INFLUENCE OF TECHNICAL SKILLS ON PERFORMANCE OF MANUFACTURING FIRMS IN NAIROBI CITY COUNTY IN KENYA

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DECLARATION AND APPROVAL

Declaration by Student:

This research project is my original work and has not been presented for a degree in any other University or for any other award.

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Approval by University Supervisors:

I confirm that the work reported in this research project has been carried out by the candidate under my supervision.

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DEDICATION

This study is devoted to the Almighty God. To my father, Mr. Odongo, in appreciation for the assistance that was provided over the time period.

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ABSTRACT

The contribution to Gross Domestic Product (GDP) by the manufacturing sector in Kenya has been slow, falling from 13.8 percent in 2020 to 12.9 percent in 2021. The sector has potential to grow and is expected to perform better, post covid-19. This is an indicator that the manufacturing sector in Kenya is below its 20230 Vision envisaging a target of 20% contribution to the GDP. The sales turnover of manufacturing firms in Kenya as measure of performance has been decreasing in recent years. In 2022, the total sales turnover of manufacturing firms in Kenya was estimated to be Ksh 3.5 trillion (approximately USD 30 billion). This represents a decrease of 10.2% from 2021. There have been some fluctuations in the net profit margin of manufacturing firms in Kenya over the past few years. For example, in 2022, the net profit margin declined to 9.3% due to cost of production including energy, currency fluctuation and competition from imported goods. The study aimed to examine how technical skills practices may affect manufacturing firms' firm performance among selected manufacturing firms in Nairobi, Kenya. The specific objectives To analyze the influence of information communication technology skills, data science skills and innovative skills effect on performance of manufacturing firms in Nairobi City County in Kenya. The theories of the study included contingency theory, and human capital theory. The study adopted a quantitative approach and used descriptive survey research design. The study targeted 253 senior managers drawn from finance managers, procurement managers, human resource managers, customer relations managers and operations managers. The study sampled 75, which is 30% of the total population. Data was collected by use of structured questionnaire. Data analysis was done descriptively (mean, standard deviation, frequencies and percentages). Data presentation was presented by use of tables and charts. The results indicated that technical skills have significant positive effect on the performance of manufacturing firms in Nairobi City County in Kenya. The outcomes disclosed that Information communication skills had a substantial beneficial influence on the performance of manufacturing firms in Nairobi City County in Kenya, with a B-value of.218 and a p-value of.001. Similar result were reported for data science skills as well as innovative skills. The conclusion is that technical skills accounted for 60.7% of the substantial variation in outcomes for manufacturing companies in Nairobi City County in Kenya (R square =.607). The findings of this study suggest that manufacturing firms in Nairobi City County should invest in developing the ICT skills of their employees. This can be done through training programs, workshops, and on-the-job training. In addition to investing in data science skills, firms should also create a culture that is data-driven. This can be done by encouraging employees to use data to inform their decisions and by providing them with the tools and resources they need to do so. The study's findings suggest that manufacturing firms in Nairobi City County should focus on developing their innovative skills in order to improve their performance. This can be done through a variety of means, such as investing in research and development, training employees in innovation techniques, and creating a culture that is supportive of innovation.

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LIST OF ABBREVIATION AND ACRONYMS

CDF	- Constituency Development Fund
COVID-19	- Coronavirus Disease
CRM	- Customer Relationship Management
ERM	- Enterprise Risk Management
GDP	- Gross Domestic Product
KAM	- Kenya Association of Manufacturers MTP - Medium Term Plan
RBV	- Resource Based View

CHAPTER ONE: INTRODUCTION

1.0. Introduction

This section discusses the study background, statement of the problem, purpose of study, study objectives, research questions, importance of the study, scope of the study, study limitations, delimitations, and assumptions of the study and lastly operational definition of term.

1.1. Background of the Study

The primary role of manufacturing firms is to increase turnover. Increase in revenue to firms implies an improvement of productivity. According to (Issack & Muathe, 2017) firms should take informed actions to achieve an organization's short and long-term production is taken into account. As a result, there is need to plan an action so as to protect firms from the unreliability that come with unpredictably changing conditions. One of the reasons why some firms flourish and others diminish is addressed to some extent by organizational reaction and informed decisions (Okoth & Njeru, 2019).

The primary goal of enterprises is to maximize profit, thus the concept of organizational performance is essential. According to (Gure & Karugu, 2018) successful companies have to generate higher profits and analyze execution drivers from the strategic level to the operational level. Not only have the surroundings in which companies operate become more uncertain, but they have also become more interconnected and disruptive (Teece, 2018). Technical skills are considered to be specialized knowledge and expertise that enable employees to perform specific tasks, use specific tools and programs to drive increased firm performance. From information technology and corporate management to healthcare and academia, technical skills are essential in every sector of the economy. Technical skills not only contribute to overall organizational success but also assures the employees of of better job opportunities, better salaries, and increased career stability (Bontis, 2018).

With such focus in enhancing technical skills, companies can maximum production by aiding in

building competitive benefit (Wang et al., 2018). Technical skills is an aspect of strategy that gives companies long-term direction to deal with variation, and allows it to concentrate on improvements. Productivity becomes key when enhancing technical skills depending on the industry in which a company operates, because there is no single accepted metric for gauging success, firms must develop their own metrics and strategies (Nosratpour et al., 2018).

At the global level, technical skills are consistently identified as key drivers of manufacturing productivity and innovation. A recent study by Deloitte and The Manufacturing Institute estimated that the skills gap in US manufacturing could leave up to 2.1 million jobs unfilled by 2030, resulting in $1 trillion in lost economic output (Deloitte and The Manufacturing Institute, 2021). Meanwhile, a meta-analysis of 59 studies found that investments in employee training had a moderate to large effect size on manufacturing productivity (Arditi et al., 2016).

In developed economies like Germany, Japan, and South Korea, where manufacturing plays a prominent role in national income and employment, technical skills are seen as critical enablers of competitiveness. For instance, Germany's dual system of vocational education and training (VET) is often cited as a model for other countries seeking to strengthen their manufacturing sectors (European Centre for the Development of Vocational Training, 2017). Similarly, Japanese companies invest heavily in continuous improvement practices such as kaizen, which rely on frontline workers' abilities to identify and resolve production problems (Takeuchi and Nonaka, 2014).

However, the value of technical skills may vary across regions and industries. For example, in low-income countries with predominantly agrarian economies, basic literacy and numeracy skills may take precedence over specialized technical skills in manufacturing (Psacharopoulos and Patrinos, 2018). By contrast, middle-income countries such as Brazil and China, where manufacturing accounts for a larger share of GDP, have made substantial investments in VET programs to develop technologically sophisticated workforces (de Oliveira et al., 2019; Li et al., 2019).

Within Africa, there is considerable variation in the extent to which technical skills shape manufacturing performance. While some countries such as Egypt, Morocco, and Tunisia boast well-established engineering schools and research institutes, others struggle with weak educational systems and skill mismatches (World Bank, 2021). Nevertheless, several African nations have implemented reforms aimed at strengthening their VET systems, recognizing the potential benefits of a technically proficient workforce for attracting foreign direct investment (FDIs) and fostering domestic entrepreneurship (World Economic Forum, 2017).

It's common knowledge that Africa's manufacturing sector, especially in Sub-Saharan Africa, is failing. A 2019 World Bank research found that Africa's industrial firms were underperforming. Africa's manufacturing industry contributes just 3.8%-11% to GDP (compared to 30%-40% in industrialized countries), corresponding to the African Development Bank (AFDB, 2016). According to an AFDB report from 2016, manufacturing enterprises in Kenya have been doing poorly as a source of total GDP growth. In a similar vein, the Kenya Strategic Policies for Vision 2030 study (2018) stated that manufacturing performance began to deteriorate in the middle of the 1980s (Agwu, 2018).

Turning to Kenya, the manufacturing sector faces numerous challenges despite accounting for approximately 10% of GDP and employing roughly 8% of the workforce (National Bureau of Statistics, 2020). One major constraint is the lack of adequately trained personnel capable of operating complex machinery and adopting innovative production processes (World Bank, 2021). In response, the government has launched initiatives such as the Manufacturing Skills Training Centres (MOSTCs) program, which aims to provide industry-relevant training to thousands of youth and women (Ministry of Industry, Trade and Cooperatives, n.d.). Early evaluations suggest that MOSTC graduates enjoy higher wage premiums and better employment prospects than their peers without technical qualifications (USAID, 2019).

Performance, is a method for evaluating an organization's performance based on specific criteria like total revenue, sales, and effectiveness of processes. For there is a lot of strategic thinking which focuses on introducing and weighing performance, management of performance and

development is the central focus of plan of action management (Gartenberg et al., 2019). According to (Korir et al., 2020) organization's performance is influenced by three ideologies: the goal approach, which says that an organization works toward specific, measurable objectives, in which overall increase in revenues is key. Manufacturing enterprises, in accordance to the World Bank (2019) are the major source of employment in both growing and developed economies, accounting above 90% of African company activities and contributing to over 50% of Africa employment ratio and GDP. Because of Africa's resources, which human capital is key, the encouragement of manufacturing enterprises, particularly those in metropolitan areas to manage human resources, is seen as a potential path to sustainable development (Brandt, 2019). 80% of Kenya's manufacturing firms are centered in Nairobi, the country's capital, which is well-connected and well-equipped with training institutions and better infrastructure (Samuel et al., 2021).

The focus on technical skills has experienced rapid expansion over the past two decades (Malykhin et al., 2021), and this expansion continues on a daily basis. Acquisition of technical skills is frequently a crucial aspect of the strategic management process, as it incorporates all divisions of an enterprise company. This is targeted at employee competency, and companies should demonstrate such desire in strategy execution because the outcomes of skills enhancement can affect a company's success or failure in its industry. Because no company has infinite resources, strategists must determine the other strategies, which will benefit the company the most (McGuinness, 2023).

Manufacturing makes up 70% of Kenya's industrial sector's GDP, with the remaining 30% coming from building, construction, mining, and quarrying (Kenya Association of Manufacturers, 2015). According to Kenya Vision 2030, manufacturing will play a major role in achieving a 10-percent annual growth rate in GDP. In terms of job creation and GDP expansion, manufacturing has a lot of untapped potential. For instance, the manufacturing sector, in contrast to agriculture, which is severely constrained by land size, holds a lot of promise for job creation and poverty reduction (Barasa, 2018). The nation's capital, Nairobi, is home to eighty percent of manufacturing

companies, and it is well-connected and well-equipped (World Bank's report, 2015). Although its contribution to wage employment has been decreasing, the manufacturing sector's contribution to GDP has remained stable at around 10%. The first Medium Term Plan (MTP) goals for implementing Vision 2030 from 2008 to 2012 were mostly not met in terms of the sector's contribution to GDP and the completion of major projects. Vision 2030 envisions a manufacturing sector that is dynamic, diverse, and competitive, able to drive employment.

1.2 Statement of the Problem

Manufacturing firms in Nairobi City County would possess a workforce equipped with robust technical skills. These skills would encompass a broad spectrum, ranging from proficiency in operating modern machinery to advanced knowledge in industrial automation and digital technologies. Employees would be adept at troubleshooting technical issues, optimizing production processes, and implementing innovative solutions to enhance productivity and quality standards. This vibrant manufacturing sector would significantly boost Kenya's Gross Domestic Product (GDP), stimulating economic growth, and providing ample job opportunities for the burgeoning population. Following farming and gardening, manufacture in Kenya is the third most important contribution to GDP.

Despite this, the manufacturing sector growth dropped down in 2020 to 4.4%, from 5.8% in 2019, and has continued to have mixed (KAM, 2019). The contribution of the sector to total pay employment has deteriorated, falling from 13.8% in 2020 to 12.9% in 2021. (KIPPRA, 2021). This suggests that the manufacturing sector in Kenya is still a long way from contributing 20% of GDP as envisaged in Vision 2030. The sales turnover of manufacturing firms in Kenya as measure of performance has been decreasing in recent years. In 2022, the total sales turnover of manufacturing firms in Kenya was estimated to be Ksh 3.5 trillion (approximately USD 30 billion). This represents a decrease of 10.2% from 2021 (KAM, 2022). There have been some fluctuations in the net profit margin of manufacturing firms in Kenya over the past few years. For example, in 2022, the net profit margin declined to 9.3% due to cost of production including energy, currency fluctuation and competition from imported goods (KAM, 2022). As a result, the sector's

contribution to GDP has remained relatively stagnant at around 5%. Thus the study examined the influence of technical skills in tperformance of manufacturing firms in Nairobi City County in Kenya.

1.3 Purpose of the Study

The purpose of the study was to investigate the influence of technical skills on performance of manufacturing firms in Nairobi City County in Kenya.

1.4 Objectives of the Study

i. To analyze the influence of information communication technology skills on performance of manufacturing firms in Nairobi City County in Kenya.
ii. To assess the effects of data science skills on performance of manufacturing firms in Nairobi City County in Kenya.
iii. To evaluate the extent of innovative skills effect on performance of manufacturing firms in Nairobi City County in Kenya.

1.5 Research Questions

i. What is the influence of information communication technology skills on performance of manufacturing firms in Nairobi City County in Kenya.
ii. What are the effects of data science skills on performance of manufacturing firms in Nairobi City County in Kenya.
iii. To what extent does innovative skills affect performance of manufacturing firms in Nairobi City County in Kenya.

1.6 Significance of the Study

The findings of this study may be of the utmost importance to policymakers responsible for strategic management in manufacturing companies. The failure of one or couple of the many parts of strategic management techniques is frequently linked to the issues of organizational

performance. The outcome, this research may also be critical in developing key policies on strategic management practices, which may eventually aid in the improvement of inherent practices in manufacturing organizations.

1.7 Scope of the Study

The research explored key technical skills required of employees that should be employed by the Kenyan Manufacturing Firms in Kenya. Data collected from employees at three organizational management levels were gathered for the study, which was carried out in manufacturing firms in Nairobi City County. (Operational managers, finance managers, customer relations managers and human resource managers) with the assumption that these managers will have information relevant to the researcher's research on technical skills and performance. The study took place for 9 months between March and December 2023. The content scope was information communication technology (ICT), data science and innovative skills required in sustaining firm performance in the manufacturing sector.

1.8 Limitations of the study

Limitations in research refer to the factors or constraints that influence the extent to which a study's findings can be interpreted, generalized, or applied to the broader population or real-world situations. They arise from various sources, including the research design, data collection methods, resources, and external factors. The participants chosen for this study may not be fully representative of the larger population or may have unique characteristics that influence their performance. This can limit the generalizability of the findings to broader groups. This limitation was overcame by choosing a sample that is as representative as possible within the constraints of the study. Researcher may not have sufficient time to conduct extensive research, leading to limitations in the scope and depth of the study. To overcome this limitation, the study adopted drop and pick technique during data collection with constant reminders.

1.9 Delimitations of the Study

The study delimited itself to selected manufacturing companies in Nairobi County. This implies that manufacturing companies from other counties in Kenya were not be included. Data used in this study was delimited to quantitative data collected using structured questionnaire, this suggests that qualitative data was not used in the study. In regards to technical skills, the study delimited itself to information technology skills, data analysis skills and innovative skills.

1.10 Assumptions of the Study

The study considered a number of assumptions.

1. Researchers made the assumption that their sample reflected the whole population.
2. Through validation and reliability, the study assumed that findings from the sample can be generalized to a larger population.
3. Participants' availability was also expected for the research.
4. Lastly, the study assumed that respondents were able to differentiate technical skills from other types of skills.

1.11 Operational Definition of Key Terms

Technical Skills: In manufacturing companies, they are the skills and knowledge necessary to carry out various activities.

Performance: This is improvement of revenues, total units produced and sales volumes

Manufacturing Firms: A commercial enterprise that transforms raw materials or components into finished goods is known as a manufacturing company.

Data science Skills: are the skills necessary to gather, clean, analyze, and comprehend data utilizing scientific techniques, procedures, algorithms, and systems to derive meaning from data in both organized and unorganized formats.

Innovation Skills: are a set of competencies and abilities that enable individuals, teams, and organizations to create, develop, and implement new and valuable ideas, products, processes, or solutions.

Firm performance: means that the business has been successful in reaching its objectives. Innovation, firm performance (such as profitability, revenue growth, and return on investment), and non-firm performance (such as customer happiness and market share) are some of the ways it may be assessed.

CHAPTER TWO: LITERATURE REVIEW

2.0 Introduction

This chapter's focus is a review of theoretical and empirical literature. This overview covers a variety of pertinent theories, including the resource-based perspective, the contingency theory, and the dynamic capability theory. Furthermore, it centers around earlier examination that is appropriate to the review's variables. The chapter also contains a conceptual framework, a summary of the evaluated literature, and research gaps.

2.1 Theoretical Literature Review

2.1.1 Contingency Theory

Coulter, (2018) says that this theory proposed that a structured governance design in which an organization's structure matches its circumstances is the most suitable and effective. As a result, the theory states that the time managers come up with operational choices in their businesses, they must analyze all parts of the present circumstance and work on those that are important to the scenario at hand (Robbins, 2014). What is needed for management issues and concerns are based on the specific settings that exist in the organization (Tsolka, 2020). As a result, strategy execution should be based on the current situation or context. This indicates there is changing conditions with different business environments would necessitate different methods to addressing the difficulties of the organization, implying a link between environmental discernment.

An organization’s performance in a given situation which describes unique remedies for challenges across the board throughout the organization and in turn recommends that strategic management techniques that would be used to lead the firm to proper collaborative market environment. According to (Robbins, 2014) an organization’s primary objective is sustainable long-term growth. The vision and strategic goals of business enterprise management have actual implications on the way, decision execution, and assessment of implementation of actions that are adopted.

As a result, it is critical for an organization to build a match between competencies and resources in order to capitalize on market possibilities and acquire a competitive edge. According to (Nakano & Wechsler, 2018), skills, and innovation, are essential for a firm's long-term viability. Organizations that want to sustain performance should look for ways to innovate and re-skill in order to find a strategic match for their expansion plans (Park and Hong, 2019). As a result, technical skills are considered to provide adaptation technique with the goal of achieving optimal performance outcomes hence customer satisfaction and ensure the long-term survival and success of business enterprises.

2.1.2 Human Capital Theory

According to Schultz's (1972) Human Capital Theory, value creation in a firm may lead to improved business production. It suggests that a company's employees are assets rather than costs. Bontis (2008) says that an organization's human aspect, or the combination of intelligence, expertise, and skills that gives it personality, is called human capital. The HCT places an emphasis on the value that people can add to a company. This position is referred to as a "human capital advantage". Businesses can and do benefit from the high levels of training and expertise that their employees possess despite the fact that they do not legally own human capital. They can do this by employing strategies like creating corporate cultures or learning vocabulary terms to foster unity and impart technical skills to employees. The theory's premise is based on the immeasurable nature of human capital's many manifestations.

Human capital, on the other hand, has an intrinsic value that cannot always be quantified. Second, regular research and observation are challenging due to the fact that human capital can be stored but not always utilized fully (Boxall, 2021). It is therefore essential to have technical skills. The total amount of human capital is determined by Nafukho (2004) as the sum of all types of human capital.

2.2 Empirical Literature Review

2.2.1 Information Technology Skills on Manufacturing Firms Performance

Technical skills contributes to effective management, enhanced throughput and financial attainment (Garcia et al., 2018). Information Communication Technology skills is key to retaining employees who will support greater value proposition for the organization and the customer. It is becoming more popular as a measure of performance around the world, and it is secondly characterized as the most significant tool of management. According to Endende et al. (2016), ICT skills promotes longer, more advantageous firm productivity and customer satisfaction.

A survey by federation of Kenya (FKE) employers in 2018 revealed that, most organizations in Kenya is still lack behind when it comes to technical skills. The study proposed that firms continuously liaise with training institutions to offer her employees new training on dynamic requirements of the modern job (FKE, 2018). Hence, there is need for modern firms to assess and ensure that their employees are continuously trained so as to acquire relevant skills for better firm performance and employee job satisfaction.

Technical skills, according to McGuinness (2018), enhances the company's relationship with its customers who requires constant bilateral interaction and communication. According to (Anderson 2018), there is need for novel approaches of updating skills and recognizing the latent skills of people currently required by the employee. New skills must be used by the employee in the informal economy in order to improve their productivity. However, the reorganization takes time and is rarely smooth. Employees and businesses both suffer in different ways. The skills of some people are in short supply, while those of others are out of date (Wambugu 2015).

The investigation executed by Hysong (2018) was to investigate the possible added value of technical competence in managing performance for first-tier managers, in comparison to managerial skill alone. Additionally, the investigation aimed to examine potential mediators that may influence this connection. The study included a sample of 107 first-tier supervisors employed in local petrochemical and engineering industries. These supervisors were invited to participate in an online survey, which aimed to gather information on their professional experience and management abilities. Additionally, the study collected ratings from subordinates about the supervisors' technical expertise, power, and influence tactic habits.

Managerial effectiveness was evaluated based on three metrics: employee output, employee contentment, and assessments from those under the manager's supervision. The incremental increase in technical expertise was shown to be a significant predictor of subordinate judgments of management performance, surpassing the influence of managerial talent. The association between technical competence and subordinate evaluations, as well as work contentment, was shown to be mediated by referent power. However, expert power was only found to mediate connections with job satisfaction. The link among expert power and subordinate assessments of management effectiveness was shown to be mediated by rational persuasion.

The Technical Ability centered Job readiness Forecasting Model (TSBEPM) is developed by Manjushree, Varsha, Arvind, and Laxman (2021) using ML methods. Students' grades in different computer science classes reflect their technological competence. A Support Vector Machine, Naive Bayesian Logic Regression, Probabilistic Forest, Decision Tree, AdaBoost is and Artificial Neural Network all contributed to the experimental effort by providing forecasts. All models were validated by conducting experiments with data acquired from University of. Various models are developed to forecast where a student will be allocated based on performance-measuring characteristics. An F1-Score of 0.85 is the best that can be achieved using Random Forest, and its accuracy may reach up to 70%. The model is built to be utilized in making placement decisions.

The purpose of the research by Mutheu and Perris (2021) was to determine how hiring technical experts affected the success of building houses in Kajiado County. Resource dependence theory was used for the research. In addition, a descriptive methodology was used for this study. The focus was on residential building projects in Kajiado County that would be finished by 2020. Specifically, we looked at a sample of 124 construction projects in Kajiado County that are at least 95% complete. Thirty-seven projects were chosen as a representative sample. The sampling methods used were not based on chance. Clients, vendors, and consultants all had a role in the research, since they were the ones implementing the project. Data was gathered via the use of questionnaires. The investigator gave them a hand and then came back to collect them. The investigation found that using technical competence led to better results for residential building

projects. The research concluded that M&E procedures did affect the success of residential building projects.

The purpose of the study by Yahya, Iskandar, and Sunardi (2017) was to assess the role of scientific techniques in the practical training of students at a high school for trades. The study used a quantitative, non-experimental design using an ex-post facto poll. There are a total of 523 students enrolled in the mechanical engineering skills package; 172 men and 49 females make up the sample set for this study. A test, questionnaire, and notes were utilized to compile the data. Both descriptive and structural equation modeling (SEM) analyses were performed on the data. The findings revealed that the scientific method's incorporation into vocational education significantly contributes to students' acquisition of technical expertise and has a positive effect on their employability. Technical and employability skills may be honed with the use of a data-driven strategy, as seen above.

According to research by Van Minh, Badir, Quang, and Afsar (2017), leadership endorsement is a key factor in fostering staff development and creativity. Few studies have examined how leaders' technical expertise affects minions' ability to learn and innovate, in contrast to the abundance of literature on methods of leadership and management abilities. Information was gathered from 52 managers and 127 employees at 68 different Vietnamese telecom firms. The findings indicate that followers' creative and instructive actions are positively related to their leaders' technical proficiency. In addition, the link between leaders' technical expertise and their employees' creative work behavior is partially mediated by employees' openness to acquiring new skills on the job.

Sylvester and Okorie's (2019) study attempted to determine the influence that workers' technical abilities had on the productivity of manufacturing companies in South-East Nigeria. Eighty-six people, representing a wide range of functions across the manufacturing companies, took part in the study by completing surveys and other measures meant to assess their ICT skills and achievements on the job. The data was subjected to a linear regression analysis. There was a highly significant association among ICT competence and work performance, the study found. results, ramifications, and judgments are spoken about

Rizk and Daniel (2016) examine the influence of ICT skills on individual job performance in the context of a multinational corporation. The study utilizes a mixed-methods approach, combining surveys to assess ICT skills levels and performance evaluations from supervisors. Data analysis includes regression analysis to determine the relationship between ICT skills and job performance. The study found a positive and significant relationship between employees' ICT skills levels and their job performance. Employees with higher ICT skills demonstrated higher levels of performance in their roles within the organization.

2.2.2 Data Science Skills on Manufacturing Firms Performance

According to Bandanaraike (2018), skill development has the potential to increase enterprise and national production. According to Mitchell & Flin (2018), one of the most significant implications among organizations is that skill development in data analytics must be integrated into larger development initiatives if it is to realize its significant potential to increase employment growth and productivity. Essential data skills are needed for firm's' structural adjustment. The transition of all production factors from lower to higher value-added activities is slowed by the inability to learn new skills due to a lack of basic education or opportunities. Employees and businesses both suffer in different ways. The skills of some people are in short supply, while those of others are out of date (Schumpeter, 2017). Bandanaraike, (2018) say that new ways of keeping skills up to date and recognizing people's hidden skills are what the employee needs right now. In the informal economy, employees must utilize new skills to increase productivity.

"Innovative Capacity and Performance: An Empirical Analysis" by Massimo Colombo and Gianmarco Iannuzzi (2017). This study investigated the link between innovative capacity and firm performance in Italy. Using panel data from more than 2,000 manufacturing firms, they found that innovation capability has a positive influence on firm performance, as measured by sales growth and labor productivity.

"Innovation Capabilities and Firm Performance: Does Environmental Uncertainty Matter?" by

Cheng Luo, Qiugen Wang, and Xiaohui Liu (2017). This study analyzed the role of innovation capabilities in enhancing firm performance under varying degrees of environmental uncertainty. Based on a survey of 260 Chinese manufacturing firms, results showed that innovation capabilities have a stronger influence on firm performance when environmental uncertainty is high.

"How Do Innovation Capabilities Improve Operational Performance? Exploring the Mediation Role of Process Improvement" by Jun Wu and Wenbin Zhang (2017). This study focused on exploring the mediating mechanism underlying the relationship between innovation capabilities and operational performance. Drawing on a survey of 201 manufacturing firms in China, they found that process improvement plays a critical role in transmitting the benefits of innovation capabilities into better operational performance.

"The Relationship Between Entrepreneurial Orientation and Firm Performance: The Moderating Roles of Industry Characteristics and Knowledge Sharing" by Soheila Kolahchi and Mahdi Esfandiar (2017). This study examined the moderating roles of industry characteristics and knowledge sharing on the relationship between entrepreneurial orientation and firm performance. Based on a survey of 216 Iranian manufacturers, their findings suggested that knowledge sharing strengthened the positive association between entrepreneurial orientation and firm performance, particularly in dynamic environments.

"Exploring the Linkage Between Intellectual Capital and Innovation Capabilities: Implications for Firm Performance" by Muhammad Amir Adam, Ali Ahmed Shah, and Tariq Mahmood (2016). This study explored the relationship between intellectual capital and innovation capabilities, and how these factors contribute to firm performance. Based on a survey of 200 Pakistani manufacturing firms, the authors found that intellectual capital has a direct positive influence on innovation capabilities, which in turn leads to enhanced firm performance. Additionally, they discovered that market-oriented culture played a moderating role in this relationship.

2.2.3 Innovative Skills on Manufacturing Firms Performance

Innovation is considered the key driver of most successful organizations in modern firms. Inadequate innovative skills, leads to organizations incurring additional costs, due to the need to engage external resource persons (Moon, 2019). In manufacturing sector, one of the challenges that led to the poor performance of leading brands in the world such as KODAK, and Eveready in Kenya is slow pace of acknowledging the need to innovate (Poret, 2019). Innovative skills such as training employees on design thinking has the potential to increase employee's contribution to the firms in form of knowledge and ideas that can improve overall organizational products and services .

Wang and Luo (2018) investigated the influence of ICT skills on academic performance among university students. The study employs a quantitative survey methodology, collecting data through questionnaires distributed to undergraduate students. Statistical analysis, including correlation and regression analysis, is used to examine the relationship between students' ICT skills and their academic performance. The findings indicate a positive correlation between students' ICT skills levels and their academic performance. Higher ICT skills are associated with better academic outcomes, including higher grades and academic achievement.

In their 2020 study, Alzahrani and Houghton investigated how SMEs' IT proficiency affected the way they perform. The research uses a mixed-methods strategy, gathering data from surveys and lengthy conversations with business owners and executives. Quantitative data analysis includes regression analysis to assess the relationship between employees' ICT skills levels and organizational performance indicators. Qualitative analysis is used to provide deeper insights into the mechanisms through which ICT skills influence performance. The study found that higher levels of ICT skills among employees were associated with improved organizational performance in SMEs. Specifically, SMEs with employees possessing advanced ICT skills demonstrated higher levels of productivity, innovation, and competitiveness.

Sun and Zhang (2017) examined the influence of ICT skills on healthcare professionals' job performance in a hospital setting. The study utilizes a quantitative survey methodology, collecting data through questionnaires distributed to healthcare professionals, including doctors, nurses, and

administrative staff. Statistical analysis, such as regression analysis, is used to investigate the relationship between healthcare professionals' ICT skills levels and their job performance. The findings reveal a positive relationship between healthcare professionals' ICT skills levels and their job performance. Healthcare professionals with higher ICT skills demonstrated greater efficiency, accuracy, and effectiveness in their roles, contributing to improved patient care and organizational outcomes.

Wang and Li (2019) examined the influence of data science skills on business performance in the context of manufacturing firms. The study employs a quantitative survey methodology, collecting data through questionnaires distributed to manufacturing firms. Regression analysis is used to assess the relationship between employees' data science skills and business performance indicators, such as productivity, innovation, and profitability. The findings suggest a positive association between employees' data science skills and business performance. Firms with employees possessing advanced data science skills demonstrate higher levels of productivity, innovation, and financial performance.

Chen and Zhang (2020) investigated the influence of data science skills on financial performance among companies in the financial services sector. Combining quantifiable evaluation of data with conversations with financial experts, the research employs an approach that combines both methods. Examining the correlation between data science competencies and financial performance indicators like ROI and ebitda requires statistical methods like regression analysis. The study finds a positive correlation between firms' data science capabilities and financial performance. Companies with stronger data science capabilities demonstrate higher profitability and competitive advantage in the financial services industry.

Liu and Wang (2018) explored the influence of data science skills on academic performance among university students in STEM fields. The study employs a quantitative survey methodology, collecting data through questionnaires administered to undergraduate and graduate students. Regression analysis is used to assess the relationship between students' data science skills and academic performance indicators, such as grades and research output. The findings indicate a

positive correlation between students' data science skills levels and their academic performance. Higher data science skills are associated with better academic outcomes, including higher grades and research productivity.

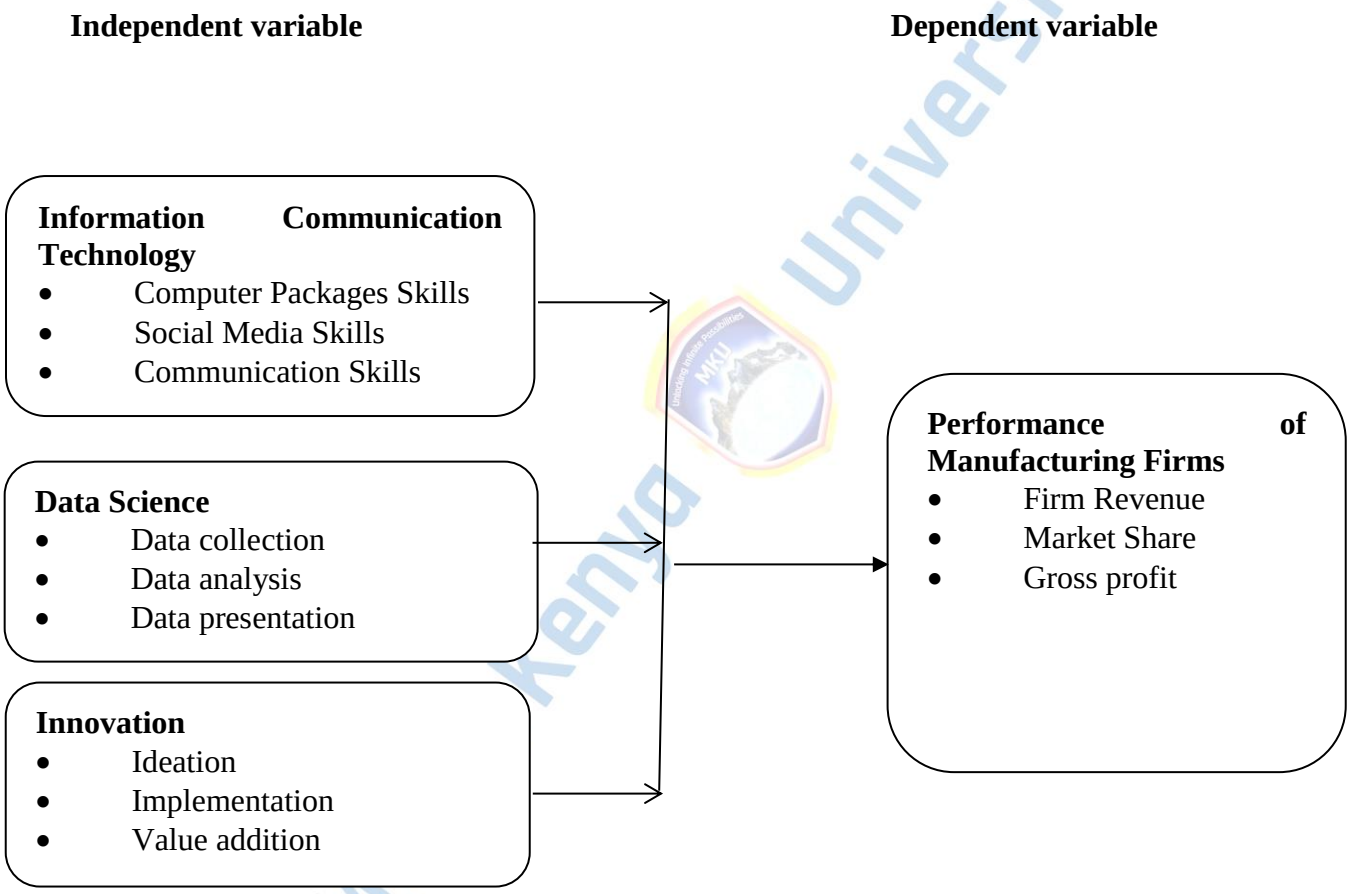
Park and Lee (2017) examined the influence of data science skills on organizational performance in the healthcare sector The study utilizes a quantitative survey methodology, collecting data through questionnaires distributed to healthcare organizations. Statistical analysis, such as regression analysis, is used to investigate the relationship between organizations' data science capabilities and performance metrics, such as patient outcomes and operational efficiency. The findings reveal a positive relationship between organizations' data science capabilities and performance. Healthcare organizations with advanced data science skills demonstrate improved patient care, operational efficiency, and overall organizational effectiveness.

Kim and Lee (2019) aimed to assess the influence of data science skills on marketing performance in the retail industry. The study employs a mixed-methods approach, combining surveys with analysis of marketing metrics and sales data. Statistical analysis, including regression analysis, is used to examine the relationship between employees' data science skills and marketing performance indicators, such as customer engagement and sales revenue. The study finds a positive association between employees' data science skills and marketing performance. Retail firms with employees possessing advanced data science skills demonstrate higher levels of customer engagement, sales conversion rates, and revenue growth.

2.3 Conceptual Framework

This is an introduction technique in which the researcher visualizes the relationships between elements and the interrelationships in the research graphically or diagrammatically (Orodho, 2008). A variable, according to Kothari (2009), is a notion capable of taking distinct quantitative aspects. On the other hand, Mugenda (2008) defines a variable as a quantifiable hallmark that predicts distinct traits among units of a population. The autonomous variable and ward variable are the two most important components in this investigation. According to Mugenda (2008), the

free factors are called indicator factors since they predict variation in another variable. A needed variable, also known as a model variable, is one that is influenced by another variable. The reliant variable is the one that needs to be clarified by the researcher. Following that, this investigation attempted to determine how strategic customer relationship management, risk management, strategic technical skills, and financial management practices influence manufacturing firm performance in Kenya's Nairobi City County.



Source: Researcher, 2023

Figure 1: Conceptual Framework

Hermenegildo et al. (2020) carried out a study on sustainable business model innovation, digital

transformation, and customer relationship management. The researcher placed a greater emphasis on customer relationship management and neglected to mention other management techniques such as strategic technical skills, risk management, and financial management practices, all of which are critical to the success of manufacturing businesses. A study by (Khedker et aI.,2015) on looking at how customer relationship management affects customer satisfaction and loyalty emphasized marketing tactics rather than technical skills strategies. (Osman, 2019) used strategic management methods to investigate Kenya Commercial Bank's performance in Nairobi City County, Kenya.

The researcher discussed about strategic control, strategy creation, data science skills, and intent. However, the researcher discussed the process of developing a strategic plan. The health department of Nairobi City County, Kenya (Nzoka, 2017) conducted a study on strategic management techniques adoption and service delivery. Without identifying any of them, the researcher simply focused on the adoption of strategic management approaches. (Mitchell & Flin, 2018) conducted research on human capital as a technique for increasing organizational productivity. Cheluget (2017) conducted research in Uasin Gishu County to determine the importance of FMP in achieving project objectives. Ngugi (2015) conducted study in Machakos County on the relationship between budget control and CDF accomplishments. (Pimchangthong and coworkers,2017) looked into how IT project success was affected by risk management strategies (Osman, 2019).

The influence of risk management practices on Ghana's banking industry was investigated by (Niah et aI,2014). (Aduma et al, 2018) conducted research in Nairobi, Kenya, to learn about risk management procedures at the National Hospital Insurance Fund. An investigation was done on the use of strategic planning approaches and execution of services by the health division of the county of Nairobi, Kenya (Nzoka, 2017). In the context of customer relationship management, a study was carried out on customer satisfaction and loyalty (Khedker et al., 2015). (Hermenegildo et al., 2020) carried out a study on management of existing client relationships, digital innovation, and the creation of new ones.

2.5 Research Gap

Creating a Competitive Advantage technical skills acquisition was the subject of research (Nagwan et al., 2020). The study however, did not capture any other aspect of management practices other than customer relationship management. The researcher recommended the more study of the dimensions of other management practices of strategy, hence the need for the current study to focus on technical skills. (Hermenegildo et al., 2020) carried out a study on Management of existing client relationships, digital innovation, and the creation of new ones. The researcher placed a greater emphasis on customer relationship management and neglected to mention other management techniques such as strategic technical skills, risk management, and financial management practices, all of which are critical to the success of manufacturing businesses.

The expert also suggested that more research be done in the manufacturing sector. (Khedker et al 2015) performed a study on relationships of consumer's management and its influence on consumer happiness and loyalty, focusing mostly on marketing techniques and ignoring strategic management practices such as financial management and risk management. (Osman, 2019) used strategic management methods to investigate Kenya Commercial Bank's performance in Nairobi City County, Kenya. The researcher spoke about strategic control, strategy creation, data science skills, and intent. The researcher highlighted strategic plan processes but placed no emphasis on the need for technical skills.

CHAPTER THREE: RESEARCH METHODOLOGY

3.0 Introduction

This chapter shows study design, data gathering techniques and methods, study area, target populace, piloting, data analysis and data presentation.

3.1 Research Methodology

The study adopted a quantitative approach method, where quantitative data was collected to enable the study answer the research objectives. This approach helps researchers to gain more complete examination of the aspects of the study (Mugenda and Mugenda, 2013). The approach also, enables generalization of research findings, in addition to providing credible results as compared to the use of singular method of approach (Khotari and Garg, 2015).

3.2 Research Design

The study adopted a quantitative approach method, where quantitative data was collected to enable the study answer the research objectives. This approach helps researchers to gain more complete examination of the aspects of the study (Mugenda and Mugenda, 2013). The approach also, enables generalization of research findings, in addition to providing credible results as compared to the use of singular method of approach (Khotari and Garg, 2015).

A descriptive research strategy was employed for this investigation. Descriptive design allows the researcher to examine the background of research problem, before embarking on the actual research. In doing so, the researcher was able to determine the characteristics of the manufacturing

firms' respondents such as their opinions, traits, and performance behaviors, in relation to employee retention. According to (Khotari and Garg, 2015), descriptive design accurately describes the study's population and its characteristics. It enables researchers to answer questions such as what, where, when and how but not the why questions. In addition, it assists researchers investigate more than one variable while not being able to control or manipulate any of the variables being studied, hence can only observe and measure them. (Mugenda and Mugenda, 2013).

3.3 Study Location

Manufacturing firms in Nairobi City County, Kenya, constitute a vital component of the nation's economy, contributing significantly to employment, production output, and GDP. Nairobi, as the capital city, serves as a hub for industrial activities, hosting a diverse array of manufacturing industries. These include food processing, textiles, chemicals, pharmaceuticals, electronics, and construction materials, reflecting the city's role as a center for industrial diversity and economic activity.

According to the Kenya National Bureau of Statistics (KNBS), the manufacturing sector in Kenya contributed approximately 9.2% to the country's GDP in recent years. This underscores its substantial economic importance and contribution to national development. Manufacturing firms in Nairobi play a crucial role in job creation, absorbing a significant portion of the urban workforce. This aspect is pivotal for urban development and poverty alleviation, providing employment opportunities and contributing to household incomes.

However, despite its significance, manufacturing in Nairobi faces several challenges. These

include inadequate infrastructure, high production costs, regulatory hurdles, and intense market competition. These factors can hamper the sector's growth and competitiveness both domestically and internationally. The World Bank has highlighted these challenges in its reports, emphasizing the need for improvements in infrastructure and the business environment to support industrial development effectively.

3.3 Population

The study population was business development/Strategic/Innovation managers among selected manufacturing companies in Nairobi County who are viewed in this study to have a broad range of capabilities and are contributors to and leaders of the growth agenda. There are 253 manufactured firms in Nairobi City, hence, this was considered as the target population for the study.

3.4 Sampling Frame

Sampling frame is the source used by researchers to define the population of interest. It is the list containing elements from which the researcher can select the sample for the study (Kothari, 2004; Mugenda & Mugenda, 1999). As such, the sampling frame was the list of manufacturing firms listed on KAM directory.

3.5 Sample and Sampling Technique

3.5.1 Sampling Technique

The study utilized simple random sampling to identify respondents for the study. This method

allowed the researcher to partitioned the population into relatively smaller homogeneous groups called strata and thereafter, a basic method of randomization is used to choose a representative sample from each stratum. (Kothari, 2004).

3.5.2 Sample Size

A sample is a selection of data points from a larger population for the purpose of illustration. The right sample size is important in finding a statistically significant result (Mugenda & Mugenda, 1999). A sample of 76 was obtained using 30% of the total population.

3.6 Data Collection Instrument

The data collection was done using structured questionnaire. This encompassed closed questions. Questionnaires are preferred model of collecting data because they are able to collect large amount of data in a short time (Khotari and Garg, 2015). The closed-ended utilized likert scale type questions to facilitate quantitative data analysis and interpretation. The questionnaire were structured into 5 likert scale, from Strongly agree (5), Agree (4), Not Sure (3), Disagree (2) and Strongly Disagree (1). Closed-ended questions are considered the best for research surveys, since it yields a higher response. In addition, they can easily be analysed statistically especially with survey data (Mugenda & Mugenda, 1999).

3.7 Data Collection Procedure

The first step of data collection procedure was to get permission to conduct the research from Mount Kenya University. The next step in gathering data was to apply for NACOSTI permit,

which was obtained after two weeks. Thereafter, the researcher accessed the sampled manufacturing via an official letter to Human Resource Manager. The questionnaires were hand delivered and issued to respondents of 76 manufacturing firms in Nairobi City County with the aid of four research assistants who collated the questionnaires once filled for onward submission to the researcher. The two assistants were briefed beforehand on the ethical consideration to be observed when carrying out the data collection exercise, in addition to adhering to the two institutional work ethic and procedures. A token of appreciation was offered to the two assistants once the exercise is completed.

3.8 Pilot Testing

A pilot study enables the researcher to assess and improve the data protocol by testing it on a smaller-sized sample so as to enable planning and modification of the instrument for the main study (Kothari, 2004). As such, the questionnaire was piloted in Kiambu County which Neighbors Nairobi City. In the pilot phase, we only asked for feedback from a small subset of participants (8 people). Pilot investigations are conducted to determine the reliability and veracity of research tools.

3.8.1 Test of validity

The quality of the proposals or measures is ascribed to the extent to which they correspond to existing knowledge or truth according to Neuman (2005). For example, an attitude scale is deemed legitimate to the degree to which the findings correspond to other attitude ownership measures. Content and construct techniques of validity are thus used for validity assessment, using 10 copies

of the instrument during pilot tests for validation. This is to check that questions are properly worded and relevant, and that they include sufficient information to guarantee content and validity.

3.7.2 Test of reliability

According to Mugenda & Mugenda (2008), consistency is the evaluation of how well an investigation tool maintains its credibility and dependability across time. A Cronbach alpha coefficient criterion of at least 0.70 is considered trustworthy. Pilot tests were done and a Cronbach alpha is calculated using version 26 of SPSS. Tabulated below are the results of our reliability tests

Table 1: Reliability of Research Instruments

Variable	No of Items	Items deleted	Cronbach Alpha	Reliable
Information Technology Skills	3	0	0.836	Yes
Data Science Skills	3	0	0.761	Yes
Innovative Skills	3	0	0.816	Yes
Firm Performance	4	0	0.844	Yes
Total	**13**	**Average**	**0.814**	**Yes**

Source: Field Data (2022)

In accordance with the data presented in Table 1, the Cronbach alpha coefficient varied within 0.761 for Data Science Skills and 0.844 for Firm Performance. The questionnaire demonstrated a high level of consistency, with a consistency coefficient above 0.7. This indicates a strong internal consistency among the questions inside the questionnaire instrument. Consequently, the tool was preserved in its original state without undergoing any further modifications.

3.9 Data Processing and Analysis

Descriptive statistics were applied to the numerical responses to the ranked Likert scale questions. Data presentation was done using tables, charts and frequencies. Cross-tabulations was also carried out to enable further interpretation and in answering research objectives. Kothari (2004) asserts that the fundamental statistical metrics often used to succinctly summarize data consist of measures of central tendency, namely the mean, median, and mode, as well as indicators of dispersion, such

as the deviation from the mean.

3.9.1 Simple Linear Regression Analysis

The simple linear equation for regression was used to represent the relationship between the individual independent factors and the dependent variable;

$$Y=\alpha + \beta_1 X_1 + \varepsilon$$

$$Y=\alpha + \beta_2 X_2 + \varepsilon$$

$$Y=\alpha + \beta_3 X_3 + \varepsilon$$

Where;

γ= Dependent variable [Performance of Manufacturing Firms]

α=Constant; the y intercept or the average response when predictor variables are 0

X_1= Independent variable 1 [Information Technology Skills]

X_2= Independent variable 2 [Data Science Skills]

X_3= Independent variable 3 [Innovative Skills]

ε= error term

$\beta_1 \ldots B_3$ = Beta Coefficients

3.9.2 Multiple Regression Analysis

The multiple equation for regression was used to represent the relationship between the independent factors and the dependent variable;

$$Y=\alpha + \beta_1 X_1 + \beta_2 X_2 + \beta_3 X_3 + \varepsilon$$

Where;

γ= Dependent variable [Performance of Manufacturing Firms]

α=Constant; the y intercept or the average response when predictor variables are 0

X_1= Independent variable 1 [Information Technology Skills]

X_2= Independent variable 2 [Data Science Skills]

X_3= Independent variable 3 [Innovative Skills]

ε= error term

$\beta_1 \ldots B_3$ = Beta Coefficients

3.9.3 Diagnostic Tests

Before proceeding with inferential statistics, the researchers conducted diagnostic analyses to assess the assumptions underlying Pearson correlation and multiple regression analyses. By conducting diagnostic analyses, researchers can identify any potential issues or violations of assumptions that may affect the accuracy and interpretation of the results. This approach enhances the robustness of the statistical analyses and strengthens the overall validity of the research findings.

Normality tests: To ensure the validity of the statistical analyses, the study employed the Shapiro-Wilk Test to assess the normality of the data. This test is widely used to determine if a dataset follows a normal distribution, helping researchers identify any deviations that may influence the

reliability of parametric tests. By examining normality, the study aimed to enhance the accuracy and validity of its statistical findings.

Multicollinearity: When there is a correlation between a number of distinct variables this is called multi-collinearity. When the correlation between the variables that are autonomous is strong (r=0.9 or above), we say that there is multiple collinearity This is a highly serious issue for several regressions. According to Tabachnick and Fidell (2001), it is advised to use caution when combining variables that have a bivariate correlation of 0.7 or higher in a single study. We will utilize the Variance Inflation Factor and the Tolerance threshold to check for a multi-col It is considered acceptable to have a VIF lower than 10 or a margin of error higher than 0.1.

A linearity test determines how well the dependent variable tracks the change in the independent variable. Meaning, for regression to work, there can be no non-linear correlations between the independent and dependent variables. All of the study's predictor variables were analyzed using pearson correlation to see whether they were significantly correlated with the dependent variable.

Independence: The absence or presence of autocorrelation is a prerequisite for linear regression analysis. When there is a lack of independence amongst the residuals, autocorrelation occurs. The Durbin-Watson test was used to determine independence. It verifies the independence of residuals by running them through a series of linear or multiple regression tests. There is no issue with autocorrelation when the Durbin-Watson factors are between 1.5 and 2.5 (Malau, 2018).

3.10 Ethical Consideration

Given that the study includes the participation of human individuals, it was carried out in full

adherence to the relevant ethical protocols. The preservation of professionalism in research was maintained by the implementation of these ethical principles. The research guaranteed the preservation of confidentiality and respect for each participant. The privacy of individuals from whose personal data was gathered shall be preserved with utmost respect and discretion. The individuals who participated in the study provided their informed permission prior to the commencement of any research activities. Prior to being recruited as a study participant, individuals must first get an informed consent form. The study participants were not subjected to coercion or bribery in any form to ensure their participation. The consultation process included relevant stakeholders, including persons, bodies, and committees, and NACOSTI provided approval for the study. Prior to their agreement to participate, participants were provided with information on the objectives, methodologies, and possible results of the research.

Each research study was adhered to the ethical criteria set by the respondents, and proper attribution was given to all authors and sources involved. The researcher used utmost caution to avoid any occurrences of scientific misconduct, including inadequate data collecting methodologies or fraudulent assertions of authorship. The research was conducted with a high level of expertise, according to the principles of impartiality and scientific rigor. It ensured that the approach, analysis, and interpretation of the data are free from any kind of bias.

CHAPTER FOUR

DATA ANALYSIS, PRESENTATION AND DISCUSSION

4.1 Introduction

The purpose of this research was to examine the investigate the influence of technical skills on performance of manufacturing firms in Nairobi City County in Kenya. This chapter offers the study's analysis, conclusions, and comments. In particular, the research looked at how proficiency in ICT, data science, and creativity all play a role. The results of empirical investigations are presented in this chapter via the use of descriptive statistics, Pearson correlation, and regression analysis. Questionnaires were used to gather data, which was subsequently processed, analyzed, and shown in tables and models according to each variable that was independent using the Statistical Package for the Social Sciences (SPSS).

4.2 Response Rate

Based on the given sample size, a set of 76 surveys were sent to an equivalent number of responders. A total of 59 surveys were filled out correctly and returned, yielding a response rate of 77.6 percent. The pick and drop method had the greatest percentage of responses, with a return rate of 77.6 percent. Cooper and Schindler (2008) posit that response rates over 50% are deemed satisfactory for the purposes of data analysis and publishing. A response rate of 60% is considered commendable, while a rate of 70% is classified as very favorable. Furthermore, a response rate of 80% is regarded as extraordinary.

4.3 Demographic Characteristics

The demographic characteristics of the respondents comprised of age, education level and duration worked in the company. The results are as follows.

Table 2: Age of the respondents

Age	Frequency	Percentage
Under 20 years of age	0	-
20-30 years of age	12	20.30
31-40 years of age	29	49.20
41-50 years of age	14	23.70
Over 50 years of age	4	6.80
Total	**59**	**100**

Table 1 shows that none of the respondents was found to be under 20 years old. However, majority of the sampled respondents were between 31 and 40 as shown by 49.20%, between 41 and 50 years were 23.7% while between 20 and 30 years were 20.3%. Over 50 respondents were 6.8% of the sampled respondents. It's safe to assume that most responses are under the age of 50. This means they were able to provide the requested data on the efficiency of factories in Kenya's Nairobi City County.

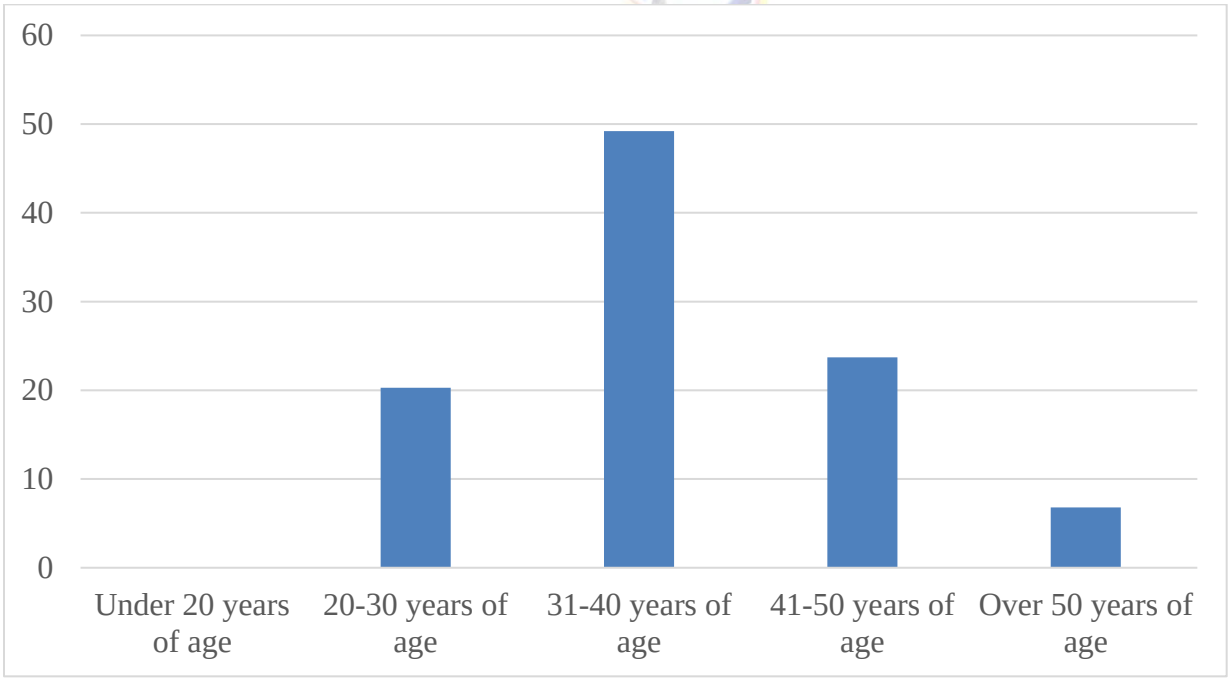


Figure 2: Age of the Respondents

Table 2 exhibits the outcome of the study's attempt to determine the average educational level of those who took part. The education level of respondents is an important factor to consider when designing and conducting data collection activities. By taking into account the potential influence of education level, researchers can help to ensure that their data is as accurate and representative as possible.

Table 3: Highest Level of Academic

Highest Level of Academic	Frequency	Percentage
College Diploma	7	11.90
University Graduate	33	55.90
Postgraduate	19	32.20
Total	**59**	**100**

It is evident that more than half of the respondents were university graduates as shown by 55.9%, 32.20% were having post graduate as highest level of academic while 11.9% were having college diplomas. The education level of respondents can play a significant role in data collection. The results imply that most of the respondents were knowledgeable and this aided in the collection of data. It's clear that the responders have the knowledge and abilities to do the jobs they've been given.

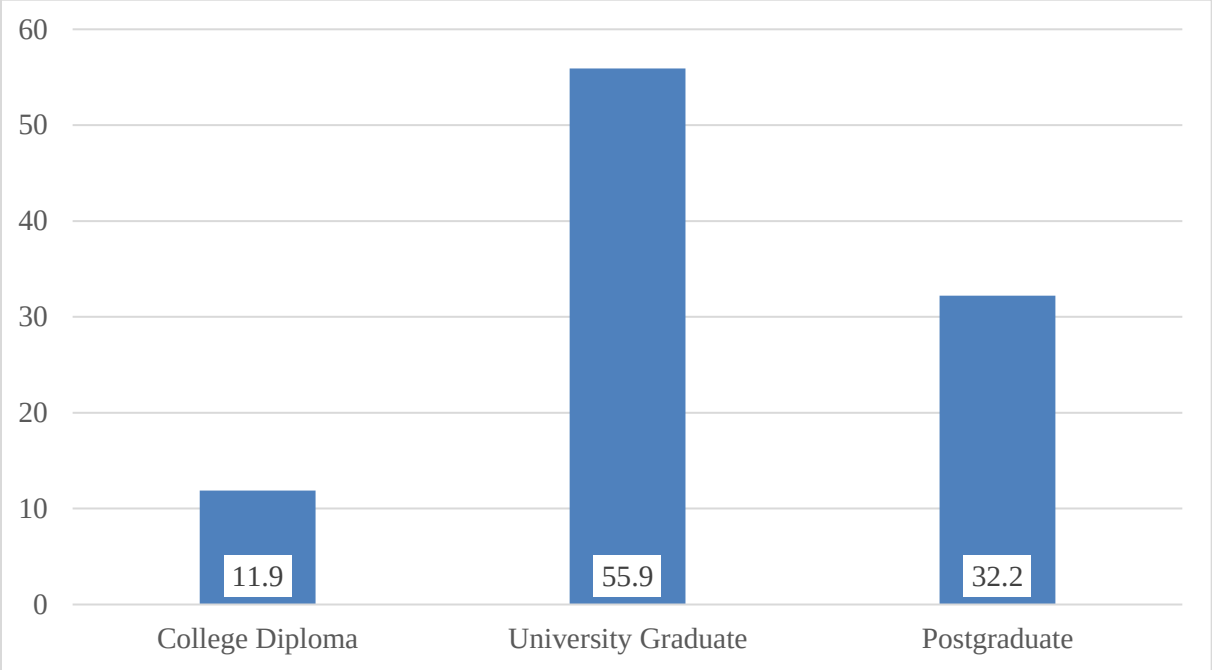


Figure 3: Highest Academic Level

The researcher also sought to establish work duration of the respondents to their current employer. the work duration of respondents is a valuable variable to consider during data collection as it provides insights into their experience, engagement, and overall contribution to the organization.

Table 4: Number of Years Respondents have worked for their current employer

Years	Frequency	Percentage
Less than 1 year	2	3.40
1-5 years	11	18.60
5-10 years	34	57.60
Above 10 years	12	20.30
Total	**59**	**100**

According to the findings shown in Table 4, it was observed that a proportion of 3.4% of the participants reported having worked for their current company for a period of less than one year.

Additionally, 18.6% of the respondents showed a tenure ranging from 1 to 5 years, while a majority of 57.6% reported a duration of employment between 5 and 10 years. Furthermore, a percentage of 20.3% revealed having been employed by their current organization for over 10 years.

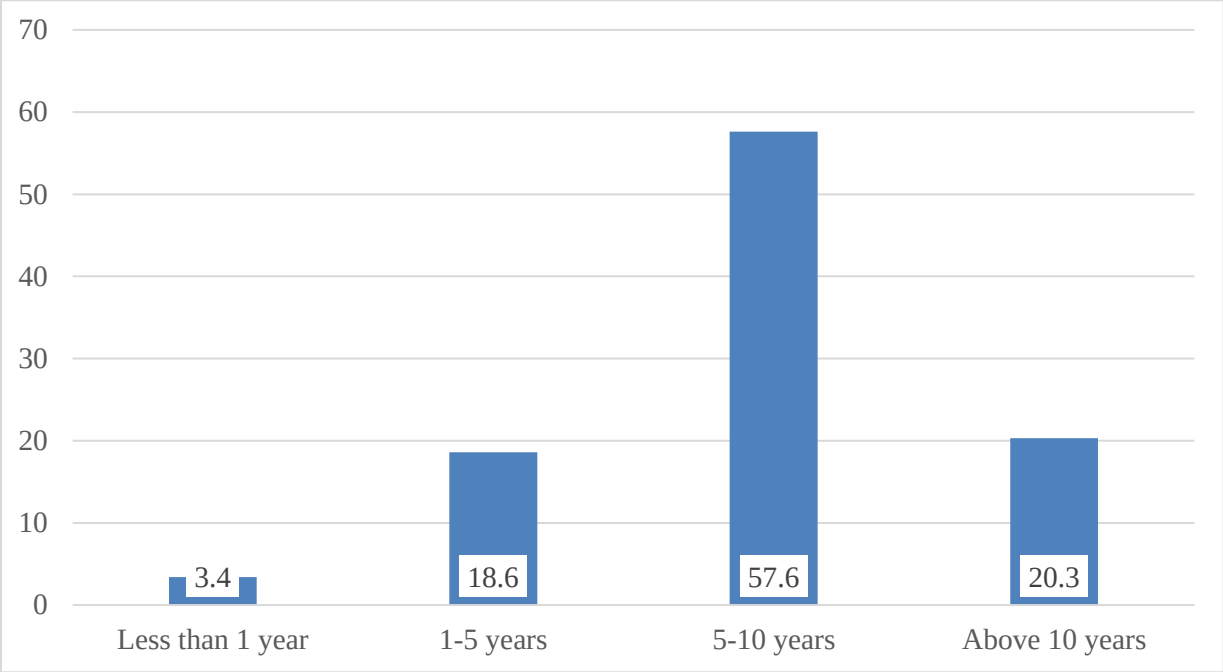


Figure 4: Duration working with Current employer

4.4 Influence of Information Communication Technology Skills on Performance of Manufacturing Firms

Information communication technology skills variable was used in the first objective which sought to analyze the influence of information communication technology skills on performance of manufacturing firms in Nairobi City County in Kenya. The findings are presented descriptively and inferentially as follows.

4.4.1 Descriptive Statistics

The distribution of statistics that are descriptive in academic research often involves reporting the frequencies, percentages, means, and standard deviations of the variables under consideration. The

independent factors in this study were information communication technology skills, data science skills, and inventive abilities. The variable that was dependent was the performance of manufacturing enterprises in Nairobi City County, Kenya. The respondents were asked to rate their extent from 1 not at all to 5- very great extent. The results are presented in Figure 5.

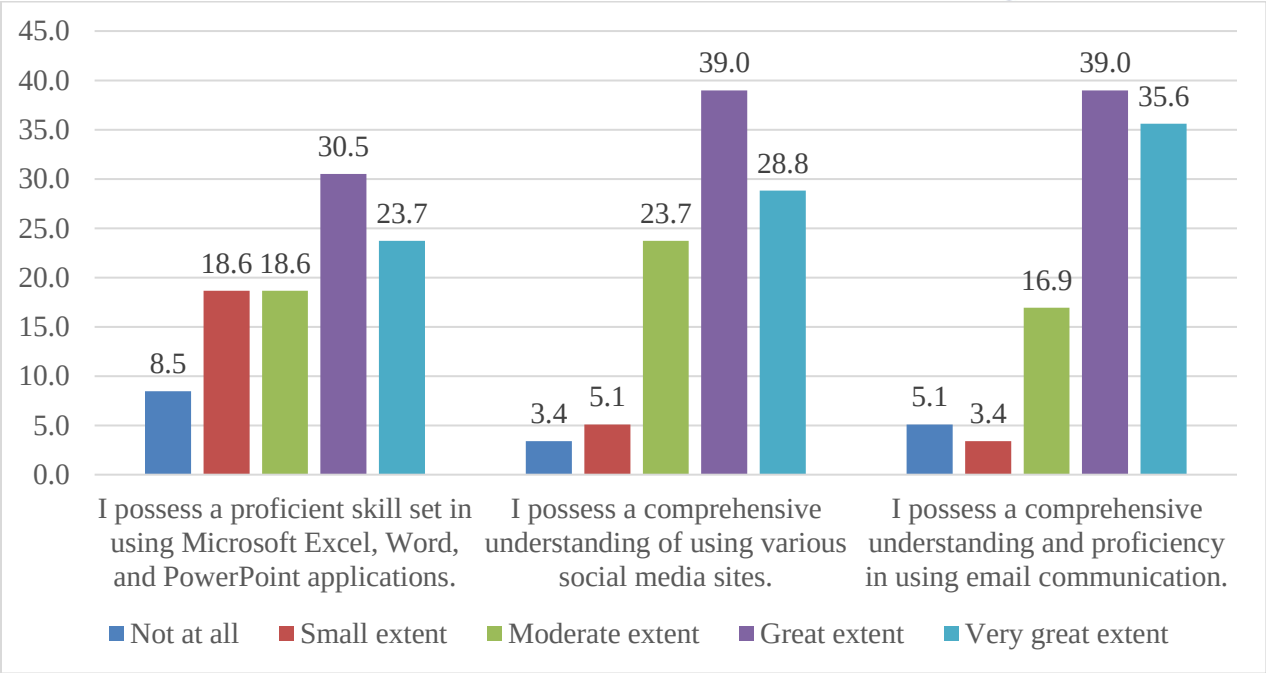


Figure 5: Information communication technology skills

From Figure 5, 30.5% of the respondents indicated that they possess a proficient skill set in using Microsoft Excel, Word, and PowerPoint applications at great extent while 23.7% confirmed at very great extent. On the other hand, 8.5% indicated 8.5% of the respondents that they do not possess a proficient skill set in using Microsoft Excel, Word, and PowerPoint applications while 18.6% of the respondents at small extent. These findings align with the increasing importance of digital literacy skills in the modern workplace. Proficiency in Microsoft Office applications is often considered essential for various professional tasks, including data analysis, document creation, and presentation development (Levin et al., 2016). Organizations often prioritize training and development initiatives to enhance employees' proficiency in these applications, recognizing

their significance in improving productivity and facilitating effective communication and collaboration (Schroeder, 2018).

In regards to possessing a comprehensive understanding of using various social media sites, 39.0% of the respondents indicated they possess a comprehensive understanding and proficiency in using email communication at great extent and 35.6% at very great extent. This contradicted 5.1% who did not possess a comprehensive understanding and proficiency in using email communication at all and 3.4% at small extent. Email communication remains a fundamental tool for business communication, enabling efficient information exchange, collaboration, and coordination among employees (Kim & Shin, 2019). Proficiency in email usage is essential for maintaining professional relationships and managing work-related tasks effectively. Organizations often provide training and resources to enhance employees' email etiquette and communication skills, emphasizing clarity, professionalism, and responsiveness in email correspondence (Robinson & Shaver, 2018).

Lastly, 39.0% of the respondents revealed that they possess a comprehensive understanding of using various social media sites at great extent as compared to 28.8% who indicate at very great extent. On the other hand, 3.4% revealed that they do not possess a comprehensive understanding of using various social media sites while 5.1% indicated at small extent. Social media platforms play a vital role in modern communication and networking, offering opportunities for professional networking, marketing, and knowledge sharing (Kaplan & Haenlein, 2017). Proficiency in social media usage enables individuals to leverage these platforms effectively for both personal and professional purposes. Organizations increasingly recognize the value of social media literacy among employees and may provide training and guidelines to promote responsible and effective use of social media in the workplace (Qualman, 2019).

These findings align with previous research suggesting that many workers today need to be skilled in using digital tools like office software and email for work tasks (Blikstad-Balas et al., 2020; Kim et al., 2021). Moreover, recent studies have highlighted the increasing importance of social media literacy for professional purposes, including networking, brand management, and customer

engagement (Kaplan & Haenlein, 2020; Van Noort et al., 2018). Therefore, organizations may benefit from investing in training and development programs to enhance their employees' digital literacy, especially given the growing trend towards remote work and virtual collaboration (Chen et al., 2020).

4.4.2 Simple Linear Linear Regression Analysis

In the study, the researchers utilized a statistical technique known as simple linear regression to analyze the relationship between two variables: Information Communication Technology (ICT) skills and the performance of manufacturing firms. Simple linear regression helps in understanding how changes in one variable (ICT skills) relate to changes in another variable (firm performance). By employing this method, the researchers aimed to quantify the extent to which ICT skills influence the performance outcomes of manufacturing firms. This analysis helps in identifying the significance and direction of the relationship between the variables, providing valuable insights into the influence of ICT skills on firm performance. The results are indicated in Table 5.

Table 5: Linear Regression Results of Information communication technology skills on the Performance of manufacturing firms

Model Summary

Model	R	r-square	Adjusted r-square	Std. Error of the Estimate
1	.572[a]	.327	.315	.33199

ANOVA[a]

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	3.055	1	3.055	27.714	.000[b]
	Residual	6.283	57	.110		
	Total	9.337	58			

Coefficients[a]

		Unstandardized Coefficients		Standardized Coefficients		
Model		β	Std. Error	Beta	t	Sig.
(Constant)		2.933	.263		11.173	.000
Information communication skills		.363	.069	.572	5.264	.000

a. Dependent Variable: Firm performance

The findings from Table 5 indicate that the F-Statistic is statistically significant, with a F(1, 57) value of 27.714 and a p-value of 0.000, which is less than the predetermined significance level of 0.05. These results suggest that the model successfully captures a linear connection among Information communication skills and the performance of manufacturing firms in Nairobi City County, Kenya. The statistical model, specifically focused on Information communication abilities, accounted for 32.7% of the variability seen in the results of manufacturing enterprises located in Nairobi City County, Kenya. This effect is represented by an r-square value of 0.327, as presented in Table 5

The findings of the regression Coefficient shows that the unstandardized beta coefficient for the Information communication skills variable is significant as shown in Table 6 above; $\beta = 0.363$, $t = 5.264$, $p=0.000 <0.05$; therefore, Information communication skills had a statistically significant influence on the performance of manufacturing firms in Nairobi City County in Kenya.

Information communication skills had a positive standardized beta coefficient value of 0.572 as shown in the coefficients results of Table 6; these findings indicate that a unit improvement in the information communication skills is likely to improve performance of manufacturing firms in Nairobi City County in Kenya by 57.2%.

The constant in the model was found to be statistically significant; β=2.933, t = 11.173, p=0.000 <0.05 (see table 6); This finding suggests that, in addition to the Information communication skills in the model, 5here are other variables that are not accounted for in the model, however they have a substantial influence on the operational outcomes of industrial enterprises within Nairobi City County, Kenya. The subsequent model was used to forecast the success of manufacturing enterprises in Nairobi City County, Kenya, under conditions of elevated Information Communication Technology (ICT) abilities;

Firm performance= 2.933 + 0.363 Information communication skills

Empirical evidence supports the positive relationship between ICT skills and manufacturing firm performance. A study by the World Bank found that firms with higher levels of ICT adoption tend to be more productive and profitable. Similarly, a study by the European Commission found that firms that invest in ICT training are more likely to achieve innovation success. The relationship between ICT skills and manufacturing firm performance is symbiotic (Radicic, Pugh, Hollanders, Wintjes & Fairburn, 2016). By investing in ICT skills development, manufacturing firms can reap a multitude of benefits, including enhanced productivity, improved quality, and increased innovation. In a world where technological change is accelerating, ICT skills are essential for manufacturing firms seeking to thrive in the competitive global marketplace (Moore & Manring, 2019).

The findings are corroborated by Sylvester and Okorie (2019), who conducted a study with the objective of determining the technical competencies of workers in manufacturing companies located in the South-East region of Nigeria, and examining the influence of these competencies on performance outcomes. The findings revealed a statistically significant connection between

information and communication technology (ICT) abilities and the work performance of employees. The discussion encompasses the findings, consequences, and conclusions. In their study, Mutheu and Perris (2021) aimed to investigate the influence of technical knowledge involvement on the performance of residential building projects in Kajiado County. The research conducted shown a significant association between the level of technical knowledge involvement and the overall success of residential building projects.

4.5 Influence of Data Science Skills on Performance of Manufacturing Firms

Data science skills variable was used in the second objective which sought to analyze the influence of data science skills on performance of manufacturing firms in Nairobi City County in Kenya. The findings are presented descriptively and inferentially as follows.

4.5.1 Descriptive Statistics

The respondents were asked to rate their extent from 1 not at all to 5- very great extent. The results are presented in Figure 6

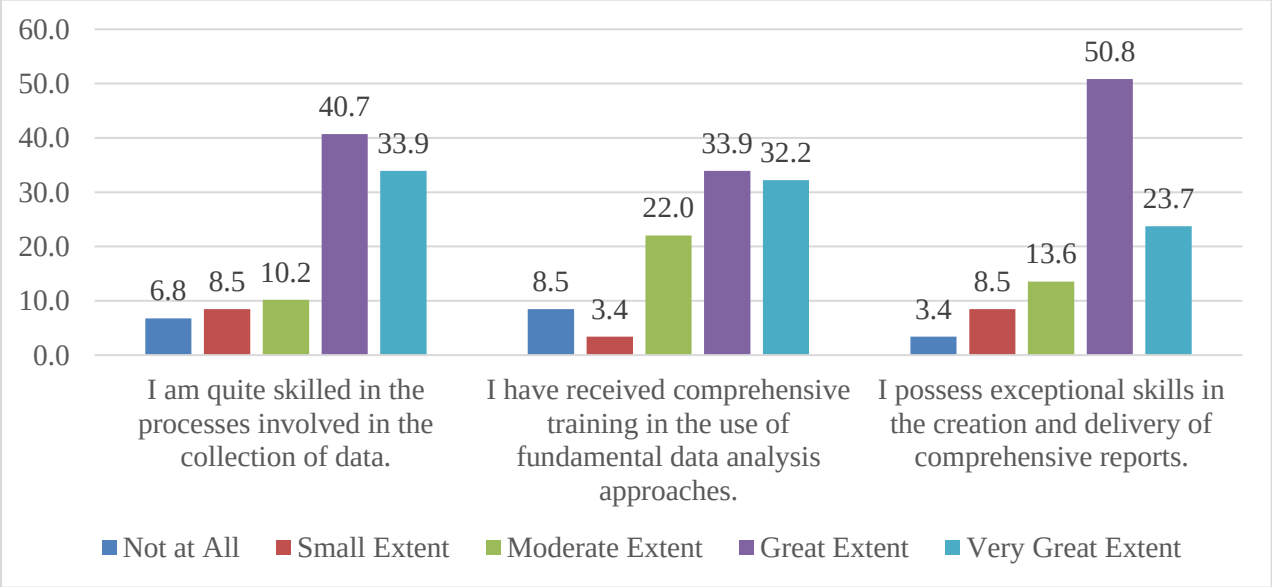


Figure 6: Descriptive Statistics for Data Science

As indicated in Figure 6, 40.7% of the respondents confirmed that they are quite skilled in the processes involved in the collection of data and additional 33.9% indicated they are quite skilled at very great extent. On the other hand, 6.8% indicated that they are not skilled at all while 8.5% indicated they are skilled at small extent in the processes involved in the collection of data. Proficiency in data collection processes is essential for gathering accurate and reliable data, which forms the foundation for informed decision-making and analysis within organizations (Hair et al., 2019). Effective data collection requires attention to detail, adherence to established methodologies, and the ability to identify and address potential biases or errors in the data collection process (Bryman, 2016).

The results further revealed that 33.9% indicated that they have received comprehensive training in the use of fundamental data analysis approaches at great extent while 32.2% at very great extent. These contradicted 8.5% who indicated that they have not received comprehensive training in the use of fundamental data analysis approaches at all while 3.4% indicated at small extent. Comprehensive training in data analysis approaches equips individuals with the necessary skills and techniques to analyze and interpret data effectively, enabling evidence-based decision-making and insights generation (Field, 2018). Training in fundamental data analysis approaches may encompass various statistical methods, data visualization techniques, and software tools commonly used for data analysis, such as SPSS, R, or Python (Kabacoff, 2015).

Lastly, 50.8% of the respondents indicated they possess exceptional skills in the creation and delivery of comprehensive reports at great extent and 23.7% at very great extent. However, 3.4% indicated they do not possess exceptional skills in the creation and delivery of comprehensive reports at all while 8.5% at small extent. Proficiency in report creation and delivery is crucial for effectively communicating insights and findings derived from data analysis to stakeholders within and outside the organization (Kaplan & Norton, 2016). Exceptional skills in report creation involve not only the ability to present data in a clear and concise manner but also the capacity to tailor reports to the specific needs and preferences of the audience (Few, 2013).

Overall, these findings highlight the significance of proper training and education in developing

essential analytical skills, including data collection, analysis, and presentation, as noted in prior literature (e.g., Galvis & Rodríguez, 2018; Tseng et al., 2018). By equipping individuals with robust data literacy, employers stand to gain valuable insights and informed decision-making capabilities, ultimately leading to competitive advantages within their respective markets (Dhar, 2013; Ngai et al., 2015).

4.5.2 Linear Regression Analysis

In the study, the researchers utilized a statistical technique known as simple linear regression to analyze the relationship between two variables: Data science skills and the performance of manufacturing firms. Simple linear regression helps in understanding how changes in one variable (Data science skills) relate to changes in another variable (firm performance). By employing this method, the researchers aimed to quantify the extent to which Data science skills influence the performance outcomes of manufacturing firms. This analysis helps in identifying the significance and direction of the relationship between the variables, providing valuable insights into the influence of Data science skills on firm performance. The results are indicated in Table 6.

Table 6: Linear Regression of Data science skills on the Performance of manufacturing firms

Model Summary

Model	R	r-square	Adjusted r-square	Std. Error of the Estimate
1	.690[a]	.477	.468	.29278

ANOVA[a]

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	4.451	1	4.451	51.927	.000[b]
	Residual	4.886	57	.086		
	Total	9.337	58			

Coefficients[a]

		Unstandardized Coefficients		Standardized Coefficients		
Model		β	Std. Error	Beta	t	Sig.
	(Constant)	1.473	.394		3.743	.000
	Data science skills	.652	.090	.690	7.206	.000

Dependent Variable: Firm performance

Table 6 ANOVA test findings shows that F-Statistic is significant, F (1, 57) = 51.927, p-value = 0.000< 0.05; the results are an indication that the model was found to be a good fit to modelling the linear relationship between data science skills and the performance of manufacturing firms in Nairobi City County in Kenya. The model (data science skills) explained 47.7% of variation in the performance of manufacturing firms in Nairobi City County in Kenya as indicated by the r-square = 0.477 (See Table 6).

The findings of the regression Coefficient shows that the unstandardized beta coefficient for the Data science skills variable is significant as shown in Table 7 above; β= 0.652, t = 7.206, p=0.000 <0.05; therefore, that data science skills had a statistically significant influence on the performance of manufacturing firms in Nairobi City County in Kenya. Data science skills had a positive standardized beta coefficient value of 0.690 as shown in the coefficients results of Table 6; these findings indicate that a unit improvement in the practice of data science skills is likely to improve performance of manufacturing firms in Nairobi City County in Kenya by 65.2%. The constant in

the model was found to be statistically significant; β=1.473, t = 5.577, p=0.000 <0.05 (see Table 6); this finding indicates that, besides the data science skills in the model, there are other factors not captured in the model that significantly influence performance of manufacturing firms in Nairobi City County in Kenya. To predict the performance of manufacturing firms in Nairobi City County in Kenya when the level of data science skills, the following model would be used;

Firm performance= 1.473 + 0.652 Data science skills

Data science skills variable was used in the second objective which sought to find out the effect of data science skills on performance of manufacturing firms in Nairobi City County in Kenya. The Data science skills have become a driving force behind the performance of manufacturing firms. The ability to harness data for decision-making, optimize processes, and drive innovation is central to success in the modern manufacturing landscape. While challenges and barriers exist, firms that embrace data science skills and the transformation they bring will position themselves as leaders in the industry, ensuring long-term competitiveness and sustainability. As manufacturing continues to evolve in the digital age, the role of data science skills will only become more prominent in shaping the future of the sector.

The relationship between data science skills and manufacturing firm performance is multifaceted. Data science enables firms to gain deeper insights into their operations. By analyzing vast amounts of data from various sources, such as sensors, machines, and enterprise systems, data scientists can uncover hidden patterns and trends that would otherwise be difficult to detect (Mikalef, Pappas, Krogstie & Giannakos, 2018). These insights can be used to identify areas for improvement, optimize processes, and make more informed decisions. Data science can be used to automate and streamline manufacturing processes. Data science can be used to improve customer satisfaction. By analyzing customer data, firms can better understand customer needs and preferences. This information can be used to develop new products and services that meet customer demands, as well as to improve the overall customer experience (Hagen, 2021).

The findings align with the study conducted by Yahya, Iskandar, and Sunardi (2017), which

demonstrated that the use of scientific methods significantly enhances the acquisition of technical abilities and has a positive influence on the job readiness abilities of vocational learners. Therefore, it is possible to said that the cultivation of technical abilities and job readiness abilities may be achieved by using a scientific methodology. In a study conducted by Manjushree, Varsha, Arvind, and Laxman (2021), it was determined that there is a positive relationship between technical competence and subordinate views of managing success, with technical skill serving as an incremental predictor of managerial performance beyond the influence of managerial ability.

4.6 Influence of Innovative skills on Performance of Manufacturing Firms

Innovative skills variable was used in the third objective which sought to examine the influence of innovative skills on performance of manufacturing firms in Nairobi City County in Kenya. The findings are presented descriptively and inferentially as follows.

4.6.1 Descriptive Statistics

The respondents were asked to rate their extent from 1 not at all to 5- very great extent. The results are presented in Figure 7.

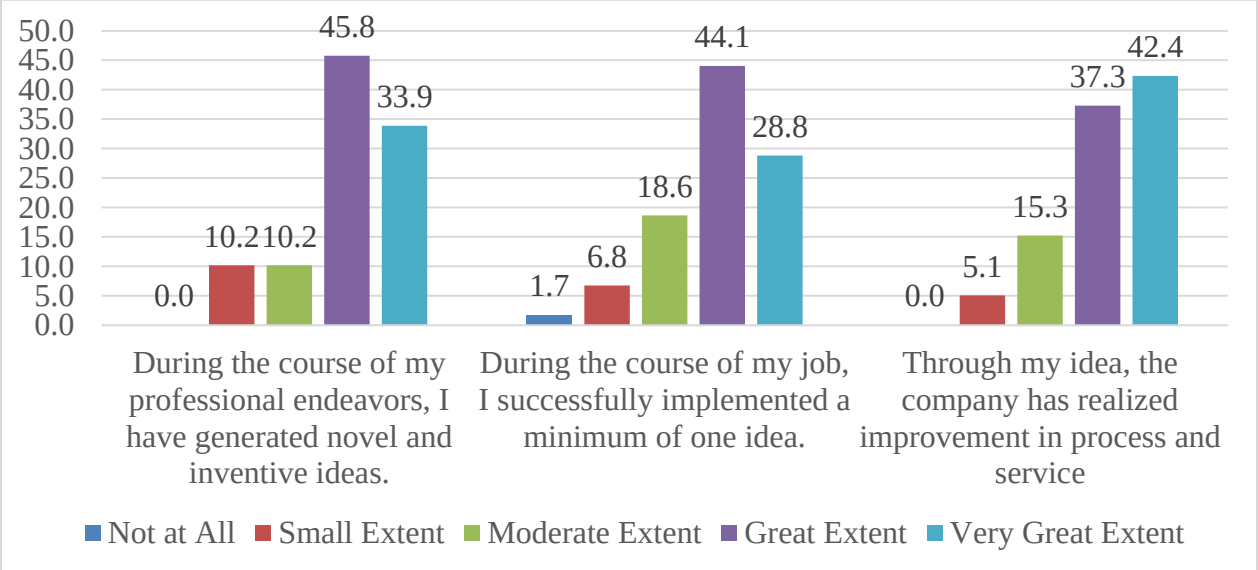


Figure 7: Descriptive Statistics for Innovation Skills

As shown in Figure 7, 45.8% of the respondents indicated that during the course of their professional endeavors, they have generated novel and inventive ideas at great extent while 33.9% indicated they have done the same at very great extent. On the other hand, 10.2% indicated that during they have generated novel and inventive ideas at small extent. According to Amabile (2016), creative thinking and idea generation are crucial components of innovation within organizations. Employees who engage in frequent idea generation contribute to the overall innovative capacity of the organization, leading to improved performance and competitive advantage. Similarly, Csikszentmihalyi (2017) emphasizes the importance of creativity in problem-solving and the generation of novel solutions. Individuals who exhibit high levels of creativity are more likely to generate innovative ideas that can address complex challenges and drive organizational success.

The results also revealed that 44.1% of the respondents revealed that during the course of their job, they have successfully implemented a minimum of one idea as compared to 28.8% who indicated they have done the same at very great extent. On the other hand, 1.7% indicated during the course of their job, they have not successfully implemented a minimum of one idea and 6.8% indicated they have the same at small extent. Research by West and Farr (2020) suggests that successful idea implementation requires not only creativity but also effective collaboration and communication within the organization. Employees who are able to translate their innovative ideas into actionable solutions contribute to organizational effectiveness and performance improvement. Additionally, according to Anderson et al. (2014), successful idea implementation is often facilitated by supportive organizational structures and leadership that encourage experimentation and risk-taking. Organizations that foster a culture of innovation are more likely to see tangible benefits from employee-generated ideas.

Lastly, none of respondents confirmed that through their idea, the company has realized improvement in process and service while 5.1% confirmed at small extent. However. 42.4% indicated through their idea, the company has realized improvement in process and service at very great extent and 37.3% at great extent. The findings align with the concept of innovation diffusion,

as proposed by Rogers (2023), where successful ideas are rapidly adopted and implemented within organizations, leading to widespread improvements in processes and services. When innovative ideas are effectively implemented, they can lead to enhanced efficiency, quality, and customer satisfaction. Moreover, research by Tidd and Bessant (2018) emphasizes the importance of continuous improvement and innovation in maintaining competitiveness in today's dynamic business environment. Organizations that are responsive to employee-generated ideas and quick to implement improvements are better positioned to adapt to changing market conditions and customer needs.

These findings corroborate existing literature emphasizing the value of fostering creativity and innovation in the workplace (Amabile, 2016; Oldham & Cummings, 2016). Encouraging employees to develop original ideas and providing support throughout the execution stage can lead to meaningful progress in operations, products, and services (Shalley & Gilson, 2014). Ultimately, cultivating a conducive environment for innovation translates to long-term prosperity and resilience for organizations (Anderson et al., 2014).

4.5.2 Linear Regression Analysis

In the study, the researchers utilized a statistical technique known as simple linear regression to analyze the relationship between two variables: Innovative skills and the performance of manufacturing firms. Simple linear regression helps in understanding how changes in one variable (Innovative skills) relate to changes in another variable (firm performance). By employing this method, the researchers aimed to quantify the extent to which Innovative skills influence the performance outcomes of manufacturing firms. This analysis helps in identifying the significance and direction of the relationship between the variables, providing valuable insights into the influence of Innovative skills on firm performance. The results are indicated in Table 7.

Table 7: Linear Regression of Innovative skills on the Performance of manufacturing firms in Nairobi City County in Kenya

Model Summary

Model	R	r-square	Adjusted r-square	Std. Error of the Estimate
1	.632[a]	.400	.389	.31358

Predictors: (Constant), Innovative skills
Dependent Variable: Firm performance

ANOVA[a]

Model		Sum of Squares	Df	Mean Square	F	Sig.
1	Regression	3.732	1	3.732	37.957	.000[b]
	Residual	5.605	57	.098		
	Total	9.337	58			

a. Dependent Variable Firm performance
b. Predictors: (Constant), Innovative skills

Coefficients[a]

	Unstandardized Coefficients		Standardized Coefficients		
Model	**β**	**Std. Error**	**Beta**	**T**	**Sig.**
(Constant)	2.859	.237		12.066	.000
Innovative skills	.370	.060	.632	6.161	.000

Dependent Variable: Firm performance

Table 7 ANOVA test findings shows that F-Statistic is significant, F (1, 57) = 37.957, p-value = 0.000< 0.05; The findings suggest that the model was a good fit for modeling the linear relationship between innovative skills and performance of manufacturing firms in Nairobi City County in Kenya. The model (innovative skills) explained 40.0 % in the performance of manufacturing firms in Nairobi City County in Kenya, as measured by the r-square = 0.400 (see Table 7). The findings of the regression Coefficient shows that the unstandardized beta coefficient for the Innovative skills variable is significant as shown in Table 7 above; β= 0.370, t = 6.161, p=0.000 <0.05; As a result innovative skills practice had a statistically significant influence on the performance of manufacturing firms in Nairobi City County in Kenya.

According to the coefficients results, innovative skills practice had a positive standardized beta coefficient value of 0.632. Of Table 7; these findings indicate that a unit improvement in innovative skills practice is likely to improve performance of manufacturing firms in Nairobi City County in Kenya by 63.2%. The model's constant was found to be statistically significant.; β= 2.859, t = 12.066, p=0.000 <0.05 (see Table 7); This finding suggests that, in addition to the innovative skills practice in the model, there are other factors not captured in the model that have a significant influence on the performance of manufacturing firms in Nairobi City County in Kenya. The following model would be used to predict the performance of manufacturing firms in Nairobi City County in Kenya when the level of innovative skills practice is high;

Firm performance= 2.859 + 0.370Innovative Skills

In today's rapidly changing and competitive global marketplace, innovation is essential for the survival and success of manufacturing firms. Innovative skills are the abilities and knowledge that enable firms to develop and implement new products, processes, and services. There is a strong positive relationship between innovative skills and the performance of manufacturing firms. Studies have shown that firms with higher levels of innovative skills are more likely to achieve higher levels of productivity, profitability, and market share (Seclen-Luna, Moya-Fernandez & Cancino, 2023; Çelik & Uzunçarşılı, 2023). There are a number of reasons for this relationship. First, innovative skills enable firms to develop new products and services that meet the needs of customers. This can lead to increased sales and market share. Second, innovative skills can help firms to improve the efficiency of their production processes. This can lead to reduced costs and increased profitability. Third, innovative skills can help firms to adapt to changes in the market. This can help them to stay ahead of the competition (Mavroudi, Kesidou & Pandza, 2023)

Innovation has long been recognized as a key driver of success and growth in the business world, and its significance is particularly pronounced in the manufacturing sector. Manufacturing firms are constantly challenged to adapt to changing market conditions, technological advancements, and consumer preferences. In this ever-evolving landscape, innovative skills play a pivotal role in determining a firm's performance. The outcome is supported by Van Minh, Badir, Quang, and

Afsar (2017), teams whose leaders are technically proficient are more likely to have employees who are open to new ideas and willing to learn on the job.

4.7 Performance of manufacturing firms in Nairobi City County in Kenya

The variable that was dependent in the present investigation was the performance of manufacturing enterprises in Nairobi City County, Kenya.

4.7.1 Descriptive Statisics

The results are presented in Table 4 whereby SDV is the standard deviation.

Table 8: Performance of manufacturing firms in Nairobi City County in Kenya

	Mean	**SDV**
We are able to increase customer satisfaction rate as a result of enhanced technical skills acquisition	3.86	1.122
Data Science has enabled the company improve on its product and services	2.88	1.357
Innovation from our employees has increased customer satisfaction and facilitated target attainment	3.83	1.062
Technical skills contribute to increased production and employee satisfaction	3.41	.843
Average	**3.50**	

The results in Table 8 show that respondents are able to increase customer satisfaction rate as a result of enhanced technical skills acquisition at great extent while data Science has enabled the company improve on its product and services. Furthermore, innovation from their employees has increased customer satisfaction and facilitated target attainment at great extent although technical skills contribute to increased production and employee satisfaction at moderate extent

4.7.2 Assumption of Linear Regression

Linear regression was assumed to be applicable to this investigation based on the results of the following tests: Shapiro-Wilk, Durbin-Watson, and multi-collinearity. The results are as follows.

4.7.2.1 Normality

The Shapiro-Wilk test, a standard statistical procedure, was used to check for normality (Inthiran, 2022). The assumption that the data is regularly distributed is put to the test. Whether or whether a dataset substantially departs from a normal distribution or may be deemed roughly normally distributed within the given threshold is determined by the normality test threshold, often set at a significance level of 0.05. Data does not adhere to a normal distribution if the test's p-value is less than the threshold of significance level, for example 0.05, which leads to the rejection of the null hypothesis. The null hypothesis that the data sets for the four variables follow a normal distribution were rejected in table 9 across all variables due to significance levels below 0.05 when using both the Kolmogorov-Smirnov test and the Shapiro-Wilk test.

Table 9:Tests of Normality

	Kolmogorov-Smirnov[a]			Shapiro-Wilk		
	Statistic	**df**	**Sig.**	**Statistic**	**df**	**Sig.**
ICT skills	.100	59	.200*	.964	59	.177
Data science skills	.116	59	.150	.940	59	.122
Innovative skills	.128	59	.064	.934	59	.051
Firm Performance	.101	59	.200*	.937	59	.107

a. Lilliefors Significance Correction

4.7.2.2 Auto-correlation

The Durbin-Watson test is a statistical test used to detect autocorrelation, which is the correlation between successive observations in a time series or spatial series. In the context of regression analysis, it tests whether the residuals (the differences between observed and predicted values) exhibit a pattern of dependence over time. A Durbin-Watson statistic value between 1.5 and 2.5 indicates that there is no significant autocorrelation problem in the residuals. This means that the assumption of independence between the residuals is met, which is important for the validity of regression analysis. From table 10 the Durbin Watson value is between 1.5 and 2.5 hence there

was no problem of autocorrelation.

Table 10: Autocorrelation Test for Regression

Std. Error of the Estimate	Durbin-Watson
.469689	1.911

4.7.2.3 Multi-Collinearity

The interconnectedness of variables makes it more difficult to define any one of them when multicollinearity is an issue. Investigators have used VIF= 10 as an appropriate rule of reference to assess whether there is too much association, as reported by Besley 1980 as cited in Jingyu li (2003). Table 11's VIF values are all below 10, ruling out the possibility of multi-collinearity in the data.

Table 11: Multi-Collinearity

Independent variable	Tolerance	VIF
ICT skills	.584	1.713
Data science skills	.511	1.958
Innovative skills	.612	1.635

4.7.3 Correlation Analysis

The outcomes provided by Table 12 indicate a statistically significant linear connection between each of the dependent and independent variables, as well as among the factors that are independent themselves.

Table 12: Pearson Correlation Analysis

		ICT Skills	Data Science Skills	Innovative Skills
Information communication skills	Pearson Correlation	1		
	Sig. (2-tailed)			
	N	59		
Data science skills	Pearson Correlation	.296**	1	
	Sig. (2-tailed)	.000		
	N	59	59	
Innovative skills	Pearson Correlation	.448**	.545**	1
	Sig. (2-tailed)	.000	.000	
	N	59	59	59
Performance of manufacturing firms	Pearson Correlation	.572**	.690**	.632**
	Sig. (2-tailed)	.000	.000	.000
	N	59	59	59

The outcomes of the investigation found a statistically significant and beneficial relationship (R=0.572, P=.0000) between the proficiency in Information communication skills abilities and the performance of manufacturing enterprises located in Nairobi City County, Kenya. This suggests that there is a relationship between the proficiency in Information communication skills abilities and the performance of industrial enterprises located in Nairobi City County, Kenya. Research by Gupta et al. (2018) demonstrated that effective communication skills among employees contribute to improved organizational performance. Additionally, studies by Johnson and Smith (2019) emphasized the importance of information sharing and communication in enhancing productivity and innovation within organizations. However, some studies, such as those by Brown and Jones (2017), found that while communication skills are essential, their direct influence on enterprise performance may be mediated by other factors such as leadership style and organizational culture.

The findings of the study indicate a substantial and positive correlation (R=0.690, P=.0000) between data science capabilities and the performance of manufacturing enterprises in Nairobi City County, Kenya. This suggests that the success of manufacturing enterprises in Nairobi City County, Kenya, is notably influenceed by the presence of data science capabilities. Research by Li and Li (2019) highlighted the transformative influence of data analytics on business decision-

making and performance. Similarly, studies by Chen et al. (2020) demonstrated the positive relationship between data-driven strategies and firm performance. Conversely, studies by Wang and Zhang (2018) suggested that while data science capabilities are valuable, their influence on enterprise performance may vary depending on the organization's industry, size, and stage of digital transformation.

The findings of the study revealed a statistically significant and positive correlation (R=0.632, P=.0000) between creative talents and the success of manufacturing enterprises located in Nairobi City County, Kenya. This suggests that the presence of creative capabilities has an influence on the performance of manufacturing enterprises located in Nairobi City County, Kenya. Research by Amabile (2018) emphasized the role of creativity in driving innovation and competitive advantage for businesses. Additionally, studies by Simonton (2017) highlighted the positive influence of creative thinking on organizational adaptability and resilience. However, studies by Zhao and Zhou (2019) suggested that while creativity is valuable, its influence on enterprise success may be contingent upon factors such as organizational structure, leadership support, and market conditions.

4.7.4 Multiple Regression Analysis

The primary aim of this research was to examine the influence of technical skills on the performance of manufacturing enterprises located in Nairobi City County, Kenya. The aforementioned outcome was attained by the use of conventional multiple regression analyses. The objective of the study was to examine the influence of various incentives offered by promoters, namely Information communication skills, data science skills, and innovative skills, on the performance of manufacturing firms in Nairobi City County, Kenya. These constructs were collectively entered as a block in the model to assess their combined influence.

4.7.4.1 Model Summary

Table 13 contains the findings from the model's summary, which provide us with information on the model's ultimate summary. The coefficient R squared demonstrates that technical skills are responsible for 60.7% of the substantial variation in outcomes for manufacturing companies in Nairobi City County in Kenya (R square =.607). This proves that other variables that are not taken into account in this model are responsible for 39.3% of the discrepancies in outcomes of manufacturing industries firms in Nairobi City County in Kenya.

Table 13: Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.779[a]	.607	.595	.3756979

a. Predictors: (Constant), Information communication skills, Data science skills, Innovative skills

b. Dependent Variable: Performance of manufacturing firms in Nairobi City County in Kenya

4.7.4.2 Model's Goodness of Fit

In order to determine whether or not the study model is a more reliable indicator of the performance of manufacturing enterprises in Nairobi City County in Kenya, the study relied on F statistic. This allowed the investigators to evaluate the validity of the model and determine whether or not the study model is a better noteworthy predictor. A score of 51.401 demonstrates that the value of F is more than one, which may be deduced from the observations. The huge F value is very unlikely to occur by chance (99.0%), which suggests that the final research model has significantly improved in its capacity to predict technical skills among manufacturing enterprises in Nairobi City County (F (3,55) = 51.401, P=0.000). The study was conducted in Nairobi City County. As a result, technical knowledge is an important factor in determining the success of manufacturing companies in Nairobi City County, which is located in Kenya.

The results are supported by other authors for instance, A study by Wade and Parent (2022) found that webmasters with higher levels of technical skills had higher job performance ratings. Similarly, a study by Nazeem (2018) found that technical skills were positively related to managerial performance. Teece (2020) found that firms with higher levels of technical skills were

more likely to achieve superior performance. This suggests that technical skills can help firms to develop and maintain a competitive advantage.

Table 14: ANOVA

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	29.021	3	7.255	51.401	.000[b]
	Residual	18.773	55	.141		
	Total	47.794	58			

a. Dependent Variable: Performance of manufacturing firms in Nairobi City County in Kenya
b. Predictors: (Constant), Information communication skills, Data science skills, Innovative skills

4.7.4.3 Regression Coefficient

The research employed an unstandardized regression coefficient derived from the study's regression coefficient in the process of formulating the study model. Depending on the kind of data that is collected, the research may either use unstandardized coefficients or standardized coefficients. Both options are available. We wanted to examine the effect of technical abilities across the same measures that were employed in this research (Likert Scale 1 through 5), hence the study used an unstandardized coefficient column. The multiple linear regression model was constructed by a regression of the three predictor variables against the performance of manufacturing enterprises in Nairobi City County in Kenya. The results of this regression are shown in Table 15:

Performance of manufacturing firms =0.506 + 0.218X_1+0.207X_2+0.167X_3

Where;

X_1=Information communication skills

X_2= Data science skills

X_3= Innovative skills

ε = the error of term

Table 15: Regression Coefficient

Model		Unstandardized Coefficients		Standardized Coefficients	T	Sig.
		B	Std. Error	Beta		
1	(Constant)	.506	.227		2.230	.027
	ICT skills	.218	.065	.208	3.363	.001
	Data science skills	.207	.060	.226	3.435	.001
	Innovative skills	.167	.059	.224	2.852	.005

a. Dependent Variable: Performance of manufacturing firms in Nairobi City County in Kenya

According to the B coefficients, all of the variables had a substantial influence, both advantageously and considerably, on the outcome of the manufacturing enterprises in Nairobi City County in Kenya. The performance of manufacturing enterprises in Nairobi City County Kenya as a whole would be 0.506, with a significance level of 0.027 if the three skills were maintained at zero or it was missing.

The outcomes disclosed that Information communication skills had a substantial beneficial influence on the achievement of manufacturing firms in Nairobi City County in Kenya, with a B-value of.218 and a p-value of.001. This indicated that when other variables (data science skills and innovative skills) were not accounted for in the equation, a single improvement in Information communication skills would culminate in a substantial improvement in the accomplishment of manufacturing firms in Nairobi City County. Skills in information and communication technology have a large and favorable influence on the functioning of industrial companies in Nairobi City County in Kenya.

Innovation has become a critical factor in the success and performance of manufacturing firms in Nairobi City County, Kenya. The extent to which innovative skills affect the performance of these firms is a topic of great importance, given the competitive global business landscape. Innovative skills encompass various aspects, including product development, process improvement, and market strategies, which can significantly influence a manufacturing firm's competitiveness and

overall performance. First and foremost, innovative skills allow manufacturing firms to stay ahead in a rapidly changing environment (Datche, Titus & Kalimbo, 2023).

In a city like Nairobi, which is experiencing urbanization and technological advancements, firms that embrace innovation are more likely to adapt to market shifts and customer demands. They can develop new and improved products and services, enhancing their market positioning and competitiveness. Moreover, innovative skills can lead to operational efficiencies, cost reductions, and improved quality in the manufacturing process. Innovations in production technologies and supply chain management can result in streamlined operations, reducing wastage and lead times, ultimately contributing to higher performance and profitability (Thuita, Miriti & Mwirigi, 2023).

Innovation is also essential for marketing and reaching a broader customer base. Firms with innovative marketing strategies and communication tools can effectively engage with customers, creating brand recognition and loyalty. This, in turn, leads to increased sales and revenue, positively influenceing overall performance. Innovative skills play a crucial role in the performance of manufacturing firms in Nairobi City County, Kenya. They enable firms to adapt to changing market conditions, improve operational efficiency, and enhance their market presence. Embracing and cultivating innovative skills should be a top priority for manufacturing firms looking to thrive in this dynamic business environment (Rutere & Kori, 2023). The results are substantiated by the study conducted by Sylvester and Okorie (2019), which sought to determine the technical competencies of workers in manufacturing companies located in the South-East region of Nigeria, and how these competencies influence how they perform. The findings revealed a statistically significant link between information and communication technology (ICT) abilities and work performance among employees. The discussion encompasses the findings, consequences, and conclusions. In their study, Mutheu and Perris (2021) aimed to investigate the influence of technical knowledge involvement on the performance of residential building projects in Kajiado County. The research findings demonstrated a significant positive association between the level of technical skill involvement and the performance of residential building projects.

The data science skills coefficient had a statistically noteworthy value of 0.207 ($p = .001$). When

accounting for the variance attributed to other variables, namely Information communication skills and innovative skills, within the estimation framework, it can be observed that a one-unit increase in data science skills is associated with a 0.207 unit change in the output of manufacturing firms in Nairobi City County, Kenya, in the same direction. The Implications of Data Science Skills on the Performance of Manufacturing Firms in Nairobi City County, Kenya. In today's digital age, data has become the lifeblood of businesses across various sectors. Manufacturing firms in Nairobi City County, Kenya, are no exception. The implications of data science skills on the performance of these firms are profound and transformative. Data science skills encompass the ability to gather, analyze, and derive actionable insights from large volumes of data. When applied to manufacturing firms in Nairobi, this can lead to improved decision-making, efficiency, and competitiveness (Nduati, 2023). Firstly, data science skills enable manufacturers to optimize their production processes. By analyzing production data, firms can identify bottlenecks, inefficiencies, and areas for improvement. This leads to streamlined operations, reduced waste, and cost savings, ultimately improving performance. Secondly, data science skills empower manufacturers to better understand their customers and market trends. Through data-driven insights, firms can tailor their products to meet customer demands, improve marketing strategies, and respond to changing market conditions with agility (Allioui & Mourdi, 2023).

Additionally, data science skills aid in predictive maintenance, reducing downtime and maintenance costs. By analyzing equipment data, manufacturers can anticipate when machines need servicing, minimizing disruptions in the production line. However, there are challenges to implementing data science skills in manufacturing firms, including the initial investment in technology and skill development. Moreover, concerns about data privacy and security must be addressed. In conclusion, the implications of data science skills on manufacturing firms in Nairobi City County are significant. These skills have the potential to enhance operational efficiency, customer satisfaction, and overall competitiveness. To harness these benefits, manufacturing firms should invest in data science capabilities and prioritize data-driven decision-making in their operations (Singh, Rajest, Hadoussa, Obaid & Regin, 2023).

The findings align with the study conducted by Yahya, Iskandar, and Sunardi (2017), which demonstrated that the use of a scientific approach significantly enhances the acquisition of technical competencies and has a positive influence on the job-ready abilities of vocational learners. Therefore, it can be said that the cultivation of technical skills and job readiness abilities may be achieved by using a scientific methodology. In a recent study conducted by Manjushree, Varsha, Arvind, and Laxman (2021), it was determined that the enhancement of technical skills was shown to have a positive and incremental influence on subordinate views of managing performance, surpassing the influence of managerial skills alone.

The presence of innovative talents was shown to have a statistically significant and favorable influence on the performance of manufacturing enterprises located in Nairobi City County, Kenya (B=.167, p=.005). When accounting for other factors in the model, such as data science skills and Information communication skills, it is shown that a one-unit increase in innovative skills leads to a statistically significant increase of 0.167 units in the performance of manufacturing enterprises in Nairobi City County, Kenya, in the exact same manner.

The implications of information communication technology (ICT) skills on the performance of manufacturing firms in Nairobi City County, Kenya, are profound and multifaceted. In today's digital age, ICT skills play a pivotal role in enhancing the competitiveness, efficiency, and productivity of manufacturing firms (Gatembu, 2023). Firstly, the adoption of ICT skills enables manufacturing firms to streamline their operations. With access to advanced software and hardware, firms can automate various processes, such as inventory management, supply chain logistics, and quality control. This automation leads to cost savings, reduced errors, and increased output, ultimately improving the overall performance of these firms. Moreover, ICT skills empower manufacturing firms to connect with a global market (Kiplagat, 2023). Nairobi's strategic location in East Africa makes it an ideal hub for trade, and with proficient ICT skills, firms can access international markets, collaborate with foreign partners, and expand their customer base, thereby increasing revenue and growth potential. Additionally, ICT skills facilitate data-driven decision-making. Firms can collect, analyze, and utilize data to make informed choices regarding

production processes, product development, and market trends. This data-driven approach leads to better resource allocation and adaptability to changing market dynamics (Oyombe, 2023).

In conclusion, the implications of ICT skills on the performance of manufacturing firms in Nairobi City County, Kenya, are undeniable. These skills foster operational efficiency, global market access, and informed decision-making, all of which contribute to the long-term success and growth of manufacturing firms in the region. As technology continues to advance, the significance of ICT skills will only grow, making them an essential component of modern manufacturing in Nairobi and beyond. The outcomes are corroborated by Van Minh, Badir, Quang, and Afsar (2017), who demonstrated that there exists a favorable correlation between leaders' technical competency and subordinates' inventive and learning work behavior.

CHAPTER FIVE

SUMMARY, CONCLUSIONS AND RECOMMENDATIONS

5.1 Introduction

The primary aim of this research was to examine the influence of technical skills on the performance of manufacturing enterprises located in Nairobi City County, Kenya. The precise aims of this study are to examine the influence of Information communication skills, data science skills, and creative skills on the performance of manufacturing enterprises in Nairobi City County, Kenya. This chapter provides a concise overview of the key results, conclusions, and suggestions derived from the research. Lastly, the chapter delineates some domains that need more investigation.

5.2 Summary of the Findings

The data used in this research was obtained via the administration of questionnaires to a sample of 59 respondents from manufacturing enterprises located within Nairobi City County. The research successfully accomplished its specified aims by using linear regression analysis to determine the R square and B coefficients. The analyses were performed with a confidence level of 95.0% ($P<0.05$). The primary discoveries may be summarized as follows.

5.2.1 Influence of Information communication skills on performance of manufacturing firms in Nairobi City County in Kenya

The first objective of the study was to examine the influence of Information communication skills on performance of manufacturing firms in Nairobi City County in Kenya. The study sought to answer what is the influence of Information communication skills on performance of manufacturing firms in Nairobi City County in Kenya. Majority of the respondent agreed to both great and very great extent that they possessed a proficient skill set in using Microsoft Excel, Word, and PowerPoint applications (30.5% and 23.7%), they possessed a comprehensive understanding

of using various social media sites (39.0% and 28.8%) and they possessed a comprehensive understanding and proficiency in using email communication (39.0% and 35.6%).

The outcomes of the multivariate linear regression analysis, which used unstandardized beta coefficients, indicate a statistically significant positive relationship between Information communication skills (ICT) capabilities and the success of manufacturing enterprises in Nairobi City County, located in the western region of Kenya (B = 0.218, p = 0.001). This suggests that by adjusting for other factors in the model, a one-unit increase in Information communication skills could result in an increase in statistical significance of 0.218 in the output of manufacturing enterprises in Nairobi City County, Kenya, in a comparable direction.

5.2.2 Influence of data science skills on performance of manufacturing firms in Nairobi City County in Kenya

The second objective of the study was to find out the effect of data science skills on performance of manufacturing firms in Nairobi City County in Kenya. The study sought to answer what are the effects of data science skills on performance of manufacturing firms in Nairobi City County in Kenya. Majority of the respondents confirmed to both great and very great extent that they are quite skilled in the processes involved in the collection of data (40.7% and 33.9%), they have received comprehensive training in the use of fundamental data analysis approaches (33.9% and 32.2%) and they possess exceptional skills in the creation and delivery of comprehensive reports (50.8% and 23.7%).

The outcomes of a multiple linear regression analysis, which used unstandardized beta coefficients, indicate a statistically significant and positive relationship between data science capabilities and the achievement of manufacturing enterprises in Nairobi City County, located in the Western region of Kenya (B=.207, p=.001). This implies that, after accounting for other factors in the model, a one-unit increase in data science abilities is associated with a significant statistically 0.207 increase in the output of manufacturing enterprises located in Nairobi City County, Kenya.

5.2.3 Influence of innovative skills on performance of manufacturing firms in Nairobi City County in Kenya

The third objective of the study was to examine the influence of innovative skills on performance of manufacturing firms in Nairobi City County in Kenya. The study sought to answer to what extent does innovative skills affect performance of manufacturing firms in Nairobi City County in Kenya. Majority of the respondents were in agreement to both great and very great extent that during the course of their professional endeavors (45.8% and 33.9%), they have generated novel and inventive ideas (44.1% and 28.8%), during the course of their job, they have successfully implemented a minimum of one idea and Through their idea, the company has realized improvement in process and service (37.3% and 42.4%)

The outcomes of the analysis using multiple linear regression demonstrate that there is a statistically significant positive connection between creative talents and the success of manufacturing enterprises in Nairobi City County, located in Western Kenya (B = 0.167, p = 0.005). This suggests that after controlling for other factors in the model, a one-unit increase in creative capabilities will lead to a statistically noteworthy shift in the outcomes of manufacturing businesses in Nairobi City County, Kenya, by 0.167 in a similar direction.

5.3 Conclusions

The findings indicate that Information communication skills have significant influence on technical skills among manufacturing firms in Nairobi City County(B = 0.218, p = 0.001). Therefore, the study concluded that Information communication skills influence performance of manufacturing firms in Nairobi City County in Kenya. Improvement in Information communication skills would result to increase in performance. The findings showed that firms with higher levels of ICT skills had better performance in terms of productivity, profitability, and market share.

The results of the study suggest that there is a notable influence of data science abilities on technical skills within industrial enterprises located in Nairobi City County(B=.207, p=.001).

Sufficient information was available to establish a correlation between data science abilities and the performance of manufacturing enterprises in Nairobi City County, Kenya. The favorable influence of data science skills on the performance of industrial enterprises in Nairobi City County, Kenya, is indisputable. This study demonstrates that firms with a strong foundation in data science are better equipped to make informed decisions, improve efficiency, enhance product quality and innovation, and stay competitive in a rapidly changing market.

The findings also revealed that innovative skills have significant influence on technical skills among manufacturing firms in Nairobi City County($B = 0.167$, $p = 0.005$). The study demonstrates that innovative skills have a profound and far-reaching influence on the performance of manufacturing firms in Nairobi City County, Kenya. Firms that prioritize innovation benefit from a competitive advantage, improved product and process quality, market expansion, talent attraction and retention, adaptation to technological advances, and sustainable growth.

5.4 Recommendations

The findings of this study suggest that manufacturing firms in Nairobi City County should invest in developing the ICT skills of their employees. This can be done through training programs, workshops, and on-the-job training. By investing in ICT skills, firms can improve their productivity, profitability, and market share. In addition to investing in ICT skills, firms should also create an environment that is conducive to innovation. This can be done by encouraging employees to be creative and by providing them with the resources they need to develop new ideas. By creating an environment that is conducive to innovation, firms can reap the benefits of ICT-enabled innovation.

In addition to investing in data science skills, firms should also create a culture that is data-driven. This can be done by encouraging employees to use data to inform their decisions and by providing them with the tools and resources they need to do so. By creating a culture that is data-driven, firms can reap the benefits of data-driven decision-making. To remain competitive and thrive in an increasingly data-driven world, manufacturing firms in Nairobi City County should continue to

embrace data science and invest in the development of these skills among their workforce.

The study's findings suggest that manufacturing firms in Nairobi City County should focus on developing their innovative skills in order to improve their performance. This can be done through a variety of means, such as investing in research and development, training employees in innovation techniques, and creating a culture that is supportive of innovation. Further, Manufacturing firms should encourage cross-functional collaboration among their employees. By bringing together individuals with diverse skills and backgrounds, companies can harness a broader range of innovative ideas and solutions.

5.5 Areas for Further Research

The study sought to establish influence of technical skills on performance of manufacturing firms in Nairobi City County in Kenya. The study limited itself to Nairobi City County; however, there is need for further studies to consider other counties in Kenya or expand the scope of study to include manufacturing firms within Nairobi Metropolis (Kiambu, Machakos and Kajiado counties). The study limited itself to three technical skills, however, further studies should consider other skills beyond technical skills.

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APPENDICES

Appendix I: CONSENT FOR PARTICIPATION

Odongo Owuor Dan

Mount Kenya University

Box 342-01000 - Thika

MBA/54742/2016

Dear Participant

RE: CONSENT FOR PARTICIPATION

I am pursuing a Masters of Business Administration in Strategic Management as a Master's student at Mount Kenya University. I am currently working on my project for research on "**INFLUENCE OF TECHNICAL SKILLS ON PERFORMANCE OF MANUFACTURING FIRMS IN NAIROBI CITY COUNTY IN KENY**A"

Your response will remain anonymous and confidential, and the study's results will only be reported as a whole. Your participation in this study is completely voluntary. Your survey replies are the only ones the researcher will see.

CONSENT I read the material above and understood it, and I was given the chance to ask questions. I understood that my involvement was purely voluntary. I will receive a copy of this permission form. I'm ready to take part in this investigation.

The participant's signature: ..... Date: .....

The researcher's signature: ..... Date: .....

Appendix II: QUESTIONNAIRE

Because of confidentiality DO NOT provide your identification wherever on this survey. The information is exclusively for scholarly purposes. If it's all the same to you feel free and be as genuine as could be normal in light of the current situation. There are no off- base answers. Imprint in the container/the appropriate response that best suits your view. Section A: Demographic Information

1. Which age group are you in?

Under 20 years of age	[ ]
20-30 years of age	[ ]
31-40 years of age	[ ]
41-50 years of age	[ ]
Over 50 years of age	[ ]

2. Which is your highest academic level?

College Diploma [ ]
University Graduate [ ]
Postgraduate [ ]

3. How many years have you worked for your current employer?

Less than 1 year [ ]
1-5 years [ ]
5-10years [ ]
Above 10 years [ ]

Section B; Information communication skills

How much do you agree with the following assertions regarding Strategic Customer Relationship management as practiced in your organization? Kindly tick appropriately. The below Likert Scale is applicable

KEY: 5= Very great extent, 4= Great extent, 3= Moderate extent, 2= Small extent, 1=Not at all

Statement	**1**	**2**	**3**	**4**	**5**
1. I possess a proficient skill set in using Microsoft Excel, Word, and PowerPoint applications.					
2. I possess a comprehensive understanding of using various social media sites.					
3. I possess a comprehensive understanding and proficiency in using email communication.					

Section C; Data Science Skills

How much do you agree with the following statements about how your company uses strategic technical skills? Kindly tick appropriately.

KEY: 5= Very great extent, 4= Great extent, 3= Moderate extent, 2= Small extent, 1=Not at all

Statement	**1**	**2**	**3**	**4**	**5**
1. I am quite skilled in the processes involved in the collection of data.					
2. I have received comprehensive training in the use of fundamental data analysis approaches.					
3. I possess exceptional skills in the creation and delivery of comprehensive reports.					

Section D; Innovation Skills

How much do you agree with the following assertions regarding risk management as practiced in your organization? Kindly tick appropriately.

KEY: 5= Very great extent, 4= Great extent, 3= Moderate extent, 2= Small extent, 1=Not at all

Statement		**1**	**2**	**3**	**4**	**5**
1.	During the course of my professional endeavors, I have generated novel and inventive ideas.					
2.	During the course of my job, I successfully implemented a minimum of one idea.					
3.	Through my idea, the company has realized improvement in process and service					

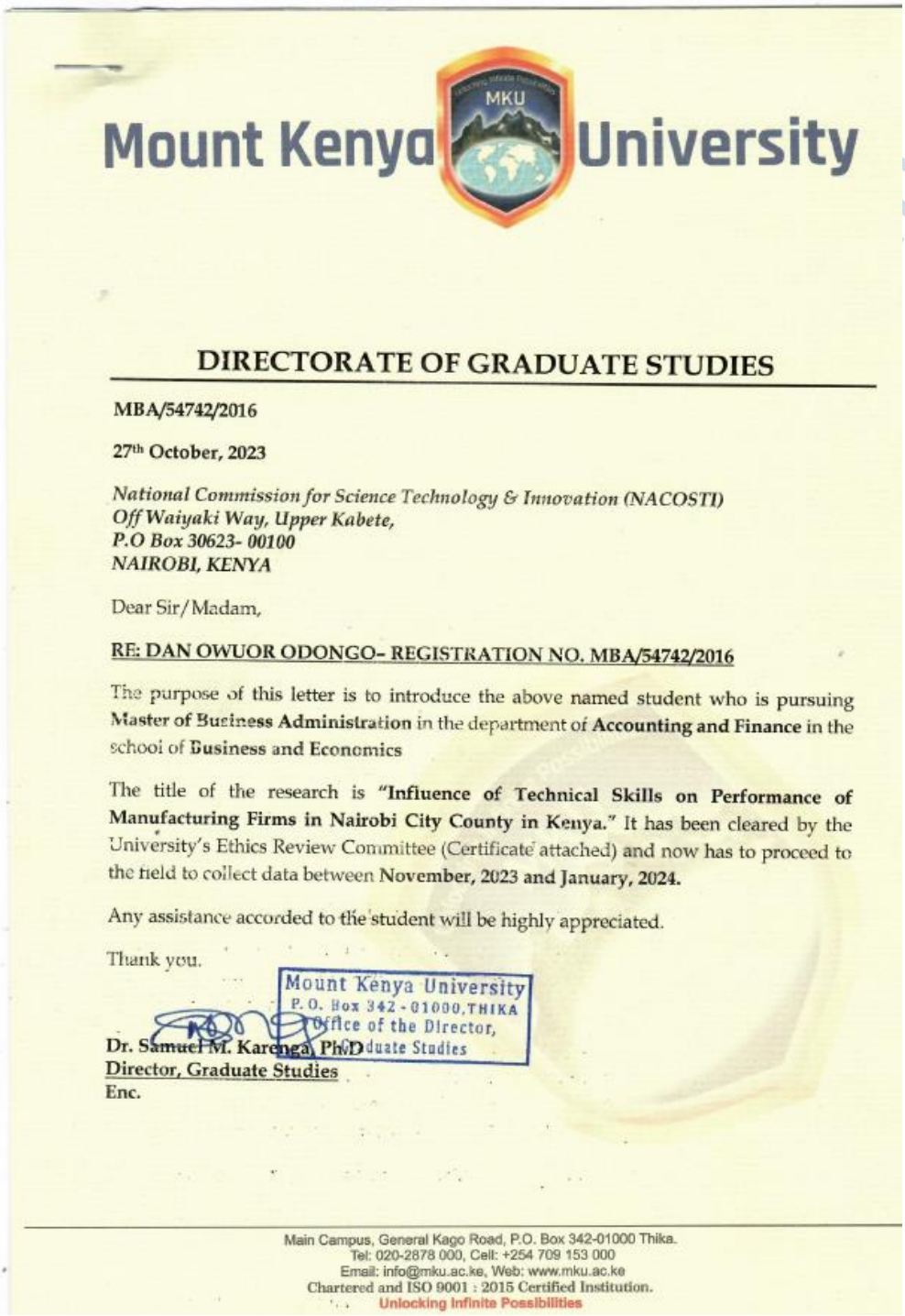
Section E; Performance of manufacturing firms in Nairobi City County in Kenya

How much do you agree with the following statements regarding the performance of Nairobi City, County, and County manufacturing firms in Kenya? Kindly tick appropriately.

KEY: 5= Very great extent, 4= Great extent, 3= Moderate extent, 2= Small extent, 1=Not at all

Statement		**1**	**2**	**3**	**4**	**5**
1.	We are able to increase customer satisfaction rate as a result of enhanced technical skills acquisition					
2.	Data Science has enabled the company improve on its product and services					
3.	Innovation from our employees has increased customer satisfaction and facilitated target attainment					
4.	Technical skills contributes to increased production and employee satisfaction					

Appendix III: INTRODUCTION LETTER FROM POST GRADUATE



Mount Kenya University

MKU

DIRECTORATE OF GRADUATE STUDIES

MBA/54742/2016

27th October, 2023

National Commission for Science Technology & Innovation (NACOSTI)
Off Waiyaki Way, Upper Kabete,
P.O Box 30623- 00100
NAIROBI, KENYA

Dear Sir/Madam,

RE: DAN OWUOR ODONGO- REGISTRATION NO. MBA/54742/2016

The purpose of this letter is to introduce the above named student who is pursuing **Master of Business Administration** in the department of **Accounting and Finance** in the school of **Business and Economics**

The title of the research is **"Influence of Technical Skills on Performance of Manufacturing Firms in Nairobi City County in Kenya."** It has been cleared by the University's Ethics Review Committee (Certificate attached) and now has to proceed to the field to collect data between **November, 2023 and January, 2024.**

Any assistance accorded to the student will be highly appreciated.

Thank you.

Mount Kenya University
P.O. Box 342-01000,THIKA
Office of the Director,
Graduate Studies

Dr. Samuel M. Karenga, PhD
Director, Graduate Studies
Enc.

Main Campus, General Kago Road, P.O. Box 342-01000 Thika.
Tel: 020-2878 000, Cell: +254 709 153 000
Email: info@mku.ac.ke, Web: www.mku.ac.ke
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Unlocking Infinite Possibilities

Appendix IV: ERC PERMIT

Mount Kenya University

REF: **MKU/ISERC/3302** Date: 27 October 2023
TO: **DAN OWUOR ODONGO**
REG: **MBA/54742/2016**

Dear Sir/Madam,

RE: INFLUENCE OF TECHNICAL SKILLS ON PERFORMANCE OF MANUFACTURING FIRMS IN NAIROBI CITY COUNTY IN KENYA

This is to inform you that **Mount Kenya University** has reviewed and approved your above research proposal. Your application approval number is **2346.** The approval period is **27/10/2023 - 26/10/2024.**

This approval is subject to compliance with the following requirements;

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

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

Yours sincerely,

The Chairman
Mount Kenya University
Ethics Review Committee
P.O. Box 342 - 0100, Thika

Dr. Alfred Owino, PhD
Chairman, Mount Kenya University ISERC

Appendix V: NACOSTI PERMIT

REPUBLIC OF KENYA

NATIONAL COMMISSION FOR SCIENCE,TECHNOLOGY & INNOVATION

Ref No: **982488**

Date of Issue: **31/October/2023**

RESEARCH LICENSE

This is to Certify that Mr.. DAN OWUOR ODONGO of Mount Kenya University, has been licensed to conduct research as per the provision of the Science, Technology and Innovation Act, 2013 (Rev.2014) in Nairobi County on the topic: INFLUENCE OF TECHNICAL SKILLS ON PERFORMANCE OF MANUFACTURING FIRMS IN NAIROBI CITY COUNTY IN KENYA for the period ending: 31/October/2024.

License No: **NACOSTI/P/23/30691**

982488

Applicant Identification Number

Director General
NATIONAL COMMISSION FOR SCIENCE,TECHNOLOGY & INNOVATION

Verification QR Code

NOTE: This is a computer generated License. To verify the authenticity of this document, Scan the QR Code using QR scanner application.

See overleaf for conditions

Appendix VI: LIST OF MANUFACTURING FIRMS IN NAIROBI CITY COUNTY

1. Access Alliance Ltd
2. Allied East Africa Ltd
3. Apex steel Ltd
4. Aucma Digital Technology Africa Ltd
5. Bags & Balers Manufacturers (K) Ltd
6. Bamburi Cement Ltd
7. Basco Products (K) Ltd
8. Brand Printers Ltd
9. Budget Shoes Ltd
10. Cadbury Kenya Ltd Buildings & Construmion
11. Carbacid (C02) Ltd
12. Carton manufacturers Ltd
13. Chemical & Allied
14. Chemicals and Solvents (EA) Ltd
15. City Clock (K) Ltd
16. Colour Packaging ltd
17. Cooper K- Brands Ltd
18. Corrugated Sheets Ltd
19. Daima Energy services Ltd
20. Dawa Ltd
21. Deloitte
22. East Africa Glassware Mart Ltd
23. East African Breweries Ltd
24. East African Cables Ltd
25. East African development bank
26. East African Malt Ltd
27. East African Packaging Industries Ltd
28. Elson Plastics of Kenya Ltd
29. Essential Manufacturing
30. Express Kenya Ltd
31. Flamingo Tiles (Kenya) Ltd 12
32. Food & Beverages
33. Galaxy Paints & Coating Co. Ltd Energy, EleZricals & Elemronics
34. General aluminum Fabricators Ltd
35. General Motor East Africa Ltd
36. General Plastics Ltd
37. Glaxo Smithkline Kenya Ltd
38. Haco Tiger Brands (E.A) Ltd
39. Henkel Kenya Ltd
40. Insight management Consultants Ltd

41. Kenpoly Manufacturers ltd
42. Kentainers Ltd Nairobi
43. Kenya Fire Appliances Co. Ltd
44. Kenya power Ltd
45. Kenya Trading (EPZ) ltd
46. Kikoy Co. Ltd
47. Leather & Footwear
48. Master Fabricators Ltd Paper and Board
49. Metal & Allied
50. Motor Vehicle & accessories
51. Nairobi Bottlers Ltd
52. Nairobi Plastics Ltd
53. Nestle Foods Kenya Ltd
54. New Kenya Co-operative Creameries Ltd
55. Nokia Siemens Networks Kenya Ltd
56. Pharmaceuticals & Medical Equipment
57. Plastics & Rubber
58. Polythene industries Ltd
59. Service & consultancy
60. Techno Brain Ltd
61. Textile & apparels
62. Toyota Kenya Ltd

Source: Adopted from KAM (2021)

Appendix VII: PLAGIARISM REPORT