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RESEARCH ARTICLE

The influence of technology on business performance: The mediating role of information sharing

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Abstract

Objective: The study aims to examine the influence of Technology on Business performance in marine fishing export companies of Sindh. Regularly, the demand for fish has been increasing but limited populations of fish create problems for demand and supply. **Methodology**: Primary data has been collected with the help of the adopted questionnaire and the respondents of this study were both upper-level management and lower level of marine export companies, which are operating in Karachi, Pakistan. A total of 190 questionnaires were distributed but only 150 were filled by responded with a response rate of 79%. The gathered data was analyzed through various statistical techniques such as Factors Analysis, Confirmatory Factor Analysis, Reliability Analysis, and Structural Equation Modelling in SPSS and AMOS. **Findings**: The present study revealed that Information sharing partially mediated the relationship between Technology and Business Performance. Implications: Based on these results, it is recommended to the top management export companies to take notice of the latest technology and incorporate it into their future policies and practices for better result in marine export in the future from coastal areas of Sindh, Pakistan. **Novelty:** Firstly this study gives insight to Information sharing as a mediator between Technology and Business Performance, unlike previous studies which verified the direct relationship between Technology and Business Performance. Secondly, as far as our information no research has been conducted on marine export firms, which are operating in Karachi, Pakistan.

Keywords: Technology; business performance; information sharing; marine fishing

1 Introduction

Business performance has been influenced and output enhanced through the use of the latest Technology[(1)]. The competitive business environment and access to the global market demand the recent Technology for business operations. The role of technology on cost reduction and improved Business process efficiency cannot be

ignored. Technology cannot be underestimated in almost every industry throughout the world[2]. The fishing sector plays an important role in the economy of Pakistan; with a share in GDP of 0.4 percent and contributes great addition into export earnings as per the Economic survey of Pakistan (2017-18). It is the main source of food and income for the coastal areas of people. The bulk export comprises shrimp about 66 percent of the total export (Economic Survey of Pakistan 2017-18). The marine fishing sector of Pakistan accounts for about 80% out of total fish production. There are around one million fishermen engaged in coastal areas of Sindh[3]. In this context, many scholars have claimed that the performance of fishing export companies can be enhanced through solving the problems related to the supply chain network[4] .

Production from fisheries not only serves as the food security but also reduce the reliance on beef, mutton and poultry used at acceptable rate. Fisheries add significant value into national income via export earnings. From July to March, in 2019-20 the total fish production estimated at 701,726 in terms of metric tons and out of this total production 474,025 metric tons were from the marine waters and rest of the production from inland waters. During the year 2019-2020 (from July to March), a total 133,226 metric tons were exported to various countries such as Thailand, Malaysia, China, Sir Lanka, Middle East and Japan so on, with revenue of $ 317.307 million. The Pakistan government has taken steps for improving both production and export. The Deep Sea Fishing policy has been implemented in 2018 which has helped to improve the well-being of fisher men community in the coastal areas. In last year production has been increased by 2.7 percent in terms of quantity, however, in terms of value it is enhanced by 8 percent[5].

As the demand for fish increases worldwide with the emergence of new markets throughout the world, effective distribution process, and global trade has to be improved[6]. The main reason for insufficient fish production from coastal areas is due to a lack of the latest technology[7]. Pakistan can earn maximum foreign exchange from marine fish export if fish exporters are supported with resources and advanced technology[8] . This study attempts to verify the influence of Technology on Business Performance in the presence of Information Sharing as a mediator in concern with the business performance of export companies. Quality and volume have been a serious problem in marine export and in the year 2017-2018 many countries have banned Pakistan's fish due to inefficient technology. The following alternative hypothesis has been proposed in this study.

H_1 : There is a significant impact of Technology on Business Performance of marine export companies in Sindh, Pakistan.

H_2 : There is a significant impact of Technology on Information Sharing of marine export companies in Sindh, Pakistan.

H_3 : The Information Sharing Mediating relationship between Technology and Business Performance of marine export companies in Sindh, Pakistan.

2 Literature review and hypothesis development

2.1 Mediating role of information sharing

The information-sharing can be successful when supply network partners used to have effective and timely collaboration[9]. In the absence of information sharing and advancement in Technology, the Business operations unable to perform at the required level, and they may lose market share in the future[1]. It is a common practice of companies to take business-related decisions based on the newly available information[10]. For this reason, most companies almost in each industry invest in information technologies to help the management access information across the supply chain network[11] . The organizational theory also suggests that it should be a culture within organization and external partners that information sharing is considered as the best tool for correct decisions especially related to demand and supply. Concerning company, industry, and culture different level of information sharing has been understood. To understand the relationship between information sharing and business performance, there is a need to examine this hypothesis.

2.2 Technology and business performance

Many studies have been conducted on the relationship between technology-related problems and business performance[12]. In their studies, they have concluded that a negative relationship indicated and this negative relationship between two variables negatively impacts various areas such as profit share and market share of business performance. They stated that further research should be conducted on the food supply chain to compare the results, and strong suggestions would be given for better business performance in the future. In their research gap, they enforced that a competitors' analysis should be conducted to understand this relationship in a better manner. The businesses must be aware of the latest and advanced technologies that are being implemented in the studied industry[13] . Furthermore, they have suggested that advanced technologies help to improve the existing process and services for better business performance. Technology is a dynamic factor that varies for time so; these changes should be adopted for the survival of a business and better performance. The advanced and new technology has a direct impact on the ability of a firm for competition into the related industries[14]. Based on the above literature review following an

alternative hypothesis has been proposed in this study.

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H_2 : There is a significant impact of Technology on Information Sharing of marine export companies in Sindh, Pakistan.

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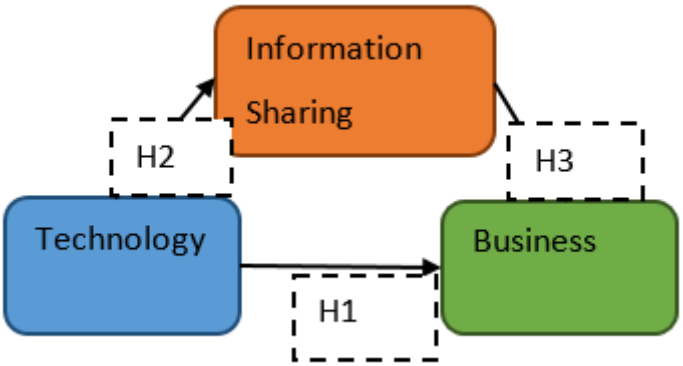

Fig 1. Conceptual Framework

3 Material and Methods

This research is based on Primary data collected from a well-structured adopted questionnaire[15]. A total of one hundred ninety questionnaires were dispersed using a Stratified sampling method. Stratified sampling was adopted because its considered unbiased and give chance to all participants to be part of the survey and sample to be suggested reliable in terms of results of this study[16]. During the data screening phase on unfilled (40) printed questionnaires were not considered for analysis due to missing values and outliers. The target population of this study was upper level and lower-level employees of fishing export companies because in regards to measuring Business Performance not only upper-level employees' perception is important but also lower level should not be ignored for better insights. Five Likert scale was used where 1 showed Strong disagreement and 5 showed Strong Agreement. Data were entered into the Statistical Package for Social Sciences (SPSS) and AMOS software for analysis. In this study, the export companies stratified random sampling is calculated based on known population formula[17] . According to Fishers Development Board, the total number of seafood export companies operates in Karachi is 93. The formula is given below as:

$$n = N/[1 + (N)(e)2$$
$$n = 93/[1 + (93)(0.05)2$$
$$n = 75$$

Whereas, n= sample size, N= Population, e= margin of error or level of significance

However, to get good results suggested data has been collected from 150 employees and they were divided into two groups such as upper level and lower level 75 from each group.

4 Result And Discussion

Descriptive Analysis

The respondent profile has been described in table IV-1. In regards to Exporting fishing experience, 1-5 years are 54 cases, 6-10 years includes 48% and above 11 years also comprised 48%. Export countries include 1-2 countries 54%, 3-4 consists of 48%, and above-5 countries comprised of also 48%. Company employees include 1-20 includes 54%, 21-50 comprised of 48% and above-50 employees were consists of 48%. The highest number of males (Managers) includes 78.7% and in terms of female-only 21.3%. Export Training (Yes), includes 86.7% and Export Training (No) 13.3% are summarized in respondent profile Table 1.

4.1 Reliability and Validity

The internal consistency of data is known as the reliability of data[16]. Table 2 , indicates the two values Cronbach's alpha value and composite reliability values, all the studies' variables validate (more than 0.70) then that data is reliable[16]. Convergent validity of how each item is different in comparison for measuring different constructs[16]. The standardized loading should be greater than 0.50 to confirm convergent validity[16]. Table 2, shows all average variance explained are higher values than 0.50, based on these values confirmed the convergent validity for this study[16].

4.2 Discriminate Validity- Heterotrait- Monotrait Ratio (HTMT)

The discriminate validity can be defined as "It is the degree in which items are differentiated than other constructs and it helps to measure the unique concepts. It also measures the relationship (correlation) between items or variables. Another recent approach is known as a Heterotrait-Monotrait Ratio (HTMT). The acceptable range for items correlation should be less than 0.85 and, another recommended this value should be less than 0.90.

, indicates that variables such as Business Performance, Technology, and Information Sharing item's values are lower than the suggested threshold of 0.85 and 0.90. It ranges from a minimum value of 0.43 (Constructs-Information sharing and Business Performance) and 0.80 maximum value (Constructs-Technology and Logistics and Business Performance). Based on these revealed results of HTMT test values, the data concluded discriminate the validity of this study.

4.3 Measurement Model (Model Fit)

ndicates the five important values such as CFA factor loading, chi-square degree of freedom, and comparative fix index, the goodness of fit index, and root mean square error of approximation. The CFA loading should be greater than 0.50 [RR], in this study its ranges from 0.841 to 0.552. Comparative fix index should be greater than 0.90[16], the table IV-5 revealed CFI ranges from 0.971 to 0.951. Similarly, the Goodness of fit also should be greater than 0.90. You can notice GFI ranges from 0.971 to 0.961. RMESA value should be less than 10. All study variables have RMESA less than suggested values 10[18], ranges from 0.090 (9) to 0.001 (0.1). Based above values data has revealed that the model is fit and structural equation modeling can be applied.

Table 1. Respondent profile

Construct	Category	Frequency	Percentage
Export Fishing Experience	1-5 Years	54	36.0%
	6-10 Years	48	32.0%
	Above-11 Years	48	32.0%
Total Number 150			
Export Countries	1-2 countries	54	36.0%
	3-4 countries	48	32.0%
	Above-5 countries	48	32.0%
Total Number 150			
Company Employees	1-20 Employees	54	36.0%
	21-50 Employees	48	32.0%
	Above-50 Employees	48	32.0%
Total Number 150			
Gender of Manager	Male	118	78.7%
	Female	32	21.3%
Total Number 150			
Export Training	Yes	130	86.7%
	No	20	13.3%
Total Number 150			

Table 2. Reliability and convergent validity

Factor	Item	Factor Loading	Cronbach's Alpha	Composite Reliability	Average Variance Extracted
Business Performance	BP1	0.69	0.77	0.86	0.60
	BP2	0.76			
	BP3	0.82			
	BP4	0.77			
	BP5	0.67			
Technology	TECH1	0.75	0.79	0.87	0.62
	TECH2	0.79			
	TECH3	0.85			
	TECH4	0.76			
Information Sharing	IS1	0.81	0.74	0.85	0.62
	IS2	0.85			
	IS3	0.78			

Table 3. Discriminate validity

Variables	BP	TECH	IS
Business Performance	0.1		
Technology	0.80	0.1	
Information Sharing	0.43	0.44	0.1

Table 4. Confirmatory factor analysis (Model Fit)

Factor	Item	CFA Factor Loading	$\lambda 2$/ df (Degree of Freedom)	CFI (Goodness of fit)	GFI (Goodness of fit)	RMESA (Badness of fit)
Business Performance	BP1	0.570	2.195	0.971	0.971	0.090
	BP2	0.652				
	BP3	0.806				
	BP4	0.724				
	BP5	0.552				
Technology	TECH1	0.615	4.503	0.961	0.969	0.062
	TECH2	0.670				
	TECH3	0.841				
	TECH4	0.687				
Information Sharing	IS1	0.691	1.671	0.951	0.961	0.001
	IS2	0.791				
	IS3	0.629				

4.4 Hypothesis testing (Mediation-Structural equation modelling)

H_1 : There is a significant impact of Technology on Business Performance of marine export companies in Sindh, Pakistan.

H_2 : There is a significant impact of Technology on Information Sharing of marine export companies in Sindh, Pakistan.

H_3 : The Information Sharing Mediating relationship between Technology and Business Performance of marine export companies in Sindh, Pakistan.

$$\mathrm{BP} = \mathrm{Constant} + \beta 11\,(\mathrm{TECH}) + \text{ error term } 1 \tag{1a}$$

$$\mathrm{IS} = \mathrm{Constant} + \beta 21\,(\mathrm{TECH}) + \text{ error term } 2 \tag{1b}$$

$$BP = \text{Constant} + \beta 31\,(\text{TECH}) + \beta 32\,(\text{IS}) + \text{ error term 3} \quad (1c)$$

Whereas, BP= Business Performance, TECH= Technology and, IS= Information Sharing

The bootstrapping for the indirect path in structural equation modeling (SEM), illustrated by (Table 5), and the author of this study found this path significant (β=0.043, p-value=0.017). Fourth, the condition has been found (equation 3) significant relationship between the independent variable and dependent variable (TECH to BP) and coefficient magnitude changes in the presence of mediators. Equation 3 revealed the results that in the presence of mediators (Information Sharing) in the model, the value of beta was reduced from 0.634 to 0.591. Furthermore, the significant relationship between Technology and Business Performance in equation 1 (p-value=.000), indicated a significant relationship in the presence of information sharing as a mediator (p-value=.002). The findings from equation 1 to equation 3 suggested that it's a partial mediation [19].

Table 5. SEM regression results for mediation model (Technology)

Predicator	Equation 1a (Dependent variable) Business Performance		Equation 1b (Dependent variable) Information Sharing		Equation 1c (Dependent variable) Business Performance	
	Direct Effect					
	β	p-value	β	p-value	β	p-value
TECH	0.634	0.000	0.345	0.010	0.591	0.002
IS	—-	—-	—-	—-	0.125	0.006
Indirect Effect						
	Indirect Path				β	p-value
	TECH>IS->BP				0.043	0.017

4.5 Discussion on Results

The results of this study revealed from our primary data that Information sharing is playing a mediating role between Technology and Business Performance in the context of marine export companies of Sindh, Pakistan. Findings confirmed that partial mediation has been suggested in this study. Similarly, results confirmed by the research revealed that the main reason for insufficient fish production from coastal areas is due to a lack of the latest technology [6]. Furthermore, this study suggested that only the survival of the fishery industry of Pakistan is connectivity of people via the latest technology, and Pakistan fishery is supported by both coastal and marine areas, which are rich in resources in terms of various kinds of fishes. Similarly, another study confirmed that current technology has a significant impact on catch fish [7]. Besides, in this study authors enforced that Pakistan's coastal communities should be developed for better export level and development of Pakistan's fishery industry. A similar study was conducted in China [20] that in the absence of information sharing in an industry leads to create a problematic situation and had a worse effect on their business performance. Many studies such as [21,22], emphasized for the global businesses, the Technology and Information sharing could not be underestimated. The big city likewise Karachi is considered as the emerging markets whereas, the number of multinational companies gets attracted to the future investment in Technology to get improved Business performance in terms of marine fishing export level.

5 Concluding remarks and practical implications

We studied the role of Information Sharing as a mediator between the Technology and Business Performance of marine fishing export companies in Sindh, Pakistan. In the present study the factor Technology was taken from Supply chain integration is studied to measure the marine export companies' performance. This study gives insight to Information sharing as a mediator between Technology and Business Performance, whereas, in previous studies research scholars verified the direct relationship between Technology and Business Performance. This research was conducted on marine export firms, which are operating in Karachi, Pakistan. The findings of this study suggested that information sharing playing its role as a mediator between Technology and Business performance. Many firms out of 75 export companies are operating in Sindh, Pakistan and they do not have the proper latest technology; they lack real-time information sharing for funds, product, and information flow. Moreover, the fish catch from coastal areas has been declined due to lack of advanced technology as confirmed from various studies conducted by research scholars and they are mentioned in this study. This study has both practical implications and theoretical contributions to the existing literature review. Top-most management employees of marine export companies and

policymakers should consider these findings for developing, designing, and implementing the policies related to these factors for better results in terms of more export level in the future. For, academia, the researchers can develop new objectives and hypotheses regarding Business performance, Technology, and Information sharing. This framework also be extended to other industries and respondents too to confirm the existing findings of this study and develop new literature and discussion forum for the future. The qualitative method through a formal interview can be adopted in order to explore the hidden problem of marine export companies in context of Sindh, Pakistan. This study was based on closed-ended questions only.

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