CAPITAL UNIVERSITY OF SCIENCE AND TECHNOLOGY, ISLAMABAD

Impact of ERPS Adoption on Project Success, with Mediating Role of Knowledge Management and Moderating Role of Employee Training

by

Muhammad Usama Munir

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Dedicated to my parents who dedicated their life to teach me how to step forward...!

CERTIFICATE OF APPROVAL

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Abstract

The purpose of the study is to understand how Enterprise Resource Planning Systems (ERPS) Adoption contributes to Project Success (PS) in the organizations of Pakistan. The study proposes a framework to examine mediating role of creative Knowledge Management (KM) between the relationship of ERPS and project success. Furthermore, moderating role of employee training (ET) is examined between ERPS and knowledge management. The data was collected from 340 employees working in different project based organizations in Pakistan. The data was then tested through SPSS to test reliability analysis. The results of the study demonstrated that ERPS is positively linked to project success. The mediating role of knowledge management is also significant between the relationship of ERPS adoption and project success. On the other hand, study indicates that employee training moderates the relationship between ERPS adoption and knowledge management. Implications, limitations ad future research direction are discussed in the end.

Keywords: ERPS, Knowledge Management, Project Success, Employee Training

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Abbreviations

DV	Dependent Variable
ERP	Enterprise Resource Planning
ERPS	Enterprise Resource Planning System
ET	Employee Training
H	Hypothesis
IV	Independent Variable
KM	Knowledge Management
PS	Project Success

Chapter 1

Introduction

1.1 Theoretical Background

Enterprise systems (ES) are an important technological investment for firms to achieve strategic objectives (Bendoly, Rosenzweig, & Stratman, 2009). In this new emerging technology oriented professional society, implementation and adoption of information systems like ERP plays vital role in customer satisfaction, reduction in cost, improvement in business processes and ultimately success of project. Moreover, ERP systems have the ability not only to link up all the management levels i.e. top, middle and lower level but also it links all departments (Aremu & Shahzad, 2015). Training and education of users plays important role in adoption of ERP systems (Bazhair & Sandhu, 2015). Enterprise Resource planning implementation includes business process standardizations, process improvements, multi-functional business process integration, reductions in inventory, and stock turns. This is the business justification of implementing ERP systems (Volkoff, Strong, & Elmes, 2005; Ross & Vitale, 2000).

Different companies with all sizes i.e. small, medium or large needs to streamline their processes, practices and business operations. To standardize their operations and processes and increase efficiency of their businesses is their top priority (Tarhini, Hassouna, Abbasi, & Orozco, 2015; Orozco, Tarhini, Tarhini, et al., 2015; Abbasi, Tarhini, Hassouna, & Shah, 2015). Enterprise Resource Planning

(ERP) is an information system (IS) that is used in organizations for integration and coordination of interdepartmental business operations. It is also called as the system which is example of other Enterprise Systems like Supply Chain Management (SCM) system, which deals with management of raw material and supply of the products. So, Enterprise Resource Planning (ERP) systems deals with management of internal processes and operations of organizations (Monk, Monk, & Wagner, 2009; Van Hau & Kuzic, 2010). Not on this, but it also gives organizations a centralized system, where unified database is available for all the departments, which makes management, execution, and storage of data and procurement, production and fulfillment processes easy and smooth (Magal & Word, 2009).

When it comes to ERP research field, it has very sound background of implementation studies. Schlichter and Kraemmergaard (2010) states in the comprehensive review of ERP research over a decade synthesize 885 peer-reviewed journal publications between 2000 and 2009 to understand the current standing of ERP research. This actually aims to develop a reliable framework that will facilitate in design, implementation and use of ERP systems. When ERP research was reviewed, almost 80% of the topics came under the categorization of ERP implementation, ERP management, ERP optimization and on ERP tools. Moreover, when they are analyzed specifically, 30% of the research came under categorization of implementation aspects, 20% on management of ERP, 17% on ERP optimization, and 14% on ERP tools and the remaining 19% deals with other ERP topics.

In this era, there is a lot of competition among companies and organizations. Everyone is looking for something competitive to cope with such competitive environment; everyone is running a race to prove its side more powerful. This is the reason technological uses and consumptions are becoming need of hour. According to the competitive environment and need of era, technological advancements and its use in operations is becoming a source of competitive advantage for organizations (Gollner, Baumane-Vitolina, et al., 2016). There is a study that depicts Enterprise Resource Planning system's adoption, organizational structure and technological change have much impact on the performance of medium sized organizations by

proposing an advanced framework that analyses significant concerns relating to ERP systems adoption and provided positive and valuable outcome for medium sized enterprise firms (Aremu, Shahzad, & Hassan, n.d.).

Knowledge management plays significant role in improvement of organizational performance (Ahmad, Lodhi, Zaman, & Naseem, 2017). It has opens up many avenues for researchers to explore its various dimensions i.e. relevance of knowledge and its management (Heisig et al., 2016). Some specific journals publish research studies on knowledge management which not only increases interest of researchers but also increased the visibility, importance and impact of knowledge management in literature (Akhavan, Ebrahim, Fetrati, & Pezeshkan, 2016).

There are various terminologies like knowledge storing, knowledge distribution, knowledge matrices, knowledge mapping, knowledge creating, and knowledge mapping. These are interlocking terms ultimately leads to and defined as knowledge management (Gloet & Terziovski, 2004; Durst & Runar Edvardsson, 2012; Reich, Gemino, & Sauer, 2014). As mentioned in the literature on project success, it is considered as a measuring tool called iron triangle (time, cost and quality) these tools are used to analyze the project success (Nubuor, Hongyi, & Frimpong, 2014). For achieving competitive advantage, organizations must implement knowledge management process by encouraging teams to take part in creating and increasing organizational knowledge (Barisnav, 2014). Knowledge is reflected as the most common item in all the projects and it is also reviewed as precondition for effective project management (Sankarasubramanian, 2009).

Training is the best approach towards the effective development of employee and it also helps in improving employee's skills (Hussain & Soomro, 2018). Employee training acts critically at two aspects i.e. grows the employee to ideal performance and it also influence on organization's current performance and upcoming objectives (Rama Devi & Shaik, 2012).

Training gives employees the solid grip on their tasks hence it is the need of the organizations. Providing employees with the detailed required information, giving and enhancing their skills or any professional development which help in their workspace is called Employee Training (Elnaga & Imran, 2013). By providing

training to the employee's company can generate more committed employees with more stable skills (Ali, Muzaffar, & Salamat, 2012). Employee is the back bone of any organization and they can make or break your business. So Top management has decided to invest in employee training programs because employee training plays an important role in employee performance. One can achieve the best outcome of training if the objective and purpose of training is identified (Elnaga & Imran, 2013).

Employee training is identified as significant component of HR which impact the employee attitude (Luthans, Avey, Avolio, & Peterson, 2010). Training is associated to the skills which top management believed that must be learned by the team members to improve their performance and increase the chance of success (Chen, Chang, & Yeh, 2004).

In the current era of technological advancement, employees who remain up to date with the technology will survive. So for this purpose training and development programs are the best practices to engage with the modern solutions (Ali et al., 2012). Many Enterprise Resource Planning consultants' states that it is very important for the companies to keep 10% to 15% of the ERP budget aside for the training of ERP system. As ERP system without having proper procedural training is of no significant use. Thus, it is safely said that ERPs success strongly based on its proper use that results from proper training for its implementation and use in the organization (Esteves, Carvalho, & Santos, 2002).

Project success can be defined in three ways i.e. as process, product or organizational success (McLeod, Doolin, & MacDonell, 2012). When we talk about success of ERP projects success, there are three major dimensions that depicts the success of Enterprise Resource Planning (ERP) systems in most efficient and effective manner i.e. Success of ERP project is defined with regard of delivering ERP solution on time and within specified cost, that means that ERP is successfully implemented if it is implemented under given reasonable budget and within reasonable prescribed timeline (Lech, 2013). Second, realization of ERP's financial and non-financial advantages is considered as ERP project investment, thus user can feel, understand and consume the importance, use and impact of it (Al-Mashari &

Al-Mudimigh, 2003). Third, ERP project success is defined as deploying the ERP artifacts within specified cost and time, while delivering organizational change so that the consumers become convinced and contented, advantages are realized and the sponsor is also contented.

Each project is different from the other like different in size, time, scope thus the project success criteria is different for each project (Muller & Turner, 2007). It is not easy to measure the project success, as in some cases projects objectives are well achieved but customer is not satisfied and in other cases objectives are not fulfilled but still customers are satisfied (Thomas, Jacques, Adams, & Kihneman-Wooten, 2008). In project based organizations, enterprise information management strategies benefit more to the project by identifying the needs of the projects and the demands on more authentic grounds and also by keeping in account its sound logical reasoning. It ultimately leads to increases performance of the projects. It also helps out in knowledge creation and dissemination between project instances (Fong, 2003).

1.2 Research Gap

Training with the ERP implementation is the ignored issue in the field of research so it must be studied because training can increase the success of ERP implementation (Lopez et al., 2018).

This study will try to address this gap. This study will use Employee training as moderator between ERP and KM. Moreover, a very little research is conducted on direct relationship between ERP adoption and knowledge management. Addition of Employee Training as moderator between ERP and KM is one of the unique areas which are yet to be explored in the field of Project Management.

This research could make a difference in the field of research as such research with these variables i.e. ERPS, Knowledge Management, Employee Training and project success collectively is not yet being conducted in Pakistan as per our best knowledge. ERPS is in spotlight and requires more and more research due to its development contribution in various fields, so it could be point of learning and

more exploration in the field of research. Moreover, ERPS adoption in the project management field of study is not much focused area of research. This study will contribute significantly in literature and research study in Pakistan. This research is also the combination of two main fields i.e. Information Technology and Project Management.

1.3 Problem Statement

As we are living in the era of technology and each manual processes are going toward automations. A lot of new tools and applications are used to remove the paper work and manual processing. Computer applications are making this manual process work a lot easier. Organizations improved their productivity through the use of computer applications. As the business grows employees fail to pass on information effectively which results in negative outcomes. In organizations a lot of time is spent on manual data entry which can be reduced using ERP system. ERP systems was not getting much of success initially due to lack of expertise. So by providing training to the employees this can be resolved and knowledge sharing can also be done effectively. Adoption of ERP system in any organization improves the efficiency and productivity of organization and ultimately leads toward the project success. As ERP system is computer based application then detailed training should be provided to the employees. So they can easily use the application and get the best out of it. Employee training is consumed as moderator in this research.

However, its relationship with some variables is not yet came to notice. On the other hand, now a day's organizations and institutions have major inclination towards project based work structures. So it becomes a need of hour to study ERPs and its relationship with project success for smooth delivery of projects. Moreover, when it comes to moderation effects of trainings between ERPs adoption and knowledge management it is also considered to be the area which is still not in spotlight instead of having its sound contribution in adoption and implementation of ERPs for smooth project delivery. So this study will provide evidence in this

area (ERP adoption, Knowledge Management, Employee Training and Project success) as it is the need of time.

1.4 Research Questions

Based on the problem statement mentioned above, following are the research questions for this study:

Research Question 1

What is the effect of ERPs adoption on the success of the project?

Research Question 2

What is the moderating role of employee training between ERP and Knowledge Management?

Research Question 3

Does knowledge management play a role of mediator between the relationship of ERPs adoption and Project success?

Research Question 4

Does the study play a significant role in the contextual settings of Pakistan?

1.5 Objective of the Study

Widely, this research aims to study the relationship between ERP systems, Knowledge Management, project success and training and development. Moreover, Employee training is used as moderator between ERP adoption and Knowledge management to check the relationship of mentioned variables. It has following specific objectives:

Research Objective 1

To explore the relationship between ERPS adoption and Project success.

Research Objective 2

To explore the association between ERPS adoption and Project Success through Knowledge Management.

Research Objective 3

To examine the moderating effect of Employee Training on the relationship of ERPS Adoption and Knowledge Management.

Research Objective 4

Testing the research model in the context of Pakistan

1.6 Significance of the Study

On one side, this research will be helpful in adding theoretical content to the field of project management and on the other side; it will also be providing solid evidences that the project success rate can be increase by the adoption of ERP system.

Through the effective use of ERP system in the organization, the knowledge can be floated and circulated throughout the organization. So ERP also plays an important role in the knowledge management of organization.

This research will elaborate that how adoption of ERP systems in organization will be helpful while implementation of project. This research opens up various avenues for researchers and develops content to the theoretical aspects of ERP systems and project success. This research will also contribute to the organizations of Pakistan for realizing the importance of ERPs systems and its efficient usage.

Today's era is the era of technology. Every business and organization wants to get competitive advantage through the use of technology. So this is the best time for organizations to adopt ERP as their business solution. This study will help the organization that how knowledge and information can be managed through the use of ERP solutions.

This will also develop better understanding that without employee training the effectivity of ERP can be decreased. Many organizations faced failure after the adoption of ERP system because they don't know how to use this technology. So this study will helpful in this regard too. This study focuses on the importance of employee training while adopting the new technology in any organization.

This domain in specific has not been explored in Pakistan, so this study will be good contribution in the field of Project management. This study will also fulfill the existing research gap in previous literature because research on ERP implementation and employee training has not been studied in the field of Project management within Pakistan.

1.7 Supporting Theory

Technology Acceptance Model is consumed as our theory foundation. As in our research ERP adoption will act as technology adoption and its impact can be explained with the help of Technology acceptance model.

1.7.1 Technology Acceptance Model

This was developed by Davis (1989). TAM is an information system theory that models how users are able to accept a technology and how they use that technology. When new technology is presented to the users, their decision depends on two factors i.e. Perceived Usefulness and perceived ease of use (Davis, 1989). Perceived usefulness means that how the user thinks that the technology will assist to enhance the performance. Perceived ease of use means that how much user is feeling easy in using the new technology. Perceived usefulness and perceived ease of use are viewed as the core variables that instantly influence and explain the results (Marangunic & Granić, 2015).

So in this study we are using ERP technology as our new technology. So ERP adoption in any company can be best explained through this model. This theory

fits best with this research. So whenever new technology is adopted, Technology acceptance model is the best approach to examine the progress.

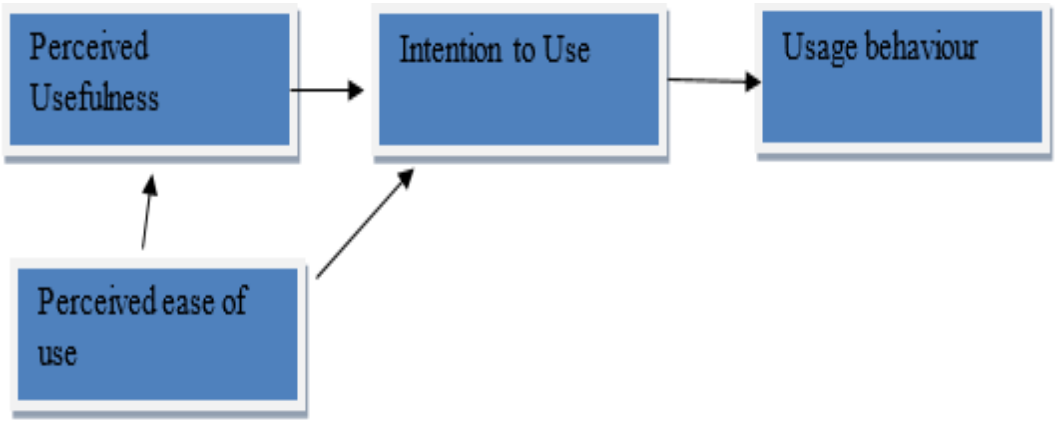

FIGURE 1.1: Technology Acceptance Model

There is facilitation function between Intention to use and usage behavior to overcome the barriers. Facilitation functions include Support, Training and other things which help to use the technology more effectively. So we will use Training as our facilitation function.

It is observed that perceived benefits are associated with the user response to trainings. So, proper communication is necessary in this regard (Venkatesh, Morris, Davis, & Davis, 2003).

Chapter 2

Literature Review

This research is based on the emerging implementation of ERP systems and its relationship with project success. As ERPs use is need of hour so this research focuses on its impact on project delivery by defining knowledge management as mediator and taking training as significant part of strengthening the relationship between ERPs and knowledge management.

The model suggests five hypotheses based on the relationship between the different variables under consideration.

2.1 Enterprise Resource Planning Adoption

ERP is a company-wide solution that unites business procedures into single alone but shared data repository (Lee & Lee, 2000). In this era of increasing competition and technological developments, there is need to store and integrate all the information supplied by different departments within a company or organization to a single server o portal. Information management helps organizations for smooth workings and makes working time effective. Enterprise Resource Planning systems are designed to cope up with this integration issue, and integrate all the information on a single point (Koch, Slater, & Baatz, 1999). ERP is a technique of using computer based technology to combine all the functions, like human resource, marketing and finance throughout the organization (Aremu et al., n.d.).

A lot of research has been done on Enterprise Resource Planning (ERP) and covered different dimensions of it. These researches concluded on many pros and cons of ERP systems and also ended up concluding its success or failure of ERP systems. But when ERP comes under spotlight in the field of research, literature shows that most of the researchers and ERP specialists has conducted researches on implementation of Enterprise Resource Systems (ERP) (Botta-Genoulaz, Millet, & Grabot, 2005; Salmeron & Lopez, 2010; Law, Chen, & Wu, 2010; Schlichter & Kraemmergaard, 2010).

According to American Production and Inventory Control Society (2001), ERP is a technique of effectively managing all the resources required to get, create and ship for customer orders in a manufacturing, distribution and service organization (Chen et al., 2004). ERP systems plays significant role in any organization. Their implementation can bring major positive changes. If enterprise resource planning is implemented successfully, it can bring competitive advantages which ultimately boost up the standing of organization (Maguire, Ojiako, & Said, 2010).

ERP enhances the value of work and reduces the operational time and cost by combining all the activities of all the departments within an organization into sole database (Awa, Ukoha, & Emecheta, 2016). It is of no objection, that Enterprise Resource Planning and its implementation plays significant role in the success of the company or organization in which it is installed or implemented but not all ERPs picture same positive results (Wong, Scarbrough, Chau, & Davison, 2005; Grossman & Walsh, 2004).

2.2 Knowledge Management

Knowledge management is an approach of reaching the right knowledge to the right persons at the right moment and assisting people share the information in the best manner to increase organizational performance (O'Dell & Grayson, 1998).

Kulkarni, Ravindran, and Freeze (2006) developed his own theory on knowledge management model. His theory as based on the hypothesis that if the quality of knowledge is better i.e. content of available information. It has a positive influence

on transfer or sharing of knowledge. Increasing the use of organizational knowledge by adopting some basic techniques of information management and organization learning is called Knowledge Management (Ahmad et al., 2017).

A method of converting individual knowledge into organizational knowledge is Knowledge Management (Rasula, Vukvsic, & vstemberger, 2012). When it comes to success of organization or company, knowledge management is considered to be one of the most impactful factor as if knowledge information available is reliable, derived from authentic resources, used in careful and impactful manner, and is stored for its any contingent use, that operations of organization are smooth and reliable and ultimately output of organization increases. (Ahmad et al., 2017).

2.3 Employee Training

Employee training plays significant role in development of organization. Training is considered as ultimate need of employees in order to work in more efficient and effective manner (Sewdass et al., 2003).

Stredwick (2005) also noted and observed that the most vital part in human resources is to facilitate employees enhance their performance (through employee training and development) and, by doing so, to ultimately improve the performance of the organization. Employee training and development has become one of the key aspects in improving employee performance in organizations, thus leading to improved organizational performance and growth. Employee training is not only considered as the construct of improved performance and success of organization but it also plays significant and strategic role in economic success of U.S organizations who accepts that they are now living in new global economy, the economy that is made up of new technological uses and responsiveness to customer needs in more technical and efficient manner (Marquardt, Nissley, Ozag, & Taylor, 2000). Employers should conduct training need analysis and provide training programs related to their needs and status (Nutting, 2000).

When it comes to any system like enterprise resource planning (ERP), use of training and its importance takes a boost. Ineffective and inefficient training systems

disappoint the user and ultimately hit the image of product and company (Choi, Kim, & Kim, 2007). Furthermore, when an employee is called for a training and is asked to learn more to contribute more, it increases the ownership among employees as they observe and admit that their contribution is what organization actually wants and your development ultimately also becomes organization's purpose. So training helps to keep employees motivated and enthusiastic (Esteves et al., 2002).

Training and development is considered as a basic tool for efficient and effective service delivery. There is need of effective training and development programs to boost up the performance of employees and ultimately increase service delivery (Mpofu & Hlatywayo, 2015). Training and employee engagement are basic constructs of improved employee's performance and has positive effect on output of employee (Sendawula, Nakyejwe Kimuli, Bananuka, & Najjemba Muganga, 2018).

2.4 Project Success

During the 80s, in the XX century, scientists mostly researched and observed the old and traditional criteria of evaluation of success o performance of any project e.g. time, cost and quality etc. In 90s, researchers started conducted the studies that were based on the facts that project success is not only determined or specific to these two to three variables rather project success is a multi-dimensional category same as different people and different companies takes success of the project differently based on their own criteria's (Fortune & White, 2006).

Pinto and Slevin (1988) observed a number of years ago, "There are some of the topics that comes under project management and are very frequently observed and yet very rarely agreed upon as the notion of project success" (p. 67). Project success is defined in a broader way (Munns & Bjeirmi, 1996) states that mostly projects are restricted to customers i.e. project end when they are delivered to the customer. In 1970s, the main concentration was on execution of project, completion of project and ultimately enhancement of project to measure the project success (Turner & Müller, 2005).

Jugdev and Müller (2005) have reviewed project success literature for past 40 years. And found that a more holistic approach to measuring success was becoming more in evidence. According to his, researchers used to measure success by impact on organizations instead of meeting the constraints. According to Thomas et al. (2008) to measure project success is not straightforward, as there are some incidents where original project objectives were not met but the clients were satisfied, but on the other hand, there were incidents when project objectives were met but customers were not satisfied.

2.5 Enterprise Resource Planning Adoption and Project Success

There are almost more than 60% of companies of United States, which are implementing or planning to implement Enterprise Resource Planning in their companies in 2000. Since then, ERP software's and the support software's of Enterprise Resource Planning's sale have increased up to 150% per year. It almost increased sales of more than $30 billion in 2004. If we talk about expenditure on ERP they are also much more (Sheu, Chae, & Yang, 2004).

If we talk about the companies who have implemented ERP systems, have a major difference with the companies not using ERP system in terms of performance. RP oriented companies and organizations tend to generate more performance and increase output across wide variety of financial outputs (Hitt, Wu, & Zhou, 2002). Now a day's Enterprise Resource Planning (ERP) is becoming critical organizational resource (Ko, Kirsch, & King, 2005) it has come under spotlight now and is considered as the backbone of information systems of many companies (Kalakota & Robinson, 2001). A lot of enterprise resource planning research has been done to find out the critical success factors (CRFs) associated with ERP implementation (Grabski, Leech, & Schmidt, 2011).

Out of overall research yet done on Enterprise Resource Planning, 80% of the topics are laid in the category of management of ERP, implementation of ERP,

optimization of ERP, and the tools of ERP. If we specifically observe, 30% are focused towards ERP implementation, 20% on ERP's management, 17% on ERP's optimization, and 14% on ERP tools. The remaining of the 19% is related to the other topics of Enterprise Resource Planning (ERP) (Schlichter & Kraemmergaard, 2010). Extensive research has been done on ERPs and they affirm that ERP systems have major inclination and focus over planning and managing of organizational resources in most effective, efficient and profitable manner in order to make sure that all the processes are integrated over ERP system (Aremu & Shahzad, 2015; Hwang & Min, 2013).

A study shows that ERP system adoption, organizational structure and technological change have much influence on the performance of medium sized organizations by proposing an advanced framework that analyses significant concerns relating to ERP systems adoption and provided positive and valuable outcome for medium sized enterprise firms (Aremu et al., n.d.).

ERP projects are considered to be the biggest projects that organizations may take. Their size, cost, and influence on business processes make them even more complex. So it could safely be elaborated that ERP systems facilitates in integrating system of whole organizations and makes further working smooth and convenient. Also, ERP enabled business processes are best for re-engineering in order to increase output and effectiveness of projects and businesses (Soh, Kien, & Tay-Yap, 2000; Nah, Faja, & Cata, 2001).

Although there is a lot of interest of practitioners and researchers over Software as a service (SAAS) ERP systems, but the research on adoption and implementation of ERP systems is not yet much explored and developed (Salleh, Teoh, & Chan, 2012; Venkatachalam, Fielt, Rosemann, & Mathews, 2012; Johansson & Ruivo, 2013).

There is no surprise that a successful implementation and use of ERP system reduces the cost, increases the efficiency and takes lesser time to complete a project, which ultimately free organizations from heavy burdens as costs and smoothen the organizational processes by delivering timely and efficient outputs. In this regard, ERP developers play significant role (Stein, 1999). Now a day there is a lot of

competition among the companies so everyone is looking for some additional ways through which they can do better than others. So, to increase their productivity, organizations needs an intelligent IT application which can do the maximum business processes across the organization (Gollner et al., 2016).

Project success can be taken as a process, product or organizational success (McLeod et al., 2012). When it comes to ERP projects success, there are three major perspectives i.e. ERP project success is defined in terms of delivering ERP on time and within specified budget (Lech, 2013) Second, ERP project investment success is the realization of ERP's financial and non-financial advantages so that consumers can understand and absorb the significance and use of it (Al-Mashari & Al-Mudimigh, 2003). Third, ERP project success is defined as deploying the ERP artifacts within specified budget and within the prescribed time, while delivering organizational change so that the consumers become contented, benefits are realized and the sponsor is also contented.

Implementation of ERP systems increases the efficiency of employees and ultimately the organizational efficiency of employees increases. It is because of the updated and reliable data which impacts the performance in positive manner (Madanhire & Mbohwa, 2016).

H_1***: ERPs adoption has direct positive relation with Project Success.***

2.6 ERP Adoption and Knowledge Management

There are two very emerging and influential organizational initiatives can be identified that are being or have been widely implemented and used for effective and efficient output delivery. The first is ERP systems and the other one is knowledge management (KM) systems (Davenport, De Long, & Beers, 1998). Knowledge management is considered to be a vital factor in the success of organizations (Antoni, Nilsson-Witell, & Dahlgaard, 2005).

Implementation of Enterprise Resource Planning (ERP) is a very complex procedure. It has challenging and dynamic process. It not only brings technological changes within the organization but also brings organizational changes in the affected company/organization (Otieno, 2010). These change need to be administered very carefully through Enterprise Resource Planning (ERP) solutions (Al-Mashari & Al-Mudimigh, 2003). Although there is knowledge and information available to overcome such challenges and issues, still there are numerous cases of failure of Enterprise Resource Planning (ERP) implementation (Soh et al., 2000; Hillman Willis & Hillary Willis-Brown, 2002; Barker & Frolick, 2003; Nah et al., 2001; Dezdar & Sulaiman, 2009).

When it comes to defining knowledge, most of the organizations define it as significant competitive asset that defines performance of organization (Alexy, George, & Salter, 2013). Enterprise Social Networks (ESN) plays significant role in information sharing and knowledge management. These networks enable users to form categorized groups specific to different topics and projects by proper maintenance in folders. This ultimately helps in storing, managing and sharing information in a reasonable manner (Aoun & Vatanasakdakul, 2012).

Ko et al. (2005) proposed a theoretical model of knowledge transfer and sharing through knowledge communication and knowledge motivation. Although significance of Knowledge management in enterprise resource planning is getting recognized, but how to manage knowledge to base the mentioned process has not yet come under point of consideration. Here systems theory is proposed to manage the relevant knowledge of enterprise resource planning implementation process (Xu, 2000). In the organizations, ERP system enables information sharing and increase the efficiency of the organization (Chand, Hachey, Hunton, Owhoso, & Vasudevan, 2005). To encourage the knowledge sharing and organizational learning, Knowledge management needs systems to form and maintain the knowledge repository (Grover & Devenport, 2001).

It is already stated in paper, that ERP is a Computer Based technology (Aremu et al., n.d.). There are two essentials of IT part of KM, knowledge capture ability of IT and usage of IT tools (Rasula et al., 2012). Shaping knowledge and saving it into

applications allow us to convert the implicit knowledge into explicit knowledge; this is called knowledge transformation cycle (Lee, Lee, & Kang, 2005).

Knowledge sharing is the process in which individuals/ employees share the existing knowledge and creates the new one as per the needs and experiences they have (Van Den Hooff & De Ridder, 2004).

Knowledge management is defined as the process of sourcing, capturing, identifying, storing, sharing, creating, implementing, and using knowledge and most of the scholars and researchers regards knowledge sharing as the most critical part of knowledge management (Cabrera & Cabrera, 2002; Zhang, De Pablos, & Xu, 2014; Zhang, De Pablos, & Zhou, 2013). They are in the view and perspective that exchange of knowledge among employees within employees is a vital part of knowledge management and ultimately produce developed outcomes. It is not possible for a company or organization to leverage its assets without effective knowledge sharing and ultimately knowledge management (Jarvenpaa & Staples, 2000).

According to Swanson, users and consultants both plays vital role in the successful implementation of enterprise resource planning systems. It shows that employees must be well aware of the ERP systems and its implementation procedures. So we can safely justify that transfer of knowledge plays a major role in terms of Enterprise Resource Planning (Soh et al., 2000).

Enterprise system lifecycle states the process of selecting, implementing and using the enterprise system. Knowledge management can assist the companies and firms through these different stages of enterprise system lifecycle (O'Leary, 2002; Robey, Ross, & Boudreau, 2002).

H_2: ERPs adoption has direct positive relationship with Knowledge Management.

2.7 Knowledge Management and Project Success

As project success is considered as time, cost and quality of project and it can be achieved by management of knowledge (Suppiah & Singh Sandhu, 2011). Knowledge management and project success are strongly related. When it comes to knowledge management it means knowledge planning, sharing and proper use of it with managed approach. Knowledge management is becoming one of the most important features in order to achieve project success. With a proper flow of information and its use within organization defines the intensity of success of project (Niedergassel & Leker, 2011).

Researchers take knowledge management as significant part of success of the project and ultimately success of organizations. If knowledge is planned, stored, use and managed properly, the projects outputs are always desired and productive (Linderman, Schroeder, & Sanders, 2010). Projects are basically involved in the development of new product or services. The organizations that are dealing with such productive projects can produce much successful results by knowledge management. Knowledge management can facilitate such organizations for smooth project delivery i.e. minimum time and cost and maximum output (Serrat, 2017). The relationship and link between knowledge management with organizational performance has been studied a lot of times and it is found that there is a positive relation between both of the variables. So better organizational performance leads the project to success (Jain & Moreno, 2015).

Knowledge sharing lessens down the effort of each and every employee over the same concern, which ultimately saves time, extra effort and cost allocated over specific project and in return project results are more effective and efficient and project is regarded as successful one (Boh, 2007). Knowledge sharing in an organization helps in building new knowledge and using the available knowledge more efficiently (Nonaka & Takeuchi, 1996). Knowledge is one of the most important resource that increases organizational performance when organization includes knowledge attainment (Wiig, 1997).

Knowledge management processes have significant impact on performance of organization i.e. it has positive relation with individual and collective learning, collaborative decision making, and innovation. Knowledge integration and innovation plays significant role in success of organization because of efficient and effective performance. More specifically knowledge sharing is one of the most significant part of knowledge management which plays an important role to performance of organization (Hansen, 1999).

Chu (2000) states that organizational learning and knowledge sharing has a positive direct relation with product development. Knowledge creation is considered as one of the major construct of improved organizational performance (Lee, Wu, Ai, & Tu, 2007). So there is need for the organizations to develop a culture where employees not only have the liberty to create knowledge but also to use, share and implement it, which ultimately boost up the success of organization with increased performance outcomes (Gold, Malhotra, & Segars, 2001). Recent research indicates that proper management of knowledge considerably plays an important role in the project performance and ultimately leads the project to success (Wei & Miraglia, 2017).

Knowledge management is about increasing the use of organizational knowledge with the help of organizational learning and information management. Knowledge management practices through information technology ultimately increase the performance of organizations i.e. universities (Ahmad et al., 2017). Using knowledge management practices and processes is considered as vital activity to achieve competitive advantage and project success in an organization (Kiessling, Richey, Meng, & Dabic, 2009). Many studies suggest that project based companies put plenty of efforts has been made to check the ability of organizations to reuse the knowledge available and influence the knowledge throughout the project (Pemsel & Wiewiora, 2013).

These leads to the below mentioned hypothesis.

H_3***: Knowledge Management has direct positive relation with project success.***

2.8 Mediating Role of Knowledge Management between ERPs Adoption and Project Success

Knowledge management is a process of creation, application, dissemination, renewal and updating of knowledge for having the maximum productive output. Knowledge or information available or needed in any organization plays a significant role in the working structures of organization, so it needs to be accurate, authentic and well-managed. We can say that, it includes planning, sharing and managing of organizational performance for smooth working (Awad & Ghaziri, 2009).

A study reveals that knowledge management and ERPs use can prove helpful in improving organizational performance, so it can safely be elaborated that if knowledge management and Enterprise Resource planning are used and implemented efficiently and collectively it leads to success of organization (Huang, Newell, & Pan, 2002). It means knowledge management and Enterprise Resource Planning are strongly connected i.e. if ERP integration systems are implemented, installed and used in an organization, then ultimately knowledge will be stored, planned, shared and managed more appropriately. This basically improves the processes and leads to project success which ultimately causes success in organizational performance.

Now a day, knowledge is not only embedded in the documents or manuals rather it is also fixed in the processes of organizations, practices of organizations, norms and culture of organization and even in the minds of employees (Merriam, 1996). Fong (2003) states that in project based organizations, enterprise information management strategies facilitates more to the project by identifying the project needs and requirements on more reliable grounds and by considering logical avenues and ultimately leads to enhanced performance of the project. It also helps out in knowledge creation and dissemination between project instances.

To understand the integration process of knowledge management into ERP lifecycle there is a need to develop or have a model to assess organization efforts towards managing knowledge in an ERP oriented work environment as Nonaka and Konno (1998) proposed the significance of a knowledge forum named as "Ba" where existing knowledge can be smoothly shared and needed knowledge in efficiently created. Although now organizations are more towards knowledge management and it is becoming their focal point but still there is need to take knowledge management more seriously (Kasvi, Vartiainen, & Hailikari, 2003).

A systematic incorporation of knowledge management (KM) into Enterprise Resource Planning (ERP) is critical and strategic (Sarvary, 1999). Effective knowledge management and its implementation plays a vital role in the success of ERP incorporated structure and is major construct of continuous improvement as it ultimately produces effective and efficient output (McGinnis & Huang, 2007). Enterprise Resource Planning (ERP) Knowledge management (KM) has direct positive impact and influence on management performance (Liu, 2011).

Enterprise Resource Planning leads to the development of integrated systems, which streamlines all the processes, systems, structures, systems, policies and culture of organization. This integration causes improved and reliable data entry which causes accurate and managed data production. Integration of Enterprise Resource Planning (ERP) in any organization causes smooth flow of operations by incorporation of best industry practices, as a result overall performance of the organization increases and success becomes ultimate. As integrated system causes smooth flow of information within the departments of organizations it's ultimately causes improved communication and boosts up the performance of employee with a noticeable margin. In such scenario, customer's satisfaction level also increases which is a true depiction of employees improved performance and success of the organization. Besides all, such concepts like Enterprise Resource Planning (ERP) and their integration in any company also reduce inventory cost; result in effective planning, and forecasting of requirements which are symbol of project success (Seddon, Calvert, & Yang, 2010).

H_4: Knowledge Management mediates the relationship between ERPs Adoption and Project Success.

2.9 Moderating Role of Employee Training between ERPs Adoption and Knowledge Management

ERPs adoption and implementation is not an easy process, they are highly complex information system that needs to be managed well and requires some serious efforts and expertise. It requires high cost, time, and sensitivity toward the details. Many ERPs implementations failed because of lack of focus to its sensitivity and requirements. Training and education is also one of the major requirements for the smooth implementation of ERP systems. An extensive knowledge is required for implementing this information system, as if employees are not properly trained about the use, adoption and implementation of ERP systems, they could never get the desired outcomes from its use and it could be considered as burden instead of convenience. Instead, a trained employee can get most out of ERPs use and implementation (Hutchins, 1998; Laughlin, 1999; Sherrard, 1998) the results drive without proper use and knowledge could never be accurate. Resources that are using and implementing the systems must have in-depth knowledge of use in order to get desired and productive outcome. For that they require extensive training and education over the systems and must be aware on how to get maximum out of it and ultimately information will be shared, stored and managed properly (Hutchins, 1998).

ERP has a strong relationship with knowledge management. In spite of the fact that technology is not defined as knowledge management nor it itself is knowledge management, but knowledge management is facilitated by human beings who apply and use technology. If knowledge is not used properly, its implementation

could be questioned. As human are major construct of knowledge storage so success of enterprise resource planning is determined to the extent knowledge is stored properly (Li & Xu, 2001).

Successful implementation of enterprise resource planning (ERP) requires accurate data migration i.e. data transfer permanently from one system to another through selecting, preparing, extracting, and transforming data (Häkkinen & Hilmola, 2008; Momoh, Roy, & Shehab, 2010). Implementation of enterprise resource planning also requires through testing (Motwani, Mirchandani, Madan, & Gunasekaran, 2002; Gargeya & Brady, 2005) and also effective trainings that there remain no gap while implementing Enterprise Resource planning in any company or organization (Markus, Axline, Petrie, & Tanis, 2000; Gargeya & Brady, 2005).

ERP system aims at storing company's data on a centralized server. This data has several purposes i.e. it may be processed, stored, used or implemented at different platforms. Some data may have resided in company's website some may be stored in form of manual and updated accordingly and so on. But even than most of the data remains in the heads of people as in some are specifically trained for it and some consume it by its use. So knowledge management is connected with ERP by having humans to achieve more success (Van Stijn & Wensley, 2001).

Organizational preparation for knowledge management plays strong significant role in ERP implemented environment. Employee's learning and training, useful and authentic information, strong data base and data network, knowledge scanning and knowledge sharing processes has a strong positive effect on increasing knowledge management in enterprise resource planning environment (Li & Zhao, 2006).

Proper training methods and procedures are considered to be the major success or failure factors of ERP systems it totally depends upon how well the employee is trained and is using the system (Sumner, 1999; Kale, 2000). It means implementation of ERP by having no/poor training can lead to failure of ERP system and proper training oriented implementation of ERP leads to the success of ERP system. So, it could safely be concluded that enterprise resource planning is something that gives boom to the company but if not implemented properly i.e. not backed by proper training can produce different results (Gupta, 2000).

Many ERP consultants believes and propose that the companies plan to implement enterprise resource planning in their companies should keep 10 to 15% of their ERP budget for training of ERP for its successful implementation (Esteves et al., 2002) As training is considered to be the most important factor of ERP implementation and success, so there is need to focus on training for proper knowledge management and ERP implementation, that training could be in form of through the lecturer, on the job training (OJT), and computer based training (Noudoostbeni, Yasin, & Jenatabadi, 2009).

H_5***: Employee Training moderates the relationship between ERPs and knowledge management i.e. proper training and education of employees on ERPs implementation and use strengthens the relationship between ERPs and Knowledge Management.***

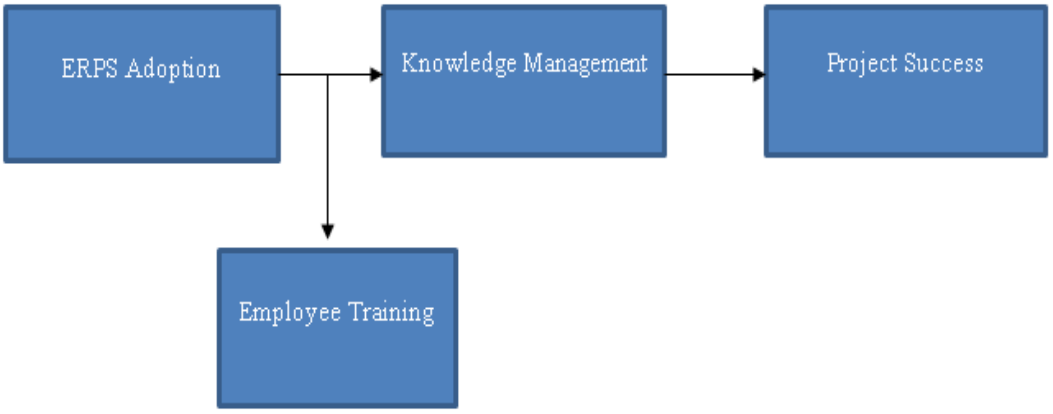

FIGURE 2.1: Research model of ERPS Adoption on Project success, with mediating role of Knowledge Management and moderating role of Employee Training.

2.10 Hypothesis of the Study

H$_1$: *ERPs Adoption has direct positive relation with project success.*

H$_2$: *ERPs Adoption have direct positive relationship with knowledge management.*

H$_3$: *Knowledge Management has direct positive relation with project success.*

H$_4$: *Knowledge Management mediates the relationship between ERPs Adoption and project success.*

H$_5$: *Employee Training moderates the relationship between ERPs Adoption and*

knowledge management i.e. proper training and education of employees on ERPs implementation and use strengthens the relationship between ERPs and Knowledge Management.

Chapter 3

Research Methodology

This chapter includes all techniques and procedures comprising research design, population, sampling methods, characteristics of sampling, unit of analysis, instruments and reliability of each variable as well as items that are implemented for the purpose to get valid results.

3.1 Research Design

3.1.1 Type of Study

This systematic research is used to describe the impact of Enterprise resource planning adoption on project success. To conduct this research, Pakistan based organizations have been targeted. Initially 400 questionnaires have been distributed but only 340 out of 400 responses were valid and considered for the research purpose. The sample chosen for this study is assumed to represent the entire population of Pakistan. The results of the study revealed by this research shall be concluded on whole population of Pakistan.

3.1.2 Research Philosophy and Quantitative Research

This research is based on hypothetical deductive research method, in which current research and previous concepts were used to explain and support our hypothesis

which will then be verified empirically for confirmation of proposed hypothesis. The hypothetical deductive model or process is an expected description of scientific method. As the name of this process indicates that there are two parts, the hypothetical and deductive parts. In hypothetical part, hypothesis is advised for assessment and in deductive part, results of assessment are deducted from the hypothesis. Then the results deducted from the hypothesis are compared with tested data to pass or fail the judgment. If the deducted hypothesis is different from the noticeable data, then the prediction is considered false and if the deductive hypothesis is not opposite to noticeable data then the hypothesis would have considered as true or pass.

To reach the great scale of population, quantitative methods are used and preferred. So this research is done using the quantitative research technique. So in order to collect quality data quantitative processes are used.

3.1.3 Unit of Analysis

Unit of analysis is usually the most important factor in any research study. In research study, the scope of unit of analysis can vary from individual to multiple groups, culture, company etc. Since this research is aimed on two-way association i.e. impact of ERP adoption on Project Success, so that unit of analysis for this research were the people working in the project based organization and using the ERP systems by themselves.

To measure the effect of ERP Adoption on project success through knowledge management amongst employees, research needed to approach the specific sector of project based organizations which basically required and advanced knowledge management through the use of ERP system. Finally, to assess the project success factor, users who ultimately gained from the projects were chosen as the unit of analysis.

3.2 Population and Sample

3.2.1 Population

This study focuses on the development sector. The population of study is the managers, subordinates and stakeholders of this field.

Data is collected from the people who will be using ERP system from public and private organizations. As ERP systems are not specific to only one industry so people using ERP system from any industry will be part of our sample. These include national and multinational level project based organizations running multiple projects in the field of Software technology, healthcare, social services, infrastructure etc. There are more than 35 projects under these multiple fields. The data is collected through questionnaire which will be filled via Google form.

3.3 Sample and Sampling Techniques

It is very difficult to collect data from the whole population due some limitations like time and resource limitations. Sampling is a technique which is normally consumed for data collection purpose. For this, particular group of individuals are selected that are the true representation of whole population. In this research, generally project based organizations of Pakistan were contacted.

Convenience sampling technique is used to collect data for impact of ERPS adoption on project success with knowledge management as a mediator and employee training as a moderator. At least 400 questionnaires were distributed and they were asked to fill it as accurately as possible.

Respondents filled total of five sections. In the first section respondent provided information related to demographics (gender, age, qualification & experience). While from second onward questions are related to our variables.

We used 5 point Likert scale to measure the responses where 1 represents “strongly disagree” and 5 represents “strongly agree”.

3.4 Sample Characteristics

The demographics used in this research are; gender, age, qualification, job sector, experience and organization.

3.4.1 Gender

To maintain the gender equality, gender is a very important element. Gender is considered as very significant element of demographics because there is a huge difference between male and female in a certain population sample. In this research, it has been well thought out to make honor of gender equality but still it has been seen that proportion of male staff is significantly more than the ratio of female employees.

TABLE 3.1: Gender

Gender	**Frequency**	**Percent**
Male	224	65.9
Female	116	34.1
Total	340	100

Table 3.1 shows the ratio of male and female gender in which 65.9% were male and 34.1% were female respondents. The percentage of male respondents was clearly high.

3.4.2 Age

Age is also considered as one of the important demographics, to which some respondents are not so comfortable in disclosing it openly. So, for the convenience of respondents range of ages are used instead of particular ages of the respondents.

TABLE 3.2: Age

Age	Frequency	Percent
20-30	88	25.9
31-40	117	34.4
41-50	82	24.1
51-60	41	12.1
61 or Above	12	3.5
Total	340	100

Table 3.2 shows that most of the respondents lies between the age of 31-40, which means that 34.4% of respondents were having the age ranging from 31-40, 25.9% respondents were having age between 20-30, 24.1% were having age ranging between 41-50, 12.1% respondents were having the age ranging from 51-60 and only 3.5% of respondents were aging above 60.

3.4.3 Qualification

Education is the main element which plays an important role in the success of any country or nation and the time also demands to compete worldwide. Education opens up new occasions for the students to grow and compete internationally. Hence, it is another important dimension of demographics.

TABLE 3.3: Qualification

Qualification	Frequency	Percent
Matric	04	1.2
Intermediate	23	6.8
Bachelors	140	41.2
MS/M.Phil.	112	32.9
PhD	61	17.9
Total	340	100

Table 3.3 represents the qualification of respondents. Maximum of the respondents were having the qualification of Bachelors, which involves 41.2% of the total respondents selected as true demonstrative sample of the whole population. 1.2% respondents were Matric qualified, 6.8% are intermediate qualified, 32.9% respondents were MS/M.Phil. qualified and 17.9% were PhD qualified respondents.

3.4.4 Job Sector

Job sector represents that what percentage of respondents belongs to public and private sector. It is the comparison of respondents working in government sector versus respondents working in any private firm.

TABLE 3.4: Job Sector

Job Sector	Frequency	Percent
Public	224	65.9
Private	116	34.1
Total	340	100

Table 3.4 shows that maximum (65.9%) of respondents works in government sector and only 34.1% of respondents works in private organizations.

3.4.5 Organization

This demographic shows that how many respondent and working in project based organizations and how many of the total respondents work in operation based organizations. Our main focus was to cover maximum project based organizations.

TABLE 3.5: Organization

Organization	Frequency	Percent
Project Based	223	65.6
Operation Based	117	34.4
Total	340	100

Table 3.5 depicts that 65.6% of the respondents were working in project based organizations and 34.4% of respondents were working in operation based organizations.

3.4.6 Experience

To collect information according to the experience of respondents, multiple ranges of experience time period were established so that every respondent can comfortably choose the specific time period of their experience.

TABLE 3.6: Experience Distribution

Experience	Frequency	Percent
1-5	9	2.6
6-10	15	4.4
11-15	114	33.5
16-20	134	39.4
Above 20	68	20
Total	340	100

Table 3.6 It can be seen clearly in the table that maximum number of respondents were having experience between 16-20 years, which summarizes that 39.4%

respondents were having experience between this range. 33.5% respondents were having experience between 11-15 years, 20% respondents come under the range of above 20 years' experience, 4.4% respondents have 6-10 years of experience, 2.6% have experience of 1-5 years.

3.5 Instrumentation

This research comprises of close ended questionnaire adopted from multiple sources which were used for the evaluation of four variables. Questionnaires were distributed among different groups of teams, employees and managers of the project based organization. The responses were received using five point Likert scale where 1 represents "strongly disagree" and 5 shows "strongly agree". Questionnaires also included the demographics.

3.5.1 ERPS Adoption

The five item questionnaire is adopted for ERPS adoption is considered by (Deloitte, 1999) and recently used by (Bradford & Florin, 2003). Some of the included items are "Reduction in inventory levels", "Improvements in order management and cycle times" and "Reduced costs in procurement". Responses will be tapped using 5 point Likert scale where 1 represents "Strongly disagree", 2 represents "disagree", 3 represents "neutral", 4 represents "agree" and 5 represents "strongly agree".

3.5.2 Knowledge Management

The five item questionnaire is adopted for Knowledge Management developed by (Kearns & Sabherwal, 2006). Some of the items included are "Knowledge and intellectual capital are viewed as key organizational assets", "We invest heavily in the capture, assimilation, and dissemination of knowledge" and "Organizational knowledge is codified and made available to all workers". Responses will be tapped using 5 point Likert scale where 1 represents "Strongly disagree", 2 represents

"disagree", 3 represents "neutral", 4 represents "agree" and 5 represents "strongly agree".

3.5.3 Employee Training

This will be rated by the employees on the basis of training they get. The three item questionnaire is adopted for Employee Training developed by (Barling, Kelloway, & Iverson, 2003) and recently used by (Chowdhury & Endres, 2010). Some of the items are "Extensive on the job training was provided by the company" and "Encouraged attending training conferences independent of the organization". Responses will be tapped using 5 point Likert scale where 1 represents "Strongly disagree", 2 represents "disagree", 3 represents "neutral", 4 represents "agree" and 5 represents "strongly agree".

3.5.4 Project Success

Project success will be rated by the employee using fourteen items scale. Project success measurement standard tool are not available in publish literature, and one tool which consist of previous research (Pinto & Pinto, 1990). Recently used by Aga, Noorderhaven, and Vallejo (2016) The sample items are "The project was completed on time", "The project was completed according to the budget allocated", "The outcomes of the project have directly benefited the intended end users, either through increasing efficiently or effectiveness", "Given the problem for which it was developed, the project seems to do the best job of solving that problem" and "The project had no or minimal start-up problems because it was readily accepted by its end users". Responses were tapped using 5 point Likert scale where 1 represents "Strongly disagree", 2 represents "disagree", 3 represents "neutral", 4 represents "agree" and 5 represents "strongly agree".

TABLE 3.7: Instruments.

No	Variable	Source	Items
1	ERP Adoption (IV)	(Deloitte, 1999)	05
2	Knowledge Management (Med)	(Kearns & Sabherwal, 2006)	05
3	Employee Training (Mod)	(Barling et al., 2003)	03
4	Project Success (DV)	(Pinto & Pinto, 1990)	14

3.6 Covariates

In this research, we utilize One-Way Anova test to see the control variables for the current study that could affect any of the variable. Our results show that none of the demographics affects the direct and indirect relationship of variables. So none of the demographics are controlled in this study. Through Anova analysis, value of p for all the demographics were above 0.05 that's make them insignificant in this research.

TABLE 3.8: Covariates

Covariates	F Value	Sig.
Qualification	1.832	0.122
Age	0.885	0.473
Job Sector	3.231	0.273
Organization	1.207	0.073
Experience	0.630	0.641
Gender	0.377	0.540

3.7 Scales Reliability

Reliability is a process to check the consistency of the results, which can be achieved after the repetition of a test on a single item. In order to check the scale reliability, the reliability of scale that the scale will produce same nature of outcomes after repeating multiple times. In the present research, Cronbach Alpha method is used to run the reliability test. It expresses the inter-dependencies of the variables and also shows that if those variables have a connection between them or not. It also calculates the single hypothesis. Cronbach Alpha is considered to be significant between 0-1 range. Mostly greater or equal to 0.7 value is considered to be acceptable but in some cases where items of variables are less than 10, 0.6 or greater value can also be considered as acceptable. The greater the value of Cronbach Alpha greater will be the reliability of the scale used and lesser the value of Cronbach Alpha lesser will be the reliability of the scale used. Table 3.9 depicts the Cronbach Alpha value of each variable used in this research.

TABLE 3.9: Scale reliabilities

Variables	**Cronbach's Alpha**	**Items**
ERP Adoption (IV)	0.770	05
Knowledge Management (Med)	0.775	05
Employee Training (Mod)	0.686	03
Project Success (DV)	0.850	14

In above table 3.9, reliability and validity analysis of each variable is shown. Cronbach Alpha value of Enterprise Resource Planning System Adoption was 0.770, Knowledge Management was 0.775, Employee training is 0.686 and Project Success is 0.850. Employee Training's Cronbach alpha was just under 0.7 but it was considered acceptable because items of ET were less than 10.

3.8 Data Analysis Techniques

After the process of data collection, relevant data from 340 respondents were separated and the selected data was analyzed on SPSS software version 21. Multiple steps were performed during analyzing the data, such procedures are mentioned below,

1. First step was to filter only those questionnaires which were filled appropriately and only filtered data was selected for analysis.
2. In the second step, we moved to software and created and coded the variables i.e. ERP (Enterprise Resource Planning) Adoption, KM (Knowledge Management), ET (Employee Training) and PS (Project Success).
3. To describe sample characteristics frequency tables were used in this regard.
4. Using numerical values, descriptive statistics was carried out.
5. Through Cronbach alpha, reliability of each variable was examined.
6. To check the significant relationship between the variables which are used in this research, correlation analysis was performed. We used Pearson correlation.
7. After making confirm that our model is fit for study and good to go, we shifted towards the regression analysis process. Single linear regression analysis of independent and dependent variables was performed to check the specified relationship.
8. We used Preacher & Hayes Process to carry out mediation and moderation to identify the function of mediator and moderator between independent and dependent variables.
9. After getting results from regression analysis, we determined that the suggested hypothesis was accepted or rejected.

Chapter 4

Results

This chapter covers results regarding descriptive statistics (Mean and Standard deviation), Correlation analysis, regression analysis in accordance with mediation and moderation analysis. Analysis results describe whether the hypothesis of research are accepted or rejected. Statistical package for social sciences (SPSS) is utilized in regard to run analysis.

4.1 Descriptive Statistics

Descriptive statistics indicates the important points of information about the variables used in this research i.e. ERP Adoption, KM, Employee Training and Project success. Descriptive statistics is the summarized information of complete data. These statistics includes total number of respondents, minimum and maximum value of every variable, mean and standard deviation of each variable. Average of responses is described by Mean value and standard deviation values demonstrate the change of responses from their means.

Descriptive analysis gives the basic information regarding the sample of the research. The information includes population size, minimum and maximum values, mean value and last but not the least Standard deviation.

TABLE 4.1: Descriptive Statistics

	N	Minimum Value	Maximum Value	Mean	Standard Deviation
Enterprise Resource Planning Adoption	340	1	5	3.4109	.73127
Knowledge Management	340	1	5	3.2888	0.85185
Project Success	340	1	5	3.2716	0.87038
Employee Training	340	1	5	3.3882	0.63162

In Table 4.1 Information regarding each variable is described in separate columns. Like in first column there are variables and next five columns explains the detail of data against each variable.

Table 4.1 depicts that the sample size was 340 for each of four variables. Every variable was rated using the five scale Likert scale in which 1 show Strongly disagree and 5 shows strongly agree. Values of Mean and standard deviation explain the crux of responses. Basically this is the observation of respondents about each particular variable. The mean value of Enterprise resource planning system adoption is 3.4109 and its standard deviation value is 0.73127. The mean value of Knowledge Management is 3.2888 whereas the standard deviation value of KM is 0.85185. Mean value for Project Success (PS) is 3.2715 & its standard deviation value is 0.87038 to be very exact. Now coming to the last variable i.e. Employee Training, its mean and standard deviation values are 3.3882 and 0.63162 respectively.

4.2 Correlation Analysis

To check the nature of nature of variation between two variables, Correlation analysis is performed. In this study the core objective to perform correlation analysis

is to check out the correlation between ERPS and Project success, the mediating role of Knowledge management and moderating role of Employee Training.

Table 4.2 show the correlation between the variables which are being studied in this research. Values of correlation are showing the type of relationship between these variables.

TABLE 4.2: Correlation

S.No	Variables	1	2	3	4
1	Enterprise Resource Planning Adoption	1			
2	Knowledge Management	.581**	1		
3	Employee Training	.471**	.610**	1	
4	Project Success	.335**	.499**	.215**	1

***Correlation is signicant at the 0.01 level (2-tailed) N=340, *P<0.05, **P<0.01, ***P<0.001*

Table 4.2 shows the correlation values of the variables in our suggested model. Enterprise Resource Planning Adoption is positively correlated with Knowledge Management (r= 0.581**, p<0.01). ERP Adoption is also positively correlating with Employee Training (r=0.0471**, p<0.01) and with Project Success (r=0.335**, p<0.01). Knowledge Management is correlated positively with Employee Training (r=0.610**, p<0.01) and with Project Success (r=0.499**, p<0.01). Employee Training is also correlated positively with Project Success (r=0.215**, p<0.01).

4.3 Regression Analysis

To check the existence of relationship between the variables, correlation analysis has been processed in this research. To validate these results regression analysis is executed. Regression analysis describes the dependency of one variable on the other, that to what extend change in one variable is bringing the change in the other variable.

To check out the relationship between independent and dependent variable simple or linear regression analysis is performed. When there are more than two variables, the multiple regression analysis has performed i.e. in the case of mediation and moderation.

A PROCESS macro by preacher and Hayes method has been utilized in both the cases of mediation and moderation regression analysis in this research. Model 1 and model 4 are performed for moderation and mediation respectively.

4.3.1 Linear Regression Analysis

Hypothesis 1: ERPs Adoption has direct positive relation with Project Success.

TABLE 4.3: Simple Regression

	Project Success		
Predictor	β	R^2	**Sig**
ERPS Adoption	0.289***	0.112	0.000

*Un-standardized regression coefficient reported N=340, *p<.01; **p<.01; ***p<.001*

Table 4.3 shows the results of our first hypothesis. In accordance to H_1, ERP adoption is positively affecting Project success. Results of regression analysis explain that ERP adoption is positively affecting project success and there is significant relationship exists between them. The R^2 value is 0.112, Beta coefficient=0.289 and p value=0. 000.The p value of 0.00 shows that relationship between IV and DV is highly significant. The positive value of beta shows that it is positively effecting and there is a positive relation between IV and DV in this study. The value of R^2 is 0.112, which demonstrates that ERP adoption is bringing a positive change of 0.112 units in Project success. Hence, our first hypothesis is accepted by applying linear regression.

In this study, X denotes the independent variable i.e. Enterprise Resource Planning Adoption and Y denotes the dependent variable i.e. Project Success. The

pictorial form of unmediated model is shown below. Path 'C' shows the unmediated and direct link of independent and dependent variable.

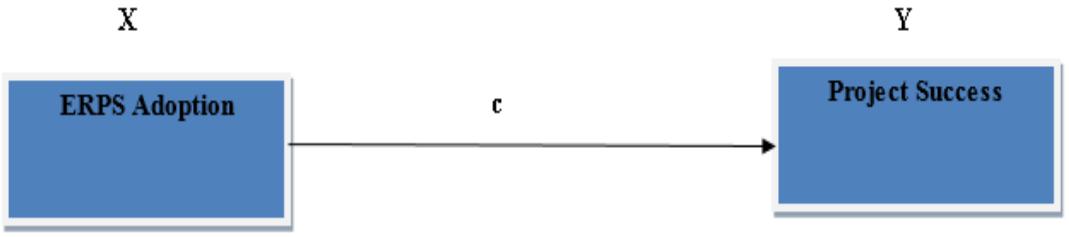

FIGURE 4.1: Linear Regression

4.4 Mediation Analysis

By performing mediation analysis, we will check our three hypotheses i.e.

H_1 ERP Adoption has direct and positive relation with Knowledge management. The other hypothesis which we will check in this analysis is Knowledge management has positive and direct relation with Project success. Last but not the least knowledge management mediates between the ERPs Adoption and Project success. So to check our hypothesis H_2, H_3 and H_4, we utilized model 4 of Process macro by Hayes. The links between Independent variable to Mediator and mediator to dependent variable must be significant to prove mediation.

Explanation of each path is following:

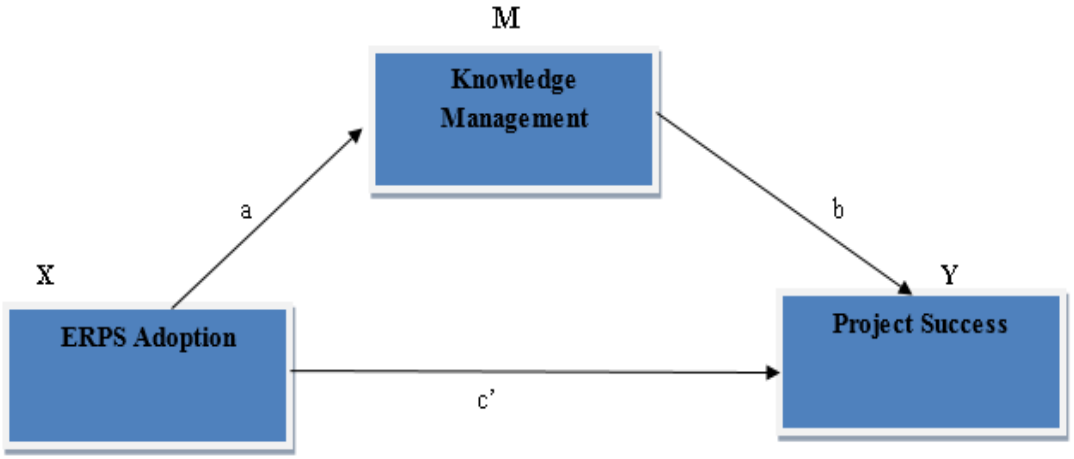

FIGURE 4.2: Mediation Analysis

TABLE 4.4: Mediation Analysis

IV	Effect of IV on M (a path)	Effect of M on DV (b path)	Direct Effect of IV on DV (c' path)	Total Effect of IV on DV (c path)	Bootstrapping for Indirect Effect	Results
	β	β	β	β	LL95%CI	UL95%CI
ERPS Adoption	0.6769**	0.3408**	0.583**	0.2890**	.1684	.3026

*Note. Un-standardized regression coefficient indicated. Bootstrap sample size 5000. LL =lower limit; CI = confidence interval; UL = upper limit. N=340, *P < .05; **P <.01*

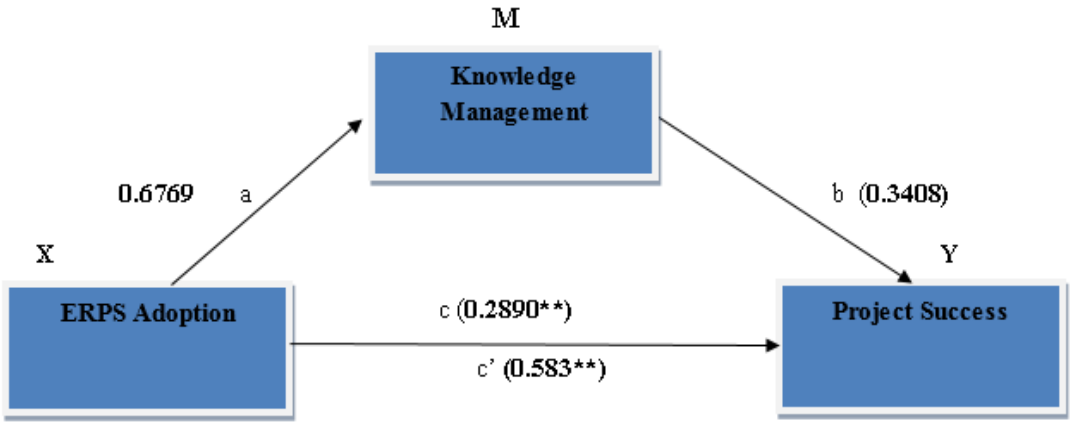

FIGURE 4.3: Mediation Analysis with coefficients

So according the figure 4.3, we have to check three paths to check our hypothesis. These paths include a, b, and c paths.

Hypothesis 2

In hypothesis H_2, we assumed that ERP Adoption is positively associated with Knowledge Management. In this mediation analysis path 'a' shows the results of this hypothesis. This hypothesis is analyzed through the first column of the mediation table i.e. Effect of IV on M (a path).

Results revealed that there is a significant and positive relation between these two variables. The β coefficient value is 0.6769, R^2 value is 0.3376 with the p value of 0.000. Positive value of B shows that there is a positive relation between ERP Adoption and knowledge management. P=0.000 shows that there is a significant

relation between the two said variables and, R^2 value of 0.3376 depicts that ERP adoption is causing 0.3376 change in knowledge management.

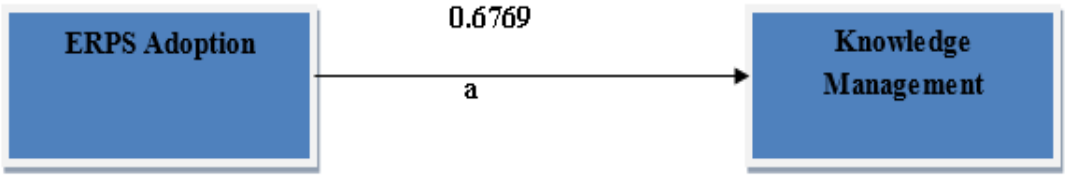

FIGURE 4.4: Hypothesis 2 pictorial representation

Hypothesis 3

Now coming towards our third hypothesis, we analyzed H_3 according to which Knowledge Management has significant and positive relation with Project Success. Column number three i.e. Effect of M on DV (b path) in table 4.4 shows the result of this hypothesis.

Results disclosed that Knowledge management is positively associated with project success. Path 'b' shows this link in the figure. The β coefficient value is 0.3408, the value of R^2 is 0.2519 with the p value of 0.000. Positive value of β and 0.000 value of p shows that there exist a positive and significant relation between knowledge management and project success. As $R^2 = 0.2519$ which demonstrates that 1 unit change in knowledge management is causing 0.2519 unit change in project success. So results justify and prove our hypothesis 3. So our hypothesis 3 is accepted.

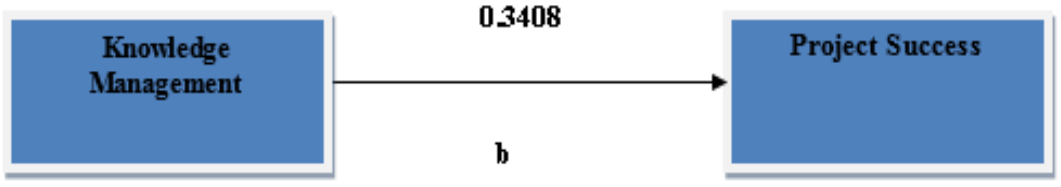

FIGURE 4.5: Hypothesis 3 pictorial representation

Hypothesis 4

To check the mediation in our research model, we analyzed our hypothesis 4, according to which we assumed that Knowledge management will mediate the relation between ERP Adoption and Project success. The result shown in the table 4.4 depicts strongly that this hypothesis is true and accepted. Results shows that the indirect relation between ERP Adoption and Project success has lower

level confidence interval and upper level confidence interval of 0.1684 and 0.3026. Both the value for LLCI and ULCI has same positive value and no zero exists between them. So, we can clearly conclude that mediation is happening. Hence, Hypothesis 4 is accepted that knowledge management mediates between ERP Adoption and project success.

So using the model 4 of PROCESS macro by Hayes in SPSS, we analyzed our three hypothesis and used their results to prove our three hypothesis. There are some other values in the mediation table let's have a look on them one by one.

4.4.1 Total Effect

Total effect explains the relation of IV and DV which in our context is ERP Adoption and Project success. This relation is our first hypothesis too in our research and we also analyzed this relation through linear regression in SPSS. So, total effect of ERP Adoption on project success is 0.2890 with the significance of 0.00 i.e. $\beta = 0.2890$ and $p = 0.00$ respectively.

As the value of β is positive than there is a positive relation between both the variable and p=0.00 that means there is a significant relation between these variables. Same values were achieved by processing the linear regression. So our hypothesis 1 is accepted by both of the processes.

4.4.2 Direct Effect

Direct effect indicates the effect of IV on DV in the presence of mediator. In our case, it shows the effect of ERP Adoption on Project success in the existence of Knowledge management. Results suggest that the impact of ERP Adoption on project success in the presence of knowledge management is 0.583 and value of p is 0.00.

This means that ERP Adoption has positive and significant impact of project success in the presence of knowledge management. β value shows the positive impact and p shows the significance of the relation.

4.5 Moderation Analysis

In our research model, Employee training moderates between the relationship of ERP Adoption and Knowledge management. We used model 1 of PROCESS macro by Hayes through SPSS to test our last hypothesis, which states that Employee Training moderates between ERP Adoption and Knowledge management.

4.5.1 Moderation Analysis

TABLE 4.5: The Moderating effect of Project Collaborative Culture

	β	se	t	p
Int_term	.1568	0.0546	2.8700	0.0044
	LL 95% CI		**UL 95% CI**	
Bootstrap results for indirect effect	0.0493		.2643	

*Note. Un-standardized regression coefficient indicated. Bootstrap sample size 5000. LL =lower limit; CI = confidence interval; UL = upper limit. N=340, * P <.05; ** P <.01*

Hypothesis 5 suggests that Employee training moderates between ERP Adoption and Knowledge Management which means that Employee Training strengthen the relationship of these two variables. Table 4.5 explains the results of this hypothesis. The reason is the interaction term of ERP Adoption and Employee training moderates on the relationship of ERP Adoption and Knowledge management because they have lower level and upper level confidence interval of 0.0493 and 0.2643 and both values have same positive sign and no zero exists between them. Similarly, interaction term shows positive and significant regression coefficient (β=0.1568, p= 0.0044) which means that Employee training moderates the relationship of ERP Adoption and knowledge management positively and significantly. Hence, we can conclude that hypothesis 5 was supported by moderation analysis.

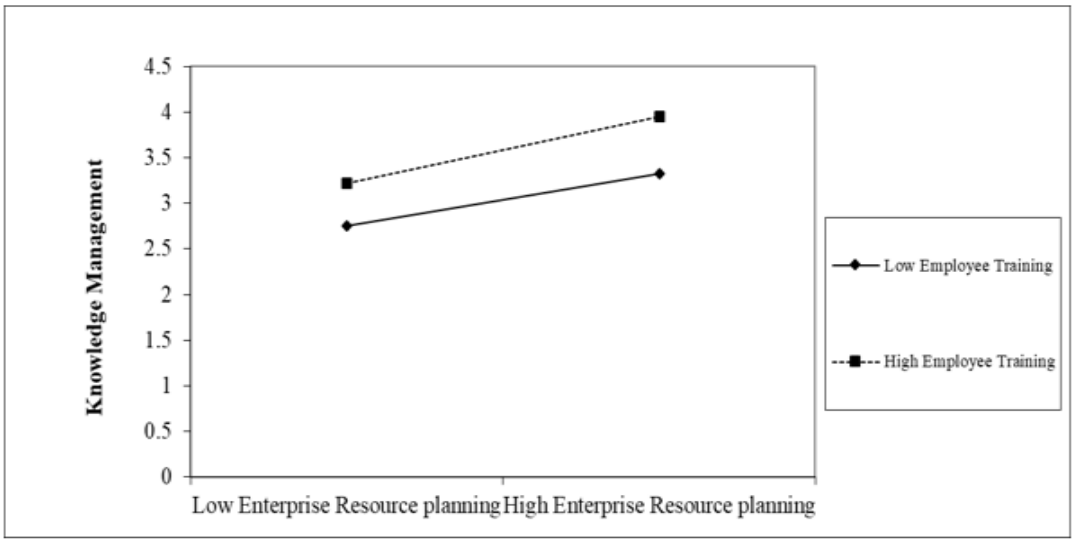

FIGURE 4.6: shows the graphical representation of acceptance of our hypothesis 5. Employee Training moderates the relationship between ERP Adoption and project success.

To explain deeply the effect of moderating effect of Employee training, slope for mediator is plotted. Figure explains that the slope of the relationship between Enterprise resource planning System Adoption and knowledge management was stronger with high employee training. Figure shows that when ERP Adoption and employee training is high than there will be higher the knowledge management throughout the organization.

4.6 Summary of Accepted/ Rejected Hypothesis

TABLE 4.6: Summary about Accepted/ Rejected hypothesis

Hypothesis	**Statements**	**Results**
H_1	ERPs Adoption has direct positive relation with Project Success.	**Accepted**
H_2	ERPs Adoption have direct positive relationship with Knowledge Management.	**Accepted**
H_3	Knowledge Management has direct positive relation with Project Success.	**Accepted**

H_4	Knowledge Management mediates the relationship between ERPs Adoption and Project Success.	**Accepted**
H_5	Employee Training moderates the relationship between ERPs Adoption and knowledge management i.e. proper training and education of employees on ERPs implementation and use strengthens the relationship between ERPs Adoption and Knowledge Management.	**Accepted**

The summary of results shows that the all the Hypothesis are accepted on the basis of results gathered from the analysis technique. Results are assumed true on the basis of accurate data analysis. All these results show the acceptance of hypothesis in the context of Pakistan.

So conclusion can be drawn from the results that enterprise resource planning system has positive and significant relation with knowledge management and project success. Knowledge management has a positive relation with project success. Knowledge management mediates between enterprise resource planning adoption and project success. Last but not the least employee training strength the relationship of enterprise resource planning system adoption and knowledge management but playing part as moderator.

Chapter 5

Discussion and Conclusion

5.1 Discussion

This chapter includes discussions of important findings towards the support of proposed model of the research. Research questions are imparted and examined with corresponding hypothesis, and we identified a proper assistance for our hypothesis. This discussion pursued by practical and theoretical implications, limitations and inclusive suggestions about enterprise resource planning system and in the end, ideas for future researches.

The main aim of this research was to check the impact of Enterprise Resource Planning Adoption on project success. In this study, we took Knowledge management as mediator and Employee training will act as moderator between Enterprise Resource Planning Adoption and Project success. This research was conducted using the data from multiple organizations from Pakistan, so this research is in the context of Pakistan.

We intended to test our proposed hypothesis which are ERPs adoption has direct positive relation with project success, ERPs adoption has direct positive relationship with knowledge management, Knowledge Management has direct positive relation with project success, Knowledge Management mediates the relationship between ERPs adoption and project success. And Employee Training moderates the relationship between ERPs adoption and knowledge management i.e. proper

training of employees on ERPs implementation and use strengthens the relationship between ERPs and knowledge management.

So these hypotheses were tested from the data gathered from 340 respondents. Our hypotheses are summarized in the result section. So hypothesis H1, H2, H3 and H4 are accepted creating a link between Enterprise Resource Planning and Project success using Knowledge Management as mediator. The results suggest that by the use of Enterprise resource planning System Adoption in any organization can achieve success more often. ERP can be useful in the knowledge Management throughout the organization which include knowledge creation and knowledge sharing.

This study includes Employee training as a moderator. Results achieved after the analysis on data which was gathered from the organization of Pakistan suggests that if proper training positively influences the relationship between Enterprise Resource Planning Adoption and Knowledge management. The role of Employee Training was found to be significant and positively affecting the relationship of Enterprise Resource Planning Adoption and Knowledge Management. Hence, it is strengthening their relation as a moderator.

It can be observed that our entire hypotheses are supported by the results achieved from the data analysis. This data was totally gathered from the organizations of Pakistan. So this research is in context of Pakistan. Discussion on each hypothesis is as following

5.1.1 Hypothesis H_1: ERPs Adoption has direct positive relation with Project Success.

It was proposed that Adoption of Enterprise Resource Planning System has direct and positive relation with project success this means that there is a positive association between the two variables. Results achieved after the analysis on data against this hypothesis (β=0.289, R^2=0.112 and p=0.000). There is a lot of literature in order to support this hypothesis.

Many researchers consider that adoption of ERPS in any organization can increase the chances of success. ERP adoption have so much effect on the performance of medium sized organizations (Aremu et al., n.d.). ERP are so giant projects and take some time in implementation. So ERP helps the organization to integrate all its functional department in one application. Furthermore, this help in making the easy and smooth flow of work after its implementation.

According to Madanhire and Mbohwa (2016), ERP implementation increase the employee's efficiency and finally organizational efficiency of the employees increase which lead to project to success. Keeping in mind all the research done regarding the relationship between enterprise resource planning and project success. Most of the data we found was in favor of their positive relation.

Enterprise resource planning in the organization increase the value of work and activities, reduces the operational cost. Simply by integrating all the activities of each department of organization in single application. This integration eases the future activities and leading the project to success. So triple constraints can be well achieved through the use of Enterprise Resource Planning in organization i.e. time, cost and quality.

There are lot of ERP solutions available in the market. Different ERP solution are available in different prices. Some of them are cheaper in cost and some are pretty expensive too. Prices of the ERP solution depends on the number of modules. So, modules and prices for ERP software will vary for each company. Before adopting and implementing ERP solution, company must go through the requirement check that which ERP software will best suit their company and then implement that ERP solution. So this can increase the chances of success.

After the collection of data from the organizations of Pakistan, we analyzed the data through SPSS and results were supporting our hypothesis too. So through literature support and results of our data collection, it can be seen clearly that through Enterprise resource planning the success ratio of the projects can be increased with context to the organizations of Pakistan.

5.1.2 Hypothesis H_2: ERPs Adoption have direct positive relationship with Knowledge Management.

In Hypothesis H_2, it was suggested and proposed that there is a direct and positive relationship between Enterprise Resource Planning Adoption and Knowledge management. Data collection had been made from the organizations of Pakistan and different analysis were processed on data that was collected. Results of those analysis also supported this hypothesis. As the value of β =0.6769, R^2=0.336, p=0.00). The p value shows that the relation between these two variable is significant enough. The value of R^2 showing that change in ERP is bringing how much change in the knowledge management. Hence, results were well in support of our hypothesis.

ERP provides advantages over competitors because all the important information is generated, stored, processed and then finally shared in a well-mannered way. ERP solutions also helps in reducing the cost, controlling the resources and improve the quality of business through its automated practices (Communication of ACM, 2000; cited by (Newell, Huang, Galliers, & Pan, 2003).

Literature about ERP and KM available currently have demonstrated their relation. As a result of implementation of enterprise system, information and knowledge float across multiple departments and division of organization (Vandaie, 2008). By the use of ERP, it can boost the organizational activities by connecting multiple parts of organization. Moreover, competitive advantage can be achieved in regards of Knowledge management (Dwivedi, Papazafeiropoulo, & Metaxiotis, 2009).

Alavi and Leidner (2001) clearly states that both ERP and KM are used in parallel in many of the organization. Using ERP and KM all together generates complementary results instead of conflicting results (Newell et al., 2003). There is a positive and significant relation between Knowledge management competencies and Enterprise Resource Planning success (Sedera & Gable, 2010). ERP is a useful tool to grab and codify the knowledge (Parry & Graves, 2008).

So, by adopting ERP system in organization, it will increase the chances of knowledge floating throughout the organization. As ERP is one application which integrates all the departments of organization i.e. IT, Management, Finance, Marketing and Human Resource. It will be easy for the employees and the managers to have all the information in single application. ERP maintains a single database repository and all the data of the organization can be accessed and saved in the single place.

ERP can be a good source to share the knowledge within the company and even out of the organization because it provides a platform for communications among the team members, managers, different departments, different divisions and ultimately different companies. ERP software can be accessed from anywhere and anytime.

So keeping in mind the previous studies and the results of our analysis, it is necessary for every project in Pakistan, proper knowledge management is the basic thing to have. So for proper Knowledge management throughout the organization, ERP can prove a very helpful tool. As it integrates all the departments of one organization into one giant application.

5.1.3 Hypothesis H_3: Knowledge Management has direct positive relation with Project Success

So, coming towards our third hypothesis which states that Knowledge Management has direct and significant relation with the project success. The results of our hypothesis (β= 0.3408, R^2=0.2519, p=0.00) proved that there is a positive and significant relationship between Knowledge Management and Project success. The positive value of β proves that there is a positive relation between these two variables. P value elaborates that there is a significant and noteworthy relation is present between them. Last but not the least value of R^2 explains that one unit change in Knowledge management creates a 0.2519 unit change in Project success.

The results support the previous research work on these two variables. The success of project is measured by cost, time and quality of project. These three parameters are also known as triple-constraints. So these parameter or constraints can be

achieved by proper management of knowledge. (Suppiah & Singh Sandhu, 2011). Many researchers believe the project success has very significant relation with knowledge management which means that if knowledge is being taken care of in organization than there are more chances of success.

Boh (2007) believes that Knowledge management in an organization decreases the amount of effort of every employee on same concern, which results in time saving, effort saving and cost saving activities. All these types of activities result in the project success.

According to organizations in Pakistan they welcome the knowledge sharing activities because they know the worth of knowledge management. This research will prove to be helpful in the region of Pakistan to implement knowledge management. This literature proposed that through proper knowledge management in the organizations of Pakistan, the chances of success increases. So it is the key to success in this era of competition.

5.1.4 Hypothesis H_4: Knowledge Management mediates the relationship between ERPs Adoption and Project Success.

In hypothesis 4, it is proposed that knowledge management mediates between the Enterprise resource planning Adoption and project success. This research states that knowledge management plays role of mediator and this hypothesis has been accepted because our results showed a significant relation through values. As in the results the lower limit and upper limit both have the same positive sign and no zero exists between them in the bootstrapped 95%. Interval around the indirect effect of relationship between Enterprise resource planning and project success. Lower limit =0.1684 and upper limit =0.3026.

Literature has also endorsed the above findings. Many researchers support the relationship mentioned in this hypothesis in their own ways. It is stated by Acar, Tarim, Zaim, Zaim, and Delen (2017) in their suggested hypothesis that effect of ERP usage on operational performance with knowledge management as mediator

is more significant than the direct relation of ERP usage and performance of organization. Knowledge management and ERP are strongly connected that if we implement ERP in organization than all the information and knowledge related to different divisions, departments and sectors will be saved, shared managed through one single database which will be provided by ERP application. As now a day, every organization is trying to remove the paper work and get the things automated than using latest technology and tools paper work can be reduced and automation can be achieved. In our case Enterprise resource planning is the big thing.

The literature proposes that knowledge management plays a vital role between enterprise resource planning and project success. That through the use of ERP in an organization the knowledge management in the organization is achieved which ultimately leads the project to success. The results of hypothesis clearly suggest that relationship between enterprise resource planning and project success is mediated by knowledge management significantly and positively in the organizations of Pakistan.

5.1.5 Hypothesis H_5: Employee Training moderates the relationship between ERPs Adoption and knowledge management i.e. proper training and education of employees on ERPs implementation and use strengthens the relationship between ERPs and knowledge management.

Hypothesis 5 shows the moderating effect of employee training between enterprise resource planning Adoption and knowledge management. The results of this hypothesis showed the significant and positive outcomes. $\beta = 0.1568$ shows that employee training is positively impacting on the relationship of KM and ERP. P=0.0044 shows that employee training has a significant relation on the link between ERP and KM. As the lower and upper limit for the interaction term is 0.0493

and 0.2643, both values are positive and there exists no zero between them. So it proves that employee training is impacting significantly and positively between the relationship of ERP Adoption and KM. Hence, moderation is present and employee training is strengthening the relation between ERP Adoption and KM.

In this research, we explored the moderating effect of employee training on the relationship of ERP and knowledge management. Specifically, the study was intended to prove that employee training enhance the knowledge management through the use ERP in organization.

The relationship of ERP and employee training has not been much explored in the previous studies. Training with ERP implementation is not much studied area in the field of research, so it must be explored because training increase the success of ERP implementation (Lopez et al., 2018). As ERP is a computer based application and employee need to have knowledge to use this application to get the maximum out of it. So if proper employee training regarding the ERP system has been provided to the employees than they can use this system more effectively.

Employees and teams who are using or implementing ERP system must have the required knowledge to use the system to achieve the best results. So if employee receive proper training regarding ERP system than he/she will be able to use it properly. In this way, knowledge sharing, knowledge storing and ultimately knowledge management can be achieved more efficiently.

So it is concluded in light of previous research and results from our data that Employee training should be encouraged in organizations and specially when new technology is adopted or implemented. Data suggests that in the contextual settings of Pakistan, training programs in organization can increase the knowledge sharing activities throughout the organization. Our results depict that employee training strengthen the relationship enterprise resource planning system and knowledge management by moderating between them.

5.2 Research Implications

Our study includes theoretical as well as practical implications with regard to project based organizations as previous studies haven't investigated the effect of ERP implementation on employee training creativity especially in Pakistan context. Our results signify that with role of ERPS knowledge management in organizations can be improved. Practically, ERPS is considered as well-known requirement of this era; this study described new vision to achieve Project success through the effective use of ERPS in projects with the involvement of knowledge management. A significant relationship has been confirmed among Enterprise resource planning and project success under knowledge management role as a mediator.

Past studies have added literature on ERPS but with employee training role as moderator has not highlighted. Research introduces employee training role as moderator exposed as potential impact on the relationship of ERP and knowledge management. Results about research certified Enterprise resource planning is connected closely to knowledge management and foster it, which thereby positively enhances the chances of project success.

Moreover, knowledge management that is core and rare variable does mediate between the association among ERPS Adoption and project success. This illustrates that knowledge management is significant in organizations in context of Pakistan because employees, managers and team members are positively affected in the presence of knowledge management.

This research is important in same manner for managers, employees, supervisors and leaders, since Pakistan is experiencing many challenges associated with technology and knowledge management which demands new researches to resolve these proportions of Pakistani culture that describe the notion of enterprise resource planning to foster the association among team members by utilizing efficient technology modes and methods to implicate knowledge management in projects by the use of employee training which is effective requirement of this century.

5.3 Limitations of Research

This study also has some limitations likewise every research, which elicits firstly particularly owing to insufficient time and resources. It is not possible to cover all the elements, so there are always some limitations. Through single moderator and mediator, the model is analyzed.

The data was gathered from different organizations based in one city of Pakistan. So in the future, researchers used to gather data from project based organization in different cities of Pakistan. The data were gathered only one time. The researchers may use time lag for data gathering in the future.

The method uses for gathering data was convenience sampling also referred as limitation in study because it not depicts the real population. The results might be different if gathered from actual size of population. Further, employees are least interested to deliver data. Persuading employees was a difficult target though.

5.4 Future Research Directions

All the aspects of study cannot be covered so there is always a room for future improvement. This research unlocks many creative possibilities for future researches. In this study, our main aim was to test the impact of enterprise resource planning system on project success but in future researchers can check the impact of ERP Adoption on other project related variable.

Moreover, the relationship between ERP and project success can be studied with some other variables. Changing the moderator between the relationship of ERP and knowledge management can also be the point of focus for future studies. Enterprise Resource planning is the unique variable in project management's domain and can be studied with combination of other variables.

We recommend additional investigation to make on data and data collection techniques. The importance of this study will be helpful and useful for the future researchers focusing on this area of research. To link ERP to variables like knowledge management. This research will be effective because it includes the element

of technology with the project domain and this model is well utilized using Technology Acceptance Model.

5.5 Conclusion

The present study makes an effort to investigate the relationship between ERP Adoption and Project success in the organization of Pakistan. A questionnaire study was conducted for data collection focused to examine the impact of ERP Adoption on project success with knowledge management role as a mediator and employee training role as a moderator between the relationship of ERP Adoption and Knowledge management. Almost 400 questionnaires were distributed to analyze the relation between proposed variables but 340 questionnaires were utilized for the study having correct information. The present study and proposed hypothesis were supported by technology acceptance model indicating that how new technology should be adopted. There are five hypotheses in our study which are tested and evaluated in context of Pakistan. All the hypotheses are accepted. The research has provided complete view of impact of ERP Adoption on project success with mediating role of knowledge management and moderating role of employee training.

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Appendix

Survey Questionnaire

Dear respondent,

I am student of MS Project Management at Capital University of Science and Technology, Islamabad and this research part of fulfilment of my degree program. It is hereby conducted on the **"Impact of ERPS Adoption on Project Success"**. For the result analysis a questionnaire is being made for which your participation will be a favour. Your participation is totally voluntary and depends on your choice. Your Identity will be kept confidential and this questionnaire will not be used as any reference on any stage/platform. If you are interested in knowing the results of this research being conducted, you may contact me on "usama.munir292@gmail.com". Your cooperation in this regard is highly appreciated.

Please complete the following questionnaire with specific regard to the above enquiry, by placing a CROSS in the appropriate box

Demographics

	1	2			
Gender	Male	Female			
	1	2	3	4	5
Education	Matric	Intermediate	Graduation	Masters	PhD
	1	2	3	4	5
Age	20-30	31-40	41-50	51-60	61-Above
	1	2			
Job Sector	Public	Private			
	1	2			
Organization	Project based	Operation based			
	1	2	3	4	5
Experience	1-5	6-10	11-15	16-20	20-Above

Please tick the relevant choices: **1= Strongly Disagree 2= Disagree 3= Neither Agree/nor Disagree 4= Agree 5= Strongly Agree**

Enterprise Resource Planning System (ERPS) Adoption

1	Reduction in inventory levels.	1	2	3	4	5
2	Reduction in the number of employees.	1	2	3	4	5
3	Improvements in order management and cycle times.	1	2	3	4	5
4	Reduced costs in procurement.	1	2	3	4	5
5	Improved cash management.	1	2	3	4	5

Knowledge Management

1	Knowledge and intellectual capital are viewed as key organizational assets	1	2	3	4	5
2	We invest heavily in the capture, assimilation, and dissemination of knowledge	1	2	3	4	5
3	We have ready access to expert knowledge within the organization	1	2	3	4	5
4	Organizational knowledge is codified and made available to all workers	1	2	3	4	5
5	We have processes for identifying and exploiting our knowledge stocks	1	2	3	4	5

Employee Training

1	Extensive on the job training was provided by the company.	1	2	3	4	5
2	Extensive off the job training was provided.	1	2	3	4	5
3	Encouraged attending training conferences independent of the organization.	1	2	3	4	5

Project Success

1	The project was completed on time	1	2	3	4	5
2	The project was completed according to the budget allocated	1	2	3	4	5
3	The outcomes of the project are used by its intended end users.	1	2	3	4	5
4	The outcomes of the project are likely to be sustained.	1	2	3	4	5
5	The outcomes of the project have directly benefited the	1	2	3	4	5

	intended end users, either through increasing efficiently or effectiveness.					
6	Given the problem for which it was developed, the project seems to do the best job of solving the problem	1	2	3	4	5
7	I was satisfied with the process by which the the project was implemented	1	2	3	4	5
8	Project team members were satisfied with the process by which the project was implemented.	1	2	3	4	5
9	The project had no or minimal start-up problems because it was readily accepted by its end users.	1	2	3	4	5
10	The project has directly led to improved performance for the end users / target beneficiaries.	1	2	3	4	5
11	The project has made a visible positive impact on the target beneficiaries	1	2	3	4	5
12	Project specifications were met by the time of handover to the target beneficiaries.	1	2	3	4	5
13	The target beneficiaries were satisfied with the outcomes of the project	1	2	3	4	5
14	Out principal donors were satisfied with the outcomes of the project implementation.	1	2	3	4	5

Thank you for your time and cooperation