



**Digitization of Logistics in FMCG Sector of Pakistan:
A New Approach to Strengthen Corporate Performance**

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Abstract

As the world is moving towards digitization which is the result of fourth industrial revolution, also known as Industry 4.0, many companies have already automated their processes while other are striving hard for undergoing the digitization process for their functions and practices. Logistics being one of the most crucial elements of the supply chains of corporations is facing major transformations and implications of digitization. In Pakistan, the concept of digitization of logistics is evolving with time. Hence, this study aims towards highlighting the importance of digitization along with the factors which play an important role in transformational process of logistics. This study has been conducted in the FMCG sector of Pakistan and it is based on quantitative method of research done with the assistance of research questionnaire.

Keywords: *Digitization, Logistics, Industry 4.0.*

1. Introduction

1.1 Digitization of Logistics

The term 'Digitization' refers to catching signals of analog algorithm and transforming into the shape of digital form of data which can be electronically stored or processed. The basic purpose of digitization is to ensure that information is available to the users anywhere, anytime to be used by any user using any kind of device at his or her convenience.

Whereas the term 'Logistics' can be defined as management of inter and intra-organizational activities and administration of flows of products, services, finances, and information which build up an organization. This management process links partner firms in a logistic chain. The foremost purpose of Logistics is to manage the creation of value for the customers by utilization of a firm's resources in order to maximize its competitiveness through its logistics chain. Rapid growth of internet and growing age of automation makes it obvious that linking inter and intra-organizational procedures with internet benefits logistics performance by making it convenient. (Kee-hung Lai, Christina W.Y. Wong and T.C.E. Cheng, 2010)

The reason that Digitization of logistics is becoming popular with time is that, integrating logistics' function with technology would enhance the supply chain responsiveness and robustness. This will result in creation of competitive advantage for the companies on the basis of their ability to compete on transparent and the most efficient delivery system.

Digitization does not only benefit the companies instead its advantages spread beyond the boundaries of organizations stretching towards the ecosystem. Digitization has immense opportunity to reduce emissions from the ecosystem as much as 10%-12% by 2025 ensuring the sustainability of the environment and playing an important part in improving the global economy.

1.2 Digital Transformation

The new prevailing environment compels industries to adapt the changing behaviors of the businesses today. Today's world is the world of Digitization which has proven to be the major driver of changes throughout the value chain. Over the past few decades demand of customers is changing quickly which has resulted in decreasing product life cycles. This revolution has given immense importance and pressure of the automation of processes. Incorporating digitization into logistics' processes leads towards the 'Logistics Transformation'. To be successful in the modern world companies need to incorporate digital transformation into their business processes in order to be successful in today's business environment(L. Barreto, , A. Amaral, T. Pereira, 2017).

Digitally integrated logistic function ensures consistent and sustainable transportation network which would make supply of goods efficient and supply chain more robust. Technological advancements have led the function of logistics to change. New technologies have been incorporated in to logistics to make it easier and faster including Intelligence Transportation System, Transportation Management System, etc. (Kayikci and Yasanur, 2018)

Digital Logistics is the most fundamental way of fulfilling the customer needs in time and being closer to them when need be. This does not only strengthen the corporate performance of the organizations but also increases the level of satisfaction among the customers. (L. Barreto, , A. Amaral, T. Pereira, 2017).

1.3 Background

As the time is moving forward the world is facing a lot of challenges. The challenges are bringing opportunities to think out of the box and innovate things in order to deal with the challenges. As we are moving ahead, we witness rapid shifts in the paradigm of each function of supply chains including Logistics. Over the past two decades, we have witnessed internet taking over most of the roles moving the processes towards automation. This is the sole reason our day-to-day lives have become progressively digital. Digitization is replacing physical existence of products and even people at work. Today, most of the companies are incorporating digitization in their processes. This modern industrial revolution is popularly known as Industry 4.0 This revolutionary progress is developing different concepts of supply chain so it is also focusing on improvement of logistics' function. Since logistics is the backbone of every company. Its strength depends upon the

performance, efficiency, and transparency of logistics. So, by applying automation to the logistics companies ensure full-time transparency from supplier to customers. By applying digitization, companies have also faced growth and entry in the global markets as internet has enabled moving different parts of the earth closer making it a global village.

Pakistan is a developing country with most of its function lagging behind than rest of the world. So is the application of the concept of digitization of logistics. It will not be incorrect to state that Pakistan is still in the stage of implementing digital technology into its supply chain functions. The slower pace of applying digitization has already brought a lot of challenges and increased the possibility of risks which if ignored could prove to be catastrophic. The purpose of this study is to highlight the significance of Digitization of logistics and its impact on the strength and performance of companies. It aims to investigate the factors associated with implementation of Digitization of logistics including Internet of Things, Technology, Globalization, and Multi-Channel distribution. This study is pursued in the FMCG sector of Pakistan and it is based on quantitative methodology done through questionnaires which were asked to be filled by the employees of several FMCG companies of Pakistan.

1.4 Problem statement

Modern age is the age of internet and technology. This has resulted in shifting of whole paradigm of working environment of businesses and converting it into a completely different form. Companies who wish to strive in the modern culture of business are steadily incorporating digitization into their logistics functions whereas those which are not making any efforts are vanishing from the industry. Rapid and phenomenal developments have been occurring in the business field making things different from how they were before.

With time supply chains have also evolved and so have the functions of logistics. Rapid changes which can be witnessed in the business functions have increased vulnerability of supply chains however, at the same time integration of technology has also provided them with numerous techniques of improving making them robust and efficient.

Pakistan is in the developing state so technological advancements hit here later than other parts of the world. Considering this fact, this study is being carried out in order to highlight the barriers which can cause an issue in making logistics digitized and how a number of factors

including technology, IOT, Globalization, and multi-channel distribution can effect the process of digitization in Pakistan.

1.5 Aim of the research

The purpose of carrying out this research is to identify the upcoming opportunities for the digitization of logistics in Pakistan. Corporate performance is the focus of this research in order to examine the effects which are imposed on it by digitization of logistics and other factors including, technology, IoT, globalization, and multi-channel distribution system and to find out their benefits for the survival of an organization in the industry.

Earlier researches on digitization of logistics have been carried out in other countries and not Pakistan. So, this research would help the businesses to identify the significance of digitization of logistics processes in order to strive in the changing business environment. Technological integration in supply chain processes will also assist organization in increasing its corporate strength and increasing the share of value along the supply chain. .

1.6 Research questions

Q1: What is the effect of internet of things on corporate performance and digitization of logistics?

Q2: What is the effect of globalization on corporate performance and digitization of logistics?

Q3: What is the effect of multi-channel distribution on corporate performance and digitization of logistics?

Q4: What is the effect of technology on corporate performance and digitization of logistics?

2.0 Literature review

Digitization has affected our lives in many ways. Not only our private lives but our business environments have also largely evolved and are still under the process of evolution. It has provided the organizations with new opportunities to grow beyond the boundaries of their home countries. Digitization of logistics has made it rather easier for the companies to go and operate globally. Logistics is the backbone of every supply chain. So, it is necessary for it to be strong enough to face the challenges in order to secure its organization. The purpose of incorporating automation in the logistics processes is to utilize the potential of technology in order to create

value for customers by transporting their needed products at the right place and at the right time in the minimum cost. (Kee-hung Lai, Christina W.Y. Wong and T.C.E. Cheng, 2010)

Digitized logistics is a holistic approach which revolves around customers. Modern logistics require highly integrated end-to-end system which ensures flow of mandatory information and goods for the purpose of value creation along the supply chain. Logistics is now becoming a new approach of providing opportunities of distribution and new business. (Eva Bucherer and Dieter Uckelmann, 2011)

Digitization of logistics is a potential process which can result in enhancing the customer value that supply chain offers to the customers(Anna Lisa Junge, Peter Verhoeven, Dr.-Ing. Jan Reipert, Michael Mansfeld, 2019). Specially with the incorporation of the data-driven logistics the strategic importance of logistics can increase thereby, increasing the worth of the systems or functions associated with the logistics of an organization.

Over the past few decades, digitization of processes has really increased pace and its usage has become unavoidable. Companies are widely using it for increasing its corporate strength, efficiency, and getting competitive edge over the rivalries in the industry. (L. Barreto, , A. Amaral, T. Pereira, 2017)

highlighted that globalization is the phenomenon of eradicating boundaries and integrating national and regional economies, cultures, and societies through trade, communication, transportation. Digitization is supposed to have some fierce effects on the industry. Digital logistics is thought to become crucial in the coming years not only for the tycoons of the industry but also for the small companies allowing them to reach globally with ease and compete.

Globalization is a crucial factor for development of logistics operations. Globalization comprises of high competition, incoming of foreign investment, increased volume of trade, and establishment of multinational companies. (Pavel Ceniga and Viera Šukalová, 2014)Suggests that with the incorporation of digitization in the functions of logistics, whole paradigm of supply chain has shifted improving the supply chain efficiency, reduced the costs and improves the service quality. Globalization vastly supports logistics of organizations making them competitive in the industry(Patrik Richnák, Klaudia Porubanová, 2017)

According to some previously done studies, it is suggested that integration of technology in organizational processes is mandatory to improve communication and coordination with partners, this leads to enhanced skills of decision making and higher performance of logistics (Kee-hung Lai, Christina W.Y. Wong and T.C.E. Cheng, 2010). Digitization of logistics is basically the practice of incorporating technology in to its functions in order to improve its functionality (E.W.T Ngai, Kee-Hung Lai and T.C.E Cheng, 2008). The objective of logistics management is to control the flow of products and information, transformation of material into finished goods, and distribution of those goods using proper channels. Technological assistance in the processes of logistics increases the coordination between all the partner firms establish string basis of electronic connections, and logistical coordination. (Shawn P.Daly and Lindsay X.cui, 2003)

Performance of logistics cannot improve if the integration of technology is not properly infused in the functions (Macharia Ngombo Wilson, Dr. Mike A Iravo, Ondabu Ibrahim Tirimba, Dr.Kepha Ombui , 2015). These choices are made strategically by the management of the organizations. These strategic choices include configuring business processes, structure of the organization, and application of IT in order to be responsive to the changing business environment (Kee-hung Lai , Christina W.Y. Wong, T.C.E. Cheng, 2008)

With the time moving towards more of a technological world, business processes are becoming more and more complex and difficult to handle. Production, manufacturing, logistics and rest of the functions of the supply chain has become complex tasks. The unavoidable role of technology has successfully transformed the concept of logistics and improved its efficiency, and its importance in unquestionable.(G. Nick and F. Pongrácz, 2016) Computers, automation and robots existed in previous decades, but the opportunities provided by the Internet revolutionize their use, and the opportunities they provide (Judit Nagy, Judit Oláh, Edina Erdei, Domicián Máté, and József Popp, 2018). The increasingly cheaper solutions allow us to monitor the activities, operation and processes of machines, materials, workers and even products themselves, and to collect, analyze and utilize data in real-time decision making (Judit Nagy, Judit Oláh, Edina Erdei, Domicián Máté, and József Popp, 2018).

2.1 Hypothesis

H1: digitization of logistics due to internet of things has significant impact on corporate performance.

H2: digitization of logistics due to globalization has significant impact on corporate performance and digitalization of logistics.

H3: digitization of logistics due to competition has significant impact on corporate performance and digitalization of logistics.

H4: digitization of logistics due to multi-channel distribution system has significant impact on corporate performance and digitalization of logistics.

2.2 Conceptual framework

Definitions of the terms

i. Digitization of Logistics:

Digitization refers to as automation process where as the definition of logistics is stated as transportation of goods from the producer to the consumer. When these two terms are combined, it gives rise to a new concept where the processes of transportation of goods is automated by incorporating artificial intelligence or technology.

ii. Corporate Performance:

Corporate performance is related to the measurement or analysis of the 'health' of an organization. It is basically a parameter of assessing how well an organization is performing in the industry.

iii. Internet of Things:

Internet of Things is a new terminology that has been introduced as a result of revolution of internet. If put simply, Internet of Things refers to connection of things or people through internet.

iv. Globalization:

The term globalization refers to going beyond the boundaries of a home country for the purpose of interacting and integrating with people, systems, businesses, economies worldwide. Globalization is a result of advancements in technology, communications, and transportation.

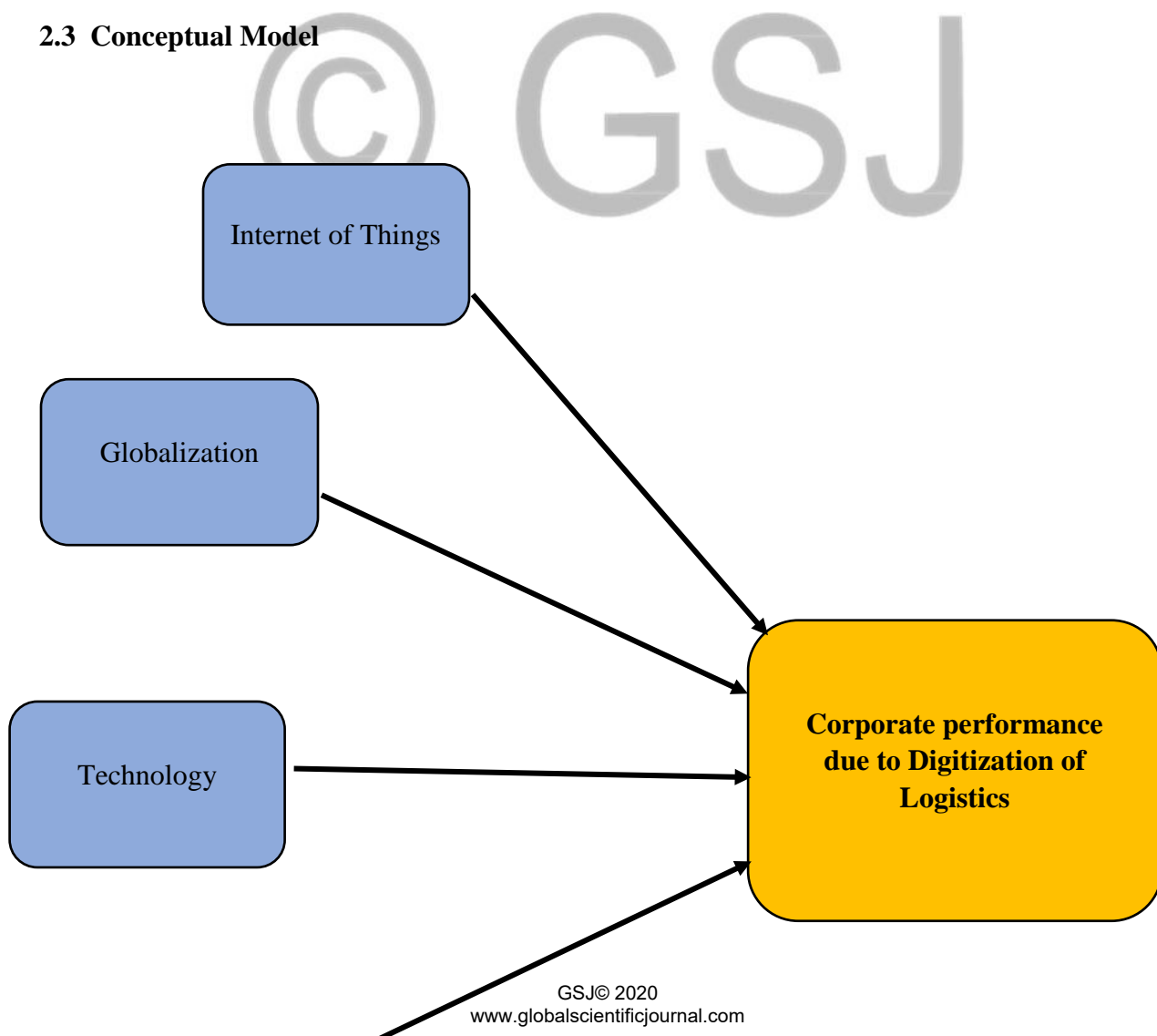
v. Technology:

Technology refers to techniques and practices of accomplishing a task using the knowledge of procedures necessary. It can be more broadly defined as items, both material and immaterial, which can be used in order to achieve value.

vi. Multi-Channel Distribution:

Multi-Channel Distribution system is the part of downstream of supply chains. It refers to usage of more than one distribution channels for the purpose of transferring goods from the producers to the consumers. Multi-Channel distribution enables the companies to fulfill customer demands at maximum pace.

2.3 Conceptual Model



Multi-channel
Distribution
System

3. Research Methodology

3.1 Introduction:

In this chapter, we focus on elaboration of the methodology adapted for the purpose of conducting this research in order to find out the factors and their effects on the performance of the organizations. This study has been investigated with the assistance of different techniques including questionnaires, data analysis, and different discussions. This research sheds light on elucidating as well as interpretative reason. It stresses the importance of digitization of logistics and its effects on the performance of the organizations. For the purpose of this study, FMCG sector has been chosen. Applying essential research and instruments including meetings as well as polls, information was collected to confirm the legitimacy and the extent of this research in Pakistan.

3.2 Research instrument

Questionnaire:

The tool used for the purpose of gathering the data for this thesis is questionnaire which is based on questions divided into each category of independent and dependent variables. Each of these questions included in the instrument of research has been adapted from different sources and is based on the LIKERT'S Scale for measuring the reactions collected in this research.

3.3 Face content & validity

The content of the questionnaire had to be necessarily validated by a PhD professor so for this purpose a highly professional PhD professor from a renowned institute of Karachi, Pakistan was contacted. After thorough reading and examination of the questionnaire it was validated by him.

3.4 Research design

As stated earlier, the purpose of this research is to find out the effects of four independent variables, which assists Digitization of logistics' function, on the corporate performance. The most commonly used technique to find out the relationship between the dependent and independent variables is the statistical analysis of correlation between them. So, in order to fulfill the need of the research of finding out the relationship, which might exist between the given dependent and independent variables, correlation analysis was conducted using SPSS. The results helped us to examine the relationship of the variables with one another which could be either positive or negative.

3.5 Types of data

The data taken for this research is of two types, explicitly, qualitative and quantitative data. This study leans towards the measurement of performance of corporations which is why the data included in this research is quantitative data. Moreover, the variables taken to be investigated for the purpose of confirming that digitization helps in strengthening the performance also intends to measure and confirm the relationship between the variables and it depends on numerical

On the other hand, the research is also based upon facts and arguments based on the non-numerical data which is gathered through different articles.

3.6 Sample size

Since the purpose of this research is to find out the importance of digitization of logistics and its significance on the corporate performance specifically in the FMCG sector of Pakistan, so for its commencement sample size of Two Hundred respondents have been taken.

The respondents chosen for filling the research questionnaire were selected from the top ranking FMCG companies of Pakistan because of the fact that these companies, some of them being multi-national, would have the understanding of the modern challenges related to technology and the complexities of the transforming business environments and the need for digitizing their logistical operations.

3.7 Study findings

This section explains the findings of the research which was conducted for the purpose of finding out the relation that might exist between one dependent and four independent variables. For this purpose, different statistical tests were performed on the collected data.

3.8 Ethical considerations

The research was conducted also by fulfilling the ethical and moral responsibilities as a researcher. As per the ethical duties, the information and data gathered from the respondents through the questionnaires are to be kept confidential and to be used only for the sake of this research. Moreover, the process of data gathering for this research was only carried forward after the permission from the higher management of the related FMCG companies was taken.

4. Results and Discussion

4.1 Analysis of the data

This study was based upon the study of the relationship between the given independent and dependent variables. For this purpose, the survey was conducted and results were gathered. These results show the existing relationship between the mentioned variables.

The results show that three of the given independent variables namely, **Globalization**, **Technology**, and **Multi-Channel Distribution** have a significant relationship with the dependent variable which is **Corporate Performance**.

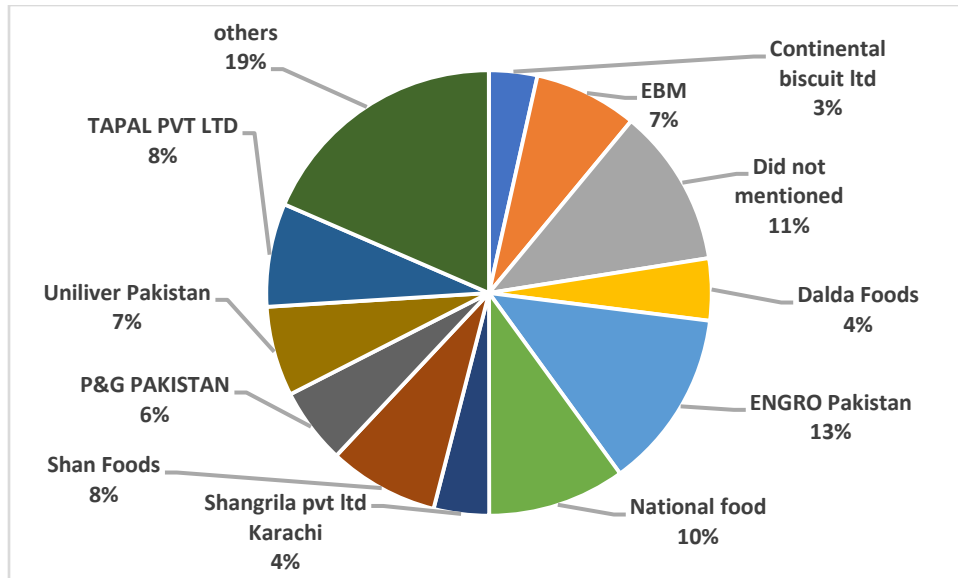
Whereas, one of the independent variables, namely, **Internet of Things** doesn't possess significant relationship with the dependent variable which is **Corporate Performance**.

4.2 Respondents' profile

200 respondents were the part of study after their consent. The number of male study subjects were greater than female i.e. male was 178, 89% whereas female was 22, 11%.

Gender	No of Respondent	Frequency
Male	178	89%
Female	22	11%

Distribution of study subjects with respect to gender.



4.3 Descriptive Statistics

Statistics

	CDL	IOT	GLOB	TECH	MDC
N Valid	201	201	201	201	201
Missing	1	1	1	1	1
Mean	4.3529	4.2920	3.8458	4.0410	4.4282
Std. Error of Mean	.03087	.03088	.02877	.02680	.03176
Median	4.4300	4.2500	3.8300	4.0000	4.5700
Mode	4.43	4.25	3.83 ^a	3.83	4.71
Std. Deviation	.43765	.43785	.40788	.37992	.45021
Variance	.192	.192	.166	.144	.203
Skewness	-.435	-.250	-.326	.341	-1.099
Std. Error of Skewness	.172	.172	.172	.172	.172
Minimum	3.00	2.88	2.33	3.17	3.00
Maximum	5.00	5.00	4.83	5.00	5.00

4.4 Regression

Variables Entered

Model	Variables Entered	Variables Removed	Method
1	MDC, GLOB, TECH, IOT ^b		Enter

Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.974 ^a	.950	.949	.09925

a. Predictors: (Constant), MDC, GLOB, TECH, IOT

R^2 value named as coefficient of determination, which is the proportion of variation accounted for by the regression model above and beyond the mean model. R^2 value for our model is 0.950 that our independent variable explains 95% of the variability of our dependent variable.

4.5 ANOVA Analysis

A multiple regression was generated to predict the status of CDL from independent variables i.e. MDC, GLOB, TECH, IOT. The F -ratio test shows that above mentioned independent variables significantly predict the dependent variable, $F(196, 4) = 923.159$, $P\text{-value} < 0.05$. Hence the regression model is a good fit of the data.

ANOVA^a

Model		Sum of Squares	Df	Mean Square	F	Sig.
1	Regression	36.376	4	9.094	923.159	.000 ^b
	Residual	1.931	196	.010		
	Total	38.307	200			

4.6 Coefficients Analysis

Model	Unstandardized Coefficients		Standardized Coefficients	t	Sig.
	B	Std. Error	Beta		
1 (Constant)	.150	.101		1.487	.139
IOT	.964	.022	.964	44.016	.000
GLOB	-.008	.018	-.007	-.420	.675
TECH	.021	.023	.018	.911	.364
MDC	.003	.019	.003	.136	.892

4.7 Reliability and Validity Testing

Scale: ALL VARIABLES

Case Processing Summary

		N	%
Cases	Valid	201	99.5
	Excluded ^a	1	.5
	Total	202	100.0

a. Listwise deletion based on all variables in the procedure.

The value of Cronbach's Alpha =0.794 for the given study. It indicates that the questionnaire reliability is 79.4%.

Reliability Statistics

Cronbach's Alpha	N of Items
.794	5

4.8 Hypothesis assessment summary

The following table shows the results of hypotheses assessments. Through this assessment we would get to know whether our assumptions or hypotheses were accepted or rejected.

	Hypotheses	p-value	t value	Empirical Conclusion
H1	Internet of things has resulted in strengthening the corporate performance and digitalization of logistics.	0.000	44.016	H1 Rejected
H2	corporate performance has been strengthened by digitalization of logistics due to globalization.	.675	-.420	H2 Accepted
H3	Corporate performance has been strengthened by digitalization of logistics due to competition.	.364	.911	H3 Accepted
H4	Corporate performance has been strengthened by usage of multi-channel distribution system	.892	.136	H4 Accepted

5. Conclusion

The purpose of this research was to find out the relationship of a few factors (independent variables) namely, Internet of Things, Globalization, Technology, and Multi-channel

Distribution system with corporate performance in regard to the digitization of logistics. Since the end goal of the logistics management is related to fulfilling customer demands on time and providing them with highest customer services which will also improve company's position in the industry, this is why the decision regarding incorporating technological advancement in logistical functions of the companies is really crucial for the success of the companies.

To conduct this research the data of 200 questionnaires was analyzed which confirmed that the variables of Globalization, Technology and Multi-channel distribution system have significant impact on corporate performance.

To elaborate it a bit further, Globalization is the result of the modern world of complexities and new technological advancements which have allowed new entrant to enter new markets anytime. The biggest challenge of globalization is that it has made everything quick. Customers want to be catered quickly for this purpose, companies ought to have highly responsive logistics system so that the goods can reach to the customers on time. For this purpose, companies can adapt digital analogy into the logistics system which allows supply chains to be responsive and agile. This in return will be able to bring higher revenues for the firm and improve its position in the market.

Technology is the main focus of the whole world today. Companies who wish to survive in the modern industry must make their logistics processes digitized by incorporating the modern technology so that not only the processes can be made faster but also their performance can be made better.

Multi-channel distribution system refers to the usage of more than one distribution systems for the purpose of making the products available to the customers who may be residing in any part of the world. However, distributing goods to a customer from Pakistan to USA cannot be made possible without the digitized or automated logistics systems.

For the companies today, it is of immense importance to understand the intensity of the aforementioned factors for the purpose of enhancing their corporate performance.

5.1 Limitations

Since this research was meant to be conducted in FMCG sector of Pakistan only so it cannot be generalized to other industries of Pakistan.

Another limitation to this study is the small sample size. The questionnaires were filled by only 200 respondents for the purpose of gathering data.

5.2Future recommendations

It is suggested that in future, if this research is conducted again, this study should be done on a broader scale. Since, it is an evolving concept in Pakistan. It must be widely highlighted in different industries of Pakistan in order to enlighten the companies about its benefits.

Logistics is the back bone of every supply chain so, by making this function automated, companies can successfully have competitive advantage over the competitors in the markets thereby, increasing the market shares and corporate performance.

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