Impact of Perceived Ease of Use and Perceived Usefulness of Enterprise Resource Planning System Adoption on End User Acceptance

by

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This thesis is dedicated to my family.

CERTIFICATE OF APPROVAL

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Abstract

Enterprise resource planning (ERP) is complicated system that contains integrated applications to manage the day-to-day business operations. The main goal of ERP system is to provide assistance to the organizations from initiation till the completion of project and it also ensure the efficiency, quality, reduced cost and enhanced profitability. The present study has investigated the impact of perceived ease of use, perceived usefulness, ERP system adoption and end user acceptance in the domain of project management. For this study, a survey was conducted for material handling from employees of project-based organizations including Bini telecom, Robstam, Ground zero technologies and IT solutions located in Rawalpindi and Islamabad. The survey questionnaires were administered to the sample of 250 respondents using convenience sampling technique. Data was analyzed by using SPSS version 21. Analysis of collected data indicates that a statistically significant relationship exists between perceived ease of use (PEOU), perceived usefulness (PU) and end user acceptance. Moreover, the results showed that ERP system adoption significantly mediates the relationship between PEOU, PU and end user acceptance. Practical and theoretical implications for this study are also discussed that will be helpful for the employees and project managers. Moreover, researchers on larger scale could draw more promising impacts which would be helpful for the future researchers and project-based organizations.

Keywords: Perceived Ease of Use, Perceived Usefulness, ERP System Adoption, End User Acceptance.

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List of Abbreviations

ERP   Enterprise Resource Planning

ES   Enterprise System

IS   Information system

PBOs   Project Based Organizations

PEOU   Perceived Ease of Use

PU   Perceived Usefulness

TAM   Technology Acceptance Model

Chapter 1

Introduction

1.1 Theoretical Background

In this modern era, organizations need competitive advantage to sustain themselves in the competitive market. Enterprise resource planning (ERP) system adoption helps an organization to gain advantage over the others. It handles the operations, information flow and manage stakeholders when deployed (Costa, Ferreira, Bento & Aparicio, 2016). In the field of project management, ERP system is one of the most important contribution to eternity of organization and that integrates the basic business functions in a manner that information can flow easily through different departments of organization. ERP installation in organization has been considered important for timely completion of project within the budget. It helps in the different perspectives including communication, human resource, time and risk management of a particular project (Abu-Hassein, Hyassat, Sweis, Alawneh & Al-Debei, 2016). The literature suggested that ERP contain number of critical success factors which are categorized in different dimensions, out of which projects specific is the one dimension that deals with projects according to the project management theory (Madi, 2020). However, the system significant importance in the field of project management is used in project depending upon the nature of the organization.

Some organizations consider ERP system implementation as a project, they establish their goal and define the required budget throughout the deployment. Effective project management techniques make the way easier in adoption of the system. The key area of focus should be the clear definition of project objectives and scope (Umble, Haft, & Umble, 2003). To implement an ERP system as a project certain factors, need to be considered for the success and failure of project including capability, flexibility and gap. The system adopted should be flexible, capable enough to perform the operation and bridge the gap between the system and organization. Project management plays an important role among all these constraints. Moreover, these strategies help in the incorporation of ERP system with ease (Basoglu, Daim, & Kerimoglu, 2007).

Several critical success factors associated with ERP system adoption; it is important to analyze those factors in terms of project success. If all the factors are considered then the projects would be successful automatically; Furthermore, the researcher suggested that if the capable project manager, proper trainer, consultant and proper management strategies are deployed then the ERP system can be adopted easily and the rate of success would be 80 percent (Bradley, 2008). ERP is used in within the organizations to manage their resources and is used in number of projects to make them successful and complete them within budget and scope. For this the most important factors are project management, top management, communication and training etc. These factors collectively help in attainment of ERP projects and other projects in Asian countries involving Pakistan (Dezdar, 2012).

ERP system is considered important for the projects, as it helps employees and project managers to complete the project within time, scope and quality. It helps in the management of human resource, budget, resource allocation and risk of every single project operating in project-based organization. ERP helps both projects and organizations in performing their tasks and processes (Kwak, Park, Chung & Ghosh, 2011). ERP is a complex structure that acquires project management specialists to implement and to transfer knowledge, technicalities in employees, so that they can use the system independently to make the project successful and to

achieve the desired tasks (Ko, Kirsch, & King, 2005). Project-based organizations expect that enterprise system (ES) are important set of integrated applications. They play a beneficial role in achievement of strategic goals and objectives associated to the projects; therefore, complexities associated with the project can be managed through this system and issues can be resolved (Davenport, 2000).

ERP systems are one of the fundamental elements within the organization that helps to manage the daily processes/core operations and to manage the projects in a cost-effective way. There are number of issues that can be faced in adoption of system starting from decision making till the successful implementation. These issues can be overcome by the top management support, system quality and training. Among these three, systems quality is considered to be a vital antecedent because it makes the management of projects capable to make decision about the structure or set up quickly by looking upon the quality. Hence, ERP helps an organization in decision making in all aspects and its implementation (Costa et al., 2016).

According to Fryling (2010), project management strategies are considered important for handling of projects budgets, resources, human resource and planning. These decisions clearly state that to overcome the triple constraint issues ERP system plays an important role. Project manager should encourage their employees to use this system for making the project successful. Some organizations take ERP implementation as a complex project, for that project management strategies are to be adopted. ERP system is significant for the projects because it helps in handling of projects form initiation phase till the execution phase, which means that from start till the end all the issues, resources, decisions, human resource, budget and everything is handled by enterprise resource planning system; hence ends with the satisfaction of organization and customer (Ghosh, & Skibniewski, 2010).

Project-based organizations (PBOs) that take the implementation of ERP as a project and are responsible for the entire process from start till end. These kinds of projects are very risky and require a lot of attention because the success rate is relatively lower than the failure rate. In case of failure, resistance along with the

dissatisfaction can be caused at both ends. For this purpose, researcher have examined that loyalty, responsibility, training, education, rationality, careful change management and interdepartmental communication (Tarhini, Ammar, Tarhini & Masadeh, 2015). ERP is different for different type of organizations depending upon the size and requirement. However, in case of small and mid-sized (SMEs) organizations, software which provide different services like (SaaS) enterprise resource system works best and gave benefits without incorporating new infrastructure, skills, software upgrades and maintenance. In case of project related organizations, there is need of ERP that involves project management practices to handle their projects (Seethamraju, 2015).

Altamony, Tarhini, Al-Salti, Gharaibeh and Elyas (2016) analyzed that the changes and risks associated with the projects. The researcher had stated in comprehensive review that change management strategies justify the adoption of ERP systems and technologies in the organizations. So, adoption of ERP system through these strategies would be considered as a positive initiative toward the success of PBOs. For a successful management of changes incurred, there is need to go through the different phases; moreover, incorporating modifications is not an easy task it includes risk and complexities. Organizations have faced risks such as lack of management support, assistance, ineffective communication with users during project handling and implementation. Risks ratio can be reduced by the incorporation of requirement specific system depending on the nature of enterprise. Hence, ERP provide the facilities to the users to adapt system according to them, it is a plus point for the organizations but it is a major reason for risk. So, in projects ERP system helps to overcome the difficulties and complexities and plays vital role in the smooth completion (Chang, Kuo, Wu, & Tzeng, 2015).

Enterprise Resource Planning (ERP) is a type of Information system that blend multiple functions in one package, this package is used by the organizations to optimize their operations and it also ensure the smooth completion of projects. All the changes initiated in terms of management and customer can be handled easily with the help of ERP. (Van Hau & Kuzic, 2010) conducted a survey on factors associated with the success of ERP, and concluded that strategies like effective

communication play 100 percent role, top management support 91.6 percent, effective training/knowledge transfer 75 percent, project champions 58.3 percent and systematic plan for change plays 50 percent role in successful ERP implementation. Hence, ERP plays effective role through these strategies among the different projects to make them successful. Moreover, the main objective of ERP is to perform core operations and also to facilitate communications flows, information flow, resource allocations among different departments (i.e. human resource, finance, supply chain, manufacturing and customer relations) and centralized view on the project from top to the lower management. It means that each and every aspect of project can be managed through the adoption of ERP (Hoch & Dulebohn, 2013).

When it comes to research field, it has extremely solid foundation for ERP adoption and implementation discussed in the comprehensive review of studies. Schlichter and Kraemmergaard (2010) states in the thorough review of ERP done in ten years by incorporating hundreds of reviews of between 2000 to 2009 that helps to examine the recent status of ERP research. The main purpose was to develop a reliable framework that will assist in designing, deployment and usage of ERP. According to the review, 80 percent of the topics were classified under ERP implementation, management, optimization and tools.

From industrial perspective, ERP has been deployed by the number of industries and witnessed the improvement in performance. Survey conducted among 444 respondents, out of which 7.5 percent of respondent were from the manufacturing industry, 16 percent from the service industry have not implemented ERP, while 32 percent of respondents have implemented ERP. Hence ERP is observed to be an important measure of success for project management and in other fields and industries (Kosasih, Salomon, Doaly, Ryandi, & Liman, 2019). Now a day there is a lot of competition and organizations have to cope with the latest technologies to sustain in the market. So, ERP provides competitive advantage to sustain (Gollner & Baumane-Vitolina, 2016).

Perceived ease of use (PEOU) and perceived usefulness (PU) are the two important antecdents that plays an important role in adoption of ERP system. PEOU is defined as user can use the particular system without incorporating his own effort

(Davis, 1989). According to Ozturk, Bilgihan, Nusair, and Okumus (2016) PEOU helps to gain loyalty of employees working in the project-based organization. In another study, researcher recommended that PEOU play significant part in adoption of ERP and it helps to predict the intentions and the behavior of user. So, for adoption of any technology particularly ERP PEOU plays and important part (Elkaseh, Wong, & Fung, 2016).

Service quality, online system usage (Mustapha & Obid, 2015), attitude, intentions are linked with the PEOU and PU plays an important role in adoption of ERP. In past literature, it is explained in depth about PEOU and PU that motivate the researchers to explore and work on these two aspects in detail with regard to ERP system, as these variables plays significant role in the success of organizations using ERP (Ma, Gam, & Banning, 2017). Other researchers have found out that usability characteristics like PEOU and PU have strong impact on enterprise resource planning and lead towards the user satisfaction. More satisfaction leads towards the customer satisfaction among project-based organizations (Calisir & Calisir, 2004).

Perceived usefulness (PU) is defined as any user using a particular system will enhance the performance (Davis, 1989). It is important element for the adoption of new technologies like ERP (Elkaseh, Wong, & Fung, 2016). According to the prior literature, PEOU and PU are inter-linked with each other which helps an organization to take decision of adoption of ERP (Sun & Zhang, 2006). PU, PEOU, perceived security and privacy are important and significant for the customers to adopt a technology (ERP) and it influence the customers attitude (Jahangir & Begum, 2008). Calisir and Calisir (2004) states that perceived usefulness PU plays vital role in acceptance of technology and results in high satisfaction level.

Literature relevant to the IS has highlighted the importance of end user acceptance (EUA), which specifies that user has to accept a technology for the successful implementation. Because if the user will not accept, organization deployed system would be of no use as the required benefits are not achieved. Moreover; trust, privacy and innovations are also important for the acceptance (Miltgen, Popovic, & Oliveira, 2013).

For achieving competitive advantage, the organizations need to pay attention towards the employee acceptance and they should polish and properly utilize the capabilities to get the appropriate results. The key success of ERP system is dependent upon the employees who willingly welcome the system and use it without any hesitation (Youngberg, Olsen, & Hauser, 2009). System can perform well if they are used, implementation without usage is worthless. The main problem that organizations face is the resistance of new technology by the management and employees, to overcome resistance there is a need to predict the intentions of employees. Intentions can be predicted by PEOU and PU (Davis, Bagozzi, & Warshaw, 1989).

It is significant for acceptance of enterprise resource planning employees should acquire proper knowledge and capabilities from graduation till the future along with the experience. There are certain external factors been identified with the collaboration of technology acceptance model (TAM) and those are personal traits, knowledge about relevant information, perceived system, technological components of ERP and perceived support (Sternad Zabukovek, Picek, Bobek, iovska Klannik, & Tominc, 2019).

1.2   Research Gap

Organizations need to sustain themselves by creating competitive advantage over others. ERP system adoption is considered to be a competitive advantage in the current era that help to enhance the efficiency, effectiveness and productivity (Masa'deh, Mufleh, & Alrowwad, 2017). With the development of the industries, now small to large organizations are planning to go for the latest tools and techniques like ERP, and are finding ways on how to successfully adopt and implement the system (Ali & Miller, 2017; Antoniadis, Tsiakiris, & Tsopogloy, 2015). ERP system adoption and end user acceptance are the two important aspects of this study. So, far latest research work emphasizes that user resistance issue is faced in the past can overcome by focusing towards the easiness and usefulness of system.

if system is easy to use and is useful then the adoption rate would be higher even in field of project management (Tubaishat, 2018; Sugandini et al., 2018).

This study will try to address this gap. This study will use ERP system adoption as mediator between PEOU, PU and end user acceptance. Moreover, due to dearth and limited literature in these variables, it is need of hour to analyze the perspective of end user and its acceptance towards ERP system. This is a unique link and yet needs to be explored in the field of project management (Gunjal, 2019). This research could make a significant difference in the field of research as such research with these variables i.e. Enterprise resource planning system adoption, perceived ease of use, perceived usefulness and end user acceptance collectively needs to be explored in Pakistan as per our best knowledge.

ERP system is in limelight and it needs to be explored, as it has a major contribution in the development of different fields. Similarly, in project management there is need to work on this and it could be a point of learning for the research scholars. As ERP system adoption in field of project management needs to be focused (Ahmer, 2018). So, it would be a significant contribution in businesses and project-based organizations. This research is also the combination of two main fields i.e. Information technology and Project management.

1.3 Problem Statement

Project management is a key factor for the successful adoption of the ERP system, but it is witnessed that inadequate project management skills play leading role towards the unsuccessful implementation and adoption of ERP. It is important to have qualified and well-trained staff in order to motivate employees and convince them to adopt the system, to overcome the past loopholes. By the incorporation of system, organizations will acquire speed, efficiency and accuracy in the day to day business operations. And through this automated and integrated system, the productivity will be enhanced in a cost-effective way. Moreover, ERP system help to manage the different department of organization and projects also, the departments include: finance, human resource, inventory, sale and purchase,

quality and sale management. Previously, projects fail due to lack of appropriate budget, resources and human assistance, this problem could easily be overcome by the ERP adoption. The issues like data errors, duplication, report generation, lack of visibility and effective communication could be resolve by ERP system. So, for the success of project-based organization and projects could be achieved by the adoption of enterprise resource planning system.

1.4   Research Question

The current study aimed to explore the following questions:

Research Question 1

Does perceived ease of use of ERP system adoption influence end user acceptance?

Research Question 2

Does perceived usefulness of ERP system adoption influence end user acceptance?

Research Question 3

Does ERP system adoption influence end user acceptance?

Research Question 4

Does ERP system adoption mediate the relationship between perceived ease of use and end user acceptance?

Research Question 5

Does ERP system adoption mediate the relationship between perceived usefulness and end user acceptance?

1.5 Objective of Study

The Specific study adds up to formulate and originate a frame to recognize the links among PEOU and end user acceptance. PU and end user acceptance. It also includes mediating role of ERP system adoption between EUA and PEOU and PU. As well as the goals of the research are:

1. To determine the relationship of perceived ease of use of enterprise resource planning system adoption and end user acceptance.

2. To determine the relationship of perceived usefulness of enterprise resource planning system adoption and end user acceptance.

3. To determine the relationship of enterprise resource planning system adoption and end user acceptance.

4. To examine the mediating role of ERP system adoption between perceived ease of use and end user acceptance.

5. To examine the mediating role of ERP system adoption between perceived usefulness and end user acceptance.

6. Testing the research model in the context of Pakistan.

1.6 Significance of Study

It is important to study the latest technologies associated with project management, in this research the center of attention is ERP adoption which is the latest technology and need to be focused. This study highlights the relationship between ERP and end user acceptance, as in the organizations ERP system adoption is directly associated with the success of the project after the acceptance of end users, if utilized properly. On one side this study will be helpful in theoretical context in the field of project management. And besides this, the study will give the evidence that there would be a significant increase in the rate of user acceptance that will contribute towards adoption of ERP system.

For the constructive use of ERP, it is important that employees should know how to use this system. So, it includes the important aspect of PEOU and PU. The success ratio of technology is dependent upon the level of comfort of employees with the system.

Furthermore, this research will elaborate that how adoption of ERP system in organization will be helpful in terms of project handling. This research opens up new ways and paths for the researcher and hence provide the theoretical aspects of ERP system and end user acceptance. This will also help to realize the organizations of Pakistan the importance of ERP system and its efficiency and effectiveness.

This century is all about the technologies. Competitors have to come up with these technologies to sustain and compete in the market. Moreover, these systems also provide competitive advantage. So, this is the best time for the organizations to adopt the ERP system for managing their operations. The present study also highlights that it is the need of hour to gain better understanding that without ease in using the system would lead to the dissatisfaction and inefficiency of ERP system. Many organizations failed the successful adoption of ERP system because they are not aware of this technology. So, this study will help in this aspect as well. This study emphasizes on ease and usefulness of a system, which is extremely important. Without this adoption of a technology is useless. So, this technology would be a great success for the organizations who have adopted ERP system. Through this they can perform their basic operations, manage communication flows and can exchange the information across different departments.

This domain in specific has not been explored in Pakistan. So, this study would be a significant contribution in the field of project management. This study will also fulfill the existing void in the existing literature because this domain in specific is not explored neither its adoption neither its implementation along with these variables in the field of project management within Pakistan.

1.7   Supporting Theory

Technology Acceptance Model (TAM) is used as supporting theory in the current study, which is given by Davis (1989).

1.7.1   Technology Acceptance Model (TAM)

Technology acceptance model is a data system that tells that how users will accept and use the particular system. It consists of two important dimensions i.e. PEOU and PU. According to Davis (1989) PU helps in increasing the productivity and PEOU ensures that all the effort is made by the particular system, these both plays an important role in adoption of ERP in term of TAM (Davis et.al, 1989; Marangunic & Granic, 2015).

In current research we are analyzing the different aspects of ERP system adoption. Almost every organization (small, mid-sized and large) is adopting ERP to perform their core operation cost effectively and efficiently. So, for technology adoption, technology acceptance model is considered to be a best fit. Whenever organization need to adopt a technology must go through or use technology acceptance model.
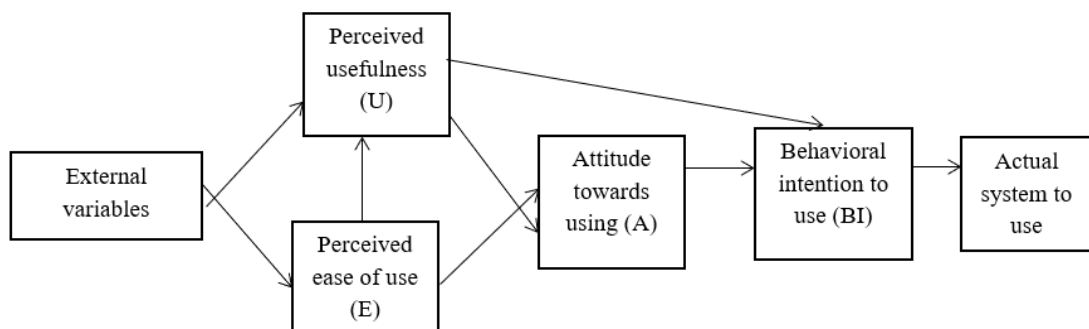
FIGURE 1.1: Technology Acceptance Model

Chapter 2

Literature Review

The current study is based on the relationship between variables like enterprise resource planning system adoption, end user acceptance, perceived ease of use and perceived usefulness. This chapter deeply explains the relationship, and also highlights the past work done by the scholars on these variables.

2.1 Enterprise Resource Planning System Adoption

ERP system is an integrated solution and a complete package that helps an organization to run its entire functions in an effective way (Klaus, Rosemann, & Gable, 2000). Rosemann, and Wiese (1999) suggests that ERP is a system that consists of integrated software packages that helps to perform the core operations and administrative functions of an organization in an effective way. For successful ERP implementation time and budget is considered to be an important parameter for project-based organizations. As every organization implement ERP according to their specifications and requirement, continuous modifications are needed and they are critical. As they can lead to increased cost and implementation time and they require non-stop up gradations (Mabert, Soni, & Venkataramanan, 2003).

2.2   Perceived Ease of Use

PEOU is the extent to which a person believes that the system is effort free, it is the believe and it comes through the interaction with particular system (Davis, 1989). Ease of use plays a vital part in forecasting the employees intentions towards acceptance of technology. For users a system or technology becomes more convenient when they have gain experience through exploring a system and that also contribute towards sufficient knowledge and confidence (Hackbarth, Grover, & Mun, 2003). However, there can be a possibility that user feel difficulty while interacting with the system. So proper seminars, awareness programs, trainings should be provided. Sometimes the sole reason is motivation, as employees are not motivated towards the usage of a new system, for those motivational seminars should be held and management should also encourage them (Samuel, Onasanya, & Olumorin, 2018). From learning environment to the working environment Brown (2002) finds out that PEOU had a great influence on predicting the adoption of a technology.

2.3   Perceived Usefulness

Perceived usefulness is the extent to which the user feels like that particular system used, enhance the performance or not (Davis, 1989). According to Davis (1989) in a project-based organization if a technology helps to enhance the performance then uses would be satisfied and positive attitude would be developed towards using a technology. Usefulness is divided into two classifications which are objective performance measure and subjective performance measure. Objective performance means does the user have the capability to interact with the system? How much a user has skills to interact or use particular system? Whereas, subjective performance measure includes the preference given by the user to use a system, simply means user like a system or not (Nielsen & Levy, 1994).

2.4   End User Acceptance

End user acceptance (EUA) means that user is satisfied and motivated for adopting a particular system and technology. Zhao, Fang, and Jin (2018) identified that for any business user acceptance is influenced by TAM factors and trust. Moreover, PEOU has strong impact on PU. These antecedents play a vital role in users adoption of any technology or system.

Self-efficacy has strong effects on the acceptance intentions of users, Zhang et al. (2017) suggested that self-efficacy is directly related to the PEOU and PU that determine the satisfaction of users in technology acceptance. Besides working environment, home environment requires users acceptance for electronic device installments. For that TAM factors along with the connectedness, compatibility and control play important role in acceptance and adoption (Park, Cho, Han, & Kwon, 2017).

2.5   Perceived Ease of Use and End User Acceptance

User acceptance and satisfaction is considered as the crucial success factor in term of information system. Mahmood, Burn, Gemoets, and Jacquez (2000) stated in meta-analysis, that deployment of such systems requires certain antecedents that lead towards the end user satisfaction and those are PEOU, PU, user expectations, user experience, user skills, user involvement in system development, organizational support, perceived attitude of top management toward the project and user attitude toward information systems. But for online system, user does not feel ease and comfort much because in this case mouse is use for controlling the system. And aged user might feel difficulty in interaction with use of mouse. So, PEOU is insignificant to some extent (McCloskey, 2006).

World Wide Web, information system and internet-based system used not in working environment rather in the home environment easiness is preferred and plays

a vital role in adoption of system in any type of users. PEOU and PU in TAM model recommended by Davis (1989) both influence and forecast the actual usage of a software, system or technology. Moreover, in develop systems/organizations PEOU not influence the usage but also influence usefulness. Ease of use includes different perspective of using a particular technology like ease in finding, understanding, self-efficacy and computer techno stress (Brown, 2002).

In research field, PEOU has a very sound theoretical background. Tzafilkou and Protogeros (2017) finds out that day by day technological changings are happening, desktop graphical application has been replaced by end user developments (EUD). That helps the users to make customized applications and software for their ease to enhance the ratio of performance with reduced time and efforts. It has also opened many avenues for the researchers to explore the different dimensions like behavioral intentions, usefulness, perceived risk, motivation (intrinsic), employee training. Top journals have published the research studies on PEOU that contribute towards user acceptance, these studies help to increase the interest of researchers and also highlight the importance and impacts of these variables in different perspectives (Cheong & Park, 2005; Lee, Hsieh, & Hsu, 2011).

Renewable energies are a type of technology that gives benefit to the human beings through the natural resources. Such technologies also require acceptance by the employees working in organizations. Cost and knowledge are the important parameters that need to be investigated before making any energy. Kardooni, Yusoff, and Kari (2016) examined that cost and knowledge of renewable energy has indirect association towards the attitude of using energy, where attitude is strongly linked with PEOU and PU. So, every type of technology need acceptance before deployment, without acceptance it would be a disaster.

Benefits of any technology can be enjoyed if the employees or management are intended towards using a system whole heartedly. Strudwick (2015) examined in the integrative review that most frequent model that is used for acceptance of technology is technology acceptance model. This model has been modified and implemented in almost every industry (health care, construction, home, offices, and school everywhere). Some employees feel difficulty in the interaction with the

system, for these in every working environment there is a need of electronic learning (e learning) that helps to train employees about the latest tools, technologies, products and services. Large to small enterprises are investing in these e learning and acceptance of these system is a critical issue in the deployment and management of system. The study suggested that PEOU and perceived credibility are foremost antecedents that influence the decision of technology management issue (Onga, Lai, & Wang, 2004).

In the past decades, considerable amount of research is conducted on PEOU, it has a strong influence on behavioral intention. And had strong direct or indirect effects on PU and on training, beliefs, attitude and intention to use. It is investigated that these antecedents have inter-relationships among each other (Venkatesh, 1999; Agarwal & Prasad, 1999; Sheikhshoaei & Oloumi, 2011). The researcher in his study inspects that TAM variables along with perceived interactivity had influence on attitude, that leads toward intention to use. And that can be measured by the satisfaction level of user, if the user is satisfied with the usage of system then there would be positive intention. Otherwise in case of dissatisfaction users will not like to use the system (Yoon, 2016).

Project-based organizations need to implement latest technologies to compete and remain stable in the competitive market, for that management have to make tough decisions. Business intelligence systems (BIS) are the one that consist of set of software packages that helps in keeping and retrieving important information and knowledge. The main purpose of these BIS is to enhance the efficiency and effectiveness in making complex decisions and they help in gaining competitive advantage. Bacha, eljob, and Zorojaa (2016) stated in the comprehensive review that BIS can be adopted by the help of technology acceptance model. It is assumed that when a technology is considered to be easier, it is more convenient, usefulness and that technology is less complicated (Van der Heijden, 2004).

Based on above argument, following hypothesis is formulated:

H₁: *Perceived Ease of Use has direct positive relation with End User Acceptance.*

2.6   Perceived Usefulness and End User Acceptance

According to Davis (1989) perceived usefulness helps in improvement and betterment of system, it is a measure that is almost needed by the acceptance of most of technologies. In the survey 89% respondents agreed that usefulness is an important parameter and that cant be neglected as users prefer such systems that are useful. PU is influence by number of factors like system has the capability to improve, system makes the work simple for the users and system helps in making legal and ethical documentation. It can be used as dependent and independent variable as it influences PEOU and contribute towards acceptance of users (Koh, Prybutok, Ryan, & Wu, 2010). Moreover, it is examined, systems that are technically perfect in term of quality or quantity often face failure due to lack of user acceptance. Individual, system and organizational characteristics helps in gaining acceptance from the end user. Individual characteristics involve support and training to the new employees, organizational level require cost and support from the management and as well as from the employees and at system level it involves PEOU, PU, system acceptability and security (Handy, Hunter, & Whiddett, 2001).

Besides at organizational level, governments are also implementing the electronic systems for providing ease to their people, all manual systems have become automatic at transaction level, information level rather at every level. Horst, Kuttschreuter, and Gutteling (2007) in the survey, finds out that risk and trust are the fundamental elements that play a vital role in adoption of any electronic system because before adoption users evaluate all the benefits and risks of the system. Hence, PU had a significant impact over adoption of E-Systems. Meta- analysis was conducted by Dwivedi, Rana, Jeyaraj, Clement, and Williams (2019) consisting of 162 studies regarding information system and information technology acceptance by end users. Results indicated that attitude is directly associated with behavioral intentions and usage behavior. And also found other variables like performance

expectancy, effort expectancy, facilitating conditions, and social influence which are considered important for usage pattern.

Enterprise resource planning (ERP) systems require acceptance before deployment. But these systems are complicated and tough. Every PBOs implement according to their needs and specifications and some modify system accordingly. PU have a direct positive association with attitude, which influence acceptance of an ERP system. This research is also a significant contribution because previously ERP implementation was not much successful due to over budget and time constraint. Therefore, PEOU and PU are considered as a success factor (Erasmus, Rothmann, & Van Eeden, 2015). EUA is almost needed by every individual, by the management and also most importantly from the customers. ebjan, Bobek, and Tominc (2014) talked about the customer relation management (CRM), organizations need CRM solutions to make the end user satisfied by the product and services. TAM variables help in the successful implementation of such solutions in the project-based organizations.

PU is a construct that is required by everyone in the organization. While the managers should help employees and users to realize that by using a particular system, will make your life, work easy and comfortable. Hence; systems perceived as useful are considered as a positive initiative that lead towards user satisfaction. Usefulness basically depends upon the user intentions and satisfaction level. The study conducted by Amin, Rezaei, and Abolghasemi (2014) finds out that PU is directly associated with the satisfaction of users. Another study suggested that PU positively influence mobile banking (Alalwan, Dwivedi, Rana, & Williams, 2016). Retailing is also playing an important role in todays business, to gain the competitive advantage, retailors are making improvements to provide better services and benefits to their users. Supply chain management, customer satisfaction and customer management are the three main technological innovations in the retailing. PU is an important antecedent that plays a significant role in adoption of innovative technologies in retailing to enjoy the benefits. Hence PU is playing an important in every industry and organization (Renko & Druzijanic, 2014).

Based on above argument, following hypothesis is formulated:

H$_2$: *Perceived Usefulness has direct positive relation with End User Acceptance.*

2.7 Perceived Ease of Use and Enterprise Resource Planning System Adoption

In todays growing world, new technologies are emerging day by day which helps organizations in attaining competitive advantage. Users have become educated and well aware about the systems so that they can obtain the desired performance out of it. But when it comes to complex and complicate systems like ERP, user resist due to different factors associated with it. So, its the task of management to motivate and encourage their employees to cope up with the latest technological advancements. Hwang (2014) examine that user experience and personal innovativeness helps in motivating the employees in ERP adoption, where internal motivation includes perceived enjoyment and PEOU and external motivation includes PU. It had a strong relationship with intentions that helps in successful adoption of a technology and system in different industries (De Toni, Fornasier, & Nonino, 2015).

Construction industry had tasted huge failure due to inefficiency, unsustainability and lack of interest of management. Among these there are different factors that shattered the industry. To overcome these problems ERP system comes in, but ERP implementation itself was a big challenge. According to the study conducted by Ozorhon and Cinar (2015) finds out three factors through the factor analysis that help in successful ERP implementation. Those are Human factor which contributes 26%, organizational factor contributes 25% and technology factor 20%, overall, 71% contribution. Technology plays fundamental role in ERP but without organization and employees it seems pretty impossible. The study highlighted the departments using ERP, accounting 2%, finance 2%, technical office 68%, administration 2%, architecture 4%, construction16%, HR 4%, procurement 2%.

Organizations are shifting towards ERP to gain benefits, while switching cost benefit analysis needs to be done. This analysis helps the organization in switching from traditional to cloud based ERP. Where cost includes perceived risk and privacy concerns and benefits includes PU and PEOU (Chang & Hsu, 2019). Management support, appropriate communication, mutual cooperation, training and technological complexity are dominant indicators in development of ERP (Orougi, 2015). Even travelling has become a lot easier than before, organizations are making new technologies and applications that give guidance to the traveler. Adoption of such systems also requires TAM variables that had made the life simpler (Marzuki et al., 2016).

Every organizations from small to large has incorporated ERP system, which plays fundamental role in improving performance and results. While deploying such systems organizations face a lot of rejections and bare unwanted attitude of users. Garaa (2011) examined that perceived ease of use of a system influence satisfaction level of users who are intended to use ERP system. Readiness for change plays a significant role in ERP implementation through PEOU (Kwahk & Lee, 2008). It is witnessed that organizations had spent millions on the ERP, but in comparison the success rate is not up to the mark. Success can be achieved by factors find out by the different researchers that influence the system. These factors determine the satisfaction level and intentions towards the adoption (Gumussoy, Calisir, & Bayram, 2007). One of the main reasons of resistance can be, users are not aware of how to use the system? Previously traditional ERP system was used, later with the changing world technologies shifted towards the cloud based and customized ERPs. Employees awareness is a key antecedent that should be kept in mind, whenever a technology is emerged organizations should give awareness and trainings to the users to overcome the problems of acceptance and resistance (Boudreau, 2003).

Based on above argument, I formulated that:

H₃: *Perceived Ease of Use has direct positive relation with Enterprise Resource Planning System Adoption.*

2.8 Perceived Usefulness and Enterprise Resource Planning System Adoption

PEOU and PU are associated with the technology acceptance model, and are directly associated with the adoption of new technologies. Research study suggested that PEOU has a strong relationship with PU in adoption of learning system (Saade & Bahli, 2005). The advancements in intranet services, representation of information has shifted from text based to multimedia. Lim and Benbasat (2000) deposits in his study that multimedia representation of information is more useful than the text based. The researcher stated that usefulness helps in engaging the end user in a productive way. Whenever a user is interacting with a system, if find it useful i.e. it improves the performance and makes it more efficient and effective, user have a positive intention towards that particular system. So, PU is an important antecedent that is linked with the adoption of any type of technology used in project-based organizations (Ramayah & Ignatius, 2005).

ERP system helps in the integration of different processes under one umbrella, and organizations incorporate such system for performing their operations. ERP is a complicated software that needs to be guided to the employees, without proper training organizations cant achieve the desired success and benefits. The critical success factors to successful ERP implementation is PU and end user satisfaction. Zviran, Pliskin, and Levin (2005) developed that usefulness had a strong influence on the satisfaction level of the employees. Usefulness plays a vital role towards ERP system adoption. Moreover; usefulness influence attitude and behavioral intentions of users using ERP or other technologies. When a system is useful, user feel comfortable and a positive attitude is perceived, PU had a significant positive relation with the attitude and intentions of the employees (Purnawirawan, Pelsmacker, & Dens, 2012). Organizations are heavily investing in the deployment of information system and want to gain desired beneficial outcomes. But these outcomes are dependent upon the usage of system. The study suggested that system quality and system integration along with PU are the key aspects that lay huge impact on the usage of IS. Organizations have now become mature, they

are incorporating new information and technology systems to achieve the success (Saeed & Abdinnour-Helm, 2008).

Hess, McNab, and Basoglu (2014) stated in the meta-analysis, while highlighting TAM model also gave emphasis on PU. 380 articles were included in this analysis and finds out that 27% of articles use PEOU as a measure and 39% used PU. Models are also considered to be important for the organizations and they help in making changes that lead towards productivity. Chang and Hsu (2019) found that trust helps in influencing PEOU, PU and reduces risks in shifting from traditional to cloud ERP. The study highlighted the cost and benefits associated with switching. Success of ERP depends upon how successfully users have adopt the system and using it without any hesitation. Hence, it depends on the decision of users. Success is compared with the different functions within the organizations and a decision is made whether it is successful or not (Holsapple, Sena, & Wagner, 2019).

Wibowo and Sari (2018), the success determinants and evaluate the relationship between them. Quality and top management support are the key success factors that plays vital role in ERP system that had a significant impact on PU and satisfaction of user, in return these promote success. In past literature, number of researchers had examined ERP system that emphasizes on ERP factors, which are used singularly and in combination with other factors that helps in evaluation of adoption and acceptance. System and information quality are considered to be the core elements that make system successful (Ullah, Baharun, Nor, Siddique, & Bhatti, 2017).

Based on above argument, following hypothesis is formulated:

H$_4$: *Perceived Usefulness has direct positive relation with Enterprise Resource Planning System Adoption.*

2.9 Enterprise Resource Planning System Adoption and End User Acceptance

ERP systems are the central and fundamental part of every PBO. The main issue that organizations typically face is the acceptance and adoption of system by the employees and management. Because the success of ERP is dependent upon the user acceptance, if the user will accept then he will go towards the usage of the system. The study held by Costa et al. (2016) find out the antecedents that play a significant role in EUA and adoption of ERP, those are system quality, behavioral intentions, management support, training, PU and PEOU. While deployment of such systems top management and project manager go through different behaviors and attitude of employees, they make multiple lame excuses to resist the deployment. To overcome the resistance organization, need to deal with the employees sensibly by knowing their caliber, interests, beliefs, values and their needs. And management should conduct training and awareness sessions to tell the benefits of the system. These initiatives lead towards EUA (Aladwani, 2001).

There are studies conducted that focuses on acceptance of ERP by the TAM approaches. And analyze that resource optimization, trust in ERP system, PU, PEOU and attitude has strong association with intentions that influence the usage of ERP (Regmi, Zhang, Khanal, Zhang, & Kim, 2019). In another research, the researcher suggested stress is a situation that is not planned but it still occurs. It has its consequences and brings a lot of negativity in the organization. It not only influence performance of organization but had great impact on the employees. The main reason of stress is end user acceptance and satisfaction of users using information and communication technologies (ERP). Employees, who are interacting with the softwares on daily basis, face stress, fatigue and tiredness (Tarafdar, Tu, & Ragu-Nathan, 2010). But stress can be overcome by making proper schedule and if users are ready to use the system then stress will not be caused.

Literature suggest that there is a need to examine employees readiness for ERP system, which is considered to be important for the user adoption and resistance.

User acceptance is a mandatory part, it justifies the willingness of usage of particular system (Nah, Tan, & Teh, 2004). Hasan (2017) stated that acceptance should be at organizational level as well as individual level. Every single user needs to accept the newly deployed system in the project-based organization for accomplishing the benefits. Before acceptance, effective evaluation is needed to judge whether the system is fulfilling the requirement and needs or not? TAM is one of the most popular models that are used for the evaluation purpose. Expert users play significant part in providing enough knowledge and details about the features to the end user, that help in acceptance and adoption of any new technology (Abu-Dalbouh, 2016). Some organizations are giving proper educational guidelines that need to be considered before taking any decision regarding technology. Aka, Esen and zer (2013) stated that more education activities are done more implementation of ERP becomes successful. And it had a significant impact on the organizational performance.

End user acceptance is most crucial constraint that decides success of ERPs. One of the major reasons of failure is that end users are not willing to adopt the system. If ERP is implemented successfully but users are not using the system, then it is not considered as success (Seymour, Makanya, & Berrang, 2007). End user training can be helpful in the acceptance of system and can overcome the issues regarding PU and PEOU. According to the study training is directly associated with the performance and effort expectancy that lead towards adoption of new technology in the PBOs (Marshall, Mills, & Olsen, 2008).

The success rate of ERP is less than 49% due to its complexity. Organization are trying to adopt the system but cannot due to complexity, lack of knowledge and other reasons, they cannot the achieve the desired benefits. Many researchers have conducted studies and highlight the different aspects that cause failure. The most important issue addressed is user resistance, is the stress and fatigue cause by the system hesitate the employees in adoption (Mahmud, Ramayah, kurnia, 2017). User resistance behavior differs according to the scenario, when its necessary to use ERP and employees dont want to use, they resist. If they want to use the system either its mandatory or not users do not resist. It depends on the user, but

when its mandatory and users are not willing; it will affect the performance and also create negativity. (Laumer, Maier, Eckhardt, & Weitzel, 2014). Although these technologies are beneficial, useful, and make life easier at work but still such system are not encouraged to use. Due to trust, complexity, anxiety etc. the rate of adoption is too low. But the literature suggests that organizations should adopt ERP system by consensus from their management and employees to get the fruitful results (Pal, Funilkul, Charoenkitkarn, & Kanthamanon, 2018).

Based on above argument, following hypothesis is formulated:

H$_5$: *Enterprise Resource Planning System Adoption has direct positive relation with End User Acceptance.*

2.10 Mediating Role of Enterprise Resource Planning System Adoption between Perceived Ease of Use and End User Acceptance

The landscape of ERP is changing with the passage of time, suppliers have increased and they are delicately handling the system. They also cater needs of organizations from large-sized to mid-sized, who deploy system according to their specification and requirements. Some organizations need guidance for deployment, in this case suppliers help them out and provide relevant details about ERP. Selection of appropriate consultants is a tough decision, because in case of poor guidance organizations can waste a lot of time and budget. There are number of elements that help in vendor selection but Vaidyanathan and Fox (2017) finds out some elements out of many that are useful and can be adopted by the PBOs to solve the issues of ERP adoption. Researcher indicated that deep, accurate and to the point internal knowledge and easiness about the system helps in efficient implementation. If the top management and employees are well trained then they can use the system with ease and comfort, hence time would not be wasted. The most important task during implementation is to ensure that ERP package is installed with in time and budget, without causing any damage to the operations

of the organization. Moreover; the researcher found that ERP system adoption significantly mediates the relationship.

In the comprehensive review of literature from 1990-2003, the researchers and practitioners find out that ERP is a core need and from last decade till now it is highest demand of every organization. It helps in performing all the functions including project management, human resource, financial, supply chain and customer information. Review include articles relevant to the client/server architecture, ERP management, quality and PEOU is associated with system. It is noticed that from 2000 till current a lot of research have been done and almost majority of researchers have talked about this planning system and main reason for successful implementation is perceived ease of use (Shehab, Sharp, Supramaniam, & Spedding, 2004). The study conducted by Sternad and Bobek (2013) had examined technology acceptance model in ERP context, and concluded that PEOU lay huge impact on the system that influence the attitude of ERP user to use the system. The study also finds out percentage of ERP users in different industries like IT and telecommunications (44.0%), manufacturing (35.2%), professional, scientific and technical activities (10.2%), wholesale and retail trade (4.1%), and others (6.5%).

Successful Implementation of ERP system is a challenging task, because of user resistance. It is found out in pragmatic literature that the key of gaining user acceptance is the successful implementation of ERP. Effective deployment helps in acquiring the desired outcomes and lead towards efficient performance (Motwani, 2016; Motwani & Sharma, 2016). So, the most important thing is to gain the end user acceptance. ERP have been deployed in most of organizations, but they cant point out the benefits achieved. It can be due to the lack of user acceptance and usage of system properly. Moreover, End user satisfaction is considered to be important in adoption of system and to overcome the failure. It is reported that 67% of ERP system get failed because they cant achieve the desired goals and objectives, 90% ERP project are not on time and within budget and 40% projects fails due to other reasons. The success rate of ERP is less and its all because of end user dissatisfaction. When a user is not satisfied by a system, he does not use it and all the time and money invested on the system is wasted

(Lapointe & Rivard, 2005). Several studies have been conducted till now which talk about end user. Researchers says that implementation of ERP system doesnt lead to the satisfaction every time, sometimes users are well aware of technologies they adopt the system but not in every case. So, ERP system adoption and end user acceptance have a direct significant relationship with each other and both influence each other (Andreas & Natariasari, 2019).

Since 1990s organizations have shifted from self-developed IS to the purchase IS like ERP systems. Management is responsible for the system to be managed within the organization, but managers face a lot of problems. To overcome Hong and Kim (2002) introduced ERP system fit for the organizations, means customized systems according to the specification and requirements. For successful implementation management need to identify the best fit for their organization and should go for ERP, which ensure success.

PEOU, PU and end user acceptance/satisfaction are associated to enterprise resource planning adoption and it significantly mediates the relationship, and it is witnessed in number of studies. Along with that culture, behavior plays vital role. In the adoption cultural dimensions influence ease and usefulness that help in changing the attitude of user towards the data system (Kim, Urunov, & Kim, 2016).

Based on above argument, following hypothesis is formulated:

H$_6$: *Enterprise Resource Planning System Adoption mediates the relationship between Perceived Ease of Use and End User Acceptance.*

2.11 Mediating Role of Enterprise Resource Planning System Adoption between Perceived Usefulness and End User Acceptance

Previous literature suggest that perceived usefulness has significant association with ERP adoption (Ramayah & Lo, 2007). The study deposits that perceived

ease of use and perceived usefulness play an important role towards the adoption and the success rate is high. Small and mid-sized (SMEs) organizations require an appropriate software or set of integrated applications to manage their daily operations, for this purpose they have shifted towards ERP system. ERP is a complex and challenging task which require huge amount of investment and time, even though the ratio of success is less due to certain factors such as social and business pressure. Moreover, training, support, appropriate leadership, PEOU and PU leads to adoption and further leads to success of system (Almajali, Masadeh, & Tarhini, 2016).

Venkatraman and Fahd (2016) found that SMEs have been shifted from traditional ERP to the cloud-based ERP systems due to the usefulness of the system. The basic aim of this system is to overcome the loop wholes left in the past. The organizations need to enhance their productivity, efficiency, effectiveness, empower employees and flexibility in order to achieve their core objectives. The mistakes done in past need to be sort out. Managers should forecast the successful implementation of ERP by looking upon the financial statement of the organizations. This would help towards a better understanding of system and would enhance the usefulness of system. The literature suggested that cause and effect relationship between management and financial aspects can result in adoption and practice of such systems (Galy & Sauceda, 2014).

Keong, Ramayah, Kurnia, and May Chiun (2012) finds out factors that influence the users intention and make the ERP system useful are performance expectancy, effort expectancy, social influence, training, communication, perceived usefulness and shared beliefs. These all factors are helpful in convincing a user to use a system, or at least experience once. The use of these systems or software is important because they provide an organizational wide database driven solution, which help in performing the core operations in short span of time. Also help in tracking the resources and manage the cross-sectional communications. It has now become a need of hour it should be a part of every enterprise, curriculum and every industry. So, from here it can be found out that perceived usefulness and enterprise resource

planning system adoption have significant association (Iriberri, Kwon, & Henson, 2015).

ERP systems are widely accepted over the globe as it is considered as one of the measurement tools that guarantee success to some extent. Acceptance is greatly influenced by the TAM models, which are discovered in past two decades and every organizations are opting them. Previous literature finds out that ERP system usage is a critical factor that is incomplete without the desired benefits. It is a common assumption that implementation of a system leads towards the success. But actually, until the end users dont accept and find the system useful, the desired objectives are not achieved. It is a challenge for the organizations to make the system acceptable by everyone by providing the comfort zones to the employees (Nwankpa, 2015).

The success rate of ERP system is 49% or even in some cases less than 49%. The key focus of researchers is towards finding out the factor that lead towards failure. The biggest cause of failure reported by the number of studies is lack of end user acceptance, mostly employees and end users are not satisfied by the system or they feel difficulty in interaction, due to which systems collapse. The reasons are techno stress and emotional imbalance of employees which is caused by the continuous use of computer technology. The solution to this problem is switching of costs and benefits and roles among the employees, which can help in gaining the interests and can overcome the level of stress (Mahmud et al., 2017).

Based on above argument, following hypothesis is formulated:

H$_7$: *Enterprise Resource Planning System Adoption mediates the relationship between Perceived Usefulness and End User Acceptance.*

2.12   Research Model
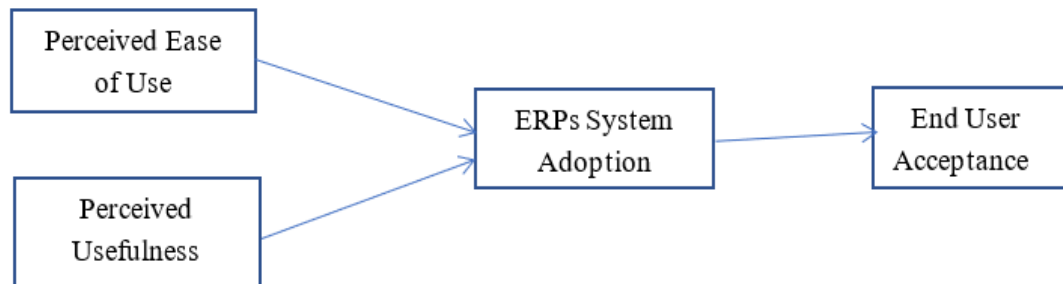
FIGURE 2.1: Research Model

2.13   Hypothesis of the Study

H₁: Perceived ease of use has direct positive relation with end user acceptance.

H₂: Perceived usefulness has direct positive relation with end user acceptance.

H₃: Perceived ease of use has direct positive relation with enterprise resource planning system adoption.

H₄: Perceived usefulness has direct positive relation with enterprise resource planning system adoption.

H₅: Enterprise resource planning system adoption has direct positive relation with end user acceptance.

H₆: Enterprise resource planning system adoption mediates the relationship between perceived ease of use and end user acceptance.

H₇: Enterprise resource planning system adoption mediates the relationship between perceived usefulness and end user acceptance

Chapter 3

Research Methodology

The focus of this chapter is towards finding out the concrete and authentic results for the research. It includes the detail about research design, population, sample and sampling technique, characteristics of sample, unit of analysis, instruments and reliability of the variables.

3.1 Research Design

3.1.1 Type of Study

The aim of this systematic research is to highlight the impact of PEOU and PU on end user satisfaction, with mediating role of ERP system adoption. To conduct the research, project-based organizations were targeted and the data was collected from project managers and employees.

Questionnaire were distributed. Most of the responses were gathered through personal visits to the relevant respondents to check whether questionnaire is filled or not. Other responses were collected through electronic mail. Out of 300 only 250 genuine responses were considered as some of the questionnaire received were incomplete. Data was kept in a password protected system; data was anonymized by separating names and each of the giving each case code. Hard and soft copies of questionnaire were protected in a secured place to which only researcher has access. The sample chosen is assumed to be the representation of the entire population.

3.1.2   Research Philosophy and Quantitative Research

It is considered to be the most important part of the research. It actually frames what is being analyzed or focused in the study. In any research study, the scope of unit of analysis varies from individual to the multiple groups, cultures, organizations and companies. ERP is a large and complex system; in this study it was aimed to analyze narrow perspective of ERP system and its bi-lateral association i.e. impact of perceived ease of use and perceived usefulness on end user acceptance. So, the unit of analysis was project managers and employees working in the PBOs who have adopted the customized ERP system according to their needs and specification particularly using Enterprise resource planning systems.

As the population of Pakistan is huge, so quantitative research is used, which help in producing the qualitied outcomes. Therefore, this research is also quantitative in nature that links different variables together and find out the desired results.

3.1.3   Unit of Analysis

It is considered to be the most important part of the research. It actually frames what is being analyzed or focused in the study. In any research study, the scope of unit of analysis varies from individual to the multiple groups, cultures, organizations and companies. ERP is a large and complex system; in this study it was aimed to analyze narrow perspective of ERP system and its bi-lateral association i.e. impact of perceived ease of use and perceived usefulness on end user acceptance. So, the unit of analysis was project managers and employees working in the PBOs who have adopted the customized ERP system according to their needs and specification particularly using Enterprise resource planning systems.

To measure the impact of PEOU and PU on ERP system adoption along with the end user acceptance among the managers and employees, research need to target the users of project-based organizations that use ERP and have enough knowledge about the system. To assess end user acceptance, there is need to target users who have successfully accepted the system and are satisfied, were selected as unit of analysis.

3.2   Population

The study focuses on the development sector. The population of study is the project managers and the employees, operating ERP system and working on the different projects in the project-based organizations. Project-based organizations included are: Bini Telecom, Ground Zero technologies, IT Solutions and Robstam. These organizations have not adopted full fledge ERP system rather they are using some and smaller aspect of ERP. These organizations are small and depending upon their requirements, need and financial resources they have adopted the customized ERP system. So, selected these organizations as the narrow perspective of ERP is to analyzed in the context of Pakistan.

Data was collected from the employees using ERP system in PBOs. As ERP systems are not specific to any of the industry so people using ERP system from any industry, different organizations from different organizations adopt this system and small organizations adopt smaller version of ERP, is part of our sample. These include national level project-based organizations running multiple projects like development projects, IT projects, health care, education, social services etc. There are more than 30 projects under these multiple fields. The data is collected through questionnaire which will be filled via Google forms (soft form) and hard form was also circulated in the PBOs.

3.3   Sample and Sampling Technique

Due to limited time and resources the data is gathered from the targeted population through convenience sampling technique. For this, particular group of individuals are selected who are true representation of whole population. In this study project-based organizations are being contact for data collection purpose.

Convenience sampling technique is used to collect the data for PEOU, PU, end user acceptance and ERP system adoption. At least 300 questionnaires (Krejcie & Morgan, 1970) were circulated and 250 were supposed to be error-free and perfect.

The questionnaire consists of 4 sections. First section includes demographics that respondents have to provide their relevant information before filling the questionnaire. Demographics included are age, gender, qualification and experience. The other part of questionnaire includes the questions related to the variables. We used 5-point Likert scale to measure the responses of the respondents where 1 represent strongly disagree and 5 represents strongly agree.

3.4 Sample Characteristics

For the current research, two questionnaires were designed. One for the project managers/top management who have adopted an ERP system in the project-based organizations and second questionnaire is for the employees/users of the system. The demographics of the study includes age, gender, qualification and the experience of the project managers and employees.

The details about the sample characteristics are as follows:

3.4.1 Gender

Gender is an important demographic, as it helps in determining the gender equality in the research. It shows the ratio of male female respondents and it is considered to be significant as it tells about the difference of gender in a certain population of sample. In the current research, it was well thought and make sure that data collected from the respondents would be without any biasness but still it had been analyzed that male respondent's ratio is greater than the female respondents.

TABLE 3.1: Gender Distribution

Gender	Frequency	Percent
Male	171	68.4
Female	79	31.6
Total	250	100

Table 3.1 shows the ratio of male and female gender in which 68.4% were male and 31.6% were female respondents. The percentage of male respondents was clearly high.

3.4.2   Age

Age is also an important demographic, but most of the respondents hesitate in telling their age openly. So, for their convenience range of ages are used despite of the particular age of the respondents.

The respondents of this research belonged to the following age groups:

TABLE 3.2: Age Distribution

Age	Frequency	Percent
18-25	75	30
26-33	99	39.6
34-41	42	16.8
42-49	22	8.8
50 and Above	12	4.8
Total	250	100

Table 3.2 illustrates that majority of the respondents lies between the age of 26-33, which means that 39.6% of respondents were having the age ranging from 26-33, 30.0% respondents were having the age between 18-25, 16.8% were having age ranging between 34-41, 8.8% respondents were having the age ranging from 42-49 and only 4.8% of respondents were aging above 50.

3.4.3   Qualication

Education plays fundamental role in the success of any country and in this hour of need it is considered more important in order to compete worldwide. It is also important for the researcher to ask the right question from the right respondent. So, after gender, qualification is another demographic that plays an important role.

Table 3.3 represents the qualication of respondents. Maximum of the respondents were having the qualication of Master, which involves 34.0% of the total respondents. 29.6% are bachelor qualified, 33.6% are MS/MPhil qualied and 2.8% were PhD qualied respondents.

TABLE 3.3: Qualification Distribution

Qualification	Frequency	Percent
Metric	-	-
Bachelor	74	29.6
Master	85	34.0
MS/Mphil	84	33.6
PhD	7	2.8
Total	250	100

3.4.4 Experience

Experience is another demographic in the research, it has its own significance. It helps to depicts the level of expertise that an individual has. So, for this purpose range of the time period of experience were established, so that respondents can choose comfortably.

TABLE 3.4: Experience Distribution

Experience	Frequency	Percent
5 and less	80	32
6-13	75	30
14-21	61	24.4
22-29	26	10.4
30 and above	8	3.2
Total	250	100

Table 3.4 shows that maximum number of respondents were having experience between 5 and less years, which shows that 32.0% respondents were having experience between this range. 30.0% respondents were having experience between 6-13 years, 24.4% respondents were having the experience between 14-21 years, 10.4% respondents were having experience between 22-29 years and only 3.2% respondents were having experience 30 and above years.

3.5   Instrumentation

3.5.1   Perceived Ease of Use

It is used as an independent variable in this research. The six-item questionnaire is adapted for PEOU which is made by (Malhotra, & Galletta, 2005). The responses were obtained by using five-point Likert scale where 1 represents Strongly disagree, 2 represent disagree, 3 represents neutral, 4 represents agree and 5 represents strongly agree. Previous studies reported reliability of PEOU which is 0.91 (Hamid, Razak, Bakar, & Abdullah, 2016). Some of items included are Learning to use [ERP] for performance-based activities is easy for me, I find [ERP] flexible to interact in performing work-related tasks and activities and I find it easy to get [ERP] to do what I want to do in performing work-related activities.

3.5.2   Perceived Usefulness

Perceived Usefulness is used as an independent variable in this research. The six-item questionnaire is adapted for PU which is made by (Malhotra, & Galletta, 2005). The responses were obtained using five-point Likert scale where 1 represents Strongly disagree, 2 represent disagree, 3 represents neutral, 4 represents agree and 5 represents strongly agree. The reliability reported of perceived usefulness is 0.92 (Hamid et al., 2016). Some of the items included are Using [ERP] would increase my performance, Using [ERP] in my work would enable me to accomplish my tasks more quickly and I would find [ERP] useful in my work.

3.5.3   ERP System Adoption

ERP system adoption is used as mediator in this research. The five-item questionnaire is adapted for ERP which is made by (Bradforda, & Florin, 2003). In the start all of the items of ERP system adoption were considered but due to the cross factor loading some of the items were dropped. Later considered five items for the current study. Responses were obtained using five-point Likert scale where

1 represents Strongly disagree, 2 represent disagree, 3 represents neutral, 4 represents agree and 5 represents strongly agree. The Cronbach alpha value for ERP is 0.784 (Awa, Ukoha, & Emecheta, 2016). Some of the items included are Reduction in Inventory levels, Reduction in number of employees and Improvement in order management and cycle times.

3.5.4 End User Acceptance

End User Acceptance is used a dependent variable in this research, which is adapted from (Aga, Noorderhaven, Vallejo, 2016) project success fourteen-item questionnaire. Project success contains 14-items, in the start all of these items were considered but due to cross factor loading the items were dropped and only four items were considered. These four items were related to the end user dimension of project success. Hence, end user acceptance was given name to the dependent variable, which contain four items for the current study. The responses were obtained using five-point Likert scale where 1 represents Strongly disagree, 2 represent disagree, 3 represents neutral, 4 represents agree and 5 represents strongly agree. Some of the items included are The outcomes of the project are used by its intended end users, The outcomes of the project have directly benefited the intended end users, either through increasing efficiency or effectiveness and The project had no or minimal start-up problems because it was readily accepted by its end users.

TABLE 3.5: Instruments

No	Variable	Source	Items
1	Perceived Ease of Use	(Malhotra, &Galletta, 2005)	6
2	Perceived Usefulness	(Malhotra, & Galletta, 2005)	6
3	ERP System Adoption	(Bradforda, & Florin, 2003)	5
4	End User Acceptance	(Aga, Noorderhaven, & Vallejo, 2016)	4

3.6 Statistical Tools

In the very first stage, the questionnaire reliability and validity was assessed by using CFA i.e. confirmatory factor analysis, through SPSS version 21 (AMOS). Then the model fit was tested via model fit. It involves indicators such as chi square, Root Mean Square Error of Approximation (RMSEA), Comparative Fit Indices (CFI), Goodness of Fit Index (GFI) and Adjusted Goodness of Fit Index (AGFI). If all of these indicators are significant then it means the model is good fit. Following are the values shown in the table:

TABLE 3.6: Confirmatory Factor Analysis (CFA)

	Chi Square	CMIN DF	GFI	TLI	CFI	RMSEA
Hypothesized Model	1435.84	2.507	0.871	0.938	0.934	0.051

As the Table 3.6 is showing that the measurement model proved to be a good fit to the data. The value of GFI is 0.871, values of TLI is 0.938 and CFI is 0.934 which are more than 0.92 and the value of RMSEA is 0.051 which is between 0.05 and 0.10 (ideal). It gave the confirmation of model fit and scale validity.
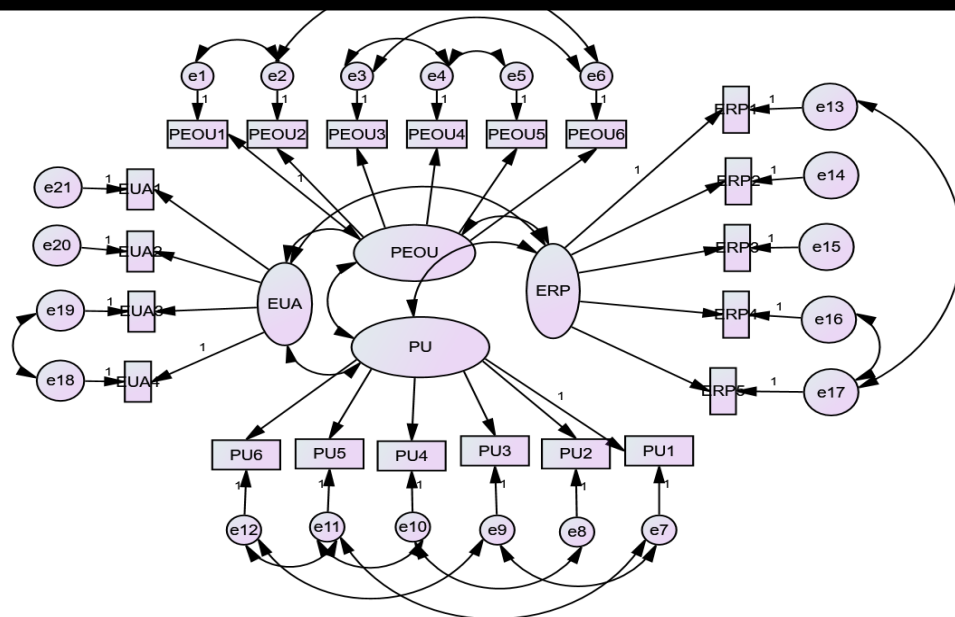
FIGURE 3.1: CFA Model

3.7   Scales Reliability

Reliability of scale is checked through Cronbach alpha, which is used to test the consistency of scores It also helps in the calculation of single hypothesis. Cronbach alpha value ranges between 0 to 1. Most of the time greater or equal to 0.7 is considered to be significant but in case of items less than 10, 0.6 or greater is considered to be significant. If the value of Cronbach alpha is high, it means the scale is highly reliable and in case of low value the scale is less reliable. Following table illustrate Cronbach alpha value of each variables used in the current study.

TABLE 3.7: Scale Reliability and Validity Analysis

Variables	Cronbach Alpha	Items
Perceived Ease of Use (IV)	0.818	6
Perceived Usefulness (IV)	0.838	6
ERP Adoption (Med)	0.703	5
End User Acceptance (DV)	0.733	4

Table 3.7 shows the reliability of each variable. Cronbach Alpha value of Perceived Ease of Use was 0.818, Perceived Usefulness was 0.838, Enterprise Resource Planning System Adoption was 0.703 and End User Acceptance Cronbach alpha value is 0.733. All the values are acceptable.

3.8   Data Analysis Techniques

After the completion of data collection from the desired respondents, data was examined in SPSS (statistical package for social sciences) software version 21. Following are the steps that were taken during the analysis of data, which are mentioned below:

1. First step is to, filter the questionnaire. Only appropriate responses were considered and selected for analysis purpose.

2. In the next step, after data collection now we move towards the software. All the variables i.e. ERP (enterprise resource planning system adoption),

PEOU (perceived ease of use), PU (perceived usefulness) and EUA (end user acceptance) used in research were created and coded including demographics (age, gender, qualification and experience).

3. Frequency tables were made that explain the characteristics of the sample data.

4. Descriptive statistics were carried out by using the numerical values.

5. Reliability of each variable used in the study was examined by using the Cronbach alpha value.

6. Pearson correlation (value of r) was checked to determine the relationship between variables whether its significant or not.

7. Then we checked that the model is fit for the study, CFA (confirmatory factor analysis) was done.

8. Single linear regression analysis was done to check the specified relationship between independent variables (PEOU and PU) and dependent variable (EUA).

9. Preacher and Hayes model was used to check the role of mediator (ERP adoption) between dependent and independent variable.

10. To test the hypothesis of study, Preacher and Hayes and correlation method was done. And concluded on the acceptance and rejection of the hypothesis.

Chapter 4

Results

This chapter give the over view about the results including descriptive statistics, correlation and regression analysis according to the mediation analysis. This analysis helps to find out whether the hypothesis is accepted or rejected. All the results are found through SPSS (statistical package for social sciences).

4.1 Descriptive Statistics

Descriptive statistics include the important information regarding the variables used in the current study which are ERP system adoption, Perceived Ease of Use, Perceived Usefulness and End User Acceptance. These statistics helps in providing the complete knowledge about the data. Descriptive statistics consist of information about the total number of respondents, minimum and maximum value, mean and standard deviation of each variable. All the variables included were measured at 5-point Likert scale. Basically, these statistics provides the summary of the sample data by indicating the significant values. Table 4.1 show information about each variable and is described in first column and whereas next five columns include details against each variable.

Table 4.1 depicts that the sample size was 250 for each of variables. Every variable was measured using the ve point Likert scale in which 1 show Strongly disagree and 5 shows strongly agree. Values of Mean and standard deviation explain the crux of

Table 4.1: Descriptive Statistics

	N	Minimum	Maximum Value	Mean Value	Standard deviation
ERP System Adoption	250	1	5	3.8187	.60546
Perceived Ease of Use	250	1	5	3.9107	.56209
Perceived Usefulness	250	1	5	3.6238	.59476
End User Acceptance	250	1	5	3.7060	.64438

Un-standardized regression coefficient reported N=250, *p<.05; **p<.01; ***p<.001

responses. Basically, this is the observation of respondents about each particular variable. The mean value of Enterprise resource planning system adoption is 3.8187 and its standard deviation value is 0.60546. The mean value of perceived Ease of Use is 3.9107 whereas the standard deviation value is 0.56209. Mean value for Perceived Usefulness is 3.6238 & its standard deviation value is 0.59476. And the mean value of End User Acceptance is 3.7060 whereas its standard deviation value is 0.64438.

4.2 Correlational Analysis

Correlation analysis is a statistical evaluation that helps in determining the strength of relationship, or we can say that it helps in determining the association between the two variables. In the current study, the motive of correlation analysis is to find out the correlation between PEOU PU and End User Acceptance with the mediating role of ERP system adoption.

Correlation analysis will tell the strength or weakness of relationship and the results are dependent upon the values generated by the SPSS. Pearson correlation value is analyzed and its ranges between -0.1 to 0.1. if the value generated is 0 that means there is no relationship between the variables. Other values except 0 highlights that whether the relationship is positive or negative. The positive and negative signs need to be analyzed for the clear understanding of data and it shows the nature of relationship. A positive sign in the value tells about direct relation which means that increase in one variable causes increase in the other variable and negative sign depicts indirect relation, which means that increase in one cause decrease in another variable.

Following table shows the correlation between the variable used in this research. And the values indicated the nature and magnitude of relationship between variables.

TABLE 4.2: Correlation Analysis

Sr No.	Variables	1	2	3	4
1	Perceived Ease of Use	1			
2	Perceived Usefulness	.731**	1		
3	ERP system Adoption	.513**	.461**	1	
4	End User Acceptance	.492**	.451**	.359**	1

**Correlation is significant at the 0.01 level (2-tailed) N=250, *P<0.05, **P<0.01, ***P<0.001

Table 4.2 shows the correlation values of the variables. Perceived Ease of Use is positively correlated with Perceived Usefulness (r= 0.731**, p<0.01). Perceived Ease of Use is also positively correlating with ERP system adoption (r=0.513**, p<0.01) and with End User Acceptance (r=0.492**, p<0.01). Perceived Usefulness is correlated positively with ERP system adoption (r=0.461**, p<0.01) and with End User Acceptance (r=0.451**, p<0.01). ERP system adoption is also correlated positively with End User Acceptance (r=0.359**, p<0.01).

4.3 Regression Analysis

Correlation analysis help in determining the existence of relationship between the variables but it does not specify the complete information like the causality of relationship. Correlation analysis is not enough to specify the results. So, for this purpose regression analysis is done. Regression analysis helps in determining the dependency of one variable over the other i.e. the extent to which one variable is related to another variable. Hence, it authenticates the dependency of variables.

To validate the relationship between independent and dependent variable simple linear regression is carried out. In case of more variables like mediation multiple regression analysis is performed. In this study, a PROCESS macro by Preacher and Hayes method has been used in the case of mediation and Model 4 is used for this purpose.

4.3.1 Linear Regression Analysis

H$_1$: Perceived ease of use has direct positive relation with end user acceptance.

TABLE 4.3: Simple Regression

Predictor	End User Acceptance		
	β	R2	Sig
Perceived Ease of Use	.462***	0.242	0.000

Un-standardized regression coefficient reported N=250, *p<.05; **p<.01; ***p<.001

Table 4.3 presents the details about perceived ease of use and end user acceptance. According to H1, PEOU has direct positive relation with EUA. Results of regression analysis explain that Perceived Ease of Use is positively aecting End User Acceptance and there is a signicant relationship between both of them. The R2 value is 0.242, Beta coecient=0.462 and p value=0. 000.The p value of 0.00 shows that relationship between IV and DV is highly signicant. The positive value of beta shows that it is positively eecting and there is a positive relation between IV and DV in this study. The value of R2 is 0.242, which demonstrates that Perceived Ease of Use is bringing a positive change of 0.242 units in End User Acceptance. Hence, our rst hypothesis is accepted by applying linear regression.

In this study, X denotes the independent variable i.e. Perceived Ease of Use and Y denotes the dependent variable i.e. End User Acceptance. 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

H$_2$: Perceived usefulness has direct positive relation with end user acceptance.

Table 4.4 explain the details about perceived usefulness and end user acceptance our second hypothesis. According to H2, PU has direct positive relation with EUA. Results of regression analysis explain that Perceived Usefulness is positively

TABLE 4.4: Simple Regression

Predictor	End User Acceptance		
	β	R2	Sig
Perceived Usefulness	.393***	.203	0.000

Un-standardized regression coefficient reported N=250, *p<.05; **p<.01; ***p<.001

aecting End User Acceptance and there is a signicant relationship between both of them. The R2 value is 0.203, Beta coecient=0.393 and p value=0. 000.The p value of 0.00 shows that relationship between IV and DV is highly signicant. The positive value of beta shows that it is positively eecting and there is a positive relation between IV and DV in this study. The value of R2 is 0.203, which demonstrates that Perceived Usefulness is bringing a positive change of 0.203 units in End User Acceptance. Hence, our second hypothesis is accepted by applying linear regression.

In this study, X denotes the independent variable i.e. Perceived Usefulness and Y denotes the dependent variable i.e. End User Acceptance. The pictorial form of unmediated model is shown below. Path 'C' shows the unmediated and direct link of independent and dependent variable.
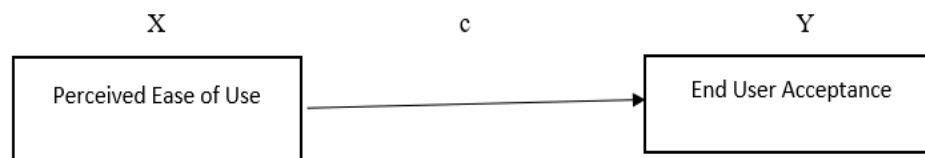

FIGURE 4.2: Linear Regression

H$_3$: Perceived ease of use has direct positive relation with enterprise resource planning system adoption.

TABLE 4.5: Simple Regression

Predictor	ERP System Adoption		
	β	R2	Sig
Perceived Ease of Use	.523***	.264	0.000

Un-standardized regression coefficient reported N=250, *p<.05; **p<.01; ***p<.001

Table 4.5 presents the details about perceived ease of use and ERP system adoption. According to H3, PEOU has direct positive relation with ERP. Results of

regression analysis explain that Perceived Ease of Use is positively aecting ERP System Adoption and there is a signicant relationship between both of them. The R2 value is 0.264, Beta coefficient=0.523 and p value=0. 000.The p value of 0.00 shows that relationship between IV and Med is highly signicant. The positive value of beta shows that it is positively eecting and there is a positive relation between IV and Med in this study. The value of R2 is 0.264, which demonstrates that Perceived Ease of Use is bringing a positive change of 0.264 units in ERP System Adoption. Hence, our third hypothesis is accepted by applying linear regression.
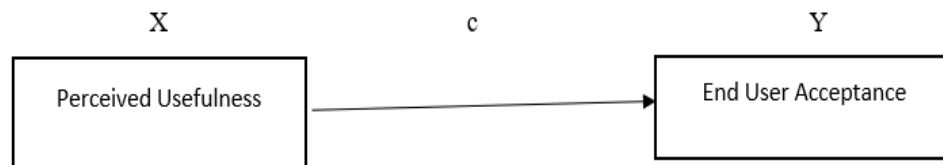
H$_4$: Perceived Usefulness has direct positive relation with enterprise resource planning system adoption.

TABLE 4.6: Simple Regression

	ERP System Adoption		
Predictor	β	R2	Sig
Perceived Usefulness	.436***	.212	0.000

Un-standardized regression coefficient reported N=250, *p<.05; **p<.01; ***p<.001

Table 4.6 presents the details about perceived usefulness and end user acceptance. According to H4, PU has direct positive relation with ERP. Results of regression analysis explain that Perceived Usefulness is positively aecting ERP System Adoption and there is a signicant relationship between both of them. The R2 value is 0.212, Beta coefficient=0.436 and p value=0. 000.The p value of 0.00 shows that relationship between IV and Med is highly signicant. The positive value of beta shows that it is positively eecting and there is a positive relation between IV and Med in this study. The value of R2 is 0.212, which demonstrates that Perceived Usefulness is bringing a positive change of 0.212 units in ERP System Adoption. Hence, our fourth hypothesis is accepted by applying linear regression.

H$_5$: Enterprise resource planning system adoption has direct positive relation with end user acceptance.

Table 4.7 presents the details about ERP system adoption and end user acceptance. According to H5, ERP has direct positive relation with EUA. Results of regression analysis explain that ERP System Adoption is positively affecting End User Acceptance and there is a signicant relationship between both of them. The

TABLE 4.7: Simple Regression

Predictor	End User Acceptance		
	β	R2	Sig
ERP System Adoption	.332***	.129	0.000

Un-standardized regression coefficient reported N=250, *p<.05; **p<.01; ***p<.001

R2 value is 0.129, Beta coefficient=0.332 and p value=0. 000.The p value of 0.00 shows that relationship between Med and DV is highly signicant. The positive value of beta shows that it is positively eecting and there is a positive relation between Med and DV in this study. The value of R2 is 0.129, which demonstrates that ERP System Adoption is bringing a positive change of 0.129 units in End User Acceptance. Hence, our fth hypothesis is accepted by applying linear regression.

4.4 Mediation Analysis

$\mathbf{H_6}$: Enterprise resource planning system adoption mediates the relationship between perceived ease of use and end user acceptance.

The hypothesis 6 shows that Enterprise Resource Planning mediates the relationship between perceived ease of use end user acceptance. In order to test this hypothesis, we have used model 4 of Preacher and Hayes in SPSS. In this analysis we have analyzed the different paths a, b, c and c' as shown in the figure. According to Preacher and Hayes for mediation there are total three effects that needs to be analyzed which are direct effect, indirect effect and total effect.

FIGURE 4.3: Mediation Analysis

TABLE 4.8: Mediation Analysis

IV	Effect on IV on M (a path)	Effect of M on DV (b path)	Total effect of IV on DV (c path)	Direct effect of IV on DV (c' path)	Bootstrap results for indirect effects	
	β	β	β	β	LLCI	ULCI
PEOU	0.4927***	0.1625***	0.5199***	0.4398	0.0190	0.1481

Un-standardized regression co-efficient reported. Bootstrap sample was 1000. Confidence Interval= 95% N=250, IV independent variable, DV dependent variable, M mediator, *p<.05; **p<.01; ***p<.001 LLCI=Lower Limit Condence Interval, ULCI=Upper Limit Condence Interval.

FIGURE 4.4: Mediation Analysis with Co-efficient

H$_7$: Enterprise resource planning mediates the relationship between perceived usefulness and end user acceptance.

The hypothesis 7 shows that Enterprise Resource Planning mediates the relationship between perceived usefulness and end user acceptance. Similarly, for this we have used model 4 of Preacher and Hayes and analyzed different paths a, b, c and c' as shown in the figure. According to Preacher and Hayes for mediation there are total three effects that needs to be analyzed which are direct effect, indirect effect and total effect.
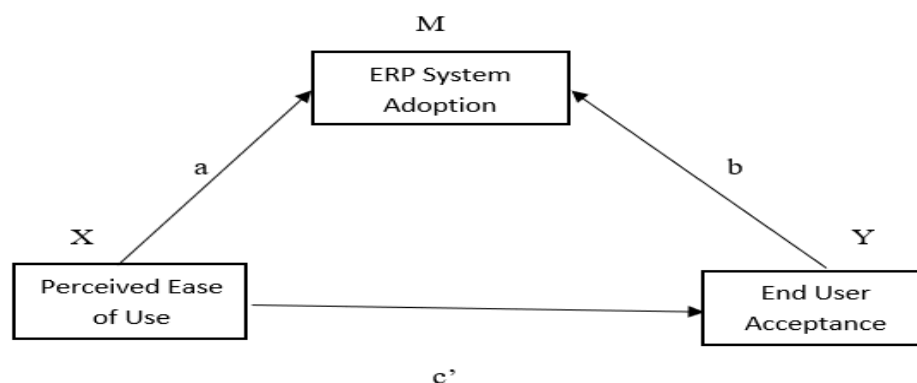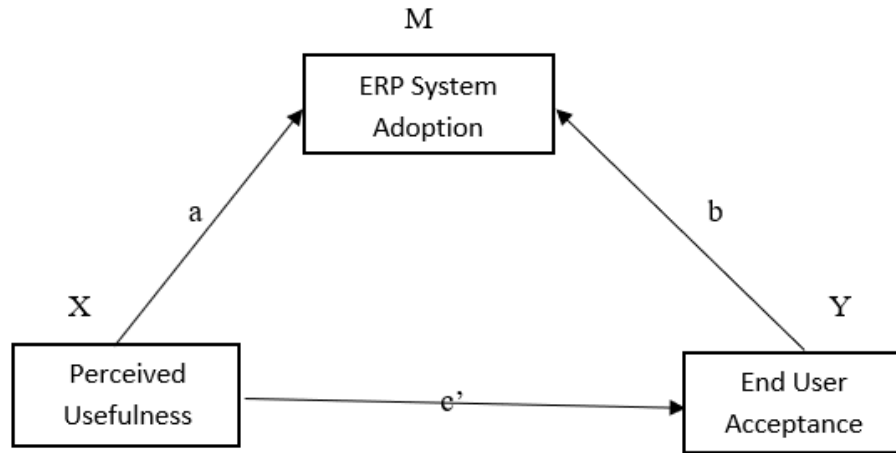
FIGURE 4.5: Mediation Analysis

TABLE 4.9: Mediation Analysis

IV	Effect on IV on M (a path)	Effect of M on DV (b path)	Total effect of IV on DV (c path)	Direct effect of IV on DV (c' path)	Bootstrap results for indirect effects	
	β	β	β	β	LLCI	ULCI
PU	0.5079***	0.2098***	0.5571***	0.4505	0.0365	0.1919

Un-standardized regression co-efficient reported. Bootstrap sample was 1000. Confidence Interval= 95% N=250, IV independent variable, DV dependent variable, M moderator, *p<.05; **p<.01; ***p<.001 LLCI=Lower Limit Condence Interval, ULCI=Upper Limit Condence Interval.

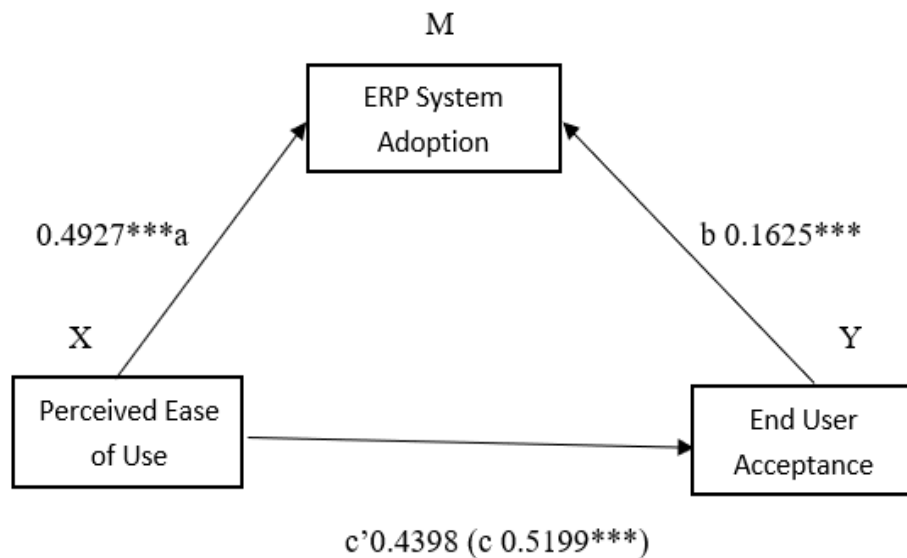FIGURE 4.6: Mediation Analysis with Co-efficient

4.5 Summary of Accepted/Rejected Hypothesis

TABLE 4.10: Summary about Accepted/ Rejected hypothesis

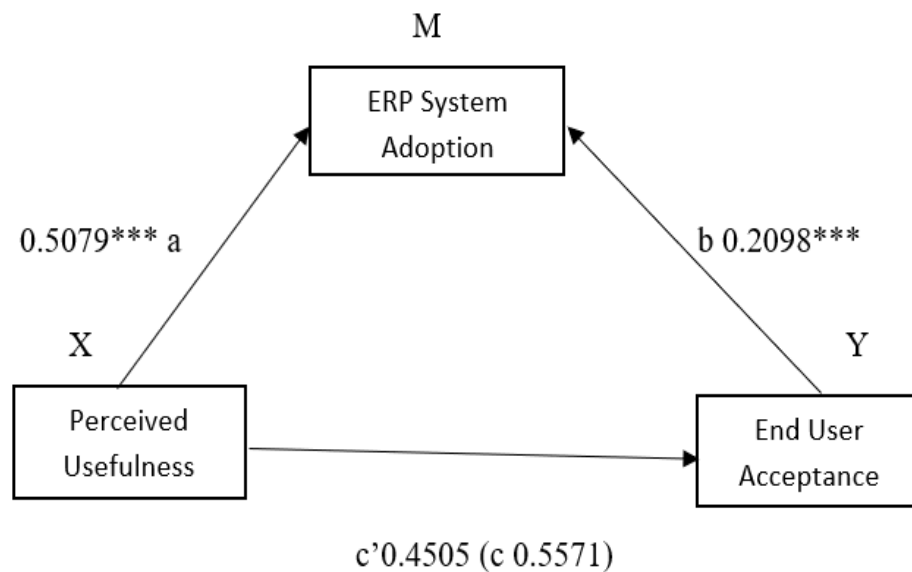| Hypothesis	Statement	Results
H1	Perceived Ease of Use has direct positive relation with End User Acceptance.	**Accepted**
H2	Perceived Usefulness has direct positive relation with End User Acceptance.	**Accepted**
H3	Perceived Ease of Use has direct positive relation with Enterprise Resource Planning.	**Accepted**
H4	Perceived Usefulness has direct positive relation with Enterprise Resource Planning.	**Accepted**
H5	Enterprise Resource Planning system adoption has direct positive relation with End User Acceptance.	**Accepted**
H6	Enterprise Resource Planning mediates the relationship between Perceived Ease of Use and End User Acceptance.	**Accepted**
H7	Enterprise Resource Planning mediates the relationship between Perceived Usefulness and End User Acceptance.	**Accepted**

The results show that all the Hypothesis are accepted on the basis of results gathered from the analysis technique. All the results are assumed to be true and accurate based on the analysis done. All these results show the acceptance of hypothesis in the context of Pakistan.

So, we can conclude that after drawing out the results that Perceived Ease of Use has positive significant relationship with End User Acceptance and ERP System Adoption. Perceived Usefulness also has a direct positive significant relationship between ERP System Adoption and End User Acceptance. ERP System significantly mediates the relationship between both of the independent variables i.e. Perceived Ease of Use and Perceived Usefulness and dependent variable i.e. End User Acceptance.

Chapter 5

Discussion and Conclusion

This chapter includes the discussion about the results find out by the analysis in the light of proposed model of the current research. The research questions and objectives of the study are examined and analyzed by the corresponding hypothesis. The discussion portion also consists of theoretical and practical implications, limitations and future directions followed by the conclusion.

5.1 Discussion

The basic aim of current research is to analyze the impact of PEOU and PU in the light of end user acceptance. In this study ERP system adoption act as a mediator between PEOU. PU and end user acceptance. This research is conducted in the context of Pakistan by collecting the data from the PBOs.

In this study, we have analyzed the assumed hypothesis which are PEOU has a direct positive relation with end user acceptance, PU has direct positive relation with end user acceptance, perceived ease of use and perceived usefulness has direct positive relation with ERP, ERP system adoption has direct positive relation with end user acceptance, ERP system adoption mediates the relationship between PEOU and end user acceptance and enterprise resource planning mediates the relationship between PU and end user acceptance.

Data was gathered by the 250 respondents and all of these hypotheses were analyzed based on the data are mentioned in result section. The results show that all the hypothesis H_1, H_2, H_3, H_4, H_5, H_6 and H_7 are accepted by creating a significant association with ERP system adoption as a mediator between PEOU, PU and end user acceptance.

It can be seen that the data was gathered by the project-based organizations of Pakistan. The analysis was done on that data and hypothesis were accepted or rejected. The discussion on the hypothesis in detail are as follows:

5.1.1 Hypothesis H_1: Perceived ease of use has direct positive relation with end user acceptance.

It was assumed that PEOU is significantly associated with EUA which means that these both of the variables are positively related. After the analysis done on data gathered, the results are $\beta = 0.462$, t= 8.9000, p=0.000 which indicated that there is a considerable positive significance between perceived ease of use and end user acceptance. The 't' value specifies the level of association between the two variables and its value should be greater than 2. If the value is greater than 2, it means that results are statistically significant. The β co-efficient shows the unit change. Here the value of β is 0.462 which demonstrates that end user acceptance is increased by 46.2% units when there is a 1%-unit change in the independent variable (perceived ease of use). P value tells the statistical significance and its value should be less than 0.05.

Previous studies find out that perceived ease of use play an important role in end user acceptance in adopting any new technology. Miltgen et al. (2013) Stated that acceptance of technology is dependent upon the employees and management of the organizations. if greater the employees feel ease in usage greater the chance of acceptance, lesser the ease lessens the chance of acceptance. Also, these both variables perceived ease of use and usefulness are correlated, both play significant role in adoption of any software, system in the PBOs. The results find out by the current study are also confirmed by some other studies (Park, & Pobil, 2013;

Yaghoubi, & Bahmani, 2010) which highlights that today's world is extremely competitive, organizations have to cope with this competition in order to sustain. Every day latest technologies are developed and they took place in market and with a passage of time becomes the necessity of time and needs to be adapted immediately by the enterprises. The one who do not adapt such modern tools and techniques is unable to sustain, hence tastes a failure and is left behind.

Other findings reveal that most of the users who prefer new systems are the one who are social and are internet users. Young employee's ratio of acceptance is high as compare to the people of certain age; they prefer to use the traditional systems. And the factors that play vital role in acceptance among employees is perceived ease of use i.e. the systems are quite easy to operate and are user friendly (Kucukusta, Law, Besbes, & Legohrel, 2015). Sometimes experience along with the enjoyment plays an important role, when an employee is experienced and well trained, he would not feel difficulty while interaction. In case of new system, he will take it as a challenge and will enjoy learning a new technology or a system. So, employees should have high motivation level, courage, must be a challenger and passionate, these qualities are very important and contribute towards the effectiveness in the organization (Abdullah, Ward, & Ahmed, 2016).

He, Chen and Kitkuakul (2018) deposits that for information system adoption technology acceptance models are widely used and they guarantee the successful acceptance. These models specifically emphasize on the usefulness of a system. It is quite natural and obvious that the useful systems are tend be effective and employees are also motivated in using them. These models are modified over the passage of time to enhance the level of satisfaction and also contribute towards incorporating courage among the employees to use and accept a technology that provide benefits.

5.1.2 Hypothesis H$_2$: Perceived usefulness has direct positive relation with end user acceptance.

It was assumed in second hypothesis; perceived usefulness is significantly associated with end user acceptance which means that these both of the variables are positively related and have a relationship. After the analysis done on data gathered, the results are β= 0.393, t= 7.960, p=0.000 which indicated that there is a considerable positive significance between perceived usefulness and end user acceptance. The 't' value specifies the level of association between the two variables and its value should be greater than 2. If the value is greater than 2, it means that results are statistically significant. The β co-efficient shows the unit change. Here the value of β is 0.393 which demonstrates that end user acceptance is increased by 39.3% units when there is a 1%-unit change in the perceived usefulness. P value tells the statistical significance and its value should be less than 0.05. So, the hypothesis is accepted.

Past literature regarding perceived usefulness and end user acceptance also concluded at the same results as our current study. Tubaishat (2018) stated that the complex and constantly changing environments create the need of adoption of latest technologies in order to store, retrieve and analyze the large amount of data within the organizations. These technologies help in the efficient handling and also helps in accomplishing the task in less time. It is very important that every member of organizations should accept the technology, acceptance will be the first step towards the usage of the particular system. Predictors like usefulness are significant that overcome the resistance by the employees and management. The study suggested that perceived usefulness is positively associated towards end user acceptance of latest tools and technologies.

End user or customer satisfaction is the key determinant that also helps in the successful adoption. Perceived ease of use and usefulness are the two predictors that make the end user satisfied by the particular system. Useful systems ensure that there is no physical and mental effort on the behalf of user, they are very user friendly and enhance the performance. Organizations should evaluate

their existing systems by these two antecedents, which would help in improvement and betterment (Abdel-Maksoud, 2018). Learning might be useful in case of the employees who are not aware of such systems, through learning and appropriate training acceptance ratio can be enhanced (Hao, Dennen, & Mei, 2017). Park, Kim, and Kim (2014) also suggested the criteria for the acceptance of information systems which are perceived ease of use and perceived usefulness. The systems which are difficult to operate should be modified and desired amendments can help in acceptance. Because employees unless are not satisfied and comfortable with any change in the organization, until the changes are not beneficial and does not provide the desired outcomes.

TAM models are very convenient they provide a baseline that helps in understanding the intentions to use a technology. It has been found out that for motivating the users another factor perception plays a vital role. It is essential to show the positive image of a system in terms of useful to make the users to use and to accomplish the organizational goals and objectives (Al- Adwan, Al- Adwan, & Smedley, 2013). These models not only emphasize on the adoption rather they also determine why the technology is accepted and rejected? They have also discovered certain factors that can help any organizations to improve and make it acceptable by the employees (Chow, Herold, Choo, & Chan, 2012).

5.1.3 Hypothesis H$_3$: Perceived ease of use has direct positive relation with enterprise resource planning.

In the third hypothesis; it was assumed that perceived ease of use is significantly associated with enterprise resource planning system adoption which means that these both of the variables are positively related and have a relationship. After the analysis done on data gathered, the results are β= 0.523, t= 9.420, p=0.000 which indicated that there is a considerable positive significance between perceived ease of use and enterprise resource planning. The 't' value specifies the level of association between the two variables and its value should be greater than 2. If the value is greater than 2, it means that results are statistically significant. The β

co-efficient shows the unit change. Here the value of β is 0.523 which demonstrates that ERP system adoption is increased by 52.3% units when there is a 1%-unit change in the perceived ease of use. P value tells the statistical significance and its value should be less than 0.05. So, the hypothesis is accepted.

Perceived ease of use is an important antecedent that helps in predicting the end user's intention, whether the user is intended to use a system or not. If the user finds ease of use in a system i.e. by using a particular system would be free of effort, time and cost, then he would definitely have positive intentions. It is also analyzed by the study that if the system is designed in a way that it is effective and is easy to use, then the perceived ease of use will have strong intentions towards using the particular system (Hamid et al., 2016). In the past literature many research scholars ended upon this conclusion that perceived ease of use and usefulness are the vital determinants that make the users to adopt a technology like ERP system (Susanto & Aljoza, 2015).

Hansen, Saridakis, and Benson (2018) states that perceived ease of use influences the number of variables like perceived usefulness, behavioral control and intentions. Employees tend to work in environments where they have control over themselves and they are free to work based on their interests. In this way they have positive intentions towards the adoption of system. The study also finds out that there is a significant association between perceived ease of use and perceived behavioral control.

Another study examined that perceived ease of use and perceived enjoyment along with usefulness have a significant links with the adoption of a technology (ERP) (Hussain, Mkpojiogu, & Yusof, 2016). Many researchers have examined the impacts of technology acceptance model and considered its factor perceived ease of use for different types of systems and behavior patterns of the customers. And the results were significant, it plays an important role (Cho & Sagynov, 2015). PEOU influence the behavior of user in a positive way and the user adopt the system. the study suggested that perceived ease of use is directly associated with user intentions in ERP system adoption. And it also influences the usefulness, whenever

a user finds a system easy, beneficial and efficient ultimately, he finds the system useful. So, both are also associated (Okcu, Koksalmis, Basak, & Calisir, 2019).

5.1.4 Hypothesis H$_4$: Perceived usefulness has direct positive relation with enterprise resource planning.

In our fourth hypothesis; it was assumed that perceived usefulness is significantly associated with enterprise resource planning system adoption which means that these both of the variables are positively related and have a relationship. After the analysis done on data gathered, the results are β= 0.436, t= 8.180, p=0.000 which indicated that there is a considerable positive significance between perceived usefulness and ERP. The 't' value specifies the level of association between the two variables and its value should be greater than 2. If the value is greater than 2, it means that results are statistically significant. The β co-efficient shows the unit change. Here the value of β is 0.436 which demonstrates that ERP system adoption is increased by 43.6% units when there is a 1%-unit change in the perceived usefulness. P value tells the statistical significance and its value should be less than 0.05. So, our fourth hypothesis is also accepted.

Pragmatic research shows that the result of this hypothesis is similar to our current research which demonstrate that ERP systems are very important and they need to be integrated in different organizations. And TAM variables are significantly associated with system. Perceived ease of use and usefulness are influence the end users to accept the system willingly and use it for future benefits (Abdullah et al., 2016; Susanto & Aljoza, 2015; Amin et al., 2014). Some studies also suggested that perceived usefulness is explained by the perceived ease of use. Both are correlated and both are used together in acceptance and resistance of a system. Therefore, PEOU has a direct significant relationship with PU (Okcu et al., 2019).

Large enterprises are also working hard to get stable in the dynamic environment of competitive marketplaces. They have changed their business practices, capabilities and processes to cope up. This study also concluded that, for this enterprise resource planning systems are considered to be the best solution which help in

building the capabilities, improve performance, helps in making the core operations efficient and also manage the communication among the stakeholders (Soliman, Karia, Moeinzadeh, Islam, & Mahmud, 2019).

Mou, Shin and Cohen (2017) stated that there are number of factors that had an impact on perceived usefulness which are trust, behavioral intentions, degree of actual usage and satisfaction. Performance is directly proportional to the actual usage, which means that when an employee uses a system perception is created, whether it is difficult or easy. Actual usage plays an important role and is directly associated with the usefulness. Many other studies have also confirmed the outcomes generated by our research which includes, users of a particular technology have positive intentions with respect to the usefulness of deployed technology. Rather usefulness has higher impact than perceived ease of use of a particular system. These two factors help in overcoming the resistance of the end users (Claudio, Velzquez, Bravo-Llerena, Okudan, & Freivalds, 2015).

5.1.5 Hypothesis H_5: Enterprise resource planning system adoption has direct positive relation with end user acceptance.

In our fifth hypothesis; it was assumed that ERP system adoption is significantly associated with end user acceptance which means that these both of the variables are positively related and have a relationship. After the analysis done on data gathered, the results are β= 0.332, t= 6.065, p=0.000 which indicated that there is a considerable positive significance between ERP and end user acceptance. The 't' value specifies the level of association between the two variables and its value should be greater than 2. If the value is greater than 2, it means that results are statistically significant. The β co-efficient shows the unit change. Here the value of β is 0.332 which demonstrates that end user acceptance is increased by 33.2% units when there is a 1%-unit change in the ERP. P value tells the statistical significance and its value should be less than 0.05. So, our fifth hypothesis is accepted.

Enterprise resource planning system should be practiced once by every type of industry and organizations. A lot of studies have been conducted that paid attention towards the different aspects of system in the organizations, the one who have adopted and the one hasn't. Kamhawi (2008) deposits that IT executives of those organizations who haven't adopted ERP system are looking forward to adapt the system as they have realized that this is the need of an hour. For this, they are conducting the training sessions, looking upon the investment and are trying to overcome the barriers in their way. Some it seemed to be a positive initiative for them to enhance their productivity. Technology brings innovation and creativity but in actual there are employees and management who have deployed the system, used it and worked hard on it to achieve the desired objectives, which means that technology is associated with the behavior of users. So, behavioral aspects are a critical success factor in term of implementation of system or software. It is important to take care of users and their mindset, culture, skills, capabilities and every aspect in detail, which would be helpful in future for the organization to get successful. These systems also make the users to remain open and challenging in adopting new changes and modifications, give confidence and make them aware of technological advancements. In short it influences the attitude in a positive way (Mitra & Mishra, 2016).

It is obvious whenever a change is incurred, end user is affected. It depends it can be positive or negative change. Similarly, deployment of new system is a result of heavy investment, it changes the organizations way of handling of daily routine processes and also includes end user's behavior. The study suggested that organizational support, training, appropriate communications, subjective norms play a significant role in predicting end user's behavior and acceptance (Zhang, Gao, & Ge, 2013). Not on individual end user, these systems have huge impact on organizational level. Everyone from top to the lower level management is affected in a different way. Many studies have also conducted that measure the individual work and performance as a whole and tried to find out the relationship between them. For this different model were also tested in different environment to test the same goal in term of different organizations and industries. The goal is

success, usefulness, end user acceptance and best utilization of IS (Mihai, 2017). The researcher also finds out that extensive research is done on ERP, but 47% studies discuss implementation phase whereas only 15% of studies discussed post-implementation phase.

User satisfaction is directly associated with ERP system adoption. Organizations who have deployed or going to deploy need to undergo a lot of changes in term of ease of use and perceived benefits. These benefits, ease and usefulness can make the user satisfied by the system. According to Widjaja, Hidayanto, Phusavat, and Sablan (2018) perceived ease of use includes budget, training, management and supplier relationship. While perceived usefulness includes selection of technology and adaptation.

5.1.6 Hypothesis H_6: Enterprise resource planning system adoption mediates the relationship between perceived ease of use and end user acceptance.

In our sixth hypothesis; it was assumed that ERP system adoption significantly mediates the relationship between perceived ease of use and end user acceptance. After the analysis done it was proven that the mediation hypothesis is accepted, as the results were significant. They shows the association of ERP system adoption as a mediator between perceived ease of use and end user acceptance as the lower limit is 0.0190 and upper limit value is 0.1481, showed by the unstandardized regression coecient and both are positive and there is no zero existing in the bootstrapped 95% interval around the indirect eect of the relationship of perceived ease of use and end user acceptance through ERP system adoption.

In the light of past literature, it has been recognized that ERP is linked with factors like TAM variables, end user satisfaction, attitude, behavioral intentions and collaborative factors. These are variables are inter-linked and influence a user to use a system (Mulyadi, Hasibuan, Shihab, & Budi, 2019). Another study concluded upon the similar outcomes that employee's attitude directly associated with system and indirectly associated with the two beliefs i.e. perceived ease of use

and usefulness, whereas ease of use in term of organizational/management support and technical complexity with usefulness. being useful along with the positive intentions leads towards the adoption of enterprise resource planning system (Le, 2017).

Many researchers tried to address the gaps left in the past, but still there is a lot of confusions that need be focused. Bazhair and Sandhu (2015) had provide a baseline for adoption and ERP association with the financial performance with in the organization. In different organizations, the implementation is different as the requirements, structure, environment and culture varies. The researcher had highlighted that financial department plays an important role in influencing the user satisfaction and apart from this there are number of direct and indirect benefit associated that needs to be focused. By considering all these aspects it would be easy for the organization and users to cope up with the system in term of adoption and acceptance. Moreover, user satisfaction is the key determinant without this the successfully deployed system would be considered as a great failure. Because if the user is not satisfied, he would not use the system and the desired objectives would not be achieved. The main moto is not just to successfully implement a system, rather it is end user acceptance willingly and happily.

In ERP acceptance and adoption process, change management strategies are also vital, as they had immense impact on the entire organization. These strategies need to be inculcated in different aspects in adoption, which are critical. In large organizations changes occurred on large scale which involve top to lower management to adopt a change successfully and to overcome the resistance. So, in ERP change management is a central part that cannot be neglected. Whenever a new system is deployed, it is the duty of project managers to look upon the employee's capabilities and skills. Do the employees have the desired absorptive capacity to absorb the system and to use the system or not? If yes then implement the system, in other case managers should conduct the training sessions and seminars and when employees get the desired experience then introduce them with the new technology. Proper guidance will be very helpful in this scenario and would serve as a positive initiative towards adoption (Mayeh, Ramayah, & Popa, 2014).

5.1.7 Hypothesis H$_7$: Enterprise resource planning system adoption mediates the relationship between perceived usefulness and end user acceptance.

In our last hypothesis; it was assumed that ERP system adoption significantly mediates the relationship between perceived usefulness and end user acceptance. After the analysis done it was proven that the mediation hypothesis is accepted, as the results were significant. They shows the association of ERP system adoption as a mediator between perceived usefulness and end user acceptance as the lower limit is 0.0365 and upper limit value is 0.1919, showed by the unstandardized regression coecient and both are positive and there is no zero existing in the bootstrapped 95% confidence interval around the indirect eect of the relationship of perceived usefulness and end user acceptance through ERP system adoption.

Day by day new technologies are invented, organizations have to sustain and maintain themselves by adopting latest techniques to get the competitive advantage. Other systems along with ERP implementation would be very helpful. As it is the latest and effective system which helps on performing basic operations and process in a cost-effective way. But in the past literature it is examined that ERP implementation show relative less rate of success which can affect the organization cost and performance. Masa'deh et al. (2017) finds out the solution to this problem that if the system is used appropriately and based on the organizational requirement the system is chosen then the chance of ERP successful implementation is high. Usability is very important term associated with the system, if the organizations spend some amount of budget on it, they can get 100% effectiveness. It helps in making the user satisfied and is also critical to the success and failure of the project.

Another study conducted had also highlighted the factors that helps in gaining the competitive advantage. Those factors are system quality, information quality, organizations readiness, strategic values which assists managers and ERP adopters to deploy the system successfully by gaining the fruitful results (Ram, Corkindale, & Wu, 2014). At the time of implementation organizations need different skills,

mutual efforts, knowledge, staff and desired investment. And most importantly appropriate plan in need that step by step help in deployment process. In case when there is no plan then organization can face quality, cost and time issues. A proper roadmap, guidance and framework is necessary (Chofreh et.al, 2016).

5.2 Practical and Theoretical Implication

The current study played a significant role in past literature, as it has both practical and theoretical implication. The contribution to the literature is in term of four variables which are perceived ease of use, perceived usefulness, ERP system adoption and end user acceptance with regard to the project-based organization. Researchers tried to address the gap left in the past, but still the literature is limited and need to be focused. ERP system adoption is a system that is widely used over the globe, now it's the need of hour for Pakistan to use this in the different industries and organizations. Which would overcome the number of issues like cost, time and resistance. This current study focused on ERP because it wasn't focused in term of ease of use and usefulness (Hess et al., 2014). Our results indicated that ERP system adoption can be improved and it is significant when employees perceived system as useful and when they feel ease in interaction. In this study, end user satisfaction was also focused that played an important role towards adoption of system.

To some extent in the past literature ERP system adoption was focused but with perceived ease of use and perceived usefulness was not highlighted. The current research highlighted that when a system adopted or deployed in the organization is easy to use and is useful, then the employees willingly accept and use it. Perceived ease of use and usefulness were two independent variables linked with the ERP system and hence lead to end user acceptance. So, according to the results ERP system is positively associated with ease of use and usefulness.

Another significant theoretical contribution is ERP system adoption is used as a mediator between two variables and end user acceptance in this study. That helps to look upon the different aspects of the system from the beginning to the ending.

This study highlighted that why organizations should implement and how they can achieve the competitive advantage over the ERP. Previous studies have used ERP as a dependent variable and have studies its association with other variables like perceived quality, attitude, user intentions and other variables (Costa et al., 2016). In this study ERP system adoption, perceived ease of use and usefulness are important and unique variables in the domain of project management, so analyzing these variables in the context of Pakistan, comes out as unique research which has contributed signicantly in the literature.

Moreover, the current research also consists of unique dependent variables i.e. end user acceptance. Previously the major issues faced by the management was the end user resistance, employees were not willing to use the system. if the system is deployed successfully but it is not used then the desired benefits were not achieved. This study highlighted this issue and provide a solution. According to the results it has been find out that perceived ease of use and usefulness has a direct significant association with the end user acceptance in context of Pakistan. This is also a significant theoretical contribution especially in the literature of ERP, which is missing in the past. Organizations need to understand their employees and their behaviors, skills and problems in order to make the successful implementation and to achieve the desired goals and objectives.

This study does have practical implementations along with the theoretical one. This study is equally important for the project managers, top management and leaders. As the world is growing rapidly and competition is increasing day by day, organizations have to come up with the latest tools and technologies to sustain and to achieve the competitive advantage. So, ERP adoption along with the end user acceptance is considered to be an important finding in re-shaping the future of project-based organizations. This research is important in a way that describes about the ERP association with end user acceptance which is fostered by the perceived ease of use and usefulness, which is the demand of this century.

5.3 Limitations and Future Research Directions

This study has some limitation like other studies, as always there is a space for the future researches. Due to the finite time and resource constraint it was not possible to cover each and every aspect so there are some limitations. This study consists of a single moderator along with the two independent variables, the model was examined.

The focus of this study was ERP system adoption in term of two TAM variables. But in the future the researchers can focus on other variable like perceived quality, value, user satisfaction, attitude and user intentions. Also, the spot light can be on multiple models like UTAUT, TOE. The current research has no moderator, in future this model can be analyzed by placing single or multiple moderators. Moreover, the association between PEOU, PU and end user acceptance can be studied with the different mediators in context of Pakistan.

The data gathered for the current study was from project-based organization, this helps the future researchers to analyze the similar model in context of public and private organizations other than project based. The data was collected from the two different cities of Pakistan i.e. Rawalpindi and Islamabad, in future the sample size can be increased and data can be collected from more than two cities. Convenience sampling technique was used which is considered as a limitation because it does not reflect the entire population. Other sampling techniques can be considered by the researchers. Hence this study can serve as a base line for the future researchers, they can incorporate these limitations in their research.

5.4 Conclusion

Enterprise resource planning systems are unique and way long different than other systems in term of complexity in deployment and also, they require huge amount of interaction between employees and technology. These systems have different perceptions to different types of end users. This information systems help in managing the flow of communication among the stakeholders and look after the

daily processes. So, it is important to understand the motives behind this system for extracting the fruitful outcomes.

The basic purpose of the present research is to inspect antecedents that influence the end users in the adoption of ERP system in the project-based organizations. The study was carried out to enhance the knowledge of system and to overcome the issues faced in term of resistance. For this purpose, data was gathered from the PBOs through the questionnaire to examine the relationship between TAM variables (PEOU and PU) and end user acceptance.

Almost 300 questionnaires were circulated and 250 were considered for the analysis as they were considered to be accurate and complete. In SPSS analysis was performed and checked the reliability and validity of data. CFA (confirmatory factor analysis) was performed to check whether the model is fit for the study or not. The assumed hypothesis was supported by the Technology Acceptance model. There are seven hypotheses in this study which were tested and analyzed in the context of Pakistan. The results demonstrate that all the hypothesis is accepted. There is a strong positive impact of PEOU and PU on end user acceptance with the mediating role of ERP system adoption.

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Appendix A

Survey Questionnaire

Dear respondent,

My name is Madni Saba Zaman. As a MS research student at Capital University of Sciences and Technology, Islamabad. I am collecting data for my research paper titled as **"Impact of Perceived Ease of Use and Perceived Usefulness of Enterprise Resource Planning System Adoption on End User Acceptance".** It will take your 10-15 minutes to answer the questions and to provide valuable information. I assure you that data will be kept confidential and will only be used for academic purpose.

Thanks a lot for your help and support!

Sincerely,

Madni Saba Zaman

MS (PM) Research Student,

Capital University of Sciences and Technology (CUST).

Section 1

Personal Information:

Please provide ($\sqrt{}$) the following information.

	1	2	3	4	5
Gender:	Male	Female			
Age:	18-25	26-33	34-41	42-49	50 and above
Qualification	Matric	Bachelor	Master	MS/MPhil	PhD
Experience	5 and less	Jun-13	14-21	22-29	30 and above

Section 2

Please tick the relevant choices:

1= strongly disagree, 2= Disagree, 3= Neutral, 4= Agree, 5= Strongly Agree

Section: A Perceived ease of use of ERP Please tick the relevant choice	**Strongly disagree**	**disagree**	**Neutral**	**Agree**	**Strongly Agree**
1. Learning to use [the system] for performance-based activities is easy for me.	1	2	3	4	5
2. I find [the system] flexible to interact in performing work-related tasks and activities.	1	2	3	4	5

Section: A Perceived ease of use of ERP Please tick the relevant choice	Strongly disagree	disagree	Neutral	Agree	Strongly Agree
3. I find it easy to get [the system] to do what I want to do in performing work-related activities.	1	2	3	4	5
4. It is easy for me to become skillful at using [the system] in work-related activities.	1	2	3	4	5
5. I find [the system] easy to use at work.	1	2	3	4	5
6. My interaction with [the system] at work is clear and understandable.	1	2	3	4	5

Section: B Perceived usefulness of ERP Please tick the relevant choice	Strongly disagree	disagree	Neutral	Agree	Strongly Agree
1. Using [the system] would increase my performance.	1	2	3	4	5

Section: B Perceived useful-ness of ERP Please tick the rel-evant choice	Strongly disagree	disagree	Neutral	Agree	Strongly Agree
2. Using [the system] in my work would enable me to accomplish my tasks more quickly.	1	2	3	4	5
3. I would find [the system] useful in my work.	1	2	3	4	5
4. Using [the system] in my work would increase my productivity.	1	2	3	4	5
5. Using [the system] would enhance my effectiveness at work.	1	2	3	4	5
6. Using [the system] would make it easier to do my work.	1	2	3	4	5

Section: C ERP System Adoption Please tick the relevant choice	Strongly disagree	disagree	Neutral	Agree	Strongly Agree
1. Reduction in Inventory levels.	1	2	3	4	5
2. Reduction in number of employees.	1	2	3	4	5
3. Improvement in order management and cycle times.	1	2	3	4	5
4. Reduced cost in procurement	1	2	3	4	5
5. Improved cash management	1	2	3	4	5

Section: D. End User Acceptance of ERP Please tick the relevant choice	Strongly disagree	disagree	Neutral	Agree	Strongly Agree
1. The outcomes of the project are used by its intended end users.	1	2	3	4	5
2. The outcomes of the project have directly benefited the intended end users, either through increasing efficiency or effectiveness.	1	2	3	4	5

Section: D. End User Acceptance of ERP Please tick the relevant choice	Strongly disagree	disagree	Neutral	Agree	Strongly Agree
3. The project had no or minimal start-up problems because it was readily accepted by its end users.	1	2	3	4	5
4. The project has directly led to improved performance for the end users/target beneficiaries.	1	2	3	4	5