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Exploring the Intervening Role of Top Management Support in the Successful Implementation of ERP: An Empirical Evidence from the Manufacturing Industry of Pakistan

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ABSTRACT

The successful implementation of the Enterprise Resource Planning (ERP from now) system is a matter of key concern for professionals in Pakistan. The study investigates the impact of three critical factors on the successful implementation of ERP in organizations. A theoretical framework is established with some hypotheses following Structural Equation Modelling (SEM) to analyze the gathered data utilizing Smart-PLS (SEM) software. Data collection was done through a survey applying 5 points Likert scale structured questionnaire. The questionnaires were distributed to a group of 142 managerial level employees in 18 public & private limited companies in Pakistan. The findings exhibit that both communication and team composition significantly influence the successful implementation of ERP systems. Likewise, the moderating role of top management support is also found inevitable as it has a strong positive impact on the relationship of both indicators. The outcomes may support ERP professionals and decision-makers in Pakistan for successful ERP execution in the future.

Introduction

In the course of the recent couple of years, ERP frameworks have turned into a key IT remedy for all kinds of organizations and enterprises. ERP is a business application that incorporates every one of the related utilitarian regions, business cycles, and information inside an association. ERP permits various offices with assorted requirements to speak with one another by having similar data in an individual server. ERP hence expands collaboration and communication between all business units in a corporation (Harrison, 2004).

Notwithstanding the many advantages the ERP frameworks give if appropriately executed, there are likewise numerous shortcomings, particularly in the execution cycle itself; for this reason, effective execution and utilization of the ERP are especially significant (Aremu, Shahzad, & Hassan, 2021). Dezdar (2017) portrayed that undertakings of ERP execution are known for their intricacy; they as a rule have a long execution cycle and are thus exposed to high gambling. In view of this large

number of reasons, the progress of an ERP execution project is unusual to suppose and inescapable to completely look at.

For this purpose, researchers in the past have introduced different factors and observed their interconnections, studied the causes, consequences, and proposed actions on ERP implementation. Communication is one of the factors that can make or break a project. Effective communication between customers, vendors, and the project team is the key to success today (Al-Hadi & Al-Shaibany, 2017). In the same manner, due to effortless data exchange between similar or uni-system usage departments, communication allows organizations to maximize the productivity of ERP programs. Some other researchers (Johnson & Babu, 2020) found that deficiency in communication can unfavorably affect the ERP Project. Similarly, if we talk about other factors behind the success of ERP, the selection, composition, and collaboration of the team cannot be ignored. Elsbach and Stigliani (2018) accepted that structure of an undertaking group is boundlessly fundamental since acting without productive coordination there may be an unpredicted and undesirable impact on the results which might not appeal to the partners. Similarly, when the project members are presented with issues, they frequently meet up and track down ways of handling issues (Ali & Miller, 2017).

The last phenomenal factor which is essential to understand for effective execution of ERP is the role of Top Management support. Ahmed, Mohamad, and Ahmad (2016) feature that the pattern of top administration support suggests that it is materialistic, monetary, scholarly, documentation, HR, and different resources are given to a group to project's fruitful conclusion prompting its conveyance. The contribution and commitment of senior-level administration in ERP task exercises of the association are considered top administration support. Actually, the absence of top administration support is viewed as one of the most often detailed boundaries project achievements (Ali & Kidd, 2014). According to Linda (2021), top management support is recognized as perhaps the most dominant factor for improving the performance of other considerable factors like inspiration, team selection, networking, and overall collaboration. Support of Top Management has been observed as a direct variable influencing ERP execution in the previous investigations. However, for the provision of clarification to the entitled ERP managers, a cross-dimensional paradigm of ERP implementation was to be diagnosed with the support of top management as moderating factors to fill the gap, while keeping communication and team composition as independent variables.

Literature Review

Communication and Team Composition

Sustainable support by involving professional experts is critical to operating and implementing a fruitful ERP framework. Without a competent group, the importance of the ERP would be unclear (AboAbdo, Aldhoiena, & Al-Amrib, 2019). The equipped team can uphold existing ERP frameworks to support and foster ERP frameworks according to necessity and give adequate preparation to line clients. From both writing and pilot concentrate on encounters, numerous small and medium organizations have neglected to proceed with ERP frameworks after their execution because of the absence of team coordination (Ha & Ahn, 2014).

The organization involves different utilitarian regions. It is very challenging to upgrade organizational execution without constant department data sharing. Despite the fact that correspondence is one of the basic issues inside the useful regions, compelling correspondence can make ERP execution more effective (Shafi et al., 2019), simultaneously unfortunate correspondence can be considered one of the disappointing factors in ERP post-implementation (Aremu, Shahzad, & Hassan, 2021). A few units of the organization need compelling correspondence including data sharing, information access, examination, synchronizing as well as announcing for ceaseless framework improvement of ERP frameworks. This helps ERP frameworks effective independent direction. Fauzi (2021) also noticed that ERP programs are intended to incorporate different business capacities and different organizational departments, so it is reasonable that communication and collaboration efforts across the project team and individuals from various departments are at the core of the execution process. These two elements do not just go in hand (Shukla, Mishra, Jain, & Yadav, 2016) but also appear to build up one another. As one goes up and the nature of joint effort expands, the other will increment subsequently also. Individuals that cooperate all the more frequently impart more regularly. The other way around, better correspondence will prompt better cooperation. The following Hypotheses can be derived from the discussion;

H1: Communication has a significant impact on ERP Successful implementation.

H2: Team Composition has a significant impact on ERP Successful implementation.

Support of Top Management

Generally speaking, top management only participates in the last phases of the project as opposed to involving in themselves during the whole project implementation (Zhao, Srite, Kim, Lee, 2021) yet for effective ERP frameworks, top management backing ought to be devoted seamlessly (Khalid & Janjua, 2021).

Simultaneously, top management support ought to give a broad preparation program to clients with direct oversight. This would be a viable method for moving the administrative information to end clients all through the ERP preparation (Ahmed et al. 2016). Top management is additionally liable for drawing consideration offering help to develop the relationship among and between to improve department correspondences. In such a manner, the end client will have an unmistakable comprehension of business exactness and can make a reasonable answer for the business (Iqbal, Long, Fei, & Bukhari, 2015). Considering the continuously evolving climate, it is very challenging to deal with workers' associations and further develop the business process without support from top management.

In a wider spectrum, the impact of organizational factors like communication, motivation, team composition, and culture on ERP implementation is highly influenced today by the involvement and support of the higher-ups i.e., top management (Ali & Miller, 2017). On the flip side, if the top management decides not to entertain the above-said components, then there is a greater probability that the project can move to disruption or even crash. The following hypotheses can be generated from the above discussion;

H3: Top Management support moderates the relationship between Communication and ERP Successful implementation.

H4: Top Management support moderates the relationship between Team Composition and ERP Successful implementation.

Theoretical Framework

The model in Figure 1 illustrates that Communication and Team composition have a favorable impact on the successful implementation of ERP. Likewise, Top management support being a moderator variable, strengthens the relationship of the aforesaid indicators with the successful implementation of ERP. It is imperative to note that the selected variables were found to be the most appropriate for this model, under the explicit context. Most of the previous studies (Ali & Miller, 2017; Asif et al., 2022; Mughal, Bahaudin & Salleh, 2019) suggested that these variables i.e. communication, team composition, and support of top management are considered as most influential factors for the successful implementation of ERP in any organization.

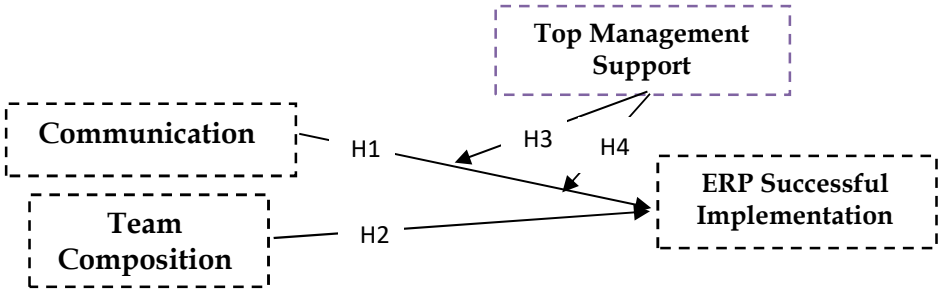

Figure 1: Model of the study

Material and Methods

The intent of this study was to conduct a survey; hence, a quantitative research paradigm was adopted under the positivism research approach (Gulati, 2009). This investigation is a cross-sectional study and was completed in a time frame of 9-10 weeks. The survey was conducted in the federal capital Islamabad along with major cities of all four provinces of Pakistan. Instrument adapted for data collection Likert scale structured questionnaire (1=strongly agree, 5=strongly disagree). The questionnaire is the most accepted and widely used technique for data collection in quantitative studies (Ticehurst & Veal, 2000). E-mail, Google forms, and social networking sites like WhatsApp and LinkedIn were used for online data collection from managerial employees of national and multinational companies in Pakistan. Most of the respondents were middle-level managers involved in dealing with and implementing ERP projects. The threat of Covid-19 was the most compelling factor to conduct a survey online.

The nonprobability technique of snowball sampling was carried out in order to reach the relevant audience. Respondents were requested to suggest other managers working with ERP systems in order to gather opinions from relevant professionals only. Snowball sampling is the most suitable approach for data collection when considering professionals as respondents. Professionals can refer to the relevant personnel they found appropriate for the survey (Saunders, Lewis, &

Thornhill, 2012). A sample size of 150 was opted as per the suggestion of Kline (2014). Out of 150 questionnaires, 142 were acknowledged. The data was collected over a span of two weeks approximately.

Results and Discussion

In this investigation, the Partial Least Square (SEM) has been utilized in order to examine the collected data, following the recommendations of Hair et al. (2017). The Smart-PLS is the most suitable tool for analyzing quantitative data. Ali, Muhammad, Rasheed, & Lodhi (2020) as well as Wong (2013) have implemented and suggested it for future examinations.

Measurement Model

A total of 4 indicators were analyzed to derive if they are valid in terms of the Discriminant and Convergent validity, Cronbach's Alpha, and Composite Reliability. Only 20 items were retained out of 29. The remaining 9 items were dropped due to a lesser factor loading value than 0.7 yardstick (Hair et al., 2017). All 20 items from four constructs found a loading value of more than a 0.7 threshold. Average Variance Extracted (AVE) values were also found more than the standard of 0.5 (Hair & Hult, 2016) as demonstrated in ithe n following table.

Table 1
Convergent Validity

Variables	Items	Factor loadings	AVE
Communication	Q2	0.794	0.599
	Q3	0.730	
	Q6	0.733	
	Q7	0.789	
	Q8	0.771	
Team Composition	Q10	0.802	0.551
	Q11	0.714	
	Q12	0.701	
	Q13	0.822	
	Q15	0.830	
	Q16	0.728	
Top Management Support	Q17	0.801	0.502
	Q19	0.780	
	Q20	0.855	
	Q21	0.791	
ERP Successful	Q22	0.810	0.632
Implementation	Q23	0.728	
	Q25	0.722	
	Q26	0.811	
	Q29	0.741	

All the indicators proved average shared value (ASV) less than their average variance extracted (AVE), illustrating that all the constructs are discriminant from one another and validity exists (Hair et al. 2013). Look at the table provided.

Table 2
Discriminant Validity

Variables	ASV	Communication	Team Composition	Top Management Support	ERP Successful Implementation
Communication	0.093	1			
Team Composition	0.109	0.378*	1		
Top Management Support	0.122	0.356**	0.399*	1	
ERP Successful Implementation	0.131	0.344*	0.211*	0.221**	1

Note: *Significant values at p-level < 0.05
**Significant values at p-level < 0.01

Similarly, the following table demonstrates the reliability of constructs. Values of more than 0.7 yardsticks (Tavakol & Dennick, 2011) proves the reliability of all four constructs using Cronbach's Alpha and Composite Reliability method.

Table 3
Construct Reliability

Construct	Cronbach's Alpha	Composite Reliability
Communication	0.874	0.719
Team Composition	0.760	0.813
Top Management Support	0.832	0.702
ERP Successful Implementation	0.778	0.766

Model Fit

The following table represents indices for model fitness. RMSEA should be less than 0.10, the degree of freedom must be between 2 and 5, and all other index indicators should meet the benchmark of more than the minimum value of 0.7 (Henseler et al., 2013; Lohmoller, 2013). Similarly, R Square is also portraying plausible model fitness with the value of 0.839, elaborating that the dependent variable Successful ERP implementation can be controlled 83.9 percent with the independent and moderator indicators of the framework. However, for the remaining 16.1 percent, other unseen factors are responsible. Results are authenticating the model fitness in all the aspects as per researchers suggested.

Table 4
Model Fitness

RMSEA	DF	CFI	NFI	RFI	IFI	R Square
0.081	4.03	7.42	8.11	8.02	9.64	0.839 (DV)

Path Model

Moderation analysis and hypothesis testing have been done in this section of the examination. In order to know the relationship between latent variables and the

moderation effect, testing was manifested through Smart PLS software. All three models illustrate the impact of Communication and Team Composition (independent variables) on Successful ERP implementation (dependent variable) and the moderating effect of Top Management support on the relationship of latent variables.

The main effect (model 1) depicts the effect of Communication and Team Composition on Successful ERP implementation which is 0.643 and 0.721 respectively. The impact of above mentioned independent variables was found positive and significant. In the next stage (model 2), moderating variable was introduced for further analysis. The direct impact of moderating variable was tested on the dependent variable in this model. Findings portray the positive impact of Top Management support on the Successful implementation of ERP with a value of 0.643 significant at $p<0.05$.

Table 5
Moderation Analyses and Beta Values

Relationship	Main effect (Model 1)	Moderator direct effect (Model 2)	Moderating effect (Model 3)
		Beta Values	
Communication → ERP Successful implementation	**0.643***	0.610*	0.589*
Team Composition → ERP Successful implementation	**0.721****	0.677**	0.623*
Top Management support→ ERP Successful implementation (Moderator → Dependent)	**--**	**0.643***	0.604*
Communication × Top Management support→ ERP Successful implementation	**--**	**--**	**0.438***
Team Composition × Top Management support→ ERP Successful implementation	**--**	**--**	**0.494****

Note: *Significant values at p-level < 0.05
**Significant values at p-level < 0.01

Moderating effect (Model 3) deals with provided pairs of indicators (communication **×** top management support & team composition **×** top management support). Findings are as per expectations. For moderating effect between Communication and ERP Successful implementation, the coefficient was positive and significant ($b = 0.438$, $p < 0.05$). In the same manner, the moderating impact of Top Management support on the relationship between Team Composition and ERP Successful implementation was also positive and significant ($b = 0.494$, $p < 0.01$). The support of Top Management strengthens the relationship of both independent variables on ERP Successful implementation.

H1 and H2 proposed that both independent variables enhance the success of ERP project implementation. The huge intensity of strong communication and better team composition leads to greater success in ERP implementation. Likewise, H3 and H4 were also accepted in the light of the results, exhibiting that support of Top Management definitely enhances the impact of independent variables on the

Successful implementation of ERP. Thus, the results support all the hypotheses proposed. These outcomes can be corroborated by the findings of Smart-PLS summarized in Table 5.

Discussion

This research study was done in Pakistan to explore the effect of multiple factors i.e. communication and team composition on the successful implementation of ERP with the moderating effect of top management support. The examination was conducted in national and multinational enterprises of Pakistan, under the paradigm of quantitative research. All the responders that were contacted for this study were managers and professionals involved in ERP project dealing and implementation. For this study, 150 respondents were contacted via snowball sampling, out of which, a total of 142 responses were acknowledged for analysis of data. The results were generated via in-depth analysis in the Smart PLS-SEM software package.

Findings depicted that both factors are responsible for the successful implementation of ERP in Pakistan. Similarly, top management support is found to facilitate doing so (Febrianto & Soediantono, 2022). In addition, the outcomes appear to strengthen the results of the past studies conducted. For example, some of the research experts in this area (Asif et al., 2022; Kenge & Khan, 2020; Malik & Khan, 2021) have also elaborated that communication and team composition have a direct positive impact on the successful application of ERP and the support of top management play a key role in this context by strengthening the relationship of the above-mentioned factors. It can be rightfully interpreted that the findings of this study were substantial enough to prove the four hypotheses.

Based on the findings, the public and private sectors in Pakistan should seek to further improve their ERP factors for the fruitful ERP implementation with greater chances of success, which was given in this paper. Also, this paper can likewise assist chief decision-makers with understanding the idea of the knowledge transfer and dynamics of certain factors in ERP successful implementation to cope and sustain respectively with national challenges and rapidly changing global scenarios.

This study has a few limitations as well, giving potential pathways to future examination. With respect to the fundamental limitation in this review, first, we ought to see that the current exploration was completed in a limited number of the organizations in Pakistan; and thus, provides a limited empirical application. Furthermore, this study investigated a few factors proposed in earlier writing, which just address all aspects influencing ERP implementation Success inside the setting of Pakistan. In like manner, professionals and experts of ERP ought to consider factors other than those referenced in our exploration. That's why, precautions should be practiced in generalizing these outcomes, and further examination is additionally expected to keep away from limitations.

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