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TECHNOLOGY ADOPTION AS A COST REDUCTION MEASURE IN THE EXPORT–IMPORT INDUSTRY

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ABSTRACT
This study describes the Technology Adoption as a Cost Reduction Measure in the Export–Import Industry. Here the research identified the Technology Adoption variables are 'Our firm uses digital documentation systems for export–import transactions' (TA-1), 'Automation has significantly reduced manual processing in operations' (TA-2), 'Integrated information systems link procurement, logistics, and finance functions' (TA-3), 'Real-time tracking technologies improve shipment visibility and control' (TA-4), 'Technology adoption has reduced transaction processing time' (TA-5), 'Our firm invests regularly in upgrading logistics and trade technologies' (TA-6), and 'Overall, technology adoption has led to measurable cost savings' (TA-7). In the study to finds out through the Multiple Regression Analysis, which variables are most impacts to Cost Reduction Measure through Technology Adoption?
Keywords: Technology Adoption, Cost Reduction, Export–Import

INTRODUCTION

Technology adoption has become an essential cost reduction measure in the export– import industry, as firms increasingly rely on digital tools and automated systems to improve operational efficiency and reduce transaction-related expenses. In international trade, activities such as documentation, customs clearance, inventory management, shipment tracking, and communication with suppliers and customers often involve complex and time-consuming processes. The adoption of technologies such as digital documentation systems, electronic data interchange, automation software, and integrated logistics platforms helps firms minimize manual errors, reduce processing time, enhance data accuracy, and streamline trade operations.

REVIEW OF LITERATURE

Tilak.L, (2026) explore Technology adoption refers to the implementation and utilization of digital tools, automated systems, and advanced information technologies to support business operations. In the export–import industry, technology plays a vital role in streamlining processes, improving accuracy, and reducing administrative and operational costs. Automated documentation, electronic data interchange, and digital invoicing reduce manual effort and minimize errors. These improvements lead to faster processing times and lower labor costs.
The role of digitalization and technology adaption in cost reduction has also received growing attention. Technologies such as enterprise resource planning systems, electronic data interchange, and data analytics improve visibility across the supply chain and reduce documentation errors, delays, and compliance costs **(Hassan et al., 2024).** Although the initial investment in digital infrastructure can be substantial, researchers argue that long-term efficiency gains outweigh the costs, making digital transformation a key component of strategic cost reduction.
Nagasanjeevi. R (2024), his in-depth research explores developing technologies and their possible influence on cost-cutting initiatives, his study investigates how cutting-edge technologies like block chain, Internet of Things (IoT), artificial intelligence. This study gives businesses the ability to make well-informed decisions, optimize their operations, and gain a competitive edge in the constantly changing global marketplace by finding and assessing the most effective cost reduction solutions.
Ramasamy Indradevi,et.al (2024) explore the technologies like AI, automation, and IoT are transforming logistics and distribution management, driving efficiency, cost savings, and improved customer experiences. This empirical investigation investigates the role of these technologies in optimizing operations, enhancing decision-making, and building resilient supply chains. The study analyzes the impact of disruptive technologies on various aspects of logistics, including inventory management, route optimization, predictive maintenance, and last-mile delivery.

OBJECTIVE:
To measure the Technology Adoption as a Cost Reduction Measure in the Export– Import Industry.

RESEARCH DESIGN AND SAMPLE

In the present study descriptive research design were adopted. Descriptive research studies are those studies which are concerned with describing the characteristics and attitude of a particular individual, or a group. Here the study describing the Technology Adoption as a Cost Reduction Measure in the Export–Import Industry. Descriptive research is a widely accepted method in fact-finding, and the study includes adequate and accurate interpretation of results. The multiple stage random sampling technique is applied to this study to Technology Adoption as a Cost Reduction Measure in the Export–Import Industry. 420 sample data was collected from Export–Import Industries.

ANALYSIS AND INTERPRETATION

The study takes employed Multiple Regression Analysis of Cost Reduction Measure through Technology Adoption.

Table-1: Model Fit Summary

Model	R	R-Square	Adjusted R-Square	Std. Error of the Estimate
Technology Adoption	0.902[a]	0.814	0.811	0.25880

a. Predictors: (Constant), TA7, TA2, TA5, TA6, TA1, TA4, TA3

Model reveals that R- (Multiple Correlation Coefficients) value is 0.902. It is measuring the degree of relationship between the Technology Adoption in Export & Import Industry and the predicted values like, 'Our firm uses digital documentation systems for export–import transactions' (TA-1), 'Automation has significantly reduced manual processing in operations'
(TA-2), 'Integrated information systems link procurement, logistics, and finance functions' (TA-3), 'Real-time tracking technologies improve shipment visibility and control' (TA-4), 'Technology adoption has reduced transaction processing time' (TA-5), 'Our firm invests regularly in upgrading logistics and trade technologies' (TA-6), and 'Overall, technology adoption has led to measurable cost savings' (TA-7).
R-Square (Coefficient of Determination) value is 0.814. It is more than about 81% of the variation of Technology Adoption in Export & Import Industry is explained by the variation in the independent variables. Adjusted R-squared value is 0.811. It adjusts the statistic based on the number of independent variables in the model. That is the desired property of goodness- of- fit statistic.

Table-2: ANOVA[a]

Technology Adoption	Sum of Squares	df	Mean Square	F	Sig.
Regression	120.938	7	17.277	257.950	0.000[b]
Residual	27.595	412	0.067		
Total	148.533	419			

a. Dependent Variable: Technology Adoption
b. Predictors: (Constant) TA7, TA2, TA5, TA6, TA1, TA4, TA3

The F-ratio in the ANOVA table interprets the overall regression model, which is a normal fit for the data. The result of F (7,412) = 257.950 and 'p' value 0.000 is less than 0.05 ($p < 0.05$), the regression model is a good fit for the data; therefore, this model is a linear relationship between the dependent and independent variables.

Table-3: Relationship between a linear combination of Technology Adoption in Export & Import Industry

Technology Adoption	Unstandardized Coefficients		Standardized Coefficients	t	Sig. P-Value	95% Confidence Interval for B		Collinearity Statistics	
	B	Std. Error	Beta			Lower Bound	Upper Bound	Tolerance (>0.2)	VIF (<5)
(Constant)	-0.23	0.099		-2.309	0.021	-0.42	-0.03		
TA-1	0.173	0.013	0.297	13.181	0.000	0.147	0.199	0.888	1.126

TA-2	0.165	0.015	0.266	11.024	0.000	0.135	0.194	0.774	1.293
TA-3	0.128	0.013	0.226	9.557	0.000	0.102	0.155	0.803	1.245
TA-4	0.179	0.016	0.248	10.931	0.000	0.147	0.211	0.878	1.140
TA-5	0.154	0.013	0.265	11.550	0.000	0.128	0.181	0.860	1.163
TA-6	0.139	0.013	0.232	10.675	0.000	0.113	0.165	0.956	1.046
TA-7	0.124	0.011	0.255	11.654	0.000	0.103	0.145	0.943	1.061

Dependent Variable: Technology Adoption

The above table shows the independent variables of the Technology Adoption variables highly significant; the p-values are less than 0.01.
It can be seen that the values of VIF of all the predictor constructs are less than 5. The tolerance values the constructs are also more than 0.2. The VIF and Tolerance values are well within the stipulated limits as suggested in the extant literature. Hence, it can be inferred that there is no substantial level of multi collinearity among independent variable, which indicates that multi collinearity is not a problem in this model.
95% Confidence Interval for B's Lower Bound and Upper Bound, both values are positive or both values are negative; it is influence on Lower Bound and Upper Bound, here all variables Lower Bound and Upper Bound both values are positive, so it is significantly influence on Lower Bound and Upper Bound.

FINDINGS

The above table derives the equation of Technology Adoption variables like **Technology Adoption** = -0.23 (β0)+β1(0.173)+β2(0.165)+ β3(0.128) +β4(0.179) + β5 (0.154) + β6(0.139) + β7 (0.124)
The significant variables are comparing with Standardized Coefficients β-values; the resulted that the first influenced Technology Adoption variable is 'Our firm uses digital documentation systems for export–import transactions' (TA-1), the β-value is 0.297. The second influenced variable is 'Automation has significantly reduced manual processing in operations' (TA-2), the β-value is 0.266. The third influenced variable is, 'Technology adoption has reduced transaction processing time' (TA-5), the β-value is 0.265.

CONCLUSION

The study concludes most influenced Technology Adoption in Export & Import Industry is 'their firm uses digital documentation systems for export–import transactions' and 'Automation has significantly reduced manual processing in operations' then 'Technology adoption has reduced transaction processing time'.

SUGGESTIONS

Technology adoption shows a relatively highly impact, it remains a critical factor for long-term efficiency improvement. Export–import firms should invest in digital documentation systems, automation tools, and integrated information technologies to streamline operational processes. The use of electronic data interchange, automated documentation, and digital transaction platforms can reduce manual errors, shorten processing time, and improve coordination among supply chain partners.

IMPLICATION

As a result, technology adoption not only lowers administrative and operational costs but also supports faster decision-making, improved compliance, and better coordination across the supply chain, thereby contributing significantly to overall cost efficiency and competitive advantage in the export–import industry.

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