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Smart Government Initiatives: Transforming Global Supply Chains through Digital Change

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ABSTRACT

This empirical research aims to explore the effects of smart government initiatives on the global supply chain to evaluate the pharmaceutical manufacturing industry in the UAE. Through the synthesis of information collected from this sector's stakeholders, the research reveals how digital innovation, spurred by smart initiatives initiated by the government, acts as a mediator between supply chain efficiency and effectiveness. The research also shows strategies which encompasses data analytics, IoT and blockchain revolutionise and transform the supply chain by increasing its transparency, responsiveness and flexibility. These digital changes, which have been supported by government policies, not only enhance efficiency, but also help improve coordination between supply chain members and optimize performance indicators internationally. The research findings presented here are relevant to policymakers and leaders of industries to design great technologies for supply chain improvements. Therefore, the study has implications that make it necessary for government agencies to develop effective strategies and policies that support smart causes meant for enhancing digital integration in the sectors. Overall, the study for the pharmaceutical manufacturers indicates that the willingness to adopt digital change supported by governmental frameworks leads to significant improvements of the supply chain performance regarding lead time as well as reliability. In addition, these advancements can contribute toward global competitiveness through the superior management of supply networks especially for global supply chains and reducing risks of supply chain disruptions.

Keywords: Smart Government, Global Supply Chain, Digital Change
JEL Classifications: O33, L14, H83, F61, M15

1. INTRODUCTION

Implementation of smart government initiatives in supply chain is therefore a radical change in the way all sectors of the economy undertake logistics, trade and resource planning. This is because as nations continue embracing of the new technologies for improvement of governmental processes including IoT, AI as well as blockchain innovation there is growing concern of how these technologies affect performance of supply chain throughout the world (Mohamed et al., 2022). The intelligent management actions through digitized bureaucracy have the objective of reducing complex bureaucratic procedures, increasing the availability of information and enhancing cross-border cooperation obstacles that can fundamentally disrupt the supply chain (Hamadneh, 2024). This research aims at evaluating the finer implications of these effects with an emphasis on how these initiatives have affected the supply chain systems and performance of organizations in the global context.

Integral to this process is the intermediary aspect of digital change where it provides the link between smart government and supply chain results (Kurdi et al., 2022). Digital transformation at the governmental levels means the adoption of refined technologies and new sophisticated approaches defining how supply chains would operate in the future (Yin and Ran, 2022). In light of this, this study seeks to explore the mediation effect of global supply chain performance by smart government policies with the view of establishing the ways in which technological developments in governing affect international logistics and trade systems. It is therefore, important to understand this mediation effect for the purpose of finding the direct and indirect impacts of smart government interventions.

Furthermore, the study looks at the specific aspects that smart government initiatives help to improve the global SC performance (Koberg and Longoni, 2019). This involves establishing a current status of the use of technology and communication platforms with regards to enhancing the transparency of global processes, simplification of procedures, achievement of efficiency in data exchange (Amponsah, 2024; Vasudevan, 2024). Through the examination of cases and available evidence from different geographical areas and industries, the study identifies different SG initiatives which can result in important supply chain improvements in terms of cost, reliability, and flexibility.

Lastly, the study discusses potential implications and applications of the findings to inform policymakers, businesses, and global trade organizations. Thus, with the help of the findings presented in this research, the proposed relationship between smart government initiatives, digital change, and supply chain performance, will help provide recommendations on how the benefits of information technology improvements need to be maximized in governance. It will be critical to define the dynamics of these strategies in order to form the future policies and strategies that should be adopted for pushing the digital innovation as a way of improving the resilience and efficiency of supply chain in the global market.

1.1. Significance of the Study

This study contributes to the body of knowledge and practice around smart government initiatives and how such presentations shape global supply chain performance in the context of understanding digital change. Since governments are stepping up their acquisition and endorsement of sophisticated technology, it is essential to analyze its influence to the supply chain networks (Huang et al., 2023). Unearthing insights beneficiary from this study reveals how these initiatives through promoting digitization not only boost supply chain effectiveness, adaptability, and openness but also amplify the chain's efficiency (Lee et al., 2024). The paper's results can be useful for policymakers and managers since they demonstrate that supply chain innovation requires governmental support. In the context of the contemporary globalization and increasing dependencies on supply chain networks, this research provides a useful conceptualisation of how smart government policies can be utilised for creating more sustainable supply networks.

2. THEORETICAL FRAMEWORK

2.1. Smart Government

In general, government agencies are always looking for new ways to better interact with their constituents. Today, "digital first" has become the rallying cry for such endeavours. Governments have been utilizing the Internet to radically transform their operations since the mid-1990s (Hujran et al., 2023). By putting a variety of government resources, including databases, websites, and help desks, in the hands of the general public, these e-government efforts have facilitated better interaction between government agencies and their citizens (Zahra, 2024). As a result of efforts, government agencies may now provide online electronic services to the general public. E-government is heavily reliant on internet technology, as seen by the usage of terms like "Virtual State" to describe this phenomenon. Countries are transforming their urban areas into technologically advanced ecosystems. They are using cutting-edge innovations to lessen expenses and boost productivity at work, as well as to foster an atmosphere where new businesses might flourish (Ilhami et al., 2022). To solve social, economic, and environmental issues and boost economic and political efficiency, "smart cities" connect information technology to physical infrastructures, commonplace things, and even human beings.

2.2. Global Supply Chain Performance

Several scholars have done studies on supply chain performance and effectiveness from a global perspective and evaluated different critical success factors that govern performance. As it has been highlighted by Makudza et al. (2023), global supply chain performance is therefore determined by the ability of an organization to line up and coordinate activities within complex and geographical networks. Organizational flexibility, responsiveness and the efficiency of the operations are some of the performance measures of an organization. Supply chains flexibility is crucial, an ever-globalized world economy stakeholders need to prepare for changes in demand patterns political instabilities and disruptions. This change is not only important for the smooth operation of the firm but also for competitiveness for those which are capable of quick adaptation.

However, authors such as Chu et al. (2020) are concerned with strategic aspects of global supply chain performance, it is mentioned that integration between supply chain practices and corporate strategy framework is critical. Consequently, it is their contention that the global supply chains that are most effective are those that are aligned with supply chain management vision and goals of competitive advantage such as cost leadership, differentiation and innovation. This perspective also reaffirms the key contingency approach where it is listed that there is the need to match supply chain strategy and operations for the best results. Furthermore, (Pulevska-Ivanovska and Kaleshovska, 2013) offer recent papers investigating the supply chain resilience in connection with the global disruptions like pandemics and trade conflicts. Their study indicates that what they have described as recoverability which means the capacity for 'recovery and adaptability' following disruptions is critically important for supply chain performance. This resilience is underpinned by

technologies and data analytics which increases the visibility, forecasting and managing of risks hence optimising the reliability and efficiency of the global supply chain networks (Ozturk, 2024; Sukkari, 2024).

2.3. Digital Change

Researchers have discussed the process of digital change from different angles stressing on how it has revolutionized virtually all sectors of the economy and the entire social fabric. Digital transformation, as identified by Almaazmi et al. (2021), is altering the very ways in which companies compete and undertake business activities. They also focus on the increasing trends of technological developments and how these have had significant impact on growth and development in productivity. New digital technologies including cloud computing, big data, and artificial intelligence increase the efficiency and speed in firms' operations. It is notable that they underlined that the digital change is not only the question of technology tools but it is a process that requires the more profound transformation of the organisational practices and strategies in order to use these technologies as the tools effectively (Filos and Banahan, 2001). This perspective also suggests that the phenomenon of digital change cannot be reduced to technical change, but rather needs to be seen as involving strategic and operative change processes. Research shows that digital change creates new forms of 'social networks,' 'economic agents,' and cultural systems. In this context, underlines a new nature of social processes concerned with the existence of digital technologies as stringing shapes structures into more fluid and connected society entities which influence economic and political processes (Alshurideh, 2024). This sociology perspective helps one to comprehend how digital change arranges social relations and underlines the importance of considering technology in the light of social and cultural factors.

3. LITERATURE REVIEW

In the public sector, "smart government" refers to a new wave of ideas for implementing information technologies (ITs) that can collect, link, and analyze massive amounts of data of varying types and formats in (almost) real-time. The term was first used in a broad sense to describe a government that comes up with ingenious and elegant answers to difficult problems. These days, the term "smart government" is used to describe a wide range of digital initiatives in the public sector that make use of new technologies to facilitate better connections between the offline and online worlds, as well as between the public and private sectors, to improve services for citizens and businesses alike (Tomor et al., 2019). The difficulties and roadblocks that prevent the widespread adoption of technology in government agencies have been the subject of numerous theoretical and empirical studies. To illustrate the conceptual work, let's look at how technology enactment differentiates between objective ITs and enacted technologies. Enacted technologies are those that have been applied by public administration, which can be thought of as the process by which objective IT meets an organization, with its specific characteristics (such as bureaucracy, networks, and other organizational features), embedded in the political-administrative system's institutional arrangements.

3.1. Smart Government and Global Supply Chain Performance

Smart government has been adopted by governments in the recent past as strategies to enhance efficiency in the government's operations. Some of these initiatives have been implemented in the global supply chain and there are positive effects that stem from this strategy. From previous research, it emerged that smart government initiatives have been employed in the following ways to enhance the supply chain efficiency for global markets; technological application, big data/information processing, and networking. Smart government initiatives have been on the rise in the past years as a tool for enhancing the effectiveness of government activities. These initiatives have the potential of influencing the performance of global supply chain since they are capable of leading to changes in the existing logistics, transportation and trade sectors (Huang et al., 2023).

One keyway in which smart government initiatives have been used to improve global supply chain performance is through the use of technology. For example, governments have been implementing electronic data interchange (EDI) systems to automate and streamline the exchange of information between different parties in the supply chain. This has been shown to improve the accuracy and speed of data exchange, which can lead to better decision-making and more efficient supply chain operations. Additionally, governments have been using RFID technology and other forms of automatic identification and data capture to improve the visibility and traceability of goods in the supply chain (Pereira et al., 2018). This can help to reduce the risk of errors and delays and can also help to improve supply chain security. Also, the use of digital platforms and data analytics can improve the visibility and transparency of supply chain operations, allowing for more efficient and effective decision making. Additionally, the use of automation and robotics can help to streamline logistics and transportation processes, reducing costs and increasing speed.

Another way in which smart government initiatives have been used to improve global supply chain performance is through the use of data analytics. Governments have been using data analytics to gain insights into the performance of the supply chain, which can then be used to identify areas for improvement. For example, governments have been using data analytics to identify patterns in supply chain data, such as trends in demand or delays in delivery. This can help to identify bottlenecks and other issues that are causing delays and inefficiencies in the supply chain. Additionally, governments have been using data analytics to predict future demand for goods and services, which can help to improve supply chain planning and forecasting.

Finally, smart government initiatives have been used in several ways to improve global supply chain performance. The use of technology, data analytics, and collaboration have been shown to be effective means of improving supply chain performance and have been implemented by governments around the world. These smart government initiatives can improve the efficiency of supply chain operations, enhance the accuracy and speed of data exchange, improve supply chain visibility and traceability, and reduce the risk of errors and delays. As technology continues

to evolve, it is expected that smart government initiatives will become even more critical to the performance of global supply chains in the future. Based on the above discussion, the following hypothesis was developed:

H_1: Smart Government initiatives positively affect global supply chain performance.

3.2. Smart Government and Digital Change

Smart Government as the subject is and always has been deeply entwined with the presence and advancement of digital change. It has been established that Smart Government, defined as the implementation of higher technologies and big data processing and analysis in public administration leads to a much faster pace of digital transformation within the sphere. For example, use of artificial intelligence, Internet of Things (IOT), and blockchain in the government systems reduces bureaucracy and increases the transparency. Researches indicate that these technologies help to deliver services that are timely, efficient, and more engaging to the citizens thus building the public trust. This establishes a momentum that enhances the growth of technology leading to wiser governance, consequently promoting development of more technologies (Sucupira Furtado et al., 2023).

Digital change on the other hand is the driving force for the development of Smart Government. Studies show that rapid technology innovations call for changes and reviews of governance frameworks and systems. During the evolution of digital tools and applications, these altered the ways that government operates or deliver services to the people, or the way it utilises its resources. For instance, cloud computing, big data analysis has made policy reforms more intelligent as it enhanced the performance of the public sector. Such digital shifts make government reconsider conventional models and fluctuations toward new forms of governing as evidence of how digitization drives the evolution toward wiser governmental practices (Korpela et al., 2017).

In addition, the dependencies between Smart Government and digital change suggest that a strategic orientation toward change is needed in how information technology is used. Accordingly, research on smart governance frameworks highlights the importance of having the technology harmonise with specific policy goals and public demand. Purchasing the most advanced hardware and software tools and equipment requires a significant number of resources, and there is the need to make sure these technologies are adopted appropriately as part of the prevailing frameworks in an effort to benefit from the changes implemented by these authorities. This alignment also ensures that there is utilization of the digital resources, optimization of potential gains of these resources, and development of a wiser and competent government. In this context, it is for this reason that Smart Government and digital change are the mutually supporting, symbiotic entities where the presence of one fuel the growth of the other. Based on the above discussion, the following hypothesis was developed:

H_2: Smart Government initiatives positively affect the level of digital change in an economy.

3.3. Digital Change and Global Supply Chain Performance

The effectiveness of supply chain operations in the global context have intrigued scholars in the recent past due to the influence of digital changes. It has been highlighted that using advanced analytics, IoT, and other emerging technologies, it is possible to achieve better visibility, efficiency, and collaboration. Another advantage of employing digital technologies is the ability of giving supply chain more transparency to figure out the areas of congestion. This can be done using real time or near real time data thus support real time/operational data analytics, as this may support organizations in monitoring supply chain performance and decision making (Khatib et al., 2022). Technology can also be used in the supply chain by providing solutions to optimise the amount of time it takes to complete each supply chain process. For instance, automation and robotics, which involve resorting to the use of machines so as to cut on the number of employees, has the potential of cutting on the costs of employees and improving on the efficiency. Furthermore, digital twins enable the modelling and optimisation of supply chain, and therefore improve supply chain results. The second significant advantage of the digital technologies is the enhancement of the supply chain integration. For instance, blockchain enables the supply chain actors to build up trust and visibility in the counterparts. For instance, digital platforms can improve communication and relationship between suppliers, manufacturers, logistics service providers and customers.

The integration of digital technologies can lead to significant improvements in supply chain performance. However, it is important to note that the implementation of digital technologies can also bring challenges, such as data privacy and security, which need to be addressed.

A literature review by Agarwal of the impact of digital change on global supply chain performance highlights several key findings (Agrawal and Narain, 2018).

- First, digital technologies can lead to improved visibility across the supply chain. This can be achieved through the use of real-time data and analytics, which can provide insights into supply chain performance and help organizations to make more informed decisions. This can also aid to improve inventory management, reduce waste, and lower costs.
- Second, digital technologies can improve efficiency in the supply chain. For example, the use of automation and robotics can help to reduce labor costs and increase productivity. Additionally, the use of digital twins can help to simulate and optimize supply chain processes, which can lead to improved performance.
- Third, digital technologies can improve collaboration across the supply chain. For example, the use of blockchain can help to increase transparency and trust between supply chain partners. Additionally, digital platforms can help to facilitate communication and collaboration between suppliers, manufacturers, logistics providers, and customers. This can lead to a more efficient flow of goods, information and services.
- Fourth, digital change may also bring challenges such as data privacy and security, compliance with regulations, integration with legacy systems, and resistance to change.

The digital technologies can lead to significant improvements in supply chain performance, but it is important for organizations to carefully evaluate the risks and benefits and to implement appropriate strategies to ensure the successful adoption and integration of digital technologies in their supply chains. Based on the above discussion, the following hypothesis was developed:

H_3: The adoption of digital technologies enhances the effectiveness global supply chain performance.

3.4. Smart Government and Global Supply Chain Performance with Mediating Role of Digital Change

Looking at the literature concerning smart government, a fascinating connection to global supply chain effectiveness can be defined, dramatically mediated by digital shift. Smart government solutions involving analytics, artificial intelligence and the utilising of blockchain help in improving the elasticity and effectiveness of supply chain. These technologies can be used to better manage various regulatory procedures, optimize customs services and optimize logistics by sharing real-time information as well as analyze data in order to make predictions. Recently a research has indicated that reinvention in government structures helps in integrating and synchronizing various international supply chains by eliminating bureaucratic procedures, enhancing the openness of various systems, and enables advancements in data forecasting and supply backing (Shaharudin et al., 2021). For instance, through blockchain technology, one gets safer and more transparent exchanges hence reducing the probability of fraud and mistakes. This shift has been as a result of Smart Government policies that not only enhance the supply chain quality but also the global trade quality as well (Raj et al., 2022). The mediating role of digital change is well captured as is shown by the fact it enables smart governance practices to culminate into improved supply chain operations. Smart Government facilitates the use of technologies to transform and enhance the major functions of the public sector that leads to improved global supply chains and hence economic development. Based on the above discussion, the following hypothesis was developed:

H_4: Digital change mediates the relationship between Smart Government initiatives and global supply chain performance.

3.5. Research Model

Figure 1 represents the research model which depicts how Smart Government and Global Supply Chain and Digital Change constructs relate to each other. The model relies on structural equation modelling techniques to evaluate validity of all constructs and their individual influence on the combined framework.

4. METHODOLOGY

4.1. Research Method

The study has applied the quantitative research method which was used to investigate the relationship between the different constructs. As per the view of (Khan et al., 2018), Research method has focused on gathering the fact and data and also classification of the data collection process to include the conclusion.

4.2. Research Philosophy

Research paper has applied on the philosophy of the positivism where the different phenomena as are significantly isolated from the point of view of the researcher. For the analysis, the positivism research philosophy has helped to save the time and effort and find the accuracy and facilitate the measurement. Other than that, the positivism using with the qualitative research method has enabled the accuracy and also maintained the identification of the factors and their implications for the theory analysis with contribution and extension.

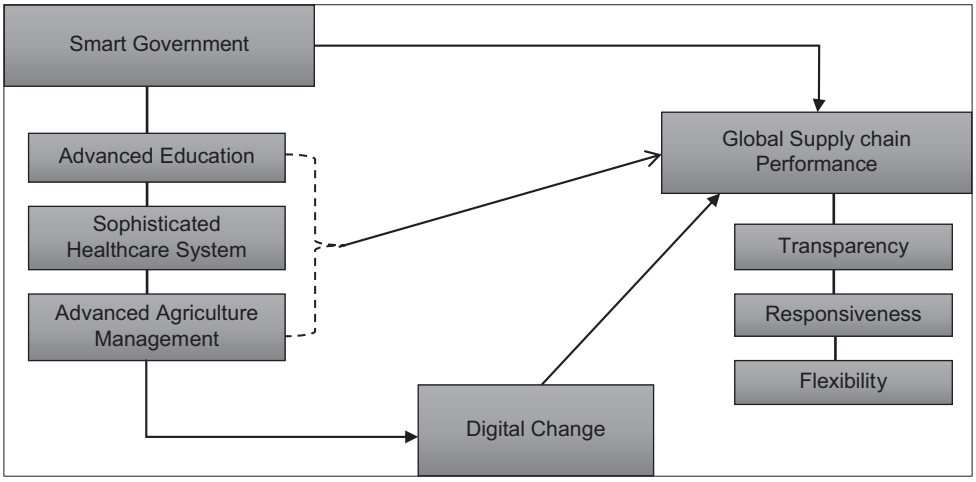
4.3. Research Approach

According to the research analysis, the research study has used deductive research approach where the main Idea has significantly developed with the theoretical basis using the analysis of the Literature.

4.4. Sample and Data Collection

The study has used the survey with the deductive research. The target population was the pharmaceutical manufacturing industry Abu Dhabi UAE. 13 manufacturing companies were approached to gather data from their employees. The employees were at managerial level such as, SC manager, IT manage, General manager. 247 respondents' data were used for analysis.

Figure 1: Conceptual model



The research study has used a combination of the snowball and convenience sampling processes. The participant is chosen using the convenience sampling technique and the targeted sample are chosen from pharmaceutical manufacturing Industry.

5. DATA ANALYSIS

Data analysis in the context of SmartPLS incorporates PLS-SEM to investigate relations that are linked to a set of variables. It is useful for both assessment of measurement and structural models, and enables the examination of theoretical concepts with the help of path analysis. They are especially valuable in the context of the studies with a smaller number of participants or when the studied model includes multiple factors. The software includes a wide range of fit indexes, means and standard errors of latent variables, test of individual paths and interaction effects. The primary utility of SmartPLS is in visualising the models along with quantitative data and then summarising them in reports that not only improve the reliability of the studies conducted but also the comprehensibility of these findings. The demographic data was also assessed to specify each factor such as, gender, age, job position and experience. Table 1 demonstrate the respondents data below.

5.1. Respondents Profile

Table 1 shows the analysis of demographic data suggests that the sample is mostly male consisting of 188 male participants and 59 female participants. Regarding the age distribution of the sample, the respondents are mostly between 30 and 40 years old, with 77 employees in the age range of 30s and 68 employees in the range of 40s, which might indicate a mature workforce. When it comes to job titles, we can identify that organizations have many Supply Chain Managers (109), then General Managers (88), and relatively few IT Managers (50), which indicates that organizations have really focused on the supply chain and managerial positions. Most of the respondents have less experience and 67 out of them has less than 30 years of experience and 85 out of them has less than 10 years of experience. Regarding the age distribution, it is possible to define the sample as consisting of both new and experienced professionals.

5.2. Reliability and Validity

The reliability and validity analysis demonstrated in Table 2, we assessed the robustness of data using composite reliability (CR) and average variance extracted (AVE) metrics. The composite reliability, which gauges the internal consistency of the constructs, was found to be above the commonly accepted benchmark value of 0.70, indicating high reliability of measurement model. Furthermore, the average variance extracted, which estimates the amount of variance explained by a construct to the amount of error variance, crossed the threshold of 0.50 which again revealing high levels convergence between validity. These results confirm that the variables used in this study are accurate and constructive in line with the global standards of reliability and validity.

5.3. Discriminant Validity

As displayed in Table 3 two different methods were used to test the discriminant validity: The HTMT and the Fornell-Larcker Criterion. The HTMT criterion proposes that, the ratio of HTMT should not exceed a certain imposed value, established ideally at 0.85 Thus, the number of items in each construct is to achieve discriminant validity. According to findings that all the HTMT ratios were below this threshold, which means that our constructs are sufficiently differentiated from each other.

Additionally, using the Fornell-Larcker criterion, we confirmed that the square root of the average variance extracted (AVE) for each construct exceeded the correlations between constructs, meeting the recommended threshold. This analysis demonstrates that the constructs exhibit satisfactory discriminant validity through their bold figures 0.741, 0.812, and 0.803 which represent the square root of average variance extracted (AVE). The square root of the AVE values (0.741, 0.812, and 0.803) demonstrate the discriminant validity of each construct. These findings affirm that our data satisfies the established benchmarks for discriminant validity, ensuring that the constructs in our study are distinct and reliably measured.

5.4. Structure Equation Model (PLS-SEM)

In SEM, coefficient of determination (R-squared, R^2) refers to the extent of the variation of a dependent variable attributable to the

Table 1: Demographic data

Items	Description	Frequency
Gender	Male	188
	Female	59
Age	Above 20	42
	Above 30	77
	Above 40	68
	Above 50	60
Job title	General Manager	88
	SC Manager	109
	IT Manager	50
Experience	<10 years	85
	<20 years	59
	<30 years	103
Total		247

n=247

Table 2: Reliability and validity

Construct	Cronbach's alpha	Average variance extracted
Smart Government	0.871	0.554
Global Supply Chain	0.854	0.691
Digital Change	0.813	0.658

Table 3: Discriminant Validity (HTMT and Fornell Larcker Criterion)

Sr No.	Construct	HTMT		
		1	2	3
	Construct			
1	Smart Government	****		
2	Global Supply Chain	0.544	****	
3	Digital Change	0.612	0.660	****
	Fornell Larcker Criterion			
1	Smart Government	**0.741**		
2	Global Supply Chain	0.631	**0.812**	
3	Digital Change	0.519	0.560	**0.803**

independent variables in the model. A greater R^2 value signifies that the formulated statistical model manages to capture or account for a considerable variability of the dependent variable. The model is illustrated in Figure 2 below.

The analysis of SEM shown in Table 4, the data enables determining some essential connections between the discussed constructs. For Hypothesis 1, The regression coefficient of SGI to GSCP is 0.429 with the R^2 of 0.633 this means that SGI has accounted for 63.3% of the variance in GSCP. With the obtained positive and-statistically significant coefficient ($P < 0.001$), this hypothesis is accepted. For Hypothesis 2, the path from SGI to DC is estimated as beta 0.494 with the R square of 0.244 indicating that SGI explains 24.4% of the variance in the DC. Acceptance is also supported by a positive and statistically significant correlation with the intention to perform this particular behavior, ($P < 0.001$). Hypothesis 3 assessed the path between DC and GSCP with beta coefficient equal to 0.491 and a substantial $P = 0.001$ implying positive relationship with GSCP. Finally, Hypothesis 4 testing the mediating role of DC on the relationship between SGI and GSCP showed that the indirect effect was significant with a beta of 0.326 and the $P = 0.001$. This result indicates an indirect positive relationship between SGI and GSCP which implies that SGI has both direct and moderating effect on GSCP via DC. All aspects of hypotheses receive quantitatively high support of $P < 0.05$ and quantitatively large path coefficients in the model.

5.5. Discussion

The research results offer significant empirical support for the hypotheses of this study about the effects of Smart Government initiatives on GSC performance and the mediating effect of digital change. As a first hypothesis, the study verifies the positive and significant relationship between smart government initiatives and the global supply chain performance. This means that as governments go out to apply smart policies like advanced digital policies and, infrastructure development, they end up augmenting the performance and productivity of global supply systems. Such initiatives can enhance more efficiency, cooperation, and timeliness and access to information in international networks. The higher coefficient establishes the need to have the right support from the government to create an environment that fosters high performance of the global supply chains (Sucupira Furtado et al., 2023).

According to Hypothesis 2, there is an evident cause and effect relationship with Smart Government initiatives having a direct impact in enhancing the level of digital change within an economy. This suggests that where the government takes the lead in its drive towards the adoption of digital technologies and practices then it ushers in the uptake of such technologies in the various sectors. Such a strong effect indicated here underlines the role of governmental actions and funding in ICT for boosting the shift towards digital in the economies (Karttunen et al., 2023). In addition, the Hypothesis 3 is another evidence which indicates that utilization of digital technologies has positive impact on global supply chain performance. This result supports the fact that the adoption of digital technologies in supply chains enhances chain effectiveness for greater and faster response (Reyes et al., 2020).

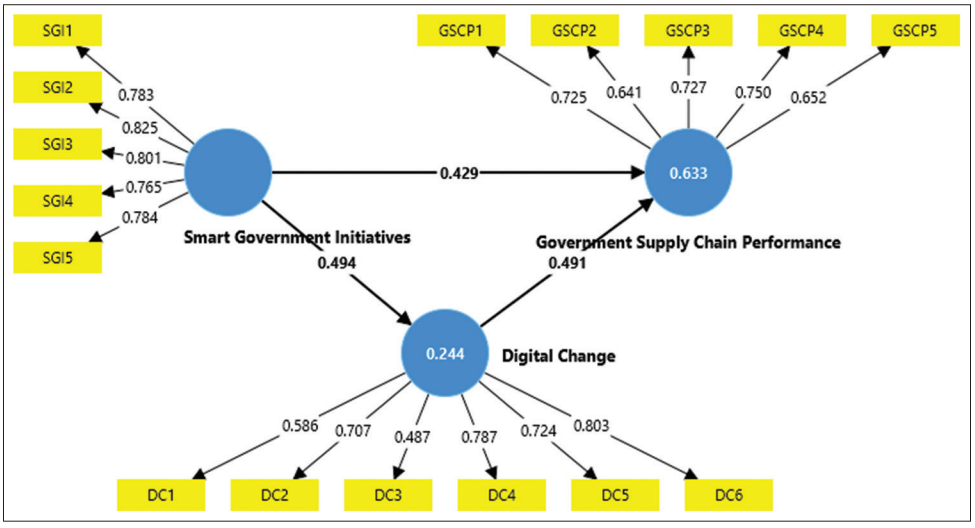
Finally, the fourth hypothesis tests the mediating effect that this digital change has to the relationship between Smart Government

Table 4: Hypothesis check

Hypothesis	Path	Beta	R^2	SE	t-statistics	P-value	Decision
H_1	SGI→GSCP	0.429	0.633	0.105	2.210	0.000	Accept
H_2	SGI→DC	0.494	0.244	0.066	2.601	0.000	Accept
H_3	DC→GSCP	0.491		0.192	2.514	0.001	Accept
H_4	SGI→DC→GSCP	0.326		0.213	3.151	0.001	Accept

SGI: Smart Government Initiatives, GSCP: Global Supply Chain Performance, DC: Digital Change

Figure 2: Structured model



projects and global supply chain performance. The high positive mediated value suggests that digital change partly accounts for how Smart Government initiatives affect supply chain performance (Hujran et al., 2023). It appears that both direct impacts exist, however digitization, as an application of digital technologies, facilitated though governmental policy on its own becomes the key mediator linking the effects of digitisation with positive benefits to global supply chain systems. Combined, these outcomes demonstrate the tight linkages between governmental policies, digitization, and aspects of supply chain, while underscoring the value of the strategic governmental initiatives in advancing economic and operational solutions.

6. CONCLUSION

It is established from the study that Smart Government positively influences the global supply chain performance in which digital change plays mediating role. This research shows that digital policies and infrastructures by government will not only enhance the efficiency of supply chain directly but also promote digital transformation, then again enhancing the supply chain performance. The substantial mediation effect discovered emphasizes the key position of digital change as a connection between central government actions and practical progress in the sphere of supply chain. This stresses the need for integrated digital solutions and conducive governmental systems for the best supply chain results; thereby pointing to the fact that the effective global supply chain management is not just about governance and technology, but both.

Smart government facilitates change through the provision of advanced tools for digital transformation and its implications for the competitiveness of the supply chain in the UAE pharmaceutical industry are discussed below. For instance, blockchain to enable end-to-end traceability; artificial intelligence for making demand forecasts; and IoT to increase real-time control may improve pharmaceutical supply chain operations. The supply of solutions could also become stronger and more responsive ensuring drug access, supply, and demand cost, while meeting regulatory requirements through government-supported programs promoting digital solutions adoption and development. These initiatives can help the pharmaceutical firms in the UAE to enhance operation efficiency and fulfill the fluctuating market needs more effectively.

6.1. Limitations and Future Recommendations

Despite the foregoing discussions, the following limitations are worth sketching: Firstly, the study is based on examples taken of the specific geographical area, the generalization of the results conditioned by which may be difficult in the countries with different levels of digital infrastructure and government stimulating for development of digital economy. Future studies should extend similar models in other environments to ensure the generalisation of findings. Secondly, it doesn't investigate the moderating variables such as the industry type or the readiness of organizations for the change that comes with Smart Government initiatives and their direct and mediated impacts. Including those variables may help avoid overgeneralizations about external contexts' impact on the outcomes of relevant government programs. Finally, the present study uses cross-sectional data and thereby has inherent limitations in how much conclusions regarding causality and consequences in the long run can be drawn. As for the method of collecting further data, only longitudinal research designs are suggested, as they allow to observe the changes in the effectiveness of Smart Government initiatives and digital change within the supply chain over time.

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