

**FACTORS AFFECTING TECHNOLOGY ADOPTION BY SMES IN THE  
AUTOMOBILE GARAGES IN NAIROBI COUNTY**

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## DECLARATION

This research project is my original work and has not been presented for an award in any other university.

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This research project has been submitted for examination with my approval as the University of Nairobi supervisor.

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## **ABBREVIATIONS AND ACRONYMS**

ADP	Accenture Development Partners
BLS	Bureau of Labor Statistics
DOI	Diffusion of Innovation
FAQ	Frequently Asked Question
GDP	Gross Domestic Product
GPS	Global Positioning System
GOK	Government of Kenya
KRA	Kenya Revenue Authority
MSEs	Micro and Small Enterprises
R&D	Research and Development
TVET	Technical and Vocational Education Training
UK	United Kingdom
US	United States
UTAUT	Universal Theory of Acceptance and Use of Technology

## **ABSTRACT**

In this digital age, the role of technology is becoming indispensable if any business is to be successful. Technology adopters are increasingly become diverse in their experiences, skills, abilities and even reasons for technology adoption. The purpose of this study was to explore the extent of technology adoption and examine factors influencing this adoption by SMEs in the automobile garages in Nairobi County. The research was informed by DOI and the UTAUT theories. It adopted cross sectional survey design, descriptive in nature. The population was the listed automobile garages. Data was collected through questionnaires which were administered through emails, WhatsApp and drop and pick mode. 64% response rate was achieved. Descriptive techniques were used to analyze and present the findings. In addition, Factor analysis was employed in the ranking the factors that affect adoption. The study found that all participants were male and majority (72%) had technical training. Majority were also above 30 years while most of the firms were below 10 years of age. The technologies identified include mobile payment (MPESA), WhatsApp, Computerized Diagnostic kit, Facebook, Official websites, email addresses and accounting softwares. Others included PDQ machines, electric Spray painting, spray booth, Computerized wheel alignment, ECU diagnostic tools, panel beating gadgets, pressure car washing gadgets, CCTV cameras and polyurethane suspension bushings. Data analysis ranked the owner/manager characteristics as having greatest influence in technology adoption, closely by characteristics of technology, followed then external factors and finally the internal firm characteristics. In terms of specific components, observability and relative advantage that accrue from a given technology, customers, competition, feedback mechanism and a culture of sharing ideas were the salient features that propel technology adoption. Based on the research findings, the study recommended benchmarking by other automobile garages and more training opportunities for continuous development, short courses to help those in this sector to keep up with new technologies.



# CHAPTER ONE: INTRODUCTION

## 1.1 Background of Study

Entrepreneurship is the backbone of any economic development and growth. Ortmans (2013) revealed that in a year, excluding US, total of 3,194,266 new startups are being established in the world. Jobs created by private entrepreneur firms account for as high as 53% of total employment (BLS, 2016). Coming to East Africa, Kenya's economy seems most vibrant with an annual growth rate which has been averaging at over 5% for almost a decade. MSEs which represent entrepreneurs, constitute 98 percent of businesses in Kenya, and contribute 30 percent of jobs as well as 3 percent of Kenya's GDP (GOK, 2015). The 2017 Economic Survey (KNBS, 2017) indicated that in fact, there were 832,900 new jobs in 2016, 85,600 of which were in the modern sector while 747,300 from the informal sector. Entrepreneurship therefore not only creates new jobs and new businesses, but it also is the glimmer of prosperity. It is one of the reasons people are able to push for their rights and even against corruption. Entrepreneurship also offers a positive substitute to the ideologies of violence and division that is often associated with the young people who have no hope for a bright future.

Technology advancement plays a key role in ensuring higher levels of economic output and delivery of new goods and services that change human lives and their potentials. It is because of technological innovation that we now have modern medical equipment, improved maternal health, reduced mortality rates, computers, mobile phones and automobiles among many others. We currently live in an industrial and technological age with internet having transformed global market to become like a small village where competition has become knowledge-based (Fischer, 1999). Looking at the Kenyan context, there has been a tremendous growth in the ICT sector in the recent years. This has changed the way things are done- from the social aspects, economic and even the political arena. The GOK has not been left behind but has embraced digitization in most of its processes as confirmed by a study by Accenture Development Partnerships (2013). For instance, there has been digitization of driving and even business license application, KRA tax returns, government tendering processes and even recently land ministry processes among others.

In the corporate world, banks among others have embraced Internet and mobile banking, digitized their customer service processes and long queues in the banks or government offices are therefore now a thing of the past. It is therefore this growing digitization in both the global and national context that created interest for this study to get deeper understanding about the extent of and factors determining technology adoption

This research was informed by two theories: Diffusion of Innovation and the Universal Theory of Acceptance and Use of Technology. Rogers, the proponent of DOI illustrated it as the process by which an innovation over time is passed through certain channels among the members of a social system. This adoption can occur either at an individual or organizational level. It is the successful adoption at both of these levels that leads to mass adoption which is also termed as diffusion of innovation. Different studies on diffusion have consistently exhibited a sigmoid pattern, the S-shaped curve (Dearing, 2010). The UTAUT on the other hand integrates constructs from Technology Adoption Model with theories of motivation, and social cognitive theory. This theory comprises of four crucial constituents that influence behavioral intention to use a technology- performance expectancy, effort expectancy, social influence, and facilitating conditions. It also incorporates additional constructs of hedonic motivation, price value and habit. The effects of the constructs on behavioral intention and technology use are then theorized to be moderated by Individual differences like gender, age and previous experiences (Otieno, 2014).

This study focused on automobile garages to represent MSEs in studying the extent of technology adoption. Previous studies have mainly focused on the corporate world. The MSE segment has been ignored because of various constraints, one being that most are not registered. There has also been an assumption that they cannot afford innovative technologies, are not IT savvy or are even not interested in Innovation. However, World Bank Group (2016) revealed that 73 percent of SMEs considered among many other obstacles, access to technology an impediment to their successful operations. Could technology adoption be on the upward mobility?

### **1.1.1 Technology and Innovation**

Technologies are prescriptions and concepts that guide the way goods and services are produced (Win & Adam 2013). Such innovations stem from the practical application or commercialization of new and creative ideas by entrepreneurs.

Any meaningful development calls for research findings to facilitate effective technological solutions well in advance (Richta, 1967). Looking briefly at the evolution of technology, this can be dated back to the 19<sup>th</sup> Century. This was after Morse invented the telegraph. Soon after, the telephone was patented by Graham Bell. By 1979, mobile technology emerged , followed by introduction of internet to the public (Taylor, 2011).The rest is history- email, text messages, various web applications like Facebook, twitter, MySpace, Skype are just but a few.

Technological innovation can be incremental or radical. Incremental is whereby systematic upgrade or development is applied. Norman & Verganti (2014) explain that this occurs through a continuous process of checking with the intended users and therefore involves deliberate research strategy or through series of mutual adaptations to ensure the product meets the users growing needs. For instance Gmail has been incremental - it initially was just an email application and with time was upgraded to allow videos, instant messages among others. Radical technologies are on the other side disruptive in nature causing significant impact. According to the Innovation Policy Platform (n.d), these create new markets and render the previous ones obsolete Digital photography is one such technology. It completely changed the traditional photography set up. Uber has also completely disrupted the traditional cab services.

Drucker (1996) proposed seven sources of innovation in Technology. Unexpected occurrences like floods, wars that cause entrepreneurs to innovate. Incongruities in a business like declining profits will stir innovations that reduce costs and thereby increasing margins. Process needs like catering for a growing need for a convenient money transfer led to introduction of mobile money transfer. Industry or market changes like globalization has forced entrepreneurs to innovate ways of being relevant since the world has become like a small village. Demographic changes, Change in Perceptions and finally New Knowledge are other sources of innovation identified.

### **1.1.2. Technology Adoption**

During the past few years, technological use has grown extensively both in terms of availability and geographical distribution. Prior to 1995, only fewer than 20 million people worldwide had internet access (Kemp, 2017). But by March 2017, 3.74 billion people were active users. This means that technology adopters are increasingly become diverse in their experiences, abilities and even reasons for technology adoption (Internet World Stats, n.d).

The most recent government report, (CAK, 2018) showed that there was 88% of Mobile penetration in Kenya and that Kenya topped globally in Internet Phone traffic (83%) with Nigeria following closely with 81%.

Two major forces come into play in technology adoption: technology-push or market-pull. Technology-push occurs when an innovation is developed, ignoring market research, and pushed to the market through intensive research and development. This forces the market then to absorb the technology whether due to its superiority or because of the pressure from the suppliers. According to Saidi (n.d), such a push model only works best for a few industries like pharmaceuticals; those whose product offerings are necessities and or without competition.

In a market pull, new technology starts as a result of an acknowledged social need (Hoti, 2015). It is in response to expressed market need which has been expressed by potential customers or market research which necessitates development of a product(s) to solve the need. Market pull sometimes may just start with prospect customers requesting for improvements to existing products. An example is the technology behind hybrid cars which has been developed in response to customers increased demand for greener products. Much has been written about technology as a concept and in fact research reveals that the technologically innovative companies have an upper hand in business. They are more likely to outperform their competitors. This study therefore sought to explore the technologies in use in the MSE sector and the factors influencing their adoption.

### **1.1.3 Automobile garages in Nairobi**

According to Wikipedia, automobile garages, also known as workshops or automobile repair shops are establishments where vehicles and light trucks are inspected, repaired and maintained. In Kenya, these generally fall under MSEs, employing less than 50 workers.

The 2016 MSME basic report (KNBS, 2016) revealed that the general distribution of SMEs by size is 92.2 per cent for Micro and 7.1 per cent for the Small enterprises, with the remainder 0.7 per cent going to Medium enterprises. In terms of economic activity, majority (57.1 per cent) of the licensed are in the service sector, with most operating in wholesale and retail trade; repair of motor vehicles and motor cycles, followed by accommodation and food service activities (8.8 per cent) and other service activities.

As seen in this profiling, repair of motor vehicles and motor cycles industry forms a bigger percentage of MSEs in Kenya. There are currently 48,500 total numbers of automobile garages in Kenya, 96.3 per cent of who are micro and small in nature (KNBS, 2016). It is a mainly male dominated sector. Strangely, it is also the sector with the highest annual closures; in the last five years it accounted for 68.5 per cent of total business closures. Most of these closures were due to increased operating expenses. Though not completely gone, the days of traditional car repair are on their way out. Auto mechanic repair in the global context is getting less greasy as diagnosis is becoming more automated to keep up with the way cars are designed and built. Could the increased expenses therefore be due to failure of local garages to embrace automation and technology adoption thus leading to these closures?

The geographical context of study was Nairobi County. The reason for the choice was because Nairobi is a metropolitan area with better access to Electricity and internet coverage all which play a major role in technology adoption. There are currently 65 listed automobile garages in Nairobi according to Kenyaplex (n.d). Obviously, auto garages being majorly an SME sector, the number of unlisted garages is way more.

## **1.2 Research Problem**

For ages, technology adoption has been inseparable with entrepreneurship. That is the reason why every industrial revolution was either initiated by key entrepreneurs or it brought about opportunities in entrepreneurship. The first industrial revolution, characterized by change from manual to technology in print, had impact on textile industry. It also introduced the use of coal and iron which led to evolution of steam engine trains (VICE, 2018). The second one was centralized on electricity and fossil fuels which introduced electrical modes of communication, petroleum cars, fertilizers, pharmaceuticals among others. The third revolution has been distinguished by Internet of Things. As a result, there has been adoption of internet banking, virtual shops and GPS-controlled mode of transport among others.

The emerging fourth industrial revolution is being characterized by increasing interconnection of products, value chains and business models. Competitiveness will therefore no longer only depend on optimization of one's resources, but the innovativeness of the total value chain- the partner technologies, products, services and systems (Reif, 2018). Even with this wave of innovation, some firms have not plugged in yet due to several factors!

Some for instance, look at the relative advantage and the perceived usefulness of the new innovation while for some because of complexity or non compatibility with previous technology as caused them to lag behind (Patel, 2005). Some factors are firm based like managerial support and skilled personnel (Talukder, 2012 while others are totally beyond the scope like government incentives or barriers and technological infrastructure (Aboelmaged, 2014).

The Economic Survey report (KNBS, 2018) just like prior periods, confirmed that employment in the informal sector accounted for 83.4 per cent of total employment in the period under review and that those engaged in the sector rose by 5.6 per cent in 2017. It also reported growth of population from 45.4M in 2016 to 46.6M in 2017. There is therefore need for incentivizing the informal sector to grow so as to address the issue of unemployment. The question therefore remains: Why do firms then chose to remain informal? The Kenya Investment Climate report (World Bank Group, 2016) revealed that 73% of SMEs considered among other things, access to technology as an impediment to their success! The world is becoming small village and so only technologically savvy firms will make since adoption saves time. It also creates equal playing field by eliminating information asymmetry thereby reducing monopolies in entrepreneurship. Again, it has led to growth of virtual shops which reduce overhead costs of running business. How best then can SMEs plug into this? Auto mechanic garages would be an appropriate context since KNBS (2016) revealed that this is the sector with the highest yearly turnover rate of 68.5 per cent and also the one leading in terms of economic activity in the service sector.

Attempts to explain the concept of technology adoption have been previously done. Ruby & Nir (2004) undertook to establish the technology adoption rates but only in the U.S and found that ~ 70% of small businesses have internet access and 38% even had official web pages. In Malaysia, Thurasamy, et al. (2009) focused only on profiling the technologies in use as well as developing an index for performance and technological adoption tracking of SMEs. In Kenyan context, Otieno (2014) sought to understand technology adoption but limited itself to only mobile payments in tours and travel businesses using the TOE ( Technology, Organization Environment) Framework. Odhiambo (2013) undertook a similar study but concentrated on e-commerce and iTax compliance only. The target population was corporate pharmaceutical firms. Wachira (2014) attempted to look at barriers and facilitators of technology adoption but used a literature review methodology.

This is far little information on adoption rates for MSMEs in Kenya and factors affecting this adoption which necessitates use of primary data collection approach to fill in any missing gaps.

This study therefore strived to answer the question: What is the extent of technology adoption in Automobile garages in Kenya? What are the factors influencing this adoption?

### **1.3 Research Objectives**

The objective of this research was to:

1. Explore the extent of technology adoption in MSEs, in the automobile garages in Nairobi
2. Examine factors influencing technology adoption in Kenya

### **1.4 Value of Study**

The findings of this study will be an eye-opener on the extent of adoption of technology in MSEs within the auto-garage sector. It will also highlight the benefits of innovation adoption for MSEs and therefore encourage the laggards to embrace technology. Those who have already adopted will be able to benchmark with their peers thereby understanding more ways to leverage on technology for achievement of growth.

The outcome of the study will also have policy implications. The government will be able to understand the impediments as well as facilitating conditions to MSE technology adoption and use that to strengthen any gaps present and undertake necessary policy facilitations.

Finally, the outcome of the study will also add contribution to scholarly literature. Many scholars have previously neglected MSE sector when it comes to technological issues. There are currently no figures for technology adoption rates in the Kenyan MSEs. This study will therefore spur interest in this growing sector whose contribution to the economy can no longer be assumed.

## **CHAPTER TWO: LITERATURE REVIEW**

### **2.1 Introduction**

This chapter reviews both the theoretical and empirical foundations of technology adoption. The first section will generally look at the relevant theories. The second part will sample literature on factors affecting adoption by various scholars.

### **2.2 Theoretical foundation of the study**

This study is anchored on theories which inform technology adoption. Different theories and models have evolved for explaining technology adoption and the most common are: Diffusion of innovation theory (DOI), Theory of Reasoned Action (TRA), Theory of Planned Behavior (TPB), and Universal Technology Adoption and Use Theory (UTAUT). However this study will be informed by a combination of the DOI and UTAUT.

#### **2.2.1 Diffusion of Innovation Theory (DOI)**

This theory is traced back to Rogers and looks at how, why and at what rate innovation is being dispersed. There are four components that determine the dissemination of a new idea: the innovation or the new idea, communication channels, time to allow for adoption and lastly the social system (Wikipedia n.d). These then go through a process of diffusion consisting of five stages: knowledge, persuasion, decision, implementation, and confirmation (Robertson, 1967). The result is six categories of users: innovators, early adopters, early majority, late majority, laggards and the leapfroggers which normally take up a sigmoid shape.

The Innovators are those who risk exploration of new ideas and technologies and account only for about 2.5% of the market share. For Early Adopters, they are those opinion leaders who give referrals and share positive testimonials about the innovations. They do not require much persuasion as they are already open minded and may actually be interested in some change. They account for about 13.5%. The Early Majority, on the other hand, are those willing to adopt new technologies if convinced by positive reviews from the earlier adopters, forming 34% of the market share. The Late Majority (34%) are the skeptics. They are reluctant to any change unless they strongly feel being left behind. Lastly, the Laggards always stick to the old proven ways of doing things, accounting for 16% of the market share.



They trust their past experiences only adopt new products when it is the only option available (Hanlon, 2013).

Schumpeter, (1976, p.83) saw DOI as creative destruction arguing that it was “the process of industrial mutation that incessantly revolutionizes the economic structure from within, destroying the old one and creating a new one”. In the early years, DOI was used to research on marketing and consumer behavior but since the proposal of Bass Diffusion Model (Li & Sui, 2011), which showed the interaction between innovators and imitators, it has being applied widely from retail services, technology to even agriculture and education among others.

### **2.2.2 Universal Theory of Acceptance and Use of Technology (UTAUT)**

The UTAUT integrates constructs from Technology Adoption Model with theories of motivation, and social cognitive theory. This theory has four key elements that determine the behavioral intention to use a given technology. The first, Performance expectancy, is the level of usefulness of a technology or the value consumers derive from using it in performing certain activities, for instance, reducing costs or increase sales. Effort expectancy is the degree of that consumers find use of a given technology easy. Social influence on the other hand is the extent to which friends, family members and other important relations inspire or motivate consumers to use a given technology. Finally, facilitating conditions are the judgments or perceptions the consumer has towards a technology. The UTAUT also incorporates additional constructs of hedonic motivation (fun and enthusiasm derived from using a technology), price value and habit. (Venkatesh et al, 2012). The effects of these constructs on behavioral intention and technology use are then theorized to be moderated by Individual differences such as age, gender, and experiences (Otieno, 2014).

One concern about UTAUT is that it is still a relatively new theory. It therefore has had limited use in research. It is however proposed to be superior to all the rest because it is able to explain 70% of variances in adoption behavior which all other previous theories were unable to explain.

## 2.3 Factors affecting Technology Adoption

Different studies have attempted to explain various factors affecting technology adoption. Rogers (1995 in Patel, 2005), the father of diffusion- related studies, looked at the characteristics of any given technology which influence its adoption. He identified five factors affecting adoption. They are: relative advantage, compatibility, complexity, trialability and observability. However some studies like Adeoti (2009) only looked at the demographic characteristics of the owner. Closely linked to this is the grouping by Mignouna & V (2011), where the determinants of adopting pest -resistant maize Technologies were grouped into four: Household specific ( demographic factors), farm specific, institutional and technological factors. Farid et al (2015) concluded that socio-economic factors are the main con into consideration while accelerating the face of technology adoption under farming system in Bangladesh.

Ana & Antonio (2006) categorised the adoption influencers into two: external, being those outside the firm's influence and internal those relating to the company. Glenn & et al (2009) categorized them into inner and outer context. It further sub grouped the inner context into structural or non structural. Talukder (2012) grouped the factors into three: perceived usefulness, managerial support and social factors. Aboelmaged (2014), technology adoption in manufacturing firms is mainly influenced by technological infrastructure and competence, expected benefits and challenges of e-maintenance, and firm size and ownership. For Muchiri (2015) five dimensions were used for the study: top management involvement, infrastructure, organization culture, individual and social factors. Young ( 2015) identified managerial support, financial constraints, organizational responsiveness, strategic plan placement, and technology champion.

For the purpose of this study, these different categories were integrated and condensed into four groups. These are attributes of the technology in use, firm's internal characteristics, demographic characteristics of the adopter/owner, and the external factors- those beyond the firms. Below is a detailed explanation of each category.

### **2.3.1 Characteristics of the Technology**

Individuals do not automatically adopt every new product in the market. It is the perception of the technology and its features that help make the decision whether to accept or reject it. Rogers (1995 in Patel, 2005) explains five features of an innovation that influence its adoption: relative advantage, compatibility, complexity, trialability and observability. Relative advantage according to the study refers to the level an innovation ranks higher than the existing one. For instance, it could be leading to more work being performed faster, or with less effort or improved interface or even reduced environmental impact. For example, the computers replaced the typewriters because they consumed less space and performed multiple actions. Compatibility on the other hand is the ability of a technology to fit in or function in harmony with the existing ones as well as needs of its potential users. A good example is the iPad which came at a perfect time when people were already using laptops to surf. Mobile phone technology therefore presented a more convenient option for users who were willing to pay for constant access to the Internet therefore making easy assimilation of iPad without making adjustments or overhaul of a system. (Yocco, 2015)

Complexity simply pertains to how easy to use a given technology is. Is it for instance too complicated to understand how it works? Is it one that would require rigorous training to use it? Moore(2012) suggests that any complex issues can be simplified through FAQs, tips, walkthrough videos, manuals and other learning material. For complicated technologies, a quick start or automatic set-up can be of help. Trialability has to do with its testability before full force implementation. How easy is it for any potential adopter to explore the innovation? Is one able to purchase the technology in smaller versions for some trial period? This helps minimize any fears of total loss because any failure can be corrected in good time before actual use. Lastly, Observability relates to the visibility and tangibility of the results to the potential adopters. Many adopters rely on results they see from early adopters in order to make a decision. Has the perceived increased productivity resulted to higher sales or profit? What are the clear benefits of using this technology?

### **2.3.2 Adopter Individual Characteristics**

As earlier seen, in the DOI theory, even with all other factors constant, there are different categories of adopters which largely depends on individual attributes. Adeoti (2009) found that demographic characteristics of the adopter played a major role in adoption of irrigation technology in Ghana.

Younger farmers were more willing to take risk while old farmers were skeptical; only willing to trust their past experiences. Education experience, income level and training of the adopter also positively influenced adoption.

According to findings by Njuguna et al (2015), family size too was a determinant in adoption technology. Larger families provided cheap labour and therefore influenced decisions in technology adoption. Gender of the adopter also played a part in access to credit facilities needed to purchase the new technology, where men who mainly hold title deeds were able to easily access the credit facilities. Rekha (2017) also found that in adoption of modern ICT technologies, gender was a factor with mobile phone penetration being higher in men than women.

Psychographic factors also play a great role. Findings by Zhao et al (2006) showed that informal social pressures; like push from family and friends, pedagogical beliefs and hedonic motivation were factors affecting technology adoption rates. The opportunities for adaptations, the time one is allowed to explore, play around with the new technology also positively shaped adoption. Word of mouth referrals from those who already used it also helped in creating a good perception towards technology (Ngoc & Ryuichi, 2002)

### **2.3.3 Firm's Internal Characteristics**

These refer to the intrinsic features of a firm that inhibit or enhance adoption of technology. They include firms processes, firms size, technological capabilities of the firm, financial resources available, firms culture, management backing /support. (Ana & Antonio ,2006) For instance, given the high risks and costs associated with early adoption of new technology, large firms are better cushioned to adopt technology. This is because they enjoy higher profits and have easier access to finances which may be appropriated in technology investment. Given their size, they are also more endowed with necessary skills and personnel to introduce and use a new technology. On the other side, given the direct costs previously employed or even obsolescence of existing skills, these may relatively have a higher switching cost which sometimes lock them into the existing technologies (Khalifa, 2016).

A firms technologival/absorptive capability is very key in technology adoption.It is essentially the firm's ability to value, assimilate and apply new knowledge in order to improve the innovation performance.

It includes the technological infrastructure and competence (Aboelmaged 2014). For instance, it is easier for firms with employees having a higher level of education, training and experience to assimilate and exploit new knowledge. Managerial and organizational capabilities also play a pivotal role in innovation adoption. Susanty et al (2012) observed that the culture of an organization has direct correlation on its adoption of IT. For example lot of bureaucracy in management hampers the decision making process, bringing new ideas and the hiring of new skills. It is the role of top management to enhance a favorable culture- one of sharing knowledge, openness, collaboration, trust, autonomy and authenticity. This has been backed by Young ( 2015) who noted that managerial support enhanced technology adoption in call centres.

#### **2.3.4 Firm's External factors**

This refers to the external environment; factors which the firm has little or no control over. For instance, pressure from competitor, as a result of reduced profits forces a firm to adopt innovating ways to enhance efficiency. But too much competition can create uncertainty of investing in a given technology. This is especially if the returns are not in the short term and inhibits the decision to adopt (Khalifa, 2016). Suppliers also especially if monopolistic in nature may dictate terms of say payment or technology to be used. For instance, the KPLC being a monopoly dictates the kind of meters to be used and the mode of payment which a firm must adhere to. There are also suppliers who offer free maintenance/support of given technologies like printing equipment, generators and this encourage firms to adopt such technologies. (Kinuthia, 2015)

Response to customer needs in the current digital world has also been pushing even the otherwise slaggards to adopt certain technology. For instance with the introduction of mobile banking in Kenya, banks were forced to also link customer accounts to their phone numbers. and continued growth in customer expectations in the current digital world have been pushing even the otherwise slaggards to adopt certain technology .For instance, with the automatic cars, most auto- garages have no option but to adopt certain technologiesThe role of government is also indispensable. The government comes through regulation, taxes, subsidies or expenditure on infrastructure. For instance, the introduction of interest caps by CBK forced most banks to retrench and had to adopt innovative ways of being efficient. As a result online banking and mobile banking was encouraged to reduce the need of visiting banking halls. (Mulwa, 2017).

Again when the government imposes taxes or gives subsidies to the importation of technology gadgets it has direct impact on its adoption. For instance, subsidies on computer accessories or the introduction of free laptops to primary schools encouraged adoption of the same. With the SGR infrastructure, logistic firms have been encouraged to adopt other there train as an alternative mode of transport.

## **CHAPTER THREE: METHODOLOGY**

### **3.1 Introduction**

This chapter considers the research methodology used in the study. It describes the research design and its justification. The chapter also explains the target population and mentioned the sampling design used. It then describes the data collection methods and tools and finally sheds light on the data analysis to be adopted.

### **3.2 Research Design**

Based on the objectives of this study, cross sectional survey design, descriptive in nature was adopted. This is because descriptive research is ideal for description of characteristics, specific predictions, the narration of facts, or features or functions of person or group (Surbhi, 2016). The study sought to explain the extent of technology adoption in terms of numbers and percentages of those who have embraced technology, what kind of technology have they embraced and the determining factors.

### **3.3 Population of the Study**

The target population for this study was automobile garages in Nairobi County. There are currently 65 listed automobile garages in Nairobi according to Kenyaplex (n.d). For the purposes of this study, we assumed all this fall in the category of Micro, Small or Medium enterprises- employing one to forty nine employees. Since the population size is small, the study was a census.

### **3.4 Data Collection**

Primary data collection was done using a questionnaire instrument. The first section of the questionnaire looked at the demographic characteristics of the respondent. Section two of the instrument focused on the extent of technology adoption; the technology in use. The last section focused on the factors affecting adoption; characteristics of the technology in use, firm's structural/ organizational factors, owner personal traits and firm's external factors. In order to gain a deeper understanding on the determining factors both a likert scale and open ended questions was be adopted (Fieldboom, n.d).

Since telephone contacts of all garages were available in the Kenyaplex listing, they were used to make the initial contacts with the respondents for the sake of familiarization and explanation of the process. Each then was offered to choose the delivery mode that is more convenient; either via email or through drop and pick. Since garages can be very busy areas, the owners of the garages or the supervisors (where the owners are not available) were chosen as the preferred respondents. It is these who are also most likely to be aware of what goes around the firm. The details of the questionnaire are shown in Appendix 1.

### **3.5 Data Analysis**

Since this study is descriptive in its research design, descriptive statistical analysis techniques were used for they enable data to be presented in a more meaningful way, thereby allowing for simpler data interpretation (Laerd statistics, 2013). Measures of central tendency, mode, mean and standard deviation will be used to arrive at the extent of adoption. Frequency tables, percentages and general discussions were used to present what technology has low and high rate of adoption. On the other hand, Factor analysis was employed in analysis of the factors that affect adoption. The key goal of factor analysis is simplification of many interrelated measures thus allowing description of data using fewer dimensions than original variables. (Statistic Solutions, 2018) This way, it is possible to construct instruments in the form of scales and subscales. With the scales, it is possible to rank the factors in order of priority.



## **CHAPTER FOUR: DATA PRESENTATION, ANALYSIS OF FINDINGS AND DISCUSSIONS**

### **4.1 Introduction**

This chapter presents and discusses the analysis of the data, presentation and interpretation of the research findings as they relate to the two research objectives: to explore the extent of technology adoption in MSEs, in the automobile garages in Nairobi and to examine factors influencing technology adoption in Kenya.

The questionnaire comprised of three sections and data generated was presented using the same criteria. The first section comprises of demographic data: age of respondent, gender, years of operation, number of employees, and educational level. The second section comprises of data describing the extent of technology in the firms. In the last section data which relates to four factors affecting technology adoption is generated.

### **4.2 Response Rate**

This study targeted the total population of the 65 listed automobile garages. However at the time of this research, some of those listed were no longer operational and therefore unable to participate in the survey. This confirmed the high annual turnover rate in this sector mentioned earlier in the study. The total population was adjusted to 56 and the questionnaire instrument administered to all; 10 through emails, 7 through WhatsApp and 39 by drop and pick mode. 40 were returned but only 36 were fully completed thereby representing 64% response rate. According to Mugenda and Mugenda (2012) whose position is also confirmed by Kothari (2011), a 50% response rate is adequate for analysis , 60% is generally good while above 70% considered excellent.

### **4.3 Demographic Characteristics of Respondents**

This section sought to establish demographic information in terms of age, gender and educational levels of respondents as well as age of the firm. This was done in order to ascertain if this mattered in technology adoption decisions

#### **4.3.1 Age of Respondents**

The study sought to find out the age of those who were involved in running the automobile garages by asking them to state either their actual ages. This was then grouped in age brackets. Table 4.1 below shows the results.

**Table 4.1 Age Distribution of Respondents**

<b>Age bracket</b>	<b>Frequency</b>	<b>Percentage</b>
Below 30 years	2	6%
31-40 years	13	36%
41-50 years	15	42%
Above 50 years	6	17%
<b>Total</b>	<b>36</b>	<b>100%</b>

(Source: Research Data, 2018)

The results indicate that majority of the owners or managers in the automobile garages are in their mid years, between 31-50 years. This implies that for this service industry, experience matters and this can only come with age.

### **4.3.1 Firm Age**

The study also sought to find out the age of the auto by asking them to state the year of establishment from which age brackets were grouped. Table 4.2 below shows the results.

**Table 4.2 Age Distribution of Firm**

<b>Age bracket</b>	<b>Frequency</b>	<b>Percentage</b>
0-5years	12	33%
6 to 10 years	11	31%
11-20years	4	11%
Over 20 years	9	25%
<b>Total</b>	<b>36</b>	<b>100%</b>

Source: Research Data, 2018)

The results indicate that majority (64%) of the automobile garages are young, below 10years. This implies that the turnover rate in this sector is high. Only very few are able to celebrate a silver jubilee.

### **4.3.2 Gender**

Respondents were requested to indicate their gender by filling the space provided. All respondents were male. This implies that this sector is male dominated.

### 4.3.3 Level of Education

The study attempted to ascertain if education level affects technology adoption technology in the automobile industry and the participants were therefore asked to share the highest level of education attained. The five options provided were: primary school, secondary school, college or polytechnic, undergraduate and post-graduate levels. Table 4.2 below shows the results.

**Table 4.3 Education Level of Respondents**

Level of Education	Frequency	%
Primary	0	0%
Secondary	0	0%
College or Polytechnic	26	72%
Undergraduate	10	28%
Post-graduate	0	0%
<b>Total</b>	<b>36</b>	<b>100%</b>

(Source: Research Data, 2018)

The findings indicate that majority of those who own or manage automobile garages college training and a few even undergraduate education levels. None had higher than undergraduate level.

### 4.4 Extent of Technology Adoption

The section was divided into two. In the first part, the participants were given a list of sample technologies and then asked to state which one was applicable in their garage by ticking yes or no. Table 4.3 below summarises the findings.

**Table 4.4 Extent of Adoption in Selected Technology**

Innovation Present	Frequency	Percentage
Mobile banking	36	100%
Use of WhatsApp	30	83%
Computerized Diagnostic kit	20	56%
Social Media Presence	17	47%
Official Website	13	36%
Official Email	13	36%
Accounting software	13	36%
Use of PDQ machines	7	19%
Computerized reminders for customers	5	14%

(Source: Research Data, 2018)

All garages surveyed (100%) had Mobile banking. Majority (83%) had Whatsapp mode of communication. A moderate number had computerised diagnostic kit (56%) as well as social media presence (47%) specifically Facebook. Only a minimum had official websites(36%), official emails (36%), accounting software (36%), PDQ machines(19%) and computerised reminders for customers (14%). Other technologies mentioned included electric Spray painting and mixing of the paints, spray booth. Computerized wheel alignment, ECU diagnostic tools, panel beating gadgets, pressure car washing gadgets, use of GPS in tracking vehicles, CCTV cameras, Polyurethane suspension bushings. The above had less than 3 mentions with an exception of panel beating gadgets and computerized wheel alignment with 21 and 20 mentions respectively.

Overall, the extent of technology available in automobile garages is only mobile banking and WhatsApp. To some extent computerised Diagnostic Kit, panel beating gadgets and computerised wheel alignment and Social Media Presence are also available. The Use of PDQ and computerised reminders is almost non existent.

#### **4.5 Factors affecting Technology Adoption**

The study sought to understand the reasons behind the choice of technology. In order to achieve this, the survey instrument was divided grouped into four major factors affecting technology adoption. These were: the characteristics of the technology in use, internal firm characteristics, owner characteristics and the external environment. Under each factor, respondents views on selected components were sought, based on the available literature review. Under characteristics of technology in use, statements were designed to understand the effect of 5 components: relative advantage, compatibility, complexity, trialability and observability. Under owner character traits, the questionnaire was designed to understand 3 variables: if the owner found technology fun, easy and effect of social influence. Under internal firm characteristics the survey instrument was structured to understand the influence of 6 variables: Budget, Vision, Personnel, Sharing of ideas, Feedback Mechanism and Risk taking culture. Finally under external firm characteristics, the following were examined: Role of Competition, Suppliers, Customers, Government, Market changes and Training opportunities.

The participants were asked to describe which statement best described their views on the above using a scale of 1-5, where: 1=strongly agree, 2= disagree, 3=uncertain, 4=agree, 5=strongly agree. Descriptive statistics, which consisted of mean and standard deviation, were used to analyze the participants' opinions for each question. For purposes of interpretation, Mean values (M)  $1 \geq M < 1.5$  will indicate that the respondents strongly disagree,  $1.5 \geq M < 2.5$  will mean respondents disagree,  $2.5 \geq M < 3.5$  will be indicative that respondents are neutral,  $3.5 \geq M < 4.5$  will indicate that respondents agree and lastly,  $\geq 4.5 M \leq 5$  will mean respondents strongly agree.

#### 4.5.1 Characteristics of the Technology

The section of the study underscores the influence of specific characteristics of a given technology on its adoption. The survey instrument sought respondents' views on 5 features of any technology according to Rogers: Relative advantage, Compatibility, Complexity, Trialability and Observability of the technology. The table 4.4 in the next page shows the respondents opinions.

**Table 4.5 Characteristics of Technology itself: Descriptive Statistics**

Attribute	Mean	Std Deviation
Observability	4.92	.280
Relative advantage	4.31	1.064
Complexity	3.72	.974
Compatibility	3.39	1.202
Trialability	3.19	.525
<b>Average</b>	<b>3.91</b>	<b>0.809</b>

(Source: Research Data, 2018)

The findings exhibited that the respondents are in strong agreement (mean 4.92, SD=0.280) that the observability of expected results from a given technology in auto mobile garages affect its adoption rates. The results also indicated that the participants agree that the relative advantage a technology brings and its level of complexity, (mean 4.31 and 3.72 respectively) influence its acceptance by automobile garages. From the results, the respondents seemed neutral as to whether compatibility and trialability of technology (mean 3.39 and 3.19 respectively) has any impact on its adoption in auto mobile garages.

The overall finding is that adopters are more interested in observability (the tangibility of results), the relative advantage a given technology has over others and the complexity (ease of use) of a given technology. The effect of the rest was minimal. The average mean on 3.91 indicated that respondents were in agreement that characteristics of technology have impact on the adoption of the same.

#### 4.5.2 Owner Characteristics

In this sub category, the study sought to bring out the effect of owner's individual traits-perceptions, attitudes and belief system on a given technology on its adoption. The questionnaire sought to understand the respondents' hedonic motivation in using technology, if they had the attitude that anyone willing could learn technology and if social influence played any role in their technology adoption. The table 4.5 below displays the opinions of those surveyed.

**Table 4.6 Owner Characteristics: Descriptive statistics**

<b>Attribute</b>	<b>Mean</b>	<b>Std Deviation</b>
Social Influence	4.33	.586
Hedonic Motivation	4.11	.820
Positive attitude	3.94	1.040
<b>Average</b>	<b>4.13</b>	<b>0.815</b>

(Source: Research Data, 2018)

The results above indicated that indeed all respondents were in agreement that the three components of individual owner traits had impact of what technology was adopted in automobile garages. Social influence (Mean 4.33) had higher influence, followed by hedonic motivation (mean 4.11) and finally positive attitude (mean 3.94). In summary, social influence has significant impact on individual adopters of technology. Category-wise, an average mean of 4.13 was an indicator that respondents agree the role of owner character traits is indispensable in influencing technology adoption in automobile garages.

### 4.5.3 Internal Firm Characteristics

The objective of this section of the survey was to find out the effect of the garages internal processes on technology adoption. The respondents were asked if the following selected six components were present: a budget for innovations and technology, a clear vision on technology, sharing of ideas, adequate skilled personnel and a culture that encouraged risk taking. Table 4.6 gives the survey results.

**Table 4.7 Internal Firm Characteristics: Descriptive statistics**

Attribute	Mean	Std Deviation
Feedback Mechanism	4.08	.439
Sharing of ideas	4.03	.506
Clear vision	3.72	.566
Adequate Personnel	3.33	.756
Risk taking culture	2.75	.770
Availability of Budget	2.44	1.340
<b>Average</b>	<b>3.39</b>	<b>0.729</b>

(Source: Research Data, 2018)

The results showed that respondents were in agreement that Feedback Mechanism (Mean 4.08) the sharing of ideas (Mean 4.03), and the clear vision in the firms (mean 3.72) existed. They were neutral about adequacy of personnel and culture that encouraged risk taking. They disagreed (mean 2.44) that there was any budget allocated for innovations and technology.

Conclusion made was that the main enablers of technology adoption in garages have been a feedback mechanism, culture of sharing ideas and a clear vision. Internal firm characteristics, as a category, seemed to only moderately affect adoption with an average mean of 3.39

### 4.5.4 External Firm Characteristics

This last section of the survey attempted to find out the impact of external factors on technology adoption. The respondents were asked to state their view on the role of the following six components in technology adoption: Competition, Suppliers, Government, Market changes and Training. Table 4.7 gives the survey results.

**Table 4.8 External Firm Characteristics: Descriptive statistics**

<b>Attribute</b>	<b>Mean</b>	<b>Std Deviation</b>
Push by Customers	4.86	.351
Effect of Competition	4.58	.604
Market changes	4.58	.500
Suppliers Influence	3.64	.723
Role of Government	1.97	.810
Availability of Training	1.92	.770
<b>Average</b>	<b>3.59</b>	<b>0.626</b>

**(Source: Research Data, 2018)**

From the above results, respondents strongly agreed that push by customers (mean 4.86), competition (4.58) and market changes (4.58) were the main reasons for their adoption of technology. They agreed that suppliers (mean 3.64) influenced adoption. They however strongly disagreed about the role of government (mean 1.97) and the availability of training (Mean 1.92)

In overall, the push by customers, competition and changing market dynamics are the outstanding determinants of technology adoption in automobile garages. Reflected in the average mean 3.59, the respondents were in agreement that external firm characteristics influence technology adoption.

#### **4.5.5 Factor Analysis**

Factor analysis was used to rank the factors and components in order of priority. Extraction was also done on each category using Principal Components Analysis. Rotation Method used was Direct Oblimin with Kaiser Normalisation. Only factors with Eigen Values  $\geq 1$  were picked. Table 4.8 below shows the extracted components under each factor.



**Table 4.9 Extracted Components of Under Each Factor**

<b>Characteristics of the technology itself</b>	<b>% of Variance</b>
Observability	50.587
Relative advantage	28.961
<b>Owner Characteristics</b>	<b>% of Variance</b>
Social Influence	77.733
<b>Internal firm characteristics</b>	<b>% of Variance</b>
Feedback Mechanism	49.659
Sharing of ideas	24.061
<b>External Firm characteristics</b>	<b>% of Variance</b>
Push by Customers	35.698
Effect of Competition	29.846

#### **4.5.5 Reliability of Findings**

Cronbach’s Alpha was used to measure reliability. Table 4.9 gives summary of the results under each category. According to Wikipedia, Cronbach’s Alpha of  $0.8 \leq \alpha < 0.9$  is a good measure of reliability,  $0.7 \leq \alpha < 0.8$  is acceptable,  $0.6 \leq \alpha < 0.7$  is questionable while  $0.5 \leq \alpha < 0.6$  is poor.

**Table 4.10 Reliability of Findings**

<b>Attribute</b>	<b>Average Mean</b>	<b>Cronbach’s Alpha</b>
Owner Characteristics	4.13	0.846
Characteristics of the technology	3.91	0.724
External Firm characteristics	3.59	0.554
Internal firm characteristics	3.39	0.74

The results show that the findings of the study are generally reliable. The reason for the poor consistency in the external factors is because Role of government and training materials had negatively affected; respondents strongly disagreed.

## 4.6 Discussions and interpretation

The study sought to explore the extent of technology adoption in automobile garages as well as understand the factors affecting adoption of technology in the auto garages. The demographic study findings revealed that majority (94%) of those who engaged in this trade mobile were mature people over 30 years and all were male! DATA USA (2016) seems to be in agreement which reports that the average age of those involved in this sector is 39.1. It could be argued that the necessary experience needed with different vehicles only comes with age. In terms of firm age, the results indicated that majority (64%) of the automobile garages are young, below 10years. This implies that the turnover rate in this sector is high. Only very few are able to celebrate a silver jubilee. This confirms findings by KNBS (2016) which reported that this sector had the highest annual closures; in the last five years accounting for 68.5 per cent of total business closures.

According to the findings, all respondents were male which confirms previous studies. Generally in automobile industry, there is still very little progress in terms of gender diversity. Globally this accounts for only 8% (Catalyst, 2018) . More will need to be done in order to attract higher numbers.

In terms of education, majority (72%) of those surveyed had at least technical training with even 28% having an undergraduate degree. This seems to be in disagreement with previous publications that this sector was reserved only for school drop outs (The Star, 2018). It could be hypothesized that this is an effect of the post election violence experienced in Kenya in the period 2017/2018. The political instability slowed down the economy leading to the highest unemployment rates; 12.1% up from a range of ~10.9% in the preceding years (Trading Economics, 2018). This pushed graduates to seek self employment as an alternative. It could also be that the government's push for entrepreneurship courses to be undertaken in TVET is finally bearing fruit!

According to the findings, the technology available in automobile garages is mainly mobile banking and WhatsApp and to some extent computerised Diagnostic Kit, panel beting gadgets, computerised wheel alignment and Facebook. Convenience, low cost of maintenance of the latter and ability to reach more people at a go, ease of sharing photos realtime are the main reasons given especially for whatsapp and other social media.

This importance of social media presence by SMEs was also underpinned by Business Matters (2017). The PDQ system still has a long way before adoption in this industry with many citing insecurity fears and cost of the machine. The findings indicated that automation of database to remind their clients of upcoming scheduled vehicle services was almost non-existent. It was surprising the reasons given for this: that they did not want to get overwhelmed by customers. They actually wanted to remain small! Most were sole proprietorships and therefore remaining small ensured they retained control, had time to pursue other interest, had personalised attention to their customers (Economics Help, 2016)

The findings that owner characteristics had more impact in technology , with the highest average mean of 4.13, agree with Ebeltagi (2013) who confirmed that the owner-manager plays a notable mediating role in the decision to adopt ICT in SMEs in the UAE. This is because he or she is the sole decision maker in most of the SMEs. However while social influence ranked highest in this category, Ramayan (2012) found out that the IS knowledge of the owner ranked highest in SMEs in Malaysia. In regards to influence of technology attributes, observability of the technology had greatest impact. This is in agreement with Tully (2015) who focused on ICT organisations and found that observability was influential in adoption decision process. He also found that trialability and compatibility played a role in technology adoption. The study findings that feedback mechanism influenced technology adoption concurred with Nkwachukwu (2014) who found that lack of effective feedback mechanism between fish farmers and the research institute hampered adoption of technology. For Kanyua (2015), a budget and infrastructure were necessary for adoption of technology in hospitals. Whereas the autogarages strongly disagreed the government involvement in technology adoption in this study, Goncalves (2016) found that role of government was crucial for adoption of public digital accounting since it was a regulatory requirement. Muriithi & David (2016) agreed with this study's findings that training materials negatively affected the adoption of technology. Muchiri (2015) also found the paramount influence of customers in adoption of technology by banks in Kenya.

The findings were also in agreement with the theories that informed the study. UTAUT identifies four main constructs that affect adoption of technology: performance expectancy, effort expectancy, facilitating conditions and social influence which are moderated by demographic factors like age, gender among others.

## **CHAPTER FIVE: SUMMARY OF FINDINGS, CONCLUSIONS AND RECOMMENDATIONS**

### **5.1 Introduction**

This chapter concludes this study. It presents a summary of findings out of which conclusions are drawn. It also provides recommendations and suggestions for further research.

### **5.2 Summary of the Findings**

The salient demographic findings were that all participants in this study were male. In terms of age, that majority of the owners or managers (78%) in the automobile garages are in their mid years, between 31-50 years. Majority of the firms (64%) had been in operation only less than 10 years. All respondents had at least college training and even 26% with undergraduate level.

The study explored the extent of technology available in automobile garages and overallly mobile banking and WhatsApp were the main techologies present. To some extent computerised Diagnostic Kit, panel beting gadgets and computerised wheel alignment and Social Media Presence are also available. The Use of PDQ and computerised reminders was almost non existent.

The study sought to understand the reasons behind the choice of technology, guided by four factors: characteristics of technology in use, owner characteristics, internal and external firm characteristicis. Under the first factor, observability and relative advantage had outstanding influence. An average mean of 3.91 indicated that respondents were in agreement that characteristics of technology have great impact on the adoption. In the second factor, social influence had greater significance on adopters of technology. An average mean of 4.13 was an indicator that respondents agreed that the role of owner character traits is indispensable in influencing technology adoption in automobile garages. Under the third factor, only feedback mechanism and a culture of sharing ideas had remarkable impact on technology. This category only seemed to moderately affect technology adoption with an average mean of 3.39. And finally under external factors, customers and competition were the outstanding determinants of technology adoption in automobile garages. A weighted mean of 3.59 indicated that the respondents were in agreement that this factor influenced technology adoption.

## **5.4 Conclusions**

The purpose of this study was to explore the extent of technology adoption and examine factors influencing this adoption by SMEs in the automobile garages in Nairobi County. This was motivated by the continuing digitization where the role of technology is becoming indispensable if any business is to be successful. The results proved that the SME segment which has been previously ignored is slowly becoming technologically savvy.

From the results, it was apparent that the owner/manager characteristics have the greatest role in what technology to be adopted. It was also clear firms will go for what is observable- the tangibility of the results very key. Customers, competition, feedback mechanism and a culture of sharing ideas were the salient features that propel technology adoption.

## **5.5 Recommendations**

The findings of this study should be used as a benchmark by other automobile garages in the MSE sector to leverage on technology for achievement of growth. Those that are lagging behind should seek to find out the tangible benefits results that have caused their pioneers to plug into technology. This could help reduce the mortality rates in this sector.

Based on the research findings, two areas scored below par: training opportunities and role of government. This has policy implications. The study therefore recommends that the government in collaboration the private sector help set training institutions for continuous development, short courses to help those in this sector to keep up with new technologies.

Finally, the outcome of the study is that SMES and specifically automobile garages are also technologically savvy. This should spur scholars to explore other sectors of this segment.

## **5.6 Area for further researcher**

Though Mobile payment was available in all firms, it would be a great opportunity for further research to explore why many did not consider having paybill numbers. It it something to do with cost of maintenance or regulatory related?

Based on this study, those under 30years age bracket only constituted 6%. There is need for further research to understand why the younger people shy away from this sector.

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## APPENDIX : Research Questionnaire

Kindly take a few minutes to complete this simple survey. It should take around 5 minutes to fill in.

### Section A: Demographic Characteristics

**Please tell us a little about yourself.**

Name \_\_\_\_\_

Age \_\_\_\_\_

Gender \_\_\_\_\_

Highest education level attained (please tick one)

Primary school

Secondary school

College or polytechnic

Undergraduate

Post-graduate

**Please tell us a little about your company.**

Garage Name \_\_\_\_\_

Years in operation \_\_\_\_\_

Number of Employees \_\_\_\_\_

### Section B: Extent of Technology Adoption

1. Kindly tick the applicable technology in your organization from the table below.

Technology in use	Yes	No
i. Do you have an official website for your garage?		
ii. Do you allow your customers to use Mobile banking e.g MPESA or Airtel Money?		
iii. Do you allow your customers to swipe?		
iv. Do you have an active social media page e.g Facebook?		
v. Do you have a system that automatically reminds your customers of upcoming vehicle service		

schedules?		
vi. Do you use computerized diagnostic testing devices?		
vii. Do you have any accounting software?		
viii. Do you file KRA and statutory online returns for yourself?		
ix. Have you tried online procurement of spare parts?		

2. What other technology is in use in your firm? Please give details

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**Section C: Factors Affecting Technology Adoption**

Kindly circle the statement which best describes the characteristics of the technology is use in the automobile garages industry.

<b>Characteristics of Technology</b>	<b>Strongly Disagree</b>	<b>Disagree</b>	<b>Uncertain</b>	<b>Agree</b>	<b>Strongly Agree</b>
i. The Use of technology in my business has enhanced efficiency in my business	1	2	3	4	5
ii. The available technology is easily into existing infrastructure	1	2	3	4	5
iii. The available technology for automobile garages is easy to use in my business	1	2	3	4	5
iv. The available technology in automobile garages allowed my	1	2	3	4	5

business to first use it on trial basis before actual usage					
v. The use of technology in my business has improved performance and hence sales and profitability.	1	2	3	4	5
<b>Firm characteristics</b>					
i. There is normally a budget set for technology adoption or replacement in my business	1	2	3	4	5
ii. There is a clear firm vision on how to use technology for higher productivity in my business	1	2	3	4	5
iii. There is adequate technical personnel to handle the technology needed in the business	1	2	3	4	5
iii. There is a culture that encourages sharing of ideas and skills in my business	1	2	3	4	5
iv. There is clear feedback mechanism on what works and what customers need	1	2	3	4	5
vi. There is an environment that encourages risk taking in my business	1	2	3	4	5
<b>Owner Characteristics</b>					
i. Technology is fun. I enjoy using technology in my business.	1	2	3	4	5
ii. Technology is not difficult and anyone willing can learn	1	2	3	4	5

iii. My friends and loved ones have influenced my attitude towards technology	1	2	3	4	5
<b>External Factors</b>					
i. My business competitors have forced me to adopt technology	1	2	3	4	5
ii. My suppliers have encouraged my business to adopt technology.	1	2	3	4	5
iii. The government has given enough incentives to encourage technology adoption in auto mechanic sector	1	2	3	4	5
iv. The current technology of cars-automatic transmission has forced this sector to adopt technology	1	2	3	4	5
v. There is enough training material on the technology available in this auto mechanic sector	1	2	3	4	5
vi. My customers have forced me to adopt new technologies in order to serve them better					

Thank you for your time

End of survey