

## Impression of Digital Transformation on Supply Chain Performance

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### Abstract

In this context of the Digital Economy, the usage of Information and communication technology to promote commercial operations has grown significantly with the beginning of electronic business. The digital transformation introduced by the fourth industrial revolution has significantly transformed the value proposal of supply chain organizations. The objective of the study is to explore the factors that influence digital transformation in the retail supply chain. The study adopted a systematic literature review of all appropriate articles. The study assumed a technology-organizational-environmental outline as a lens to see the sights factors that impact the adoption of digital supply chains thin the retail industries. The study results that most technological factors influence the adoption of digital supply chains within the retail industries compared to organizational and environmental factors. The study contributes to the body of knowledge on the factors that influence the adoption of the digital supply chain within the retail industries.

**Key Words:** Digital transformation, supply chain, retail industries, inventory management.

### Introduction

The value of digitalization and recent trends in industrial technologies have evolved dramatically in supply chain management is an expedition for the viable edge. Facilities from industries convergence and cooperation among various supply chain players and fast exchange of information. The participants of supply chain players and fast exchange of information. The contributors can simplify monotonous work, The Internet of Things contributes to cost savings and service changes in many functional areas including storage, inventory control, ordering, customer service, development scheduling, and supplier operations.

Recent players in the industry are implementing digital innovations like digital sales control, e-procurement, e-payments, and partnerships to improve customer experience. At the same time,

industry-updated technologies, such as cyber-physical systems, internet things, on-demand availability of computer system resources, cognitive computing, etc. will provide a fundamental change in the future but some pieces of the recent industry technology and that will affect the supply chain right now. In this study frame we will try to determine how big this impact is and whether companies are ready for the upcoming industrial revolution.

Readiness for these revolutionary innovations is significant as it leads to better consistency of choices and enhanced efficiency of the supply chain. To create value, the firm's emphasis is on responsive sourcing and delivery in the supply chain beyond the effectiveness of internal operations. Supplier-flexible networks are used by companies to deliver a range of products.

The purpose of this analysis is to assess the effect of digitalization and industry technologies implementation on supply chain performance in the context of the digital economy. The researcher conducted the research with the following objectives. a) Identifying the supply chain processes effect of the digitalization and industry technologies, b) Assessing the influence of convergence between internal and external supply chain electronically activated actors. c) Recognize the issues confronting supply chain organization and their supply chain participants in the process of technology-powered netwosactions. dd determine how infrastructural conditions and capabilities in the area of information technology impact the management of the electronic supply chain. e) Propose suitable and sustainable industry management and supply chain enhancement techniques.

As a result, we put forward two hypotheses that we intended to confirm or reject in the course of studying the empirical data:

H1: There is statistical evidence of a relationship between digitalization and supply chain performance

H2: there is no statistical evidence of a relationship between industrial technologies and supply chain Given that the study was conducted in Cochin and Vishakhapatnam, we suggested that it is logical to formulate H2 in a presented way, relying on [3], according to which in Cochin organizations are not taking interest in making these policies and as a result their Industry updated is facing different challenges. They stick to old and traditional business techniques and face adverse consequences. These problems are not only confined to Cochin, many surrounding

developing (including Vishakhapatnam) and underdeveloped countries are facing these problems. In highly developed countries changes in the manufacturing sector are pressuring corporations to follow a new model of production called “agile growth”. It is seen as a successful tactic in a business that is highly competitive with evolving customer expectations and drastic changes in efficiency. The key role of Industry updates is to simplify networking across the Internet. Industry updated is described as a meta concept to improve development further and to build value structures by connecting the physical world with the digital environment [4]. Since technological innovations cannot be effectively implemented in the absence of appropriate social needs, we considered it possible not to take into account certain technological limitations, since technology transfer and the development of global innovation networks [5] currently allow us to catch up with the existing technological gap on the principle of “catch-up development”. At the same time, Vishakhapatnam and Cochin are approximately on the same level in many digital and technology indexes, being in the top third of the leading countries in the world or being very close to it, for example, taking 48 and 51 places, respectively, in The Network Readiness Index 2020 [6]. Therefore, it is much more important to understand the impact of digitalization and Industry updated technologies on supply chain performance, as well as to assess the readiness for Industry updates in the organizations of these two countries.

## **Review of Literature**

### *Impact of digital transformation*

The literary analysis reflects on concepts of Industry updated in the supply chain, policy growth, and change management. Technology and creativity enable businesses to work differently and deliver uniquely timely goods and services, providing flexibility increases towards the changing requirements of the market related to improving the supply chain performance [1]. [7] Indicates that the Internet of Things infrastructure has helped to build methods for strengthening activities in the supply chain. Customer responsiveness is improved and consumers' retention, sales, and income increases are boosted. [8] Agrees that supply chain management increases the productivity and efficiency of a business. The financial performance of corporations and the depth and complexity of their supply chains are associated. Through implementing creative forms of transacting business, the value produced affects suppliers, intermediate manufacturers, and customers alike. [9] Describes the supply chain as the flow of goods, knowledge, money,

and services from suppliers of raw materials through plants and warehouses to customers. The supply chain includes domestic and foreign partners in multiple locations. Multiple trade partners from vendors, producers, dealers, and consumers provide the supply chain control of products and services. The purpose is to enhance inventory management, company operations, and customer care to eliminate unhealthy environments and threats.

### *Sustainability issues of supply chain*

Sustainability issues of supply chain management in Industry updated dedicated works [10-12]. The idea of ensuring sustainable development in them is based on the concept of the circular economy concept, which has originated from both industrial ecology and environmental economics. Practitioners often consider it as a way to overcome the limitations of linear production and consumption models for increasing resource use efficiency. The circular economy has been introduced to achieve a better balance between the economic aspect and the environmental and social aspects of sustainability. As new technologies emerge, novel business models can orient organizations toward enhancing sustainability outcomes through circular economy principles.

However, in this statement interoperability issues that control the links were not taken into account. The flow of knowledge in logistics and supply chains is as critical as the flow of products, resources, and people. Therefore, high inventory turnover is expected for the retail sector which needs prompt knowledge transmission in the supply chain. [13] Emphasizes that knowledge consistency and scheduling provide effective decision-making and simplify reaction to consumer needs. According to [14] manufacturers are still trying to manage stock levels and ensure the correct items are accessible at the store level in the right amounts. Store inventory outputs need to be avoided and consistent stock supply maintained to sustain consumer loyalty. [15] Stresses that the operating structure of the organization must achieve large competitive and strategic goals which need to be expressed in quality, pace, confidentiality, flexibility, and cost improvement steps. [15] Says the essence and requirement of the goods of the business must be taken into consideration when developing a supply chain. An automated IT structure with open buyers and vendors supplying inventory details and modified demand levels, allowing it easier to enforce supply pulling and, therefore, not drive up inventory in expectation of potential demand is important. In the supply chain, timely changes are needed for successful and productive

inventory refill. 2.3 Organizational and operational agility. The producers must continually upgrade goods and services in an increasingly digital world and build a competitive edge. Companies and industries must be agile to build value and differentiate themselves from the competition [16]. The agility of the organization depends on the information, know-how, and inventiveness of its members [17]. Organic agility requires responsiveness, pace, versatility, and abilities. Moreover, there is constant creativity in organizational agility. New prospects, including automation of added nonvalue activities through equipment and agile applications, are created by technological advancement in the manufacturing world. This allows businesses to easily respond to environmental shifts and variations. Through extending the concept of operational organizational agility, agility is the capacity to respond to change that is achievable by relentless creativity and the use of scalable and re-configurable technology [18]. Agility is often associated with the fast and accurate electronic document circulation between humans and the establishment of a relevant and real-time information system exchanging information without human beings. Lean development is also the first phase in improving process management both in manufacturing and post-production, both in identifying and eliminating waste sources. Lean development coupled with efficient technological usage contributes to operational stability and increased resource performance [19]. The core concepts that enable the development of Industry updated companies to work in the world, are organizational and operational agility. It also makes for quicker and more effective decision-making. Operating agility helps them to plan for consumer needs efficiently and effectively with computers and devices.

#### ***Barriers to implementing digital transformation in companies and segments***

In every market, businesses face a broad variety of obstacles in digital change implementation and management. Organizational, strategic, cultural, or administrative problems may be [20]. This barrier literature reflects on four dimensions: societal, operational, institutional, and strategic. All these aspects are grouped into a multiplicity of parameters that the literature on the topic of digital transformation posed. Research in the field of supply chains in separate economic sectors and countries may be of particular interest. For instance, studies such as [21-23] provide insight into the situation in the automotive industry, while [24] demonstrate best practices in the agriculture supply chain. In our research work, we were interested in examples of best practices in the usage of Industry updated technologies to separate them from the experience of

digitalization of supply chains, so we used these works in the development of questionnaires and during interviews conducted for this study.

### **Methodology Implemented in the Study**

For the observational data analysis, a qualitative approach was applied. Five qualitative interviews (presenters of 5 different companies' profiles that were called in this research as "Sports brand", "Outdoor brand", "Fashion brand", "Healthcare brand" and "Apparel brand") gathered the analytical evidence from 236 semi-structured open interviews and surveys. This approach helps to consider more fully how they perceive and understand digital transformation. The details of the interviewed experts are shown in Table 1. Thus, fresh knowledge and thinking from our respondents have been made possible. In a brief interview guide, each of the interviewees had a short description of the subjects and keywords. Findings suggest that the interviewee has some time to immerse in the topic and some time for thinking and probably offering a new perspective. The interviewees were told at the beginning of each meeting of the intent and how to use the gathered information. They also were assured that neither their real name nor the name of the business would be revealed in any manner contrary to ethical principles. For data collection and then data analysis, a questionnaire for a certain number of participants should be distributed using the SPSS statistical methodology for analytical proof of the research hypotheses. Regression is an inferential statistical test that analyzes the data gathered and validates the findings of the study based on a 5 percent margin of error. However, 236 participants were distributed, 162 participants addressed the survey and the findings will be disclosed as follows: - There is a significant relationship between Digitalization and Supply chain performance since the margin error is 0.039 which is lower than 0.05; - There is a significant relationship among I updated technologies and Supply chain performance since the margin error is 0.041 which is lower than 0.05. Thus, the following hypotheses could be validated: H1: There is statistical evidence of a relationship between digitalization and supply chain performance - Accepted. H2: There is no statistical evidence of a relationship between technology and supply chain performance – Rejected

Table 1 shows the Demographic and professional characteristics of the interview experts (compiled by the author)

			Respondents from Vishakhapatnam	Respondents from Cochin
1.	Gender	Male	75	89
		Female	65	70
2	Education Level	UG	110	86
		PG	24	12
		Doctorate	3	1
3	Experience	5-10 years	33	19
		10-20 years	96	64
		>20 years	8	16
4	Job position	Consulting	102	73
		Mid manager	22	17
		Top manager	13	9
5	Relations to Business	Consulter	12	7
		Employee	114	87
		Co-owner	8	4
		Major owner	3	1
6	Area of Business	Sports brand	28	18
		Outdoor brand	20	22
		Fashion brand	23	21
		Healthcare brand	30	19
		Apparel brand	36	19
<b>Surveyed</b>			<b>137</b>	<b>99</b>

### Multiple Regression Analysis

<b>Model Summary</b>				
<b>Model</b>	<b>R</b>	<b>R<sup>2</sup></b>	<b>Adjusted R<sup>2</sup></b>	<b>Std. An error in the estimate</b>
1	.488 <sup>a</sup>	.466	.417	.02414
a. Predictors: (constant), Digitalization, Industrial Technologies				

**Table 2.**  
**Results of Regression Analyze (compiled by Authors)**

<b>Coefficients</b>					
<b>Model</b>	<b>Unstandardized Coeff.</b>		<b>Standardized Coeff.</b>	<b>T</b>	<b>Sig.</b>
	<b>B</b>	<b>Std.Error</b>	<b>Beta</b>		
(constant)	.027	.011		2.429	.025
Digitalization	.289	.121	.081	2.388	.039
Industrial Technologies	.282	.128	.198	2.031	.041
a. Dependent variable: Supply chain performance					

Thus the following equation can be explained as follows:

$$Y=A+BX_1+BX_2$$

Where Y= dependent variable, A=constant, B=Coefficient, X=Independent variables

Their supply chain performance was a strong correlation between digitalization (0.039), and technology, (0.041). The following calculation may be done based on the regression. Supply chain performance = 0.025 + 0.039 (digitalization) + 0.041 (I updated technologies) This indicated that: - For every one unit increase in digitalization, the supply chain performance was affected by 3.9%; - For every one unit increase in I updated technologies, the supply chain performance was affected by 4.1%. The researchers then proved that the other hypotheses of analysis were correct and that the null hypotheses were denied and also researched the relation between the variables if the relation is proportional or inverse.

### **Major Findings of the Study**

This study illustrates the projected impact of digital transformation on the entire supply chain. Implementing digital transformation through the practice of the Internet of Things and Artificial Intelligence tends to prove that digital transformation is of high importance to the supply chain performance. Furthermore, the research highlighted the barriers which might face the companies



while implementing digital transformation in their supply chain practices. As a result, statistics evidenced the presence of a relationship between digitalization, industry-updated technologies, and supply chain performance. This means that H1 is accepted and H2 is rejected. Companies should recognize the relevance of innovative business models that add value to their product portfolio and enter additional demand platforms and new digital consumers. It is therefore important for supply chain managers to learn how these digital technologies can be used and how these technologies can be used in their current supply chain processes. The represents of brands in Vishakhapatnam are more optimistic about the prospects for Industry updated technologies introduced into the supply chain in comparison with the Vishakhapatnam ones (the values of the coefficients are 78.4 and 42.1, respectively), which is generally justified by the larger territory and population of Vishakhapatnam. Industry-updated technologies are known to be a solution for some traditional problems with infrastructure, typical for Vishakhapatnam. Experts pointed out that successful adaptation of Industry technologies depends largely on the cyber recourses which confirms the applicability for Vishakhapatnam and Cochin of the conclusions of [25], which found that this specifically concerns small and medium enterprises (SMEs) as they do not have the same supply chain recourses as large enterprises. The new design enables SMEs to visualize the required cyber resources and the integration process and the transformational roadmap of the integration process of Internet of Things technologies consolidated in the cyber themes of the future makeup of supply chains. Most of the examples of successful implementation of technologies in logistics systems were reduced to digitalization, which in recent years, according to the interviewed experts, provided an increase in supply chain performance. However, experts have already mentioned examples of using Artificial Intelligence to solve problems of route optimization, as well as examples of processing Big Data to determine customer needs. All this has been made possible thanks to real-time decision making, given the information gathered in the Cloud computing and Cloud robotics analyzed by the monitor and drives customers' behavior (data trends) for an optimal intelligent demand assessment, as well as effective and efficient input/output processes in logistics [26]. Almost all respondents confirmed the importance of advanced development professions and specialists with relevant competencies in the organization to ensure industry-updated readiness. The most popular answers include Designer of Innovative Systems; Specialist in the Field of Artificial Intelligence, Big Data Analyst, Expert in Cloud and Fog Computing, Block chain Programmer; and Trend watcher /

Forsiter. The companies “Apparel Brand” in Vishakhapatnam and “Outdoor Brand” in Cochin were the most ready for industry-updated technologies. Among the most pressing issues for further study by the experts were named: the development of new organizational cultures, norms, policies, and techniques to more effectively manage challenges in regulations, intercommunication, interoperability, and transparency, among others, which allows us to identify further priority areas of research in the context of the Fourth Industrial Revolution.

### **Limitations and Discussion**

This research should be viewed as an addition to existing studies taking into account the small quantity of up-to-date work undertaken in this area. Interviews with managers may be particularly useful for prospective analysis. However, there are still some drawbacks to this review. Due to the limited number of tests, the findings cannot be generalized. Conducting research on the example of other companies and even involving other employees could lead to a change in the results. If the same study was extended to various enterprises in one sector, entirely different results may have been drawn. In addition, the interview partners have diverse careers and perspectives, all of them in different positions and locations. This results in multiple-faceted responses dependent on Conclusions and recommendations The study showed that investing in and deploying emerging technologies will generate a sustainable competitive advantage for companies through improved access to information, cost reduction, improved product quality, responsiveness, and cooperation skills. Digitalization as well as the implementation of Industry updated technologies of supply chain management would carry groundbreaking improvements. This paper attempts to highlight some of the issues that stress the importance of the management of the digital supply chain, its challenges, and how these challenges can become a competitive advantage. We evaluated the impact of digital transformation on supply chain performance and the readiness to implement such technologies in Vishakhapatnam and Cochin, considering the results of a study of five brands. A combined management of the digital supply chain could significantly promote the integration of the supply chain reduce fragmentation in the industry and also provide a sustainable approach towards digital technologies. By improving Industry technologies and growing consumer data access, businesses are trying to enhance their service, pertinence, and usability. To make a long-term relationship with each client, they strive to increase supply chain performance. The company's challenge was to adapt a specific deal to the

client. The usage of consumer knowledge is a valuable method in the development and management of sustainable client interactions with most organizations. The main element of a loyal partnership is to remain relevant in contact with the client irrespective of the medium. Digitalization and Industry updated technologies implementation have been shown to provide an efficient contribution to enhancing business efficiency and productivity. The research assesses the effect of electronic business within the supply chain and offers information on how the potential of Industry updates in the management of the supply chain can be used. The issues of managing organizations in conditions of high readiness for the Fourth Industrial Revolution require further study.

## **References**

1. Saengchai, S, Jermittiparsert, K. *International J. of Innovation, Creativity and Change* 8(8), 103-121 (2019)
2. D. Ivanov et al., *Annual Reviews in Control* 46, 134-147 (2018)
3. S. Saengchai, K. Jermittiparsert, *International J. of Supply Chain Management* 8(5), 733-744 (2019)
4. B. Tjahjono et al., *Procedia Manufacturing* 13, 1175-1182 (2017)
5. E. Dudukalov et al., *Contemporary Economics* 10(4), 299-310 (2016)
6. S. Dutta, B. Lanvin, *The Network Readiness Index* (2020)  
[https://networkreadinessindex.org/wp-content/uploads/2020/11/NRI-2020-V8\\_28-11-2020.pdf](https://networkreadinessindex.org/wp-content/uploads/2020/11/NRI-2020-V8_28-11-2020.pdf)
7. E. Manavalan, K. Jayakrishna, *Computers & Industrial Engineering* 127, 925–953 (2019)
8. M. Mubarik et al., *J. of Cleaner Production* 292 (2021)
9. R. Stechow, M. Mißler-Behr, *The EUrASEANs: J. on Global Socio-Economic Dynamics* 6(7), 51-57 (2017)
10. T. Hayhoe et al., *J. of Self-Governance and Management Economics* 7(2), 31-36 (2019)
11. E. Nica, *J. of Self-Governance and Management Economics* 7(3), 27-33 (2019)
12. B. Esmaeilian et al., *Resources, Conservation and Recycling* 163 (2020)

13. L. Li, *Systems Research and Behavioral Science* 37(4), 579-592 (2020)
14. D. Ushakov et al., *J. of Advanced Research in Law and Economics* 10(8), 2566-2573 (2019)
15. K. Hobusch, M. Mißler-Behr, *The EUrASEANs: J. on Global Socio-Economic Dynamics* 5(6), 40-47 (2017)
16. Y. Chong, C. Chen, *International J. of Advanced Manufacturing Technology* 48(1-4), 395-406 (2010)
17. A. de Carolis et al., *IFIP International Conference on Advances in Production Management Systems*, 13-20 (2017)
18. S. Nadella, J. Euchner, *Research-Technology Management* 61(4), 11-15 (2018)
19. B. Gates, *Lean Manufacturing in the Age of the Industrial Internet. Supply & Demand Chain Executive* (2014) [https://www.sdexec.com/sourcing\\_procurement/article/12019013/lean-manufacturing-in-the-age-of-the-industrial-internet](https://www.sdexec.com/sourcing_procurement/article/12019013/lean-manufacturing-in-the-age-of-the-industrial-internet)
20. A. Glas et al., *International J. of Business and Management Invention* 5(6), 55-66 (2016)
21. N. dos Santos et al., *IFIP Advances in Information and Communication Technology* 591 (2020)
22. E. Dudukalov et al., *E3S Web of Conferences* 217, 03004 (2020)
23. K. Markov, P. Vitliemov, *IOP Conference Series: Materials Science and Engineering* 878, 012047 (2020)
24. S. Kumar et al., *J. of Cleaner Production* 293, 126023 (2021)
25. P. Radanliev et al., *Cybersecurity* 3(1), 13 (2020)
26. C. Garay-Rondero et al., *J. of Manufacturing Technology Management* 31(5), 887-933 (2019)