

Midocean University

College of Management

Department of Master Project Management



The Impact of New Technologies on the Success of Logistics Platforms within the Postal Sector – Saudi Arabia

**أثر التقنيات الحديثة على نجاح المنصات اللوجستية في قطاع البريد
بالمملكة العربية السعودية**

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بِسْمِ اللَّهِ الرَّحْمَنِ الرَّحِيمِ

“In the name of God, the most gracious, the most merciful”

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Dedication

This work is dedicated to all those who have been pillars of support and guidance throughout this journey. Special thanks go to my mother and father, whose unwavering faith and love have been my constant source of strength. To my wife, for her endless patience. To my brothers and sisters, for their boundless support and belief in my capabilities. To my close friends, for their companionship and unwavering support through all phases of my life.

I extend my sincere gratitude to my company InfinitePI and SPL and its leadership for empowering me and providing the opportunity and support to actively participate in their pioneering digital initiatives in the postal logistics sector. This experience has been immensely enriching and instrumental in shaping my understanding and passion for the field.

Lastly, I would like to thank the Midocean university for their invaluable educational guidance and for fostering an environment that encourages exploration, learning, and innovation.

This research is a testament to the collective encouragement, wisdom, and support I have received from each one of you. Thank you for being my inspiration, motivation, and for contributing to my growth both personally and professionally.

Introduction

The postal sector, including Saudi Post, is experiencing intensified competition due to the surge in online shopping and parcel delivery. This situation necessitates a comprehensive review and improvement of postal services to safeguard its market position. Despite the notable expansion of logistics services in Saudi Arabia, awareness of innovative technologies capable of enhancing the postal sector's logistics platforms remains somewhat limited. It is imperative for Saudi Post to investigate and adopt these technologies to boost its operational efficiency and the quality of services provided. Embracing sophisticated logistics solutions and prioritizing research and development are crucial steps for Saudi Post to maintain its competitiveness and align with evolving customer demands. Effectively leveraging these technologies will optimize operations significantly. Fundamentally, Saudi Post is tasked with innovating and adapting to overcome the challenges posed by the digital era, ensuring its continued prominence in the Saudi postal industry.

Background

The logistics industry stands at the forefront of a monumental shift, marked by the swift integration of emerging technologies that are redefining the very fabric of supply chain dynamics and operational efficiencies. This sea change is especially pronounced in the postal sector, which is increasingly turning to sophisticated operational platforms to maintain a competitive edge in a market rapidly evolving towards digital predominance. Among these platforms are InterOps, dedicated to data interoperability; DataOps, focusing on data management; CoreOps, which centralizes on essential logistics processes; DXPOps, aimed at enhancing digital customer experiences; CommercialOps, for devising commercial strategies; and SecOps, ensuring the integrity and security of data. The pivotal role of these platforms is in their ability to seamlessly marry groundbreaking technologies such as the Internet of Things (IoT), Artificial

Intelligence (AI), blockchain, and data analytics with the daily mechanics of logistics operations—ushering in an era of real-time tracking, intelligent routing, and automated warehouse management.

Amid this whirlwind of digital evolution, Saudi Arabia, as the cradle of Islam and home to the religion's two most sacred cities, stands as a pivotal player. Its government, in alignment with Vision 2030, is investing heavily in modernizing the nation's infrastructure to support a diversified and sustainable economy. Saudi Post, now SPL, established in 1926, is a key institution in this transformation, adopting a new identity that emphasizes its role as a global connectivity hub. Through strategic acquisitions and the development of digital and logistics capabilities, SPL is enhancing service quality and fostering innovation in the logistics sector. This paper endeavors to shed light on the profound impact these technological advancements and operational platforms have on the success and future viability of logistics platforms within the postal sector.

This investigative journey is propelled by noticeable gaps in existing scholarship concerning the holistic incorporation of these avant-garde technologies within postal logistics, juxtaposed against an escalating demand for more sophisticated, reliable, and efficacious postal and logistics services in today's global e-commerce landscape. To navigate this complex field, the study adopts a mixed-methods approach, blending quantitative analyses of performance metrics from cutting-edge logistics platforms with qualitative insights from seasoned industry professionals.

Subsequent sections of this document will delve into a literature review that contextualizes our investigation within the broader scholarly discourse, followed by a detailed exposition of our research methodology, an analysis of the findings, and a discussion that bridges our observations with their broader academic and practical implications. Through its findings, this study aspires to contribute valuable perspectives to the ongoing dialogue surrounding digital transformation in the postal arena, providing key insights for researchers, industry practitioners, and policymakers. More than merely underscoring the critical role of emerging technologies in shaping the future trajectory of logistics platforms, this analysis

aims to spotlight best practices and flag potential avenues for further innovation and investigative inquiry.

Theoretical Framework

This research is underpinned by a theoretical framework that integrates the principles of the Diffusion of Innovations Theory (Rogers, 2003), the Technology Acceptance Model (TAM) (Davis, 1989), and the Unified Theory of Acceptance and Use of Technology (UTAUT). This framework is essential for examining how innovations, particularly in technology, are adopted and utilized within organizations to enhance operational efficiency, service delivery, and competitive positioning.

Diffusion of Innovations Theory offers a lens to understand the mechanisms through which new technologies are adopted in the postal logistics sector. It emphasizes the role of communication channels, time, and the social system in influencing the rate of adoption. This theory is particularly relevant for identifying factors that either facilitate or hinder the adoption of technologies like AI, IoT, and blockchain within the sector, including technological attributes, organizational readiness, and external pressures.

Technology Acceptance Model (TAM) focuses on two primary factors that predict the use of a new technology: perceived usefulness and perceived ease of use. TAM is instrumental in understanding the behavioral intentions of stakeholders within the postal sector towards adopting new logistics technologies, thereby elucidating the path from behavioral intention to actual technology usage.

Unified Theory of Acceptance and Use of Technology (UTAUT) extends this framework by incorporating additional elements that may influence technology acceptance and usage, including social influence and facilitating conditions. UTAUT provides a comprehensive approach to assessing the likelihood of new

technology integration within organizational settings, making it highly applicable to studying the Saudi postal sector's technological landscape.

By weaving these theories together, this study aims to deeply explore how emerging technologies are integrated into the logistics operations of the Saudi postal sector. It seeks to uncover the operational benefits, navigate the complexities of adoption challenges, and evaluate the overall impact on service quality and competitiveness. This theoretical framework serves as the cornerstone for investigating the multifaceted dynamics of technology adoption and utilization in enhancing the efficacy and resilience of postal logistics in Saudi Arabia.

Premises of the Study

This research is grounded on a set of interrelated premises that underscore the transformative potential of new technologies in the logistics operations of the postal sector, particularly within the Saudi Arabian context. These premises integrate and expand upon the foundational assumptions to offer a holistic view of the anticipated research trajectory:

1. **Technological Integration and Transformation:** The incorporation of cutting-edge technologies such as Artificial Intelligence (AI), the Internet of Things (IoT), and blockchain is posited to significantly enhance operational efficiency, transparency, and customer satisfaction in the postal logistics sector. This premise aligns with the theoretical framework that views technological integration as a catalyst for operational transformation and improved service delivery.
2. **Operational Platforms as Catalysts:** Advanced operational platforms (e.g., DataOps, SecOps) are crucial for harnessing the potential of new technologies. These platforms facilitate streamlined logistics processes, improved data security, and service optimization, indicating a direct relationship between technology adoption and operational improvement.

3. **Challenges to Adoption:** The premises acknowledge inherent challenges in adopting these technologies, including workforce skill gaps, organizational resistance to change, and high implementation costs. These barriers are recognized as critical factors that influence the trajectory of technology integration within the sector.
4. **Strategic Investment and Vision 2030 Alignment:** The strategic investment in new technologies and overcoming the aforementioned challenges are deemed essential for the Saudi Arabian postal sector to sustain its competitive edge and achieve the goals outlined in Vision 2030. This premise underscores the importance of strategic foresight and investment in driving sector-wide transformation.
5. **Empirical Contribution:** Acknowledging a gap in empirical research, this study is premised on providing valuable insights into the tangible impacts of technological advancements on postal logistics operations. It aims to bridge the empirical gap by elucidating the real-world applications and outcomes of technology integration within the unique Saudi context.
6. **Societal and Economic Implications:** Beyond operational efficiency and sectoral competitiveness, the study also considers the broader societal and economic implications of technological integration. This includes the potential for technology to enhance inclusivity, accessibility, and sustainability in postal services, contributing to the socio-economic development goals of Saudi Arabia.

Problem Statement

Saudi Post's ambition to be recognized as a leading global postal corporation and a prime destination for investment within Saudi Arabia is set against a backdrop of rapid technological advancements and significant adoption challenges, particularly within the unique operational context of the Kingdom's postal services. While Saudi Post strives to create value for its stakeholders and achieve excellence in its business operations, logistics emerges as a critical yet underutilized system within the sector.

Research highlights that both Saudi Post and private postal/courier companies have not fully exploited the potential of logistics systems, with a reliance on outsourcing as an expensive approach and a lack of investment in systems that ensure timely and efficient delivery. This underlines a pressing need for the implementation of logistics platforms powered by the latest technologies, essential for managing operational information, handling physical cargo and transportation, warehousing, and inventory.

However, the integration of emerging technologies such as Artificial Intelligence (AI), the Internet of Things (IoT), and blockchain into the postal sector introduces a complex landscape marked by these rapid advancements and the unique challenges they pose within Saudi Arabia's postal services. Despite the global recognition of technology's impact on logistics and supply chains, there exists a conspicuous gap in empirical studies specifically addressing the adoption and effects of these cutting-edge technologies within the Saudi Arabian postal context. This gap is particularly pronounced in exploring the specific challenges and opportunities these technologies present, often overlooked in broader logistics research.

This investigation aims to bridge these critical gaps by offering a comprehensive examination of the transformative influence of nascent technologies on Saudi Arabia's postal logistics operations. It seeks to unveil the barriers to technology integration and the prospects they offer, enhancing strategic decision-making and fostering sustainable progress and innovation within the sector. By exploring the

effects of emerging technologies on the logistics frameworks of the postal industry, this research endeavors to provide actionable insights for industry stakeholders, policymakers, and scholars. The goal is to support the development of robust strategies for the effective integration and application of these technologies, thereby catalyzing the advancement and competitive edge of the Saudi Arabian postal sector in the ever-evolving technological landscape.

Identified Gaps

The exploration into the transformative effects of emerging technologies on logistics platforms within the postal sector, particularly emphasizing the Saudi Arabian context, uncovers several critical gaps compounded by the evolving consumer demands for faster and more reliable delivery services. Integrating the newly identified aspects with the previously outlined gaps, we find:

Consumer Demand and Delivery Expectations:

The success of logistics platforms is increasingly driven by consumer expectations for prompt delivery and the ability to track and trace shipments efficiently. This consumer-centric demand highlights a gap in understanding how emerging technologies can be leveraged to meet these expectations within the Saudi postal sector.

Cost and Inventory Management:

Another significant gap lies in addressing the high costs associated with inventory maintenance and ensuring high service levels. The burden of stocking inventory due to unclear transportation plans and inaccurate service level cost estimations underscores the need for research into how technologies can optimize these aspects.

Technology-Driven Transformation:

The advent of electronic commerce and the introduction of new business models facilitated by technological advancements point to a gap in current research and industry insights. There is a notable absence of

comprehensive studies on how such technologies are reshaping business operations and consumer interactions within the postal logistics framework of Saudi Arabia.

Scarcity of Empirical Research:

There remains a notable lack of empirical studies specifically focused on the Saudi Arabian postal sector's adoption of these technologies, crucial for understanding their potential to revolutionize postal logistics operations.

Fragmented Views on Operational Impact and Comprehensive Frameworks:

The existing literature often presents fragmented views on the operational benefits and challenges these technologies pose, along with a lack of holistic frameworks for their adoption and integration. This gap is critical for accurately assessing the potential enhancements or impediments posed by technology.

Addressing these integrated gaps is essential for a deepened understanding of how emerging technologies impact postal logistics operations, particularly in meeting the evolving demands of consumers in Saudi Arabia. It is imperative to gain a holistic view of technological advancements' implications on the postal sector to enhance decision-making processes and support continuous growth and innovation. This effort is crucial for crafting strategies that not only capitalize on technological advancements but also adeptly manage the complexities of their integration into existing postal logistics frameworks, ensuring the sector's resilience and adaptability amidst rapid technological change and shifting consumer expectations.

Research Objectives and Importance

This research adopts a comprehensive approach to examine the dynamic interplay between emerging technologies and logistics platforms within the postal sector, with a special focus on the unique context of Saudi Arabia. The study is particularly notable for several reasons:

First, it scrutinizes the application of technology within logistics processes, setting itself apart from other studies that may primarily focus on technology's impact on various sectors, often relegating logistics to a secondary consideration. This emphasis is increasingly critical due to the privatization of the Saudi postal sector. Following the Saudi postal law's update in alignment with the Vision 2030 objectives, the market has witnessed a significant influx of companies, highlighting the need for optimal strategies to secure and maintain a competitive advantage. This context makes the study particularly relevant for stakeholders within the Saudi postal market.

Furthermore, the development trajectory of logistics in Saudi Arabia, marked by ambitious initiatives, positions it as a valuable model for logistics strategy and operations. This modeling is crucial, given the challenges of creating efficient strategies from the ground up and the benefits of learning from more successful examples. The insights generated are anticipated to benefit both government and private sector entities in the postal sector, both presently and in the foreseeable future.

The research is propelled by four main objectives:

- **Exploration of Technological Innovations:** Investigating technologies such as AI, IoT, optimization software, cloud computing, data analytics, and blockchain to understand their integration, application, and impact on enhancing operational processes within the postal sector.
- **Comparative Analysis:** Evaluating the postal sector's digital transformation initiatives against those in other industries to discern similarities, differences, and the unique challenges and opportunities each presents.

- **Assessment of Impact:** Assessing the comprehensive effects of new technologies on logistics operations, customer experiences, and sustainability efforts, aiming to offer a holistic perspective on both the advantages and potential drawbacks.
- **Identification of Best Practices:** Identifying and outlining effective strategies for technology adoption and implementation, drawing on case studies, industry benchmarks, and expert insights to provide actionable recommendations for postal services.

The significance of this study spans strategic, operational, and societal dimensions of digital transformation in the postal sector:

- **Strategic Imperatives:** The study emphasizes the critical importance of embracing technological innovations to enhance competitiveness, operational efficiency, and meet evolving customer expectations, underlining the role of cutting-edge technologies in securing sustainable growth and a competitive edge.
- **Industry Relevance:** By addressing the pressing challenges of increasing competition and changing consumer preferences, the research highlights the essential role of digital transformation in driving innovation and ensuring market adaptability.
- **Stakeholder Perspectives:** Considering the viewpoints of postal operators, customers, regulatory authorities, and industry partners, the study advocates for a unified approach to technology adoption, stressing the need for alignment among stakeholders to ensure the successful integration and utilization of new technologies.

Collectively, these objectives and insights provide a comprehensive roadmap for addressing the digital age's challenges and opportunities, particularly for the Saudi postal sector. This study aims to guide strategic technology adoption and innovation, ensuring the sector's resilience and success in an ever-evolving digital landscape.

Research Questions

This study is poised to undertake a detailed examination of the pivotal role emerging technologies—specifically Artificial Intelligence (AI), the Internet of Things (IoT), and blockchain—play in transforming the logistics platforms of the Saudi Arabian postal sector. Central to this exploration are several research questions designed to methodically address the identified gaps in existing literature and provide insights into the integration and impact of these technologies.

Main Question:

How are emerging technologies and operational platforms reshaping the success and functionality of logistics platforms within the postal sector of Saudi Arabia?

Sub-Questions:

1. **Technological Integration:** In what ways are specific technologies such as AI, IoT, and blockchain, along with operational platforms like DXPOps, CommercialOps, and SecOps, driving the evolution of logistics operations within the postal sector? This question aims to uncover the direct impact of these technologies on the sector's operational landscape.
2. **Process and Activity Enhancement:** How do these operational platforms specifically facilitate key processes and activities within the postal sector's logistics operations? This includes examining the roles of different platforms in improving logistics functions and the specific operational efficiencies they introduce.
3. **Operational Efficiency, Customer Satisfaction, and Cybersecurity:** How do platforms such as DXPOps, CommercialOps, and SecOps contribute to enhancing operational efficiency, customer satisfaction, and cybersecurity within the postal logistics framework? This inquiry seeks to identify the benefits these platforms offer in creating a more secure, efficient, and customer-focused postal service.

4. **Technological Roles:** What are the distinctive roles of IoT, blockchain, AI, and data analytics in revolutionizing logistics operations? This question delves into the transformative potential of these technologies in innovating logistics practices and outcomes.
5. **Integration and Collaboration:** How does the integration of these technologies and platforms facilitate seamless data exchange and collaboration across the postal logistics ecosystem? The focus here is on understanding the synergies created by technology integration and their effects on operational cohesion and efficiency.
6. **Investment Impact:** With the significant investments being channeled into digital technologies, how is this financial commitment influencing operational improvements and the competitive advantage of the postal sector? This question examines the relationship between investment in technology and tangible improvements in sector performance.

Through a structured exploration of these questions, the research aims to significantly contribute to the knowledge base regarding the application of cutting-edge technologies in postal logistics within Saudi Arabia. The objective is to illuminate the pathways for adopting these technologies effectively, overcoming operational challenges, and leveraging their potential to foster strategic advancements and sustainable growth in the sector.

literature review

This literature review critically synthesizes insights on Saudi Post, the premier governmental postal operator within the Kingdom of Saudi Arabia, alongside the broader implications of emerging technologies and operational platforms in the postal sector. It methodically explores their implementation and impact within the Saudi context, drawing upon studies by Lukonga (2020), Niu et al. (2021), Ranjan & Foropon (2021), and Phillips-Wren et al. (2021) to shed light on the sector's evolution in providing express mail, logistics, and remittance services.

Examining Saudi Post's strategic evolution and its ambitions within the express mail and logistics sectors, this review assesses initiatives aimed at revitalizing internal mechanisms and service offerings through strategic partnerships within the Vision 2030 framework (Saudi Post explores Oracle, 2013). This plan's aim is to foster organizational and societal advancement towards sustainable growth and prosperity for Saudi Arabia.

The review scrutinizes logistics processes and systems, characterized by comprehensive information, structured frameworks, and sequential events (Zdolsek Draksler et al., 2023; Blagojević et al., 2022). It delves into strategic management of the flow of goods, information, and finances, emphasizing the critical role of technological integration in enhancing operational efficiency and strategic alignment with Vision 2030.

Technological Innovations and Operational Platforms:

- **Operational Platforms' Role in Digital Transformation:** This section evaluates platforms like InterOps, DataOps, CoreOps, DXPOps, CommercialOps, and SecOps for their contribution to operational efficiency, data security, and customer satisfaction. The analysis reveals gaps in research regarding these platforms' foundational role in the sector's digital transformation.

- **Impact of Revolutionary Technologies:** The adoption of IoT, AI, blockchain, and data analytics in revolutionizing postal logistics is critically examined. Studies discussing these technologies' optimization potential and competitive advantages are evaluated for their consensus and divergences (Woschank et al., 2020; Chen, 2022).

Investment in Digital Technologies:

- **Digital Expenditure's Impact:** The financial commitment to digital technologies and its translation into operational and competitive enhancements is scrutinized. The review evaluates assertions about digital solutions' share of supply chain execution expenditure.

Navigating Challenges:

- **Addressing Operational Challenges and Policy Needs:** Challenges in adopting new technologies, including policy development and cybersecurity, are reviewed. Insights into overcoming these hurdles highlight remaining gaps, especially within the Saudi context (Buhulaiga, 2021; AlGhazzawi, 2020; Alfozan & Aoude, 2021; Al Sadawi et al., 2022; Morawiec & Sołtysik-Piorunkiewicz, 2022).

Technologies Driving Change:

- **Detailed Analysis of Specific Technologies:** A detailed examination of each technology's transformative role in logistics operations is provided, assessing their operational impacts and integration into logistics operations.

Sector-Wide Implications and Forward Look:

- **Broader Implications and Future Directions:** The review concludes with considerations of technological adoption's wider implications, including workforce dynamics and environmental sustainability, advocating for a balanced approach to technological advancements.

Concluding Remarks:

By integrating insights from the literature with critical evaluations of technological integration, this review, enriched with citations, aims to contribute novel perspectives on the challenges and opportunities emerging technologies present in the Saudi Arabian postal sector. This comprehensive analysis sets the stage for future research and strategic planning within this evolving landscape.

Case Study

Digital Transformation at Saudi Post through Infinite Platform Logistics Company - by SPL

Introduction to the Case Study: This case study embarks on an in-depth exploration of the digital transformation initiatives undertaken by Saudi Post through its subsidiary, Infinite Platform Logistics Company, set against the evolving digital landscape of the postal sector. Drawing from the foundational insights provided by strategic SPL vision in line with 2030 vision, this narrative not only sheds light on Saudi Post's strategic shift towards a digital-first approach but also incorporates a personal perspective, stemming from my involvement as a Delivery Manager for several digital initiatives within the company. My role has afforded me a unique vantage point, allowing me to witness firsthand the

transformative impact of these digital endeavors on the organization's operations and strategy.

The choice of Saudi Post and specifically, Infinite Platform Logistics, as the focal point for this case study is twofold. Firstly, it serves as an opportunity to present a real-world application of theoretical digital transformation concepts within a leading postal corporation, offering a practical lens through which to examine the strategic, operational, and technological shifts occurring in the sector. Secondly, this company was selected to be the population for participants in my survey, aiming to garner insightful data from those directly engaged in and impacted by these digital initiatives. This dual approach enriches the case study with empirical evidence and personal reflections on the challenges and triumphs of steering a traditional postal service towards digitalization and innovation.

By situating Saudi Post's digital transformation within the broader discourse on postal and logistics sector innovation, this case study not only demonstrates the successful integration of digital technologies but also contextualizes this journey within a wider industry narrative. The inclusion of my experiences and the rationale behind choosing this company for both the case study and survey population participants provides a comprehensive overview of the digitalization's role in modernizing traditional postal services and contributing to the sector's evolution.

Strategic Vision and Context: Highlighting the launch of Infinite Platform Logistics as Saudi Post's strategic response to the digital age's demands, this section interweaves theoretical perspectives on digitalization with my firsthand experiences. It offers a real-world view of implementing digital transformation theories within Saudi Post, reflecting on the strategic vision that propels the company towards digital excellence.

Implementation and Technological Integration:

- **InterOps for Enhanced Connectivity:** By fostering interoperability across various systems and extending connectivity to global logistics networks, Infinite Platform Logistics achieved seamless international shipping

capabilities and forged partnerships with e-commerce giants, enhancing service diversity and reach.

- **DataOps for Strategic Insights:** The robust DataOps framework was not only about managing data but also leveraging predictive analytics and machine learning to forecast demand, optimize logistics routes, and ensure preemptive maintenance, significantly improving operational efficiency and reliability.
- **CommercialOps for Revenue Diversification:** Infinite Platform Logistics explored diverse revenue models such as subscription services for premium delivery options, digital locker solutions, and financial services, tapping into new customer segments and reinforcing Saudi Post's market position.
- **DXOps for an Immersive Experience:** Pushing the boundaries of customer engagement, the initiative included augmented reality for virtual tracking, virtual post offices for remote access, and AI-powered chatbots, setting a new standard for customer experience in the logistics sector.
- **SecOps with Advanced Threat Intelligence:** Enhanced SecOps practices, incorporating threat intelligence and machine learning, ensured proactive cybersecurity measures, safeguarding sensitive data, and reinforcing customer trust in Saudi Post's digital offerings.
- **CoreOps for Sustainable Excellence:** Emphasizing environmental responsibility, CoreOps integrated green logistics practices, including electric delivery fleets and eco-friendly packaging, aligning operational practices with global sustainability goals.

Conclusion:

Concluding the case study, this segment contextualizes Saudi Post's digital transformation within the broader discourse on postal and logistics sector innovation. It emphasizes the significance of Saudi Post's strategies and outcomes in contributing to a deeper understanding of digitalization's pivotal role in the industry.

Research Design and Methodology

Research Design:

This investigation employs a quantitative research design, utilizing a structured survey and interviews to delve into the impact of emerging technologies on logistics platforms within the postal sector. This method is chosen for its ability to quantitatively measure the technological implementation's benefits, operational efficiency improvements, and the challenges encountered during adoption processes.

Population of the Study:

The study focuses on professionals within the postal, logistics, and supply chain sectors. Given the digital transformation spotlighted in the case study of Infinite Platform Logistics, part of Saudi Post, professionals involved in or knowledgeable about new technologies' integration into logistics platforms form the core of this study's population.

Sample Characteristics:

Respondents primarily consist of employees from Infinite Platform Logistics, representing over 85% of the survey participants. This composition offers an in-depth perspective on the digital transformation efforts within Saudi Post and its subsidiary.

Respondents span various roles and experience levels within the sector, providing a comprehensive view of technological advancements' impact:

- C-level / VP / President
- Director

- Senior Manager
- Technical Specialist
- Manager
- Analyst / Junior Staff

Sample Size Determination:

With 183 responses collected, the sample predominantly comprises individuals from Infinite Platform Logistics and Saudi Post, enabling detailed analysis of internal perceptions and experiences regarding digital transformation efforts. This sample size strikes a balance between the depth of individual responses and the breadth of perspectives across the organization.

Data Collection Procedures:

Data was gathered through a Google Forms survey distributed among professionals within the digital, logistics, postal, and supply chain sectors, with a significant emphasis on Infinite Platform Logistics employees. The survey solicited insights on demographic backgrounds, technology implementation experiences, observed benefits, operational efficiency improvements, and challenges faced during technology adoption.

Method of Analysis:

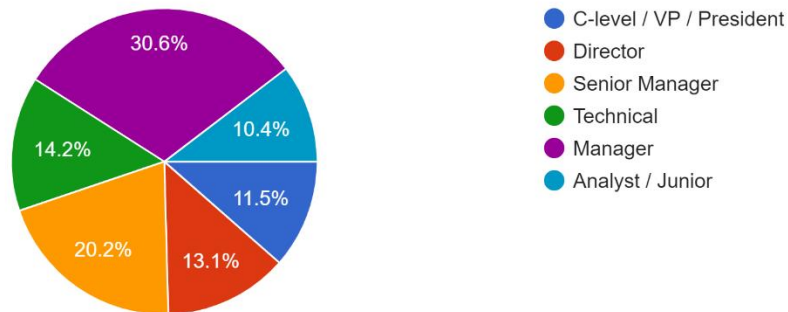
Analysis will utilize descriptive statistics to synthesize survey data, employing frequencies, percentages, and measures of central tendency (mean, median) to encapsulate the findings. Visualization techniques, including bar charts and pie charts, will illustrate the distribution of responses related to technology implementation, perceived benefits, and adoption challenges, emphasizing insights predominantly drawn from Infinite Platform Logistics employees.

Survey Questions and Results:

Q1:

Please let us know your role in the organization.

183 responses



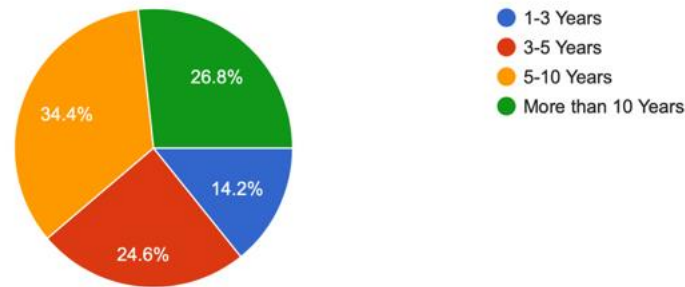
Roles in the Sector

- **Findings:** The respondents include Managers (30.6%), Senior Managers (20.2%), Directors (14.8%), Technical roles (14.2%), Analysts/Junior roles (10.4%), and C-level/VP/Presidents (9.8%).
- **Conclusion:** The wide range of roles indicates a comprehensive perspective on the impact of new technologies across various levels of organizations, highlighting the importance of technology adoption across different hierarchical levels.

Q2:

How many years of experience do you have in the digital, logistics, postal, or supply chain sector?

183 responses



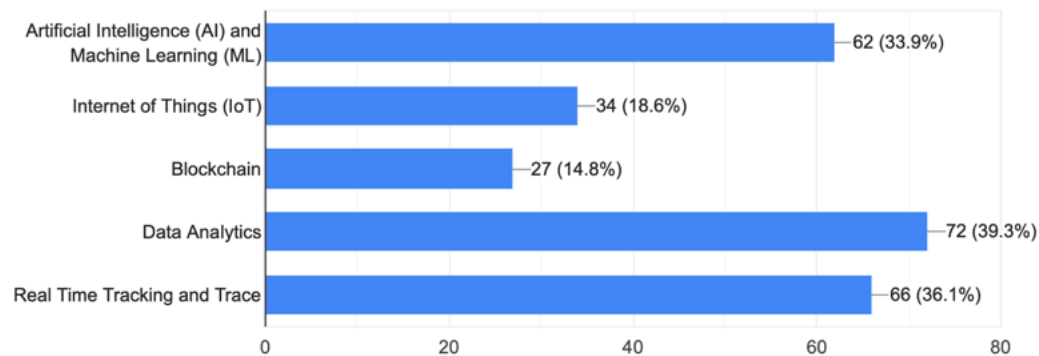
Years of Experience

- **Findings:** Respondents have varied experience in the sector, with 5-10 Years (34.4%), More than 10 Years (26.8%), 3-5 Years (24.6%), and 1-3 Years (14.2%).
- **Conclusion:** The distribution suggests that the insights come from a mix of both seasoned professionals and those relatively newer to the field, providing a broad perspective on the adoption and impact of new technologies.

Q3:

Which of the following technologies has your organization implemented within its logistics platforms? (Select all that apply)

183 responses



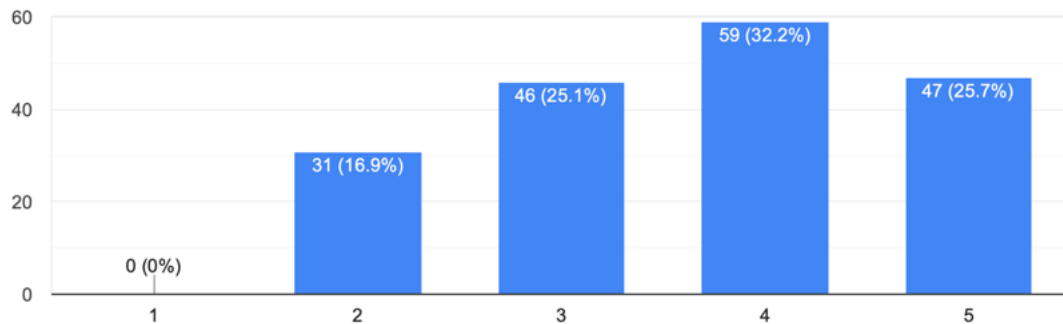
Technologies Implemented

- **Findings:** The most commonly implemented technologies are Data Analytics (72 mentions), Real-Time Tracking and Trace (66 mentions), AI and ML (62 mentions), IoT (34 mentions), and Blockchain (27 mentions).
- **Conclusion:** The focus on data analytics, real-time tracking, AI, and ML reflects an industry trend towards leveraging technology for enhanced decision-making, operational efficiency, and innovation.

Q4:

On a scale of 1 to 5, how would you rate the overall impact of the new technologies on your logistics operations?

183 responses



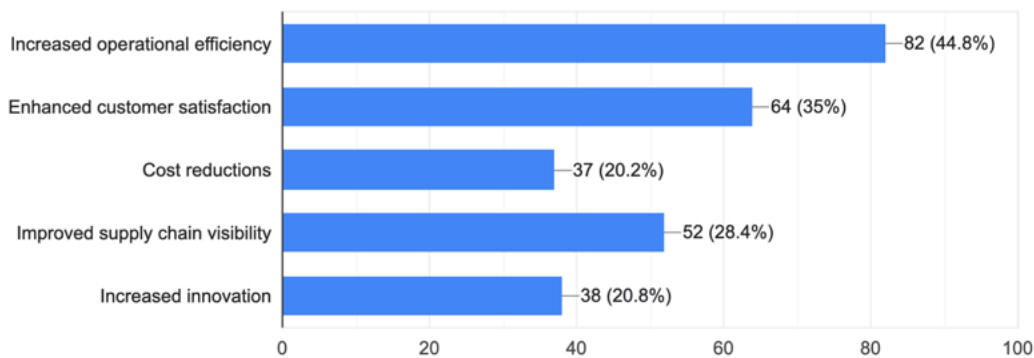
Impact Rating of New Technologies

- **Findings:** The overall impact ratings are positive, with 32.2% rating 4 out of 5 and 25.7% rating 5 out of 5.
- **Conclusion:** The positive ratings indicate a strong perceived value of new technologies in improving logistics operations, with a significant portion of respondents acknowledging their beneficial impact.

Q5:

What are the primary benefits your organization has realized from implementing new technologies in logistics? (Select all that apply)

183 responses



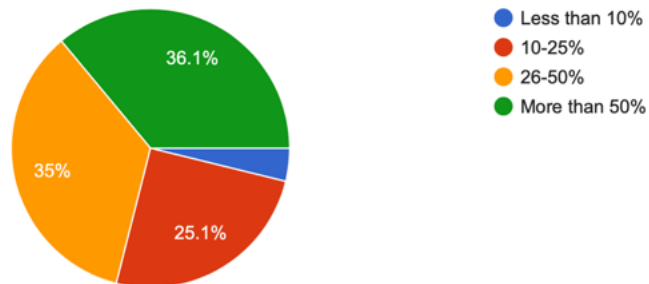
Primary Benefits Realized

- **Findings:** The primary benefits realized include increased operational efficiency (82 mentions), enhanced customer satisfaction (64 mentions), improved supply chain visibility (52 mentions), increased innovation (38 mentions), and cost reductions (37 mentions).
- **Conclusion:** These findings underscore the critical role of new technologies in enhancing operational and customer service aspects of logistics, with operational efficiency and customer satisfaction being the most pronounced benefits.

Q6:

Can you estimate the percentage improvement in operational efficiency as a result of adopting new technologies?

183 responses



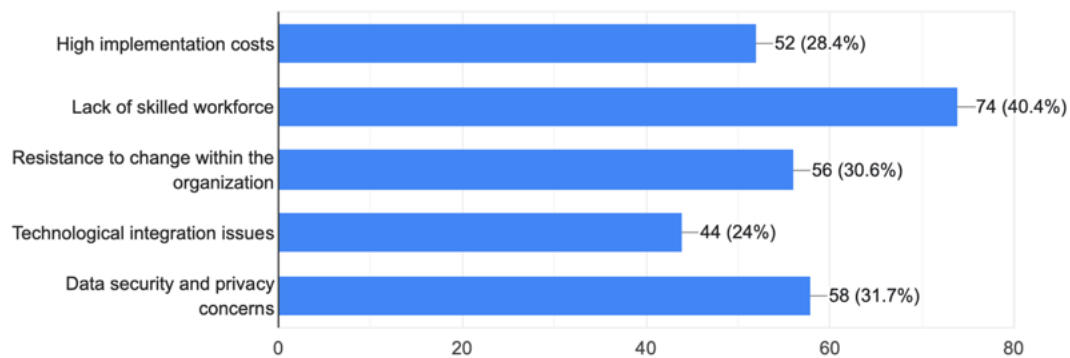
Estimated Improvement in Operational Efficiency

- **Findings:** Respondents estimate significant improvements in operational efficiency, with 36.1% reporting more than 50% improvement and 35% reporting a 26-50% improvement.
- **Conclusion:** The high percentage of respondents reporting substantial improvements reflects the impactful role of technology in driving efficiency gains within logistics operations.

Q7:

What are the biggest challenges your organization faces in adopting new technologies for logistics?
(Select all that apply)

183 responses



Challenges in Adopting New Technologies

- **Findings:** Major challenges include lack of skilled workforce (74 mentions), data security and privacy concerns (58 mentions), resistance to change within the organization (56 mentions), high implementation costs (52 mentions), and technological integration issues (44 mentions).
- **Conclusion:** These challenges highlight the critical barriers to technology adoption, emphasizing the need for skilled workforce development, cultural change management, and addressing cost and security concerns.

Findings and Conclusion:

Overall Conclusion:

The survey data reveals a logistics sector that is positively impacted by the adoption of new technologies, with notable improvements in operational efficiency and customer satisfaction. However, significant challenges in technology adoption, such as skill gaps, resistance to change, and security concerns, need to be addressed.

Recommendations:

- **Invest in Training:** Develop comprehensive training programs to bridge the skill gap and equip employees with the necessary technological skills.
- **Foster a Culture of Innovation:** Implement change management strategies to overcome resistance and foster an organizational culture that embraces innovation.
- **Address Security and Integration Concerns:** Prioritize data security and ensure seamless integration of new technologies with existing systems to maximize their benefits.
- **Optimize Costs:** Explore cost-effective solutions and technologies that offer a high return on investment to mitigate the concern of high implementation costs.
- **Forge Strategic Partnerships:** Encourage collaborations with technology firms, academic institutions, and other logistics companies to foster innovation, streamline technology integration, and share best practices. Such partnerships can accelerate the adoption of cutting-edge technologies and drive industry-wide improvements.
- **Advocate for Supportive Regulatory Policies:** Engage with policymakers to shape a regulatory environment that facilitates technological innovation and adoption in logistics. This includes advocating for regulations that

protect data while not stifling innovation, as well as seeking government incentives for companies investing in new technologies.

- **Develop a Comprehensive Digital Strategy:** Craft a strategic plan that aligns digital initiatives with overall business objectives, ensuring that technology investments directly contribute to operational efficiencies, customer satisfaction, and market competitiveness. This strategy should also include provisions for workforce development and cultural adaptation to support digital transformation.
- **Utilize Data for Enhanced Customer Insights:** Leverage advanced analytics and big data technologies to gain deeper insights into customer behaviors and preferences, enabling more personalized and responsive logistics services. This approach can significantly enhance customer satisfaction and loyalty.
- **Emphasize Sustainable Technology Solutions:** Focus on implementing technologies that not only optimize operations but also promote environmental sustainability. Solutions that reduce emissions, waste, and energy consumption can improve operational efficiency while also addressing increasing consumer demand for eco-friendly business practices.
- **Implement Continuous Improvement Mechanisms:** Establish systems for ongoing evaluation of technology performance, ensuring that digital tools and processes remain effective and are iteratively improved based on operational data and feedback. This approach supports sustained benefits from technology investments.
- **Adopt Agile Implementation Practices:** Utilize agile methodologies for the deployment of new technologies, allowing for more flexible and responsive project management. Agile practices can help logistics companies more effectively navigate the uncertainties of digital transformation, adjusting strategies in real-time to achieve optimal outcomes.

Abstract

This study explores the transformative impact of new technologies on logistics platforms within the postal sector of Saudi Arabia, a pivotal area underpinning the nation's ambitious Vision 2030. With a focus on cutting-edge technologies such as Artificial Intelligence (AI), the Internet of Things (IoT), and blockchain, this research investigates how these innovations enhance operational efficiency, improve customer service, and contribute to the sector's competitive advantage. Employing a mixed-methods approach that combines quantitative data analysis with qualitative insights from industry experts, the study provides a comprehensive examination of technology adoption within Saudi Post and its subsidiary, Infinite Platform Logistics Company.

Key findings reveal that technological integration significantly boosts operational efficiency and customer satisfaction, despite challenges such as skill gaps, organizational resistance, and high implementation costs. Strategic investments in technology and overcoming adoption barriers are identified as crucial for maintaining competitiveness and aligning with national development goals.

The study contributes to the academic discourse by filling a gap in empirical research regarding the adoption and impact of new technologies in the Saudi postal logistics sector. It also offers practical implications by outlining strategic recommendations for stakeholders, including the importance of investing in workforce training, fostering a culture of innovation, addressing security and integration concerns, and developing comprehensive digital strategies.

This research not only underscores the critical role of emerging technologies in shaping the future trajectory of logistics platforms but also highlights best practices and potential avenues for further innovation and investigation, paving the way for a technologically advanced, efficient, and competitive postal sector in Saudi Arabia.

الخلاصة

تستكشف هذه الدراسة التأثير التحويلي للتقنيات الجديدة على المنصات اللوجستية داخل القطاع البريدي في المملكة العربية السعودية، وهو مجال محوري يتماشى مع رؤية البلاد الطموحة 2030. مع التركيز على التقنيات المتطورة مثل الذكاء الاصطناعي (AI)، وإنترنت الأشياء (IoT)، و blockchain، تبحث هذه الدراسة في كيفية تعزيز هذه الابتكارات وتمكين التقنيات الحديثة للكفاءة التشغيلية، وتحسين خدمة العملاء، والمساهمة في الميزة التنافسية للقطاع. ومن خلال استخدام نهج متعدد الأساليب يجمع بين تحليل البيانات الكمية والرؤى النوعية من خبراء الصناعة، توفر الدراسة فحصاً شاملاً لاعتماد التكنولوجيا داخل البريد السعودي وشركته التابعة له شركة Infinite Platform Logistics Company.

تكشف النتائج الرئيسية أن التكامل التكنولوجي يعزز بشكل كبير الكفاءة التشغيلية ورضا العملاء، على الرغم من التحديات مثل الفجوات في المهارات، والمقاومة التنظيمية، وارتفاع تكاليف التنفيذ. وتعتبر الاستثمارات الاستراتيجية في التكنولوجيا والتغلب على عوائق التبني أمراً بالغ الأهمية للحفاظ على القدرة التنافسية والمواءمة مع أهداف التنمية الوطنية.

تساهم الدراسة في الخطاب الأكاديمي من خلال سد فجوة في البحث التجريبي فيما يتعلق بتبني وتأثير التقنيات الجديدة في قطاع الخدمات اللوجستية البريدية السعودي. كما أنها توفر آثراً عملية من خلال تحديد التوصيات الإستراتيجية لأصحاب المصلحة، بما في ذلك أهمية الاستثمار في تدريب القوى العاملة، وتعزيز ثقافة الابتكار، ومعالجة المخاوف الأمنية والتكامل، وتطوير استراتيجيات رقمية شاملة.

لا يسلط هذا البحث الضوء على الدور الحاسم الذي تلعبه التقنيات الناشئة في تشكيل المسار المستقبلي للمنصات اللوجستية فحسب، بل يسلط الضوء أيضاً على أفضل الممارسات والسبل المحتملة لمزيد من الابتكار والبحث، مما يمهد الطريق لقطاع بريدي متقدم تقنياً وفعال وتنافسي في المملكة العربية السعودية.

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Questionnaire booklet:

Midocean University
College of Management
Department of Master Project Management

Dear Respondent,

I am a Master's candidate in Management at Midocean University, currently conducting a study titled "The Impact of New Technologies on the Success of Logistics Platforms within the Postal Sector – Saudi Arabia." This study aims to examine the transformative effects of emerging technologies on logistics operations and their broader implications for the sector.

Your participation in this questionnaire is invaluable to my research. Please be assured that all information provided will be kept confidential and used solely for academic purposes. Your cooperation is greatly appreciated.

Thank you in advance for participating in this study. Should you have any questions, feel free to contact me.

Sincerely,
Yousef Altartoori
Master Candidate at Midocean University
College of Management
Department of Master Project Management
Email: Yousefmar1@gmail.com
Phone: 00966582229889

Questionnaire:

Q1: What is your role in the organization?

- C-level / VP / President
- Director
- Senior Manager
- Technical Specialist
- Manager
- Analyst / Junior Staff

Q2: How many years of experience do you have in the digital, logistics, postal, or supply chain sector?

- 1-3 Years
- 3-5 Years
- 5-10 Years
- More than 10 Years

Q3: Which of the following technologies has your organization implemented within its logistics platforms? (Select all that apply)

- Artificial Intelligence (AI) and Machine Learning (ML)
- Internet of Things (IoT)
- Blockchain
- Data Analytics
- Real-Time Tracking and Trace

Q4: On a scale of 1 to 5, how would you rate the overall impact of the new technologies on your logistics operations? (1 = No impact, 5 = Transformative impact)

- 1
- 2
- 3
- 4
- 5

Q5: What are the primary benefits your organization has realized from implementing new technologies in logistics? (Select all that apply)

- Increased operational efficiency
- Enhanced customer satisfaction
- Cost reductions
- Improved supply chain visibility
- Increased innovation

Q6: Can you estimate the percentage improvement in operational efficiency as a result of adopting new technologies?

- Less than 10%
- 10-25%
- 26-50%
- More than 50%

Q7: What are the biggest challenges your organization faces in adopting new technologies for logistics? (Select all that apply)

- High implementation costs
- Lack of skilled workforce
- Resistance to change within the organization
- Technological integration issues
- Data security and privacy concerns

Gratitude:

Thank you for taking the time to complete this survey. Your input is incredibly valuable to our study and will contribute significantly to our understanding of the impact of new technologies on the logistics sector. We are deeply grateful for your participation and insights.

Best Regards,

Yousef Altartoori

Master Candidate at Midocean University

College of Management

Department of Master Project Management

Email: Yousefmar1@gmail.com

Phone: 00966582229889

Questionnaire & Survey raw data

(extracted from Google Form database)

2	Analyst / Junior	1-3 Years	Data Analytics	2	Cost reductions	10-25%	Lack of skilled workforce
3	Analyst / Junior	3-5 Years	Internet of Things (IoT)	2	Cost reductions	26-50%	Resistance to change within the organization
4	Analyst / Junior	1-3 Years	Internet of Things (IoT)	2	Increased operational efficiency	Less than 10%	Resistance to change within the organization
5	Analyst / Junior	More than 10 Years	Blockchain	5	Enhanced customer satisfaction	More than 50%	Resistance to change within the organization
6	Analyst / Junior	1-3 Years	Real Time Tracking and Trace	2	Increased innovation	10-25%	Technological integration issues
7	Analyst / Junior	1-3 Years	Blockchain	2	Increased operational efficiency, Improved supply chain visibility	10-25%	Data security and privacy concerns
8	Analyst / Junior	1-3 Years	Real Time Tracking and Trace	2	Enhanced customer satisfaction, Increased innovation	Less than 10%	Lack of skilled workforce
9	Analyst / Junior	1-3 Years	Data Analytics	2	Improved supply chain visibility	10-25%	Data security and privacy concerns

10	Analyst / Junior	1-3 Years	Blockchain	2	Increased operational efficiency	Less than 10%	Lack of skilled workforce
11	Analyst / Junior	1-3 Years	Data Analytics, Real Time Tracking and Trace	4	Increased operational efficiency, Enhanced customer satisfaction, Improved supply chain visibility, Increased innovation	26-50%	High implementation costs, Lack of skilled workforce, Resistance to change within the organization, Technological integration issues, Data security and privacy concerns
12	Analyst / Junior	1-3 Years	Internet of Things (IoT)	3	Improved supply chain visibility	10-25%	Data security and privacy concerns
13	Analyst / Junior	3-5 Years	Artificial Intelligence (AI) and Machine Learning (ML)	2	Cost reductions	10-25%	High implementation costs
14	Analyst / Junior	1-3 Years	Blockchain	3	Enhanced customer satisfaction, Improved supply chain visibility	Less than 10%	Resistance to change within the organization
15	Analyst / Junior	1-3 Years	Data Analytics	2	Enhanced customer satisfaction	10-25%	Lack of skilled workforce

16	Analyst / Junior	1-3 Years	Data Analytics	2	Increased innovation	Less than 10%	High implementation costs, Data security and privacy concerns
17	Analyst / Junior	1-3 Years	Blockchain	2	Cost reductions	10-25%	Technological integration issues
18	Analyst / Junior	1-3 Years	Internet of Things (IoT)	3	Enhanced customer satisfaction	10-25%	Lack of skilled workforce
19	Analyst / Junior	1-3 Years	Data Analytics	2	Cost reductions	10-25%	Lack of skilled workforce
20	C-level / VP / President	More than 10 Years	Artificial Intelligence (AI) and Machine Learning (ML), Data Analytics, Real Time Tracking and Trace	5	Increased operational efficiency, Enhanced customer satisfaction, Cost reductions, Improved supply chain visibility, Increased innovation	More than 50%	High implementation costs, Resistance to change within the organization, Data security and privacy concerns
21	C-level / VP / President	5-10 Years	Artificial Intelligence (AI) and Machine Learning (ML), Blockchain, Real Time Tracking and Trace	5	Increased operational efficiency, Enhanced customer satisfaction, Cost reductions, Improved supply	26-50%	High implementation costs, Resistance to change within the organization, Data security and privacy concerns

					chain visibility, Increased innovation		
22	C-level / VP / President	5-10 Years	Internet of Things (IoT)	4	Enhanced customer satisfaction	26- 50%	High implementation costs
23	C-level / VP / President	5-10 Years	Artificial Intelligence (AI) and Machine Learning (ML)	5	Increased operational efficiency	More than 50%	Data security and privacy concerns
24	C-level / VP / President	5-10 Years	Data Analytics	4	Enhanced customer satisfaction	26- 50%	Resistance to change within the organization
25	C-level / VP / President	5-10 Years	Artificial Intelligence (AI) and Machine Learning (ML)	4	Increased operational efficiency, Enhanced customer satisfaction	More than 50%	High implementation costs
26	C-level / VP / President	More than 10 Years	Data Analytics	5	Enhanced customer satisfaction	26- 50%	Resistance to change within the organization
27	C-level / VP / President	5-10 Years	Artificial Intelligence (AI) and Machine Learning (ML)	4	Increased operational efficiency	More than 50%	High implementation costs

28	C-level / VP / President	More than 10 Years	Internet of Things (IoT)	5	Enhanced customer satisfaction, Increased innovation	More than 50%	Lack of skilled workforce
29	C-level / VP / President	5-10 Years	Data Analytics	5	Enhanced customer satisfaction	More than 50%	Data security and privacy concerns
30	C-level / VP / President	More than 10 Years	Internet of Things (IoT)	4	Enhanced customer satisfaction	26- 50%	Lack of skilled workforce
31	C-level / VP / President	5-10 Years	Internet of Things (IoT)	4	Enhanced customer satisfaction, Improved supply chain visibility	26- 50%	Lack of skilled workforce
32	C-level / VP / President	5-10 Years	Artificial Intelligence (AI) and Machine Learning (ML)	5	Increased innovation	More than 50%	Data security and privacy concerns
33	C-level / VP / President	More than 10 Years	Data Analytics	5	Cost reductions	More than 50%	Lack of skilled workforce
34	C-level / VP / President	More than 10 Years	Real Time Tracking and Trace	5	Cost reductions, Increased innovation	26- 50%	Data security and privacy concerns
35	C-level / VP / President	More than 10 Years	Data Analytics	5	Enhanced customer satisfaction	More than 50%	Lack of skilled workforce

36	C-level / VP / President	More than 10 Years	Artificial Intelligence (AI) and Machine Learning (ML), Data Analytics	5	Enhanced customer satisfaction, Increased innovation	More than 50%	Resistance to change within the organization
37	C-level / VP / President	More than 10 Years	Blockchain	5	Increased operational efficiency	More than 50%	High implementation costs
38	Director	More than 10 Years	Internet of Things (IoT), Data Analytics	5	Increased operational efficiency	More than 50%	Lack of skilled workforce, Technological integration issues
39	Director	More than 10 Years	Artificial Intelligence (AI) and Machine Learning (ML), Data Analytics	5	Enhanced customer satisfaction	More than 50%	Lack of skilled workforce
40	Director	More than 10 Years	Real Time Tracking and Trace	5	Enhanced customer satisfaction, Increased innovation	More than 50%	High implementation costs, Data security and privacy concerns
41	Director	5-10 Years	Artificial Intelligence (AI) and Machine Learning (ML)	5	Increased operational efficiency	26- 50%	Lack of skilled workforce
42	Director	1-3 Years	Internet of Things (IoT)	4	Enhanced customer satisfaction	26- 50%	Resistance to change within

							the organization
43	Director	5-10 Years	Internet of Things (IoT)	4	Enhanced customer satisfaction	26-50%	Resistance to change within the organization
44	Director	5-10 Years	Artificial Intelligence (AI) and Machine Learning (ML)	4	Enhanced customer satisfaction	26-50%	High implementation costs
45	Director	5-10 Years	Data Analytics	4	Cost reductions	More than 50%	Technological integration issues
46	Director	5-10 Years	Real Time Tracking and Trace	4	Enhanced customer satisfaction	26-50%	High implementation costs
47	Director	More than 10 Years	Blockchain	4	Enhanced customer satisfaction	26-50%	Technological integration issues
48	Director	5-10 Years	Blockchain, Real Time Tracking and Trace	5	Improved supply chain visibility	More than 50%	Data security and privacy concerns
49	Director	5-10 Years	Data Analytics	4	Cost reductions	26-50%	Technological integration issues
50	Director	More than 10 Years	Blockchain	4	Enhanced customer satisfaction	26-50%	Lack of skilled workforce
51	Director	5-10 Years	Artificial Intelligence (AI) and Machine Learning	4	Improved supply chain visibility	26-50%	Technological integration issues

			(ML), Data Analytics				
52	Director	5-10 Years	Artificial Intelligence (AI) and Machine Learning (ML), Data Analytics	4	Improved supply chain visibility	26-50%	High implementation costs
53	Director	5-10 Years	Data Analytics, Real Time Tracking and Trace	4	Cost reductions	26-50%	High implementation costs, Technological integration issues
54	Director	5-10 Years	Data Analytics	4	Enhanced customer satisfaction	26-50%	Resistance to change within the organization
55	Director	5-10 Years	Real Time Tracking and Trace	4	Improved supply chain visibility	26-50%	Technological integration issues
56	Director	5-10 Years	Internet of Things (IoT)	4	Increased operational efficiency	26-50%	High implementation costs
57	Director	More than 10 Years	Artificial Intelligence (AI) and Machine Learning (ML), Blockchain	4	Increased innovation	26-50%	Data security and privacy concerns
58	Director	5-10 Years	Real Time Tracking and Trace	4	Increased operational efficiency	26-50%	Technological integration issues

59	Director	5-10 Years	Data Analytics	4	Enhanced customer satisfaction	26-50%	Lack of skilled workforce, Data security and privacy concerns
60	Director	More than 10 Years	Artificial Intelligence (AI) and Machine Learning (ML), Data Analytics, Real Time Tracking and Trace	5	Increased operational efficiency, Improved supply chain visibility, Increased innovation	More than 50%	High implementation costs, Resistance to change within the organization
61	Director	More than 10 Years	Artificial Intelligence (AI) and Machine Learning (ML), Data Analytics	5	Cost reductions	More than 50%	Technological integration issues
62	Manager	1-3 Years	Data Analytics	2	Increased operational efficiency	10-25%	Lack of skilled workforce
63	Manager	3-5 Years	Internet of Things (IoT)	2	Cost reductions	10-25%	Technological integration issues
64	Manager	5-10 Years	Data Analytics	5	Cost reductions	More than 50%	Lack of skilled workforce
65	Manager	1-3 Years	Blockchain	2	Cost reductions	10-25%	High implementation costs
66	Manager	3-5 Years	Artificial Intelligence (AI) and Machine	2	Enhanced customer satisfaction	10-25%	Lack of skilled workforce

			Learning (ML), Internet of Things (IoT)				
67	Manager	3-5 Years	Blockchain, Real Time Tracking and Trace	2	Enhanced customer satisfaction	10-25%	Resistance to change within the organization
68	Manager	3-5 Years	Data Analytics, Real Time Tracking and Trace	3	Increased innovation	Less than 10%	Resistance to change within the organization, Technological integration issues
69	Manager	1-3 Years	Data Analytics	2	Improved supply chain visibility	10-25%	Resistance to change within the organization
70	Manager	1-3 Years	Blockchain, Data Analytics	2	Enhanced customer satisfaction	10-25%	Lack of skilled workforce
71	Manager	3-5 Years	Artificial Intelligence (AI) and Machine Learning (ML), Internet of Things (IoT), Real Time Tracking and Trace	4	Increased operational efficiency, Enhanced customer satisfaction, Cost reductions, Improved supply chain visibility, Increased innovation	26-50%	High implementation costs, Lack of skilled workforce, Resistance to change within the organization, Technological integration issues, Data security and privacy concerns

72	Manager	3-5 Years	Artificial Intelligence (AI) and Machine Learning (ML), Internet of Things (IoT), Data Analytics, Real Time Tracking and Trace	4	Increased operational efficiency, Enhanced customer satisfaction, Cost reductions, Improved supply chain visibility, Increased innovation	More than 50%	High implementation costs, Lack of skilled workforce, Resistance to change within the organization, Technological integration issues, Data security and privacy concerns
73	Manager	5-10 Years	Artificial Intelligence (AI) and Machine Learning (ML), Internet of Things (IoT), Data Analytics, Real Time Tracking and Trace	4	Increased operational efficiency, Enhanced customer satisfaction, Cost reductions, Increased innovation	26-50%	High implementation costs, Lack of skilled workforce, Resistance to change within the organization, Technological integration issues, Data security and privacy concerns
74	Manager	3-5 Years	Artificial Intelligence (AI) and Machine Learning (ML), Real Time	4	Increased operational efficiency, Increased innovation	26-50%	High implementation costs, Data security and privacy concerns

			Tracking and Trace				
75	Manager	5-10 Years	Artificial Intelligence (AI) and Machine Learning (ML), Real Time Tracking and Trace	4	Increased operational efficiency, Improved supply chain visibility	More than 50%	High implementation costs, Lack of skilled workforce, Resistance to change within the organization, Data security and privacy concerns
76	Manager	3-5 Years	Artificial Intelligence (AI) and Machine Learning (ML), Blockchain	2	Improved supply chain visibility	10-25%	High implementation costs, Resistance to change within the organization
77	Manager	3-5 Years	Data Analytics	3	Improved supply chain visibility	10-25%	High implementation costs, Data security and privacy concerns
78	Manager	3-5 Years	Blockchain	3	Increased operational efficiency, Cost reductions	10-25%	Resistance to change within the organization

79	Manager	3-5 Years	Artificial Intelligence (AI) and Machine Learning (ML)	4	Increased operational efficiency, Improved supply chain visibility	26-50%	High implementation costs, Technological integration issues
80	Manager	3-5 Years	Data Analytics	3	Enhanced customer satisfaction, Improved supply chain visibility	10-25%	Lack of skilled workforce, Resistance to change within the organization
81	Manager	1-3 Years	Blockchain	3	Cost reductions	10-25%	Technological integration issues
82	Manager	3-5 Years	Data Analytics	3	Cost reductions	10-25%	Lack of skilled workforce, Resistance to change within the organization
83	Manager	3-5 Years	Internet of Things (IoT)	4	Cost reductions	10-25%	Lack of skilled workforce
84	Manager	3-5 Years	Blockchain	3	Enhanced customer satisfaction	10-25%	Resistance to change within the organization
85	Senior Manager	More than 10 Years	Artificial Intelligence (AI) and Machine Learning (ML), Data Analytics, Real Time	4	Increased operational efficiency, Enhanced customer satisfaction, Improved supply chain	26-50%	High implementation costs, Lack of skilled workforce, Resistance to change within the organization,

			Tracking and Trace		visibility, Increased innovation		Technological integration issues, Data security and privacy concerns
86	Senior Manager	3-5 Years	Internet of Things (IoT)	3	Cost reductions	10-25%	Lack of skilled workforce
87	Senior Manager	5-10 Years	Internet of Things (IoT)	3	Increased operational efficiency	10-25%	High implementation costs
88	Senior Manager	5-10 Years	Internet of Things (IoT)	2	Increased operational efficiency	More than 50%	Lack of skilled workforce
89	Senior Manager	3-5 Years	Data Analytics	3	Cost reductions, Improved supply chain visibility	26-50%	Lack of skilled workforce
90	Senior Manager	5-10 Years	Internet of Things (IoT)	4	Enhanced customer satisfaction	26-50%	Resistance to change within the organization
91	Senior Manager	More than 10 Years	Data Analytics	4	Enhanced customer satisfaction, Increased innovation	More than 50%	Data security and privacy concerns
92	Senior Manager	5-10 Years	Internet of Things (IoT), Data Analytics	4	Cost reductions	26-50%	Technological integration issues

93	Senior Manager	5-10 Years	Data Analytics	4	Increased operational efficiency	26-50%	Resistance to change within the organization
94	Senior Manager	5-10 Years	Data Analytics	4	Increased innovation	26-50%	Resistance to change within the organization
95	Senior Manager	3-5 Years	Blockchain	3	Cost reductions	10-25%	Resistance to change within the organization
96	Senior Manager	5-10 Years	Artificial Intelligence (AI) and Machine Learning (ML)	4	Cost reductions, Improved supply chain visibility	26-50%	Resistance to change within the organization
97	Senior Manager	5-10 Years	Artificial Intelligence (AI) and Machine Learning (ML)	5	Enhanced customer satisfaction	26-50%	Lack of skilled workforce
98	Senior Manager	3-5 Years	Data Analytics	3	Enhanced customer satisfaction, Improved supply chain visibility	10-25%	High implementation costs, Technological integration issues
99	Senior Manager	3-5 Years	Blockchain	3	Increased operational efficiency, Improved supply chain visibility	10-25%	Lack of skilled workforce, Data security and privacy concerns

100	Senior Manager	5-10 Years	Real Time Tracking and Trace	5	Increased operational efficiency	26-50%	High implementation costs, Lack of skilled workforce
101	Senior Manager	5-10 Years	Real Time Tracking and Trace	3	Enhanced customer satisfaction	26-50%	Resistance to change within the organization
102	Senior Manager	3-5 Years	Blockchain	3	Improved supply chain visibility	10-25%	Lack of skilled workforce, Technological integration issues
103	Senior Manager	5-10 Years	Artificial Intelligence (AI) and Machine Learning (ML), Internet of Things (IoT), Blockchain, Data Analytics, Real Time Tracking and Trace	5	Increased operational efficiency, Enhanced customer satisfaction, Improved supply chain visibility, Increased innovation	26-50%	High implementation costs, Lack of skilled workforce, Resistance to change within the organization, Technological integration issues, Data security and privacy concerns
104	Senior Manager	5-10 Years	Artificial Intelligence (AI) and Machine Learning (ML), Real Time Tracking and Trace	4	Increased operational efficiency, Improved supply chain visibility, Increased innovation	More than 50%	High implementation costs, Lack of skilled workforce, Technological integration issues

105	Technical	1-3 Years	Internet of Things (IoT)	2	Enhanced customer satisfaction	10-25%	Lack of skilled workforce
106	Technical	3-5 Years	Internet of Things (IoT)	2	Improved supply chain visibility	10-25%	Lack of skilled workforce
107	Technical	1-3 Years	Data Analytics, Real Time Tracking and Trace	2	Increased innovation	Less than 10%	Data security and privacy concerns
108	Technical	3-5 Years	Data Analytics	4	Increased operational efficiency, Enhanced customer satisfaction	26-50%	Lack of skilled workforce, Technological integration issues
109	Technical	3-5 Years	Data Analytics	3	Cost reductions	26-50%	Data security and privacy concerns
110	Technical	3-5 Years	Data Analytics	2	Increased operational efficiency, Improved supply chain visibility	10-25%	Technological integration issues
111	Technical	1-3 Years	Data Analytics	2	Enhanced customer satisfaction, Improved supply chain visibility	10-25%	High implementation costs, Resistance to change within the organization
112	Technical	3-5 Years	Artificial Intelligence (AI) and	3	Cost reductions	10-25%	Lack of skilled workforce

			Machine Learning (ML), Data Analytics				
113	Technical	3-5 Years	Internet of Things (IoT)	3	Increased operational efficiency	10-25%	High implementation costs
114	Technical	1-3 Years	Real Time Tracking and Trace	2	Cost reductions	10-25%	Lack of skilled workforce
115	Technical	5-10 Years	Artificial Intelligence (AI) and Machine Learning (ML), Internet of Things (IoT), Data Analytics, Real Time Tracking and Trace	4	Increased operational efficiency, Enhanced customer satisfaction, Improved supply chain visibility	More than 50%	Lack of skilled workforce, Resistance to change within the organization, Technological integration issues, Data security and privacy concerns
116	Technical	3-5 Years	Internet of Things (IoT), Real Time Tracking and Trace	3	Enhanced customer satisfaction	10-25%	Lack of skilled workforce
117	Technical	3-5 Years	Internet of Things (IoT)	4	Enhanced customer satisfaction	26-50%	Resistance to change within the organization
118	Technical	3-5 Years	Blockchain	3	Increased operational efficiency	26-50%	High implementation costs, Resistance to change within

							the organization
119	Technical	3-5 Years	Artificial Intelligence (AI) and Machine Learning (ML), Real Time Tracking and Trace	4	Increased operational efficiency	26-50%	Lack of skilled workforce
120	Technical	3-5 Years	Data Analytics	3	Cost reductions	10-25%	Lack of skilled workforce, Data security and privacy concerns
121	Technical	3-5 Years	Real Time Tracking and Trace	4	Enhanced customer satisfaction, Improved supply chain visibility	26-50%	Lack of skilled workforce
122	Technical	3-5 Years	Blockchain	2	Improved supply chain visibility	10-25%	Technological integration issues
123	Technical	3-5 Years	Data Analytics	3	Improved supply chain visibility	10-25%	Technological integration issues
124	Technical	3-5 Years	Data Analytics	4	Enhanced customer satisfaction, Cost reductions	26-50%	Technological integration issues

125	Director	5-10 Years	Artificial Intelligence (AI) and Machine Learning (ML), Data Analytics, Real Time Tracking and Trace	4	Increased operational efficiency, Enhanced customer satisfaction, Improved supply chain visibility	26-50%	High implementation costs, Data security and privacy concerns
126	Director	5-10 Years	Artificial Intelligence (AI) and Machine Learning (ML), Data Analytics, Real Time Tracking and Trace	3	Increased operational efficiency, Enhanced customer satisfaction, Improved supply chain visibility	26-50%	Lack of skilled workforce, Resistance to change within the organization
127	Director	5-10 Years	Data Analytics, Real Time Tracking and Trace	4	Increased operational efficiency, Enhanced customer satisfaction, Improved supply chain visibility	26-50%	Lack of skilled workforce, Resistance to change within the organization
128	Technical	3-5 Years	Artificial Intelligence (AI) and Machine Learning (ML), Data Analytics, Real Time	3	Increased operational efficiency, Enhanced customer satisfaction, Improved supply	10-25%	Technological integration issues, Data security and privacy concerns

			Tracking and Trace		chain visibility		
129	Technical	3-5 Years	Data Analytics, Real Time Tracking and Trace	4	Increased operational efficiency	10-25%	Technological integration issues, Data security and privacy concerns
130	Technical	5-10 Years	Data Analytics, Real Time Tracking and Trace	4	Increased operational efficiency, Enhanced customer satisfaction, Improved supply chain visibility	More than 50%	Technological integration issues, Data security and privacy concerns
131	Manager	3-5 Years	Data Analytics, Real Time Tracking and Trace	2	Increased operational efficiency, Improved supply chain visibility	26-50%	High implementation costs, Resistance to change within the organization, Data security and privacy concerns
132	Manager	3-5 Years	Artificial Intelligence (AI) and Machine Learning (ML), Data	4	Increased operational efficiency, Enhanced customer satisfaction,	26-50%	Lack of skilled workforce, Resistance to change within the organization

			Analytics, Real Time Tracking and Trace		Improved supply chain visibility		
133	Manager	3-5 Years	Real Time Tracking and Trace	4	Increased operational efficiency, Improved supply chain visibility	More than 50%	Resistance to change within the organization, Technological integration issues
134	Senior Manager	5-10 Years	Data Analytics, Real Time Tracking and Trace	4	Increased operational efficiency, Cost reductions, Improved supply chain visibility	26- 50%	Resistance to change within the organization, Technological integration issues, Data security and privacy concerns
135	Senior Manager	5-10 Years	Artificial Intelligence (AI) and Machine Learning (ML), Data Analytics, Real Time Tracking and Trace	4	Increased operational efficiency, Improved supply chain visibility	More than 50%	Resistance to change within the organization, Technological integration issues

136	Technical	5-10 Years	Artificial Intelligence (AI) and Machine Learning (ML), Data Analytics, Real Time Tracking and Trace	4	Increased operational efficiency, Improved supply chain visibility, Increased innovation	More than 50%	Resistance to change within the organization, Technological integration issues
137	Technical	5-10 Years	Artificial Intelligence (AI) and Machine Learning (ML), Data Analytics, Real Time Tracking and Trace	4	Increased operational efficiency, Improved supply chain visibility	10-25%	Resistance to change within the organization, Technological integration issues, Data security and privacy concerns
138	Technical	5-10 Years	Data Analytics, Real Time Tracking and Trace	4	Enhanced customer satisfaction, Improved supply chain visibility	More than 50%	Resistance to change within the organization, Technological integration issues
139	Manager	3-5 Years	Blockchain, Data Analytics, Real Time Tracking and Trace	5	Increased operational efficiency, Enhanced customer satisfaction, Improved supply chain visibility	More than 50%	Resistance to change within the organization, Technological integration issues, Data security and privacy concerns

140	Manager	3-5 Years	Data Analytics, Real Time Tracking and Trace	4	Increased operational efficiency, Improved supply chain visibility	26-50%	Resistance to change within the organization, Technological integration issues, Data security and privacy concerns
141	Manager	5-10 Years	Data Analytics, Real Time Tracking and Trace	3	Increased operational efficiency, Enhanced customer satisfaction, Improved supply chain visibility	More than 50%	Resistance to change within the organization, Technological integration issues, Data security and privacy concerns
142	Senior Manager	5-10 Years	Artificial Intelligence (AI) and Machine Learning (ML), Real Time Tracking and Trace	3	Cost reductions, Increased innovation	More than 50%	High implementation costs, Lack of skilled workforce, Data security and privacy concerns
143	Senior Manager	More than 10 Years	Artificial Intelligence (AI) and Machine Learning (ML)	3	Increased operational efficiency	More than 50%	Data security and privacy concerns
144	Senior Manager	More than	Artificial Intelligence (AI) and	5	Increased operational efficiency	More than 50%	Data security and privacy concerns

		10 Years	Machine Learning (ML)				
145	Senior Manager	More than 10 Years	Artificial Intelligence (AI) and Machine Learning (ML)	5	Increased operational efficiency	More than 50%	Lack of skilled workforce
146	Senior Manager	5-10 Years	Real Time Tracking and Trace	3	Increased innovation	More than 50%	High implementation costs
147	Senior Manager	More than 10 Years	Real Time Tracking and Trace	5	Increased operational efficiency	More than 50%	Resistance to change within the organization
148	Senior Manager	More than 10 Years	Real Time Tracking and Trace	5	Increased innovation	More than 50%	Lack of skilled workforce, Data security and privacy concerns
149	Senior Manager	More than 10 Years	Real Time Tracking and Trace	5	Increased operational efficiency	More than 50%	High implementation costs
150	Senior Manager	More than 10 Years	Real Time Tracking and Trace	5	Increased operational efficiency	More than 50%	Lack of skilled workforce, Data security and privacy concerns
151	Senior Manager	More than 10 Years	Real Time Tracking and Trace	3	Increased operational efficiency	More than 50%	Data security and privacy concerns
152	Senior Manager	More than 10 Years	Artificial Intelligence (AI) and Machine	5	Increased operational efficiency	More than 50%	Lack of skilled workforce

			Learning (ML)				
153	Senior Manager	More than 10 Years	Artificial Intelligence (AI) and Machine Learning (ML), Blockchain	5	Increased operational efficiency	More than 50%	Data security and privacy concerns
154	Senior Manager	More than 10 Years	Artificial Intelligence (AI) and Machine Learning (ML)	5	Increased operational efficiency	More than 50%	Lack of skilled workforce
155	Senior Manager	More than 10 Years	Artificial Intelligence (AI) and Machine Learning (ML)	3	Increased operational efficiency	More than 50%	Data security and privacy concerns
156	Senior Manager	More than 10 Years	Artificial Intelligence (AI) and Machine Learning (ML)	3	Increased operational efficiency	More than 50%	High implementation costs, Lack of skilled workforce
157	Manager	5-10 Years	Artificial Intelligence (AI) and Machine Learning (ML), Real Time Tracking and Trace	4	Increased operational efficiency	More than 50%	High implementation costs

158	Manager	More than 10 Years	Artificial Intelligence (AI) and Machine Learning (ML)	3	Increased operational efficiency	More than 50%	Lack of skilled workforce, Data security and privacy concerns
159	Manager	5-10 Years	Artificial Intelligence (AI) and Machine Learning (ML)	3	Enhanced customer satisfaction, Increased innovation	More than 50%	High implementation costs, Lack of skilled workforce
160	Manager	More than 10 Years	Real Time Tracking and Trace	5	Increased operational efficiency	More than 50%	Lack of skilled workforce
161	Manager	5-10 Years	Artificial Intelligence (AI) and Machine Learning (ML)	5	Increased innovation	More than 50%	High implementation costs, Data security and privacy concerns
162	Manager	More than 10 Years	Real Time Tracking and Trace	3	Increased innovation	More than 50%	Data security and privacy concerns
163	Manager	5-10 Years	Internet of Things (IoT)	3	Increased operational efficiency	26-50%	High implementation costs
164	Manager	More than 10 Years	Artificial Intelligence (AI) and Machine Learning (ML)	5	Increased operational efficiency	More than 50%	Data security and privacy concerns
165	Manager	More than	Artificial Intelligence (AI) and	5	Increased innovation	More than 50%	High implementation costs, Lack of

		10 Years	Machine Learning (ML)				skilled workforce
166	Manager	5-10 Years	Artificial Intelligence (AI) and Machine Learning (ML)	5	Increased operational efficiency	More than 50%	Lack of skilled workforce, Data security and privacy concerns
167	Manager	More than 10 Years	Artificial Intelligence (AI) and Machine Learning (ML)	5	Increased innovation	More than 50%	High implementation costs, Lack of skilled workforce
168	Manager	5-10 Years	Real Time Tracking and Trace	5	Increased innovation	More than 50%	Data security and privacy concerns
169	Manager	5-10 Years	Data Analytics	3	Enhanced customer satisfaction	More than 50%	Lack of skilled workforce
170	Manager	5-10 Years	Real Time Tracking and Trace	3	Increased operational efficiency	More than 50%	High implementation costs, Lack of skilled workforce
171	Manager	5-10 Years	Blockchain	5	Increased innovation	More than 50%	Data security and privacy concerns
172	Manager	5-10 Years	Internet of Things (IoT)	3	Increased operational efficiency, Increased innovation	26- 50%	High implementation costs
173	Manager	More than 10 Years	Real Time Tracking and Trace	3	Increased operational efficiency	26- 50%	Lack of skilled workforce, Data security and

							privacy concerns
174	Manager	More than 10 Years	Internet of Things (IoT)	5	Increased operational efficiency	26-50%	High implementation costs
175	Manager	More than 10 Years	Artificial Intelligence (AI) and Machine Learning (ML)	3	Increased operational efficiency	26-50%	Lack of skilled workforce
176	Manager	More than 10 Years	Real Time Tracking and Trace	3	Increased operational efficiency	More than 50%	High implementation costs, Lack of skilled workforce
177	Manager	More than 10 Years	Artificial Intelligence (AI) and Machine Learning (ML)	3	Increased operational efficiency	26-50%	High implementation costs, Data security and privacy concerns
178	Manager	More than 10 Years	Artificial Intelligence (AI) and Machine Learning (ML)	5	Cost reductions	More than 50%	Lack of skilled workforce, Resistance to change within the organization, Data security and privacy concerns

179	Manager	5-10 Years	Artificial Intelligence (AI) and Machine Learning (ML), Data Analytics, Real Time Tracking and Trace	5	Increased operational efficiency, Enhanced customer satisfaction	More than 50%	Lack of skilled workforce, Resistance to change within the organization
180	Manager	More than 10 Years	Artificial Intelligence (AI) and Machine Learning (ML), Data Analytics, Real Time Tracking and Trace	4	Increased operational efficiency, Enhanced customer satisfaction, Increased innovation	More than 50%	Lack of skilled workforce, Resistance to change within the organization
181	Manager	More than 10 Years	Artificial Intelligence (AI) and Machine Learning (ML)	5	Cost reductions	26-50%	Lack of skilled workforce, Resistance to change within the organization
182	Manager	More than 10 Years	Real Time Tracking and Trace	3	Increased operational efficiency	26-50%	High implementation costs
183	Manager	More than 10 Years	Internet of Things (IoT), Real Time Tracking and Trace	5	Increased operational efficiency	26-50%	Lack of skilled workforce, Data security and privacy concerns