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LEVERAGING ROBOTIC PROCESS AUTOMATION AS AN ENABLER OF ORGANIZATIONAL DIGITAL TRANSFORMATION: A CASE OF A TELECOMMUNICATION COMPANY IN KENYA

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Declaration

I, Maureen Cherotich Sitienei, do hereby declare that this research project report is my original work and where there is contribution of other individual, it has been duly acknowledged. To the best of my knowledge, this research work has not been presented in any educational institution for academic credit.

Maureen Cherotich Sitienei

P54/12078/2018

Signature…… Date……

I, Prof. Elisha Toyne Opiyo, do hereby certify that this project report has been presented for examination with my approval as a University of Nairobi Supervisor.

Prof. Elisha Toyne Opiyo

Signature…… Date ……

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Abstract

Organizations are adopting newer technologies in a rapidly evolving digital environment to develop new or change present business processes to meet changing business and customer expectations. Robotic Process Automation is at the forefront of these disruptive technologies and has immense potential for transforming the delivery of processes. Organizations spend significant amount of time managing processes that are highly repetitive, straightforward, rule-based and time-consuming and can be automated with RPA. However, often organizations which have embarked on their digital transformation journey, using RPA as an enabler, do not scale beyond concept proof. This research aimed at establishing a model for RPA adoption. Previous studies on technology adoption frameworks, digital transformation frameworks and concepts on RPA supported this research. Influence of RPA performance expectancy, RPA effort expectancy, RPA facilitating condition, RPA social influence and RPA risks and threats on leveraging RPA were investigated with age, gender and experience as moderating factors. To test these factors, the study took a quantitative approach where data was collected from 117 employees of the study organization using structured questionnaires. Analysis of data was carried out using SPSS tool and presented using tables, charts and percentages. Multiple linear regression result demonstrated that 92.1 per cent of the variation in the dependent variable was accounted for by independent variables. The outcome presents a framework for leveraging RPA. The inferences of these results for future research are discussed.

Keywords: Robotic Process Automation, digital transformation, adoption, software robot

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Acronyms

RPA	Robotic process Automation
Dx	Digital Transformation
BPM	Business Process Management
DOI	Diffusion of Innovation
FTE	Full-time Equivalent
PBC	Perceived Behavioral Control
POC	Proof of Concept
TAM	Technology Acceptance Model
TPB	Theory of Planned Behavior
TRA	Theory of Reasoned Action
UTAUT	Unified Theory of Acceptance and Use of Technology
CBAM	Concern-Based Adoption Model
RPAPE	RPA Performance Expectancy
RPAEE	RPA Effort Expectancy
RPASI	RPA Social Influence
RPART	RPA Risks and Threats
IRPAAI	Institute of Robotic process Automation and Artificial Intelligence

Definition of Terms

Robotic Process Automation - A form of business process automation technology based on metaphorical software robots (bots) or artificial intelligence (AI) workers.

Digital Transformation - a series of deep and coordinated culture, workforce, and technology shifts that enable new business and operating models and transform an institution's operations, strategic directions and value preposition.

Adoption - Act of embracing and using something

Variable - Anything that can take on differing or varying values

CHAPTER ONE

INTRODUCTION

1.1 Background to the problem

Digital technologies are radically reshaping organizations in every industry. To seize the benefits of these digital developments, organizations are pursuing change to capture the benefits of these changing technologies. To stay competitive in the digital age, organizations need to modernize rapidly existing services and business processes (Uskenbayeva, Kalpeyeva, Satybaldiyeva, Moldagulova, & Kassymova, 2019). Organizations are driven by the need to react to customers' needs, stay business competitive, and create value and to increase productivity by providing higher quality operations. Among these digital trends is Robotic Process Automation which enables a system to function without direct human interaction (Groover, 2014). The key drivers of automation by organizations are productivity enhancement and continuous process improvement (Lakshmi, Vijayakumar, & Sricharan, 2019).

Process automation is developed to get out the most unreliable perspective, human error, in processes thereby improving accuracy, quality, and speed of operations. RPA empowers organizations to automate tedious and monotonous operations. Organizations that have taken advantage of the RPA breakthrough have encountered benefits such as increased quality of service and processing time, reduced error rate and employee satisfaction. The IEEE Standards Association describes robotic process automation as a pre-configured software case that uses business rules and pre-defined action sequences to complete the independent execution of a variety of processes, procedures, transactions and tasks in at least one disparate software system to generate results or services with human exception management (IEEE Std 2755-2017, 2017).

Some of the RPA application techniques include process automation, IT support and administration, and Robotic assistant. RPA advancement simulates a guideline based, non-subjective activity phases without trading off the legacy IT systems (IRPAAI, 2019). A software developer builds a set of actions for automating a task in traditional process automation techniques and uses internal application programming interfaces or dedicated scripts to access the interface to back-end systems. On the other hand, by looking at the user performing the task inside the graphical user interface (GUI) of the application, RPA systems create the action list and then execute automation by repeating those tasks directly in the GUI.

There is a gap in the use of legacy IT systems when it comes to connecting to other systems, creating a need for human intervention to fill the gaps often with a series of actions that are mundane but necessary. RPA is an emerging field that seeks to automate these simple processes. The "robot" can consistently carry out set rules to action requests. Automation of procedures can accelerate back-office activities in different sections of an organization such as finance, customer service and human resources by performing routine tasks such as data entry, issuance of purchase order, and access credentials provisioning on systems, or business procedures that require employees to log into different systems. Automated procedures in the remote administration of IT infrastructure can reliably explore and resolve issues for quicker procedure throughput.

RPA permits an organization to handle short-term demand without extra head count or training. Advances in the way machines process common language, rescue information and frame simple content mean that RPA can speed up response to clients in natural language as opposed to software code. Innovation can therefore support the conservation of resources for large call centers, for customer interaction centers, improve the speed with which customer requests are handled and reduce human error. RPA can also be integrated into other technologies such as chat bots. RPA has the potential to allow for technology-driven digital transformation (Willcocks et al ,2017)

In 2014 and 2015, RPA began to gain acceptance when firms started to announce significant savings due to automation. By early 2016, there was more market uptake for RPA for back-office automation (Willcocks & Lacity, 2016).

1.2 Problem statement

There exists a lot of processes and tasks that are highly structured, deterministic and repetitive in many organizations. Telecom companies handle high number of manual repetitive tasks such as fault clearance, customer contacts, installations, product provisioning among others. Employees waste substantial time coping with repetitive procedures that can result in human error caused, decreased employee morale due to monotonous activities and increased operating costs. More than 70% of these enterprise processes can be automated using software robots (Genpact, 2018). RPA can be used by organizations to automate these processes without disrupting the underlying systems and infrastructure. Organizations are convinced that robotics can deliver benefits, such as improved compliance, faster turnaround times and higher quality with attractive payback periods. Despite the hype around RPA, there is currently slow uptake of RPA by organizations. Study by Deloitte reports that adoption of RPA at scale has not progressed (Wright, Witherick, & Gordeeva, 2018). Rutaganda et al (2017) found out that many

RPA adaptors suddenly losing interest when trying to scale their proof of concept. (Rutaganda, Bergstrom, Jayashekhar, Jayasinghe, & Ahmed, 2017) .This has been attributed to lack of an effective model for RPA adoption. By adopting RPA, implementation of once-complicated, labor-intensive and time-consuming processes can be streamlined while at the same time reducing operating costs and improving customer experience. RPA can be integrated with existing software programs such as ERPs to eliminate human intervention in the business models by automating their tasks. RPA technology is key to the future of Artificial Intelligence and will be the virtual workforce minimizing human intervention (Rai, Siddiqui, Pawar, & Goyal, 2019).

The company being studied is one of Kenya 's leading telecommunications companies and is undergoing a digital transformation process. One of its key areas of focus is recognizing and accelerating the use of emerging technologies to make their business processes more efficient. RPA is among the technologies perceived as providing great opportunities for scaling and ultimately transforming traditional knowledge work paradigms.

1.3 Research objectives

The study will be guided by the following specific objectives:

i. To investigate how RPA Performance expectancy, influence digital transformation of an organization
ii. To investigate how RPA effort expectancy, influence digital transformation of an organization
iii. To establish how RPA Facilitating conditions influence digital transformation of an organization
iv. To examine effect of RPA Social Influence on organizational digital transformation
v. To investigate the influence of RPA risks and threats on digital transformation of an organization
vi. To investigate the effect of age, gender and experience as moderating factors for independent and dependent variables.
vii. To formulate and validate the framework for the adoption and use of RPA for digital transformation

1.4 Research questions

The research questions that the study seeks to answer include:

i. How does RPA Performance expectancy influence digital transformation of an organization?
ii. What effect does RPA effort expectancy have on an organizational digital transformation?
iii. How does RPA social influence affect digital transformation of an organization?
iv. How does RPA Facilitating conditions influence digital transformation of an organization?

v. What is the impact of RPA risks and threats on digital transformation of an organization?

vi. How is the relationship between independent and dependent variables affected by age, gender and experience?

vii. How can RPA be leveraged to enhance digital transformation in an organization? How will the conceptual framework be tested and validated?

1.5 Significance of Study

This research study will provide a framework for RPA leveraging to the organization with the aim of adopting RPA in its digital transformation journey. The study will also support these organizations in streamlining internal processes, enabling better insight into trends and opportunities for digital transformation through RPA. In addition, this study will make a theoretical contribution by establishing a foundation for future RPA study.

CHAPTER TWO

LITERATURE REVIEW

2.1 Overview of Robotic Process Automation

The Institute for Robotic Process Automation and Artificial Intelligence (IRPAAI) describes RPA as the use of innovation that enables an organization's employees to configure a software robot to capture and understand legacy IT systems for transaction, operating data, response generation and communication with other advanced frameworks (IRPAAI, 2019). Robot process automation is the technical emulation of a human worker with the objective of efficiently and cost-effectively carrying out structured tasks (Slaby & Fersht, 2012). In business practices, RPA creates software to execute tasks traditionally performed by individuals, such as converting information from various input sources such as email and spreadsheets to systems such as Enterprise Resource Planning and Customer Relationship Management systems (Willcocks & Lacity, 2016). Using the RPA framework, an organization can design a robot to capture and infer operating and data handling systems, trigger responses and communicate with other systems. (Rutaganda et. Al ,2017)

The recent years has seen intense increment in the uptake of RPA in back offices and common administration tasks, and in business process outsourcing(Willcocks & Lacity, 2016). There is an increasing necessity in organizations for cost competence, regulatory enforcement, competitive margins and high-quality knowledge (Theyssens, 2017). RPA gives a way to handle these requirements thereby reducing the labor costs and improving the speed, precision and quality of the undertaking (Theyssens, 2017). Organizations are developing the RPA innovation practice to streamline tasks and diminish costs. Organizations can computerize routine guidelines established business procedures, empowering users to dedicate additional opportunities to attending to clients or other value-add tasks. RPA software robots are trained algorithms which operate on the user interface in a manner that a human worker would do (Wil M. P., Bichler, & Heinzl, 2018). The ability of a software robot to adjust to conditions and circumstances, in comparison to legacy IT automation systems, make it suitable for almost any task in an organization. RPA handles the system in the same way, as a human employee would do, with comparable access rights. This allows any organization to implement the change rapidly and competently, without changing underlying infrastructure and procedures.

Different commercial vendors provide different software tools for RPA. Some tools are dedicated, while others have RPA functionality embedded in their software or offer other RPA-bundled tools. Dedicated RPA software is available from providers such as Kryon Systems, Automation Edge, Blue Prism, Automation Anywhere, UiPath and Soft Motive (Le Clair, 2014). Vendors like Pegasystems and Cognizant offer RPA alongside conventional BPM, CRM, and BI features. These software platforms are structured so that they can work in parallel with the existing IT systems with minimal or no change is needed on the existing systems. RPA is also being utilized with process mining. The collaboration aims to automatically visualize and select processes with the highest automation potential and therefore build, test and deploy RPA agents driven by the process models discovered (Wil M. P., Bichler, & Heinzl, 2018). For instance, RPA vendor UiPath work in partnership with process mining vendor Celonis.

RPA evolved from straight through processing (STP) which was first used in the financial sector in the mid-1990s (Wil M. P., Bichler, & Heinzl, 2018). STP applied to procedures which could be performed without human intervention. As a result, STP became applicable to only a few operations, and workflow management systems developed into Business Process Management systems. Intelligent process automation is the next step in the automation journey (Reddy, Harichandana, Alekhya, & S. M., 2019). RPA technology is being continuously transformed to Intelligent Robotics by embedding RPA tool with Artificial Intelligence, Machine Learning and other cognitive technologies (Devarajan, 2018). Intelligent Process Automation (IPA) performs self-learning from process discovery, training robots, the generation of natural language and automated documentation systems, and AI screen recognition among others (Anagnoste, 2018). Software tools have been developed which combine RPA and AI such as: Atos SE, Oracle Policy Automation Cloud Service and Ross which is built on IBM's Watson cognitive computer (Reddy, Harichandana, Alekhya, & S. M., 2019).

2.1.1 RPA Benefits and Challenges

Lacity, Willcocks, & Craig (2018) assessed the impact of business services automation on different client organizations. They found that initial RPA adopters observed that automation would radically transform back office processes, provide much lower costs while enhancing service quality, improving compliance and increasing speeds of delivery. It also freed employees from demotivating tasks which allowed them to focus on more complex, challenging, and valuable work, thus increasing productivity. RPA does not require changes to current IT and infrastructure systems. The robots are entirely able to work inside the user interface, therefore leaving the IT structures unchanged. It is a major benefit over automation accomplished by back-end integration, which also involves extensive overhaul of internal

systems (Asatiani & Penttinen, 2016). Lacity and Willcocks (2015) identify RPA as an easy-to-configure system where system users can run business operations without programming and users can be trained to automate the process independently in a short period of time.

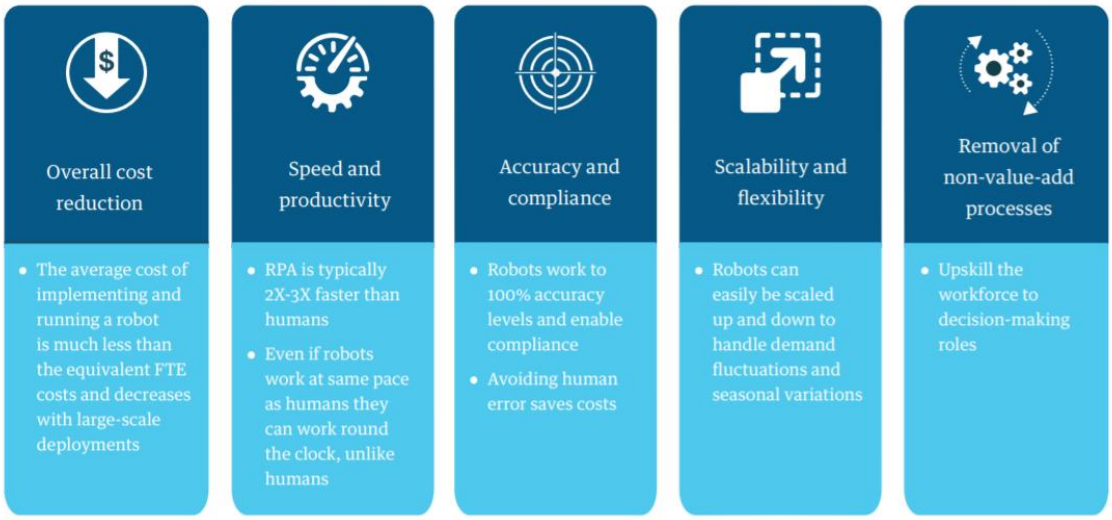

Figure 1 – Summary of Benefits of RPA Adoption for Enterprise (Genpact, 2018)

Key RPA challenges defined by IRPAAI (2019) include identifying business cases that support investment returns (ROI), avoiding creeping scope and increasing complexity, automating inherently bad process elements and handling exceptions when they arise (IRPAAI, 2019). Forrester (2017) considered that while RPA adoption is growing rapidly, it is a fairly new technology and, as a result, for many organizations, governance basics are defined as they implement RPA, knowledge gaps in processes are creating new governance issues, and robot central control is evolving. Asatiani & Penttinen (2016) viewed RPA as a bad fit for work tasks that require complex interpretation skills, creativity or subjective judgement and is therefore best suited for structured work tasks.

Like with every automation technology, it is argued that RPA can eradicate jobs. Forrester Research estimated that RPA applications would jeopardize the livelihoods of 230 million or more human workers equal to approximately 9% of the world's workforce (Chris, et al., 2017). Whereas Lacity and Willcocks (2015) reported that post-implementation RPA feedback was mostly positive and no significant job losses were observed, Asatiani and Penttinen (2016) argued that there is still a risk of job losses considering the software robots as a direct jobs' contenders. They argued that a possible consequence from this could be tensions between the management and employees, subsequently influencing the employee's morale in a destructive manner (Asatiani & Penttinen, 2016). They suggested that the implementation and

deployment of RPA should be delicately managed and communicated appropriately. Employees carrying out repetitive duties may be moved to more productive jobs. Robotic automation could itself build jobs in robotic management, consulting, and advanced data analysis in the long term (Asatiani & Penttinen, 2016)

Although front-end integration offers versatility and speed at which it can be applied, machine-to - machine communication is still inferior to back-end integration. RPA is now a temporary solution, filling the void between manual processes that are built on existing IT systems and redesigning processes that operate on fully automated systems (Asatiani & Penttinen, 2016).

2.1.2 Application of Robotic Process Automation

RPA is a scalable, versatile and non-invasive tool that can revolutionize various industry domains and functions such as Human Resources, Banking, Audit, Supply chain, Telecom, Customer Support among others (Devarajan, 2018). In Human Resources, RPA can be used in processes such as recruitment, on-boarding and off-boarding, data processing, regulatory administration and payroll processing. An on-board workflow template can be triggered automatically by the user account to streamline the on-boarding of new hires. The Bots will then make a rule-guided decision on the credential to be given to the new employee or the documents to be submitted on-board. Software robots can quickly gather all files in resume scanning and shortlisting of applicants and match it with a list of work specifications. These requirements can be predefined rules which guide the process of selection. The best applicants would then be informed and called for interviews, while those who do not comply can be informed of their rejection. Use of RPA in human resources therefore results in reduced HR onboarding processing cost, reduced error rate in human resources onboarding process, increased onboarding processing speed, decreased onboarding time and increased regulatory compliance. Use of RPA equally leaves HR to focus on a wide range of value-added tasks such as personal interviewing, talent management, performance optimization, rewards, culture, and workplace design and employee training among others.

RPA tools can be used in banking and financial services to automate routine and manual banking processes and data errors (Devarajan, 2018). With RPA, back office banking staff can expect drastically reduced human effort to support commercial banking processes that traditionally require manual transfer of data from applications to core systems to complete transactions. RPA can also be applied in maintenance of data consistency of customer's details, account opening, streamline card activation and support against money laundering by ensuring compliance. RPA can make a significant contribution to assisting company compliance by ensuring accuracy of KYC information. KYC is a mandatory procedure for every bank customer. The Thomson Reuters survey reports that banks spend approximately $ 500

million on KYC compliance globally every year (Dickenson, 2019). Silo data and disconnected internal processes can lead to redundant data entry, errors and data quality issues. Therefore, boarding takes a longer time. RPA will significantly reduce the cost of manual KYC analysis, and analyze consumer data with increased accuracy and reduced error.

In customer care, automating RPA customer services significantly reduces the time spent by human agents to identify customers and provide better customer support. Customer service representatives often need to switch between different applications and data sources to respond to customer enquiries and complaints. With RPA, the customer service representative can retrieve information more quickly and reduce the waiting time of the customer. Collecting and analyzing the information required may be time-consuming, resulting in delays. RPA can be integrated with customer services to automatically integrate disparate data sources, reducing the average customer handling time, reducing errors and creating efficiency.

Audit firms also deal with large volumes of data that are analyzed through repetitive and time-consuming processes (Devarajan, 2018). Audit can therefore leverage on RPA capabilities throughout the audit life cycle including data collection, risk assessment, audit planning and reporting. RPA can be applied in internal audit compliance assessment, documentation, data aggregation and integration. RPA will standardize and merge data from multiple sources, streamline the gathering of audit evidence and potentially plan activities. RPA may also conduct audit tests in other software applications which have been pre-programmed (Cohen, Rozario, & Zhang, 2019).

2.1.2 Application of Robotic Process Automation in Telecommunication

Robotization of processes is applicable to different organizational functions in the telecommunication industry. Many telecommunications service providers are burdened with rapid growth and vast quantities of organizational processes such as data processing, cost reduction, improved business efficiency, talent acquisition, and new technology creation that RPA is ideally placed to assist in. The telecommunications industry is well placed to take advantage of the innovations of the next decade, one of which is RPA (Gogineni , 2019). The telecommunications industry is dominated by high-frequency, repetitive, rule-based processes that are essential to the proper delivery of services and hence highly qualified for automation.

Currently organizations are battling with enhancing process efficiency, reducing human interventions and making the best use of their existing human resources. A study on Telefónica O2, a UK provider of telecommunications, automated 15 key processes including SIM swaps, credit checks, order

management, customer reassignment, unlatching, porting, customer dispute resolution, and customer data updates (Lacity, Willcocks & Craig, 2015). Other areas of application of RPA in telecommunications include customer on-boarding and off-boarding, network management, service deployment, billing, customer support, among others.

Adopting RPA technology in customer onboarding and offboarding greatly reduces cumbersome paper work and human interventions making the process efficient and flawless. RPA can facilitate a seamless KYC in compliance with the regulations, be quick, flexible and customizable. Onboarding platform can be automated with RPA making the process comprehensive, consistent and absolute. The customer and the third party should be able to track the status in real-time making it transparent, which increases visibility and engenders trust. RPA also runs various processes in parallel minimizing human intervention and manual errors. It enables an organization to earn higher revenues by shortening the time spent on onboarding with a high level of customer satisfaction, leaving staff with more time to interact with clients. Therefore, even in organizations that rely on legacy systems, most on-board customer activities can be done automatically, significantly enhancing customer experience.

For network management, RPA can be used in event, incident, and diagnostic management areas for automated task resolution, allowing network engineers flexibility to deal with complex issues rather than being bound to processing volumes. Therefore, RPA helps develop networks with enterprise planning, including improvements in performance control, network architecture, and digitization of networks. Incorporating RPA into the billing process ensures that you never miss out on a confidential billing or billing cycle by automating customer data management, billing, reconciliation and multi-channel. Finally, when customer support agents are on the line, RPA bots will take a parallel look at sensitive customer details in various systems, allowing agents to enhance First Call Resolution (FCR) metrics and increase customer satisfaction. The virtual assistant will be capable of gathering and distributing data through various touch points and eventually contributing to enhanced client experience. (Reddy, Harichandana, Alekhya, & S. M., 2019)

2.2 Digital transformation

Digital transformation is a significant shift in business and strategic processes, practices, expertise and structures to make full use of the advancements and opportunities of a combination of emerging technologies and their exponential effect across society, considering current and future changes, in a strategic and prioritized way (Andersson, Movin, & Mähring, 2018). The digital advancements of organizations are lauded as a key to organizational challenges associated with both proficiency and

efficiency. Digital innovation symbolizes a progressive re-evaluation of how an enterprise is using technology, people and processes to significantly enhance business performance (Westerman, Bonnet, & McAfee, 2014). The emergence of digital technologies has led businesses in practically every industry to take several actions to explore and harness their benefits (Fitzgerald, Kruschwitz, Bonnet, & Welch, 2013). This often includes transformation of significant business tasks and impacts products and processes, as well as authoritative frameworks, as companies need to set up executive activities to oversee these unpredictable transformations. Organizations are facing radical transformation because of the maturity of digital technologies and their universal diffusion of all markets. In addition to the expanded interest from customers, companies are facing ever tougher challenge due to globalization and exerting pressure to transform digitally ahead of others, seeking to endure and attain competitive leads.

Organizations that effectively oversee digital innovations can hope to acquire at least one of three capacities: better customer understanding, streamlined processes and new business framework lines. (Fitzgerald, Kruschwitz, Bonnet, & Welch, 2013). As a growing technology, capable of improving business results, RPA has the capability to backing these capacities. RPA takes on an altogether different role contingent upon the procedure and the business. Through its automation proficiencies, RPA enables companies to handle operational difficulties, for example, routine assignments. Organizations can in the same way pick up information about their business designs and the presentation of their work processes through information given by RPA. They would then be able to use this data to embrace innovative strategies, which help adapt their procedures to be productive. RPA allows separate specialty units within the organization to modify solutions that quickly digitize processes, convey long term sustainable significance in a short time frame, while minimizing overall threats. By structuring and positioning smart processes at the level of the business unit, administrators can support monotonous activities without adjusting to the consolidated standard for those procedures. As a result, while achieving efficiency and cost savings, the organization maintains adaptability. A significant number of genuine procedures operated within a company may, in any event, benefit from the digitization of their various instances, the exclusion of numerous fixes, changes and updates that occur after a certain period.

2.3 Theoretical Literature Review

There exist different knowledge and networking initiatives that have been developed for structured implementation of digital transformation initiatives across organizations. Carr (1999) defines technology adoption as the phase in which an individual or an organization identifies an innovation for use. Quick advances are being made in innovation advancements in every domain and the concerns identified with

innovation selection have increased prominently in recent times. Organizations are making vast investments to introduce new innovations that have the capability of bringing a standard shift in the lifestyle of the operators. Users adoption is therefore crucial for RPA as an emerging technology. Previous investigations have been conducted on factors that would impact the adoption of technology, and researchers have developed several models that meet their criteria. In addition, the study of appropriate models that organizations can use to build new business models based on digital opportunities has been carried out.

A report on innovation adoption research by Hameed, Counsel & Swift (2012) concluded that th e most widely used models of all innovation adoption theories were Diffusion of Innovation Theory, Per ceived Innovation Characteristics, Theory of Reasoned Action, Theory of Planned Behavior, Technology Acceptance Model, Technology Acceptance Model 2, Technology Acceptance Model 3, Technology, Organization and Environment Model and Unified Technology Acceptance and Use Theory.

2.3.1 Theory of Diffusion of Innovations

Innovation Diffusion Theory was first introduced by Everett Rogers in 1962. Rogers (1983) identified diffusion as the mechanism by which a novelty is transmitted over a period between individuals in a community through a variety of channels. The messages in this communication were concerned with innovative ideas. Rodgers' theory highlighted four main elements which drove diffusion, including innovation, channels of communication, time and the social system. Interaction between these constituents encouraged an individual to understand why an individual chose to embrace innovation. (Straub, 2009).

Rogers acknowledged five different characteristics of an innovation that affects its acceptance. They included its compatibility, complexity, trialability, observability and relative advantage. The innovations with higher comparative benefit were theoretically better and would be embraced swiftly. Advancement that appropriated into an entity’s present understanding of similar ideas would more likely be accepted together with those that are easy to comprehend. Further, triability would enable the acceptance of an innovation. An entity is also more likely to embrace a technology if every person has the innovation.

Communication channels make available the framework by which information about a specific development was exchanged between people. Accordingly, the degree of contact an entity has to information influences the diffusion method. Social communications, similarly to an individual assessment of an advancement by a peer or contact through broad communications (near-peers), influences an individual to embrace a comparable viewpoint on a novelty (Rogers, 1983). Social systems

could be workplaces, authoritative gatherings, casual gathering, and the different subsystems of these assemblies. Community norms and arrangement influence how an advancement penetrates a populace.

Rogers's effort on acceptance and dissemination was narrowed over the set of time. What causes an entity to embrace early versus late advancement? What are the characteristics and effects of a timely adoption versus a late adoption? Rogers initially classified adopters into sets dependent on the overall extent of time it took for a level of people to embrace. The time measurement is engaged with diffusion in the innovation choice procedure, in the innovations of an entity and in a development's rate of acceptance of a framework, normally estimated as the total number of individuals from the framework that receive the advancement at a specific time (Rogers, 1983). Rodgers abstracted five main steps from the innovation decision procedure that include information, persuasion, choice, application and confirmation. The decision-making body passes from familiarity to innovation, to the development of an attitude towards technology, to the choice of whether to make progress, to the implementation of innovation, and finally to the validation of that choice. Innovativeness is the level at which an individual or a unit of acceptance is moderately earlier than the other affiliates of the system when it comes to innovation (Rogers, 1983) . This resulted in categorizations of members of a collective system focused on innovation as innovators, early adopters, early majority, late majority, and laggards subject to the measure of time of adoption by fellows of a community. As a constituent in diffusion theory, social system may function as consequence in that the variations that occur to a person or to a community because of choosing to accept or reject innovation.

2.3.2 Concerns-Based Adoption Model (CBAM)

Developed by Hall, the CBAM model is based on Fuller 's efforts in the transformation and classification of teacher anxieties from a developmental point of view (Christou et al., 2004; Fuller, 1969; Hall, 1979). The uncertainties that emerged were not restricted exclusively to teaching but rather similarly identified with fears that developed during the selection of any educational innovations (Hall & Hord, 1987). CBAM was grounded on six assumptions and affirmations established for observing the change process. The model assumed that change is not an event but a procedure, is practiced by people, is a profoundly close to personal experience, encompasses progressive evolution, is best comprehended in operating terms and is the focal point of assistance ought to be on people, advancements, and context (Straub, 2009).

CBAM model constituted stage of concern (SoC), level of use (LoU) and configuration of innovation (IC). SoC refers to distinct attributes in relation to the concerns of the educator for themselves and their

learners during the practice of acceptance and is the fundamental foundation on which the model was established (Straub, 2009). During the approval cycle known as the seven concern phases of CBAM, the SoC scale divides educators' concerns into seven stages. Stage 0, awareness concerns, shows that advancement should not bother users or adopters because they have no knowledge of it. Stage 1, information concerns, is when likely to adopt an apprehensive approach to collecting additional information about the transition. The third stage, personal concerns, occurs when individuals observe the change to pose an individual risk and may need to know the personal impact of the innovation. Individuals may have concerns about their ability to make use of technologies or need confidence in their competencies. Fourth stage, management concerns, is concerned with how adopters fail in terms of planning, teamwork and time taken out of their schedules to test and use the technology to deal with change in practical terms. Fifth stage, consequence concerns, occurs when potential adopters think about the potential effects that change will have on other individuals, such as learners, in several instructive settings. Sixth stage, collaboration concerns, is often common to shift professionals who are normally managers or group supervisors. There is unrest in bringing groups together to develop pre-eminent practices in the efficient use of technology. The final stage, refocusing concerns, is when users decide whether the proposed advance is really the best way to accomplish their objectives and priorities or, perhaps, an alternative development with a noteworthy impact would be more fitting (Hall & George, 1979). The LoU and IC discuss the attributes of the innovation. The LoU scale defines the conduct stages as teachers switch from a lower utilization level to a higher utilization level (Straub, 2009). The Innovation Configuration (IC) applies to the process of updating the innovation.

2.3.3 Theory of Reasoned Action (TRA)

The Model of Reasoned Action (Fishbein and Ajzen, 1975) was based on social psychology. The concept was based on behavioral intention, attitude and subjective norm. According to the philosophy of TRA, attitude refers to summing up beliefs about a specific subjective conduct of assessments of these convictions while subjective norms are the influence of individuals in their communities on their behavioral intentions. The individual beliefs subjective to the significance of one’s characteristics to their every opinion will influence an individual’s behavioral intent. According to TRA, the behavioral intention of an entity is based on its attitude and subjective norms (Fishbein and Ajzen, 1975).

2.3.4 Theory of Planned Behavior (TPB)

In 1991, Icek Ajzen introduced the TPB paradigm he built out of Reasoned Action Theory (TRA). A key factor in the TPB framework is the apparent behavioral control, which TPB applies to the attitudes

of the system and the subjective norm defined in the TRA. Observed behavioral control denotes individuals' observation of the level of simplicity of demonstrating the subject behavior (Ajzen, 1991). Objectives are presumed to capture motivational issues that affect the habit; they indicate how difficult it is for individuals to see how much effort they predict to demonstrate their behavior (Ajzen, 1991). Ajzen (1991) recommends that the tougher it is to take part in a behavior, the more likely it is to perform. However, to some extent, the performance also relies on non-motivational variables including accessibility of mandatory opportunities and resources.

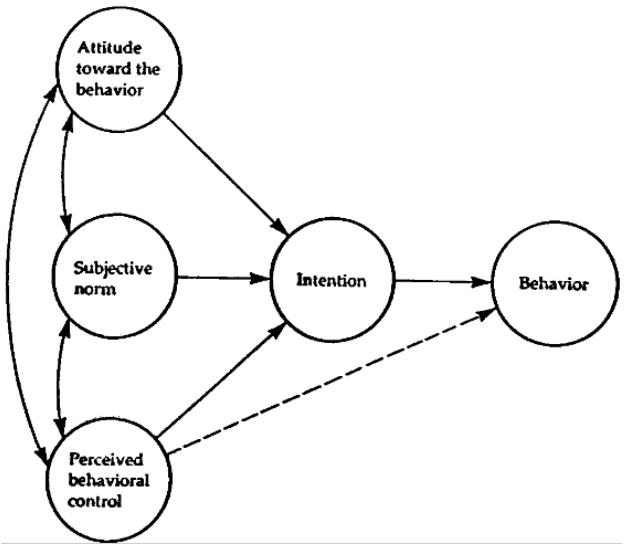

Figure 2 – Theory of Planned Behavior (Ajzen, 1991)

2.3.5 Technology Acceptance Model

Initially suggested by Davis (1986), TAM claims that acknowledgement of innovation by an individual is influenced by its alleged usefulness and its observed ease of use. These two core conceptions in TAM are the manner in which the potential adopter identifies with its convenience (how simple the innovation will be to learn and execute) , how they view the innovation and its probable worth (the degree to which the change will progress the individual's performance) (Straub, 2009). The underlying test of technology acceptance Theory with regards to adoption of email services and file editor authenticated the framework. The outcomes were that professed usefulness is a more grounded aspect than apparent ease of use when comparing the two drivers of technology adoption (Rajesh & Rajhans, 2014).

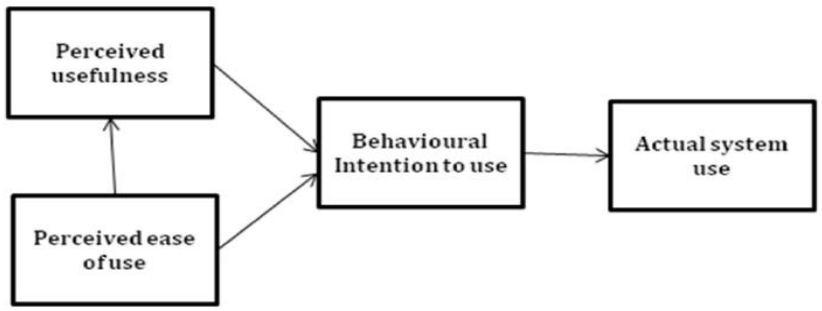

Figure 3 - Technology Adoption Model (Davis, 1989)

2.3.6 Unified Theory of Acceptance and Use of Technologies (UTAUT)

Introduced by Venkatesh et. al (2003), the development of the UTAUT framework was motivated by a need to unify existing research efforts in technology acceptance field (Ahmad, 2014). Venkatesh and his associates examined the more prominent characteristics of the common frameworks and concepts to comprehend the individual adoption of innovations. They studied the Theory of Reasoned Action, the Technology Acceptance Model, the Motivational Model, the Theory of Planned Behavior, a model combining the Technology Acceptance Model and the Theory of Planned Behavior, the model of PC utilization, the Innovation Diffusion Theory, and the Social Cognitive Theory. Eventually, they established four theoretical concepts, which include Performance Expectancy, Effort Expectancy, Social Influence, and Facilitating Conditions. These concepts characterize the determinants of intent to use or individual's utilization habit, that play key roles as alternates of Technology Acceptance (Venkatesh, 2003). Notwithstanding these factors, the hypothesis considered factors such as gender, age, experience, and willingness to use to moderate the relationship between the different factors and the intention to use them.

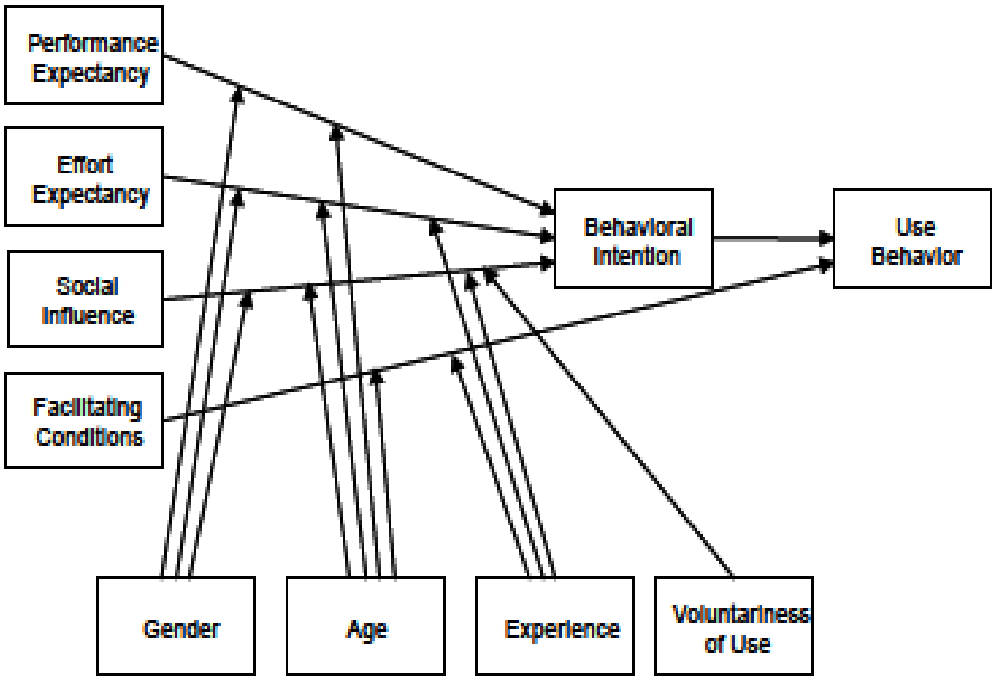

Figure 4 - Source Unified Theory of Acceptance and Use of Technology, Venkatesh et al., pp447

Performance expectancy relates to the extent which an organization recognizes that the use of an innovation will support the individual to achieve advances in execution of their job (Venkatesh, 2003). Perceived usefulness, outward motivation, work-fit, relative gain and results expectations are notions from TAM, MM, MPU, IDT and Social Cognitive Theory models that relate to performance expectancy. Performance expectancy therefore estimates improvement through the framework, enhancement of product, positive impact for performance and usefulness of the organization's representatives.

Effort Expectancy is level of simplicity related with using innovation (Venkatesh, 2003). Perceived Ease of Use, Complexity and Ease of Use are the key factors measured by Effort Expectancy. Each concept is noteworthy only during the first run, becoming less important over periods of continued use, reliable with past research. Effort-oriented paradigms are relied upon to be increasingly notable in the preliminary phases of an innovation, once development issues represent difficulties, and later become dominated by instrumentality anxieties (Venkatesh, 2003).

Social influence describes the level that an individual identifies that other significant people trust that the person should use the innovative system (Venkatesh, 2003). As indicated by Ahmad (2001) the key factors derived from technology acceptance theories that equal social influence are subjective norm, social issues and image. Subjective norm is the individual's discernment that the clear majority critical to him figure whether to play out the behavior in question while social issues defines the individual's disguise of

the focus group's intellectual, cultural and explicit relational understanding with others in explicit social situations. Image identifies how much utilization a novelty is will enhance a person's image or position in a social framework. Venkatesh and Davis (2000) establish that in compulsory setting, social influence has direct impact on objective while in voluntary setting, social influence works by swaying insights about the innovation. Social influence affects personal behavior compliance, internalization, and identification (Venkatesh, 2003).

2.3 Empirical Literature Review

2.3.1 Adoption of RPA and Digital Transformation

It's Schmitz et al. (2019) studied the case of technology-induced change in process execution as part of the organization's digital transformation strategy. Its application was illustrated based on a concrete project in the telecommunications sector, where RPA was used as a means of digitizing and automating transactional activities (Schmitz, Dietze, & Czarnecki, 2019). The case described how the study organization used RPA to achieve process digitalization. The establishment and implementation of the RPA project was structured in terms of organization and governance, processes and technology and operations. A lean and agile organization was defined to guide the RPA project. Relevant processes for RPA automation have been identified and prioritized to balance ease of implementation with associated savings potentials. Technology and operations involved vendor selection and the operations of the RPA solution. The case company achieved significant increase in the number of automatic transactions through RPA. Additional advanced technologies such as Artificial Intelligence (AI) had to be used for higher automation levels in combination with RPA (Schmitz, Dietze, & Czarnecki, 2019).

UI Path, an RPA vendor, proposes two methodologies on how businesses can adapt in the 'automation first era': top-down-approach and bottom-up approach. Current market trends illustrate that businesses are opting to adopt straight-line automation as the primary focus of their transformation activities, attempting to address short-term objectives with a high return-on-investment. This bodes well for the immediate future of RPA products.

Juntunen (2018) study on the intra-organizational adoption of RPA, focuses on perceived influence, individual and managerial facilitation factors (Juntunen, 2018). The effect of external variables was recognized in the system, as it allowed additional concept to be incorporated into the model through the constructs of beliefs. Juntunen (2018) categorized the contextual factors affecting adoption and acceptance into attributes of creativity, organizational attributes, individual attributes and facilitation of the management. Characteristics of innovation reflect the quality of change and the qualities of organization.

The construct attribute for change management facilitation describes the strategies and tactics managers used to facilitate and speed up adoption.

2.3.2 Digital Transformation

Corver and Elkhuizen (2014) proposed the Cognizant's Digital Business Transformation Framework which focuses on customer, product, organization and processes and systems as its key areas. Corver and Elkhuizen reasoned that digital transformation is initiated by the and then extends to other areas. The framework therefore holds that Dx should start by understanding the customer first, enhancing service and digitizing the customer experience then to the other three areas. Corver & Elkhuizen (2014) considered the proposed structure could be useful in creating a digital organizational vision and in setting up new business models based on digital opportunities.

Nylen and Holmstrom (2014) introduced the digital innovation strategy framework for the evaluation and enhancement of digital products and innovation in services, a management framework that enabled businesses manage emerging digital innovation processes. The model was focused on user experience, value proposal, digital development, competences and improvisation. It offered a valuable tool that helped companies providing digital products and services to assess where they are at the point in time, leading towards digital products and services development. Nylen and Holmstrom (2014) defined product, digital environment and organizational properties as the three dimensions of digital product management and business innovation. Product covered customer interface and company value proposition whereas digital environment entailed digital evolution scanning and organizational properties referred to competencies and improvisation.

Matta et al. (2015) established a Digital Transformation Framework to address the organization's understanding of digital transformation processes. The approach was to develop a digital transformation strategy, which served as a core framework for incorporating the entire planning, prioritization and execution of innovation initiatives within an organization. The framework explored the use of technology, improvements in value development, organizational shifts and financial aspects as main constructs of strategies for digital transformation that were independent of industry or enterprise. The use of technology presented the organization's attitude towards emerging technologies, and its willingness to leverage them. Changes in value creation related to the impact of digital transformation strategies on the value chains of the organization. Structural changes provided the basis for new changes, such as the organization of a company, products, processes or competencies that are affected by changes. However, the financial aspects were at the heart of this framework and served as the driving force and bounding force of the

transformation. Matta et al. argued that while lower financial pressure on the core business decreased perceived pressure for action, organizations already under financial pressure would lack external means to fund the transition (Matta, Hessa, & Benlian, 2015).

The Framework for Digitalization Piano Digital Business Transformation was released in a report by the Global Center for digital business transformation. Wade (2015) described the direction that companies should take to prevent change, to understand the benefits of transformation and to derive the most value from emerging technology and business models. Wade (2015) defines seven aspects of digital transformation including: business model (how an organization makes money), structure (how the organization is organized), people (company employees), processes (how the company performs tasks), IT capabilities (how the organization gathers and handles information), offerings (how the company provides products and services), and model of engagement (how the business interacts with its internal and external stakeholders). These components are collectively referred to as the digitalization piano. Guiding questions for each category were defined and, by addressing these issues, the digitization piano can be used to provide a blueprint for the transformation needs. The theory proposes that if a firm approaches more than one item simultaneously, the chances of a positive transformation are enhanced, i.e. plays chords rather than keys.

2.4 The Gap in Robotic Process Automation

RPA uptake creates a research gap in RPA agents control of to avoid security and compliance risks. When RPA agents impersonate people there are ethical and security threats. Further research is needed on compliance between RPA activities and defined business processes

2.5 Conceptual Framework

Sekaran (2003) describes the conceptual framework as a theoretical model of how a researcher makes a rational sense of the relation between the various factors defined as relevant to the problem. The framework discusses the interrelationships between the variables considered integral to the problem dynamics under investigation.

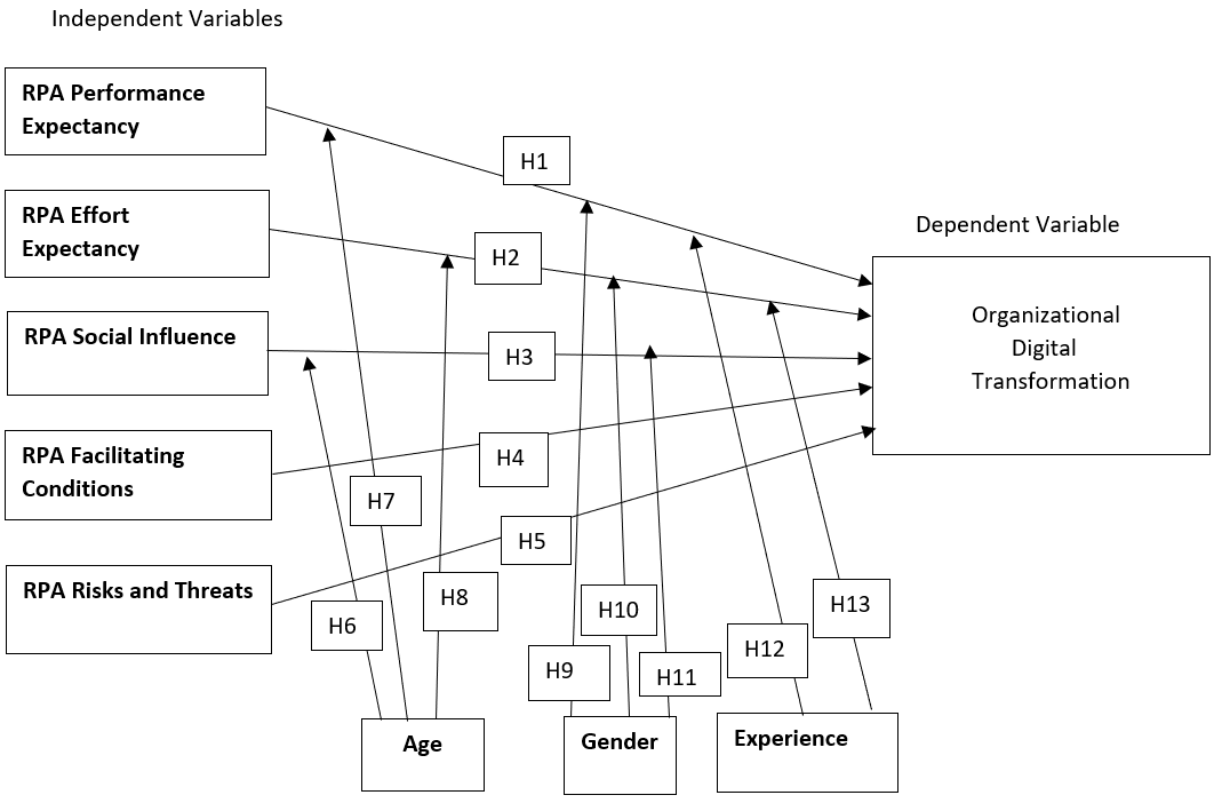

Figure 5 - Conceptual Framework (Own elaboration)

Concepts from theories of user adoption and empirical studies were discussed and incorporated to construct the conceptual model. The model presents an approach that can be used by an organization in adoption of RPA into their processes to transform themselves into a digital organization.

Table 1 - Operationalization of Conceptual framework

Variable	Description	Key Indicators	Measure
1. RPA Performance Expectancy	Degree to which the organization believes that RPA will enable employees to perform their duties more efficiently to meet the organization's objectives	• Perceived Usefulness of RPA • Perceived Advantage of RPA	• Likert scale
2. RPA Effort Expectancy	Degree to which employee view RPA is easy to use	• Perception of ease of use of RPA	• Likert scale
3. RPA Facilitating Conditions	The degree to which the organization supports RPA e.g. through training, providing financial resources	• Organizational Support for RPA • Employee support for RPA	• Likert scale

4. RPA Social Influence	The degree to which the organization is influenced to adopt and use RPA	• Competition adoption • Customer expectation • Vendor Notification	• Likert scale
5. RPA Risks and threats	Level of Potential harm of RPA and likelihood to which the harm can be realized by the organization	• Perception of potential harm	• Likert scale
6. Organizational Digital Transformation	Adoption of RPA by the organization	• Extent of adoption of RPA	• Likert scale

Table 2 - Description of moderating factors

Moderator	Description	Measure
1. Age	Time of life of employee	• Category Scale
2. Experience	Time in which an employee has worked with the organization	• Category scale
3. Gender	Gender of employee	• Category Scale

The hypotheses of the study were:

H1: RPA performance expectancy does not influence digital transformation of the organization

H2: Ease of use of RPA does not influence digital transformation of the organization

H3: There is no relationship between RPA facilitating conditions and organizational digital transformation

H4: RPA Social Influence does not influence digital transformation of the organization

H5: RPA risks and threats do not influence digital transformation of the organization

H6: Age does not moderate the effect of social influence on digital transformation

H7: Age does not moderate the effect of performance expectancy on digital transformation

H8: Age does not moderate the effect of effort expectancy on digital transformation

H9: Gender does not moderate the effect of Performance expectancy on digital transformation

H10: Gender does not moderate the effect of effort expectancy on digital transformation

H11: Gender does not moderate the effect of social influence on digital transformation

H12: Experience of employees does not moderate the influence of performance expectancy on digital transformation

H13: Experience of employees does not moderate the effect of effort expectancy influence on digital transformation

CHAPTER THREE

METHODOLOGY

3.1 Research Design

A case study of a telecommunication organization was be carried out to evaluate adoption of RPA. Exploratory research was conducted as little was known about the current situation and little information was available on how similar research problems were resolved in the past (Sekaran, 2003). Extensive interviews with employees recognized as RPA 'champions' was done to get a grip of the problem (Sekaran, 2003) .This research provided insights on adoption of Robotic Process Automation. Hypotheses formulated from the framework were subsequent testing through interviews and questionnaire surveys.

3.1.1 Survey

Survey was done to obtain data from the organization's employees in a standard and systematic way. The data entailed understanding of RPA by employees, identification of processes that can/have qualified as candidates for RPA, the pros and cons and the future of RPA. Patterns in the data that can be generalized to a larger group were established (Oates, 2006)

3.1.2 Data Requirements

The data that was generated include the age of the respondent, years of experience with the organization, their age and their perception of automation using RPA .

3.1.3 Data Generation Method

Below are some of the methods that were used in generation of data:

i. Questionnaires

A set of pre-defined questions were issued to the respondents via email and WhatsApp. Questionnaires were also be used in structured interviews. The mode was suitable because it facilitated obtaining of responses from a good number of participants.

ii. Interviews

Semi-structured and unstructured interviews were used. Conversations were held with employees within the organization to gain insights on their understanding of RPA, if and how they have applied RPA in their role and the potential areas they can apply RPA in their day-to-day tasks. Interview was suitable because it enabled obtaining of detailed information through asking open-ended questions whose logic might differ for different individuals. For the questionnaire response score a 5-point Likert scale was

adopted to measure the constructs. The scale ranged from "strongly disagree" to "strongly agree" five response options.

iii. Observations

Data was collected through both direct and indirect observation at the workplace by seeing, hearing, analyzing and making inferences on RPA developments. This encourages research on what individuals do rather than what they report when addressed.

iv. Documents

They informed interviews, observations and questionnaires. The research utilized documents found as well as documents produced by the researcher. The found documents that already exist in the organization such as documented processes, job descriptions, procedure manuals among others were used. Personal papers and communications and documents were also be used as source of data. The advantage of document-based research is that information is quick, cheap and convenient to obtain. However, they will require to be carefully evaluated including their author, source, purpose and how it was produced (Oates, 2006).

3.1.3 Sampling Frame

Oates (2016) describes a sampling frame as a list or selection of the entire population of individuals which may be included in a survey, from which the sample will be selected. The sampling frame for the was the employees in the telecommunication organization as at 2020.

3.1.4 Sampling Technique

The participants were chosen using snowball sampling. The RPA "champions" were deliberately handpicked, so cases were also projected to produce valuable data to fulfill the research purpose. Having gathered data from an RPA “champion”, the respondent was requested to provide other individuals relevant to the research topic. They will be approached and will further provide other relevant respondents. This in turn increases the sample size.

3.1.5 Sample size

To determine a manageable sample size, as suggested by Kothari (2004), the Slovin formula was applied to the population with a marginal error of 5 per cent (95 percent confidence level). This implies that there are 95 out of 100 chances that the results of the sample represent the true condition of the population within the specified range of precision, compared to 5 out of 100 chances that it does not (Kothari, 2004).

$n=N/(1+Ne^2)$

n-sample size

N- population size

e- marginal error

$n=200/ (1+200(0.05)^2)$

=134 employees

3.2 Data Collection Methods

Each participant was issued with the questionnaire. The questionnaire comprised of employee's demographic information together with the factors that influence RPA adoption: RPA performance expectancy, RPA effort expectancy, RPA social influence, RPA Facilitating conditions and RPA Risks and threats. Five-point Likert scale was used ranging from strongly disagree to strongly agree.

3.3 Data Analysis Methods

3.3.1 Quantitative Data Analysis

Using the SPSS software, data was analyzed, and the results were presented in tables, charts and graphs. Patterns in the data were identified and conclusions drawn. The benefit of using this approach to analyze data is that the research is based on well-established methods, and the applicable tests offer trust in the results. Additionally, vast quantities of data can be easily analyzed (Oates, 2006).

3.3.3 Reliability and validity

Sekaran (2003) describes the measure's reliability as the degree to which it is free of bias or error, and thus ensures accurate measurement over time and throughout the instrument's various components. Inter-item consistency reliability is a measurement of the accuracy of the data collected by the respondents on all the items in the analysis (Sekaran, 2003). Cronbach's alpha was used for the test of reliability, both for consistency and stability. The Cronbach alpha is a reliability metric used to determine how well the components in the collection respond to each other in a positive way. This is based on the mean inter-correlation of the elements calculated by the model (Sekaran, 2003). Factor analysis was used to determine if the items are certainly tapped by the items they measure theoretically.

3.4 Ethical Consideration

Researcher sought permission from the organization of the study. The participants were also informed about the study's purpose before participating in questionnaires and interviews. All data obtained will be confidential and will only be used for scholarly purposes.

CHAPTER 4

RESULTS AND DISCUSSION

4.1 Introduction

This chapter presents the results of the data collected during the research and analysis of the data. The chapter includes the quantitative and descriptive data analysis, the data reliability analysis, the analysis of the variables used to test the hypothesis of the research. Questionnaires were distributed through google forms to the staff of the organization under study. The interview was focused on five main areas: perceived benefits of RPA, perception of ease of use of RPA, organizational and employees support, RPA social influence and perception of potential risks and threats.

4.2 Response Rate

For the study the target research sample was 134 participants. A total of 117 responded while 17 did not answer the questionnaire. The overall response rate was 87.3% all of which were valid responses. Mugenda and Mugenda (2003) asserts that a response of more than 60% is good for a study.

4.3 Demographic Information

4.3.1 Gender of Respondents

Out of 117 respondents, 52.3% of the were male whereas 47.7% were female.

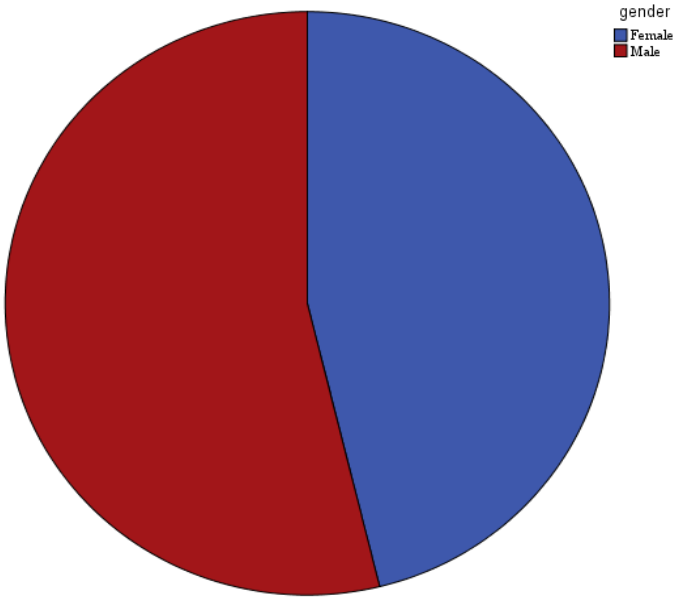

Figure 6- Gender of Respondents

4.3.2 Respondents by Age bracket

40.3% of the participants were aged 20-29,39% aged between 30-39,18.2% between 40-49 and 2.5% above the age of 50 and above.

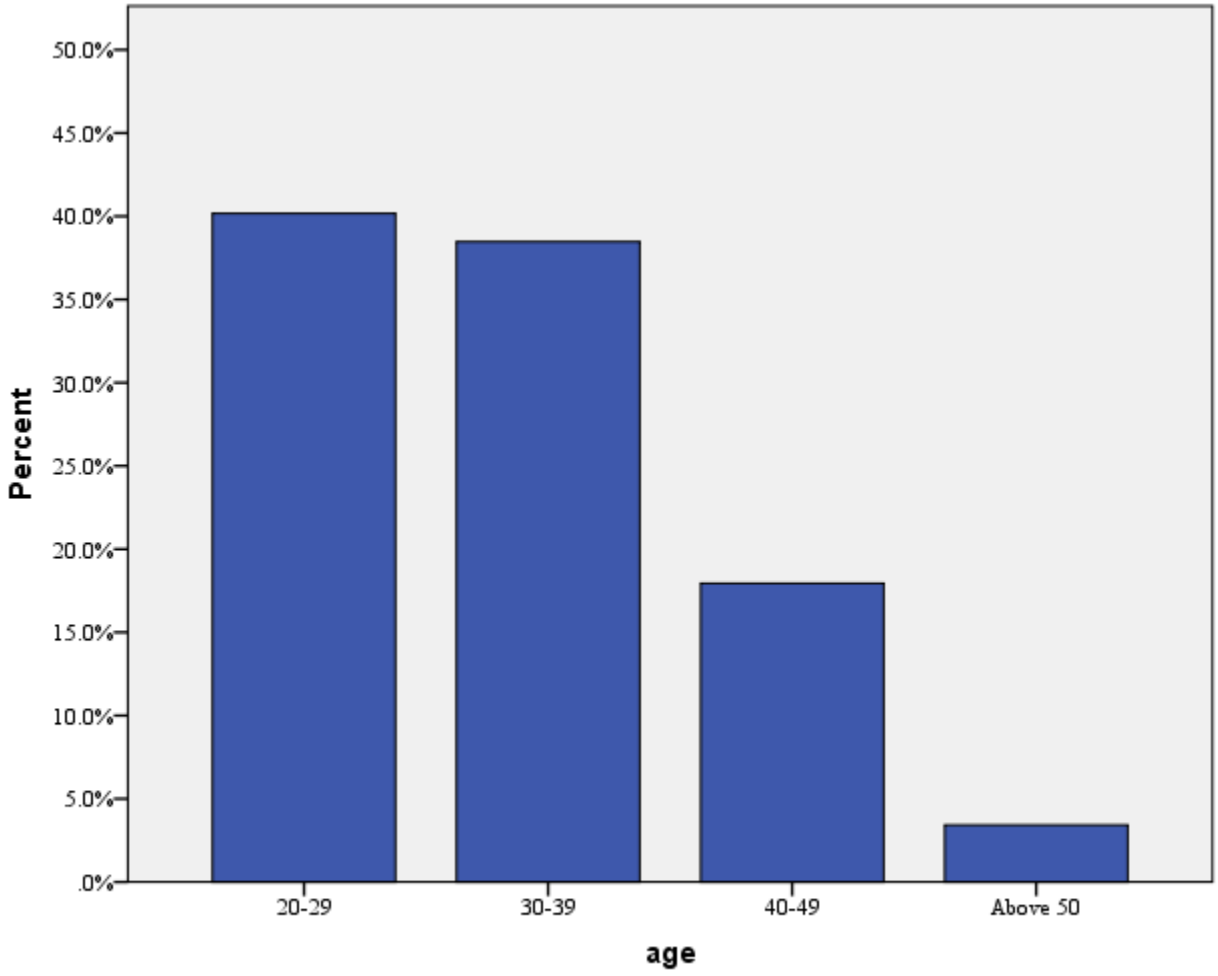

Figure 7- Age of Respondents

4.3.3 Respondents by level of Education

Majority of the respondents (70.5%) had completed their education up to the bachelor's degree at the time of the study. 25% had a master's degree, 4.5% possess diploma degree, and none had a doctorate.

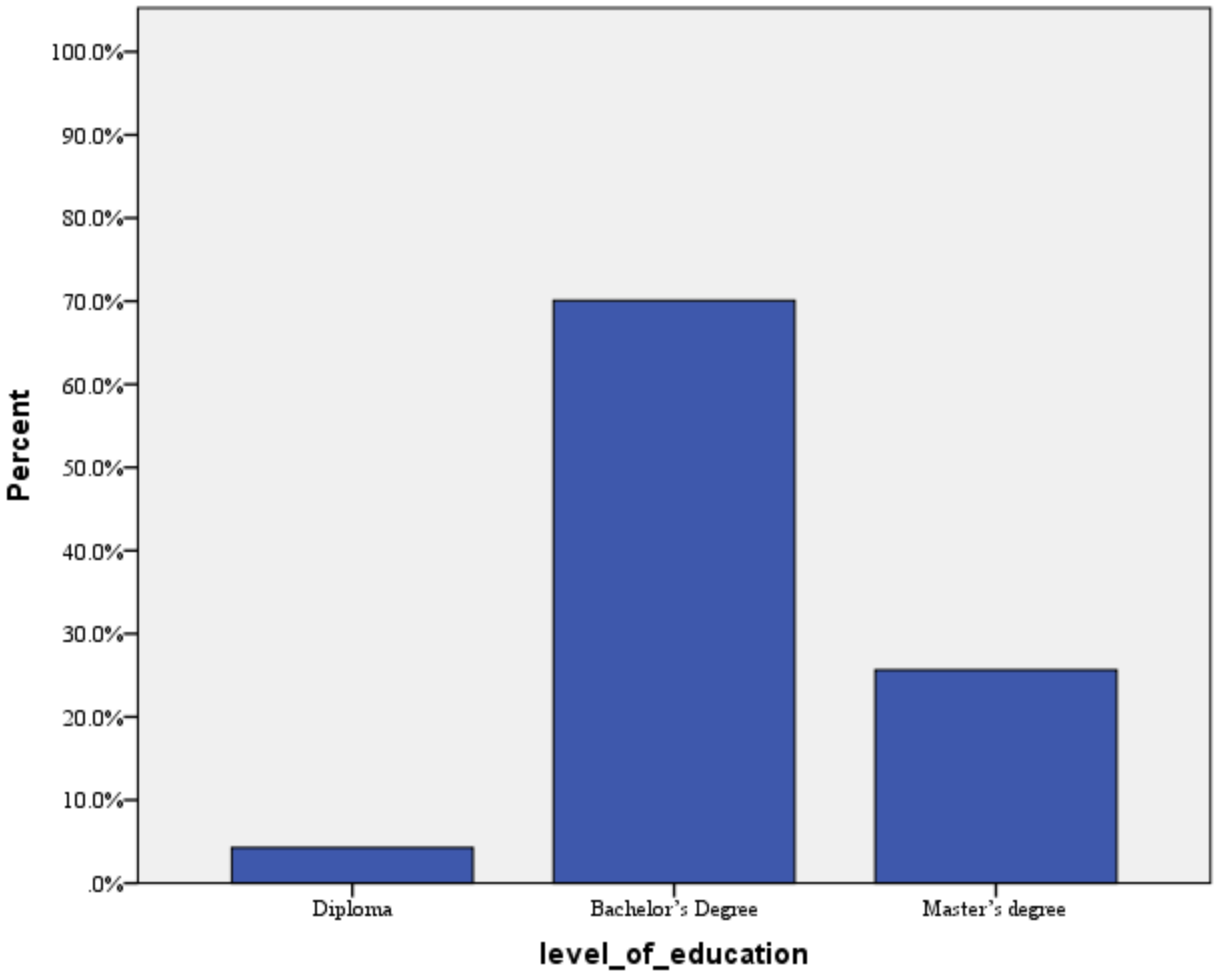

Figure 8 -Distribution of respondents by level of education

4.3.4 Respondents by years of experience with the organization

The participants were required to share their years of experience with the organization. The majority had more than 5 years of experience (26%) and those with 2-3 years of experience (23.9%) followed by those with 3-5 years of experience (21.7%). 16% had 1-2 years of experience, while 12.4% had less than 1 year of experience.

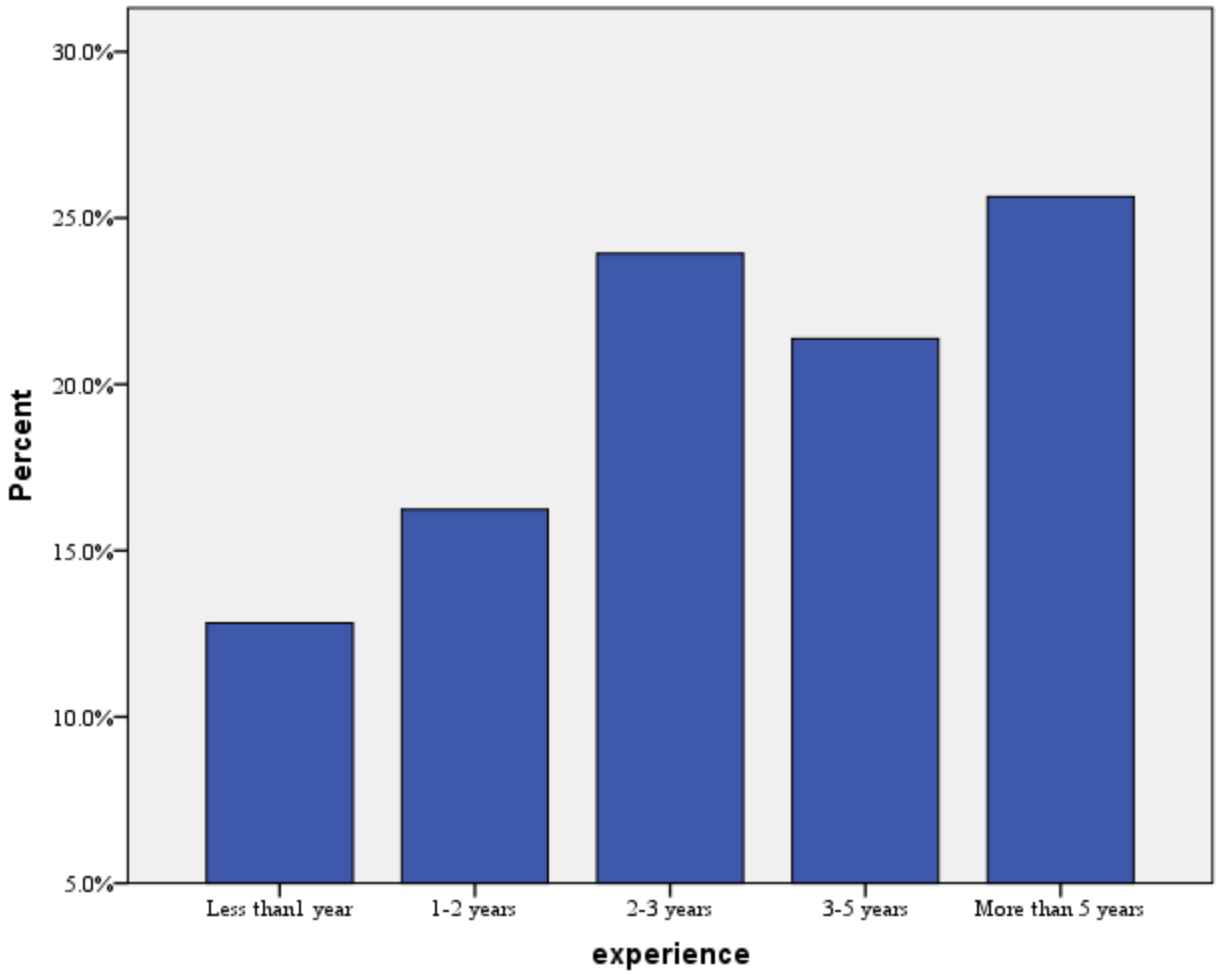

Figure 9- Distribution of respondents by experience

4.4 Test for Normality of Data

A normality assessment was conducted to determine the type of distribution of the data collected. The values of skewness and kurtosis were used to determine data normality. Skewness is applied to determine the symmetry of the distribution. A positive value indicates that distribution is shifted towards the left whereas positive skewness indicates that distribution is shifted towards the right. The results show that data distribution is towards the left. The distribution is however symmetric as the skewness value is between +1 and –1. This is an indication of a substantially skewed distribution. Kurtosis, on the other hand, is an indicator of whether the data is heavy or lightweight. A positive value for kurtosis indicates a peak distribution whereas a negative value indicates a flatter distribution. The general guidance is that the distribution is too large when the number is greater than +1. Likewise, a kurtosis of less than -1 indicates

an overly flat distribution (Hair, Ringle, & Sarstedt, 2016). The kurtosis value lied between +1 and -1 with the highest value as 0.170 and lowest value as -0.970. the data set therefore had a normal distribution.

Table 3 - Normality Tests Results

Descriptive Statistics

	N	Skewness		Kurtosis	
	Statistic	Statistic	Std. Error	Statistic	Std. Error
RPAPE	117	-.282	.224	-1.045	.444
RPAEE	117	-.239	.224	-.109	.444
RPAFC	117	-.452	.224	.170	.444
RPASI	117	-.280	.224	-.572	.444
RPART	117	-.224	.224	-.970	.444
Dx	117	-.336	.224	-.238	.444
Valid N (listwise)	117				

4.5 Reliability Analysis

Cronbach's Alpha was used to calculate data internal consistency. It is a coefficient of reliability which shows how well the set of variables are positively correlated to each other. The closer the value is to 1, the higher the reliability for internal consistency (Sekaran, 2003).The Cronbach's coefficient was 0.702 indicating that the items had a high internal consistency of 70.8% which was acceptable.

Table 4 - Cronbach's Alpha value

Reliability Statistics

Cronbach's Alpha	Cronbach's Alpha Based on Standardized Items	N of Items
.702	.765	5

4.6 Factor Analysis

4.6.1 Kaiser-Meyer-Olkin (KMO) and Bartlett's test of sphericity

To determine the sampling adequacy of the factor analysis, the Kaiser-Meyer - Olkin (KMO) test was used. Factor analyzes were used to ensure that the variables used reflect the definition expected. The KMO test allowed us to ensure that the data we had were suitable for a Factor Analysis and therefore determined whether we had assessed what we intended to measure. The Bartlett Sphericity test tested the hypothesis that the correlation matrix is an identity matrix. This illustrated whether the variables in the study were unrelated and therefore unsuitable for structural detection. The table below shows the findings from KMO and Bartlett sphericity tests.

Figure 10-KMO and Bartlett's test of sphericity

KMO and Bartlett's Test

Kaiser-Meyer-Olkin Measure of Sampling Adequacy.		.687
Bartlett's Test of Sphericity	Approx. Chi-Square	181.169
	df	10
	Sig.	.000

The KMO value (0.687) was between 0.5 and 1 and the Bartlett's test of sphericity significance value (p=.000) was a small value (<0.05). The results depict that the null hypothesis was rejected such that there was a statistical relationship between the categorical variables. Factor analysis may therefore be useful with the data.

4.6.2 Factor Extraction

Principal axis factoring method was used to conduct factor extraction. Once an initial solution was obtained, varimax rotation method was used to rotate the loadings. The Varimax rotation method produces factor loading which is either very high or very low thus making it easier to match a single factor to each item. Rotation maximizes high loads and minimizes low loads, to create the simplest possible structure.

Table 5 - Total Variance explained

Total Variance Explained

	Initial Eigenvalues			Extraction Sums of Squared Loadings			Rotation Sums of Squared		
Factor	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %
1	2.614	52.290	52.290	2.277	45.535	45.535	1.598	31.958	31.958
2	1.014	20.280	72.569	.761	15.226	60.761	1.440	28.803	60.761
3	.710	14.202	86.771						
4	.372	7.443	94.215						
5	.289	5.785	100.000						

Extraction Method: Principal Axis Factoring.

In the initial solution only two factors had their eigen values greater than 1. They accounted for approximately 72.6% of the initial variables' variability. This suggested that two variables were associated with Digital Transformation, but there was a lot of unexplained variation (27.4%). The total variation in the extracted solution was 60.8 %, a variance of 15.2 % from the initial solution clarified by these two variables before rotation. This implied that 15.2% of the variance explained by the initial solution was lost due to dormant influences specific to the initial variables and variance which the model factor cannot explain. The scree plot below confirms only two variables have eigenvalues greater than 1.

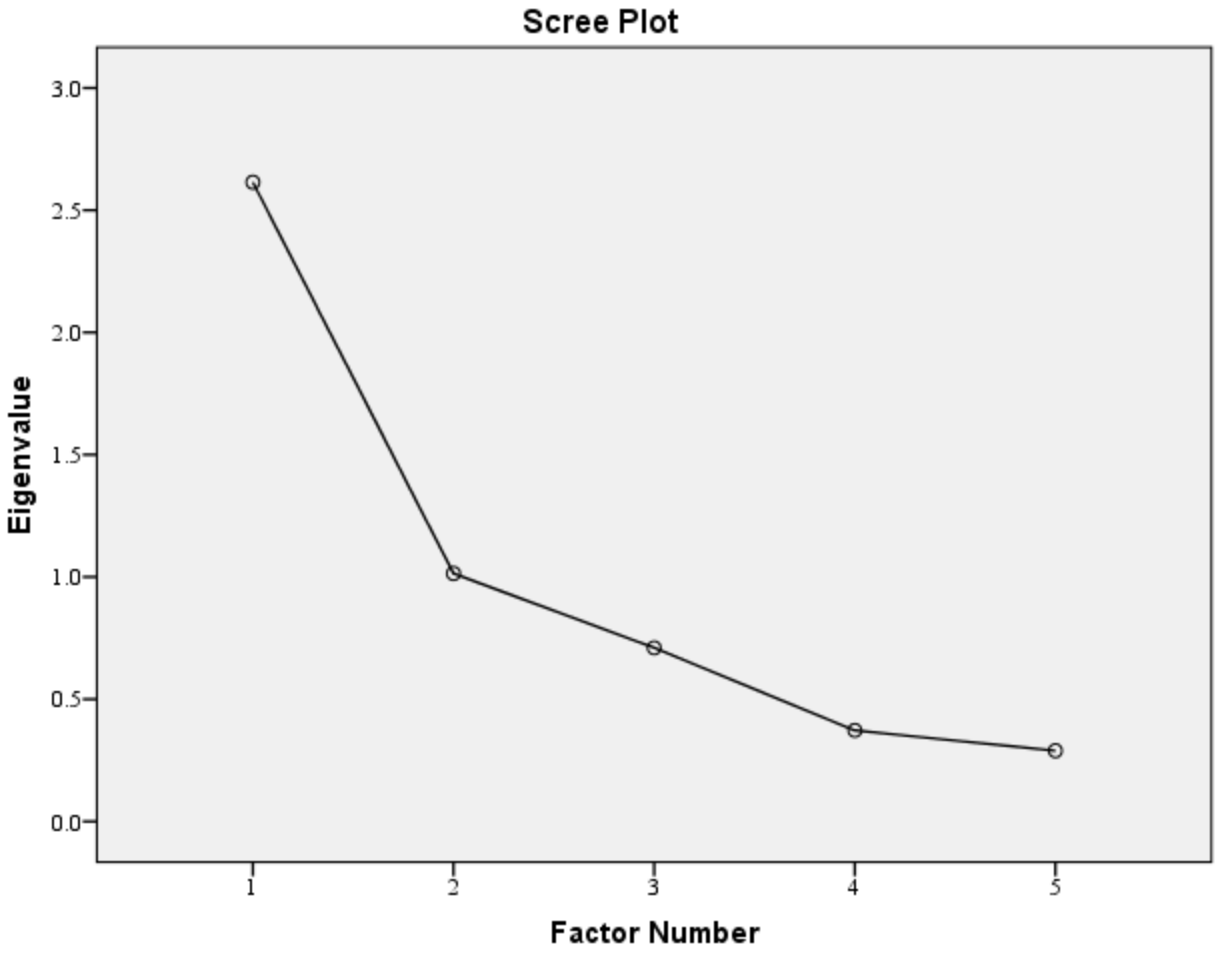

Figure 11 - Scree Plot

4.6.3 Factor Rotation

The two factors were selected for further analysis using varimax rotation method. The results are provided in the table below

Table 6 - Varimax Rotation

Rotated Factor Matrix[a]

	Factor	
	1	2
RPAPE	.718	.163
RPAEE	.547	.527
RPAFC	.855	.206
RPASI	.098	.979
RPART	.207	.367

Extraction Method: Principal Axis Factoring.
Rotation Method: Varimax with Kaiser Normalization.
a. Rotation converged in 3 iterations.

Rotated factor loadings reflect how each factor weights each variable, and the association between the variables and the factor. RPAPE, RPAFC, RPAEE and RPART are well loaded in component 1 and all variables are well loaded in component 2. All the variables included in the conceptual framework were supported in the results of the factor analysis.

4.7 Descriptive Statistics of the Variables

The variables' descriptive statistics are presented in this section. The independent variables are RPA Performance expectancy (RPAPE), RPA Effort Expectancy (RPAEE), RPA Social Influence (RPASI), RPA Facilitating Conditions (RPAFC) and RPA Risks and Threats (RPART). The dependent variable is organization digital transformation (Dx).

4.7.1 RPA Performance Expectancy

The respondent's feedback on RPA Performance Expectancy was evaluated. The results are presented in the table below.

Table 7 - Descriptive Statistics for RPA Performance expectancy

Descriptive Analysis

	Strongly Disagree (%)	Disagree (%)	Neither agree nor Disagree (%)	Agree (%)	Strongly Agree (%)	Mean	Median	Std. Deviation	Minimum	Maximum
RPA can save you time on repetitive processes	0.0	2.6	14.5	27.4	55.6	4.36	5.00	.825	2	5
RPA can improve the quality of work produced	13.7	14.5	17.1	23.9	30.8	3.44	4.00	1.410	1	5
RPA can significantly reduce costs	.9	17.9	27.4	14.5	39.3	3.74	4.00	1.185	1	5
RPA can reduce risks and increase compliance	16.2	20.5	23.9	28.2	11.1	2.97	3.00	1.263	1	5
RPA can reduce process complexity	13.7	17.1	7.7	24.8	36.8	3.54	4.00	1.471	1	5

Averagely, all attraction points and benefit of RPA were well understood by the respondents. The strongest focus was the time-saving benefits of RPA. 55.6% of the respondents strongly agreed that using RPA would help them save time on repetitive processes. The participants also agreed that RPA can improve on their quality of work, significantly reduce costs and reduce process complexity. However, 23.9% of the respondents (mean 3.00, Std Dev 1.263) neither agreed nor disagreed that RPA can reduce risks and increase process compliance.

4.7.2 RPA Effort Expectancy

The participant's responses on RPA Performance Expectancy was evaluated and the responses are presented in the table below.

Table 8 - Descriptive Statistics for RPA Effort Expectancy

Descriptive Analysis										
	Strongly Disagree (%)	**Disagree (%)**	**Neither agree nor Disagree (%)**	**Agree (%)**	**Strongly Agree (%)**	**Mean**	**Median**	**Std. Deviation**	**Minimum**	**Maximum**
I find it easy to understand and implement RPA in our processes	2.6	16.2	28.2	41.9	11.1	3.43	4.00	.977	1	5
We have standardized the various processes of our operations	13.7	12.0	13.7	35.9	24.8	3.46	4.00	1.349	1	5

41.9% of the participants agreed that they found it easy to understand and implement RPA in their processes (mean 3.43, Std Deviation 0.977) whereas 35.9% (mean 3.70, Std deviation 1.243) agreed that they have standardized the processes in their operations. The perceived ease of use could be attributed to the fact that the participants were from a technical background. The 28.2% of users who neither agreed nor disagreed could be attributed to fact that not all users had interacted with RPA.

4.7.3 RPA Facilitating Conditions

The participant's responses on RPA Facilitating Conditions was evaluated and the responses are presented in the table below.

Table 9- Descriptive Statistics of RPA Facilitating Conditions

	Descriptive Analysis									
	Strongly Disagree (%)	**Disagree (%)**	**Neither agree nor Disagree (%)**	**Agree (%)**	**Strongly Agree (%)**	**Mean**	**Median**	**Std. Deviation**	**Minimum**	**Maximum**
In our organization, RPA is an organization-wide initiative	1.7	11.1	30.8	25.6	30.8	3.73	4.00	1.072	1	5
Our organization is developing RPA talent and skills by investing in RPA Trainings and encouraging employees to pursue digital qualifications on automation	.9	14.5	17.1	44.4	23.1	3.74	4.00	1.001	1	5
Employees are taking personal initiatives to learn and implement RPA	5.1	8.5	15.4	23.9	47.0	3.99	4.00	1.200	1	5
Our organization outsources RPA work to other organizations	44.4	26.5	16.2	9.4	3.4	2.01	2.00	1.141	1	5
Our organization provides us with the necessary financial support to implement RPA	3.4	12.8	29.9	33.3	20.5	3.55	4.00	1.063	1	5

47% of the participants strongly agreed that employees were taking personal initiatives to learn and implement RPA (Mean 3.99, Std Deviation 1.200). Majority of the respondents agreed that RPA was an organization-wide initiative (Mean 3.73, Std Deviation 1.072) and that the organization was investing n RPA training to develop RPA talent and skills (Mean 3.74, Std Deviation 1.001).33.3% of the participants also agreed that the organization provided them with the necessary financial support to implement RPA (Mean 3.55, Std Deviation 1.063). 44.4% also strongly disagreed that their organization outsources RPA work.

4.7.4 RPA Social Influence

The table below represents the results of evaluation of participant's responses on RPA Social Influence.

Table 10 - Descriptive statistics of RPA Social Influence

Descriptive Analysis										
	Strongly Disagree (%)	**Disagree (%)**	**Neither agree nor Disagree (%)**	**Agree (%)**	**Strongly Agree (%)**	**Mean**	**Median**	**Std. Deviation**	**Minimum**	**Maximum**
Our competitor's use and adoption of new technologies have influenced the organization to adopt and use RPA in our processes	22.2	35.9	16.2	15.4	10.3	2.56	2.00	1.276	1	5
Our customers' expectations drive our organizational digital transformation initiatives	6.8	12.8	12.8	36.8	30.8	3.72	4.00	1.224	1	5
RPA vendors have influenced the organization to pursue use of RPA	23.9	37.6	25.6	11.1	1.7	2.29	2.00	1.009	1	5

36.8% of the respondents agreed that their customer's expectations drove their RPA adoption and use (Mean 3.72, Std Deviation 1.224). More than 35% disagreed that neither their competitors nor RPA vendors have influenced then to pursue use of RPA. Further,35.9% of the participants disagreed that their competitors had influenced them to adopt RPA.

4.4.5 RPA Risks and Threats

The participant's responses on RPA Risks and Threats was evaluated and the responses are presented in the table below.

Table 11- Descriptive statistics of RPA Risks and Threats

Descriptive Analysis										
	Strongly Disagree (%)	**Disagree (%)**	**Neither agree nor Disagree (%)**	**Agree (%)**	**Strongly Agree (%)**	**Mean**	**Median**	**Std. Deviation**	**Minimum**	**Maximum**
RPA robots introduces new risks that must be addressed to secure sensitive data	8.5	12.0	23.1	26.5	29.9	3.57	4.00	1.268	1	5
Data used by RPA bot is stored securely and therefore cannot be accessed by unauthorized third parties.	12.0	13.7	37.6	21.4	15.4	3.15	3.00	1.198	1	5
RPA adoption is faced with resistance from employees for fear that it will take away their jobs	16.2	23.1	29.1	26.5	5.1	2.81	3.00	1.152	1	5

29.9% of the participants strongly agreed that RPA introduces new risks that must be addressed to secure sensitive data. On the other hand, majority could neither agree nor disagree if data used by RPA is stored securely or if there is resistance from employees for fear that RPA adoption will take away their jobs.

4.8 Correlation Analysis of variables

The correlation of Spearman 's rank was used to evaluate the relation between independent variables (RPAPE, RPAEE, RPASI, RPAFC and RPART) and the dependent variable, Organizational Digital Transformation (Dx). Spearman's correlation coefficient, (ρ, also signified by r_s) determines the strength and direction of relationship between two ranked variables. Spearman's rank correlation was used because it is assumed that variables that are ordinal, they represent a paired observation and there is a monotonic relationship between them such that as the value of one variable increases, so does the value of the other variable and vice versa.

4.8.1 Correlation between RPAPE, RPAEE, RPASI, RPAFC, RPART and Organizational Digital Transformation (Dx).

The analysis indicated that RPAPE, RPAEE, RPASI, RPAFC and RPART had a significant relationship with organization digital transformation (Dx). All the independent variables had a positive coefficient, meaning there was a positive relationship between each independent variable and the dependent variable (Oates, 2006). A correlation coefficient of between 0.3 and 0.7 demonstrates a reasonable correlation. RPAEE demonstrated strongest relationship with Dx with Spearman's coefficient (r_s=.810, p=.000). This therefore means that effort expectancy of RPA of the respondents positively influenced digital transformation of their organization. Equally, a positive and statistically significant correlation existed between RPAPE and Dx, RPAFC and Dx and RPASI and Dx with a correlation coefficient of (r_s=.741, p=.000), (rs=.751, p=.000) and (r_s=.763, p=.000) respectively. RPART demonstrated a moderate positive relationship with Dx (r_s=.456, p=.000). The results are presented in the table below.

Table 12 - RPAPE, RPAEE, RPASI, RPAFC, RPART and Dx correlation matrix

Correlations

			RPAPE	RPAEE	RPAFC	RPASI	RPART	Dx
Spearman's rho	RPAPE	Correlation Coefficient	1.000					
		Sig. (2-tailed)						
		N	117					
	RPAEE	Correlation Coefficient	.534**	1.000				
		Sig. (2-tailed)	.000					
		N	117	117				
	RPAFC	Correlation Coefficient	.648**	.545**	1.000			
		Sig. (2-tailed)	.000	.000				
		N	117	117	117			
	RPASI	Correlation Coefficient	.297**	.628**	.268**	1.000		
		Sig. (2-tailed)	.001	.000	.003			
		N	117	117	117	117		
	RPART	Correlation Coefficient	.206*	.246**	.215*	.391**	1.000	
		Sig. (2-tailed)	.026	.008	.020	.000		
		N	117	117	117	117	117	117
	Dx	**Correlation Coefficient**	**.741****	**.810****	**.751****	**.763****	**.456****	**1.000**
		Sig. (2-tailed)	**.000**	**.000**	**.000**	**.000**	**.000**	
		N	**117**	**117**	**117**	**117**	**117**	**117**

**. Correlation is significant at the 0.01 level (2-tailed).
*. Correlation is significant at the 0.05 level (2-tailed).

4.9 Regression Analysis

It was assumed that a linear relationship exists between the dependent and independent variables. Multiple regression analysis was done to investigate the extent to which the predictors would predict the organization digital transformation. The findings are presented below.

4.9.1 Multiple Regression Analysis between RPAPE, RPAEE, RPASI, RPAFC, RPART and Dx

Multiple regression is used when predicting the value of a variable based on the value of two or more other variables. The results therefore display the degree of relationship between the dependent variables and the independent variable. *R* can be considered a measure of the quality of the prediction of the dependent variable. A value of 0.967, in this case, indicate a good level of prediction. The R^2 value of .934 implied that the predictor variables, RPAPE, RPAEE, RPASI, RPAFC and RPART, accounted for 92% of the variance in organizational digital transformation (Dx), with all external factors kept constant.

Adjusted R-squared(R^2=.934) determined how reliable the correlation is and how much is determined by the addition of independent variables.

Table 13 - Regression Model Summary

Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.967[a]	.934	.924	.08741

a. Predictors: (Constant), RPART, RPAPE, RPASI, RPAFC, RPAEE

Source: Field Data 2020

4.9.2 Results of Anova

The results of Analysis of Variance (ANOVA) demonstrated that the overall regression model was significant;

$$F(5,111) = 88.75,\ p<0.001,\ R^2=.97$$

P-value was less than 0.005 implying that the independent variables RPAPE, RPAEE, RPASI, RPAFC and RPART significantly influenced the respondent's organization digital transformation (Dx).

Table 14 - Results of Anova

ANOVA[a]

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	4.851	5	.970	88.759	.000[b]
	Residual	.764	111	.007		
	Total	5.615	116			

a. Dependent Variable: Dx

b. Predictors: (Constant), RPART, RPAPE, RPASI, RPAFC, RPAEE

4.9.3 Individual Regression coefficient

The Beta coefficient shows the changes in organizational digital transformation was generated by the independent variables. The beta coefficient demonstrates the degree of change in the outcome variable (Dx) for every unit of change in the independent variable. The beta coefficient value was positive for each independent variable. Therefore, for every unit increase in the predictor variable, the dependent variable increased by the beta coefficient value. The *t*-test results assess whether the beta coefficient is significantly different from zero. The results show that the independent variables RPAPE, RPAEE, RPAFC, RPASI and RPART positively influenced the dependent variable Dx. However, only RPAEE, RPAFC and RPART are statistically significant to Dx as their p values p > .05.

Table 15 - Regression Coefficient

Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	-.051	.165		-.307	.760
	RPAPE	.050	.020	.123	2.388	0.171
	RPAEE	0.16	0.032	0.42	5.297	0.003
	RPAFC	.071	.018	.171	3.95	0.002
	RPASI	.069	.017	.188	4.17	0.067
	RPART	.059	.017	.164	3.55	0.024

a. Dependent Variable: Dx

The regression model was expressed as:

$Dx= a+\beta 2RPAEE+\beta 3RPAFC+\beta 5RPART+e$

$Dx=-0.51+0.16RPAEE+0.71RPAFC+0.59RPART+0.165$

where:

RPAEE=RPA Effort Expectancy

RPAFC=RPA Facilitating conditions

RPART=RPA Risks and Threats

e=random error

a=constant where regression intercepts y axis

β=regression coefficients

4.10 Effect of Moderators

Multiple regression was done to evaluate whether the moderating factors affect specific independent variables.

4.10.1 Effect of Age on RPAPE, RPAEE and RPASI

Table 16- Effect of age moderating factor

Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	2.941	.460		6.388	.000
	RPAPE	-.538	.204	-.275	-2.637	.010
	RPAEE	.577	.418	.172	1.381	.170
	RPASI	-.194	.139	-.155	-1.392	.167

a. Dependent Variable: age

The correlation output showed that RPAEE, RPASI and age were not statistically significant because their p-values (.170 and .167) were greater than 0.05. This implies that age was not a significant moderator of RPAEE and RPASI. However, RPAPE and age were statistically significant because their p-value was less than 0.05 ($p<0.05$)

4.10.2 Effect of Gender on RPAPE, RPAEE and RPASI

Table 17-Effect of gender moderating factor

Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	1.582	.281		5.634	.000
	RPAPE	.128	.124	.109	1.025	.307
	RPAEE	.143	.255	.071	.562	.575
	RPASI	-.142	.085	-.190	-1.672	.097

a. Dependent Variable: gender

The correlation between RPAPE, RPAEE, RPASI and gender had p-values of .307,.575 and .097 respectively (where $p > .05$). Therefore, gender was not a significant moderator of either RPAPE, RPAEE or RPASI.

4.10.3 Effect of Experience on RPAPE and RPAEE

Table 18- Effect of experience moderating factor

Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	1.722	.643		2.680	.008
	RPAPE	.139	.329	.044	.422	.674
	RPAEE	1.271	.564	.234	2.253	.026

a. Dependent Variable: experience

The correlation between RPAPE and participant's experience resulted in a p value .674 where ($p>0.05$). This implied that experience did moderate the association between RPAPE and organizational digital transformation (Dx). However, there was a significant and positive correlation between RPAEE and experience ($p= 0.026$).

4.11 Hypothesis Testing and Discussion

The regression summary (table 13) showed that the independent variables accounted for 92.1% of the variance in the dependent variable($R^2=0.921$). The remaining 7.9% was accounted for by other factors not discussed in the model. Results of ANOVA also demonstrated significant relationship between the predictor variables and the dependent variable. The Beta coefficient value was positive for each independent variable.

H1: RPA performance expectancy does not influence on digital transformation of the organization

Model tests by Venkatesh (2003) identified performance expectancy construct as the strongest predictor of intention in UTAUT (Venkatesh, 2003). The beta coefficient value was positive for RPA performance expectancy and organizational digital transformation. However, there was no significance between RPAPE and Dx. H1 therefore holds true.

H2: Ease of use of RPA does not influence on digital transformation of the organization

The results of RPAEE showed that most employees agreed that they find it easy to understand and implement RPA and that they have standardized their various process in their daily routines. A positive and statistically significant correlation existed between RPAEE and Dx with a correlation coefficient of ($r_s=.810$, $p=.000$). Further, regression analysis demonstrated a positive and significant relationship between RPAEE and organizational digital transformation. Positive RPAEE positively influences

organizational digital transformation. The results therefore reject H2. This is consistent with Venkatesh's (2003) study which identified that effort-oriented constructs are supposed to become more prevalent in the early stages of a new activity but later become overwhelmed by concerns about instrumentality.

H3: There is no relationship between RPA facilitating conditions and organizational digital transformation

Most participants agreed that the organization is supporting RPA in terms of enabling trainings and providing the necessary financial support. RPAFC had a strong and positive correlation with Dx with coefficient (r_s=.751, p=.000). Appelbaum et. al. (2012) suggested that visible and continuous support and facilitative management is necessary for change success. Results from regression analysis demonstrated RPAFC was positively and statistically significant to organizational digital transformation. The results therefore hold that positive RPAFC positively influences organizational digital transformation and rejects H3.

H4: RPA Social Influence does not influence on digital transformation of the organization

The results of correlation analysis demonstrated that RPASI had a strong correlation to organization digital transformation (Dx) (r_s=.763, p=.000). However, individual regression showed that RPASI is not statistically significant to organizational digital transformation(p=0.067). Venkatesh and Davis (2000) noted that social impact only tended to be relevant in the early stages of individual technology knowledge, with its position fading with time and gradually being negligible with continued use. The results could be attributed to the varied responses on if the users have already implemented RPA.H4 therefore holds true.

H5: RPA risks and threats do not influence digital transformation of the organization

Majority of the participants agreed that RPA robots pose additional threats that must be addressed to secure confidential data. RPART demonstrated a realistic relationship with Dx (r_s=.456, p=.000). Results from individual regressions indicated that RPART is significant to Dx (p <.05). The results support that RPART influences Dx and rejects H5.

H6: Age does not moderate the effect of social influence on digital transformation

H7: Age does not moderate the effect of performance expectancy on digital transformation

H8: Age does not moderate the effect of effort expectancy on digital transformation

The correlation output showed that RPAEE, RPASI and age are not statistically significant (p> 0.05). Age is not a significant moderator of RPAEE and RPASI. However, the results demonstrated that RPAPE and age are statistically significant (p<0.05). There is however no significance between RPAPE and Dx, H6, H7 and H8 therefore hold true.

H9: Gender does not moderate the effect of Performance expectancy on digital transformation

H10: Gender does not moderate the effect of effort expectancy on digital transformation

H11: Gender does not moderate the effect of social influence on digital transformation

Previous research on gender disparities found that males appear to be extremely task-oriented (Minton and Schneider 1980) and that their success levels were especially exceptional. Study has shown that on average, the females perform more routine or codifiable tasks that are more prone to automation than the males across all sectors and occupations. Moreover, women perform fewer tasks requiring analytical input or abstract where technological change can be complementary to human skills and improve labor productivity (Brussevich, Dabla-Norris, & Khalid, 2019). On the other hand, research found that gender stereotypes have a clear psychological foundation and are stable, but subject to change over time. (Kirchmeyer, 2002). Venkatesh et al. (2000) indicated that females appear to be more receptive to the views of others and therefore make the social impact more apparent as they develop an aim to use it. However, the participants' gender in this research did not have a substantial impact on the effect of RPAPE, RPAEE, and RPASI on Dx. The results therefore hold true for H9, H10 and H11.

H12: Experience of employees does not moderate the influence of performance expectancy on digital transformation

H13: Experience of employees does not moderate the effect of effort expectancy influence on digital transformation

Regression results showed a significant and positive correlation between RPAEE and experience ($p=0.026$). This implies that experience would moderate RPAEE such that more experience would mean that such employees would understand the benefits of process automation in enabling them to perform their duties more efficiently and would find it easy to use. The results therefore hold true H12 and rejects H13.

4.1.2 Achievement of objectives

The purpose of this research was to evaluate how organizations can leverage robotic process automation to digitally transform themselves. All the research objectives were achieved.

i. **To investigate how RPA Performance expectancy, influence digital transformation of an organization**

   RPAPE has no significant influence on organizational digital transformation

ii. **To investigate how RPA effort expectancy, influence digital transformation of an organization**

RPAEE influences Organizational digital transformation

iii. **To examine effect of RPA Social Influence on organizational digital transformation**

RPA Social Influence has no significant influence Organizational digital transformation

iv. **To establish how RPA Facilitating conditions influence digital transformation of an organization**

RPA Social Influence influences Organizational digital transformation

v. **To investigate the influence of RPA risks and threats on digital transformation of an organization**

RPA risks and threats influence organizational digital transformation.

vi. **To examine influence of age, gender and experience as moderating factors of independent and dependent variables.**

Age and gender do not moderate the relationship between the independent and dependent variables. Experience moderates influence of RPA effort expectancy on digital transformation.

vii. **To formulate and validate framework for leveraging of RPA for digital transformation**

The conceptual framework was formulated, tested and the resultant model obtained (figure 12)

Table 19-Summary of Discussion

Objective	Hypothesis	Outcome	Status
O1:To investigate how RPA Performance expectancy, influence digital transformation of an organization	H1: RPA performance expectancy does not influence on digital transformation of the organization	RPA performance expectancy does not influence digital transformation of the organization	Accepted
O2:To investigate how RPA effort expectancy, influence digital transformation of an organization	H2: Ease of use of RPA has no influence on digital transformation of the organization	RPA effort expectancy influences digital transformation of the organization	Rejected
O3:To establish how RPA Facilitating conditions influence digital transformation of an organization	H3: There is no relationship between RPA facilitating conditions and organizational digital transformation	RPA facilitating conditions influences organizational digital transformation	Rejected
O4:To examine effect of RPA Social Influence on organizational digital transformation	H4: RPA Social Influence does not influence digital transformation of the organization	RPA Social Influence has no influence on digital transformation of the organization	Accepted
O5: To investigate the influence of RPA risks and threats on digital transformation of an organization	H5: RPA risks and threats do not influence digital transformation of the organization	RPA risks and threats influences digital transformation of the organization	Rejected
O6: To examine influence of age, gender and experience as moderating factors of independent and dependent variables	H6: Age does not moderate the effect of social influence on digital	Age does not moderate the effect of RPASI on digital transformation	Accepted
	H7: Age does not moderate the effect of performance expectancy on digital transformation	Age does not moderate the effect of RPAPE on digital transformation	Accepted
	H8: Age does moderates the effect of effort expectancy on digital	Age does not moderate the effect of RPAEE on digital transformation	Accepted
	H9: Gender does not moderate the effect of Performance expectancy on digital transformation	Gender does not moderate the effect of RPAPE on digital transformation	Accepted
	H10: Gender does not moderate the effect of effort expectancy on digital transformation	Gender does not moderate the effect of RPAEE on digital transformation	Accepted
	H11: Gender does not moderate the effect of social influence on digital	Gender does not moderate the effect of RPASI on digital transformation	Accepted
	H12: Experience of employees does not moderate the influence of performance expectancy on digital	Experience of employees does not moderate the influence of RPAPE on digital transformation	Accepted
	H13: Experience of employees does not moderate the effect of effort expectancy influence on digital	Experience of employees moderates the effect of effort expectancy influence on digital transformation	Rejected

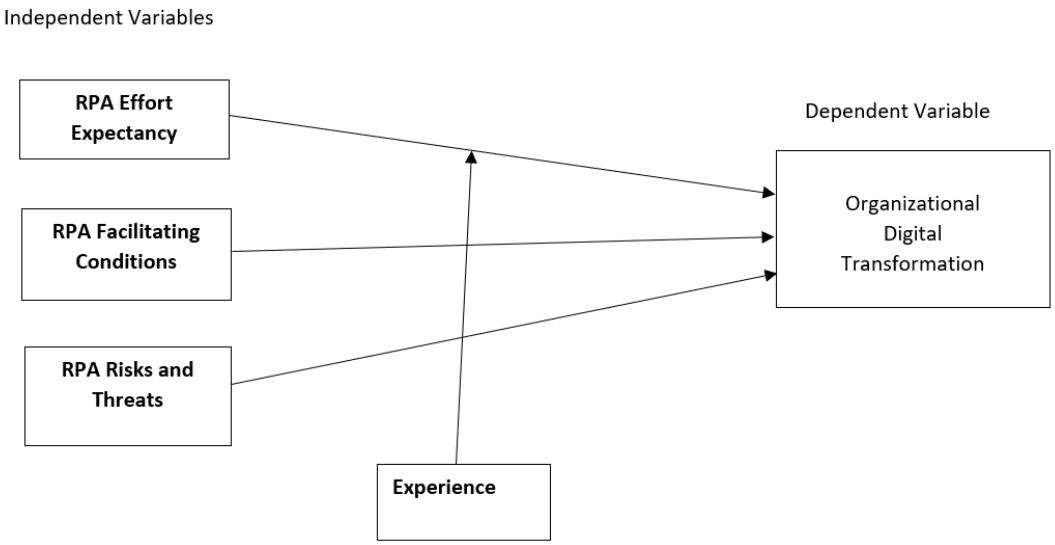

Figure 12 - Resultant model

From the results, it is established that RPA effort expectancy, RPA facilitating conditions and RPA risks and threats influence leveraging of RPA. The results are consistent with the Xchanging case study, which concluded that project sponsorship, organizational support, organizational fitness, harmonized processes and internal RPA capability facilitated the adoption of RPA. (Willcocks, Lacity, & Craig,2015)

CHAPTER FIVE

CONCLUSION AND RECOMMENDATIONS

5.1 Introduction

The study presented and discussed the results with the goal of formulating, testing and validating a model for RPA implementation and usage in the telecommunications sector with a focus. This chapter includes the study's accomplishments, findings and recommendations.

5.2 Conclusion

The study established that leveraging of RPA is influenced by RPA Effort Expectancy, RPA Facilitating conditions and RPA risks and threats. The key indicators were Perception of ease of use of RPA, Organizational Support for RPA and Perception of potential harm of RPA. Experience was a key moderator of RPA effort expectancy influence on organizational digital transformation. The study notes despite the potential of adoption of RPA to digitally transform organizations, RPA has inherent risks such as likelihood of breach of confidentiality and leakage of information. There is also fear by employees that leveraging RPA will take away their jobs.

5.3 Research Limitations

The study encountered a few challenges when conducting the study. Most of the participants were aged between 20 to 49 with only 2.5% above the age of 50. Also, only quantitative data analysis was done. Non-numeric data was therefore not considered in the research. Further, the participants had technical background and the business users were left out. This could result in a biased outcome. The research study was done in only one case organization and therefore the generalizability of the findings may not apply in other contexts.

5.4 Contribution of study

The research has provided a framework for leveraging Robotic Process Automation. The model can be used as guide by organizations which intend to adopt RPA in their processes. The study also contributes to the research body a conceptual framework for adoption.

5.4 Recommendations

The study recommends the following to facilitate adoption and use of robotic process automation.

Adequate risk framework- there are potential risks which need a model to guide operations and use of the technology while safeguarding users, systems and customers.

Building staff capacity- there is need to build staff capacity to enable them use RPA tools to the benefit of the organization.

Change of employees' perspective-there is need to change employee's view of robotic process automation so that they can provide support for its implementation.

5.5 Further study

Study is recommended to investigate further the factors identified to influence use of RPA and to refine the conceptual model grounded on the results. It is also proposed that case studies on the use of RPA in different organizations should be explored and compared. This would contribute to the generalization of findings and thus to the advancement of RPA adoption research. Further study on risk gaps of RPA is required and the effectiveness of new developments in RPA such as cognitive intelligence.

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Appendices

Appendix I: Budget Plan

Table 20 - Budget Plan

Item	Cost	Justification
Laptop	50000	Computer for research development
Software	40000	Software for data analysis
Airtime	1500	Contacting research participants
Internet	10000	Distribution of questionnairres and conducting research
Printing	2000	Reports for submission
Total	**103500**	

Appendix II: Research Plan

Table 21 - Activity Plan

	Activity	Earliest start date	Duration(week	Precedence
	Start	1/10/2019	0	
A	Literature Review	1/10/2019	21	-
B	Develop Questionnaires	20/01/2020	1	-
C	Conduct Pilot Research	27/1/2020	2	B
D	Review and Analyze Pilot	10/2/2020	1	C
E	Finalize development Questionnaires and Sampling	17/2/2020	1	D
F	Distribution of Questionnaires	24/2/2020	4	E
G	Collection of Questionnaires	16/3/2020	2	F
H	Data Analysis	23/3/2020	3	G
I	Research write up	6/4/2020	3	A,H
	End	27/4/2020	0	H

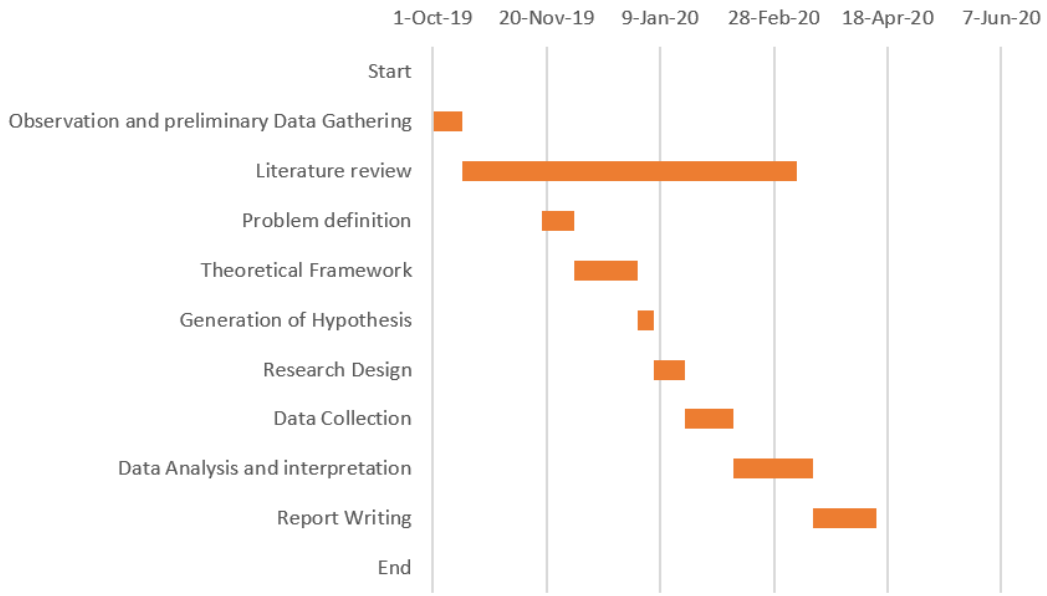

Figure 13 - Gantt Chart

Appendix III: Questionnaire

RESEARCH QUESTIONNAIRE

I am a student at the University of Nairobi conducting a research study on "Leveraging robotic process automation (RPA) for digital transformation". Kindly assist with information required in this questionnaire as accurately as possible. The information provided will be confidential and will be used for academic purposes only.

A. Personal Details

Please select one

1. What is your age bracket?
   a) 20-29
   b) 30-39
   c) 40-49
   d) Above 50
2. What's your gender?
   a) Male
   b) Female
   c) Prefer not to say
3. How long have you been working with your organization?
   a) Less than1 year
   b) 1-2 years
   c) 2-3 years
   d) 3-5 years

e) More than 5 years

4. What is your level of education?
   a) Diploma
   b) Bachelor's Degree
   c) Master's degree
   d) Doctorate
5. Have you deployed any software robot in your function/organization?
   a) Yes
   b) No
   c) Not Sure

B. RPA Performance Expectancy

RPA Performance Expectancy refers to the degree to which the organization believes that Robotic Process Automation will enable employees to perform tasks more efficiently to meet the organization's objectives. Please answer the below questions as accurately as possible.

1. To digitally transform your organization, are you working on any automation initiatives using RPA tools in your function or organization? (check box)
   a) We have implemented RPA for some processes
   b) We are currently trialing RPA as a pilot /Proof of Concept
   c) No, we are not currently deploying RPA
   d) We are not currently running RPA but interested in doing so
   e) I don't know
3. To what extent do you agree/disagree with the below statement about RPA
   a) RPA can save you time on repetitive processes
   b) RPA can improve the quality of work produced
   c) RPA can significantly reduce costs
   d) RPA can reduce risks and increase compliance
   e) RPA can reduce process complexity

C. RPA Effort Expectancy

1. To what extent to you agree or disagree with the below statements about RPA (1-Strongly Disagree,2-Disagree,3-Neither agree nor Disagree,4-Agree,5-Strongly Agree)
   a) I find it easy to understand and implement RPA in our processes
   b) We have standardized the various processes of our operations

D. RPA Facilitating Conditions

RPA Facilitating Conditions refers to the degree to which the organization supports Robotic Process Automation initiatives

1. To what extent do you agree/disagree with the below statements about RPA in your organization (1-Strongly Disagree,2-Disagree,3-Neither agree nor Disagree,4-Agree,5-Strongly Agree)
   a) In our organization, RPA is an organization-wide initiative

b) Our organization is developing RPA talent and skills by investing in RPA Trainings and encouraging employees to pursue digital qualifications on automation
c) Employees are taking personal initiatives to learn and implement RPA
d) Our organization outsources RPA work to other organizations
e) Our organization provides us with the necessary financial support to implement RPA

E. RPA Social Influence

RPA Social Influence refers to the degree to which the organization is influenced by to adopt RPA in their processes

1. To what extent do you agree/disagree with the following statements regarding your organization's business and operational environment? (1-Strongly Disagree,2-Disagree,3-Neither agree nor Disagree,4-Agree,5-Strongly Agree)
   a) Our competitor's use and adoption of new technologies have influenced the organization to adopt and use RPA in our processes
   b) Our customers' expectations drive our organizational digital transformation initiatives
   c) RPA vendors have influenced the organization to pursue use of RPA

F. RPA Risks and threats

RPA Risks and threats refers to level of Potential harm of RPA and likelihood to which the harm can be realized by the organization

1. To what extent do you agree or disagree with the following statements regarding use of RPA to digitally transform the organization (1-Strongly Disagree,2-Disagree,3-Neither agree nor Disagree,4-Agree,5-Strongly Agree)
   a) RPA robots introduces new risks that must be addressed to secure sensitive data
   b) Data used by RPA bot is stored securely and therefore cannot be accessed by unauthorized third parties.
   c) RPA adoption is faced with resistance from employees for fear that it will take away their jobs
2. Are there any risks that you think the organization should take into consideration when adopting RPA in their processes?

   _____