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Research article

Assessing The Impact Of Digital Procurement Capabilities On The Supply Chain Performance In Oman

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Abstract

This study investigates the relationship between digital procurement capabilities (DPC) and supply chain performance (SCP) within the Sultanate of Oman's business environment. The research addresses specific questions regarding DPC's impact on organizational supply chain effectiveness. A structured questionnaire was developed using Microsoft Forms and administered to employees across various Omani companies employing digital procurement processes. Data were analyzed using SPSS 26.0, employing descriptive statistics, one-way ANOVA, and simple linear regression analysis. Findings reveal that DPC significantly influences SCP across small, medium, and large enterprises. Results indicate that organizations can enhance procurement efficiency, gain critical insights into supplier performance and market trends, and make informed decisions that strengthen supply chain outcomes through effective integration of digital procurement capabilities. The study demonstrates that digital adaptability in procurement processes serves as a strategic enabler for improved operational dynamics and competitive advantage. Key limitations include potential self-report bias, convenience sampling methodology, and cross-sectional design, which constrain generalizability. Future research should employ longitudinal designs, probability sampling techniques, and multi-source data collection to validate and extend these findings across diverse industrial contexts and geographical settings within the Gulf Cooperation Council region.

Keywords: Digital Procurement Capability, Digital Adaptability, Supply Chain Performance, Sultanate of Oman

1. Introduction

Today's businesses rely heavily on supply networks in the quickly changing global marketplace. Magd *et al.* (2021) argued that the digital transformation of supply chains has revolutionized how businesses deliver goods to customers, manage inventories, and better acquire the finest products and services. Given the

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strategic location of Oman as a regional hub in the Middle East, this research investigates the impact of digital procurement capabilities on supply chain performance in Oman. As supply chains grow in the face of increasing globalization and complexity, procurement skills have become a critical differentiator for companies looking to enhance flexibility, reduce costs, and improve performance. Digital procurement can improve communication and collaboration between suppliers and companies, streamline procurement processes, and reduce operational inefficiencies by adopting digital procurement technologies. These technologies cover a wide range of tools, including blockchain, artificial intelligence, big data analytics, supplier relationship management platforms, and e-procurement systems. All these technologies are essential to improve transparency, automate procurement processes, and provide supply chain managers with useful information.

In recent years, the Sultanate of Oman, an expanding economy, has witnessed notable advancements in trade, logistics, and infrastructure. Oman has grown to be a significant participant in global supply chains, especially in industries like manufacturing, retail, and oil and gas, because of its advantageous location along crucial maritime trade routes. But like many other industries worldwide, supply chains in Oman confront a variety of difficulties, such as fluctuating demand, the requirement for cost effectiveness, problems with managing suppliers, and outside disturbances like pandemics and geopolitical unrest. By strengthening supplier cooperation, cutting delivery times, and increasing supply chain resilience, digital procurement can provide answers to many of these problems (Shrivastava *et al.*, 2024).

In the past, procurement processes in Oman were characterized by traditional manual methods involving lengthy paperwork, in-person negotiations, and sealed bids as stated by Slimi et al. (2021). These methods led to inefficiencies, increased costs, and difficulties in managing suppliers. Inadequate use of technology also led to a lack of openness and real-time data, making it difficult for organizations to make informed decisions. In the past, procurement was often viewed as a back-end administrative activity that prioritized transactional tasks such as order placement, contract negotiations, and logistics management over strategic value. It became clear that procurement could no longer be limited to a tactical role with the primary goal of reducing costs as global supply chains became more complex and market conditions became more volatile. Organizations in Oman were forced to reevaluate their procurement strategy because of the additional exposure brought about by the global COVID-19 pandemic by exposing supply chain vulnerabilities, including poor inventory management and inefficiencies caused by a lack of real-time data. As companies realized the need to integrate technology to improve transparency, efficiency, and strategic decision-making, there has been a slow but significant shift towards digital procurement.

Although digital procurement is still in its infancy in Oman, it has enormous potential to improve supply chains' resilience and efficiency. Aiming to diversify the economy and lessen dependency on oil earnings, the nation's Vision 2040 project highlights the significance of innovation and digitization in several industries (Alshubiri, 2023). This makes it easier for companies to use digital procurement technologies, especially in sectors like retail, manufacturing, and logistics. Many Omani businesses are still in the early phases of adopting digital procurement, despite the possible advantages. It is important and timely to investigate how Oman's supply chain performs in relation to digital procurement skills for several reasons.

1.2 Objectives of the study

We attempted to accomplish the following research objectives.

1. To investigate whether organizations perceived digital procurement capability differs across industry sectors.
2. To examine whether organizational digital procurement capabilities have any statistically significant impact on their supply chain performance.

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2. Literature Review

2.1 Digital procurement capability

The ability of a company to efficiently use different e-procurement procedures to improve supply chain performance is known as digital procurement capabilities. This capability is crucial as it allows organizations to leverage digital technologies to improve operational efficiency and decision-making in procurement activities. Organisational capabilities are divided into two categories in literature: operational capabilities and dynamic capabilities. Digital procurement skills are seen to be dynamic, allowing businesses to innovate and adjust their buying procedures. Businesses need these skills to adapt to shifting market conditions and strengthen their competitive edge.

Hallikas *et al.* (2021) investigated how digital procurement capabilities impact supply chain performance by looking at how firms' data analytics capabilities—which are defined as the capacity to use both internal and external data—affect digital procurement capabilities. Through survey done with 348 respondents form Finnish manufacturing industry and biorefinery enterprises which was comprised of respondents from diverse management levels and industries having an average revenue of €633M. This data was analyzed using appropriate statistical tools and the results suggest that data analytics is essential to improving digital procurement capabilities. Businesses that successfully evaluate both internal and external data can make well-informed decisions that enhance supply chain performance and procurement efficiency. Businesses can learn more about supplier performance, market trends, and operational efficiency by incorporating data analytics into their procurement procedures. Additionally, research shows that supply chain performance and digital procurement capabilities are positively correlated. Businesses that invest in and use digital procurement procedures typically see more supplier collaboration, lower prices, and increased efficiency. This link emphasizes how crucial it is to guarantee the constant and efficient usage of digital tools in addition to having them available.

Despite several restrictions, the study offers insightful information about digital procurement capabilities and how they affect supply chain performance. The findings' applicability to other areas and sectors is restricted by its regional focus and the industrial process sector. It's possible that the limited sample size, sectoral focus, and presumption of early data analytics maturity won't accurately represent the diversity or developments in other contexts. The efficiency of data analytics in procurement procedures may also be hampered by difficulties integrating unstructured external data. These restrictions draw attention to the necessity of doing more extensive research in various sectors, geographical areas, and data analytics maturity levels in order to confirm and expand the results.

Digital procurement is being facilitated by advanced analytics, blockchain, the Internet of Things, robotic process automation (RPA), collaboration tools, and strong cybersecurity technologies. These technologies streamline, automate, and optimize procurement processes to increase productivity, lower costs, and improve supplier relationships. Althabatahet *et al.* (2023) wrote a research paper that aims to fill a key knowledge gap regarding the integration of Industry 4.0 (I4.0) technology into procurement procedures. The study aims to investigate how various technologies, including artificial intelligence (AI) and the Internet of Things (IoT), can improve supply chain management's procurement process' efficacy and efficiency. The study analyses 111 research publications taken from the Scopus database using a thorough literature review technique. I4.0, also known as Procurement 4.0 (P4.0), Big Data, the Internet of Things, Additive Manufacturing, Blockchain, E-Procurement, and Artificial Intelligence are among the seven subtopics into which the research papers are divided. Strict PRISMA rules are followed during the evaluation process to guarantee a solid approach and openness. In the end, the analysis shows that I4.0 technologies particularly blockchain and e-procurement—have drawn a lot of interest in literature. These technologies provide a variety of value propositions, including improved data protection, shorter lead

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times, cost optimization, and simplified supplier evaluation.

Organizations can enhance supply chain operations and make data-driven decisions by combining several I4.0 technologies to create synergistic impacts. This study offers novel perspectives on how Industry 4.0 technology can revolutionize procurement procedures. It draws attention to the necessity for businesses to use these technologies in order to attain long-term expansion and operational effectiveness. The study contributes significantly to the body of knowledge on procurement and Industry 4.0 technology by outlining the way to more effective supply chain management. However, it has a number of drawbacks, such as a selective literature review of 111 research papers that might not include all pertinent studies and could introduce bias. It may ignore other significant developing technologies in favour of concentrating mostly on Industry 4.0 technologies like blockchain and e-procurement. Furthermore, the assessment only includes works published between 2012 and 2022, leaving out more recent advancements in the quickly developing Industry 4.0 space. Because procurement challenges and technological implementations vary, the conclusions might therefore not be generalizable across industries or regions. Additionally, the lack of original empirical data or case studies reduces the findings' practical applicability, indicating the need for more study with a wider scope and real-world validation.

By increasing productivity, encouraging diversity, guaranteeing transparency, and bolstering regional businesses, digital procurement transformation stimulates economic growth and eventually builds a stronger, more resilient economy. For that Wibowo et al. (2024) public a research paper it goals to investigate how Central Java Province's economic growth is being accelerated by the digital procurement transformation. It emphasises how digital technology may improve the procurement process' efficacy and efficiency, promoting local economic growth. using a descriptive analysis approach and a survey of literature. This method makes it possible to analyze and summarize a variety of circumstances and factors pertaining to the transition of digital procurement. It focusses on comprehending how this change might spur economic expansion in Central Java, with a special emphasis on the function of human resource competency in efficient procurement. The results show that Central Java's economic maturity and growth have benefited from the adoption of digital procurement.

According to the survey, the shift to digital procurement has raised transaction values and enhanced procurement process completion rates. Additionally, it emphasises how SMEs are increasingly participating in procurement activities, which raises overall economic turnover. Because it tackles a specialized field of research about the transformation of digital procurement in the Central Javan setting, this study is unique. It offers insightful information about how digital technology can be used to boost economic growth and enhance governmental procurement procedures. The suggestions for putting digital procurement transformation into practice, like building digital infrastructure and improving human resource capacities, greatly enrich the body of previous research. The study admits that the breadth of its empirical analysis may be constrained by the fact that its conclusions are based on secondary data and a literature review. Primary data gathering may be investigated in future studies to further validate the results. Furthermore, the study's conclusions imply that although the transformation of digital procurement might stimulate economic expansion, there are obstacles that must be overcome for long-term success.

Traditional supply chain operations are being transformed into more effective and efficient processes with the help of digital technologies. Additionally, it demonstrates how supply chains are becoming more digital and how businesses are using technology to enhance their procurement procedures. The requirement for increased supply chain operations efficiency, openness, and responsiveness is what is driving this change. Wirtz in 2024 elucidate the principles of digital procurement and supply chain management. It aims to identify the main players and modes of communication in the process as well as to design the structural

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framework of digital procurement. It also describes the different stages of Digital Procurement and its possible advantages, before summarizing the steps involved in putting digital procurement systems into place. The method used entails a thorough analysis of the fundamental ideas behind digital procurement and supply chain management. The framework of digital procurement is presented methodically in the study, along with the roles and interactions of many stakeholders. Additionally, it deconstructs the stages of digital procurement and offers guidance on how these stages might be successfully applied inside businesses. The results emphasize how crucial it is to comprehend the different stages of digital procurement and the possible benefits they provide.

The study highlights that the effective adoption of digital procurement techniques depends on a clearly defined implementation procedure. In order to optimize supply chain management, it also identifies the major players in the procurement process and their interconnections. The paper's uniqueness is found in its methodical definition of digital procurement and its stages. The study contributes to the body of knowledge on supply chain management by offering a clear framework and describing the relationships between important players. It acts as a useful manual for businesses trying to successfully apply digital procurement practices. Although the paper offers a comprehensive review of digital procurement and supply chain management, it might be lacking in case studies or empirical evidence to back up its assertions. Future studies could examine how the suggested frameworks are really used in the real world and the difficulties that organizations have when putting them into practice. This could improve knowledge of how supply chain efficacy and efficiency are affected by digital procurement.

2.2 Supply chain performance

In today's intricate and cutthroat corporate world, digital technologies have become indispensable for improving supply chain performance. Businesses can increase their operational effectiveness, responsiveness, and efficiency by incorporating digital tools and systems into supply chain operations.

Nathan et al examine how digital technology can improve supply chain performance and give businesses a competitive edge by enhancing supply chain capabilities. The study focusses on the effects of digital and information technologies on supply chain performance and capacities, as well as how supply chain flexibility and agility contribute to competitive advantage. By using a quantitative methodology, gathering data through a survey questionnaire. A thorough literature analysis served as the basis for the questionnaire's development, and both academic and industry specialists helped to pretest it for clarity. Data on the effects of digital technology on supply chain performance was collected from 150 managers and supply chain executives working in Bangladesh's ready-made garment (RMG) sector. The results show that RMG enterprises' supply chain capabilities are much improved by digital supply chains, which in turn gives them a competitive edge and improves supply chain performance. The report also emphasises how digital technology directly affects supply chain performance and capability, promoting operational agility and flexibility. By offering concrete data on the connection between digital technologies and supply chain performance, this study adds to the body of knowledge already available on digital supply chain capabilities. It provides insightful information for practitioners, legislators, and supply chain managers, highlighting the significance of incorporating digital technologies to improve supply chain flexibility and agility. Although the study offers valuable insights, its scope is restricted to Bangladesh's RMG business, which could limit the findings' applicability to other industries or geographical areas. To confirm and build on these findings, future studies should examine the effects of digital technology in various sectors or regions.

Adoption of digital technology is essential to improving firms' performance in the technologically advanced world of today. It describes how digital technologies are integrated and used effectively within a company, which can result in notable gains in productivity, operational efficiency, and overall

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competitiveness. Adoption of digital innovations becomes crucial for attaining superior performance outcomes as organizations confront more and more pressure from local and worldwide competition. Setiadi et al (2024) investigates the connections among digital adoption, strategic sourcing, inventory management, and procurement excellence, as well as their combined influence on business performance. The study is to shed light on how these elements can be used to improve an organization's financial and operational results, especially when considering PT Semen Indonesia Tbk by uses a survey approach and a quantitative research strategy to gather information from 325 managers at PT Semen Indonesia Tbk. A Likert scale was used to gauge replies, and the questionnaire was created using theoretical dimensions determined by specialists. Structural equation modelling (SEM) was used in the data analysis to evaluate the correlations between the variables.

The results show that inventory management, strategic sourcing, and digital adoption all have a favourable impact on business performance, both directly and indirectly, by improving procurement excellence. This implies that companies can simultaneously enhance their supply chain collaborations, procurement procedures, and technology adoption to attain improved performance results. By offering an integrated model that clarifies the synergistic mechanisms underpinning successful strategy implementation, this study adds novel empirical insights. It highlights how crucial it is to maintain supplier connections, inventory control, and information systems all at the same time, giving managers doable approaches to promote long-term greatness in their companies. The study admits a number of shortcomings, such as its sole use of a quantitative technique and its dependence on managers as the only data source. To improve the results, future studies are urged to use a variety of data sources and approaches. The study also indicates that more investigation into various aspects and metrics may improve comprehension of the intricate connections between the variables.

Sheel et al (2019) examine how supply chains' flexibility, alignment, and agility can be improved by implementing blockchain technology. When taken as a whole, these enhancements offer a competitive edge that enhances business performance. An email survey was used to gather empirical data from 397 supply chain professionals in India. The measures were confirmed by confirmatory factor analysis, and the hypotheses were tested using structural equation modelling. They discovered that supply chain agility, alignment, and adaptability are greatly increased by blockchain technology, which boosts business performance and competitive advantage. The trust that blockchain technology fosters also improves business performance.

Blockchain is seen by managers as a tool to improve service and delivery capabilities, shorten lead times, and increase the frequency of product development. Notwithstanding its potential, adoption obstacles include regulatory frameworks, practical blockchain technology experience, and a lack of understanding. This article is unusual in that it empirically connects supply chain factors (agility, alignment, and flexibility) and company performance with blockchain technology. By showing how disruptive technologies like blockchain might affect important supply chain variables and performance outcomes, it closes a study gap. As opposed to using real-world implementation experiences, the study depends on respondents' impressions. Although there is currently no legal structure in existence, it is assumed that government regulations are favourable. Although blockchain is seen as a stand-alone technology, its effectiveness hinges on how well it integrates with other systems, big data, and the Internet of Things. Future studies might look at the effects on particular industries, how blockchain lowers costs, and how it integrates with new technology.

Mutambik (2024) has examined how supply chain effectiveness is improved during disruptive times through the development of strategic partnerships mediated by digital transformation. The goal of the study is to comprehend how these factors interact and how they affect operational agility and adaptability

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in the context of the supply chain. The study uses a mixed methods approach, combining qualitative and quantitative methodologies. Professionals from the Saudi manufacturing industry participated in surveys and semi-structured interviews. By utilizing the advantages of both approaches, the mixed methods design offers a more thorough comprehension of the study topics. After analyzing the data according to the report, inter-business cooperation, leadership, technical culture, and recruitment management are the four main factors that facilitate the digital transformation of the supply chain.

According to the findings, supply chain resilience and effectiveness are increased through the synergy of digital transformation and strategic alliances, which also improves operational agility and flexibility. By shedding light on the intricate connection between supply chain management, digital transformation, and strategic alliances, this study makes a substantial contribution to the body of existing literature. It draws attention to how crucial these elements are to creating resilient supply networks, especially in unpredictable situations, a topic that is currently comparatively understudied. The report admits a number of shortcomings, its use of a single informant questionnaire raises questions regarding the validity and reliability of the information gathered. The study was cross-sectional and may have limited generalisability due to the quantitative phase's small sample size (N = 393) and the short time frame for data collection. Data from one industry sector (manufacturing) in one nation (Saudi Arabia) served as the basis for the analysis. I propose the following research hypotheses:

RP1: Digital procurement capability positively affects supply chain performance.

2.3 Research gap and contribution of the study

As previously stated, the Review of Literatures examine the subject from many perspectives. Upon reading and evaluating earlier research, I discovered numerous gaps, which is why it is crucial to concentrate on and address these gaps in my own study. First, the Sultanate of Oman will serve as the study's geographical setting because no research has been done in the Omani context; instead, the majority of studies have been carried out in other nations, such as Malaysia, Finland, France, etc. Second, the majority of research have employed qualitative techniques, while very few have employed quantitative approaches. For this reason, this study collects and analyses data using the quantitative approach. Lastly, whereas some earlier studies concentrated on certain industries, I will be examining digital procurement and how it affects supply chains in Oman in this study.

3. Methodology

3.1 Research Questions

Since they help to accomplish the primary goal of the study, research questions are the most crucial component of the study. The information gathered from the right people provides the answer to the research topic. Respondents who worked in various sectors of the Omani supply chain were asked to complete a questionnaire for this study. This study aims to address the following research questions in order to fulfil the research objectives.

RQ1: Based on their industry, do organizations differ significantly from each other in terms of their perceived digital procurement capability?

RQ2: Based on their type of industry, do organizations differ from each other significantly in terms of their perceived supply chain performance?

RQ3: Do organizational digital procurement capabilities have any statistically significant impact on their supply chain performance?

3.2 Research hypotheses

Global supply chain operations have been profoundly changed by the quick development of digital technology, which has allowed businesses to improve productivity, simplify procedures, and adjust to

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shifting market conditions. Adopting digital procurement capabilities has grown in importance in Oman as supply chains deal with local logistical and economic issues while meeting global standards. According to current studies, digital procurement features including data analytics, automation, and supplier collaboration platforms improve supply chains' overall performance. These skills improve decision-making, lower expenses, and increase operational efficiency, all of which support strategic and financial performance. Furthermore, it has been pointed out that this relationship may produce a more accurate and lucid image of supply chain performance when various mediating and moderating factors are present, such as digital adaptation, digital resilience, information processing capacity, governmental pressures, social norms, etc.

In this context, we formulate the following research hypotheses in light of the existing literature:

H1: Based on their industry, organizations don't differ significantly in terms of their perceived digital procurement capability.

H2: Based on their type of industry, organizations don't differ significantly in terms of their perceived supply chain performance.

H3: Organizational digital procurement capabilities have no statistically significant impact on their supply chain performance.

3.3 Research design, population and sampling

A research design is a plan for employing empirical data to address your research issue. A carefully thought-out research design makes it easier to make sure that your techniques align with your goals and that you employ the appropriate data analysis. The descriptive research design was determined to be the most suitable for our study based on the research questions and objectives. Employees from different companies in Oman that use digital procurement make up the research population. Convenience sampling and the referral method are used in this study to contact the sample elements, or respondents. Employees from a variety of companies that use digital Procurement procedures were given the questionnaire. A total of 150 completed responses to the questionnaire, which was administered using Google Forms, were processed using SPSS 24.0.

3.4 Sources of data and data collection

Employees in managerial roles at different companies with digital procurement activities in the Sultanate of Oman will provide secondary data for this study. As previously stated, in order to gather primary data, the researcher used a questionnaire that was adapted from earlier, pertinent, and current study. Each of the five significant components of this questionnaire includes multiple statements drawn from currently used, reliable scales. The questionnaire's first section, which incorporates quotes from Jukka et al. (2021) discusses digital procurement capacity. "Our company implemented e-Bidding (The buyer requests an offer from the seller)" is one of the questions that are part of the questionnaire. The second, third section was quotes from Dubey et al. (2023). The second section is related to digital adaptability, one of these questions included in the questionnaire is" We closely work with our partners to adapt our business models according to government policies related to the environment". And the third section, which is about digital agility, among the enquiries that are part of the survey is ''We closely work with our partners to identify any potential threats that could disrupt the supply of blending raw materials''. ''Our company IT infrastructure provides seamless access across physical locations and multiple entry points for users'' is one of the questions in the fourth part, which is about information processing capacity, and is borrowed from Bag et al. (2020). The questionnaire's final section focusses on supply chain performance. "Our company has been able to reduce the transaction cost of supply chain operations using digital technology" is the standard statement from this category, from which the many things in this section are derived.

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3.5 Tools used in data analysis

In this study, a variety of analytical tools were employed. The reliability analysis tool was employed first, then one-way ANOVA, descriptive analysis, and the two-independent sample t-test. The foundation of the analysis was the use of SPSS 24.0 to effectively analyse the questionnaire.

3.5.1 Reliability, validity and generalizability

For research to be accurate, legitimate, and applicable, reliability, validity, and generalisability are essential components. The consistency of measurements is evaluated by reliability, which determines if a tool yields consistent results across time, among observers, or under various circumstances. Cronbach's Alpha is a common approach used for scale dependability. Validity encompasses construct validity (alignment with theoretical notions), criterion-related validity (correlation with external standards), and content validity (ensuring thorough coverage) and examines how well an instrument captures the intended concept. The degree to which results can be extrapolated to populations outside of the study setting is known as generalisability. Although issues like sampling limits may limit wider applicability, these ideas are related since valid findings promote generalisability and trustworthy tools boost validity. When these factors are taken into consideration, research is guaranteed to be impactful, significant, and reliable.

3.6 Ethical considerations

Any research study's legitimacy and integrity are largely dependent on ethical issues. Following ethical guidelines promotes confidence and dependability in the research process while protecting participants' rights, privacy, and dignity. To comply with accepted ethical norms and guarantee the study's success, several crucial ethical procedures were used.

First and foremost, confidentiality and privacy were given top priority. The study design specifically refrained from gathering participants' personal data to preserve their privacy and anonymity. Because personnel from different firms participated in the study, it was especially important to remove any potential dangers related to the disclosure of sensitive information.

Second, the study process relied heavily on informed consent and voluntary involvement. The decision to take part in the study was left entirely up to the participants. They have the freedom to accept or reject participation without suffering any negative repercussions, according to a certain component of the questionnaire. This demonstrated respect for personal autonomy by guaranteeing that participation was completely voluntary.

Thirdly, the study placed a strong emphasis on each respondent's appreciation, dignity, and respect. The purpose of the study was to protect the respondents' rights and refrain from taking any acts that would compromise their personality or sense of dignity. Furthermore, participants received statements of gratitude for their time and effort, which strengthened mutual respect and ethical behaviour.

The study upheld high integrity standards and protected the rights and welfare of its subjects by following these ethical guidelines. In addition to supporting the ideals of research, these moral standards also help ensure that the study's conclusions are trustworthy and widely accepted.

4. Results and Data Analysis

4.1 Analysis of demographics

The profile of the respondents and sample characteristics are summarised in this section of the study with respect to several factors, including the size of the company in terms of the number of employees, the type of company (industrial or service), years of managerial experience, and managerial position.

4.2 Type of industry

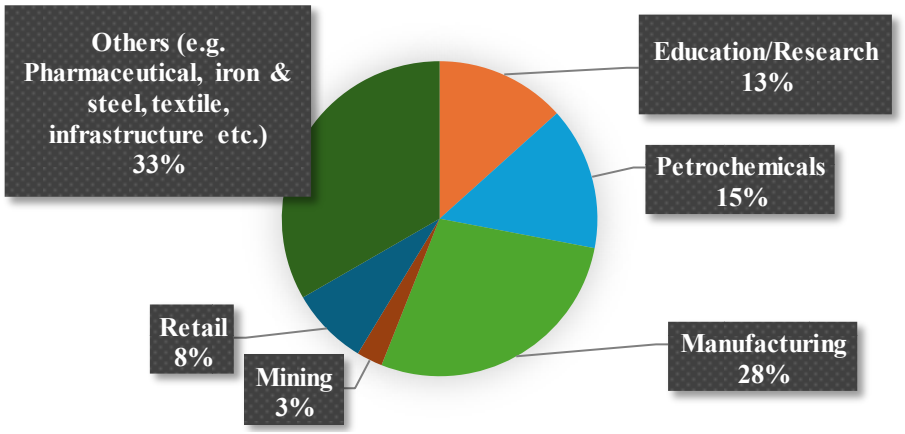
The industry type that the respondents' companies specialise in is depicted in figure 2. Education/Research, Petrochemicals, Manufacturing, Mining, Retail, and Others (pharmacies, iron and

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steel, textiles, infrastructure, etc.) are the main categories of these. It is evident from Figure (2) that only 28% of the businesses were in the manufacturing sector, while 33% of them were in the other sectors (pharmacies, iron and steel, textiles, infrastructure, etc.).

Figure 1

Type of Industry

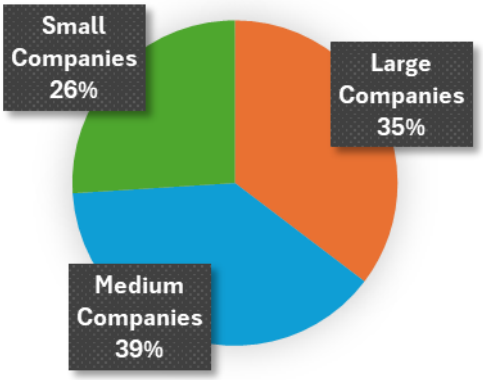


4.2.1 Firm size

The figure 2 indicates the firm size from where the survey participants come. 39% of the respondents' reported that they were from medium companies, whereas only 35% of the respondents were from large companies.

Figure 2

Firm Size



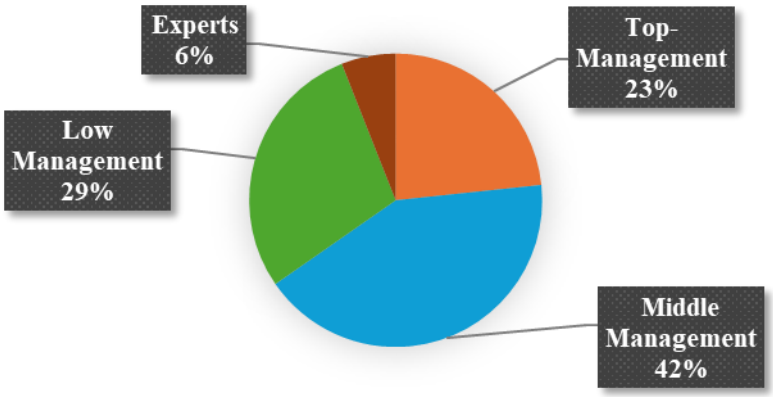
4.2.2 Managerial position

As shown in Figure 3, the respondents' managerial positions were categorised into top management, middle management, low management, and experts. Out of the total respondents, 42% of respondents were middle management, while those who were in low management were 29%. Hence, we may say that most of our respondents were in middle management or low management.

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Figure 3

Managerial Position

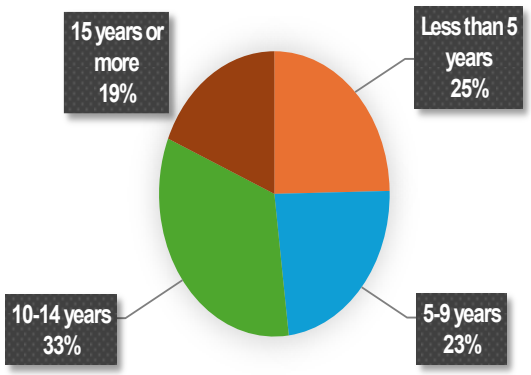


4.2.3 Total managerial experience (Years)

The number of years of total managerial experience an employee that categorized into four different categories are shown in (Figure 4) 33% of participants had 10-14 years of experience.

Figure 4

Total Managerial Experience (Years)



4.3 Reliability and validity analysis

To guarantee validity and reliability in this study, the proper examination procedure was followed. The findings of the reliability analysis show that all of the measuring scales used in this study have a high degree of reliability (Chronbach's α value > 0.60) (Table 1). Prior to distributing the survey, I additionally verified the scales' content validity.

Table 1

Reliability analysis

Construct Name	α-Value	No. of Items
Digital procurement capability	0.939	6
Supply chain performance	0.921	3

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4.4 Descriptive statistics

The descriptive data are displayed in Table 2 below. Two constructs were considered in the study: digital procurement capability, supply chain performance. The standard deviations and mean values can be used to determine how respondents react about each of these behavioural patterns.

Table 2

Descriptive Statistics

Constructs	N	Mean	Std. Deviation
Digital procurement capability	150	3.7467	.82890
Valid N (listwise)	150		

4.5 Testing of hypotheses

The following hypothesis was put to the test by the researcher: Based on their industry, organizations don't differ significantly in terms of their perceived digital procurement capability. The hypothesis test findings are displayed in Table 3 below, which indicates that there is insufficient evidence in the data to draw the conclusion that different industries have different perceptions of digital procurement capabilities. Consequently, the p-value in the t-test (.068), which is higher than 0.05, lends credence to the notion that perceptions may in fact be same across industries.

The p-value is near the 0.05 cutoff, even though the study shows no significant difference. This implies that the variations might not be entirely insignificant. The conclusions could be improved with more data or a larger sample size. If more post-hoc tests are required to investigate certain pairwise differences among industries, they can be carried out.

Table 3

ANOVA (Digital Procurement Capability vs Type of Industry)

		Sum of Squares	df	Mean Square	F	Sig.
DPC	Between Groups	6.965	5	1.393	2.102	.068
	Within Groups	95.409	144	.663		
	Total	102.373	149			

There are no statistically significant changes in the perceived supply chain performance (SCP) according to industry type, according to the ANOVA analysis (F = 1.044, p = 0.394) in Table 6 below. This suggests that companies in different industries have similar opinions about how well their supply chains are performing and that these opinions are not significantly impacted by industry-specific issues.

This finding may indicate that, independent of industrial context, fundamental components of supply chain performance—like responsiveness, efficiency, and dependability—are universally acknowledged and valued. Therefore, even if there can be subtleties unique to a given industry, they have little bearing on how effective a supply chain is seen overall. While making small adaptations for industry-specific difficulties, organisations may profit from concentrating on supply chain techniques that are generally applicable.

Table 6

ANOVA (Supply Chain Performance vs Type of Industry)

		Sum of Squares	df	Mean Square	F	Sig.
SCP	Between Groups	2.623	5	.525	1.044	.394
	Within Groups	72.332	144	.502		
	Total	74.955	149			

According to the model's statistical significance (F (1, 148) = 61.872, p <.001) in Table 8 below, the regression analysis showed that DPC significantly and favourably effects SCP. A moderate link between the two variables is shown by the model, which accounts for 29.5% of the variance in SCP (R2 =.295) in

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Table 7 below. According to the unstandardised coefficient (B =.465, p <.001) in Table 9 below, SCP rises by 0.465 units for every unit increase in DPC. The standardised beta coefficient further supports the robustness and positivity of this connection (Beta =.543, t = 7.866, p <.001) in Table 9 below. All things considered, the results show that DPC is a substantial predictor of SCP, and the model offers both statistically significant and useful information about this association.

Table 7

Regression Analysis

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.543[a]	.295	.290	.59762

Table 8

ANOVA (digital procurement capabilities vs supply chain performance.)

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	22.097	1	22.097	61.872	.000[b]
	Residual	52.858	148	.357		
	Total	74.955	149			

Table 9

Coefficients

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	2.328	.227		10.274	.000
	DPC	.465	.059	.543	7.866	.000

The hypotheses in this study are displayed in table 8 below. Three theories regarding the subject of the study. Two of them were accepted, while one was turned down.

Table 8

Summary of Hypotheses Testing Results

No.	Hypotheses	Result	Decision	Reference
H1	Based on their industry, organizations don't differ significantly in terms of their perceived digital procurement capability.	p = 0.068 > 0.05, not significant	not rejected	Table 3
H2	Based on their type of industry, organizations don't differ significantly in terms of their perceived supply chain performance.	p = 0.394 > 0.05, not significant	not rejected	Table 6
H3	Organizational digital procurement capabilities have no statistically significant impact on their supply chain performance.	p = 0.000 < 0.05, significant	rejected	Table 7-9

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5. Conclusions and Recommendations

In line with the study's objective of understanding the relationship between digital procurement capability and supply chain performance, this study used a structured questionnaire to collect data from participants on several topics. For example, in the profile questions, the researcher sought to identify the respondents' company size, managerial position, overall managerial experience (measured in years), and industry type (education/research, manufacturing, petrochemicals, mining, retail, etc.). There are several hypotheses in this study that were initially hypothetical and were eventually accepted or rejected through the use of appropriate statistical tests. First, companies' perceptions of their digital procurement capabilities are the same regardless of the type of industry they operate in, which was eventually accepted. Second, there are clear disparities in how companies perceive their digital flexibility and adaptability, as evidenced by the hierarchical infiltration of management (including experts, lower management, middle management, and senior management), which was eventually rejected. Third, companies' perceptions of their information processing capabilities are similar regardless of the industry they operate in, which was eventually accepted. Finally, according to the first hypothesis, the digital purchasing skills of manufacturing organizations are influenced by the many industries they focus on and the relationships between them.

5.1 Implications & recommendations of the study

The study produced a number of important conclusions with practical ramifications. First, a t-test p-value of 0.068 showed that there were no statistically significant variations in how organisations perceived their digital procurement capabilities across industries. The observed changes may not be completely insignificant, though, as indicated by the p-value's closeness to the 0.05 threshold. This calls for additional investigation using a larger sample size and post-hoc pairwise comparisons to identify any relevant industry-specific subtleties. Second, the views of digital agility and adaptability by Managerial Position were shown to differ significantly ($F = 7.888$, $p = 0.000$ and $F = 12.057$, $p = 0.000$), highlighting the influence of administrative hierarchy on perceptions of digital capabilities.

This research emphasises the necessity for focused tactics to promote shared knowledge and align perspectives across hierarchical levels, such as customised managerial training programs and cross-functional communication campaigns. An ANOVA test revealed a p-value of 0.313, indicating that perceptions of information processing capability (IPC) were consistent across industries. This suggests that factors other than industry type, like internal processes or company-specific characteristics, have a greater influence on IPC views. The need for industry-neutral IPC enhancement techniques that emphasise universal elements like culture, leadership, and technology adoption is indicated by this consistency. In practice, researchers should build on these results by conducting long-term studies and analysing the ways in which IPC, digital agility, and adaptability all affect performance. In order to share best practices in digital transformation, practitioners should create cross-industry partnerships, improve digital training at different organisational levels, and use these insights to develop data-driven initiatives. Aligning organisational attitudes, enhancing digital skills, and promoting successful digital transformation across industries are the overall goals of these recommendations.

5.2 Limitations of the study

Research studies frequently face intrinsic constraints that affect their quality, scope, and the relevance of their conclusions. Notwithstanding careful attempts to resolve and lessen challenges, a number of limitations in this research have affected the breadth of analysis and the applicability of findings in different settings. Among these restrictions are:

i. Research Community and Sample Size: The quality and dependability of the study's conclusions are greatly impacted by the target population's selection as well as the sample size. The accuracy and

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validity of the data gathered in this study were limited by the sample size and research community restrictions.

ii. Data Collection Method: The main tool used to collect data was a questionnaire. Although practical, this method is fundamentally less reliable and perceptive than qualitative techniques like interviews, which yield richer, more complex data.

iii. Time Restrictions: The limited amount of time allotted to this study made it impossible to increase the sample size and collect more thorough data. This limitation has an impact on the study's overall efficacy and depth.

iv. External Factors' Dynamic Nature: The study's findings may not be applicable in the long run due to the constantly changing nature of environmental and global issues. The findings may become less applicable in other situations or later on due to differences in environmental conditions, protective measures, and legislative systems.

Contextualising the study's findings requires acknowledging and stating these limitations. It gives readers the ability to assess the results critically, comprehend their significance, and think about how they might be used. Furthermore, admitting shortcomings opens the door for studies to overcome these limits and investigate different approaches by offering insightful information for subsequent study. Researchers help to continuously improve the field's knowledge and practice by openly discussing these difficulties.

5.3 Directions for future research

To overcome the shortcomings of this study and improve its general rigour, future researchers should take into account several important developments.

The target population must first be precisely defined, and a sufficient sample size must be guaranteed. Inaccuracies and challenges in gathering data might arise from small sample numbers. Researchers can increase the findings' generalisability and dependability by increasing the sample size.

Second, it is advised to use a variety of data collection techniques, with a focus on interviews. Compared to other approaches, interviews yield more detailed, accurate, and less arbitrary information, providing a deeper understanding of the topic.

Third, to conduct a more comprehensive examination, it is imperative that the research timetable be extended. More individuals will be able to participate as a result, improving the scope and depth of data gathered.

Lastly, the goal of future research should be to generate results that are both applicable and flexible enough to change with the times. In order to ensure that their findings are robust and generally relevant despite contextual heterogeneity, researchers must take into consideration environmental, political, and other dynamic aspects.

Future research can overcome present constraints and produce more thorough and significant findings by pursuing these avenues.

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