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ERP Implementation in Pakistan: An Application of Nadler's Congruence Model

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Abstract

This study provides a comprehensive explanation of inter-relationships of a variety of factors at play during ERP implementation using Nadler's Congruence Model (Nadler and Tushman, 1980) and Rogers' Diffusion of Innovation Model (Rogers, 1983). Most of the studies which focus upon identification of critical success factors in ERP implementation fail to cater for the complex and integrative nature of ERP implementation – the use of Nadler's model fills this gap. The study is based on data from 150 respondents from four organizations which had functional ERP systems. Respondents were asked about the role of communication, coordination, collaboration, learning orientation of culture, embedded routines, uncertainty, exposure through training, skills and knowledge; these variables relate to the people, formal and informal organization and work aspects of Nadler's model. Results verify Nadler's proposition of complex inter-relationships of organizational components, thereby necessitating subsequent changes in all of organizational elements for successful implementation. Also, communication came across as the strongest component for successful implementation having an impact on awareness, perceived value and motivation to use. Exposure through training had an impact on awareness, while collaborative culture increased perceived value, and coordination between departments resulted in higher motivation to use.

Keywords: ERP; ERP Implementation; MIS Implementation; Nadler's Congruence Model; Change Management

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1. Introduction

The last two decades have witnessed an increasing attention of businesses towards enterprise resource planning (ERP) systems, irrespective of industry and size (Bondarouk Parry & Furtmueller, 2017; META Group, 2004; Scott & Shepherd, 2002). Although investments in ERP systems are generally suggested to pay off (Hitt,Wu & Zhou, 2002), however, the success and relative impact of these systems varies for each individual case (Amid, Moalagh & Ravasan, 2012; Gattiker & Goodhue, 2005; Hawari & Heeks, 2010;Lai, Lai & Lowry, 2016; Sykes Venkatesh& Johnson, 2014). There have been cases where ERP implementation was late or over budgeted(Lewis, 2001; Zaheer, 1995), led to immense wastage of investments and resources (Hawari & Heeks, 2010), or failed to achieve the expected benefits altogether (Amid, Moalagh & Ravasan, 2012; Ribbers & Schoo, 2002; Sykes et al., 2014; Veiga, Keupp, Floyd & Kellermanns, 2014; White & Fortune, 2002). Heightened interest of businesses towards ERP systems, as well as cases of failures led to a surge in studies aiming to explore the dynamics of information technology, including ERP systems implementation. Resultantly, numerous critical success and resistance factors have been proposed (e.g. Ben-Zion, Pliskina & Fink, 2014; Bingi, Sharma & Godla, 1999;Bondarouk et al., 2017; Dezdar & Sulaiman, 2009; Finney & Corbett, 2007; Gattiker & Goodhue, 2005;Hong & Kim, 2002;Maditinos, Chatzoudes & Tsairidis, 2012; Morabito, Pace & Previtali, 2005; Ngwenyama & Nielsen, 2014; Sykes et al., 2014; Wang, Klein & Jiang, 2006).

Although beneficial, yet such an approach of identification of isolated success factors does not completely cater for the complex nature of the ERP systems. Involvement of a large number of internal and external entities, as well as functional silos makes ERP implementation a complex and difficult task (Karim, Somers & Bhattacherjee, 2007; Ngwenyama & Nielsen, 2014; Wang, Klein & Jiang, 2006). To capture the intricacies of such complex changes, Gattiker & Goodhue (2005) rightly pointed out the need of study of ERP implementation in context of existing theoretical frameworks; however, such an approach is scarce in the literature. To date, only a few studies have analyzed ERP implementation in light of comprehensive theoretical frameworks and models (e.g. Gattiker & Goodhue, 2005; Kemp & Low, 2008).

To address this gap, this paper uses Nadler's congruence model (Nadler & Tushman, 1980) and Rogers' diffusion of innovation model (Rogers, 1983) to understand ERP implementation. The sophistication of ERP systems lies

with the belief that these systems do not only offer the 'automation' of processes but also introduce the concept of full integration between all of an organization's elements (Al-Mudimigh, 2007; Bondarouk et al., 2017; Maditinos et al., 2012; Ngwenyama & Nielsen, 2014). Nadler's congruence model (Nadler & Tushman, 1980) proposes a 'concept of fit' among various components of an organization, where these components are interlinked with each other maintaining a constant homeostasis. Any change attempts to disrupt the balance. The detailed attention of this model to inter-relationships between organizational components makes it an appropriate choice for investigating the changes following implementation of ERP, which has profound impact across all components of the organization. Furthermore, Rogers' diffusion of innovation model (Rogers, 1983) proposes various distinct stages a user goes through before accepting or rejecting any innovation. This breakdown of acceptance decision into distinct stages singles out this model as appropriate for getting deeper insights into factors that shape user's decision of acceptance (or rejection) of ERP systems. In the text to follow, we first provide an overview of relevant literature, followed by explanation of our proposed frameworks. Methodology and major findings are then discussed. Lastly, limitations and avenues for future research are stated.

2. Review of Literature

2.1 Resistance, change and ERP systems

Ford and Ford (2009) categorize resistance to be a 'valuable feedback', rather than a mere 'threat'. It is actually a 'language' used by employees to express their discomfort; thereby shedding light on the flaws in the system (Lapointe & Rivard, 2005). Resistance and change are 'chain processes' (Pettigrew, Woodman & Cameroon, 2001), stemming from a logical sequence of activities over time, that shape the final outcome of response towards it by employees, rather than being merely one-time radical incidents. Furthermore, defining ERP systems, contrary to popular belief, ERP systems are not simple 'automation' of existing work processes, but in fact encompass complete integration of technological and organizational factors and hence require demanding collaboration and synchronization among all the stake holders (technology, business processes, departments and individuals) (Al-Mudimigh, 2007; Bondarouk et al., 2017; Maditinos et al., 2012; Ngwenyama & Nielsen, 2014). ERP systems should be considered as a package, which combines both information technology and business processes (Maditinos et al., 2012). In the various studies conducted to

explore the success factors for ERP implementation, factors like communication, top management commitment, strategic alignment, trainings, integration etc. have been found to be critical in ultimate success of such systems (e.g. Bingi et. al., 1999; Finney & Corbett, 2007;Karim et al., 2007; Sharma, 2013; Veiga et al., 2014). Although the importance of these results is undeniable, however, a more holistic understanding of complex changes that occur during ERP implementation rather than mere study of encapsulated variables is the need of the hour.

2.2 Nadler's congruence model

Nadler's Congruence Model (Nadler & Tushman, 1980) is one of the most comprehensive models of change management, which incorporates and explores the complex inter-relationships of a multitude of factors present in an organization. Although this model has been used to study other change processes (e.g. Bezboruah, 2008) however, to date, technological innovations, particularly ERP implementation, have not been explored in context of this model. The model proposes that organizations are 'open systems', comprising of four major components, namely *formal organization, informal organization, people* and *work*, which are interdependent upon each other and maintain a constant homeostasis (Figure 1). Each of these four components is made up of a variety of factors which govern the interrelationships of these components. A 'concept of fit' prevails across these components, where they are to be aligned with each other for greater efficiency (Nadler & Tushman, 1989). Any change in the organization will work to disrupt the fit among the components, and the organization will attempt to regain the fit. Furthermore, a transformation process transforms the input (environment and resources; which include people as well as technology) into the output (at individual, group and organizational level). These outputs would vary depending upon the change process under consideration, however, one of the obvious outputs of any change will be the acceptance (or rejection) of the particular change. Each of the four organizational components, as well as the outputs identified in Nadler's model are discussed in the text to follow.

Insert Fig. 1 about here

2.2.1 Organizational components

A large number of factors govern the relationship between the four components of an organization, as described by Nadler. However, for the scope of this study, only the variables cited as critical for ERP implementation as per previous researches will be discussed.

Formal organizational factors entail structures and processes that are formally created to assist the task that is to be performed (Nadler & Tushman, 1980). Of the many elements of a formal organization; *communication* and *coordination* are widely quoted to be critical for success of ERP implementation (e.g. Finney &Corbett, 2007; Ifinedo, 2008; Sharma, 2013; Sykes et al., 2014 etc.).Effective communication of organizational policy throughout the organization is quoted to be important for successful ERP implementation (Finney & Corbett 2007). Effective communication plays an important role when changes are to be incorporated, and is required on all levels and throughout the business process (Sykes et al., 2014). Barriers to communication and absence of flow of information during any change process in general (Ford & Ford, 2009), and ERP implementation in particular (Sharma, 2013), along with lack of proper communication of need, goals and aspirations (Maditinos et al, 2012) trigger resistance. The inability to communicate the benefits of change to the company as well as employees, and silence on part of top management opens up doors for uncertainty and speculations; thereby increasing frustration among the employees (Ford, Ford & D'Amelio, 2008; Gefen, 2004). Absence of proper communication can also lead to lack of trust, resulting in both skepticism i.e. doubt management ability, and cynicism i.e. disbelief in management motive (Gefen, 2004). Employees feel that change agents are not working in their favor. This belief amplifies their rejection of the proposed change process altogether (Fox & Hamburger, 2001). Oreg (2006), however, argued that communication alone cannot 'reduce' resistance directly; but is merely an act of providing information to the employees. Based on that information, employees decide to accept or reject the change.

Among other formal organizational components, coordination also stands out as a critical factor for ERP implementation (e.g. Kumar& Van Hillegersberg, 2000; Rouhani, Ashrafi & Afshari, 2013)**.** ERP systems call for complete integration among all the units of an organization. Functions and departments previously working in silos are required to work together, in a highly integrated fashion, where one unit is excessively dependent upon input from other units. The highly integrated nature of ERP systems, and its complex designs and operations make coordination imperative for success (Karim et al., 2007; Rouhani, Ashrafi & Afshari, 2013). If the departments fail to receive required information on time, the whole work process gets delayed, resulting in lack of efficiency. Lack of coordination has been stated to be a prominent factor in leading to implementation failure (Kumar & Van Hillegersberg, 2000). Studying the policies and practices of companies which have undergone successful up-gradation to ERP systems, Kim, Lee and Gosain (2005) observe that one of the factor common among those organizations was focus on the functional coordination. According to their survey, more companies successful in ERP implementation considered cross-functional coordination to be of critical importance compared to companies which ranked lower on a scale of success of implementation.

The second component of organization (Figure 1), namely the informal organization constitutes the processes, relationships and norms that emerge and prevail in organization, despite not being 'formally' present (Nadler &Tushman,1980). Among the most prominent factors of informal organization mentioned in past work of ERP implementation are the collaboration and learning orientation. The collaboration and support within an organization from top management helps in reducing resistance (Karim et al., 2007; Maditinos et al., 2012). While coordination discussed in the preceding paragraphs is the formal integration between units and departments, the collaboration refers to an overall culture of cooperation among members of the organization. Furthermore, organizations which have an appreciation for skill development, and have a strong belief in learning and adapting are found to be more welcoming towards change (Ke & Wei, 2008). ERP system implementation is not a smooth process, and faces many hurdles in terms of bugs and errors, and need of acquiring new skills. It also requires extensive sharing of information among departments and individuals. This demands a proactive approach towards learning new skills and sharing of information. However, if an organization does not value initiatives and skill development, employees choose not to make an effort towards skill development because of fear of failure and social face saving. Lack of support and collaboration makes employees fearful about sharing

information. These fears, fear of failure and fear of sharing information, are materialized in terms of resistance towards the system altogether. Also, employees who previously used to work independently have to work in collaboration with others under the said systems, and are required to share information. This may be perceived as threat to their power, and hence be resisted (Klein& Knight, 2005).

The third component of any organization as proposed by Nadler and Tushman (1980) is the people. The end users' behavior has been stated as critical for success of any information technology project (Bondarouk et al., 2017; Bondarouk & Ruel, 2008; Veiga et al., 2014). Of the different factors pertaining to this component, knowledge and skills, and exposure through trainings have been mentioned considerably in context of ERP implementation. Presenting arguments in favor of importance of knowledge and skills; intellectual capital is the most critical factor for any business process (Milost, 2007). Success of ERP implementation relies greatly upon the users involved, their understanding of the systems and their skill level. From among various features of human capital, employee flexibility to adapt to changes and their creativity is pertinent for optimum performance (Armstrong, 2006). Individual skills and knowledge is given importance in literature, because even if organizations manage to build up a conducive environment for change management, including critical factors like management support, communication, etc., lack of appropriate skills and knowledge on employees' part can hamper the deployment process (Bondarouk et al., 2017; Grover, Jeong, Kettinger & Teng, 1995). However, he further argues that although importance of knowledge and skills cannot be denied, but they are in no way a guarantee to success. It is employee motivation, and awareness about the new roles and responsibilities that play the front role (Bondarouk et al., 2017; Veiga et al., 2014). In absence of these two critical factors, even the most skilled employees may end up resisting the systems.

Among other factors of user resistance, Kim et al. (2005) state *exposure to appropriate training* as one of the critical factors that determine acceptance or rejection of the system. Lack of exposure to training leads to ambiguities in users about ERP implementation, hence, reducing their ability to completely understand the underlying purpose of ERP implementation and to recognize how business processes will change due to the implementation process. Many 'good' workers end up avoiding the systems due to lack of exposure to such systems (Sharma, 2013). Exposure through training is agreed to be vital in reducing employee resistance towards changes in organizations and enhancing their acceptance of the change, as it provides an

opportunity to interact with the systems, understand the workings, and clarify their ambiguities for better understanding.

The *work* that is performed to achieve objectives and goal of any organization and to get the job done also constitutes a major component of organization (Figure 1). Literature identifies various factors comprising this component, *embedded routines* and *uncertainty* being among some of them**.** Despite clear alignment of change with strategic goals, and effective communication, resistance seems inevitable at times. Klein and Knight (2005) highlight the underlying reason in terms of 'knowing doing' gap, where benefits and importance of innovation are realized by end users, but they are unwilling to adopt the innovation because of comfort level with prevailing system and the level of greater effort required to cope up with new systems. ERP implementation signals a tremendous change in traditional business practices; hence triggering employee resistance. Davenport (1998) observed that ERP demands organizational discipline and standardized processes. Over the period of time, employees get comfortable in following the 'routine', and anything that disrupts the routine is viewed as a threat. Due to a shift from established cultural practices and prevailing knowledge of processes to required new practices and knowledge set, users tend to resist changes to stay with current situations, a phenomenon known as status quo bias (Kim & Kankanhalli, 2009). Changes in organizations inevitably result in speculations about the future. Jones and colleagues (Jones, Watson, Hobman, Bordia, Gallois, & Callan, 2008) argue that uncertainty is one of the most important factors leading to resistance towards organizational change. According to their study, ERP implementation is generally met with a negative response from the employees, and this response is largely because of increased uncertainty associated with the change being brought. Several factors may lie at the root of this uncertainty. ERP calls for changes at all organizational levels, and has an impact on work processes, job roles, power structure, and many other areas. All these changes render employee uncertain about the future of their jobs, chain of command, promotion opportunities, status of work units, etc.

In light of the review of literature and Nadler's (Nadler and Tushman, 1980) congruence model, Figure 2 presents a snapshot of these inter-relationships. The dotted line represents the relationship among particular factors, as proposed or verified in previous researches. It is to be noted that the schematic diagram presented here is not inclusive of all the possible interrelationships, and many other relationships besides those proposed here may exist. Based upon the identified interrelationships, we propose;

Hypothesis 1 Factors identified through Nadler's congruence model will have strong inter-relationships with each other in ERP implementation.

Insert Fig. 2 about here

2.2.2 The outcomes of awareness, perceived value and motivation

Nadler and Tushman (1980) propose that a transformation process transforms the inputs of an organization into outputs. These outputs span three levels, namely; individual, group and organization level. Organization and group level outputs entail the output derived from the organization as a whole, and from certain teams or work groups present in each organization respectively, whereas individual level output refers to each employee productivity, efficiency, resistance etc. Group and organizational outputs can be usually measured by evaluating whether the goals and objectives set by an organization or team has been met or not, whereas, measurement of individual level output requires an in-depth analysis of various variables involved. As stated before, one of the obvious outputs of any change is the employee acceptance (or rejection) of that change. Rogers (1983) proposes that acceptance (or rejection) of any change is decided after an individual passes through various complex stages, which have been described in lines to follow.

According to Rogers (1983) 'Diffusion of Innovation Theory', users go through several distinct phases, each involving number of variables, before making their final decision of acceptance or rejection of any innovation. This theory can therefore serve as a basis to understand the different variables that play their role in shaping the final decision of acceptance (or rejection) of the ERP systems implemented. Rogers (1983) terms innovation to be "an idea, practice, or object that is perceived as new", whereas diffusion is defined as "the process by which an innovation is communicated through certain channels over time among the members of a social system". Innovation diffusion process consists of 5 steps, namely*;* knowledge, persuasion, decision, implementation, and confirmation (Rogers, 1983). During the persuasion stage, users form perceptions about the value that the systems can bring, and are then motivated (or otherwise) to accept the system. Thus, some of the key variables involved for shaping the acceptance decision can be identified as awareness, perceived value and motivation. This study therefore used these three variables as determinants of ultimate individual level output, i.e., acceptance (or rejection) of the system.

2.3 Theoretical framework

Drawing from both Nadler's congruence model (Nadler and Tushman, 1980) and Rogers diffusion of innovation model (Rogers, 1983), we propose our framework and hypothesis of impact of selected organizational factors on user's decision of acceptance (or rejection) of the systems (Figure 3). For the scope of this study, two factors from each of the four organizational components of Nadler's congruence model were selected, which were taken to be independent variables. The selection was made on the basis of review of literature, as well as from the insights gained from preliminary interviews conducted, as discussed in later sections. As discussed, rather than measuring the decision to accept or reject as a single variable, we examined three of the variables, user awareness, perceived value and motivation, as derived from diffusion of innovation model as dependent variables. Using these three variables instead of a generic acceptance (or rejection) variable will help to dig deeper into the underlying factors and causes that result in user's adoption of the systems. Thus, we propose;

Hypothesis 2 *Formal organizational factors* of communication and coordination will affect user awareness, perceived value and motivation to use the systems.

Hypothesis 3 *Informal organizational factors* of collaboration and learning orientation will affect user awareness, perceived value and motivation to use the systems.

Hypothesis 4 *People factors* of exposure through training and skills and knowledge will affect the user awareness, perceived value and motivation to use the systems.

Hypothesis 5 *Work factors* of embedded routines and uncertainty will affect user awareness, perceived value and motivation to use the systems.

Insert Fig. 3 about here

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3. Method

Data were collected from four Pakistani organizations, located in the Oil & Gas, and Health sector. Two organizations from each of the two sectors were a part of the study. All the participant organizations had fully functional ERP systems. Data were gathered in two phases; qualitative being the first followed by a quantitative phase. During the first phase, a total of eight semi-structured interviews were conducted from top management of the organizations, to verify the factors shortlisted from literature review as being important or otherwise during ERP implementation. The interview comprised of broader questions regarding common hurdles faced during ERP implementation, along with specific questions to verify the relevance of factors identified from literature. Example of few specific questions include "How important it is to communicate system objectives and benefits of ERP systems to employees?", "To what extent did the trainings improve performance", etc. All the interviews were conducted face to face, recorded and later, transcribed. By the end of first phase, the factors identified as important in the literature were reinforced as being critical by the interviewees. Following the interviews was the second phase i.e. the quantitative phase, which is the focus of this paper. Details of the questionnaire are discussed later in this section.

A sample of 150 questionnaires was collected using random sampling. Forty questionnaires were distributed in each of the four organizations. One manager from each of the organization was selected on the basis of references, and was requested to distribute the questionnaires within the organization, so as to solicit a higher response rate. Since the manager was selected based upon strong references, the total response rate was 94%, where all forty questionnaires were completed and received from three organizations, while thirty completed questionnaires were received from the fourth organization. Completed questionnaires were collected personally by the researchers from employees in the three organizations, while the manager collected and returned the completed questionnaires from one organization in the Oil and Gas sector. The sample was distributed as follows; majority of respondents were males (69%). Respondents between 26-40 years of age constituted more than half (53%) of the sample size. The percentage of Bachelors and Master degree holders was almost equal; 44 and 42% percent, respectively. Approximately 21% of the respondents had 4-6 years of experience with the current organization, while 20% had more than 6 years of experience with their current organization.

3.1 Measures

The questionnaire comprised of three sections. Section A included attribute questions, to attain the background information of respondents. Section B dealt with the identified internal factors that can impact the dependent variables. A series of question was asked about internal factors for example knowledge and skills, exposure through training, communication, coordination, embedded routines, uncertainty, learning orientation and collaboration. Summated indices of these were calculated for analysis. The last section, Section C comprised of questions about user awareness, perceived value and motivation.

The questionnaire was formulated by both adapting the questions from previous studies, as well as formulating new questions to meet the stated objectives. The rational of adapting rather than adopting was to tailor the questionnaire as per the demands of specific change, i.e. ERP implementation, being studied, while self-development of items became a necessity where factors identified as critical in the literature and through interviews had not been specifically tested in the past literature. All questions were asked for each variable using a five point Likert scale. Alpha values of all the items ranged from 0.6 - 0.86 (Table 1).

3.1.1. Formal organization components

We measured communication by adapting two items from Amoaka-Gyampah (2004) and Jyothibabu, Farooq & Pradhan (2010) each, and one item from Visagie and Steyn (2011). An example of the items includes “I was well informed about the project”. Coordination was measured by adapting two items from Jyothibabu et al. (2010), while one item was self-developed. An example item includes “My organization encourages people to get answers from across the organization when solving problems”. The self-developed item stated “I received input needed to perform my job from other departments”.

3.1.2 Informal organization

Questions for learning orientation were self-developed, in order to maximize the possibility of gathering relevant information. The items included “My organization encourages learning of new skills”, “My organization facilitates in learning of new skills”, “There is a proactive approach towards learning new skills in my organization”, and “My organization emphasizes on development of new capabilities”. Four items were used for measuring collaboration, where one item was adapted from Harp (2011), while three items were self-developed. The self-developed

items include “There is a proactive approach towards sharing of information in my organization”, “My colleagues assisted/helped me in overcoming the problems I faced with the system”, and “My peers actively gave me advice regarding usage of new system”.

3.1.3 People

Knowledge and skills was measured using two items from Kim and Kankanhalli (2009). An example includes “I was able to change to the new way of working with the ERP system without the help of others”. Four items scale was adapted from Amoaka-Gyampah (2004) to measure exposure through training. An example of items includes “The training gave me confidence in new systems”.

3.1.4 Work

An embedded routine was measured through a five items, self-developed scale. The items included “ERP implementation altered the way I used to perform my job”, “My work routines were disrupted after ERP implementation”. Uncertainty was measured using three items, where one item was adapted from Elving, Hansma & Boer (2011), and two self-developed items were used. An example of self-developed item includes “I was not clear of the role expected of me after ERP implementation”.

3.1.5 Dependant variables

Three items scale was adapted from Kim and Kankanhalli (2009) to measure perceived value. An example item includes “Considering the time and effort that I have to spend, the change to the new way of working with ERP system is worthwhile”. Motivation was measured using a three item self-developed scale. The items included “I was willing to work hard to make the system up-gradation successful”, “I was willing to learn new skills needed to work with the new systems”, and “I actively participated/gave feedback for better implementation”. Lastly, three items were used to measure awareness, which include “I am well aware of the benefits of the ERP system”, “I clearly understand the purpose of ERP implementation”, and “I was given appropriate training to help improve my awareness of ERP systems”.

4. Results

The means, standard deviation and correlations of all variables are presented in Table 1. Hypothesis 1 stated that the identified variables will have strong inter-relationships with each other. As per results (Table 1,

Figure 4), all the proposed correlations (Figure 2) have been verified as significant, except correlation between communication and uncertainty, and exposure through training and uncertainty, thereby lending partial support to the hypothesis. However, the analysis also resulted in significant correlations between variables which were not proposed in our framework. The new correlations identified have been marked with straight line arrows in the figure (Figure 4). The verification of correlations other than those proposed further reinforce Nadler's argument that organizations are complex systems and have complex interrelationships between a variety of factors.

Insert Table 1 about here

Insert Fig. 4 about here

Table 2 reports the regression analysis to test Hypothesis 2, 3, 4 and 5. The R-Square values of 0.460, 0.490 and 0.323 for *awareness*, *perceived value* and *motivation*, respectively, imply that the organizational factors explain significant variance in awareness, perceived value and motivation.

Insert Table 2 about here

Hypothesis 2 predicted that *formal organizational* factors (communication and coordination) will affect user *awareness, perceived value* and *motivation*. In partial support to the hypothesis, communication stood out to be a significant predictor of all three dependent variables, while coordination significantly predicted motivation (B=0.31***) (Table 2). Complementing the findings, communication also had the strongest correlation with awareness (0.615**) and perceived value (0.62**), while second strongest correlation with motivation (0.490**) out of all the factors studied (Table 1).

Hypothesis 3 and 4 predicted that *informal organizational* factors (learning orientation and collaboration), and *people* (knowledge and skills, and exposure through trainings) will affect user *awareness, perceived value*

and *motivation*. In partial support to both the hypothesis, collaboration was a significant predictor of *perceived value* (B=0.21*), and exposure through training was found to be a significant predictor of *awareness* (B=0.26**) respectively (Table 2). Among striking findings was the result of *work* (knowledge and skills, and uncertainty avoidance), where none of the two identified variables had any effect on user *awareness, perceived value* or *motivation* (Table 2). Therefore, Hypothesis 5 has not been supported.

5. Discussion, implications and conclusions

Most of the studies in the area of technological innovation, including ERP implementation focus on identification of resistance and success factors (e.g. Ben-Zion et al., 2014; Bingi et. al., 1999; Bondarouk et al., 2017; Finney & Corbett, 2007; Hong & Kim, 2002; Karim et al., 2007). While such an approach might be appropriate for simpler technological innovations, however, complex changes such as ERP implementation demand a more holistic outlook. The present study therefore contributes to the literature by providing a comprehensive explanation of resistance towards ERP implementation, by examining the phenomenon in context of a classical theoretical framework. Only a few other studies have adopted a similar approach in the past (e.g. Gattiker& Goodhue, 2005; Kemp & Low, 2008).

Nadler's congruence model (Nadler &Tushman, 1980) formed the basis of our study to investigate the intertwined relationships of organizational factors (Hypothesis 1). We also tested the relative impact of selected factors on three independent variables that shape user decision (Hypothesis 2,3,4 and 5), rather than a single, generic variable of 'acceptance' the variables of awareness, perceived value and motivation provide a deeper insight into the underlying causes which shape end user's decision of ERP acceptance.

Overall, consistent with Hypothesis 1, this study verified the complex inter-relationships of organizational factors, as proposed by Nadler and Tushman (1980). These findings reinforce the idea of organizations being complex systems, where various components of an organization are interdependent upon each other, rather than existing in silos (Nadler & Tushman, 1980). While these results do not undermine the importance of critical success factor identification as previously done, however, they add to Gattiker and Goodhue's (2005) argument of need of ERP study in context of existing frameworks. Since ERP implementation demands changes in numerous organizational factors, it will create a ripple effect, thereby disrupting the natural balance of an organization. Therefore, presence of

certain factors alone cannot guarantee success unless they are well knit into the web of any organization. Conclusively, ERP deployment process is to be approached on a holistic level, paying due attention to each and every factor, and making appropriate changes in them. Any attempt to deploy ERP systems, without consequent changes in critical factors will lead to implementation failure.

As per Hypothesis 2, in affirmation of previous studies (e.g. Ford & Ford, 2009; Finney & Corbett 2007; Kemp & Low, 2008; Maditinos et al., 2012; Sharma, 2013; Sykes et al., 2014), we found communication to be an important factor for all three variables. These results indicate that communication is vital irrespective of the implementation process, in order to provide necessary information, project a positive image, as well as to boost employee moral to use the systems.

Like Karim et al, 2007, Kim et al. (2005) and Sharma (2013), we found exposure through training to be an important factor, but for awareness alone. Contrary to Rouibah, Hamdy & Al-Enezi (2009), it was not found to significantly impact perceived value. A possible theoretical explanation is that trainings themselves do not have any significant impact on perceived value, rather, it is the opportunity to clear out ambiguities, improving awareness about workings and benefits that help employees gauge the value of systems. At the end of the day, it is the better communication opportunities that trainings provide to obtain knowledge about the systems that help them weigh the outputs of the system versus input (Karim et al., 2007). Significant correlation between communication and exposure through training (Table 1) strengthens the interpretation.

We concluded collaboration to have an impact on perceived value, which compliments propositions of Maditinos et al. (2012) and Sykes et al. (2014). Furthermore, coordination was found to impact user motivation, corroborating previous studies (e.g. Rouhani, Ashrafi &Afshari, 2013; Kim et al., 2005; Kumar & Van Hillegersberg, 2000). However, employee motivation was not found to be impacted by embedded routines, as previously asserted (e.g., Kim & Kankanhalli, 2009).Although respondents were more likely to agree that the embedded routines got disrupted after systems were implemented (mean = 3.21), however, this did not appear to result in reducing their motivation to adapt to the systems. One of the possible explanations can be that change in routines in itself does not serve to dampen employee morale. Rather, it is the disruption of operational efficiencies, which can be manifested in the form of poor coordination among departments, which serves to influence employee motivation about

the systems. Significant correlations between the two provide support to this explanation (Table 1).

Unlike previous assertions (e.g. Jones et al., 2008), we did not find support for Hypothesis 5, where uncertainty did not impact user awareness, perceived value or motivation. This finding can be explained in context of the Pakistani culture, which has been characterized as low in Uncertainty Avoidance by the GLOBE study (House et al. 2004). According to GLOBE's dimension of Uncertainty Avoidance, societies high on this dimension tend to avoid unpredictable situations, whereas those low on Uncertainty Avoidance do not respond strongly to unpredictable scenarios. Therefore, this finding remains note-worthy, and further research is required in the said areas to verify the link between cultural context of a country and the resistance to change and technological innovation.

The variation in relative impact of each of the organizational factor on user awareness, perceived value and motivation is noteworthy (Hypothesis 2, 3 and 4). It adds to the literature by empirically verifying that although the identified organizational factors are critical for overall decision of acceptance or rejection of the systems, however, their impact varies depending upon the decision stage of the user. Consequently, it is proposed that the relative importance of critical factors will change depending upon the implementation phase. Therefore, it is important for organizations to understand the relative role of each factor at every stage of implementation, and invest in the factors accordingly. In parallel to this, due attention should also be paid to the complex interrelationship of these individual factors throughout the implementation process (Hypothesis 1), so as to maintain organizational balance. In other words, a well-articulated change management plan with clear demarcation of the factors to be addressed depending upon implementation phase is important.

5.2 Implications, limitations and future research

The study contributes to the literature in two ways. First, by utilizing a classical change management model in specific context of technological innovation, and hence providing a comprehensive view of scenario at play during and after such innovations. Secondly, it also identifies the critical factors that lie at the heart of user resistance, by pinpointing important factors at each stage before user decision of acceptance (or rejection) of such innovations. Such identification would help deal with these factors meticulously and effectively, thereby increasing the likelihood of success.

While our research addressed the gap in literature by providing a holistic approach towards study of resistance and ERP implementation, there

are nonetheless certain limitations that are to be considered. First, as the sample pool was limited to four organizations from two sectors, the sample size was smaller and hence, the generalizability of results to other scenarios is yet to be proven. Additionally, only a limited number of factors (two for each of four organizational components) were used in the study, where organizations are composed of a large variety of factors with subtle yet crucial inter-relationships. Furthermore, the study was conducted at a given time after the change efforts had been extended, therefore, the perceptions and eminent issues faced by employees before or during the process were not captured. The snapshot nature of this study did not allow in-depth analysis during the ERP implementation roll-out phase.

Addressing the limitations stated above, there are numerous positive avenues for future research in this particular subject matter, conducted particularly in Pakistan while providing enough room to be replicated to an international world-view. Replicating findings of this study in other organizations and sectors would determine the generalizability of the research, since it is imperative to broaden research dynamics in order to check whether findings are applicable to other sectors and organizations. Further, for a more comprehensive understanding, research work can be conducted using this study as a guide to delve deeper into the complex relationships between all the components identified by introducing other factors which were excluded due to lack of time and other resources in this study. Interesting and conclusive analysis can thus be generated extending the findings further to include other factors at play. Lastly, the research was designed as a snapshot study and can also be molded into a longitudinal research framework where employee attitudes and resistance to change can be measured prior to, during and after the implementation process in order to fully understand the several variables at play.

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