

The Role Of Enterprise Resource Planning System's Assimilation Between Top Level Management Support And Organizational Performance: Evidence From Manufacturing Sector Of Lahore

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Abstract

Enterprise Resource Planning (ERP) systems have become increasingly popular in organizations as a means to improve efficiency and effectiveness. This study is an extension of the enterprise resource planning (ERP) assimilation research from individual to organizational levels, that it is individual users that convert the potential of ERP systems into organizational performance. Moreover, the success of ERP implementation largely depends on the support of top management. This study aims to examine the relationship between top management support and organizational performance through ERP assimilation in the manufacturing sector of Lahore. We develop and test a theoretical model to examine how enterprise systems are assimilated into organizations once they have been implemented. Using a survey questionnaire, data was collected from 300 manufacturing firms in Lahore. The results indicate a positive relationship between top management support and organizational performance mediated through ERP assimilation, user satisfaction and individual performance. The findings highlight the importance of top management support in the successful implementation and assimilation of ERP systems and its positive impact on organizational performance. This study provides insights regarding the significance of individual level assimilation within an organization in the post-implementation phase and provide managerial insights on how firms could enhance ERP assimilation at the individual level that could affect the organizational level assimilation.

Keywords: ERP assimilation, top management support, user satisfaction, organizational performance, individual performance.

Introduction

Organizations are increasingly relying on integrated enterprise systems, such enterprise resource planning (ERP) systems, to support corporate operations and competitive strategies in this era of fierce competition and globalization. Over the past thirty years, ERP systems' popularity has increased significantly (Roberts et al., 2023).

However, businesses frequently do not fully utilize and explore the potential of ERP systems to meet business goals after the systems are committed to everyday operations because of their size and complexity (Bajwa et al. 2004; Dezdar & Sulaiman 2009). The existing research indicates that few businesses have fully reaped the benefits of their ERP systems (Kalogiannidis et al., 2023). However, dramatic ERP failures are common (Chatterjee et al. 2002), and Pakistan

has a particularly high failure rate for ERP projects especially in manufacturing sector (Jamil & Qayyum, 2015; Yasir et al., 2021).

Top management support has been cited as one of the most crucial success factors in studies on the drivers of ERP systems over the last few decades (Zhang et al., 2023; Liang et al., 2007). According to Shao et al. (2017), top management must show that it is there for them in order to inspire and motivate other managers and workers, settle conflicts and rebalance power, and reward positive conduct, particularly during the absorption period.

Few studies, however, have examined at the link between the success of ERP and the support of top management. Research regarding the impact of top management support and ERP success began to emerge now (Deelert et al., 2022). However, the majority of these studies concentrated on the adoption and implementation of ERP, and only a limited number of studies examined the important role that top management during the ERP assimilation period (Kouki, et al., 2008; Luminita & Ana-Maria, 2013; Lin 2010). Existing research frequently lacks details regarding how, where, and why "top management support" contributes to ERP performance over the course of its lifecycle (Jayeola et al., 2022).

Scholars in the fields of strategic management and marketing have thoroughly examined the extremely dynamic environment in which firms now operate and found that time-to-market, globalization, and competitive challenges necessitate organizational agility (Sambamurthy et al., 2003). According to cross-disciplinary study (Kharabe & Lyytinen, 2012), information systems in general may assist agility at the organizational level. However, a review of the literature reveals that there is a specific knowledge gap regarding how large-scale, highly integrated, transformative, and complex innovations like enterprise systems affect organizational agility. Along the aspects of

organizational performance, little is known about the assimilation of enterprise systems and organizational agility. Businesses must comprehend how enterprise systems integration affects agility given the high cost of ERP systems and the significant risk of failure. Since it is difficult for businesses to perform better in the current dynamic business climate (Syamil et al., 2022).

According to Esteves & Bohórquez (2007) assimilation of technology has the most explanatory power and can accurately and comprehensively characterize user satisfaction. In order to fully understand the essential needs and genuine demands of the organisation, it is therefore essential to install and integrate an ERP system (Venugopal, Devi, and Rao, 2010, Shaul and Tauber, 2013, Nwankpa & Roumani, 2014). The introduction and deployment of new technologies in business processes would be superficial and have a negative impact on performance without the involvement and interest of users. Therefore, assimilation at the human level has a direct impact on assimilation at the organizational level.

Assimilation of ERP happens concurrently at the organizational and individual levels, not only at one level (Al-Okaily et al., 2021). Assimilation studies, however, frequently concentrate on assimilation at the organizational level. Individual users, on the other hand, are crucial to the integration of ERP into companies. Any technology that is deployed and becomes a part of daily life or is "institutionalized" is controlled by individual users.

To our knowledge, no study have created a comprehensive model to examine, how these constructs relate to one another, particularly in the context of ERP assimilation. Because of this, there is a big gap in the literature when it comes to the combined impact of top management support, ERP assimilation organisational agility, and user happiness on individual and

organisational performance. We suggest that in order to better understand how these variables interact and have an overall impact on organisational performance, it is crucial to employ a theory-driven approach to incorporate them into a single complete model. This knowledge will offer more practical guidance for managing ERP and other significant enterprise systems.

Manufacturing sector of Pakistan and ERP assimilation

Pakistan, with a population of around 201 million people, is the world's sixth most populous country with a GDP of around USD 5.4 billion (Statista, 2022). Pakistan's manufacturing industry, on the other hand, is a major contributor to growth and is critical to the country's economic progress. Pakistan's manufacturing sector accounts for 13% of the country's gross domestic product (Government of Pakistan Ministry of Finance, 2022). Pakistan's manufacturing industry has long been a stronghold of the country's economy. ERP has also aided the economic development of Pakistan. ERP has ushered in a new era in the organization's cognitive process, rules, and procedures. ERP systems have made a significant contribution to the growth, well-being, and vitality of many businesses, and stand out due to their scope and use. Most ERP companies now target small and mid-sized businesses when it comes to implementation. Pakistani businesses are rapidly adopting the enterprise system. However, spectacular ERP failures are frequent, and especially in manufacturing sector of Pakistan the failure rate of ERP projects is high (khan & Malik, 2020). The manufacturing sector of Pakistan is the third largest sector and this sector is relying a lot on ERP to deliver their

Literature Review

ERP assimilation

The literature on IT assimilation served as the foundation for the definition of ERP assimilation.

services effectively to other sectors and businesses (Rehman et al., 2020). Most of the manufacturing firms in Pakistan are becoming more customer-centric and responsive in today's market; otherwise, business intelligence information systems like ERP would fail to deliver the promised results.

Purpose and significance of this study

This study is significant in many ways. First, this study is theoretically significant as it will conceptualize ERP assimilation by integrating a combination of variables which is not being explored earlier. Assimilation is a multifaceted concept, and concentrating on just one perspective only provide partial knowledge of the phenomenon. As a result, there is a need to examine and conceptualize ERP assimilation on a variety of levels, particularly in Pakistan where the post-implementation phase of ERP assimilation is being disregarded. Second, this study will fill the contextual gap as there are limited studies regarding ERP assimilation in the context of developing countries. Other countries can gain a lot of insight from Pakistan's experience as a developing nation. Third, this study will be significant for identifying the mediating role of ERP assimilation towards organizational performance through organizational agility, user satisfaction and individual performance. Fourthly, this study would guide industrialists in manufacturing sector regarding the importance of ERP assimilation for long term success. Finally, the results of this study would be generalizable to the developing countries having the same economic and geographical background.

The idea of ERP absorption is the degree to which the use of ERP technology permeates organizational projects or work processes and becomes routine in those projects' operations (Purvis et al., 2001). In contrast to research on

ERP adoption and deployment, ERP assimilation research is still in its infancy (Liang et al., 2007; Chen & wang, 2015). In earlier studies, ERP success was evaluated in terms of its first deployment, including the cost, time, early performance, and other characteristics, primarily from the standpoint of project management. The ERP lifecycle's succeeding phases after deployment are not well understood, and they have not gotten enough attention (Shao et al., 2017). The economic benefits of the system's applications cannot be completely realized until the applications have been deeply integrated in an organization, which is a long-term and continual improvement process (Xu et al., 2017). The organizational-level ERP assimilation was described by Liu et al. (2010) as "the extent to which the ERP technology is used in facilitating business processes and the degree to which it supports business decision making at operational and strategic levels" (p.188). To create the theoretical model and use ERP assimilation in our investigation, we used this definition.

Top management support

The authority, guidance, and resources offered by the top managers before, during, and after the adoption of any IT systems, including ERP systems, are referred to as top management support (Hsu et al., 2019). It is often believed that when senior managers openly promote an IT system, other organizational members view these actions favorably and adjust the system in a similar manner. Top management support is thought to be crucial for the success of a deployment (Somers & Nelson, 2004). According to a traditional perspective, the implementation of ERP initiatives "totally depends on the top management's commitment" (Bingi et al, 1999).

ERP systems are complex and can significantly impact the operations and processes of an organization. Hence, the support of top management is necessary to create a positive environment and ensure the success of the

implementation process. Top management support can take various forms such as providing financial resources, dedicating time and effort, promoting the change, and making key decisions (Stylos et al., 2021). The support from top management can help communicate the importance of the ERP system to employees and mitigate resistance to change. Additionally, it can ensure that the ERP system aligns with the organization's goals and objectives and is effectively integrated into the organization's operations (Frau, 2022).

when senior management shows a high level of support and dedication, it is reasonable to expect the system's success to be high as well (e.g., Davenport, 1998; 2000). Indeed, Liang et al. (2007) discovered that senior management involvement and participation is favourably related to ERP use and is occasionally associated with ERP success (Tam & Oliveira, 2017). Top management support, according to Deelert, Jaturat, and Kuntonbutr (2022), is a crucial mechanism for driving ERP assimilation and leading to effective performance.

Organizational agility

Organizational agility has been researched during the past 20 years in a variety of fields, including strategic management, operations, marketing, and information technology. Because of this diversity in organizational agility definitions, there is a lack of theoretical coherence (Schnackenberg et al. 2011). Organizational agility is distinguished from other organizational attributes in the present debate by three main factors: First, organizational agility acknowledges the rate of organizational change as demonstrated by the notion of decision-making speed in "high-velocity" situations (Judge & Miller 1991).

In this study, we shall refer to Tallon & Pinsonneault's (2011) definition of organizational agility as follows "(Organizational) agility (is) described as the capacity to quickly, skillfully,

and easily identify opportunities and risks in the environment."

It is not enough to only think about how having or not having enterprise systems affects organizational agility in order to describe the influence of enterprise systems on organizational agility. The technology must be utilized in order to have any impact on organizational behaviors that qualify as agile. Incorporating the intricate interactions between the three properties of enterprise systems as a class of information systems—deep and large-scale process integration, real-time data integration, and "best practices" process design—would not be possible by only observing the system's existence (Nazir et al., 2022). Only after extensive usage of the technologies do these impacts become relevant to an organization's ability to be agile, i.e., increasing speed, flexibility, sense, and response (Syamil et al., 2022).

User satisfaction

ERP user satisfaction is regarded to be more beneficial after adoption compared to other IT endeavors (Wagner and Newell, 2007). Organizations need to develop their user-satisfaction skills if they hope to succeed in integrating ERP in the long run. User satisfaction is the perception that results from using an information system. Employee willingness to absorb information from throughout the system increases user satisfaction with ERP systems. It is also considered to be a prerequisite for the recurring use of data (Wu and Wang, 2007).

The degree of system adoption and user satisfaction is a crucial indicator of implementation success. Businesses will be able to better integrate the ERP system, and users will be able to use it to boost performance (Liu et al., 2011). When users are happy with the system, they have more control over the routine tasks they perform at work (Wagner and Newell, 2007). Users get feelings of ownership when they

incorporate the system. The success of the ERP system can be impacted by the ERP users, who are a crucial component of the ERP environment (Barki et al., 2008). User satisfaction is therefore essential for ongoing ERP system integration throughout the post-implementation phase. Unsatisfied ERP users are more likely to stop using the system or switch to shadow systems, but satisfied ERP users are more likely to continue using the system (Cataldo et al., 2022).

Individual performance

Task performance, employee commitment, efficiency, job effectiveness, job clarity, usefulness, decision-making, and learning are all examples of an individual's performance (Gable, et al., 2008). A well-implemented ERP system can streamline processes, improve data accuracy, and provide real-time visibility into key performance indicators, enabling employees to make informed decisions and work more efficiently. On the other hand, a poorly implemented ERP system can lead to confusion, reduced productivity, and decreased morale. Therefore, effective ERP assimilation and training are crucial for ensuring that employees are able to use the system to its full potential, which in turn can positively impact individual performance (Park et al., 2007). ERP assimilation and individual performance are positively related as a well-implemented ERP system can lead to improved work processes, increased efficiency, and better decision-making capabilities for employees. By automating manual tasks, providing real-time access to data, and streamlining workflows, an ERP system can reduce the time and effort required for certain tasks, freeing up employees to focus on higher-value activities (Gao et al., 2014). Moreover, an ERP system can also improve data accuracy, leading to more informed decision-making, and increased job satisfaction for employees. Effective training and support during the assimilation process can also enhance employees'

confidence and competence in using the system, further improving their performance. In conclusion, a successful ERP assimilation can lead to a positive impact on individual performance within an organization, as employees are equipped with the tools and information needed to perform their tasks more effectively (Alzahrani et al., 2021).

Organizational performance

Organizational performance includes production, profitability, communication, and expansion of the company (Ifinedo, et al., 2010). ERP assimilation can increase individual performance, which can then lead to an improvement in organizational performance. When employees are equipped with an effective ERP system, they are able to perform their tasks more efficiently and make informed decisions. This leads to increased productivity and job satisfaction for individual employees, which in turn contributes to overall improved organizational performance (Cebekhulu & Ozor, 2022). Moreover, as the ERP system integrates and streamlines business processes across departments, it can eliminate inefficiencies and improve data accuracy. This can result in better-informed decision-making, increased operational efficiency, and improved customer satisfaction, which can drive overall organizational performance. Therefore, effective ERP assimilation can lead to a positive chain reaction, starting with increased individual performance and culminating in improved organizational performance (Han, 2021).

Research Framework

The Theoretical Background for Modelling

The proposed ERP assimilation success model of this study is based on Diffusion of innovation theory. The functional, administrative, strategic, and organizational repercussions of a fully integrated ERP system would be extensive, both tangible and intangible. It is important to evaluate how individuals, the ERP system, and the organization adjust to the business's larger operating environment after ERP technology has been installed.

The process through which a new concept spreads over time and through specialized channels within a social system is known as diffusion of innovation (Rogers, 2003). The percentage of the population that uses ERP technology is roughly distributed across time since people's levels of enthusiasm for embracing new technologies vary. According to Rogers (2003), people assess technological advancements using the following five criteria: relative advantage, complexity, compatibility, and observability.

Research Model

The research model comprises of variables: ERP assimilation, top management support, user satisfaction, organizational agility, organizational performance, and individual performance. The relationships between every two constructs and the proposed model is demonstrated under

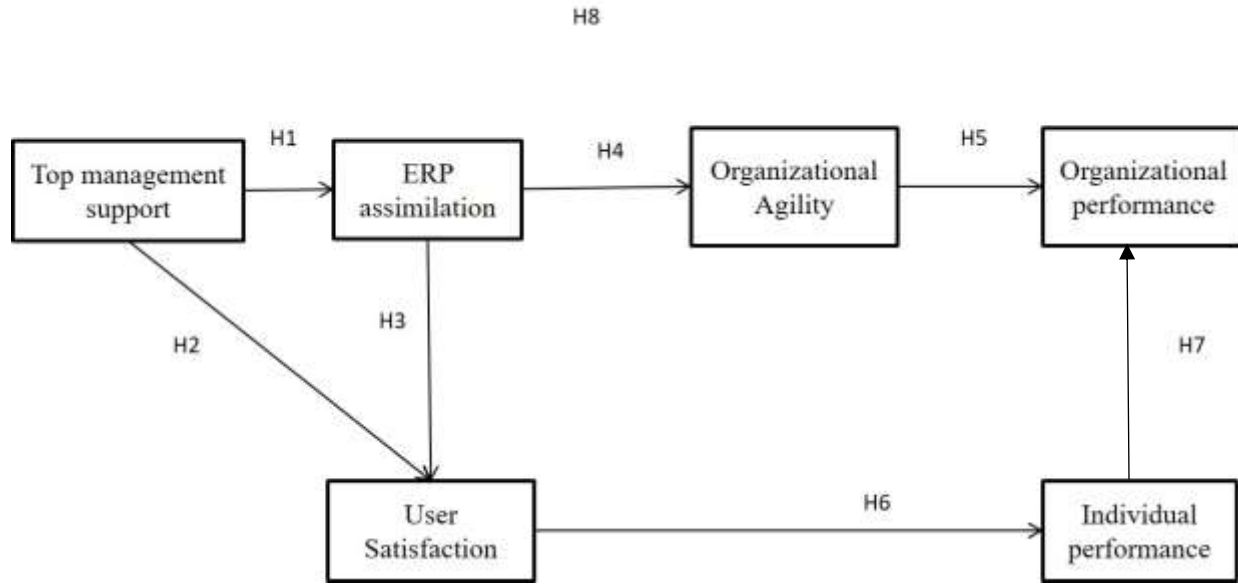


Figure1: Proposed research framework

Reliability Statistics

The following table no.1 shows the reliability statistics. It shows the results of Cronbach alpha for TMS=0.819, EA=0.832, OA=0.815, US=0.876, IP= 0.778 and OP=0.775. The value of Cronbach alpha for all variables is above the

0.887. The minimum acceptable value as it should be more than 0.6 (Sekaran & Bougie, 2016). Moreover, this table shows that the AVE value of all six variables is greater than .5 that also falls in the acceptable region. As a result, each value meets the requirements of the instrument's reliability.

	Cronbach's alpha	rho_A	Composite reliability	Average variance extracted (AVE)
TMS	0.819	0.945	0.721	0.550
EA	0.832	0.906	0.842	0.651
OA	0.815	0.863	0.828	0.623
US	0.876	0.879	0.876	0.703
IP	0.778	0.779	0.776	0.537
OP	0.775	0.798	0.776	0.541

Table 1: Reliability statistics

Data Collection and Analysis

Instrument/Data Collection Tool

Data for this study was gathered using the survey questionnaire. It is based on earlier studies (Roky & Al Meriouh, 2015; Nwankpa & Rou, 2014; Hasan, Miah, Bao, & Hoque, 2019 mani; Liang,

Saraf, Hu& Xue, 2007). The questionnaire is divided into two sections: demographic questions and study variable questions. The Likert scale was employed, with five points ranging from strongly disagree to strongly agree. A total of 41 items were included in the questionnaire to operationalize the variables. There were 3 items

for top management support, 9 for ERP assimilation, 18 for organizational agility, 4 for user satisfaction, 4 for individual performance and 3 for organizational performance.

Participants

The manufacturing firms in Lahore, Pakistan, are the target population of this study, and the individuals including employees and supervisors are unit of analysis. Using a convenience sampling technique, the researcher individually distributed questionnaires to the 350 respondents in order to obtain a sample size of 300 respondents with the maximum possible corrected responses. Before visiting the manufacturing firms, the researcher scheduled a meeting with the respondents' HR departments and IT departments. The researcher went to the firms on the scheduled day, met the respondents face-to-face, gave the surveys to the real respondents, and took great effort to explain any areas where they had trouble answering to the questionnaire's assertions. All of this was done to ensure that the data collecting was error-free.

Descriptive Analysis

The respondents were 20% managers, and 80% employees. All the respondents were from manufacturing sector of Lahore. 73% of respondents were male and 27 % were female having more than six years of experience. This provides evidence that the majority of respondents were knowledgeable about ERP system and had experience of using it. Where necessary, the researcher also gave the respondents an explanation of the idea of ERP assimilation.

Data analysis tool

For the analysis, the researcher employed the most recent version of SmartPLS, 4.0. Regression and mediation analyses were conducted using PLS-SEM.

Results

After the measurement model has generated appropriate and acceptable data, this research tested a structural model to assess the research hypotheses. Figure 2 shows the empirical findings of the structural model, including the explanatory power, values of the path coefficients, and significance values pertaining to the paths. The bootstrap resampling (5000) procedure was used to assess the path's significance. As reported in Table 2, all of the study hypotheses are supported except hypothesis 4. The results reveal that direct effect of TMS on EA is positive and significant ($\beta=.841$, $p<.01$) that leads to accept H1. These results are in line with the past studies (Deelert et al., 2022; Shao et al., 2017). The results also show positive and significant impact of TMS on US ($\beta=.21$, $p<.01$) and EA on US ($\beta=.994$, $p<.01$) respectively that lead to accept H2 and H3. Past studies are in line with the acceptance of H2 and H3 (Liu et al., 2011; KOUKI & PELLERIN, 2020; Nirwanto & Andarwati, 2013). The results also reveal that direct effect of EA on OA is insignificant ($\beta=.741$, $p>.01$) that leads to rejection of H4. Whereas the results also show positive and significant impact of OA on OP ($\beta=.16$, $p<.01$), US on IP ($\beta=.985$, $p<.01$) and IP on OP ($\beta=.832$, $p<.01$) respectively that lead to accept H5, H6 and H7. The last hypothesis H8 present the direct relationship between the independent and dependent variables and show that TMS have a significant positive effect on OP ($\beta = 0.712$, $p < 0.000$). Thus H8 is also accepted.

This study uses the Henseler, Ringle, and Sarstedt (2015) mediation process to examine the mediating role of EA, US, OA, and IP between TMS and OP. Indirect effect is the strength to which a change in the predictor variable results in a change in the criterion variable via the mediator variable. The significance of indirect effects is seen in Table 3. The findings of this study showed the path TMS -> EA -> US->IP->OP is

significant as compared to TMS -> EA -> OA->OP.

In smartPLS, the evaluation of the R values is the primary way to calculate the model's explanatory power (Chin, Thatcher, and Wright 2012). R square values demonstrate how much

independent variable is explained by dependent variables. Here, R square for EA is 0.708 that means TMS causes variance in EA to 70.8% that is strong explanation by the variable whereas the R square value of OA is 0.610, OP is 0.696, US is 0.952 and IP is 0.989 that means US causes strongest variance in IP to 98.9%.

Path	Original sample	Mean	T value	P values	Results
TMS -> EA	0.725	0.729	18.877	0.000	Supported
EA -> OA	0.419	0.414	4.579	0.000	Supported
OA->OP	0.045	0.049	1.045	0.296	Not Supported
TMS -> US	0.653	0.652	18.770	0.000	Supported
EA -> US	0.616	0.628	9.006	0.000	Supported
US -> IP	0.794	0.795	24.386	0.000	Supported
IP-> OP	0.643	0.644	15.017	0.000	Supported
TMS -> OP	0.347	0.350	8.103	0.000	Supported

Table 2: Path coefficient

Path	Original sample	Mean	T value	P values	Results
TMS -> US -> IP->OP	0.105	0.099	2.784	0.005	Supported
TMS -> EA -> OA	0.304	0.300	5.041	0.000	Supported
TMS -> EA -> OA->OP	0.014	0.015	0.993	0.321	Not Supported
EA -> OA->OP	0.019	0.020	0.995	0.320	Not Supported
TMS -> EA -> US->IP	0.355	0.365	6.577	0.000	Supported
TMS -> US -> IP	0.163	0.154	2.914	0.004	Supported
TMS -> EA -> US	0.447	0.459	6.854	0.000	Supported
TMS -> EA -> US->IP->OP	0.228	0.236	5.362	0.000	Supported
EA -> US -> IP	0.489	0.499	8.720	0.000	Supported
EA -> US -> IP-> OP	0.315	0.322	6.947	0.000	Supported
US -> IP-> OP	0.510	0.512	11.461	0.000	Supported

Table 3: Specific indirect effects

	R-square
EA	0.708
OA	0.610
OP	0.696
US	0.952
IP	0.989

Table 4: Goodness of fit

Conclusion

The main objective of the study was to empirically examine the role of ERP assimilation by finding the causal relationship of different variables e.g., relationship between top management support, ERP assimilation, organizational agility and organizational performance, relationship between User satisfaction and individual performance and the how ERP assimilation contributes to organizational performance through ERP assimilation, user satisfaction, organizational agility and individual performance. The findings of the study made it possible to fulfill this objective. The findings suggest that top management support improves organizational performance and it also helps in assimilating ERP. However assimilation hinders organizational agility. Moreover, Organizational agility has positive and significant impact on organizational performance. Findings also indicate that top management has positive and significant impact on user satisfaction. It means that top management can enhance individual performance by focusing on ERP assimilation. The findings further explore the mediating role of ERP assimilation, user satisfaction and individual performance and confirms its sequential mediation. All hypotheses have been accepted except hypothesis 4, as direct and indirect relationships of all other independent, dependent and mediating variables are significant and have positive impact. The findings of the study contributes to the literature of ERP assimilation. This study varies from past research in that it moves beyond the implementation stage to focus

on the assimilation process that occurs after implementation. Hence, the findings would be helpful to the managers in having a better knowledge of how and why the post-implementation period of ERP systems contributes to the supply of more business advantages especially in developing countries like Pakistan.

Future Research

As discussed earlier, ERP systems, are a complex technological breakthrough for a company. However the failure rate of ERP systems at post implementation stage is very high. Many scholars are working on this phenomena. This study attempted to explore major dimensions of this issue. This study uses organizational agility as a mediator which fails to establish a significant relationship. In future research, organizational learning can be used as a mediator to further explore other dimensions of the study. The impact of ERP assimilation is examined as a mediator in this study. In future its impact can be explored as a moderator. The sample has been taken from the manufacturing firms of Lahore only and data has been collected from the supervisors and employees of only these industries. Future studies may use other cities for data collection. This study is a quantitative study and ERP assimilation is a phenomena that can be explored qualitatively. Future studies may use qualitative method or a mixed method approach to explore it further. This study has been conducted in the context of a developing country Pakistan. Future research may focus on other developed or developing countries with different background and culture.

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