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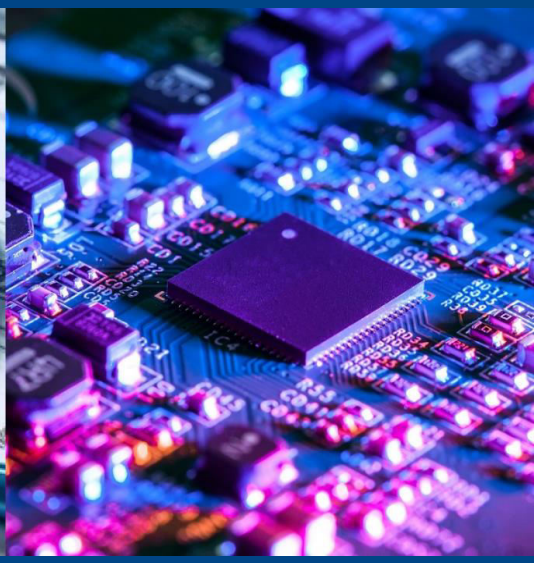

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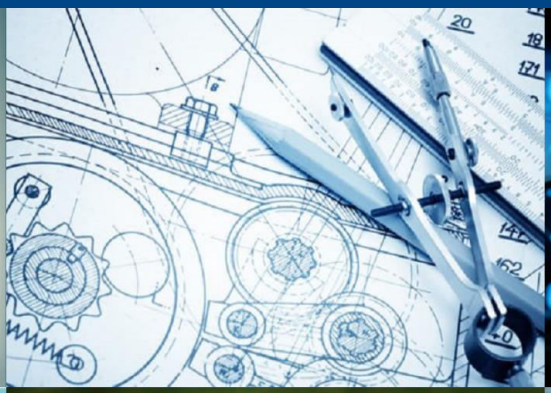

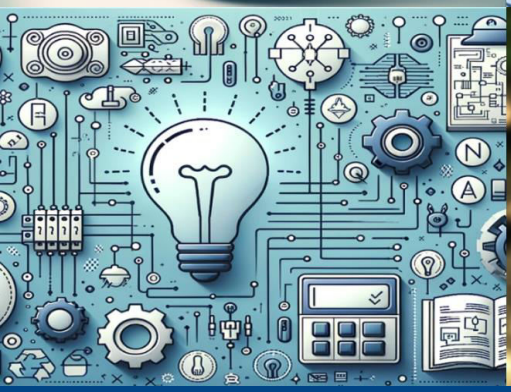

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A Study on Influences of Digital Tools in Freight Forwarding Services in International Clearing and Shipping Agency (ICSA), Chennai

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ABSTRACT: Freight forwarding services are the dedicated logistical services that the companies, called freight forwarders, arrange to arrange the transportation of the cargo between one location and another to businesses and individuals. These services act as an intermediary between the shippers and carriers which may comprise shipping lines, air freight companies, trucking services, etc and assist in ensuring efficient, safe and legal transportation of the cargo between the shippers and the carriers. The objective of the study is to analyse in order to evaluate the impact of digital technology use in freight forwarding activities on the efficiency of operations. The sample of the study is 120. Descriptive research design and convenience sampling method has been used. Questionnaire has been used as a primary data. Simple percentage analysis, chi-square analysis, regression and anova statistical tools have been applied to reach the findings of the study. It is found that there is some significant relationship between digital tools currently used in the freight forwarding operations and implementation of digital tools reduced operational costs. It is suggested that the company can look for cost-effective digital solutions and investment strategies to make the process less costly and complicated. It is concluded that although digitalization has resulted in numerous advantages for the organization, the true effectiveness of this initiative will be largely defined by the organization's ability to tackle obstacles such as high investments required for this purpose, problems of integrating new technologies into existing systems, and low employee readiness to adapt to them. Ensuring sufficient technical skills, providing employees with consistent education opportunities, and developing positive attitude towards the introduction of technological innovations are all crucial factors in ensuring that the achieved results persist in the long run.

KEYWORDS: Digital Tools, Freight Forwarding Services, International Clearing, Shipping Agency, CRM in Logistics, Transportation Management System (TMS).

I. INTRODUCTION

Freight forwarding services are the dedicated logistical services that the companies, called freight forwarders, arrange to arrange the transportation of the cargo between one location and another to businesses and individuals. These services act as an intermediary between the shippers and carriers which may comprise shipping lines, air freight companies, trucking services, etc and assist in ensuring efficient, safe and legal transportation of the cargo between the shippers and the carriers. Generally, freight forwarders do not actually transport cargo but are involved in such operations as booking cargo space, preparing documents, arranging the process of customs clearance, insuring cargo, and tracking shipments. As a result, freight forwarding services can make it easy to transact business activities in the global transportation of cargo by engaging in such logistics activities. The digitization significantly improves the efficiency of the freight forwarding services since, with the help of digitization, it becomes simpler to automatism the processing of documentation, shipment tracking, cargo booking, and numerous other routine operations. Digitization assists companies in fulfilling their orders much quicker, reducing the chances of mistakes. This allows the employees to have more time to focus on strategically important activities. In general, efficiency results in improved outcomes as well as more resource-efficient processes. This aspect is extremely important considering the intricacy of global supply chains involving many parties and stakeholders. The use of new technologies help to reduce the cost of operation as it helps to prevent too much manual labor, decrease paperwork and optimize the allocation of available funds. Transportation Management System (TMS) offers the ability to plan more cost-effectively, manage fuel more efficiently, eliminate unnecessary storage and prevent errors in the shipping process. Digitalization helps to avoid

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costly mistakes in the procedure of handling the documentation. This means that companies will save money without having to lose on services provided.

OBJECTIVES OF THE STUDY

- Identify different digital technologies that have been introduced within the freight forwarding activities.
- The effect of digitalization on the cost-efficiency of freight forwarding activities is evaluated.
- Barriers to adopting digital technology by freight forwarders are also examined.
- Levels of employee satisfaction and adaptability to the new system of operations are evaluated.
- Compare operational performance before and after the adoption of digital technology.

II. REVIEW OF LITERATURE

Dowling (2025) The primary objective of the study is to ascertain the level of awareness, benefits, and shortcomings associated with the use of technology by the employees within the industry of freight forwarding. In addition, Dowling considered the impact of digitization in relation to the performance of freight forwarders in the shipping industry. The target population was the workforce within the industry of freight forwarding in the shipping industry. The total number of subjects under investigation was 120 individuals, and the data collection process employed an online questionnaire approach.

Hofmann (2024) Carried out a study whose main objective was to examine the significance of block chain technology as well as other forms of digital technology in promoting transparency in the operations of the freight forwarders. The main goal of the study was to determine the effects of digitization on trust building, lowering costs, and efficiency. The sample size used for this research was 165 logistics professionals while the type of data gathered included both primary and secondary data. Both descriptive research approach and convenience sampling technique were employed. The findings show that the use of blockchain technology increases transparency but at a high cost.

Queiroz (2023) The researcher examined the problems and prospects associated with applying novel technology such as block chain and artificial intelligence within the supply chain and freight forwarding process. This study aims at identifying obstacles to and impacts of the application of digital tools. The total sample size was 140 participants, while the methods applied were survey and secondary data gathering. Descriptive approach to research along with convenient sampling technique was adopted. It emerged that while new technology facilitates effectiveness and transparency, certain problems arose in terms of integration and costs.

III. RESEARCH METHODOLOGY

This study adopts a descriptive research design. Convenience sampling is adopted in this study. Both primary data and secondary data are applied to the study. The size of the sample to be used in this study is 120 respondents. Simple percentage analysis, chi square analysis regression analysis and anova has been used in this study.

Data analysis and interpretation

Table No. 1 DEPARTMENT OF THE RESPONDENTS

Department	Number of Respondents	Percentage (%)
Operations	30	25.00%
Freight Forwarding	25	20.80%
Customs Clearance	20	16.70%
Documentation	25	20.80%
Others	20	16.70%
Total	**120**	**100%**

Source: Primary data

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Interpretation

Respondents indicate that the highest proportion (25%) belongs to the Operations department, followed by Freight Forwarding and Documentation with 20.8% each, while 16.7% of respondents are from Customs Clearance and other departments, based on a total sample size of 120, showing a fairly balanced distribution across key functional areas.

Table No.2 DIGITAL TOOLS ARE CURRENTLY USED IN YOUR FREIGHT FORWARDING OPERATIONS

Digital Tools Used	Number of Respondents	Percentage (%)
Transportation Management System (TMS)	35	29.20%
Electronic Data Interchange (EDI)	30	25.00%
IoT / Tracking Systems	28	23.30%
Artificial Intelligence (AI) Tools	27	22.50%
Total	**120**	**100%**

Source: Primary data

Interpretation

The data indicates that 29.2% of respondents use Transportation Management Systems (TMS), followed by 25% using Electronic Data Interchange (EDI), 23.3% using IoT/Tracking Systems, and 22.5% using Artificial Intelligence (AI) tools, showing that while TMS is the most widely adopted tool, there is a relatively balanced use of various digital technologies in freight forwarding operations.

Table No.3 IMPLEMENTATION OF DIGITAL TOOLS REDUCED OPERATIONAL COSTS

Opinion	Number of Respondents	Percentage (%)
Strongly Agree	40	33.30%
Agree	35	29.20%
Neutral	25	20.80%
Disagree	20	16.70%
Total	**120**	**100%**

Source: Primary data

Interpretation

Respondents reveal that 33.3% strongly agree and 29.2% agree that the implementation of digital tools has reduced operational costs, while 20.8% remain neutral and 16.7% disagree, indicating that a majority of respondents perceive digital tools as effective in reducing operational costs, although a considerable portion expresses neutrality or disagreement.

Table No.4 IMPLEMENTATION OF DIGITAL TOOLS REDUCED OPERATIONAL COSTS

Opinion	Number of Respondents	Percentage (%)
Strongly Agree	38	31.70%
Agree	34	28.30%
Neutral	26	21.70%
Disagree	22	18.30%
Total	**120**	**100%**

Source: Primary data

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Interpretation

Respondents reveal that 31.7% strongly agree and 28.3% agree that employees face difficulty adapting to new digital technologies, while 21.7% remain neutral and 18.3% disagree, indicating that a majority of respondents perceive adaptation to new digital tools as a challenge, though a notable proportion expresses neutrality or does not experience significant difficulty.

CHI SQUARE ANALYSIS: RELATION BETWEEN DIGITAL TOOLS CURRENTLY USED IN THE FREIGHT FORWARDING OPERATIONS AND IMPLEMENTATION OF DIGITAL TOOLS REDUCED OPERATIONAL COSTS

Null hypothesis (Ho):

There is no significance difference between digital tools currently used the freight forwarding operations and implementation of digital tools reduced operational costs.

Alternative hypothesis (H1):

There is some significance difference between digital tools currently used in the freight forwarding operations an implementation of digital tools reduced operational costs.

Chi-Square Tests			
	Value	df	Asymp. Sig. (2-sided)
Pearson Chi-Square	135.434[a]	9	0
Likelihood Ratio	145.923	9	0
Linear-by-Linear Association	33.261	1	0
N of Valid Cases	120		
a. 8 cells (50.0%) have expected count less than 5. The minimum expected count is 2.13.			

INFERENCE

As per the above table, it is inferred that the P value is .000. it is significant to 5% (0.05) significant level. The minimum expected count is 2.13. Thus alternative hypothesis is accepted and it is found that there is some significant relationship between digital tools currently used in the freight forwarding operations and implementation of digital tools reduced operational costs.

ANOVA TEST: To Analyze The Impact Of Department Of The Respondents On Employees Face Difficulty Adapting To New Digital Technologies

NULL HYPOTHESIS (HO): There is no significant relationship between Department of the respondents and employees face difficulty adapting to new digital technologies.

ALTERNATIVE HYPOTHESIS (H1): There is a significant relationship between Department of the respondents and employees face difficulty adapting to new digital technologies.

ANOVA					
EMPLOYEES FACE DIFFICULTY ADAPTING TO NEW DIGITAL TECHNOLOGIES					
	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	1.482	3	.494	2.673	.051
Within Groups	21.443	116	.185		
Total	22.925	119			

The table clearly shows that Department of the respondents and employees face difficulty adapting to new digital technologies has a figure on 2.673 values and significance around .051 level than the sum of squares between groups and within groups values have 1.482 and 21.443 respectively. Hence, the significant value is greater than 0.05 for which the significant percentage is above 95%, hence null hypothesis accepted. Thus, rejecting alternative hypothesis i.e., There is no significant relationship between department of the respondents and employees face difficulty adapting to new digital technologies.

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IV. SUGGESTIONS

- There is a need to integrate the use of advanced technologies, such as AI and IoT, with existing systems such as TMS and EDI to facilitate greater visibility and coordination.
- The company must ensure that there is greater consistency in the use of digital technologies throughout the entire process, thus increasing efficiency.
- There must be equal availability and knowledge of digital technology use among all departments to allow smooth operations.
- The company should continuously monitor the use of digital tools and improve its effectiveness to ensure greater cost efficiency and reduced redundancy.
- The company should have adequate digital documentation and validation to avoid unnecessary errors and costs due to inefficiency.
- It would be necessary to streamline the workflow by means of automation, tracking, etc., to achieve greater efficiency and cost savings.
- The company should overcome implementation challenges by conducting effective trainings, adopting a phased approach, and having a proper integration strategy.
- The company can look for cost-effective digital solutions and investment strategies to make the process less costly and complicated.
- There will be regular training provided by the organization to facilitate greater adoption of digital technologies by employees.
- A user-friendly approach and sufficient support will facilitate greater comfort among employees using digital technology.
- The company can also improve training through hands-on practice sessions as well as regular upgrades so that employees can be adequately equipped with the ability to handle digital systems.
- The company can also keep upgrading its digital technology infrastructure to cater to operational needs and provide better user experience.
- The company can also work on streamlining its digital processes to improve shipment processing time further.
- The company can make better use of digital platforms to foster transparency and improved service delivery to customers.
- The company can also constantly update its digital strategies and embrace new technological developments.

V. CONCLUSION

It is concluded that the use of digital tools in the freight forwarding services offered by International Clearing and Shipping Agency (ICSA), Chennai, has resulted in significant changes to the process efficiency and accuracy in service provision. Introduction of technologies like Transportation Management Systems, Electronic Data Interchange, IoT and AI solutions helped the company make decisions faster, decreased reliance on manual labor and improved coordination between different departments. It also allowed for better management of processes which ultimately made it possible to achieve cost savings in terms of international logistics operations management.

It can be further concluded that, although digitalization has resulted in numerous advantages for the organization, the true effectiveness of this initiative will be largely defined by the organization's ability to tackle obstacles such as high investments required for this purpose, problems of integrating new technologies into existing systems, and low employee readiness to adapt to them. Ensuring sufficient technical skills, providing employees with consistent education opportunities, and developing positive attitude towards the introduction of technological innovations are all crucial factors in ensuring that the achieved results persist in the long run.

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