

Role of Smart Logistics in Future Trade of Saudi Arabia under Vision 2030

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Abstract

This research has been focused on the role and importance of smart logistics in managing future trade in Saudi Arabia under Vision 2030. The study was conducted using 300 randomly drawn employees working in logistics and transportation organizations and having more than 2 years of experience. The result of this research has demonstrated how Saudi Arabia has already started investing in smart logistical infrastructure under Vision 2030. The literary discussions have also supported the country's immense potential from smart logistics. The findings of this research clarify that the majority of survey participants have mostly agreed that smart logistics is the possible future solution for Saudi Arabia's economic development and Saudi organizations must put some good effort into enhancing and developing smart logistics mechanisms. Also, this study has offered a few recommendations that would enable the country to successfully implement smart logistics and develop into a major trading hub in the future.

Keywords: *Logistics Hub, Smart logistics, Physical Internet (PI), Logistics sector, Transportation sector.*

1. Introduction

Smart logistics plays a pivotal role in Saudi Arabia's future trade under Vision 2030. Smart logistics will be used to track and monitor shipments, automate operations, and provide real-time insights into supply chain processes. It will help to reduce costs and improve efficiency to promote collaboration between stakeholders and enhance customer experience. This research aims to evaluate the role of smart logistics in the future trade of Saudi Arabia under Vision 2030. To investigate this, primary research data has been collected from industry experts. The research will identify the challenges faced by the government in the implementation of smart logistics and explore the potential opportunities for the country's future trade. The research will help to provide recommendations on how the government of Saudi Arabia can use smart logistics to its maximum benefit to increase trade and economic growth in the country.

Saudi Arabia is presently going through an important transition as part of the National Industrial Development and Logistics Program's (NIDLP) Vision 2030 initiative in hopes of diversifying its economy as well as reducing its dependence on oil. Vision 2030 places a strong emphasis on the adoption and improvement of statutes and regulations along with financial and societal changes, which will contribute to notable developments in all facets and an increasingly successful and flourishing economy (NIDLP, 2023). The expansion and prosperity of the nation's exports and manufacturing sectors depend on the establishment of a robust, effective logistics industry, which constitutes one of the

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project's major goals. In July 2021, Crown Prince Mohammed bin Salman's announcement of the "National Transport and Logistics Strategy" is seen as a comprehensive plan with optimistic benchmarks for achieving the Vision 2030 initiative (Zigurat, 2021). Additionally, it will solidify Saudi Arabia's alliances with the worldwide financial system and allow it to take advantage of its advantageous geographic location at the intersection of three different continents by expanding its economic activities through the development of a sophisticated logistics services industry, the construction of high-quality infrastructure, as well as applying aggressive economic models to boost efficiency and sustainable development within the logistics sector (Lee, 2022). However, a key element in accomplishing this vision is anticipated to be the adoption of smart logistics.

Smart logistics involves the incorporation of technological advancements in all activities performed within and beyond the warehouses, from the arrival of the products at the cargo ports to their dissemination and transportation to the target client in compliance with the terms of the contract (Mecalux, 2021). Most importantly, this strategy entails the integration of smart gadgets into logistics activities. Using cutting-edge technology like artificial intelligence (AI), the Internet of Things (IoT), blockchain, as well as big data analytics to streamline logistical operations is commonly referred to as smart logistics (Market Prospects, 2022). It guarantees optimum, continuous operational performance by implementing modern technology and automation technologies. Similarly, it intends to leverage networked devices and also the gathering of every bit of data generated in the operation to improve process management, maximize warehouse capacity, and lower operational expenses. Logistical administrators may have full knowledge of the events taking place in the warehouses by analyzing this information before determining an action (Mecalux, 2021). Smart logistics unifies all components of the logistics network to ensure that it can completely comprehend the overall logistics management, making it possible to handle a variety of situations quickly and make any required autonomous changes. For example, distribution mechanisms, specifically in European regions, heavily rely on smart logistics (The Collider, 2022). Smart technologies are needed to ensure availability and effective transportation across regions as urban ecosystems become more complicated. Therefore, smart logistics seems to be crucial for Saudi Arabia's Vision 2030 since it can aid the nation's ambitions to broaden its economic system and minimize its reliance on petroleum exports. The progress and profitability of other industries including manufacturing, building, and tourism are dependent upon the expansion of a sophisticated and functional logistics sector.

Smart logistics may be capable of facilitating the seamless experience of trade between nations because Saudi Arabia already has the highest population and most prosperous economy within the Middle East (IMF, 2023). The wide variety of operational infrastructure and networks make up Saudi Arabia's transportation and logistics industry. Logistics and transportation are vital for economic survival because of the nation's location between Asian and European continents, its prominence in the international energy market, and the ongoing reliance on foreign commodities to satisfy basic customer needs (OBG, 2022). Adopting such logistical innovation can serve as a stepping stone for Saudi Arabia on regional and international levels. Smart logistics systems can revolutionize the logistics industry by boosting client engagement, lowering prices, enhancing efficiency, as well as strengthening transparency in the distribution network. Saudi Arabia could gain a competitive edge over other nations in the Middle East and establish itself as a pioneer in logistical excellence and creativity by implementing smart logistics solutions. Also, it may encourage foreign direct investment and raise the nation's level of competitiveness internationally (NIDL, 2023). Hence, it becomes rational to evaluate the possible impact that smart logistics systems will have on Saudi Arabia's trade in the years to come in line with Vision 2030.

1.1 Research Significance

The research on the role of smart logistics in the future trade of Saudi Arabia under Vision 2030 is extremely important in today's globalized world. It is essential to understand the potential of logistics and its importance in the context of Saudi Arabia's Vision 2030. The research will help to understand the current state of the logistics sector within the country and the potential opportunities and challenges presented by digitalization and technology. The research will also help to identify the gaps in the existing logistics infrastructure and how best to utilize the available resources and capabilities to meet the ambitious goals set by Vision 2030 (AlArjani, et al. 2021). It will also provide insight into the strategies and initiatives that can be implemented to make the logistics sector more efficient and cost-effective, such as the use of advanced analytics, automated processes, and digital technologies. Besides that, there are some opportunities for Saudi Arabia to capitalize on the growing global trade and the potential for the country to become a major player in the international logistics market that has been discussed in this research.

1.2 Aim and Objectives

The goal of this study is to evaluate the possible influence of smart logistics on Saudi Arabia's commerce in the years to come under Vision 2030. The analysis will look at how the nation's logistics industry is functioning right now, point out its main problems and prospects, and weigh the advantages and drawbacks of using smart logistics technologies.

Objectives

The following objective of this study is:

- To understand Saudi Arabia's vision of 2030 in economic development
- To critically evaluate the strategies for the development of smart logistics in Saudi Arabia
- To explore the link between smart logistics and Saudi Arabia's vision of 2030

2. Literature Review

Saudi Arabia's growing logistics industry.

According to Lee (2022), Saudi Arabia's logistics industry has undergone considerable changes recently, with an emphasis on strengthening performance metrics, reducing regulations, as well as infrastructural developments. The government's Vision 2030 project has served as the driving force behind this which seeks to expand economic opportunities, decrease reliance on oil income, and restructure the nation into a center for worldwide logistics. The government of the nation has made significant investments in modernizing the facilities to serve the logistics industry. NIDL (2023) highlights that to build and improve transportation facilities, such as airports, shipping ports, highways, and railroads, the government has allotted more than SAR 9 billion. Other massive projects have also been started in the nation, including NEOM, the Red Sea Project, and Qiddiya, which are anticipated to open up new prospects for logistics and draw in international capital. Saudi Arabia has implemented several measures to reform laws and simplify the process for corporations to conduct business there. SIMAH (2020) claims that new bankruptcy legislation went into effect in the nation in 2018 and offers businesses a more streamlined and open way to reorganize or liquidate. The government has additionally introduced several projects to improve customs processes while reducing the time as well as the expense associated with exporting and importing commodities. In recent times, Saudi Arabia's logistics industry has performed consistently better. Moreover, Sivan (2022) predicted that from 2020 and 2025, Saudi Arabia's logistics sector will expand at a compounded yearly growth rate OF 7.3 %.

Pasparakis et al. (2023) have made a compelling argument for the crucial role of human involvement and collaboration between humans and technology in transitioning from Industry 4.0 to Industry 5.0. This collaboration creates greater flexibility and customization, which is easily achievable with human input. The combination of Industry 4.0 technologies and human creativity can lead to time-saving automation of tasks and innovative problem-solving in a warehouse setting. Feng et al. (2023) said that the implementation of an indoor positioning system (IPS) in conjunction with IoT technology can present a highly effective solution for warehouse workers in optimizing their time management. According to Grosse (2023), A seamless integration of technology and human factors is the key to unlocking the full potential of warehouse order-picking operations. With such synchronization in place, success is not just a possibility, but a certainty.

Huge investments in modern smart logistics are expected to have a positive impact on Saudi Arabia's e-commerce industry. PYMNTS (2023) reported that in the region of Jeddah, the Saudi Authority for Industrial Cities and Technological Zones (Modon) has agreed upon an agreement to construct 14 new high-tech storage facilities that are going to run depending on a public-private sector cooperation approach. The modern facilities will be digitized and computerized, enabling companies to utilize their warehouse facilities using a mobile application. The most current project by Modon in Saudi Arabia seems to be an element of a bigger economic boom that will encourage more robotics inside the retail industry. Saudi Arabia has made enormous advancements in several areas essential for the growth of the logistics sector under the Vision 2030 initiative. Zigurat (2021) believes that another significant aspect of attracting investments as well as leadership for the e-commerce and logistics sectors is the proposal of three major airport locations in Riyadh, Jeddah, and Dammam to accommodate the largest logistical facilities for the e-commerce powerhouse. It will make logistics processes more effective and serve as a working example for every future smart technology in this area. Also, PR Newswire, (2022) points out that the venture capitalist eWTP Arabia Capital as well as other companies have joined forces with logistics company J&T Express to develop the biggest smart logistics industrial zone in Saudi Arabia. With the cooperation of regional firms such as Aramco and Saudi Telecommunication, the recent launch of the three massive cloud information centers in Saudi Arabia seems to have a significant influence on AI as well as big data analytics. Zigurat (2021) added that big data and artificial intelligence are two of the very crucial components of smart logistics. Saudi Arabia is currently developing its data analysis division. Nevertheless, the enormous advancement of AI as well as big data in different industries in the country offers hope for the logistics area to flourish.

Furthermore, as part of Saudi Vision 2030, the administration has encouraged a rise in international investment by offering compelling incentives to venture capitalists. For instance, YCPS (2022) shows that the Saudi authorities use standard agreements for both domestic and foreign vendors, while somehow lowering potential fines by limiting them to 20 % of the contract amount. While it might appear that these conditions solely benefit individuals involved within the construction sector, since logistics seems to be a highly associated activity, it might additionally be advantageous for this sector. Likewise, it reflects the government's continuous endeavors, which are supported by projects such as Saudi Vision 2030. Also, SBM (2020) claims that logistics companies can track the current condition of a shipment anywhere in the globe and anticipate any possible problems with a clear, end-to-end picture of all their activities, leading to considerable increases in performance and sustainable development.

The current state of renewable and sustainable energy production as per Vision 2030

Saudi Arabia's Vision 2030 is an effective plan to transition the nation to a low-carbon economy. To achieve this, the country has set a target to generate 27.3 GW of renewable energy by the year 2030. As per the researcher Abdul-Jabbar (2020), the government has

implemented various initiatives such as the Renewable Energy Project Development Office (REPDO), which is responsible for the development of renewable energy projects. Currently, renewable energy sources such as wind, solar, geothermal, and biomass provide only 2.5% of the total electricity generation in the country (Abdul-Jabbar, 2020). For that reason, the government has also introduced several policies to encourage sustainable energy production, such as the National Renewable Energy Program, which aims to promote the use of renewable energy sources, and the “National Energy Efficiency Program”, which aims to reduce energy consumption.

Challenges faced by Saudi Arabia in developing smart logistics.

The research paper published by researchers Al-Sayed, et al. (2022) discussed several challenges in developing smart logistics under Vision 2030. These challenges include a lack of infrastructure, funding, and resources, a lack of standardization and interoperability, inadequate access to data, a lack of technical and human resources, and a lack of effective communication and collaboration between stakeholders (Al-Sayed, et al. 2022). To overcome these obstacles, Saudi Arabia should focus on creating an environment that supports research and innovation, along with developing an appropriate legal and regulatory framework.

Strategies for the development of smart logistics in Saudi Arabia

The Saudi Arabian shipment and supply chain business completely relies on smart logistics. Therefore, the nation has been trying to create and apply smart logistics solutions to boost productivity, minimize expenditures, and enhance client satisfaction. Madhukar (2021) pointed out that the strategy encompasses a variety of significant initiatives that allow the accomplishment of both social as well as financial objectives in addition to adopting efficient governance methods to improve organizational functioning in the transportation system consistently. The Saudi government believes that this strategy will enhance both human and technological capacity in the nation's transportation and logistics industry. Lota (2021) also emphasizes that this strategy's focus areas involve expanding the country's facilities, launching a variety of channels and logistical hubs, implementing cutting-edge operational techniques and processes, as well as creating and strengthening strong alliances between the public and private sectors. This strategy hopes to make Saudi Arabia the fifth-largest public transportation passenger market worldwide, significantly boost the number of international tourist attractions to over 250, and establish a brand-new national airline, which is all going to support other industries—such as Hajj, Pilgrimage to mecca, and tourism—achieve its national objectives. Also, it aims to improve the capacities of the air freight industry by expanding its throughput to over 4 million tonnes.

According to Marmore (2022), the country's government policy targets a throughput of more than 40 million boxes per year by 2030, considering all related expenditures in building port facilities and improving its connectivity with the country's logistical sectors. Saudi Arabia is increasing its interconnection with global shipping routes to establish connections with roadway and rail systems as well as enhance the effectiveness of the transportation environment and also its finances. Marmore (2022) further added that the national policy also seeks to extend the expected 8,080 km overall length of new railroads, along with the 1,300-kilometre "land bridge" program, which is expected to have the potential to move over 50 million tonnes of cargo yearly. This railway route would link the harbors of the country located on the Arabic Gulf coastline with those located on the Red Sea coastline, creating unique and attractive prospects by crossing through current logistical and urban centers, financial regions as well as mining operations. Similarly, smart logistics and IoT are quickly expanding in Saudi Arabia's logistical market. It will encourage companies to enhance their last-mile distribution strategies in hopes of speeding up shipments. Therefore, YCPS (2022) believes that such projects offer several interesting investment prospects for businesses interested in joining

the Saudi logistical sector, in addition to outlining specific structures and strategies for boosting Saudi Arabia's worldwide visibility. Nevertheless, these strategic developments indicate that Saudi Arabia's shipping and logistics sector will keep expanding quickly. This progress will ultimately result in increased logistical capacity, positioning Saudi Arabia as a major player in the world of logistics.

Concept of Physical Internet in the Future of Logistics in Saudi Arabia under Vision 2030

The Vision 2030 of Saudi Arabia aspires to make the country a global logistics hub by 2030. According to the researchers, Jaziri, et al. (2019) one of the key drivers to achieve this goal is the implementation of the Physical Internet (PI) concept. This concept is based on the transformation of physical logistics into digital and modular processes. It seeks to optimize the flows of goods, energy, and services in an interconnected and optimal network.

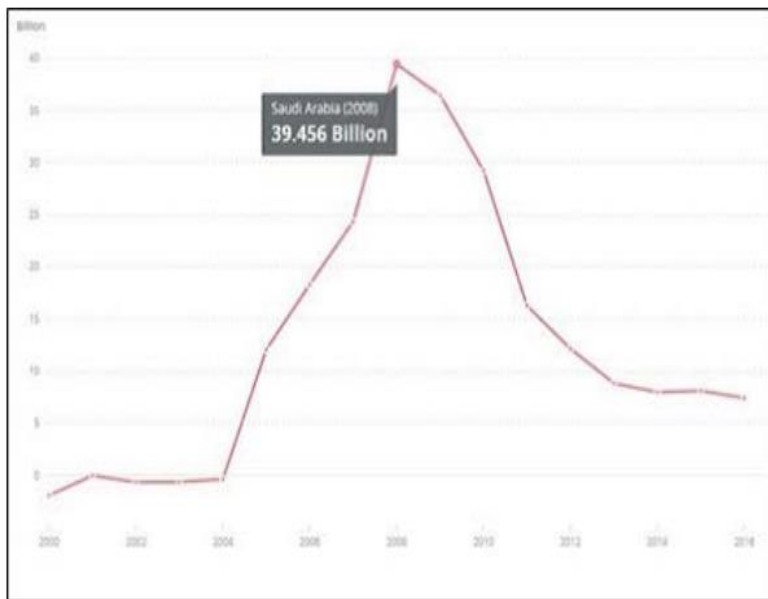


Figure 1: Foreign Direct Investment in Saudi Arabia

(Source: Jaziri, et al. 2020)

The link between smart logistics and Saudi Arabia's Vision 2030

The Saudi Arabian government's long-term economic strategy, Vision 2030, which aims to restructure the economic system and lower reliance on oil, is not possible without smart logistics. According to NIDL (2023), this strategy offers an outlook for an economic system that is more creative, diversified, and resilient with an emphasis on technologies, entrepreneurial as well as social development. Developing Saudi Arabia into a massive worldwide logistics center remains one of the main goals of Vision 2030. However, it requires developing world-class facilities, enhancing logistical services, and utilizing cutting-edge technologies to increase the effectiveness and performance of the logistics industry. The achievement of this goal depends heavily on smart logistics. Mecalux (2021) claims that logistics businesses can streamline their activities by incorporating technologies like AI, big data analytics, IoT, blockchain, etc. All of these technological breakthroughs could be utilized in supply chain and transportation services. For instance, AI is capable of helping automate logistical procedures and improving forecasting capabilities. On the other hand, IoT devices could be employed to monitor the whereabouts and status of cargo while it's on route offering supply chain managers immediate insight. Likewise, the distribution network may be made more transparent and traceable with the help of blockchain technology, which is crucial for sectors like medicine and food.

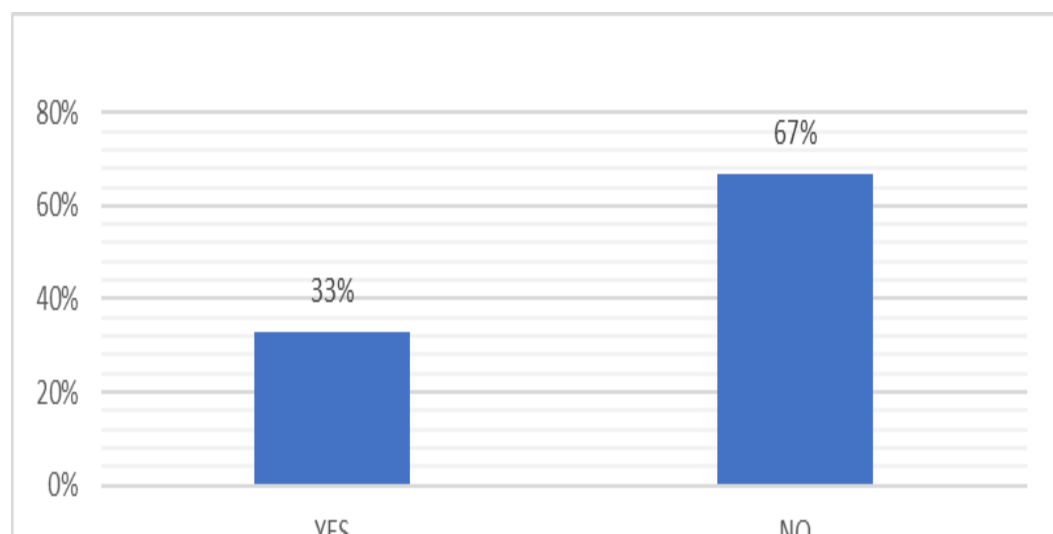
Shipsy (2022) stated that smart logistics could assist in fulfilling other important goals of Vision 2030 besides making Saudi Arabia a destination for international logistics for instance, it can significantly reduce the operating expenses in the nation and boost its competitive advantage by lowering transportation costs and promoting the supply chain performance. As a result, it will increase local corporate development and draw in more overseas investments. Likewise, OBG (2022) highlights that smart logistics could also help other industries like e-commerce, production, and hospitality, that are essential to the Vision 2030 project. For instance, it could support e-commerce businesses in growing their consumer reach as well as enhancing sales by offering speedier and more dependable shipping services. Most importantly, it can lessen companies' ecological footprint while facilitating the expansion of regional production ventures by increasing distribution network reliability. Consequently, smart logistics supports the growth of the knowledge-based logistics industry and the establishment of fresh employment opportunities. Also, Kauf (2019) indicates that Saudi Arabia may be capable of managing its natural resources more efficiently through the implementation of smart logistics, which might result in cost reductions, increased effectiveness, and more responsible use of the country's resources.

3. Research Methodology:

A primary data collection technique has been selected for this study to support the researcher in obtaining specific information about the topic under investigation. The data has been collected from 300 randomly drawn employees using purposive random sampling techniques and it includes both males and females from Saudi Arabia's logistics and transportation sector organization. The questionnaire consists of 20 items based on the Lickert type and measures the objectives of the study. The reliability and validity of the questionnaire were found to be within acceptable range. The data were collected using Google Forms and in person. The participants were assured about the confidentiality of their responses. The obtained data were analyzed using suitable statistical tools and were interpreted accordingly.

4. Results and Discussion:

Table 1: Opinion based on gender towards smart logistics in Saudi Arabia's future trade under Vision 2030.



(Source: Self-created)

Table 1 elaborates on respondents' opinions in the research regarding the significance of smart logistics in Saudi Arabia's future trade under Vision 2030, there were 66.7 % of male respondents and 33.3 % of female respondents. The male and female respondents believe that smart logistics enabled by technology have an immediate beneficial impact on the environment of smart cities in Saudi Arabia as well as around the globe. which has a beneficial effect on both social and economic performance. Their viewpoint on smart operations has also been acknowledged. They claimed that by enhancing the monitoring and tracing of products as they move from their point of origin to their point of destination, the use of freight transport telematics can enhance the environment of smart cities all over the kingdom.

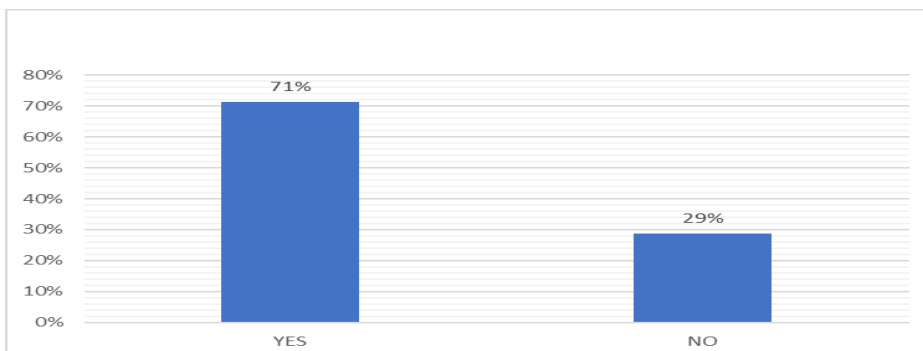
Table 2: Respondents familiar with the goals of Vision 2030.



(Source: Self-created)

In Table 2 It has been recognized from the survey results that almost 94.3 % of respondents are very much aware of Saudi Arabia's Vision 2030 project which indicates that the government has been pretty effective in increasing people's awareness regarding such major projects. According to the respondents, Saudi Arabia is rapidly developing into a country of breathtaking and outsized developments, and people are also giving praise to the ambitious Saudi Vision 2030 initiative led by Crown Prince Mohammed bin Salman. The objective is to solidly establish the kingdom as a must-visit tourist location. The respondents provided insightful feedback on restaurants, luxurious hotel rooms, and some incredibly awesome new visitor attractions in Saudi Arabia. They added that Saudi Arabia is no novice to some astounding and beautiful architectural endeavors. As the nation moves closer to achieving the objectives of Vision 2030, new developments are clearing the way for incredible hotels, top-tier leisure locations, and an unforgettable range of experiences throughout the Kingdom. and finally, they emphasized the fact that these advancements are applicable when founded on smart logistics and a strong supply chain system.

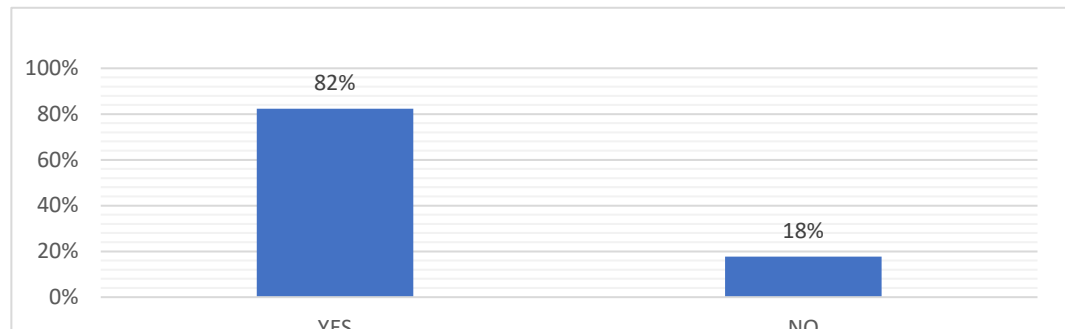
Table 3: Opinion-based smart logistics will play a crucial role in the future trade of Saudi Arabia under Vision 2030.



(Source: Self-created)

In Table 3, Out of 300 respondents, nearly 71 % believe that smart logistics technologies will play a major role in future trade operations in Saudi Arabia. This response is further backed up by the fact that logistics constitutes one of the main industries planned for development under Vision 2030 (NIDLP, 2023). The Saudi government also acknowledges that achieving its aims of economic transformation would depend on increasing the reliability and productivity of logistics. On the other hand, 29 % of the respondents think that only smart logistics will not be enough to enhance the effectiveness of the logistical industry.

Table 4: Smart logistics will have a favorable impact on the Saudi logistics business.



(Source: Self-created)

In Table 4, Many respondents—around 66.3 %—believe that smart logistics technology will have a positive influence on the Saudi Arabian logistics sector, while just 33.7 % think differently. The favorable reactions are further reinforced by the reality that smart logistics will assist shipping companies in optimizing the distribution of resources, like employees, automobiles, and storage facilities, allowing them to fulfill the expanding market needs and maintain their competitiveness in the international market (YCPS, 2022).

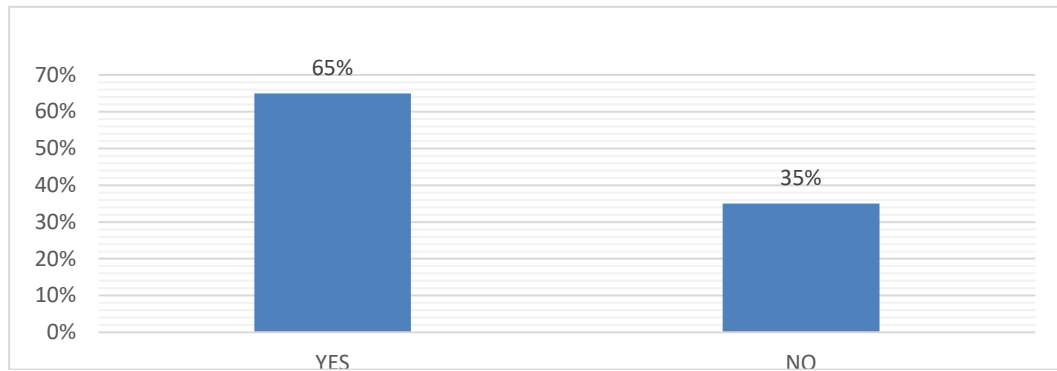
Table 5: Smart logistics have the largest influence on Saudi Arabia's future trade operations.

Areas of Future Trade	f	Percentage
Manufacturing process	154	51.33
Customer satisfaction	60	20.0
Cutting expenditure	86	28.7

(Source: Self-created)

Table 5 shows that for 51.33 % of the survey participants, smart logistics will primarily benefit the manufacturing process, while 28.7 % expect it will lead to decreased costs, and 20 % say it will result in higher consumer satisfaction. It is also supported by the finding that the development of a strong, efficient logistics system is necessary for the growth and profitability of a country's manufacturing sectors. (Zigurat, 2021).

Table 6: Companies started implementing smart logistics technologies in Saudi Arabia



(Source: Self-created)

When respondents were asked whether their organizations had begun investing in Saudi Arabia's smart logistics solutions, 65% of participants said yes, while 35% said no in Table 6.

For instance, the logistics service provider J&T Express financed the construction of the biggest smart logistics industry complex in the world alongside other Saudi Arabian collaborators including the investment company eWTP Arabia Capital (PR Newswire, 2022).

Tabadul Champions Digital Logistics in KSA, in the opinion of Transportation and Logistics Middle East News With the introduction of the "Beyond" Strategy, the logistics industry in the area is being driven toward digital transformation. To support effective logistics operations, the new plan will strengthen collaboration with stakeholders from the public and private sectors. According to Al-Otaibi, Tabadul "works toward enhancing the digital transformation towards a sustainable digital economy, in line with the goals of Saudi Vision 2030, aspiring to transform Saudi Arabia into a leading global logistics hub" through its actions. Tabadul's Beyond strategy will aid in achieving inclusive development by enhancing supply chain e-services and boosting the range of products it currently offers to the financial services, business, and governmental sectors. Tabadul also hopes to dominate regional and international digital logistics by advancing logistics automation, boosting the efficiency of the private sector, and providing cutting-edge services in the KSA area.

Table 7: More opportunities should be offered by the government to promote the use of smart logistics technologies. (N=300).

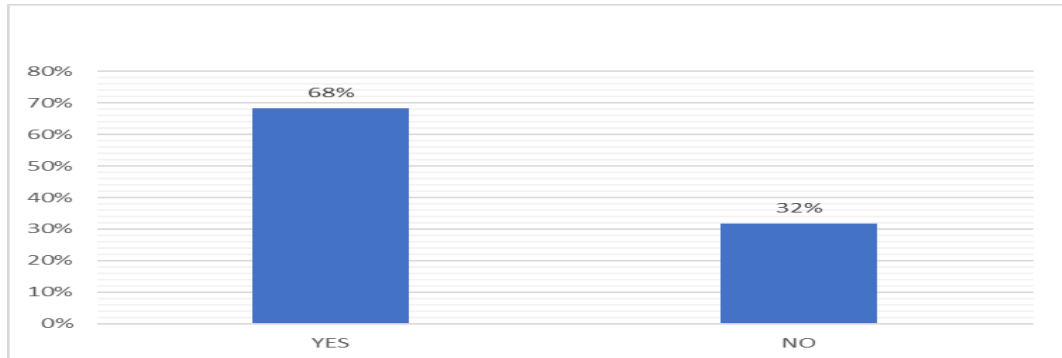
Response categories	f	Percentage
Strongly Agree	174	58.0
Agree	100	33.3
Disagree	6	2.0
Strongly Disagree	0	0.0
Neutral	20	6.7

(Source: Self-created)

When questioned if the government should provide more possibilities to encourage the adoption of smart logistics technologies, in Table 7, 58 % of participants strongly agreed, 33.3 % simply agreed, 2 % disagreed, and 6.7 % stayed neutral. However, according to Arabian Business News the Red Sea Project, Diriyah, King Salman Energy Park, King

Salman Park, THE LINE, TROJENA, and Qiddiya are just a few of the ambitious megaprojects that the Saudi government has announced its plans to launch. These projects are expected to make the country a global economic powerhouse and provide more opportunities to adopt smart logistics technologies.

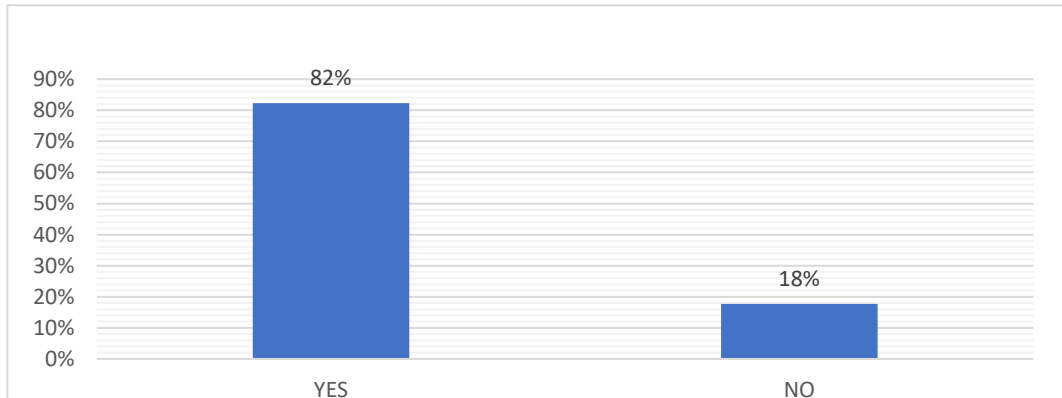
Table 8: Smart logistics implementation will decrease the carbon emissions in Saudi Arabia’s transportation.



(Source: Self-created)

According to Table 8, when the participants were told that the deployment of smart logistics would reduce Saudi Arabia's transportation-related carbon pollution, 68.3 % approved while 31.7 % disapproved. Smart logistics' capacity for decreasing businesses' environmental impact while promoting the establishment of local production enterprises by boosting the dependability of distribution networks also serves as a confirmation of its validity (OBG, 2022).

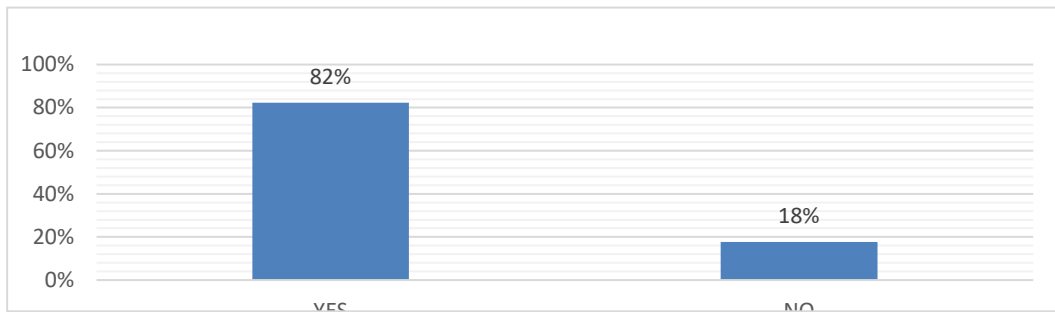
Table 9: Saudi Arabia would be able to compete more successfully in global trade if smart logistics are implemented.



(Source: Self-created)

Furthermore, according to 69.3 % of survey participants, smart logistics would enable Saudi Arabia to operate more effectively in the world of trade, while only 30.7 % disagree in Table 9. It is also reinforced by the suggestion that adopting smart logistics systems could boost the economic growth of the country globally and enhance the trade possibilities with other nations (Shipsy, 2022).

Table 10: Usage of smart logistics will increase the sustainability of international trade in Saudi Arabia.



(Source: Self-created)

In Table 10, Among the 300 survey participants, 82.3% believe that the implementation of smart logistics would improve the sustainable development of international trade in Saudi Arabia, while 17.7 % think differently. The argument is further highlighted by the fact that shipping companies can monitor the progress of a shipment from any location around the world and anticipate any probable problems thanks to a comprehensive, end-to-end overview of all their activities, leading to considerable increases in productivity and sustainability development (SBM, 2020). Nonetheless, the development of the railway track would connect the nation's harbors that are positioned along the Arabian Gulf (Marmore, 2022). This could assist shorten the duration required to move goods across Saudi Arabia's ports by easing congestion and disruptions at the border.

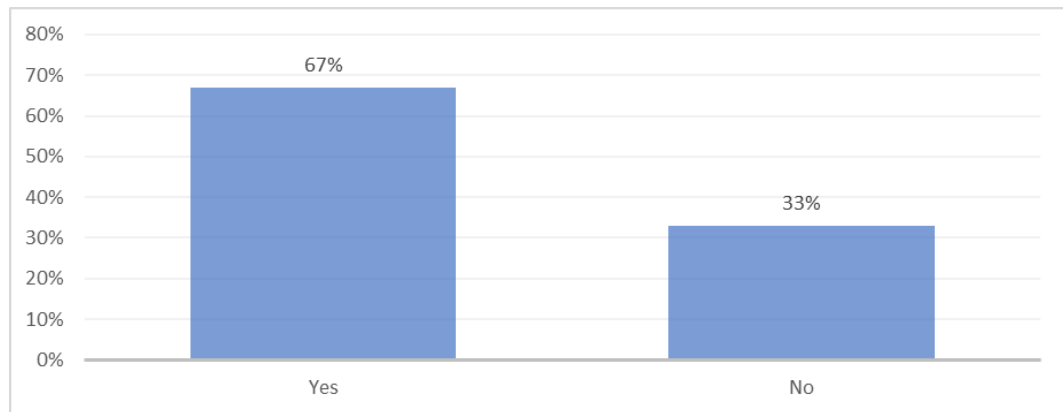
Table 11: Smart logistics reduces the amount of damaged or misplaced shipments in Saudi Arabia

Response categories	f	Percentage
Strongly Agree	116	38.7
Agree	87	29.0
Disagree	37	12.3
Strongly Disagree	10	3.3
Neutral	50	16.7

(Source: Self-created)

Table 11 indicated that the overwhelming majority of respondents (38.7 %) wholeheartedly agreed when asked if smart logistics would help Saudi Arabia see a reduction in the quantity of defective or mishandled goods. The reason for this is that IoT-enabled smart logistics solutions can assist avoid product loss or damage during shipment (Mecalux, 2021).

Table 12: Smart Logistics development increases trade between Saudi Arabia and other nations.



(Source: Self-created)

Table 12 shows that almost 67 % of participants feel that smart logistics will increase trade between Saudi Arabia and other nations. Smart logistics may assist speed up customs processes, shorten transit times, and enhance collaboration and connectivity, which could also contribute to making cross-border commerce more functional, dependable, and affordable for businesses and promote higher trade between Saudi Arabia and other countries (IMF, 2023). It's because Saudi Arabia's Vision 2030 project prioritizes economic diversification, and smart logistics can assist in simplifying the process and more convenient for Saudi Arabian companies to compete in international markets and pursue fresh business possibilities by enhancing the effectiveness and dependability of the distribution network (Ships, 2022). It might help Saudi Arabia maintain its natural assets better, which will lead to decreased expenses, increased effectiveness, and more appropriate consumption of its resources (Kauf, 2019).

Table 13: Implementing smart logistics would boost the overall standard of living in Saudi Arabia (N=300).

Response categories	f	Percentage
Strongly Agree	123	41.0
Agree	100	33.3
Neutral	50	16.7
Disagree	15	5.0
Strongly Disagree	12	4.0

In response to this question in Table 13, an overwhelming number of individuals (41 %) strongly agreed, 33 % agreed, only 5 % disagreed and 16.7 % remained neutral. This is because smart logistics may enhance Saudi Arabians' living conditions by reducing emissions of greenhouse gases, environmental pollution, and heavy traffic (OBG, 2022). When compared to the rest of the region, Saudi Arabia's export mix is more heavily weighted toward travel and transportation, which emphasizes the significance of building infrastructure to satisfy future demand. Transport contributes 26% of the Kingdom's service-related exports, compared to 24.8% locally, according to the Oxford Business Group. Travel accounts for 49.4% of service-related shipments overall, compared to

27.5% locally. Approximately SR172.3 billion (\$45.9 billion) or 6.6% of the total SR2.62 trillion (\$698.5 billion) in GDP was contributed by the sectors of transportation, storage, and communications in 2020. With the ongoing execution of Vision 2030 reforms and projects, which are detailed in the National Transformation Program (NTP) and the National Industrial Development and Logistics Program, this share is probably going to increase. (NIDL).

According to the government's current plans, it will spend more than SR500 billion (\$133.3 billion) to build ports, airports, rail routes, and other infrastructure by 2030. These objectives indicate a variety of reasons for investors to collaborate with the government or put forth long-term foreign direct investment (FDI) projects, such as the privatization of state assets and joint ventures to add significant new infrastructure, which mimics financial structures like the subcontracting for Riyadh's new metro. The high rating Saudi Arabia received in the "Agility Emerging Markets Logistics Index 2022 Survey", which assesses the business environment, digital readiness, and investment opportunities in 50 developing markets, can be attributed in part to this investor-centric strategy. Sixth place, which Saudi Arabia has held since 2020, was reached in 2022.

Table 14: Saudi Arabia can accomplish its overall economic objectives under Vision 2030 with the use of smart logistics.

Response categories	f	Percentage
Strongly Agree	160	53.3
Agree	80	26.7
Neutral	29	9.7
Disagree	24	8.0
Strongly Disagree	7	2.3

Table 14 shows that, according to 53.3 % of survey respondents, the deployment of smart logistics will empower Saudi Arabia to achieve its overall economic goals outlined in Vision 2030. The fact that smart logistics is expected to play a significant role in assisting the nation's economy's diversification and it is fair to anticipate that employing it would benefit the nation's efforts to restructure its economy in alignment with Vision 2030 (Zigurat, 2021).

5. Conclusion and Recommendations

In conclusion, the logistics sector is vital to the growth of many regions and the prosperity of many nations. Increasing the participation of the logistics and transportation sector to improve Saudi Arabia's GDP remains one of the primary goals of the Vision 2030 program because the country is focusing on non-oil revenue sources. Therefore, smart logistics will be an ideal solution for the nation in reducing its reliance on oil, diversifying its economic system, and fostering sustainable growth by strengthening the efficacy and reliability of its supply chain operations and opening the doors to various opportunities for future trade.

Advanced technologies like IoT, big data analysis, and AI must be integrated into Saudi Arabia's adoption of smart logistics to improve shipping, distribution, and stock control. Nonetheless, although the nation has already begun to make investments in technological

infrastructure, more funding should be allocated to the creation of storage systems, cloud services, and high-speed wireless connectivity (Transition-China, 2023). It is also crucial to train and create a qualified workforce in smart logistics technology to guarantee the effective execution of this plan (Cho, 2018). Saudi Arabia must spend money on establishing a talented workforce of technology specialists to facilitate the deployment of smart logistics. Saudi Arabia could collaborate with other governments and organizations from around the world to take advantage of their skills and experience in smart logistics (Transition-China, 2023). By working together, Saudi Arabia will have better accessibility to cutting-edge innovations and industry standards, as well as channels for international trade.

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