectional and quantitative involving descriptive, correlation and regression statistics. A cross-sectional design involves examining variables under investigation at one point in time (Salkind, 2011). A quantitative approach was preferred because it enables generalization of the findings. This study took cross-sectional design since it focused on testing rather than generating theory.

3.2 Study Population

The study constituted 232 firms (both manufacturers and importers) enrolled on the system (URA records, 2020; URA website: www.ura.go.ug Accessed in October, 2020). Both manufacturers and importers were chosen because they were the target group for the digital stamping system of tracking introduced by URA. The unit of analysis was selected firms (manufacturers and importers) using the digital stamping system of tracking and the unit of inquiry were heads of operations or managers in those firms. The heads of operations or managers were preferred because they were perceived to be knowledgeable about the phenomena under study due to their direct dealing with the system.

3.3 Sample Size

A sample size of 144 enrolled firms out of the total population of 232 firms was obtained based on a sample determination table developed by Krejcie and Morgan (1970). One questionnaire was distributed per firm, making a total of 144 questionnaires. These were considered representative enough for the study.

3.4 Sampling Design and Procedure

Both probability and non-probability sampling methods specifically simple random sampling and purposive sampling respectively were used to select respondents (firms and individuals) from the population. Simple random sampling was applied to select the firms. Simple random sampling technique is flexible and gives equal chance to respondents to be in a sample (Amin, 2005). This method involved identifying and giving numbers to each of the firms as per the accessed population. These numbers were then placed in a container, mixed thoroughly and randomly picked until the sample number (144) was reached. The selected firms were then the sample units for the study.

Purposive sampling on the other hand were used to select individual respondents (heads of operations or managers) According to Saunder et al. (2003), purposive sampling approach is where a researcher uses judgment to select cases that best enable him/her answer specialized questions. Further, strategic issues on the study can only be obtained from specific people making purposive sampling a right approach for this study. This is because they are more knowledgeable about the phenomena under investigation. This involved identifying the heads of operations or managers and then separating them from the rest of the population for easy accessibility.

3.5 Sources of Data

The study considered a primary source of data. This is because it provides first-hand and new information to the researcher needed for the study. This data was collected by use of closed-ended structured questionnaires which were distributed to the respondents and later retrieved.

3.6 Data Collection Instrument and Procedure

Data was collected using a self-administered structured questionnaire comprising of only closed-ended questions. Closed-ended questions are easy to administer, analyze and saves time during data collection (Mugenda & Mugenda, 2003). A drop and pick method of distributing questionnaires was used where a minimum of one and a maximum of two weeks were given to the respondents to respond to the questions. A questionnaire was appropriate because the study covered a large population within a specific time.

3.7 Measurement of Variables

A self-administered structured questionnaire anchored on a 5-point Likert scale ranging from “1= Strongly Disagree (SD), 2= Disagree (D), 3= Not Sure (NS), 4= Agree (A) to 5= Strongly Agree (SA)” was designed and provided for respondents to select suitable responses. A five point Likert scale was opted for because it produces better distribution of data, ideal for a larger study and relatively easier for respondents to understand. This was applied to all the study variables below;

- i. **Firm capabilities;** was measured based on dimensions of adaptive capability, absorptive capability and innovative capability adapted from the works by Teece et al. (1997) and Wang and Ahmed (2007).

- ii. **Collaboration;** was measured using dimensions such as information sharing, decision synchronization and incentive alignment adapted from the works by Simatupang and Sridharan (2008).
- iii. **Effectiveness of digital stamping system;** was measured based on dimensions of frequency of use, nature and ease of use and user satisfaction adapted from the early study by Green (2001).

3.8 Validity and Reliability

The study considered content validity. According to Creswell (2005), content validity measures the extent to which the questions on the instrument and the scores from these questions represent all possible questions that could be asked about the study content. This involved requesting experts such as practitioners and academicians to cross check whether the instrument was valid before its final administration. Content Validity Index (CVI) was then computed and any value of 0.70 or more was considered good as suggested by Kothari (2004).

Reliability test involved use of a Cronbach Alpha to determine the consistency of the instrument and any value of 0.70 or more was considered good as suggested by Nunnally (1978). These are presented in the table below;

Table 1: Reliability and Validity

Variables	Cronbach Alpha Coefficient	Content Validity Index
Firm Capabilities	.778	.800
Collaboration	.740	.867
Effectiveness of Digital Stamping System	.931	.933

Source: Primary Data

The results in Table 1 above indicate that the research instrument was both valid and reliable, generating content validity index and Cronbach Alpha coefficient values above 0.70 respectively. This implies that the instrument even when subjected several times to the field, will deliver accurate and consistent results hence valid and reliable.

3.9 Data Processing, Analysis and Presentation

After data collection, the researcher cross examined the questionnaires to check for the correctness of the responses. Data were then compiled, classified, aggregated to the levels of firms in the manufacturing and importing sectors using the Statistical Package for Social Scientist (SPSS) version 23 function for aggregating under the SPSS option menu and analysis conducted. Descriptive statistics were then produced to understand the characteristics of respondents. Pearson correlation analysis was conducted to examine the relationship between the study variables. Regression analysis was also conducted to determine the extent to which the predictor variables predict the dependent variable. The results were presented in a table format for easy interpretation.

3.10 Ethical Consideration

An introductory letter was requested from the university and presented to the respondents seeking permission to collect data since the proposal was approved by the supervisors. Human dignity was observed by keeping anonymity of respondents in the questionnaire. Appointments were made with the specific respondents to determine the convenient time when the questionnaire would be administered especially after being granted permission to go on with the study. The questionnaires were structured to ease response and were kept confidential. The respondents were briefed about the importance and reason of the study and finally, after data collection, analysis and presentation, the questionnaires were destroyed by shredding.

CHAPTER FOUR

DATA ANALYSIS, INTERPRETATION AND PRESENTATION

4.0 Introduction

This chapter presents the findings generated from data analyses and interpretations based on the study objectives and research questions. It includes descriptive statistics, Pearson correlation and regression analyses results presented in an effort to satisfy the following objectives;

- i. To examine the relationship between firm capabilities and effectiveness of digital stamping system of tracking in selected firms in central region.
- ii. To examine the relationship between collaboration and effectiveness of digital stamping system of tracking in selected firms in central region.
- iii. To examine the mediating role of collaboration in the relationship between firm capabilities and effectiveness of digital stamping system of tracking in selected firms in central region.

4.1 Response Rate

Table 2: *Response Rate*

Respondent	Targeted Sample	Acquired Sample	Response Rate
Firms (Manufacturers & Importers)	144	124	86.1%

Source: Primary Data

The response rate presented in Table 2 above indicates that the researcher targeted a sample of 144 firms. However, the researcher was able to acquire questionnaires from only 124 firms, making a response rate of 86.1% which was adequate for analysis.

4.2 Background Characteristics

These include both the firm attributes and the individual attributes of respondents (The heads of operations or managers) as presented and interpreted in the tables below;

4.2.1 Firm Attributes

These include the age of the firm and the category of business the firm deals in as presented below;

Table 3: *Firm Characteristics, Total N = 124*

Firm Age	Count	Valid Percent	Cumulative Percent
Less than 3 yrs	2	1.6	1.6
4-6 yrs	31	25.0	26.6
7-10 yrs	45	36.3	62.9
11-14 yrs	32	25.8	88.7
Above 15 yrs	14	11.3	100.0
Category of Business	Count	Valid Percent	Cumulative Percent
Manufacturing	106	85.5	85.5
Import	18	14.5	100.0

Source: Primary Data

The results in Table 3 above shows that 98.4% of the firms (both manufacturing and import) have been in operation for more than 3 years and only 1.6% of the firms have been in operation for less than 3 years. Majority of these firms (85.5%) are in manufacturing business and a few (14.5%) are in import business. This means that most of the firms were responding from the point of experience, with manufacturing firms dominating the study. This is justifiable given the drive by the government to promote local manufacturers or producers through the “BUBU” initiative.

4.2.2 Background Information of Individual Respondents

This constitutes the gender of respondents, age group, level of education, length of service in the firm, and current job role or position in the firm as presented in the table below;

Table 4: *Background Characteristics of Individual Respondents, Total N = 124*

Gender	Count	Valid Percent	Cumulative Percent
Male	72	58.1	58.1
Female	52	41.9	100.0
Age Group	Count	Valid Percent	Cumulative Percent
20-29 yrs	41	33.1	33.1
30-39 yrs	48	38.7	71.8
40-49 yrs	34	27.4	99.2
50 yrs and above	1	0.8	100.0
Level of Education	Count	Valid Percent	Cumulative Percent
Diploma	52	41.9	41.9
Degree	61	49.2	91.1
Masters	11	8.9	100.0
Tenure in the Firm	Count	Valid Percent	Cumulative Percent
Less than 1 yr	6	4.8	4.8
1-5 yrs	74	59.7	64.5
6-10 yrs	38	30.6	95.2
11-15 yrs	6	4.8	100.0
Job Role/ Position	Count	Valid Percent	Cumulative Percent
Operations head / Supervisor	98	79.0	79.0
Manager	26	21.0	100.0

Source: Primary Data

The results presented in Table 4 above indicate that the study was dominated by male respondents (58.1%) while female respondents were 41.9%. This means that most firms were run by males who are flexible and energetic. Majority (66.9%) of those respondents were above 30 years of age while a few (33.1%) were below 30 years of age. This means that most of them were sound and experienced people. Regarding education level, 58.1% of the respondents had undergraduate degrees and above while 41.9% of the respondents had attained up to diploma level of education, an indication that most of them meet the requirements for the positions they held and were knowledgeable. Concerning the length of service in the firm, majority (95.1%) of the respondents had worked in their respective firms for over 1 year and only 4.8% of the respondents had worked for less than a year. This means that most of them were competent people with enough knowledge,

skills, experience and were responding from the point of view. Finally, with regard to job role or position held in the firm, 79.0% of the respondents were operation heads or supervisors while only 21.0% were managers. This means that the operation heads or supervisors dominated the study due to the fact that they would be easily accessed since they were always available in the work stations.

4.3 Factor Analysis for the Study Variables

Factor analysis in this study was conducted for the purpose of verifying the structure of the variables, and determining whether the extent to which the items used actually capture the study variables. The factor analysis results show that items with loadings of less than 0.500 were removed from the factor components and those with values above 0.500 were considered. This was applied to all the study variables as below;

4.3.1 Factor Analysis for Firm Capabilities

Table 5: *Factor Analysis Results for Firm Capabilities*

Statements	<i>Absorptive capability</i>	<i>Adaptive capability</i>	<i>Innovative capability</i>
We have a strong aptitude for risk taking with expectations for high returns	.505		
We use experiences from both success and failures to influence our business actions	.786		
We hold resources that presently determine our business goals	.602		
We are equipped with excellent professional knowledge	.834		
We are constantly improving our business processes		.677	
We evolve rapidly to respond to shifts in our business		.570	

priority			
We always challenge old traditions and practices		.819	
We use different operational procedures to suit the needs of the business environment			.642
We always develop new skills and procedures to support our activities			.746
We always seek new technology trending to ease our operation			.578
Eigen Value	2.206	1.427	1.092
Variance %	29.415	19.024	14.559
Cumulative %	29.415	48.440	62.999
KMO and Bartlett's Test			
Kaiser-Meyer-Olkin Measure of Sampling Adequacy.	.681		
Bartlett's Test of Sphericity			
Approx. Chi-Square	123.312		
Df	28		
Sig.	.000		

Source: Primary Data

The results in Table 5 above show that components such as absorptive capability, adaptive capability and innovative capability jointly account for 62.999% of the variance in firm capabilities. The most dominant component was absorptive capability which account for 29.415%, followed by adaptive capability which account for 19.024% while the least was innovative capability accounting for 14.559% of the variable. The most influential features under absorptive capability were; we are equipped with excellent professional knowledge (.834); we use experiences from both success and failures to influence our business actions (.786); we hold resources that presently determine our business goals (.602); and we have a strong aptitude for risk taking with expectations for high returns (.505). This therefore means that absorptive capability is the best and most influential component of firm capabilities.

The KMO (Kaiser-Meyer-Olkin) measure of sampling adequacy was above 0.500 with a value of 0.681, showing that the sample was adequate for testing with the factor analysis tests. Further, it was noted that the Bartlett's Test of Sphericity had a level of significance less than 0.05, indicating

that the components or dimensions of the global variable, are reasonably correlated and can as such be expected to belong to the same variable.

4.3.2 Factor Analysis for Collaboration

Table 6: *Factor Analysis Results for Collaboration*

Statements	Information Sharing	Incentive Alignment	Decision Synchronization
We provide others with any information that is needed	.728		
We keep others informed about changes in needs that arise	.703		
We have information systems that facilitate information dissemination	.752		
We take necessary steps to freely share information relevant for business development	.738		
We share benefits of our relationship with others		.696	
We share with others risks resulting from our relationship		.721	
We are provided with detailed procedures on how to protect our businesses from risks		.678	
We are provided with training support to improve our business		.681	
We are committed to improvements and strengthening relationships			.821
We welcome and embrace any initiative within the business environment			.771
We comply to the policies and regulations governing our operations			.908
Eigen Values	2.8657	1.3937	.9891
Variance %	38.2094	18.5824	13.1877
Cumulative %	38.2094	56.7919	69.9796
KMO and Bartlett's Test			
Kaiser-Meyer-Olkin Measure of Sampling Adequacy.		.713	
<i>Bartlett's Test of Sphericity</i>			
Approx. Chi-Square		485.425	
Df		105	
Sig.		.000	

Source: Primary Data

Results in Table 6 above indicate that information sharing, incentive alignment and decision synchronization all together account for 69.9796% of the variance in collaboration. The most influential components were information sharing, and incentive alignment which independently account for 38.2094% and 18.5824% of the study variable respectively and the least was decision synchronization with 13.1877%. The most influential features of information sharing were; we have information systems that facilitate information dissemination (.752); we take necessary steps to freely share information relevant for business development (.738); we provide others with any information that is needed (.728); and we keep others informed about changes in needs that arise (.703). This therefore means that information sharing, and incentive alignment as components of collaboration can be considered highly than decision synchronization.

The Kaiser-Meyer-Olkin (KMO) measure of sampling adequacy was above 0.500 with a value of 0.713, showing that the sample was adequate for testing with the factor analysis tests. Further, the Bartlett's Test of Sphericity had a level of significance less than 0.05, indicating that the components or dimensions of the main variable are reasonably correlated and can as such be expected to belong to the same variable.

4.3.3 Factor Analysis for Effectiveness of Digital Stamping System

Table 7: *Factor Analysis Results for Effectiveness of Digital Stamping System*

	<i>Frequency of use</i>	<i>Nature and ease of use</i>	<i>User satisfactio n</i>
We frequently monitor the operation of the system	.656		
We avail facilities and requirements needed for the system	.531		
We get realistic expectations about the system capabilities	.774		
We make sure the system does not affect productivity		.657	

We make easy the process of accessing the system		.619	
We obtain skills on how to use the system through training		.640	
We make sure the right stamps are used on products			.812
We make sure the system performs the function it is meant to			.700
Eigen Values	3.152	1.644	1.492
Variance %	38.693	23.582	21.556
Cumulative %	38.693	62.276	83.832
KMO and Bartlett's Test			
Kaiser-Meyer-Olkin Measure of Sampling Adequacy.		.946	
<i>Bartlett's Test of Sphericity</i>			
Approx. Chi-Square	1457.433		
Df	105		
Sig.	.000		

Source: Primary Data

The results in Table 7 above show that the main components of effectiveness of digital stamping system of tracking include frequency of use, nature and ease of use, and user satisfaction, which jointly account for 83.832% of the variance in the variable. Frequency of use, and nature and ease of use were the most dominant components of effectiveness of digital stamping system of tracking and account for 38.693% and 23.582% respectively, while user satisfaction is the least dominant component of effectiveness of digital stamping system of tracking, accounting for 21.556%. The most salient features of frequency of use were; we get realistic expectations about the system capabilities (.774); we frequently monitor the operation of the system (.656); and we avail facilities and requirements needed for the system (.531). Therefore, frequency of use, and nature and ease of use are the best components of effectiveness of digital stamping system of tracking. The KMO (Kaiser-Meyer-Olkin) measure of sampling adequacy was above 0.500 with a value of 0.946, showing that the sample was adequate for testing with the factor analysis tests. Further, it was noted that the Bartlett's Test of Sphericity had a level of significance less than 0.05, indicating that the components or dimensions of the main variable, are reasonably correlated and can as such be expected to belong to the same variable.

4.4 Relationship between the Study Variables

The study used Pearson (r) correlation analysis to examine the relationship between the study variables. The Pearson correlations coefficient ranges between -1.000 and 1.000. A Perfect positive relationship is indicated by a positive 1.000 while a perfect negative relationship is represented by a -1.000. Evans (1996), establishes that correlation values which are less than 0.400 are weak, while those that are at least 0.400 but less than 0.600 are classified as moderate. Finally, those values over 0.600 are classified as being strong. Field (2009) states that means represent a summary of the data and standard deviations show how well the means represent the data. Given that the variables were measured on a five-point Likert scale such that 1 represents Strongly Disagree (SD), 2 – Disagree (D), 3 – Not Sure (NS), 4 – Agree (A) and 5 - Strongly Agree (SA), means closer to 1 or 2 can be interpreted as indicating disagreement with the issues, those closer to 3 indicate uncertainty about the issues raised while means closer to 4 or 5 indicates agreement with the issues under the variables as presented in the table below.

Table 8: *Correlation Analysis*

	Mean	SD	1	2	3
Firm Capabilities-1	3.930	.568	1.000		
Collaboration-2	3.153	.933	.486**	1.000	
Effectiveness Of Digital Stamping System-3	4.411	.827	.463**	.458**	1.000

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

Source: Primary Data

4.4.1 The Relationship between Firm Capabilities and Effectiveness of Digital Stamping System of Tracking

The results in Table 8 above indicate a statistically positive and significant relationship between firm capabilities and effectiveness of digital stamping system of tracking ($r = .463^{**}$, $\text{sig.} < .01$). This means that firms with the ability to timely adapt itself by aligning resources and capabilities

with environmental changes can easily use the digital stamping system hence its effectiveness. Similarly, firms that take external knowledge combines it with internal knowledge and absorb it for internal usage have the capacity to frequently use the digital stamping system. Also, when firms develop new changes by aligning strategic innovative orientation with innovative behaviours and processes, they find it easy to embrace any change that may come in the business environment hence satisfaction. Therefore, firm capabilities are associated with effectiveness of digital stamping system of tracking. But absorptive capability is the most influential dimension of firm capabilities.

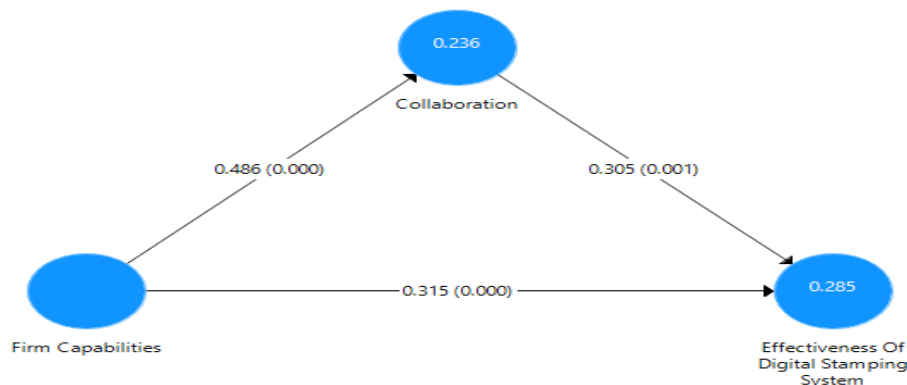
4.4.2 The Relationship between Collaboration and Effectiveness of Digital Stamping System of Tracking

The results in Table 8 above shows a statistically positive and significant relationship between collaboration and effectiveness of digital stamping system of tracking ($r = .458^{**}$, sig. $< .01$). This means that accurate, timely, frequent and two-way exchange of relevant information within and among firms help to build confidence and trust making it easy to use the digital stamping system of tracking hence its effectiveness. Similarly, firms that share risks, costs and benefits within or among themselves tend not to refrain from any change that may occur in the business environment. In other words, they tend to confront it which in turn results in their satisfaction. Also, when firms participate in joint planning activities related to business transactions, they tend to learn from each other thereby equipping themselves with knowledge, skills and experience which may in turn result in the effectiveness of the digital stamping system of tracking. Therefore, collaboration is associated with effectiveness of digital stamping system of tracking. But information sharing is the most influential dimension of collaboration.

4.4.3 The Mediating Role of Collaboration in the Relationship between Firm Capabilities and Effectiveness of Digital Stamping System of Tracking

The researcher used SMART-PLS software to test the mediating effect of collaboration in the relationship between firm capabilities and effectiveness of digital stamping system of tracking. The SPSS data was exported to the SMART PLS Software and then the conceptual model was constructed using the software and thereafter, the “bootstrapping” of the software used to generate the indirect and direct effects. The indirect effects were observed and presented in the report to determine whether the mediation was supported or not. The Partial least squares approach provided by the SMART-PLS allows us to test for the mediating interactions by presenting both the direct, indirect and total effects as well as the significant values that relate to the links. The partial least square was adopted because the study sought to understand the prediction and interaction among variables (Hair et al., 2017). The model generated for this cause was presented as shown in the figure below;

Figure 2: *The Mediating Role of Collaboration*



The model results revealed that there is a statistically significant relationship between firm capabilities and collaboration (Beta = .486, sig. < .05). Similarly, the model and the results

indicated in Table 9 below, show that firm capabilities significantly influences effectiveness of digital stamping system of tracking (Beta = .315, sig < .05).

Table 9: Mediation and Direct Effects

Direct Effects	Beta	Mean	STDEV	T Statistics	P Values
Collaboration → Effectiveness of Digital Stamping System	.305	.303	.089	3.407	.001
Firm Capabilities → Collaboration	.486	.483	.069	7.030	.000
Firm Capabilities → Effectiveness of Digital Stamping System	.315	.310	.088	3.592	.000
Indirect Effects	Beta	Mean	STDEV	T Statistics	P Values
Firm Capabilities → Collaboration → Effectiveness of Digital Stamping System	.148	.148	.052	2.831	.005
Total Effects	Beta	Mean	STDEV	T Statistics	P Values
Collaboration → Effectiveness of Digital Stamping System	.305	.303	.089	3.407	.001
Firm Capabilities → Collaboration	.486	.483	.069	7.030	.000
Firm Capabilities → Effectiveness of Digital Stamping System	.463	.457	.069	6.690	.000

Source: Primary Data

The results above showed that the Direct effect paths were all significant for instance, path from Collaboration → Effectiveness of digital stamping system ($\beta = .305$, $p < .05$), the Path from Firm capabilities → Collaboration ($\beta = .486$, $p < .05$). The results further show that at the same time, the Indirect path from firm capabilities to effectiveness of digital stamping system i.e. Firm capabilities → Collaboration → Effectiveness of digital stamping system was also statistically significant ($\beta = .148$, $p < .05$). Therefore results show that Collaboration plays a partial mediating role in the relationship between the Firm capabilities and Effectiveness of digital stamping system of tracking. This means that the effects of Firm capabilities on Effectiveness of digital stamping system of tracking are partly channeled through collaboration.

4.5 Regression Analysis

A multiple regression model was used in the study to examine the extent to which firm capabilities and collaboration can predict effectiveness of digital stamping system of tracking. This is presented in the table below;

Table 10: Regression Model Analysis

	<i>Unstandardized Coefficients</i>		<i>Standardized Coefficients</i>	t	Sig.
	B	Std. Error	Beta		
(Constant)	.569	.646		.881	.380
Firm Capabilities	.666	.186	.315	3.577	.001
Collaboration	.392	.113	.305	3.463	.001
Dependent Variable: Effectiveness of Digital Stamping System					
R		.534			
R Square		.285			
Adjusted R Square		.273			
Std. Error of the Estimate		1.024			
F Statistic		24.116			
Sig.		.000			

Source: Primary Data

The results in Table 10 above indicate that firm capabilities and collaboration account for 27.3% of the variance in effectiveness of digital stamping system of tracking (Adjusted R Square = .273). These imply that other factors contribute 72.7%. The results further show that firm capabilities (Beta = .315, sig. < .05) and collaboration (Beta = .305, sig. < .05) are all significant predictors of effectiveness of digital stamping system of tracking. But firm capabilities is the most influential predictor of effectiveness of digital stamping system of tracking as represented by the highest Beta value. The regression model was statistically significant (sig. < .05).

CHAPTER FIVE

DISCUSSIONS, CONCLUSIONS AND RECOMMENDATIONS

5.0 Introduction

This chapter discusses the findings reported in the previous chapter based on the research questions and objectives, draws conclusions and suggests recommendations for the findings, states limitations of the study and also proposes some areas for further research.

5.1 Discussion of Findings

The findings were discussed based on the research objectives and research questions as below.

5.1.1 Firm Capabilities and Effectiveness of Digital Stamping System of Tracking

The study established a positive and statistically significant relationship between firm capabilities and effectiveness of digital stamping system of tracking following the Pearson correlation analysis results. Further, the regression analysis results revealed that firm capabilities is a statistically significant predictor of effectiveness of digital stamping system of tracking. These mean that firms

that have a strong aptitude for risk taking with expectations for high returns can not hesitate to obtain skills on how to use the system through training. Similarly, firms that are equipped with excellent professional knowledge tend to make easy the process of accessing the system hence its effectiveness. Also, firms that constantly improve their business processes tend to ensure the system performs the functions it is meant to, which in turn results in their satisfaction. In addition, firms that prioritize rapid response to shifts in business often get realistic expectations about the system's capabilities. Further, firms that always develop new skills and procedures to support their activities often make sure the right stamps are used on their products, thus ensuring effectiveness of the system. Therefore, an improvement in firm capabilities results in effectiveness of the digital stamping system of tracking.

These findings are supported by the works of Ambrosini et al. (2009) who found that firm capability is a source of superior performance (effectiveness) and may result in sustainability. Similarly, Vijay and Ajay (2011) revealed that capabilities are vital in enabling businesses to interact effectively with both the internal and external environment to achieve desired outcome. Also, Mulyono (2013) confirmed that performance (effectiveness) is dependent on the resources and the capabilities that these businesses control. Further, Sudan (2015) opined that enhanced tax stamps, particularly those with track and trace mechanisms, are important to maintain an accurate and objective measure of what has been produced by each manufacturer based on their capabilities.

5.1.2 Collaboration and Effectiveness of Digital Stamping System of Tracking

The study established a positive and statistically significant relationship between collaboration and effectiveness of digital stamping system of tracking following the Pearson correlation analysis results. Further, the regression analysis results confirmed that collaboration is a statistically

significant predictor of effectiveness of digital stamping system of tracking. These imply that firms that have information systems that facilitate information dissemination tend to frequently monitor the operation of the system. Similarly, when firms take necessary steps to freely share information relevant for business development, they make easy the process of accessing the system. Also, firms that are provided with training support to improve their business are likely going to make sure the right stamps are used on products and ensure that the system performs the function it is meant to hence its effectiveness. In addition, when firms are provided with detailed procedures on how to protect their businesses from risks, it becomes easy for them to make sure the system does not affect productivity. Further, firms that welcome and embrace any initiative within the business environment as well as complying to the policies and regulations governing their operations are likely to avail facilities and requirements needed for the system. Therefore, collaboration within and among firms enhances effectiveness of digital stamping system of tracking.

These findings are supported by Sanders and Premus (2002) who asserted that Information is seen as the “glue” that holds together the business structures that allow them to respond to the changing environment. Similarly, Nyaga et al. (2010) affirmed that firms are building collaborative relationships with their partners in order to achieve efficiencies and effectiveness. Also, Cheng (2011) stated that to ensure effectiveness of tax systems, authorities demand that manufacturers or suppliers implement common processes which often require the sharing of information. Further, Cao and Zhang (2011) revealed that open, frequent, balanced, two-way, multilevel communication is generally an indication of close collaboration and result in effectiveness of systems.

5.1.3 The Mediating Role of Collaboration in the Relationship between Firm Capabilities and Effectiveness of Digital Stamping System of Tracking

The study established that collaboration partially mediates the relationship between firm capabilities and effectiveness of digital stamping system of tracking following the SMART-PLS results. This means that collaboration is fundamental even in the presence of firm capabilities. It also implies that even when there is collaboration among firms through information sharing, incentive alignment and decision synchronization, firm capabilities within firms remains significant towards ensuring effectiveness of digital stamping system of tracking. In other words, firm capabilities influences effectiveness of digital stamping system of tracking even in the presence of a mediator. Therefore, the effect of firm capabilities on effectiveness of digital stamping system of tracking is partly channeled through collaboration.

This finding is supported by the findings of OECD (2015) that stated that access to additional information sources and capabilities to link existing information in various government systems is helping tax authorities to better detect evasion or avoidance hence effectiveness of the system. Also, Fichman et al. (2014) affirmed that human capabilities are needed to integrate organizations' core competitive advantages and knowledge with these widened opportunities to generate successful digital innovations that can leverage market offerings. These capabilities enable companies to respond quickly to digital transformation and to thereby exploit digital innovation.

5.2 Conclusions

The study sought to examine the relationship between firm capabilities and effectiveness of digital stamping system of tracking. It can therefore be concluded that firm capabilities is statistically a significant predictor of effectiveness of digital stamping system of tracking. This means that to

ensure effectiveness of the digital stamping system of tracking, firm capabilities such as absorptive, adaptive and innovative capabilities need to be developed.

The study also sought to examine the relationship between collaboration and effectiveness of digital stamping system of tracking. It can therefore be concluded that collaboration is a statistically significant predictor of effectiveness of digital stamping system of tracking. This means that information sharing, incentive alignment and decision synchronization need to be improved within or among firms if they are to ensure effectiveness of the digital stamping system of tracking.

Further, the study sought to examine the mediating role of collaboration in the relationship between firm capabilities and effectiveness of digital stamping system of tracking. It can therefore be concluded that collaboration partially mediates the relationship between firm capabilities and effectiveness of digital stamping system of tracking. This means that firms need to collaborate even when they have the capabilities to respond to changes. In other words, even when firms develop absorptive, adaptive and innovative capabilities, they need to collaborate if they are to ensure effectiveness of digital stamping system of tracking.

5.3 Recommendations

The firms need to develop capabilities necessary for their operations and transformational purposes. This can be possible through organizing trainings tailored to the needs of the staff, workshops as well as encouraging them to attain professional courses to equip them with excellent professional knowledge suitable for handling business activities as this will enable them comply to the changes in the business environment easily.

There is need by the firms to demonstrate ability to improve their business processes and respond rapidly to shifts in business priority as this will enable them to easily avail the facilities and requirements needed for the system. This is possible through developing new methods and procedures of operations as well as training the staff on how to apply them.

There is need by the firms to put in place appropriate information system that facilitates information dissemination with the intent of keeping others informed about the changing business environment and way forward. Free sharing of information creates trust and confidence among staff hence commitment to their roles.

The firms need to collaborate with the tax authorities by complying with the policies and regulations governing their operations as this will open their minds towards any change in the business environment. This is possible through sensitization on the benefits and need for embracing the change.

5.4 Limitations of the Study

The study was limited to central region with a focus on Kampala, Wakiso, Mukono and Entebbe and ignored other areas prone to similar problems. However, the study remained relevant due to the fact that many firms are confined within these areas.

The study was cross-sectional and quantitative involving descriptive, correlation and regression statistics and ignored the qualitative approach of collecting data which could have provided a supplement to the quantitative data.

5.5 Suggested Areas for Further Study

Further study should look at a similar topic but with a focus on a large geographical area including other districts since this study focused on only four districts in the central region of Uganda. This will provide a basis for comparison of results.

Further study should apply the qualitative approach of collecting data in addition to the quantitative approach. This will help to concretize the findings obtained.

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APPENDICES

Appendix One: Research Questionnaire

**MAKERERE UNIVERSITY
MAKERERE UNIVERSITY BUSINESS SCHOOL
FACULTY OF GRADUATE STUDIES AND RESEARCH**

Dear respondent,

You have been selected to participate in a study on **“Firm Capabilities, Collaboration and Effectiveness of Digital Stamping System of Tracking: A Case of Selected Firms in Central Region, Uganda.”** The study is being conducted in fulfillment of the requirement for the award of a degree of Master of Business Administration. This questionnaire is seeking information on the study. The study is purely academic and the information provided will be treated as highly CONFIDENTIAL. The researcher guarantees the destruction of the questionnaires once the data has been analyzed and conclusions drawn. Your co-operation is highly appreciated.

SECTION A: Background information

Please tick the most appropriate option

A1- Gender

Male	Female
1	2

A2- Age Group

20-29 years	30-39 years	40-49 years	50 years and above
1	2	3	4

A3- Level of education

Diploma	Degree	Masters	PhD	Others (specify)
1	2	3	4	5

A4- Length of service in the firm/company

Less than 1 year	1-5 years	6-10 years	11-15 years	More than 15 years
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1	2	3	4	5
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A5- How long has this firm/company been in operation?

Less than 3 years	4-6 years	7-10 years	11-14 years	Above 15 years
1	2	3	4	5

A6- Current job role/position in the firm/company

Operations head/Supervisor	Manager
1	2

A7- What category of business is your firm/company dealing in?

Manufacturing	Import	Others (specify)
1	2	

In the following sections please state the extent to which you agree or disagree to a particular statement about each competence by ticking the appropriate response.

	SECTION B: FIRM CAPABILITIES	Strongly	Disagree (2)	Not sure (3)	Agree (4)	Strongly
	In a bid to show some level of capabilities, ...					
AD1	We respond quickly to changes in the business environment	1	2	3	4	5
AD2	We are able to combine newly acquired knowledge with existing knowledge successfully	1	2	3	4	5
AD3	We are constantly improving our business processes	1	2	3	4	5
AD4	We evolve rapidly to respond to shifts in our business priority	1	2	3	4	5
AD5	We always challenge old traditions and practices	1	2	3	4	5
AB1	We have a strong aptitude for risk taking with expectations for high returns	1	2	3	4	5
AB2	We use experiences from both success and failures to influence our business actions	1	2	3	4	5
AB3	We hold resources that presently determine our business goals	1	2	3	4	5
AB4	We are equipped with excellent professional knowledge	1	2	3	4	5
AB5	We take initiative to discover and explore new sources of ideas and knowledge	1	2	3	4	5
IN1	We use different operational procedures to suit the needs of the business environment	1	2	3	4	5
IN2	We always develop new skills and procedures to support our activities	1	2	3	4	5

	SECTION B: FIRM CAPABILITIES	Strongly	Disagree (2)	Not sure (3)	Agree (4)	Strongly
	In a bid to show some level of capabilities, ...					
IN3	We always seek new technology trending to ease our operation	1	2	3	4	5
IN4	We often deal in products and services trending in the market	1	2	3	4	5
IN5	We often make good decisions basing on the new offers in the business environment	1	2	3	4	5

	SECTION C: COLLABORATION	Strongly	Disagree (2)	Not sure (3)	Agree (4)	Strongly
	In a bid to ensure collaboration, ...					
IS1	We provide others with any information that is needed	1	2	3	4	5
IS2	We keep others informed about changes in needs that arise	1	2	3	4	5
IS3	We use various data sources for easy business planning	1	2	3	4	5
IS4	We have information systems that facilitate information dissemination	1	2	3	4	5
IS5	We take necessary steps to freely share information relevant for business development	1	2	3	4	5
DS1	We are committed to improvements and strengthening relationships	1	2	3	4	5
DS2	We always plan and seek resolution about improving business	1	2	3	4	5
DS3	We forecast the possibility of changes in the business environment and consult how to go by them	1	2	3	4	5
DS4	We welcome and embrace any initiative within the business environment	1	2	3	4	5
DS5	We comply to the policies and regulations governing our operations	1	2	3	4	5
IA1	We share benefits of our relationship with others	1	2	3	4	5
IA2	We share with others risks resulting from our relationship	1	2	3	4	5
IA3	We are provided with detailed procedures on how to protect our businesses from risks	1	2	3	4	5
IA4	We are provided with training support to improve our business	1	2	3	4	5
IA5	We are often appreciated for compliance with the law	1	2	3	4	5

	SECTION D: EFFECTIVENESS OF DIGITAL STAMPING SYSTEM	Strongly	Disagree (2)	Not sure (3)	Agree (4)	Strongly Agree
	In a bid to ensure effectiveness of digital stamping system of tracking, ...					

FU1	We spend credible amount of effort interacting with the system	1	2	3	4	5
FU2	We frequently monitor the operation of the system	1	2	3	4	5
FU3	We embrace and frequently use the system	1	2	3	4	5
FU4	We avail facilities and requirements needed for the system	1	2	3	4	5
FU5	We get realistic expectations about the system capabilities	1	2	3	4	5
NU1	We operate and maintain the system easily	1	2	3	4	5
NU2	We make sure the system does not affect productivity	1	2	3	4	5
NU3	We make easy the process of accessing the system	1	2	3	4	5
NU4	We obtain skills on how to use the system through training	1	2	3	4	5
NU5	We often commit ourselves to the system	1	2	3	4	5
US1	We make sure the right stamps are used on products	1	2	3	4	5
US2	We make sure the system performs the function it is meant to	1	2	3	4	5
US3	We are equipped with enough knowledge of the system	1	2	3	4	5
US4	We participate in any development concerning the system	1	2	3	4	5
US5	We make sure the cost of administering the system is low	1	2	3	4	5

Thanks for your Cooperation

