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From innovation to impact: Investigating the financial and sustainability outcomes of digital transformation in Saudi Arabia context

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Abstract

This research aims to discuss the digital transformation implications on firms' financial performance. Digital transformation can support firms in the field of digitizing their business models. Practically in terms of standards operating procedures "SOPs". Firms' digitalization may have a beneficial impact on their financial performance by adopting different types of technologies that allow for the efficient use of resources and the reduction of cost, enabling the transformation of business models into sustainable ones within the circular and digitized economy. With huge potentials in improving firms' performance and enhancing growth, digital transformation has raised much attention from firms worldwide. On the other hand, the high costs associated, and capital required with the transformation cannot be ignored. Few researches have looked into firms' financial performance before and after adopting digital transformation, after examining the benefits and costs of digital transformation. This paper is about to give a complete analysis of the effect of digital technologies on the financial performance of firms, in an attempt to fill existing research gaps. With a random sampling method of stratification (with 30–50 companies), the study includes factory owners, brokers, service providers, and those within tourism and hospitality and have been randomly selected in order to get a diverse representation. The findings show that stable competitive advantage crazily leads to significant cost savings and highlights the subject of effective differentiation and position in the market. Firms that successfully exploit their competitive advantages effectively gain in profits due to the fact that they have simplified their processes and lowered their costs. Nevertheless, the financial concerns related to sustainability investments and monitoring improvements demonstrate low short-term benefits because of the absence of other influences that are the motivating factor of the production line. Sustainability projects, which are part of the companies' strategic initiatives, are found to have a limited role in direct reduction in costs, and hence more research is required in the field to investigate their wider implications beyond cost-effectiveness. The research indicates that the application of dynamic innovations and market insights is of great importance for the achievement of a unique market advantage. Moreover, it gives room to explore more variables in order to conduct more in-depth studies on the interrelationships between environmental strategy practices, digital transformation, and financial outcomes. Therefore, future research can bridge corresponding gaps and new research directions for the better digital strategy implementation which generates improved financial results and long-term business success.

Keywords: Corporate performance, Digitalization, Innovation, Saudi Arabia context, Sustainability.

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1. Introduction

Digital transformation is the process by which organizations bring digital technology into all aspects of their business, causing radical changes in the way they operate and create value for customers [1]. This notion covers various technologies and practices that include automation, artificial intelligence (AI), cloud computing, data analytics, and the Internet of Things (IoT) [2]. Technology has changed the paradigms of the traditional business, innovation is even driven, and business are opened up to the customers in a better way.

Digitization adoption has been increasing fast in the past few years as the technology changes and the competition intensifies. The companies that embrace such technologies get a considerable competitive advantage since they can optimize the processes, cut expenses, and provide the better customer experiences [3]. For instance, automation via robotic process automation (RPA) automates repetitive tasks, which enable employees to concentrate on more value-added activities [4]. In the same manner, data analytics can offer useful information, which allows companies to take smart decisions and forecast market behaviour [5]. The adoption of digital technology therefore has a direct impact on the operations, profitability, and sustainability of firms.

The effects of digital transformation are seen, but the impact of it on the financial performance still is shrouded in obscurity. Another area of research shows that the introduction of the digitalization did not bring any major financial improvements in the area, on the other hand, the complexity and the costs associated with the deployment of technology is evident in other areas [3, 6]. The one reason is that a lot of different reasons leads to it, that include how technology is spread, the company's culture and also the nature of the industry. Moreover, the transformation journey itself is also a source of disruption because it requires change in processes and redefine roles of employees [7]. This may in turn lead the resistance and slowing implementation. This will also demonstrate that the implications to some sectors are beneficial, others are detrimental, and in some cases, it is in some sector that the overall implications are uncertain.

There are contradictory results of the first set of the researches about the digital transformation impact on financial performance, thus conclusion about this issue requires a deeper analysis and perception from a more holistic point of view. On the other hand, the literature is weakened by the fact that the definition as a gap in the literature. Taking this into consideration, the research aims to fill this gap by investigating the relationship between some components of digital transformation and several key financial indices, such as continuing growth in revenues and profitability. This research seeks to highlight the source of digital transformation which is in a view to offer the information that the businesses with can take a stand and come up with the appropriate digital strategies.

1.1. Research Problem

Impact of digital transformation on financial performance is a multi-faceted topic that recent research has focused on. There are numerous studies that have addressed this intricate relationship between the two, revealing both positive and negative consequences of digitization initiatives. Another study dealing with Chinese listed companies demonstrated that the digital transformation is bad for the financial performance at the beginning and even led to the poor financial results [8]. Nevertheless, the higher investment in research and development (R&D) would allow to eliminate this negative effect over the time that would bring the profit to the companies in the long run. Additionally, one other research on European listed firms during the COVID-19 pandemic underscored the interplay of digitization and financial performance. Some studies indicated that digital transformation had a mixed impact, with a negative impact on ROA and ROE and a positive impact on Tobin's Q [9] signifying a long-term positive effect on financial performance. In addition, a study of the Swedish-listed firms [10] investigated the impact of the maturity of digital indicators on financial performance measures. The results showed that digital maturity has a negative short-run effect on ROA and ROE mainly due to the time gap between IT spending and the corresponding performance metric. Nevertheless, Tobin's Q was noted to have a positive impact, presenting long-term advantages of IT transformation to market value.

Overall, these studies underscore the nuanced relationship between digital transformation and financial performance, emphasizing the importance of factors such as R&D investment, digital maturity, and the time horizon for assessing the impact of digital initiatives on financial metrics. The critical research problem for this study is: How does digital transformation influence a firm's financial performance, and what specific elements of digital transformation are the most significant drivers?

1.2. Research Motivation

The research is motivated by several factors, which define the significance of financial effect of digital transformation. To start with, the increasing focus on the digital transformation across the industries has made the companies spend a lot on the digital technologies. The companies are adopting digital tools which enhance the way they do business, they improve consumer satisfaction, and they get ahead of their competition. The level of resources committed to these projects is fairly high and, therefore, it is important to know the financial aspects to ensure that investments fit the strategic objectives and are profitable. Analysis of these financial outcomes will enable business executives to make smarter investments on online. There is ambiguity in research outcomes related to this subject that this investigation aims to address. The earlier research regarding the effect of digital transformation on the financial performance was inconclusive with some indicating a positive level of relationship while others showing no clear benefit. This inconsistency points to the necessity for more detailed studies to define the link between digital transformation and financial results. The aim of this study is to provide a comprehensive overview of the current research gaps in this field and to offer a more detailed knowledge of how digital technologies impact the financial performance of an organization.

Finally, this research has significant practical and policy implications. Science based guidelines are always sought after by business leaders and policy makers so that they can be helped in their decision-making process. With a clearer perspective on the financial results of digital transformation, leaders will be able to come up with the plans that will provide the maximum ROI from digital investments. The result of this study can also be used for policy makers to implement the policies that promote digital innovation and simultaneously ensure growth and stability. These issues are the subject of the current research, which aims at providing important knowledge to both academic and business communities, enabling well-informed decision making and a successful digital transformation strategy.

1.3. Research Objectives

The research objectives are designed to systematically explore the relationship between digital transformation and financial performance. The key objectives is:

To examine the relationship between digital transformation and a firm's financial performance.

The specific research objectives are:

i. To identify the most relevant financial indicators such as revenue growth, profitability, and return on investment.
ii. To identify the relationship between automation and financial performance.
iii. To establish the relationship, is any, between data analytics and financial performance.
iv. To establish the relationship is any between technical skills development and deployment and financial performance.
v. To establish which of these tenets of digital transformation have the most significant impact on financial performance.

1.4. Hypotheses

Given the research problem, the following hypotheses guide the investigation:

- Null Hypothesis ($H0$): There is no statistically significant relationship between digital transformation, including components like automation and data analytics, and a firm's average revenue growth rate.
- Alternate Hypothesis ($H1$): Firms that implement digital transformation, with a focus on automation and advanced data analytics, experience a statistically significant higher average revenue growth rate.

1.5. Research Importance

This research has practical implications and potential academic contributions and instructions for policy and industry practices. To begin with, the results of the study are anticipated to let firms have the specific information on how digital transformation can stimulate financial success. Understanding the factors that underpin optimal financial performance are vital as companies in different industries are investing in digital technologies. The research will enable firms to identify the areas where they should direct their digital transformation efforts to get the best results. Through identifying the optimal techniques used in the application of digital tools, organizations can direct the resources to the activities that generate growth and profitability.

This research adds to the general academic knowledge concerning the relationship of the digital transformation with financial performance. The study provides a systematic model as well as empirical analysis to fill the existing literature gaps. This contribution is very crucial especially in view of the ambiguity and controversial findings of the previous studies. The research can be used as a cornerstone reference for future studies by providing a more specific understanding of the influence of digital transformation on the financial performance. It opens up the opportunity to investigate the effect of certain technologies or the industry specific variations of the outcomes of digital transformation.

The research is of great importance to policy makers as well as industry stakeholders. The outcomes could direct policy makers in creating policies and incentives to promote successful adoption of digital technologies and at the same time ensure a sustainable growth. Likewise, industry stakeholders could utilize the results of the study to set standards for digital transformation, therefore unifying the approaches and ensuring their effectiveness throughout the industry. This study has implications not only for the individual businesses but also determines trends in the entire industry and policy decisions.

To address these hypotheses and research objectives, the study seeks to supply a detailed analysis of the influence of digital transformation on financial performance. Due to the expected contributions in academic and practical business strategy of this research, importance of it is emphasized, proving its relevance in a fast-changing digital sector.

2. Background

2.1. Digital Transformation from Corporate Angle

Digital transformation is a new trend worldwide. Essentially, in 2020, "Covid Year" digital transformation became a substantial part of a disaster recovery plan for all firms. Several factors force firms to get into this new trend to protect and sustain their performances and improve the decision-making process. It was discovered that the more digital transformation readiness, the faster the response to disaster recovery. This will lead to protecting firms from business disruption. Digital transformation infrastructure readiness would be the fundamental part of this protection [11]. On the other side, several challenges firms are facing in this regard starting from cyber security risk and data privacy protection to funds availability and convincing investors to finance digital transformation to better profit generation in the future.

2.2. The History of Digital Transformation

Digital The digital transformation took the driving seat during the fourth industrial revolution via implementing technologies and tools in business activities, with the strong improvement of the 5G internet, cloud computing that replaced servers, and blockchain technology. Markets are changing the way firms operate, the way firms do business, and consumers' behavior [12]. Traditional/classic businesses are being transformed into digital, what is known as digitization. The top three countries, which are the US, Singapore, and China, in economy-wide digitalization, were proactive in adopting the DT strategy in both government and private sectors.

Naturally, firms are interested in DT, but it is not straightforward whether it may bring tangible benefits to firms are intangible benefits to add more value and keep pace with new technology to maximize stakeholders' interest. Based on the survey results of Wipro Digital in 2017 in the US, 50% of the senior executive respondents revealed that their firms failed in their DT strategy. That is, managers believe in the benefits of a DT adoption but are frustrated with the progress of DT and get results from it in their firms. Conceptually, DT benefits a firm such as lower cost, better operating efficiency, or enhanced innovation success. In practice, DT implementation is complex because of the enormous cost, learning curve, and adjustment involved. Hence, it is a research question whether a firm's DT adoption improves its performance or not. Moreover, how long does it take to show the improvement?

Meanwhile, sustaining the business model is also important, and we cannot separate performance improvement and business sustainability from each other. In addition, can the positive impact be recognized in the short term, or can the negative impact be recognized in the short term due to the huge budget investment required? In contrast, the positive impact needs time to be recognized. In other words, there is a positive impact in the long term versus a negative impact in the short-term formula.

The history of digital transformation goes back further than we may expect; its roots extend all the way to the 1940s and is likely to continue affecting the global business landscape for decades to come. In addition, based on the investigation done in 2020 "COVID year," half of FORBES Global 2000 will see their businesses depend on their ability to create digitally transformed products, services, or experiences. As a side note, world spending on digital transformation reached two trillion $ in 2022 [13]. Digital transformation can be applied to different types of technologies such as artificial intelligence, "AI," which is basically the intelligence of software or digital machine, which is the opposite of living beings and primarily humans. As of today, AI is widely used in different sectors, whether government, semi-government, or private. Also, industries such as IT, financial services, and automotives. ChatGPT is a great example of AI. AI is one of the digital transformation forms that positively impacted firms' shift towards increased automation and data-driven decision-making. On the other hand, questions are raised about the ethical implications and risks of AI on human beings.

Machine learning, as another type of technology, is a field of study in artificial intelligence where cumulative statistical algorithms can learn and add to any machine this knowledge. That is why they describe it as a machine when adding to it more algorithms like a brain that learns new information by reading or observation. The best example of machine learning that is very relevant to this research is robotic analytics that widely used in firms' ERPs. The disadvantage of machine learning is the validity and accuracy of algorithms that add to any machine [11]. Another type of digital transformation technology is blockchain, which is a distributed ledger with growing lists of records. In other words, blocks that are securely attached through cryptographic hashes. Consequently, block transactions are irreversible. Once they are recorded, the data in any given block cannot be altered retroactively without altering all subsequent blocks [11].

In brief, algorithm protocol is the base of blockchain. The most important example of blockchain is digital currency such as bitcoin, which transformed the industry of currency exchange and added digital methods to the classic/traditional ones, also making the currency exchange faster and more efficient. At the same time, the disadvantages are the questions raised about the source of truth related to the real value of such currencies and the financial base of valuation [10]. Ultimately, Big data, from its name, is defined as the parallel computing tools to manage the datasets. It comprises all the above types of technology data and allows the analytical firms to benefit from it by analysing and testing. The disadvantages of big data are the privacy issue and the risk of breach.

2.3. Financial Performances

A financial performance can be an indicator or detector that is calculated for an organization to examine its healthiness. It can also be a tool whose result indicates or detects a particular financial strength or weakness state. When we compare financial performance in two years, the comparison result also indicates a change in performance or state of a business strategy that correlates with the risk or progression of a failure. Financial performances are mathematical characteristics that can be detected and measured in the financial areas of the organization [10]. The role of financial performance is

important in financial reporting and analysis. As a formula, it consists of a numerator and a denominator to show a link between financial statements' items and another to briefly help read these statements from non-financial aspects.

Further, financial performance can assist in diagnosing any potential risk in the company's different areas, such as performance, liquidity, debt position, and profitability. Financial performance has been used in predicting bankruptcy and in the due diligence process to invest or divest. Financial performance is also useful in several ways, including measuring the sustainability of the business and evaluating the most effective financial performance areas.

3. Literature Review

3.1. Theoretical Framework

The issue of digital transformation and the effects of it on corporations' financial performance is one of the most discussed questions not only from the theoretical perspective but also from the practical side. From a theoretical aspect, digital transformation is perceived as a special phenomenon associate with financial consequences. The Resource-Based View (RBV) is an explanatory theory aimed at capturing the factors behind variability in financial outcomes. According to RBV, the source of a firm's advantage, arising from its above average returns, is its unique resources, which can be either tangible or intangible [14]. In this perspective, digital technologies are considered as critical assets that firms can employ to achieve operational effectiveness, innovative culture, and customer service capability. This strategic advantage can lead to more attractive financials in the context of digital transformation.

Another pertinent theoretical approach is dynamic capabilities that deal with the ability of an organization to respond quickly to alterations in the market by reorganizing its internal resources and capabilities [15]. In this regard, digital transformation is a strategic multi-dimensional capability, which enables the suppliers to identify and utilise new opportunities as well as reconfigure their existing resources, processes and business models. Depending on the industry characteristics, this flexibility also increases the market power and financial performance of a firm through the development of a more dynamic and flexible organizational structure.

The Technology Acceptance Model (TAM) and the Diffusion of Innovation (DOI) theory offer useful frameworks to explain the adoption and integration of digital technologies within organizations [1]. The models suggest that customer acceptance, operational adaptation time, and technology adoption and actual use are the factors that can determine the capacity and readiness of a firm for digital transformation. Hence, these factors are related to the financial outcome of the company and some businesses can easily adapt the changes associated with digital systems while others may struggle in implementing new technologies.

The theory of organizational learning emphasizes on the function of the firm in learning, capturing, applying and innovation of new knowledge and skills in the digital era [16]. Digital transformation is a "springboard" that assists the organizations in learning and gaining a new set of skills and competencies required for successful utilization of digital technologies. Organizations which harness digital transformation are considered to become more innovative and competitive which has a positive impact on the financial performance. Such diversity of theoretical approaches creates a good basis for realizing the impact of digital transformation on the financial performance of the company. The research will be further enriched by the inclusion of these points of view, and this will enable the researchers to study the intricate and multi-dimensional relationship between digital transformation and financial performance, which in turn, will facilitate the improvement of understanding of this issue as well as prepare the ground for subsequent empirical research.

3.2. Empirical Literature Review

The scholarly work on digital transformation in firms' financial figures shows a contradictory picture which in fact becomes distant. On the positive side, some studies found a causal effect, whereas others return non-conclusive or even negative outcomes. Such observations stress again on the relevance of properly contextualizing each particular situation and paying attention to different mediating variables in this process. Financial performance includes a correlation to financial results in one aspect of the research done. One example is the study by Masoud and Basahel [17] which investigated the effect that digital transformation, customer experience and IT innovation have on firm performance. Their works indicate that the three dimensions (decentralization, participation, and transparency) play a considerable role in a number of financial statistics including profit and return on assets. On the other hand, Zhai and his colleagues' findings in 2022 exhibited a trend of positive connections between digitalization and improved corporate performance. The study also identified two important moderating factors: due to the financial tightness, and the organizational slack. Compensatory and capable firms with economical backing and structural superiority were more likely to accelerate the digital transformation and enhance performance. Thanks to a variety of changes that positively impact financial performance following digital transformation, the positive impact can be explained. Initially, the integration of digital technologies might generate an operational expenditure and cost reduction due to the fact that automation of various processes, streamlining of workflows and reduction of manual labour can be performed [18]. It is a situation that can lead to the rise in yield and decrease in production costs.

Digital transformation can contribute to not only the creation of new sources of income but also innovative business models for the firms. The emergence of digital technologies has brought unusual opportunities to create innovative products and stretch the limit of its customer base and even enter new market segments [19]. The increase in revenue may be one of the efficiency outcomes as could be improved financial performance. In addition, digitalization will not only help organizations to compete in the market but also will enhance its market relevance because it will give a firm the capacity to adjust the business operations in line with the changes in the external environment as well as customers' preferences. By

applying analytical tools along with the instant data, companies will be able to take more informed decisions, will be able to optimize their services and will be able to meet their clients' requirements in a better way [20].

Digital transformation has also been associated with some negative impacts of financial performance. Some of the researchers expressed a bad influence, which was especially prominent in the beginning period. The work of Han and Tang [8] indicates that there exists a definite correlation between digital motions and reduced financial performances of the corporations appearing in public in China. Their arguments incorporate the factor that is directly linked to the high investment costs of digital transformation including the R&D expenditures and the implementation of innovative technologies which might worsen the financial results in the short run. Similarly, Liang, et al. [21] found that digital transformation has a mixed effect on market performance and financial performance, and it may not be as positive in the first year. It is demonstrated in the writing that it is paramount for the actors of the selected IT industry to constantly answer to these national policies and continue to implement digital transformation in order to overcome the difficulties. The negative contribution of digital mobility to financial performance can concern mainly several points. To begin with, the introduction of digital entrepreneurship technologies may be an expensive and laborious process overloaded with investment in the infrastructure, software, and employee training [18]. Initially, these overhead costs can vary from modest to substantial, depending on the firm's investment level, straining its financial resources and cutting into short-term financial performance. Therefore, the final stage of technological transformation could, also, became an obstacle for companies because of disruption which could change business processes and would leave a temporary inefficiency and reduced productivity [19]. Revenue loss and profit decrease are the possible outcomes in that process, although it is most likely to occur at the first stage of the transition.

In addition, many business firms have got to experience a cultural overhaul and a changing of their process and mindset [20] in order to be able to fully implement digital transformation. This change, which is quite challenging, may meet employee's resistance, which makes the situation get worse for the firm thereby hurting its financial outcomes in the short term. The current work has shown that the digital transformation and financial performance are interrelated and this relationship one is the alike relationality, and the relationship can have multiple mediating factors. The company's investment in R&D and innovation is another factor called here. The further study by Han and Tang [8] showed that digital transformation may result in abridged financial performance in the short run however allocation of more fund to R&D section can lessen it in the long run.

The impact of digital transformation often depends on firm's intrinsic characteristics and does not fit all firms the same way. Zhai, et al. [22] study demonstrates that companies having greater financial resources and some space to operate at a workplace have higher likelihood to use digitalization and improve their financial performance. This point the need to create a firm organizational design and the needed skills toward sustainable digital transformation implementation will be highlighted. In the longer run, firm will rather benefit because its financial performance will be positively affected by the successful implementation of digital transformation initiatives. Through the increase of operational efficiency, the development of new income sources and the boost of company competitiveness, the digital transformation can lead to more profits, higher market share, and better financial indicators [18]. Although the comprehensive utilization of these long-term advantages is connected with the competency of the organization in successfully managing the transition process and in overcoming the initial obstacles related to digital transformation.

4. Research Methodology

The methodology describes how data will be collected and analysed to examine the impact of digital transformation on firms' financial performance.

4.1. Samples and Data Collection

4.1.1. Samples

A stratified random sampling method will be used. This approach ensures a diverse representation of firms across various industries and sizes. Firms from manufacturing, trading, services, and tourism & hospitality sectors are the target of the study. The sample will include 30–50 firms, which are equally distributed among the different industry categories. This size makes it possible to ensure statistically significant results but at the same time to keep an acceptable range for qualitative investigation by means of case studies.

4.1.2. Data Collection

The data will be obtained via a survey questionnaire – tool that assesses different facets of digital transformation and its effect on the financial performance. The survey will be sent via electronic channels to the contact person of each selected firm. To complement the main data, financial performance metrics will be obtained from the public sources including financial reports, company websites, and industry publications. These measures will be revenue, income, and profit margins.

4.2. Measures

The content of the questionnaire items is designed to measure the elements of digital transformation and their associated impact on financial performance. Here are the particular steps:

i. Automation: Assesses the degree of automation technologies acceptance in business processes. This is achieved through questions that touch on use of Robotic Process Automation (RPA), automation in production, and advantages of automation.

ii. Data Analytics and Business Intelligence: Assesses the utilization of data-driven decision-support tools, big data analytics, and business intelligence software. This credit consist of questions on a modern analytics application, big data technologies, and data-driven decision-making.
iii. Operational Intelligence: Captures the use of tools to monitor and optimize business operations in real time, such as OSIsoft PI System.
iv. Technology Investment: Measures the firm's investment in digital technologies, cloud computing, and emerging technologies like AI, IoT, and blockchain.
v. Technical Skills and Collaboration: Assesses the firm's focus on developing technical skills among employees, hiring for tech roles, and cross-functional collaboration.
vi. Sustainability and Digital Transformation: Examines the use of digital technologies to support sustainability goals, reduce costs, and leverage sustainability as a competitive advantage.

4.3. Variables Measurement

4.3.1. Dependent Variables

The primary dependent variable is financial performance. This will be measured using the using the average year on year revenue growth for the firms included over the last 5 years. This represents the rate of increase from year to year. This will be expressed as a percentage to address the difference across firms' sizes and industries thus standardizing the analysis. This approach will best show the impact of DT as it shows the growth rather than the size of the revenue accurately fitting the research objective.

4.3.2. Independent Variables

The independent variables represent the various dimensions of digital transformation, they show the different tenets identified from qualitative analysis of past studies that are responsible for the changes in performance of the firms from a digital transformation perspective. These include:

- Automation: The level of automation in business processes.
- Data Analytics: The extent of data-driven decision-making and the use of business intelligence tools.
- Operational Intelligence: The usage of tools to optimize real-time business operations.
- Technology Investment: The investment in digital technologies, cloud computing, and emerging technologies.
- Technical Skills: The focus on technical skills development among employees.

4.4. Data Analysis

4.4.1. Quantitative Analysis

The quantitative analysis of this study will use an integrative approach that will utilize different statistical tools, which will examine the link between digital transformation and financial performance. Data for this analysis will be obtained through a well-structured questionnaire that is based on Likert scale which is a popular way of measuring attitudes and perceptions in social science research. Respondents will need to evaluate a number of statements in relation to their company's efforts to transform digitally and their perceived financial outcomes. The scale is usually from 'strongly disagree' to 'strongly agree,' thereby ensuring the complexity of attitudes toward the question by the respondent. The data collected will be entered into Statistical Package for the Social Sciences (SPSS) for analysis. The first stage is getting descriptive statistics which are a summary of the basic characteristics of the dataset. This task will involve the computation of central tendency (mean, median and mode) as well as dispersion (standard deviation and range) measures. Descriptive statistics will help to look at the whole data and evaluate the response and relationship patterns.

Correlation analysis will be used for detecting variable relationships. In such scenario, the research aims to measure the relationship between the level of digital transformation (which is assessed by the Likert scale responses) and financial performance indicators that include revenue growth, profitability, and return on investment. The correlation coefficients, such as Pearson's r, will define the magnitude and the direction of the relationships between these variables. Positive correlation shows that as digital transformation initiatives increase, the financial performance also goes up. The next step is to perform the regression analysis aimed at testing the potential causal relationships between digital transformation and financial performance. A regression model will be formulated with the financial performance being the dependent variable and digital transformation measures as independent variables. This analysis aims to investigate if digital transformation significantly affects financial performance, given other variables such as company size, industry, and market conditions. The evaluation includes the determination of the regression coefficients and their statistical significance that digital transformation is able to predict financial outcomes.

In the analysis, a range of diagnostic tests will be used to assure that the data satisfies the underlying assumptions of the statistical validity. This involves testing for linearity, multicollinearity, and heteroscedasticity. Through the application of meticulous quantitative analysis, the study intends to offer strong empirical evidence on the influence of digital transformation on the financial performance, thus contributing to both academic knowledge and practical business insight.

4.5. Econometric Model

Let Yi represent the dependent variable, which is the average revenue growth rate for a specific firm over 5 years. The general form of the multiple linear regression model to assess the impact of digital transformation on revenue growth rate can be written as follows:

$$Yi=\beta 0+\beta 1\mathrm{A}+\beta 2\mathrm{DA}+\beta 3\mathrm{OI}+\beta 4\mathrm{TI}+\beta 5\mathrm{TS}+\epsilon i$$

Where:

i. Yi is the dependent variable, which is the average revenue growth rate for the $i$ith firm over a 5-year period.
ii. $\beta 0$ is the intercept, indicating the expected average revenue growth rate when all independent variables are zero.
iii. $\beta 1,\ldots,6$ are the coefficients for each of the independent variables, indicating the expected change in the revenue growth rate for a one-unit change in the respective independent variable.
iv. ϵi is the error term, capturing the unexplained variation in the revenue growth rate.

4.5.1. Independent Variables

The model captures the following independent variables which are explanatory tenets of digital transformation:

- A: Automation.
- DA: Data Analytics
- OI: Operational Intelligence
- TI: Technology Investment
- TS: Technical Skills

4.5.2. Analysis and Interpretation

With this econometric model, we used the ordinary least squares (OLS) regression to ($\beta 1,\ldots,6$) the coefficients. The primary outcomes to evaluate are: The primary outcomes to evaluate are:

Significance of Coefficients: Test the statistical significance of each coefficient to determine which elements of digital transformation have a significant impact on five-year average revenue growth rate.

Magnitude and Direction of Coefficients: Identify the direction of influence of each independent variable on the rate of the revenue growth and what is the power of this influence.

Model Fit: Evaluate the goodness-of-fit of the model using measures such as $R2$ and adjusted $R2$. Furthermore, we will carry out regression diagnostics, which will be tested for common problems such as multicollinearity, heteroscedasticity, and residual patterns which can affect the reliability of the model's output. This econometric model presents a structure to analyse the impacts of all dimensions of digital transformation on firms' revenue growth in the longer run.

4.5.3. Results and Discussion

Demographics Analysis:

Bar Chart:

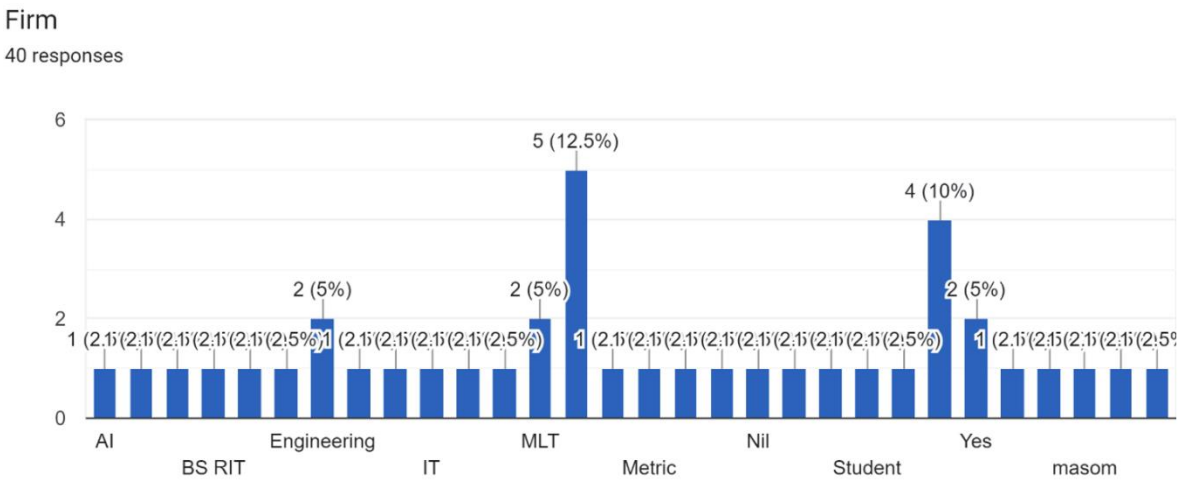

Figure 1.
Bar chart of Firms.

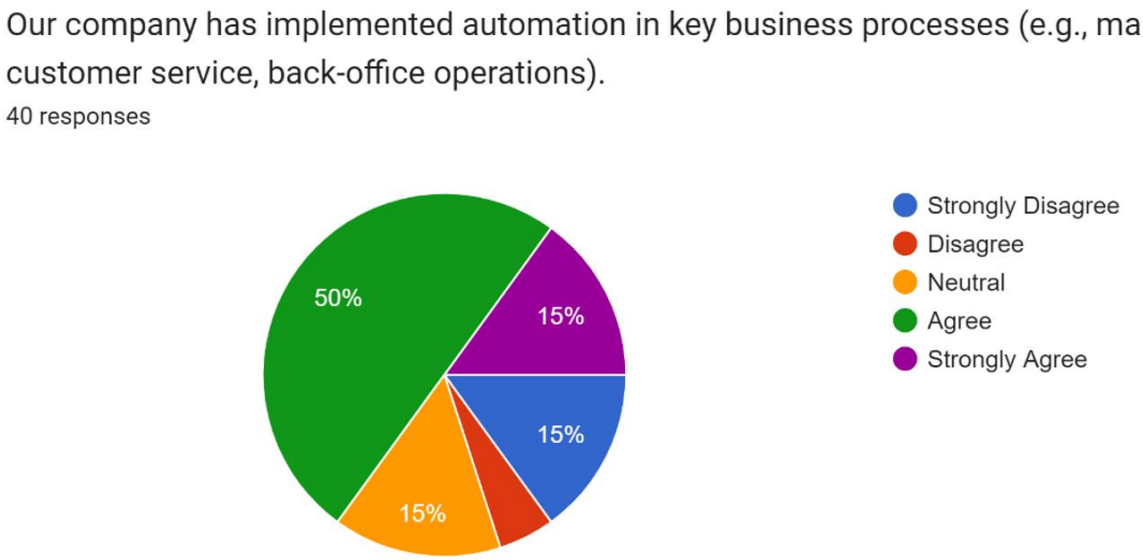

Figure 2.
Pie chart shows that the Agree are most respondents are 50%.

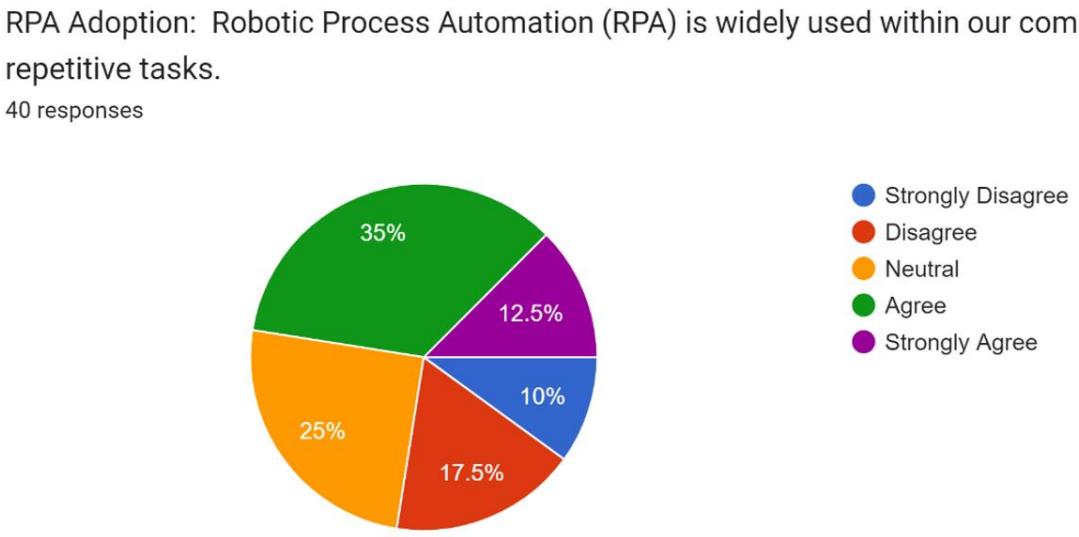

Figure 3.
Pie chart shows that the Agree are most respondents are 35%

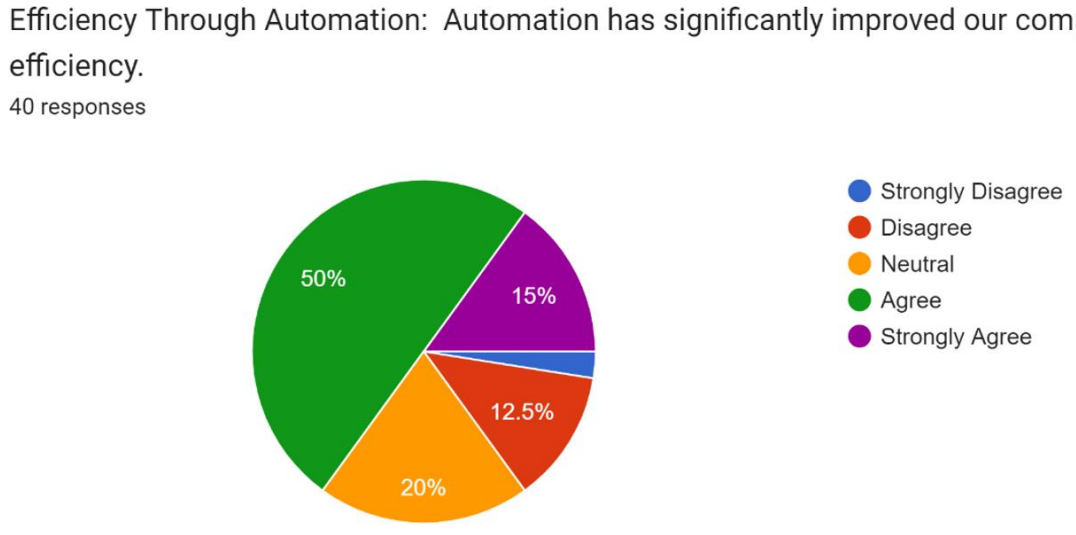

Figure 4.
Pie chart shows that the Agree are most respondents are 50%

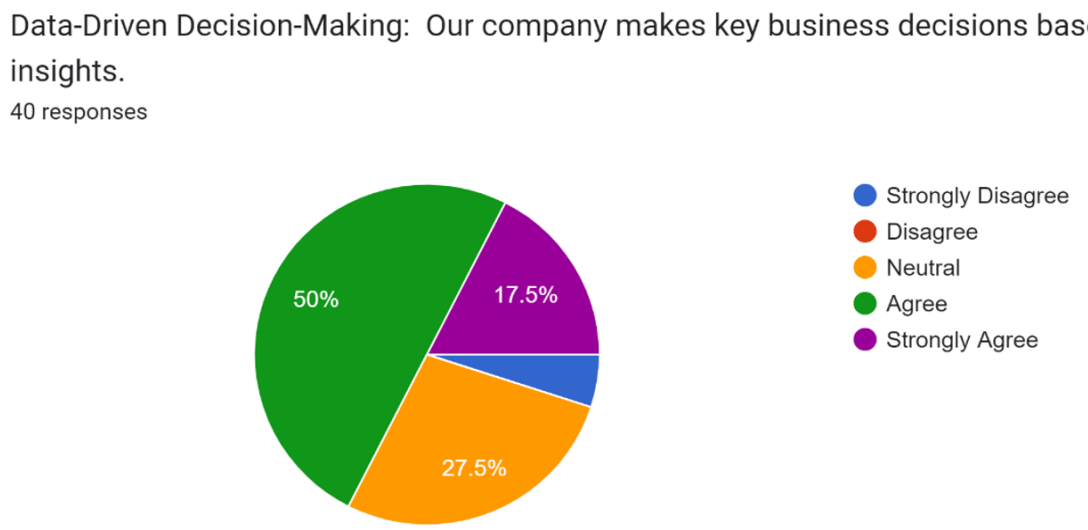

Figure 5.
Pie chart shows that the Agree are most respondents are 50%.

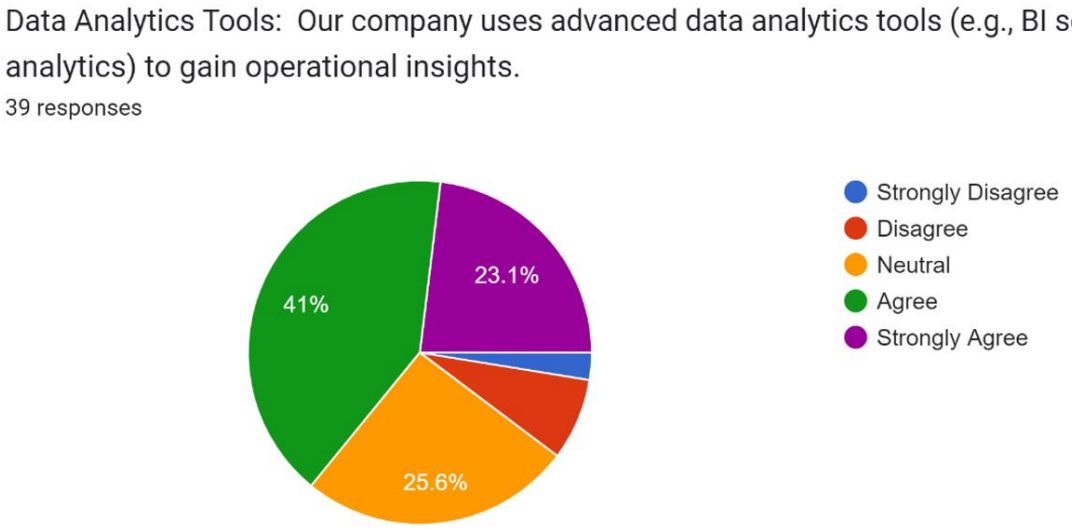

Figure 6.
Pie chart shows that the Agree are most respondents are 41%

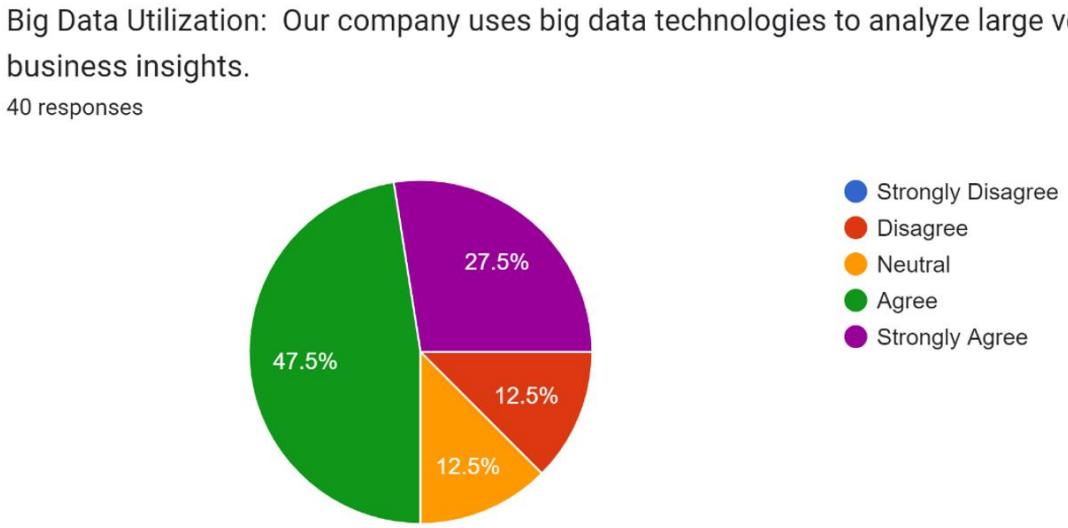

Figure 7.
Pie chart shows that the Agree are most respondents are 47.5%

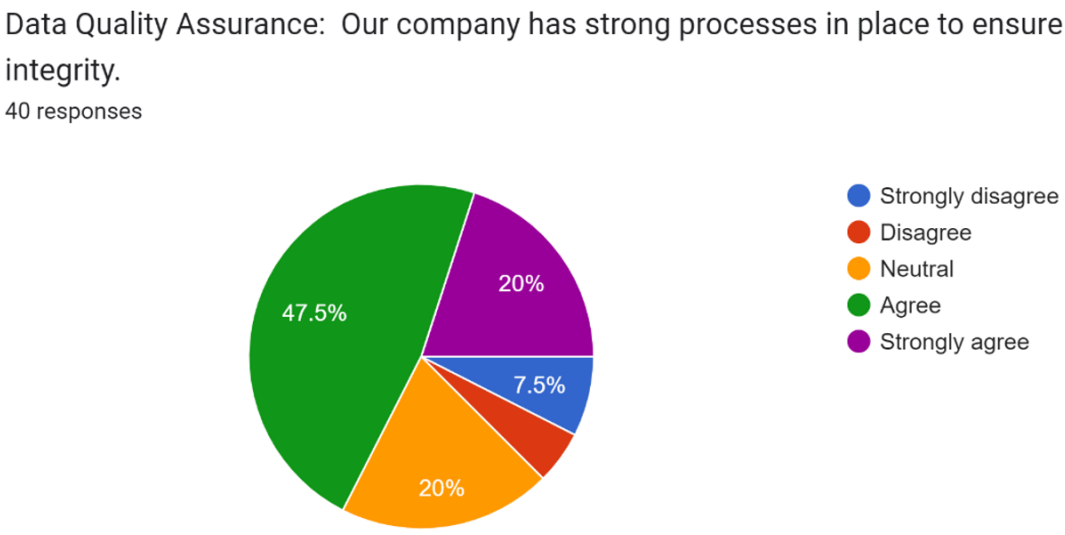

Figure 8.
Pie chart shows that the Agree are most respondents are 47.5%

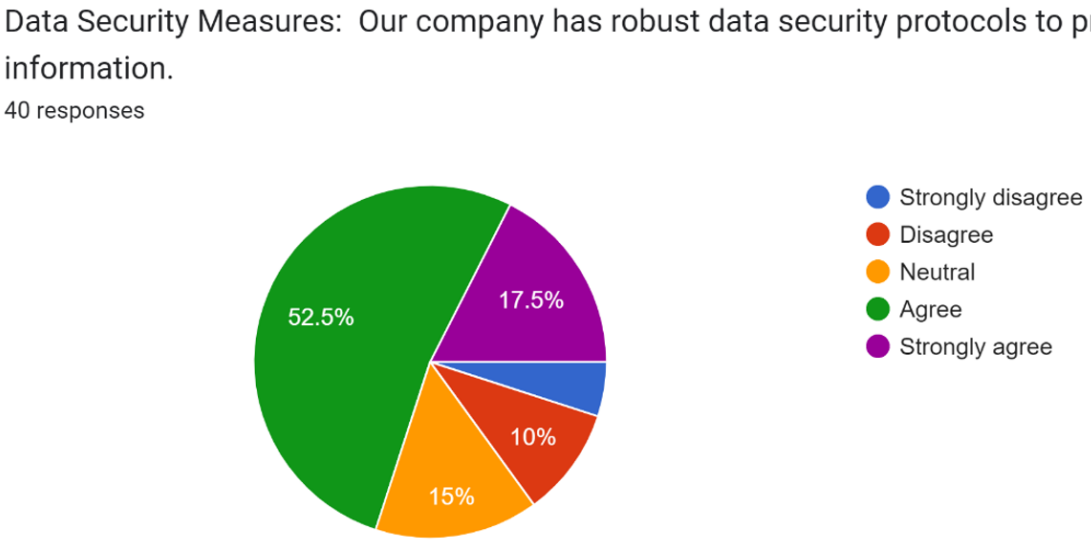

Figure 9.
Pie chart shows that the Agree are most respondents are 52.5%.

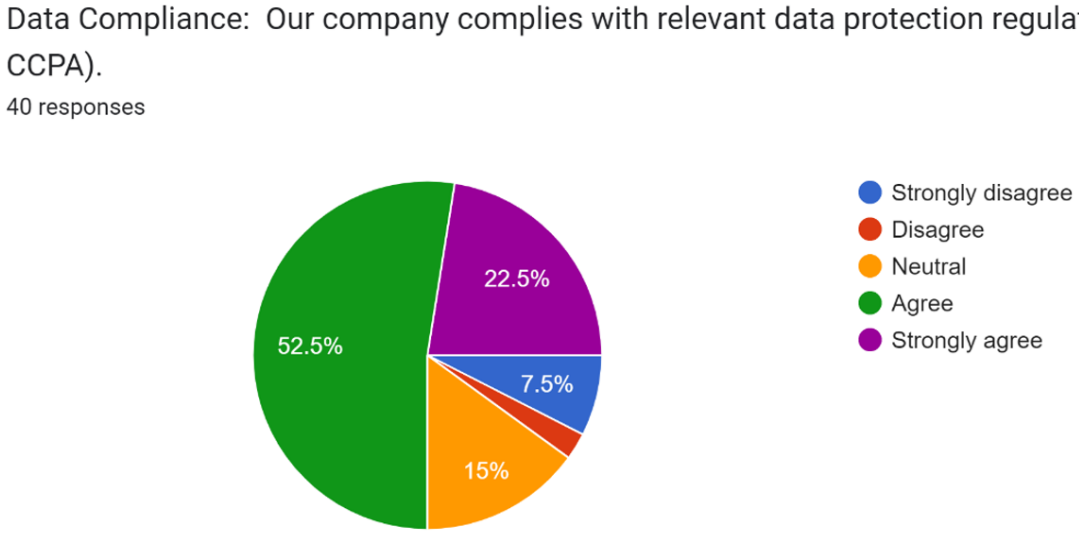

Figure 10.
Pie chart shows that the Agree are most respondents are 52.5%.

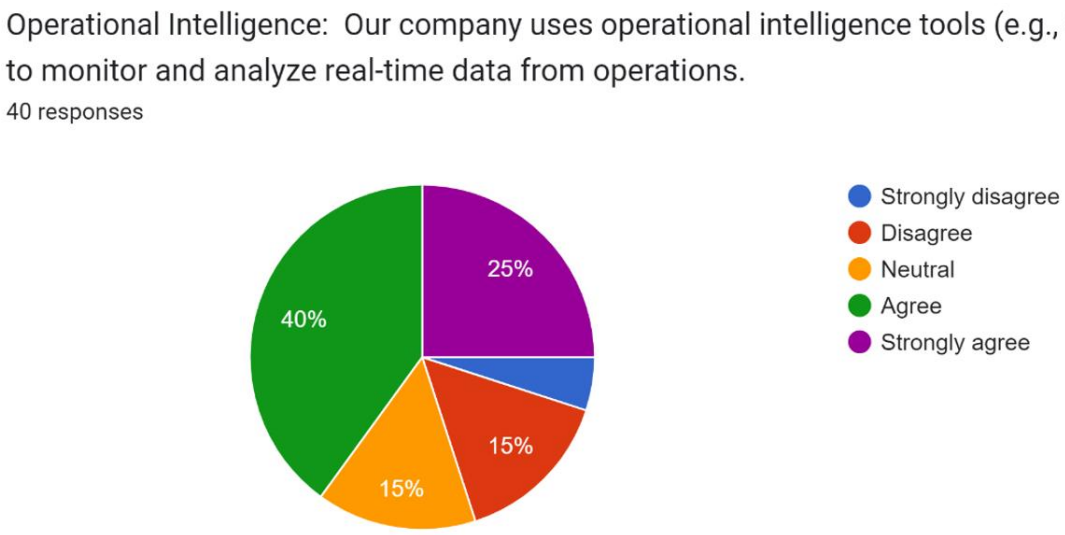

Figure 11.
Pie chart shows that the Agree are most respondents are 40%.

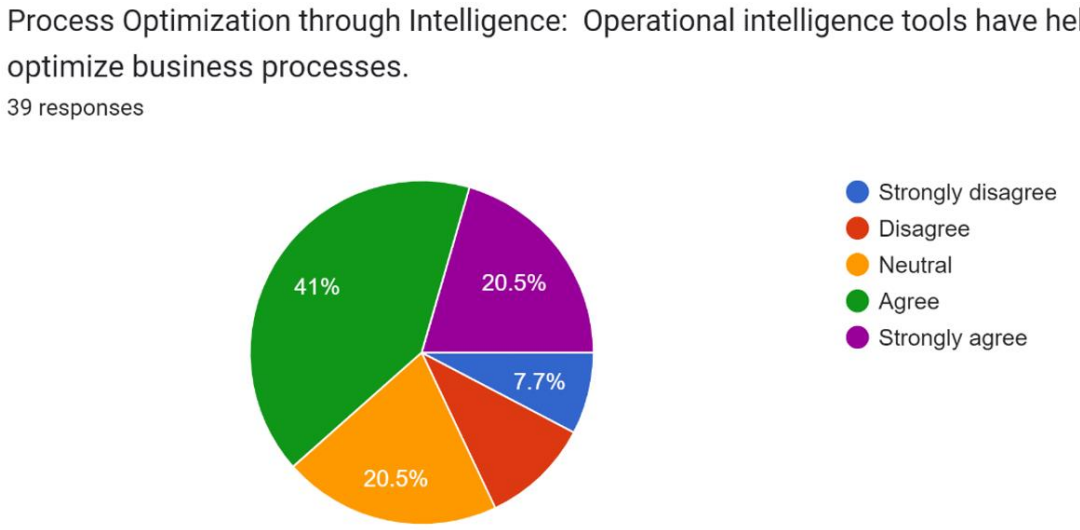

Figure 12.
Pie chart shows that the Agree are most respondents are 41%

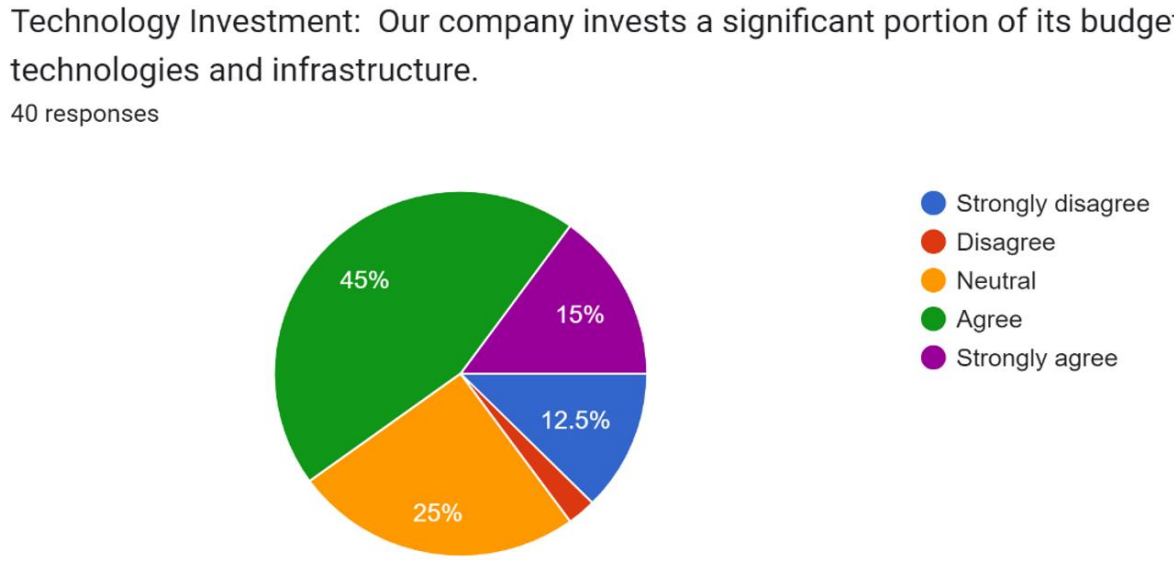

Figure 13.
Pie chart shows that the Agree are most respondents are 45%.

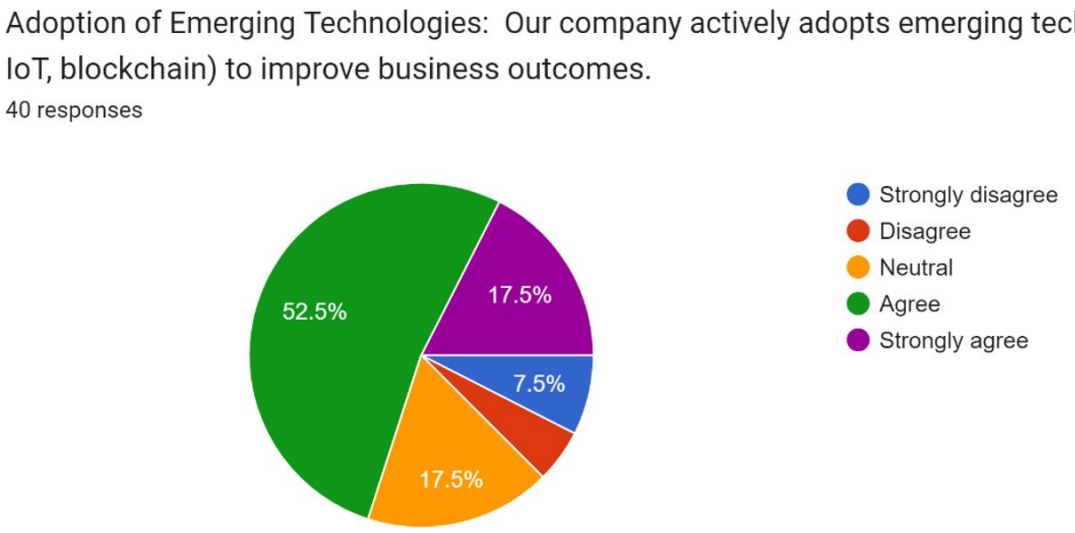

Figure 14.
Pie chart shows that the Agree are most respondents are 52.5%.

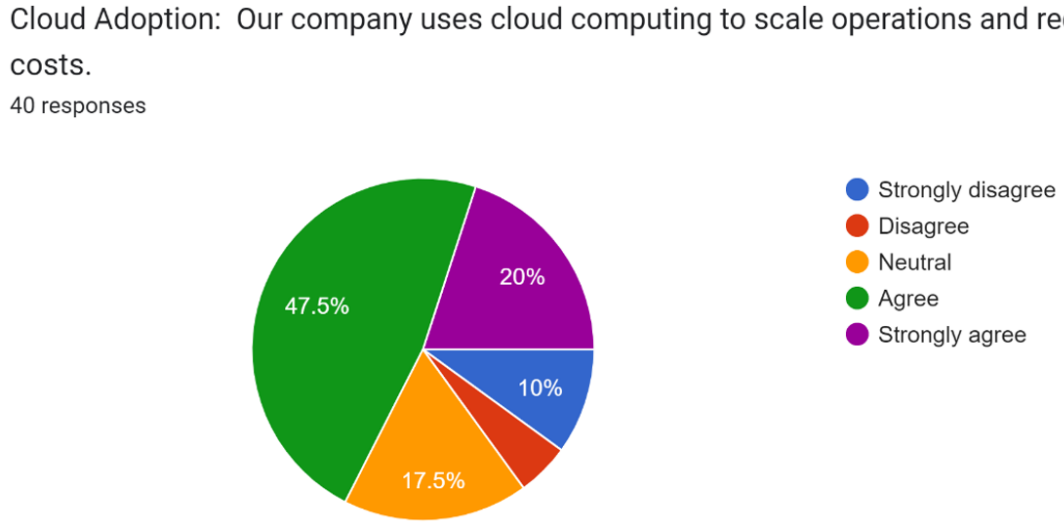

Figure 15.
Pie chart shows that the Agree are most respondents are 47.5%.

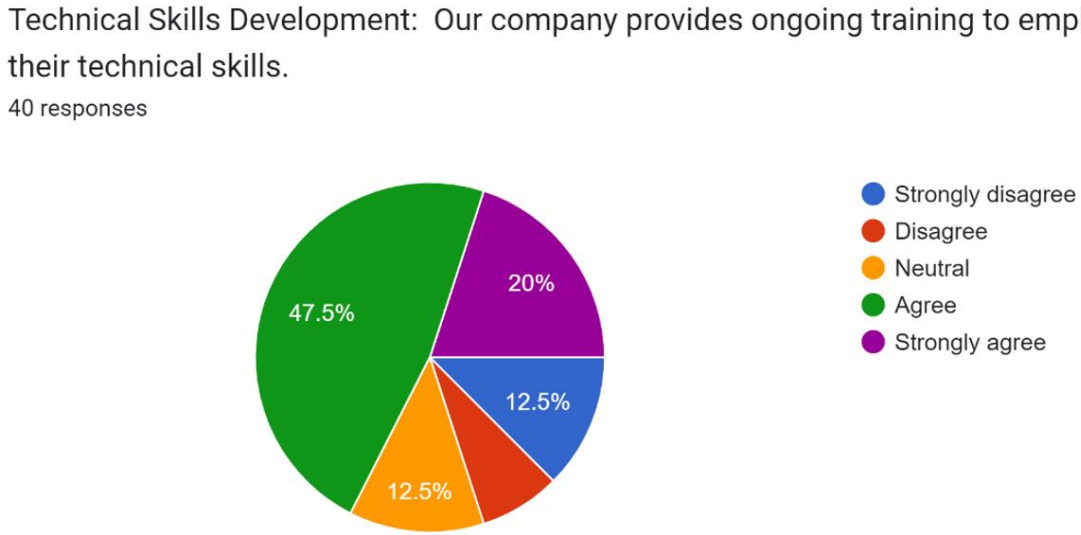

Figure 16.
Pie chart shows that the Agree are most respondents are 47.5%.

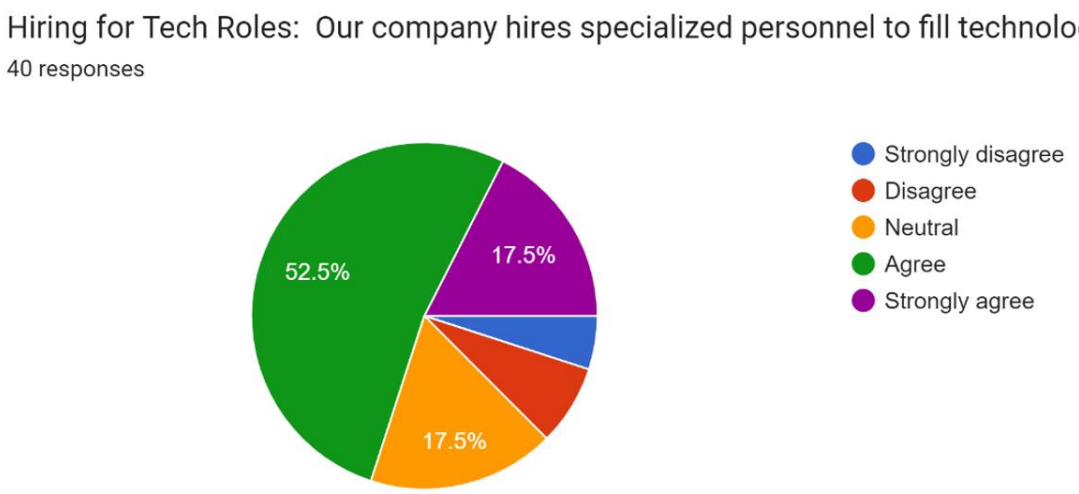

Figure 17.
Pie chart shows that the Agree are most respondents are 52.5%.

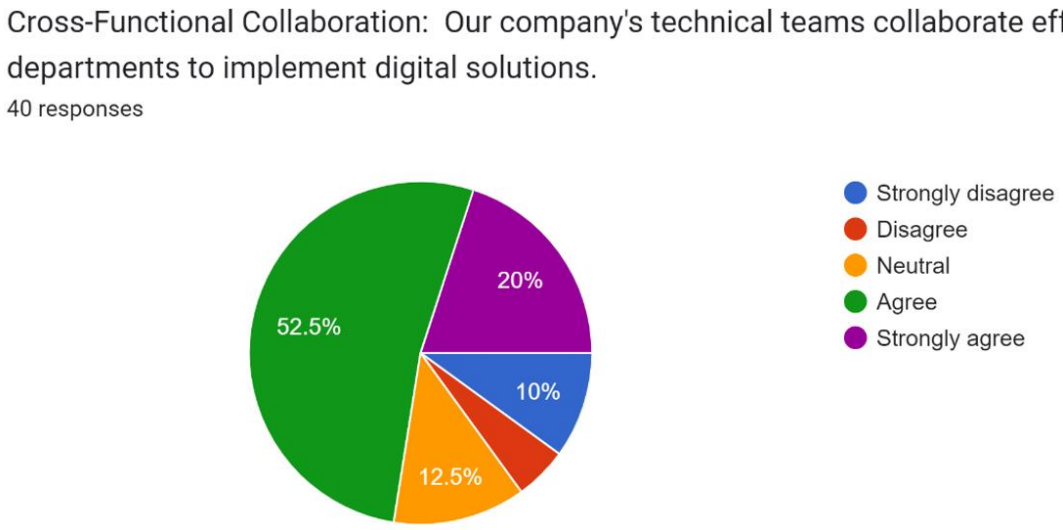

Figure 18.
Pie chart shows that the Agree are most respondents are 52.5%

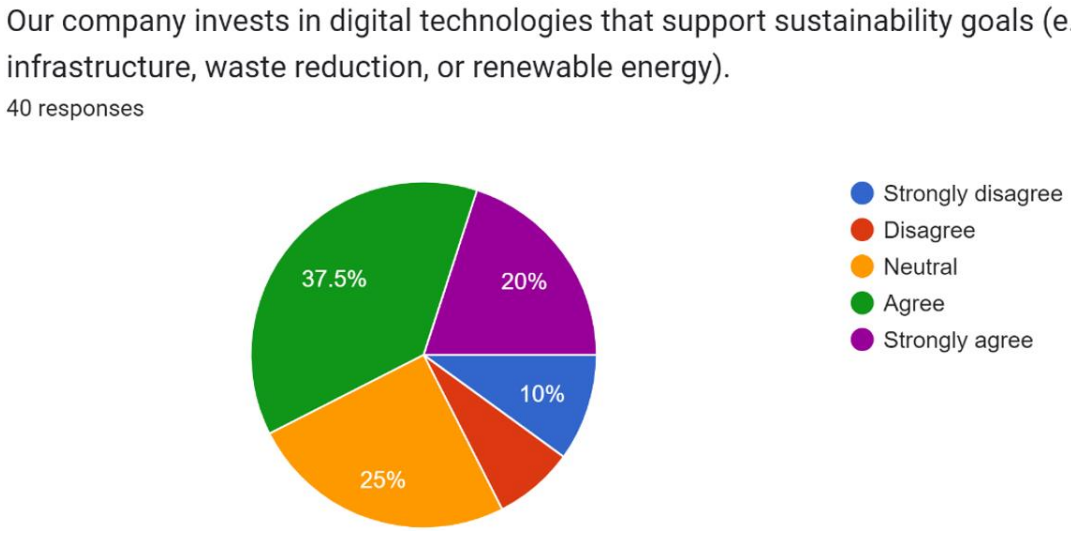

Figure 19.
Pie chart shows that the Agree are most respondents are 37.5%

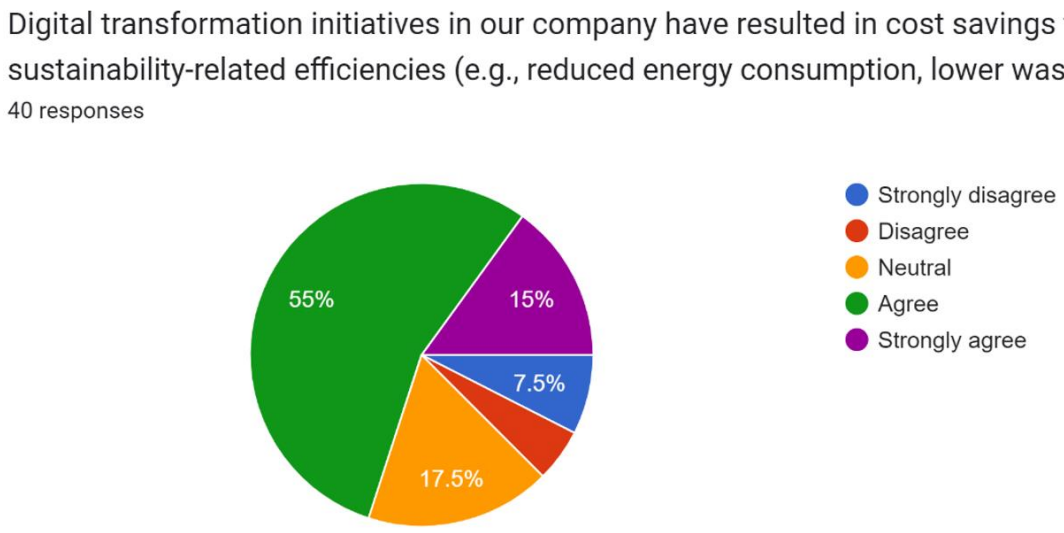

Figure 20.
Pie chart shows that the Agree are most respondents are 55%.

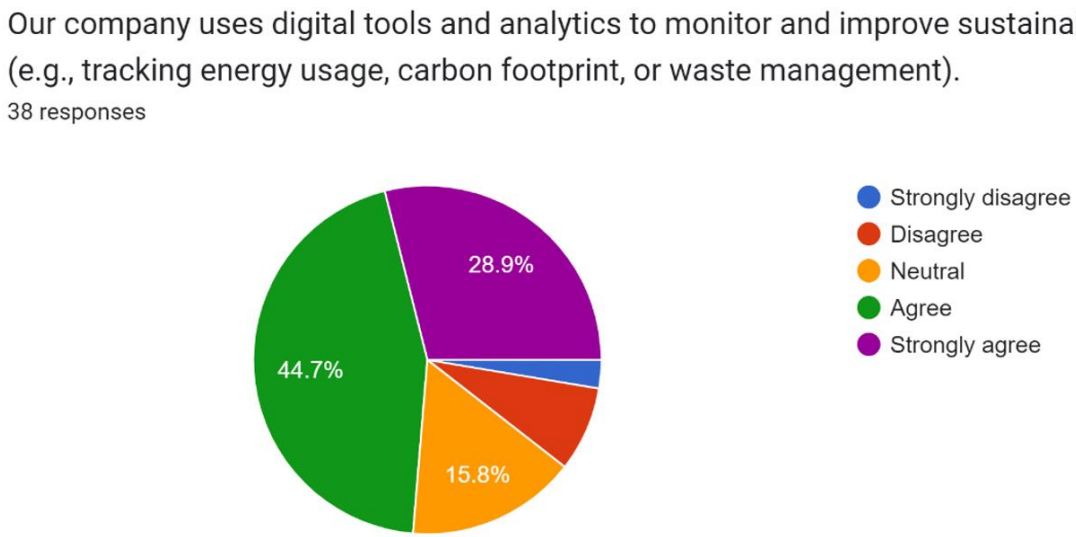

Figure 21.
Pie chart shows that the Agree are most respondents are 44.7%

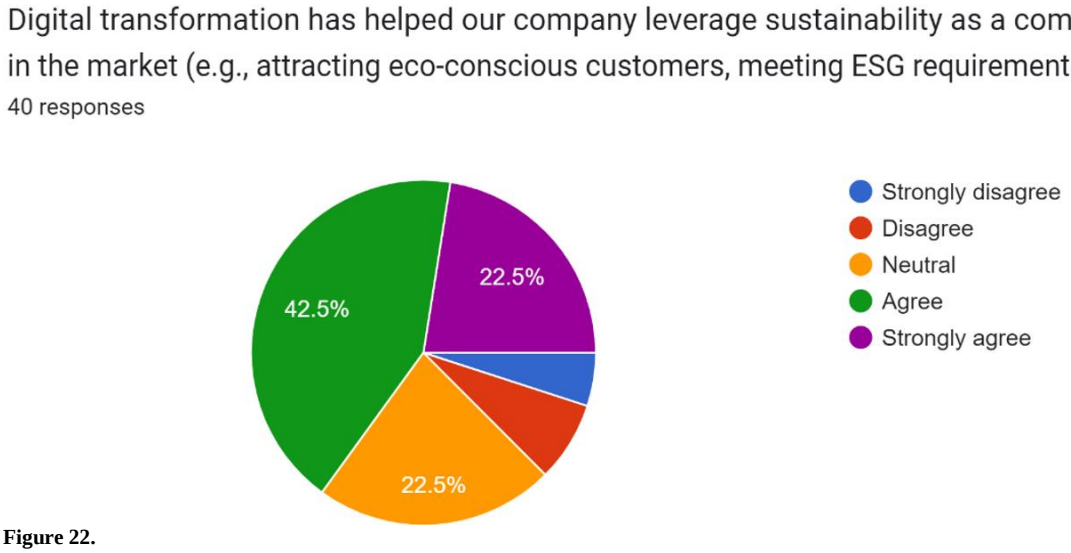

Figure 22.
Pie chart shows that the Agree are most respondents are 42.5%.

Table 1.
Descriptive Statistics of the Each Variable.

Descriptive Statistics					
	N	**Minimum**	**Maximum**	**Mean**	**Std. Deviation**
Our company has implemented automation	41	1	5	3.15	1.333
Robotic Process Automation	41	1	5	3.17	0.998
Efficiency Through Automation	41	1	5	3.41	1.072
Data Driven Decision Making	41	1	5	3.68	0.960
Data Analytics Tools	41	1	5	3.37	0.968
Big Data Utilization	41	1	5	3.88	1.077
Data Quality Assurance	41	1	5	3.37	1.019
Data Security Measures	41	1	5	3.39	0.972
Data Compliance	41	1	5	3.32	0.934
Operational Intelligence	41	1	5	3.68	1.105
Process Optimization through Intelligence	41	1	5	3.49	1.287
Technology Investment	41	1	5	3.15	1.062
Adoption of Emerging Technologies	41	1	5	3.61	1.093
Cloud Adoption	41	1	5	3.41	0.805
Technical Skills Development	41	1	5	3.15	1.333
Hiring for Tech Roles	41	1	5	3.17	0.998
Cross Functional Collaboration	41	1	5	3.41	1.072
Sustainability Investment	41	1	5	3.68	0.960
Cost Savings	41	1	5	3.37	0.968
Monitor Improvement	41	1	5	3.88	1.077
Competitive Advantage	41	1	5	3.37	1.019
Valid N (listwise)	41				

This row represents the first variable in your dataset, for example your company has adopted automation, "Robotic Process Automation" and etc. The column holds the number of observations (the response) for each variable. Consequently, the response to 41 plus each of the variable totals is 41. The lowest possible number obtained for each variable. For instance, for the variable "Our Company has implemented automation," the least value is 1. The greatest values recorded were for all the variables. For instance, for “Our organization has put automation into place", the highest value would be 5. The average for each variable. It is the most prevalent value that is enshrined in the data. One of the factors is that the sample average for the influencing factor "Our Company has implemented automation" is 3. 15. We telling the spread of the data around the mean. It will display the magnitude of variation or the deviation which have been made from the mean. The mean standard deviation for "Our business has put automation in place" is 1. 333.

Interpretation:

The factors associated with the digital transformation projects like the economy (for example, the idea of the digital transformation initiatives in terms of economic relationships such as trade between countries) or the business cycle (the process of the expansion of the market with the help of new communication technologies and the growth of markets) are also considered. g. (automation, data analysis, technology investments) have different meanings i.e. 3 businesses to 3 000 companies. 88, indicating rather high rates of alignment or implementation. The standard deviations are not the same for all the variables, which proves that the level of variability or agreement among respondents is different for each element of digital transformation. Data for a changing "Monitor Improvement" variable resulting in the highest mean (3. 88) that on average may identify highest level of agreement about this variable among respondents. The "Cloud Adoption" variable stands out among the others for having the smallest standard deviation of 0.805 which signifies a considerably less spread of opinions rating for this variable compared to other variables.

Table 2.
Pearson correlation coefficients of the relationships between the factors that are having an influence on digital transformation.

	Automation in Key Business Processes	Robotic Process Automation	Efficiency Through Automation	Data Quality Assurance	Data Security Measures	Data Compliance
Automation in Key Business Processes	1	0.375*	0.464**	0.291	0.283	-0.339*
Robotic Process Automation	0.375*	1	0.680**	0.429**	0.652**	0.262
Efficiency Through Automation	0.464**	0.680**	1	0.316*	0.441**	-0.035
Data Quality Assurance	0.291	0.429**	0.316*	1	0.660**	0.243
Data Security Measures	0.283	0.652**	0.441**	0.660**	1	0.329*
Data Compliance	-0.339*	0.262	-0.035	0.243	0.329*	1

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

Pearson Correlation: It is this table column where the correlation coefficient is calculated between every pair of variables. The correlation coefficient is a number that is between -1 and 1. The one variable rises, the other variable may increase too (positive correlation), while it decreases when the first continues to grow (negative correlation).

Sig. (2-tailed): This shows that the significance level of the correlation coefficient is the associated value. It is the numerical measure of the likelihood of getting the correlation coefficient by chance if there was no true correlation in the population. A significance level of non-zero decimals. "r = 0.5" typically indicates that the relationship is statistically important, which means that the generated r value falls outside of the range of lower and higher values.

Interpretation:

Positive Correlations there is a perfect positive correlation between "Our company has implemented automation" and Efficiency Through Automation (r = 0. 464, p = 0.0002 Moving on to the second core idea, the increased productivity of firms with automation in place is shown in Robotic Process Automation" has a highly positive relationship fact "Efficiency by Automation" (r = 0.68, p < 0. 001) stands for “increases in employee productivity, which suggests that firms that use robotic process automation are more likely to have higher efficiency levels.” Negative Correlations. Our business has the automation, and in the automation, the data compliance is the major aspect (r=.-0.339, p = 0.030) Automation adoption by these businesses could result in higher data compliance because of the fact they’ve moved from control.

Other Significant Correlations. Robotic Process Automation" has a high positive correlation with Data Security Measures (s = 0. 652, p < 0. 001) and "Big Data Utilization", inferring that firms who are using robotics process automation usually focus on data security and the use of big data. Non-Significant Correlations. While some of the pair correlations are tangible - for example, between "Data Quality Assurance" and "Efficiency through Automation", others remain more obscure and interconnected. (0.316, p = 0.042), are not significant at the level. 05 level.

Table 3.
Pearson correlation coefficients between each variable associated.

	Hiring for Tech Roles	Cross Functional Collaboration	Sustainability Investment	Cost Savings	Monitor Improvement	Competitive Advantage
Hiring for Tech Roles	1.000	0.680**	0.423**	0.451**	0.113	0.429**
Cross Functional Collaboration	0.680**	1.000	0.374*	0.211	0.110	0.316*
Sustainability Investment	0.423**	0.374*	1.000	0.477**	0.373*	0.530**
Cost Savings	0.451**	0.211	0.477**	1.000	0.308*	0.596**
Monitor Improvement	0.113	0.110	0.373*	0.308*	1.000	0.497**
Competitive Advantage	0.429**	0.316*	0.530**	0.596**	0.497**	1.000

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

Pearson Correlation: This column represents the correlation coefficient between each variable with the other. The correlation coefficient can be expressed by a real number between -1 and 1. Positive correlation, refers to a situation where two variables are directly related, as one of them tends to increases, the other tends to increases directly with it. On the other hand, negative correlation, indicate an inverse relationship, where as one variable increase, the other tends to decrease.

Sig. (2-tailed): The level of this coefficient is also displayed. It exhibits the possibility of seeing the correlation coefficient by accident if there were no true correlation in the population by chance. The effect size of 0.05, indicates that the correlation is statistically significant.

Interpretation:

Training for Technology Positions and Cross-Functional Communication (r = 0). 680, p < 0. 001), in this consideration, the connection between the Sustainability Investment and the Cost Savings has been considered (r = 0). 477, p = 0. 002), Money Saver and Development of the project (r = 0. 308, p = 0. 050).

Among the major themes of the passage, you will encounter "Monitor Improvement" (r = 0) and Competitive Advantage (r = 0). 497, p = 0. 001).

Negative Correlations, It seems that both of the variables mentioned are positively correlated to life expectancy. Other Significant Correlations, Competitive Advantage was found to have a highly positive correlation with "Hiring for Tech Roles" (r = 0.429, p = 0.005 Meanwhile, the finding from Spearman's calculated correlation (r = 0.05), "Cross Functional Collaboration" (ρ = 0.05), highlights the significant and positive correlation between the success of product innovation and the collaborative relationship between different departments in an organization. 0.316, p = 0.044 ESG ("Ethical Sustainability Governance"), "Sustainability investment" and "Social responsibility" (r = 530, p < 0. (001) shows that the companies with higher competitive edge are mostly inclined to hire people for tech roles, cross-functional collaboration, and sustainability investment. Non-Significant Correlations. Some victories or trends, for example, must be attributed to the fact that the sustainable strategy focused on "Monitor Improvement" and "Hiring for Tech Roles" (r = 0.113, p = 0.482, the struggle of two respectively, is not statistically significant in regard to the overall story. 05 level.

Table 4.
Model Summary Regression Model.

Model Summary[b]				
Model	**R**	**R Square**	**Adjusted R Square**	**Std. Error of the Estimate**
1	0.519[a]	0.269	0.210	0.861

Note: a. Predictors: (Constant), Efficiency Through Automation, Automation in Key Business Processes, Robotic Process Automation. b. Dependent Variable: Cost Savings.

R: The multiple correlation coefficient (otherwise called the multiple R) represents the degree and direction of the linear relationship between the predictors and the dependent variable. On the contrary, in this, model, the coefficient is the multiple correlation. 519.

R Square: R^2 implies “R-squared” and it implies the variable that is predictable from the dependent variables. In this model, variance of 26%. Our model only explains 9% of the factors that cause "Cost Savings" due to "Efficiency Through Automation," "Our company has put automation in key business processes," and Robotic Process Automation.

Adjusted R Square: The value of variables was modified to make R^2 adjust according to the number of predictors in the model, and this, in turn, gives a more accurate estimate. In this model, adjust R square is 0.210.

Std. Error of the Estimate: It is the degree to which the residuals (the differences between the dependent and observed values) tend to be around zero (i.e. the average value of the residuals), and thus serve as a measure of spread. Here was the case of the ordinary error of estimate being 0. 861.

Interpretation:

Combined the predictors "Efficiency Through Automation," "Our company has implemented automation in key business processes," and "Robotic Process Automation" explain about 26. Of the entire variance observed, the factor with the biggest contribution has been documented to be 9% for "Cost Savings.

The R^2 changed, which means that the improvement in explanatory power of the model when taking into account multiple predictors is less than that when dealing with one predictor.

The standard error of the estimate shows the average deviation of the observed values from the predicted values of “Cost Savings”.

In principle, the model brings some predictive power however there may be overlooked factors beyond the model which may also role play in "Cost Savings." Thus, revision of the model could be worth considering, as it can better model predictively.

Table 5.
Analysis of Variance ANOVA.

ANOVA[a]					
Model	**Sum of Squares**	**df**	**Mean Square**	**F**	**Sig.**
Regression	10.096	3	3.365	4.542	0.008[b]
Residual	27.416	37	0.741		
Total	37.512	40			

Note: a. Dependent Variable: Cost Savings.
b. Predictors: (Constant), Efficiency Through Automation, Automation in Key Business Processes, Robotic Process Automation.

Sum of Squares (SS): This is the sum of the square differences between the predicted values and the mean of the dependent variable.

Degrees of Freedom (DF: This signifies how many clusters there are, which is what is used for estimating the parameter if a single piece of information is received. For the regression model, DF are 3 (there are three predictors in this case) and the DF is none other than the total number of observations minus the number of predictors minus 1.

Mean Square: This is the sum of the squares divided by the degrees of freedom. It is the depiction of how accurately each predictor explains the average variation.

F Value: The F statistic is the ratio of mean square residuals to mean square fit. It is the ultimate test for the efficacy of the regression model.

Sig. (p-value): It is this p-value that goes to F values. It shows us how likely we might see the F statistic by reject if the null hypothesis (i.e. assuming there is no connection between predictors and the dependent variable) were true by chance.

Interpretation:

The regression model is statistically significant, as is revealed by the significant F-statistic (F = 4.542) and the p-value of 0.0008. The research findings were statistically significant for the adjustment of the dietary recommendation with $\alpha < 0.05$.

The latter implies that the model would accurately perceive at least one predictor that is significantly related to the independent variable Cost Savings.

Nevertheless, the coefficients of the individual predictors must be understood to know what their specific contributions to the prediction of Cost Savings.

Table 6.
Coefficient of Determination.

Coefficients[a]					
Model	**Unstandardized Coefficients (B)**	**Std. Error**	**Standardized Coefficients (Beta)**	**t**	**Sig.**
(Constant)	2.239	0.596		4.628	0.000
Automation in Key Business Processes	-0.188	0.181	-0.250	-1.042	0.304
Robotic Process Automation	0.587	0.187	0.600	3.115	0.004
Efficiency Through Automation	-0.073	0.182	-0.103	-0.403	0.690

Note: Dependent Variable: Cost Savings.

Unstandardized Coefficients (B): These coefficients are the measure of the change in the dependent variable (that is, "Cost Savings") for a one-unit change in the predictor variable, with other predictors being held constant.

Std. Error: This part of the output has the standard errors related to coefficient estimates. It determines the degree of the coefficient change.

Standardized Coefficients (Beta): These coefficients are the standardized variables that show the change in the dependent variable in the units of standard deviation for a one-standard deviation change in the predictor variable. The standardized coefficients permit equalization among variables with different scale, making it possible to compare the importance of an independent effect across predictors.

The t statistic indicates the relative value of the coefficient to its standard error. It is meant to prove the null hypothesis that the coefficient is equal to zero.

Sig. (p-value): Now, what you've got is the p-value connected with the t statistic. This indicates the likelihood of observing the coefficient estimate if the null hypothesis (no correlation) were true if the alternative hypothesis (a correlation) is observed.

Interpretation:

The constant term acts as an estimation of the value of "Cost Savings" when all the predictor variables are zero. In this model 2.339 (p-value < 0. 001), with a higher significance, explains "Cost Savings" through the "Cost savings" dimension.

Our company has implemented automation: This predictor has a coefficient of -0.181, but this is not statistically significant (p = 0.126). This implies that the level of agreement with the statement "Company has implemented automation" does not significantly impact the "Cost Savings" when the other predictors in the model are considered.

Robotic Process Automation: The predictor which has a value of 0.583 is a predictor. Is a statistically significant value (p = 0.004). It means that with every one-unit increase in the agreement with the statement Robotic Process Automation, Cost Savings will be approximately 0.583 units. Efficiency through Automation: This variable can be regarded as predictor in relation that it has a -0. 073, a is the relationship between two of the items, "Efficiency through automation" and "Cost savings", which is not statistically significant (p = 0.690). This indicates that there is not a statistically significant correlation between the statement "Efficiency through automation" and "cost savings" in this model.

Scatter Plot

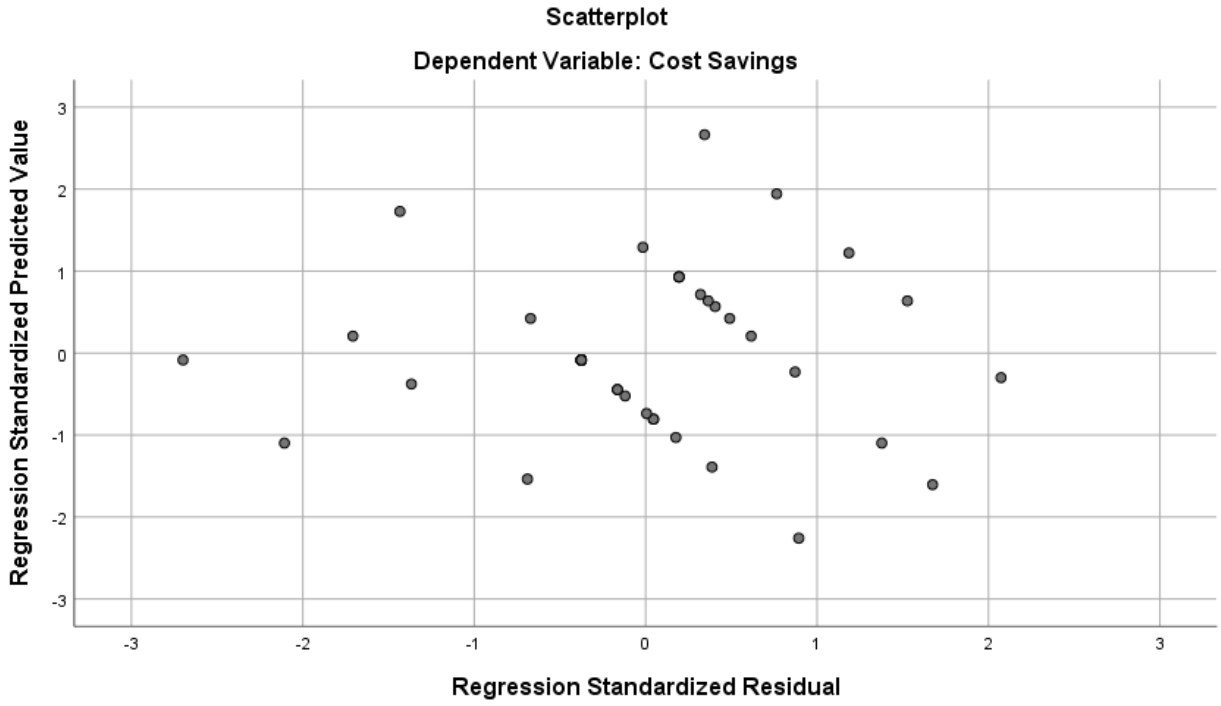

Figure 23.
Scatter plot of cost saving residual.

Table 7.
Model Summary of Regression Analysis.

Model Summary[b]				
Model	**R**	**R Square**	**Adjusted R Square**	**Std. Error of the Estimate**
1	0.771[a]	0.595	0.562	0.641

Note: a. Predictors: (Constant), Data Compliance, Data Quality Assurance, Data Security Measures.
b. Dependent Variable: Cost Savings.

R: The multiple correlation coefficient (hereafter denoted as Multiple R) signifies the linearity and direction of the link between predictors and the dependent variable. In this model, several correlation coefficients have a multiple correlation value of 0.771.

R Square: The coefficient of determination (R^2) represents the proportion of variance in the dependent variable that is predictable from the independent variables. The overview is 59 percent thus as in this framework. There is 5% Predictor Variance among cost savings, identifying the factors which are "Data Compliance", "Data Quality Assurance" and "Data Security Measures".

Adjusted R Square: This figure modifies the R^2 by taking into account the number of predictors in the model, which gives a more precise estimate of the goodness of fit of the model. In this model, the adjusted R-squared value would turn out to be equal to 0. 562.

Std. Error of the Estimate: In this case, it is displaying the significance of the standard deviation of the residuals (the differences between the estimated values of the independent variable and dependent variable). In this model, the standard error of the estimate is 0. 641.

Interpretation:

Data Compliance, Data Quality Assurance, and Data Security Measures, which are between them responsible for over 59% of variation in the dependent variable, enshrine them as the main predictors. The adjusted R^2 indicates that the model's explanatory power decreases slightly when taking into consideration the number of predictors. The standard error of the estimate stands for the norm mean deviation of the real and the predicted "Cost Savings."

Table 8.
Analysis of variance ANOVA.

ANOVA[a]					
Model	**Sum of Squares**	**df**	**Mean Square**	**F**	**Sig.**
Regression	22.306	3	7.435	18.093	0.000[b]
Residual	15.206	37	.411		
Total	37.512	40			

Note: a. Dependent Variable: Cost Savings.
b. Predictors: (Constant), Data Compliance, Data Quality Assurance, Data Security Measures.

Interpretation:

In addition, the regression model is considered to be statistically significant, as news stories with more sources, these lead to a positive significant F statistic (F = 18.093) and consequently a low p-value of 0. In conclusion, a change in the interest rates had a significant impact on GDP levels tending to decrease in the long-term ($p < 0.05$).

This conclusion can be deduced from the fact that at least one of the predictors in the model is correlated with the dependent variable Cost Savings.

The average impact factors of "Data Compliance," "Data Quality Assurance," and "Data Security Measures" help explain the differences in the "Cost Savings" variables.

Table 9.
Coefficients of Determination.

Coefficients[a]					
Model	**Unstandardized Coefficients (B)**	**Std. Error**	**Standardized Coefficients (Beta)**	**t**	**Sig.**
(Constant)	0.028	0.466		0.060	0.953
Data Quality Assurance	0.273	0.133	0.282	2.046	0.048
Data Security Measures	0.395	0.143	0.388	2.758	0.009
Data Compliance	0.449	0.130	0.385	3.451	0.001

Note: a. Dependent Variable: Cost Savings.

Interpretation:

The look forces the perception when all the predictors are not bearing on the choice so, to get the meaning of "Cost Savings" the term constant represents 0. This time it is 0.028, p = 0.953 meaning that it is not significantly different from 0.

Data Quality Assurance: This predictor is the one, which possesses a coefficient of 0. 273, at a notable p-value (p = 0.046). It indicates that for every one-unit increase in "Data Quality Assurance," "Cost Savings" will be inclined to rise by approximately 0. 273 units.

Data Security Measures: This indicator has partial change. In regression analysis, 325, with the significance of (p=0.029). It means that given the one unit increase in "Data Security Measures" the "Cost savings" will be increased around 0. 325 units.

Data Compliance: The above predictor has a coefficient of 0.397 in which p-value is statistically significant (p = 0.001). It implies that healthy “Data Compliance" level have a tendency to influence "Cost Savings" such that as "Data Compliance" increases by one unit, then "Cost Savings" is expected to increase by about 0. 397 units.

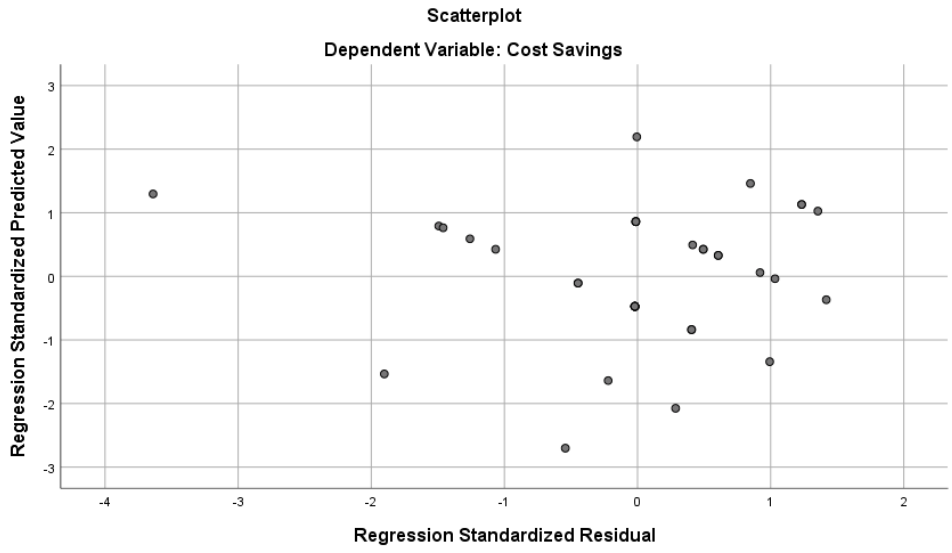

Figure 24.
Scatter plot of cost saving residual.

Table 10.
Model Summary of Regression Analysis.

Model Summary[b]				
Model	**R**	**R Square**	**Adjusted R Square**	**Std. Error of the Estimate**
1	0.519[a]	0.269	0.210	0.861

Note: a. Predictors: (Constant), Cross Functional Collaboration, Technical Skills Development, Hiring for Tech Roles.
b. Dependent Variable: Cost Savings.

R: Multiple correlation coefficient is another name of the multiple R that measures the strength and direction of the linear proportion between independent or predictor along with the dependent variable. This one is no exception: r = 0. 519.

R Square: The coefficient of determination R^2 is the measure of the proportion of the variance in the dependent variable that is the result of the independent variables. Under this model, we have been given around a total of twenty-six books. The five explanatory factors account for 9% of the variance in "Cost Savings." These factors are: "Cross Functional Collaboration," Technical Skills Development," and "Hiring for tech roles."

Adjusted R Square: This value facilitates the comparison between the R^2 values because it takes into consideration the number of predictors in the model, thus yielding a more correct estimation of the model's goodness of fit. In this model, we obtain adjusted SS which is 0. 210.

Std. Error of the Estimate: This illustrates the standard deviation of the residuals, which can be calculated by taking the deviation between the observed and the estimated values of a dependent variable. In this model, the standard error of the estimate is 0. 861.

Interpretation:

The predictors "Focussing on Team Crossover," "Acquiring/Developing Skills," and "Targeting New Hires to Take Technological Roles" have the power to explain as much as 26%. 9% "Among factors that shape "Cost Savings," "the share of individual factors is 9%.

The adjusted R^2 indicates that the model's explanatory power is slightly lower when the number of predictors is included.

The standard error of the estimate shows in average how the predicting values from the observed values deviate from the true value of "Cost Saving".

Table 11.
Analysis of variance ANOVA.

ANOVA[a]

Model	Sum of Squares	df	Mean Square	F	Sig.
Regression	10.096	3	3.365	4.542	0.008[b]
Residual	27.416	37	0.741		
Total	37.512	40			

Note: a. Dependent Variable: Cost Savings.
b. Predictors: (Constant), Cross Functional Collaboration, Technical Skills Development, Hiring for Tech Roles.

Interpretation:

Linear regression model for data shows it is also statistically significant because F statistic (F = 4.542) is significant, and p-value (0) is less than 0 for reference data set. Our study shows a significant decrease ($p < 0.05$) in body mass index (BMI) after the 12-week physical training program.

This implies that at least one of the predictors in the model is significantly related to the cost saving dependent variable.

The factors Cross Functional Collaboration, Technical Skills Development, and Hiring for Tech Roles together have a combined impacting effect on Cost Savings.

Table 12.
Coefficients of Determination.

Coefficients[a]

Model	Unstandardized Coefficients (B)	Std. Error	Standardized Coefficients (Beta)	t	Sig.
(Constant)	2.339	0.505		4.628	0.000
Technical Skills Development	-0.181	0.116	-0.250	-1.567	0.126
Hiring for Tech Roles	0.583	0.187	0.600	3.116	0.004
Cross Functional Collaboration	-0.073	0.182	-0.081	-0.403	0.690

Note: a. Dependent Variable: Cost Savings.

Interpretation:

For the case where all the predictor variables would have absolutely zero output, "Cost Savings" is essentially the constant term. The B-value is 2.339, with a highly significant probability at p = 0. 000 that this is different from zero.

Technical Skills Development: The second input predictor has an influence coefficient of -0181. The mean value of the students was 181 with a non-significant p-value (p = 0.126). This implies that there is no statistically significant relationship between "Technical Skills Development" and "Cost Savings" at the 0.05 significance level.

Hiring for Tech Roles: This variable has a coefficient of zero. 5. 83, there was a binary representation (p = 0. 004). It suggests that as "Hiring for Tech Roles" increases by one unit, wages increase by about 0. 583 units.

Cross Functional Collaboration: This forecaster has a coefficient of -0. Among many, (-0.073, p = 0.690) with statistically insignificant relation between "Cross Functional Collaboration" and "Cost Saving". 05 significance level.

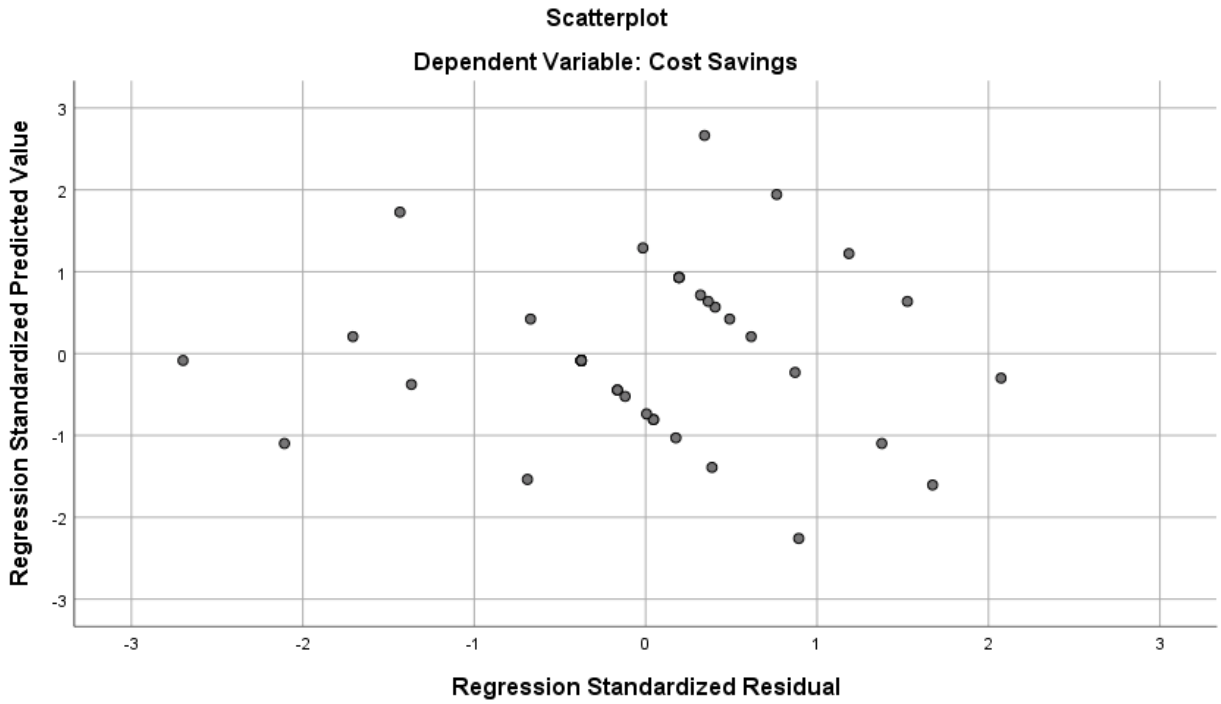

Figure 25.
Scatter plot of cost saving residual.

Table 13.
Model Summary of Regression Analysis.

Model Summary[b]				
Model	**R**	**R Square**	**Adjusted R Square**	**Std. Error of the Estimate**
1	0.626[a]	0.391	0.342	0.785

Note: a. Predictors: (Constant), Competitive Advantage, Monitor Improvement, Sustainability Investment.
b. Dependent Variable: Cost Savings

R: The multiple correlation coefficient (also called the multiple R) stands for the strength and direction of the linear relationship between the predictors and the dependent variable. The simple regression equation on television advertisement and sales, whereas in this methodology, the multiple coefficients of equalization is found to be zero. 626.

R Square: R-squared R^2 value suggests the amount of dependent variable variances that could be explained by the independent variables. In this model, the clouds make about 39%. The variation of the "Cost Savings" metric can be explained by just 1 percent from the factors "Competitive Advantage," "Monitor Improvement," and "Sustainability Investment," and hence these factors can be considered as being very important.

Adjusted R Square: This adjustment referred as R^2 which basically represents the squared value of variance that is accountable by the model's predictive power. In this model, the adjusted R^2 is 0. 342.

Std. Error of the Estimate: This stands for the standard deviation of the residuals (the residuals are those scattered deviations from the predicted values of the dependent variable). The regression model with the standard error of the estimate being zero has been used in this model. 785.

Interpretation:

The "Competitive Advantage," "Monitor Improvement," and "Sustainability Investment" predictors together explain about 39% change in ""Cost-Cutting"" determines the outcome.

The R^2 adj of 0.9078 shows the slight reduction in explanatory power of the model when considering the number of predictors.

The standard error of the estimate represents the average deviation of the actual values from the predicted values of "Cost Savings.

Table 14.
Analysis of variance ANOVA.

ANOVA[a]					
Model	**Sum of Squares**	**df**	**Mean Square**	**F**	**Sig.**
Regression	14.686	3	4.895	7.934	0.000[b]
Residual	22.826	37	0.617		
Total	37.512	40			

Note: a. Dependent Variable: Cost Savings.
b. Predictors: (Constant), Competitive Advantage, Monitor Improvement, Sustainability Investment.

Interpretation:

The whole regression model is statistically significant with an F value of 7.934 Its t-test and p-value is 0.000 and 0. To sum up, there is no difference between and movies in the given terms above, and both can provide an immersive experience for the viewers, but they come with own abilities, and viewers have their own choices.

This implies that the difference in "Cost Savings" which is explained by the predictors "Competitive Advantage," "Monitor Improvement," and "Sustainability Investment" is statistically significant and is not due to chance.

Thus, in this context, there is at least one predictor in the model that shows the higher odds of a significant association with "Cost Savings."

Table 15.
Coefficient of Determination.

Coefficients[a]					
Model	**Unstandardized Coefficients (B)**	**Std. Error**	**Standardized Coefficients (Beta)**	**t**	**Sig.**
(Constant)	1.035	0.577		1.794	0.081
Sustainability Investment	0.229	0.154	0.227	1.485	0.146
Monitor Improvement	-0.016	0.134	-0.018	-0.121	0.905
Competitive Advantage	0.460	0.156	0.484	2.959	0.005

Note: a. Dependent Variable: Cost Savings.

Interpretation:

The constant term is the one which expresses the "Cost Savings" estimation when all the predictor variables are zero. Here, the division by 2 is done twice, resulting in it. 0.035, which associates significant association with the p-value of 0.081, which means that it is not at all statistically significant at the conventional significance level of 0.05.

Sustainability Investment: This indicator is supplied with a coefficient of 0. Conclusion confirms a significant association between the consumption of processed meat and the risk of developing colorectal cancer, supported by a p-value of 0.146. The graph shows that for every one-unit increase in "Sustainability Investment," "Cost Savings" should increase by about 1. According to the regression model, for an 8% increase in the spot price we should count on a 0.9% increase in demand. However, this relationship is not statistically significant at the 0.05 confidence level. 05 significance level.

It is the predictor which holds the sign of -0.016 that the probability for the student to get a better grade on the essay after the revision is 0.905. It implies that no appreciable correlation exists between "Monitor enhancement" and "Cost minimization" statistical wise. 0.05 significance level.

Competitive Advantage: In this case, the predictor takes the form of the coefficient number 0. 460, the p-value being so significant that it is 0. 005. It demonstrates that for every 1 unit upgrade of "Competitive Advantage" with percent of "Cost Saving" is likely go up by approx. 0%. R^2 =0.146 represents the share of variation in housing prices that is explained by the explanatory variables combined and is statistically significant at the 0.05 level. 05 significance level.

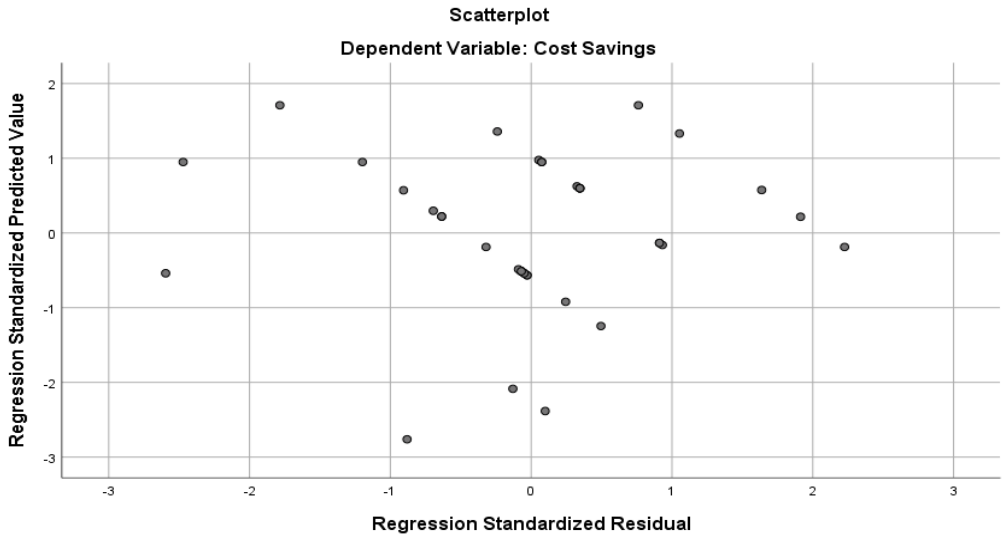

Figure 26.
Scatter plot of cost saving residual.

5. Discussion

Competitive Advantage's Influence on Cost Savings: The marginal significance for the variable “Competitive Advantage” is p value 0.005 (t values), implying that firms to have superior competitive edge are associated with greater cost saving. This conclusion highlights the fact that the positioning and differentiation are the key factors for achieving the financial efficiency. Firms which know how to leverage any competitive advantage effectively are usually able to maximize their outputs, streamline their processes, and cut costs. This is why they are likely to see a boost in their profits.

Limited Impact of Sustainability Investment and Monitor Improvement: Regardless of significance ($p > 0.05$) of either "Sustainability Investment" or "Monitor Improvement", their share of direct impact on the annual cost savings within surveyed enterprises is negligible. This finding indicates that although the sustainability programs and improvements in the monitoring are significant to the overall business performance and accountability, these factors may not be linked to the direct cost-saving benefits. Nevertheless, it should be emphasized that there are some factors that indirectly operate to benefit the cost savings through other channels thus not being supported in this model.

Need for Further Investigation: The zero-significant association between "Sustainability Investment" and "Cost Savings" requires in-depth research to explore whether there is some hidden relationship between these two variables. Further research could be done on the potential mediating or moderating variables that explain the indirect effect of environmentally friendly initiatives on cost savings. Besides, the permission for the use of qualitative tools such as case studies or interviews could be considered to have further insights on the intricate relationship between sustainability activities and financial profits.

Implications for Business Strategy: "Cost Savings" represents a remarkable lesson that competitive positioning has since companies should concentrate on building and sustaining competes advantages via product innovation, quality enhancement, and market segmentation. Managers should constantly evaluate their firm's competitive position and try to find the ways to improve the operational efficiency and cut the costs while keeping or improving the value for customers.

Limitations and Recommendations: While this effort points to the direction of a region’s good governance, it is essential to acknowledge the limitations of the research, such as the sample size and the range of variables examined. Then broader and customized dataset could be explored in order to cover a bigger number of businesses not only from one but rather from different industries. Furthermore, including the factors of operational efficiency, technological adoption, and market dynamics that are not related to the cost savings could give a better picture of the drivers of cost savings in the digital transformation context.

5.1. Limitations

The methodology outlined above has some limitations to providing a conclusive answer to the research questions which are:

i. A relatively small sample size may affect the generalizability of the results.
ii. The reliance on self-reported data from the survey may introduce bias.
iii. Differences across industries may affect the comparability of results.

6. Conclusion

Hence the completed regression analyses are the essential outcome that provides insightful information about the reasons contributing in cost savings of businesses that go through digital transformation. The results indicate that while the competitive advantage is the key factor that produces cost savings across different models, the sustainability investment and monitor improvement do not have any direct effect on cost savings.

One essential component of competitive advantage that has profound repercussions in management processes is strategic differentiation and market positioning, which are heavily relied upon for the achievement of the desired financial efficiencies. Enterprises need is to provide their companies with distinctive market advantages which can be achieved by the dynamic use of disruptive innovations and getting market insights for better decoding of the operations and cost reduction.

Though the investment in sustainability and monitoring of improvement are crucial parts of organizational strategy, their direct impact on cost savings is limited which indicates the need for further study of their indirect influences. While the current study sees beyond sustainability practices and offers a direction for green procurement, it might also pursue more variables and employs qualitative methods to determine these relationships in the context of organizational performance and financial results in further research.

The overall demonstrate the challenge of making tempting options and for so they ensure strategic determination that brings about viable financial performance. Through the drivers of cost savings, the organizations can develop more effective strategies to handle the challenges and opportunities of the digital disruption which will eventually improve their competitiveness and profitability in the long run.

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