

CAPITAL UNIVERSITY OF SCIENCE AND
TECHNOLOGY, ISLAMABAD



**Impact of IT Tools on Project
Value: Mediating Role of Team
Coordination and Moderating
Role of Top Management Support**

by

Zulfiqar Ahmed

A thesis submitted in partial fulfillment for the
degree of Master of Science

in the

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This thesis is dedicated to my family.



CERTIFICATE OF APPROVAL

Impact of IT Tools on Project Value: Mediating Role of Team Coordination and Moderating Role of Top Management Support

by

Zulfiqar Ahmed

(MPM181040)

THESIS EXAMINING COMMITTEE

| S. No. | Examiner | Name | Organization |
|--------|-------------------|-------------------------|-----------------|
| (a) | External Examiner | Dr. M. Arif Khattak | BU, Islamabad |
| (b) | Internal Examiner | Dr. S. M. M. Raza Naqvi | CUST, Islamabad |
| (c) | Supervisor | Mr. Rizwan Ali Khan | CUST, Islamabad |

Mr. Rizwan Ali Khan

Thesis Supervisor

November, 2020

Dr. Mueen Aizaz Zafar

Head

Dept. of Management Sciences

November, 2020

Dr. Arshad Hassan

Dean

Faculty of Management & Social Sciences

November, 2020

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Then which of the Blessings of your Lord will you deny. (Surah Ar-Rehman)

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(Zulfiqar Ahmed)

Registration No: MPM181040

Abstract

The current study investigates the impact of IT tools on the project value in the project-based organizations. The study showed how IT tools affect project value. The thesis was driven by research goals which included figuring out to what degree Digital Communication Tools, Automatic Document Management Software and Project Management Software are contributing to add value in the project. Data was obtained from 291 respondents who work in various project-based organizations including public and private organizations throughout different cities in Pakistan. The results outline that IT tools have significant and positive impact on the project value. Moreover, team coordination mediates the relationship of IT tools and project value. In addition, Top Management Support moderates the relationship and the results revealed significant impact of interaction effect that provides evidence for moderation. The study found that use of IT tools in project management have a positive influence on project value. We concluded with practical and theoretical implications as well as future research directions.

Keywords: IT tools, Team Coordination, Top Management Support, Project value, Project Based Organizations

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List of Abbreviations

| | |
|-------------|--|
| AMOS | Analysis of Moment Structures |
| CFI | Comparative Fit Index |
| GFI | Goodness of Fit Index |
| IFI | Incremental Fit Index |
| IT | Information Technology |
| PV | Project Value |
| RBVT | Resource Based View Theory |
| SPSS | Statistical Package for Social Sciences |
| TC | Team Coordination |
| TLI | Tucker-Lewis Index |
| TMS | Top Management Support |
| VRIO | Value, Rarity, Imitability, and Organization |

Chapter 1

Introduction

1.1 Background

The use of IT is growing largely in the project management (PM) field. The operational role including information systems (IS) has been investigated by several scholars. More recent efforts have expanded early findings and shown that IT tools can improve organizational efficiency and lead to higher quality (Zhang, 2006). (Henderson & Venkatraman, 1993) came up with a model known as strategic alignment that clearly identified relations between IT strategy, business strategy, business and IT infrastructure and other related processes.

According to the study of IIE Solutions readers, about 20% respondents utilizing the Project Management software; however, many usually use only with the simple features and relatively easy interface (Bounds, 1998). There is a very wide and diverse range of available IT solutions. More than 120 different IT tools were included in a recent survey of PM vendors (PMS Survey, 1999). Software packages differ in terms of functionality, complexity, availability and, last but not least, price. However, the software usage efficiency not depend entirely on software's functional features and characteristics. Brynjolfson and Hitt (1998) propose that many of the IT benefits associated with the company's unique features and remaining benefits are generally associated to the software. Choosing appropriate IT tools and providing training and promoting effective team coordination are some

of the practices that can be done to maximize the advantage of using IT tools and the project's overall value. All kinds of technology, particularly PC-based software, are highly visible elements of project management right now in conferences, journals, and presentations, and have been around for over a decade. Allnoch (1997) provides advice on selecting a project management IT tools. The different tools are grouped for different PM tasks based on their support: cost management, scheduling, resource management, risk management, process management and communication management. Slightly diverse classification arrangement for IT tools depicts the complexity levels of features (Wit & Herroelen, 1990). As, systems provide the means in order to identify wide range of software characteristics and features. The rate of using of IT tools calculated and used to assess trends of use of IT based on the category.

Research related to this study subject will divide into two sources. One source of research channel is mostly related to the PM and other one is related to use of IT in project value creation. The project management field integrates, use principles and ideas of many other areas of management. Nevertheless, the project concept itself reflects the distinctive feature of PM as "a project is a temporary endeavor undertaken to create a unique product or service" (Duncan, 1996). Generally, Projects are subjected to the situational notions, of various, organizational, environmental, internal effects and constraints by their very existence. In conjunction with increased awareness of projects in the organizational environment, PM work focuses on numerous features that impact project value (Bryson & Bromiley, 1993; Deutsch, 1991). Project-based firms try to create value to the services and products they usually offer. They not only have highly unpredictable and unknown opportunities in order to obtain value in a project (Nightingale et al, 2011). Project stakeholders or other partners can also accumulate value over the period of time and can leave the firm easily (Chang et al., 2013). Value capturing, commonly the difference between a firm's revenue and the firm's retained cost (Bowman & Ambrosini, 2000), capturing value is essential to the firm's survival (Teece 2010; Zott et al., 2011). Value slippage should have restricted or may be

prevented to maximize value capturing and secure a firm's long term competitiveness and viability (Chang et al., 2013). Despite the strong tactical arguments in favor of building project's interest, there is no powerful unifying philosophical aspect to the debate. Clear guidelines on how practitioners can react in top management support of value creation to the espoused ideology is also missing. A significant area of work that the traditional project management culture frequently overlooks to relate the prior attempts in order to create value inside the unique value based project (Male et al., 2007; Thomson et al., 2003). It's significant to highlight that there are not at a lot of explanations in the quality management literature. The incentive to put such debates to the project community's notice is to prevent others from attempting different hypothetical conclusions. However, such previous discussions have major effects for the conceptualization and execution of value creation within the framework of programs. In directing the approach to a narrative methodology, the boundaries of the approaches are more important. The prior discussion delivers the vital theoretical platform from where to criticize the current direction of arguments in support of value creation in search of a theory of value creation. Value can be created or captured only by training employees well. Edwards & Rees (2006) have been studying to provide team coordination opportunities to make the human resources of the organization effective, compliant and competent and to get it to the required levels. In many types of learning, assessments, computer testing and even reviews, employee's growth will manifest itself. Work processes within the teams entail constant coordination and collaboration of resources in order to achieve shared goals, strengthen the ability to cope up with the changing organizational practices and priorities. Coordination occurs when two or more people do the same or perform complementary tasks at the same time while aligning the actions in accordance with the strategy. Coordination among working teams consists of two or more people who provide better results and outcomes while aligning individual task to the team tasks and individual objectives to team objectives. Within the Team, members permit potential alliance realization and unseen communication that take place within the teams (Bettenhausen, 1991). Team members usually involved in a range of dependent

activities like working with each other sharing tasks inputs, managing processes, achieving common goals and distribution of rewards (Wageman, 1995). Achieving team coordination is a difficult process because independent team members may not agree on the time marked, team policy and roles within the team strategy. Therefore, to achieve the goals team members need to coordinate. In recent studies it is noted that researcher has mostly focused on planning and communication mechanism, that is, explicit coordination (Espinosa et al., 2004). The explicit coordination is a result of plans, deadlines, schedules and other related programs (Faraj & Sproull, 2000).

In making decision, top management must be aware of knowledge skills of their employees, past interest and behavior accordingly, so on the bases of these characteristics they can make projections that how the other team members will handle the circumstances. According to (Gersick & Hackman, 1990) habitual routines followed by the team in order to handle the situations. One of the advantages of IT integrated production management system is to make coordination within the team and able to upkeep the complex processes added. In 1980s/90s IT tools proposed a solution to challenge to the western world, the whole concept was usually technological driven. However, researchers argued that the use of technology can create problems and issues if the social cooperative work of organization is generally ignored (Harper et al. 1989). Talking about the regulation of internal collective actions between teams, team not given any higher authority while the higher management performs most of the crucial activities like planning and other detailed activities. Cross-training provided by higher management is not only efficient and flexible but better in terms of sharing knowledge and ideas. (Weber 1997). It is difficult for the single membered team to deal with the complexity of new products specially multi team projects that need technological expertise form diverse areas (Weinkauff & Gemnden, 2004). For the overall execution of the project, established team should work together and collectively in order to achieve certain objectives and goals of the projects (Kazanjian et al.,2000). The use of technological tools requires the support of top management and individual factors

(Komala, 2012). Sustainable project value is related and has linked with information technological tools in project management (Hartman & Ashrafi, 2002). Many non-government organizations use technological tools to manage project and manage data. However, these organizations are still not able to get maximum benefits from the information technology and many of the data remain scattered on the paper and on the computer of individual. According to (Al-Ammary & Hamad, 2012) non-governmental organizations have only basic technological tools and have limited software skills to perform tasks. The organizations that are using advance technologies are facing problems in dealing with the technology and aligning technological objectives with the company objectives. IT tools which generally delay the performance of the project are related to the human, organizational and culture issues. (Hartman & Ashrafi, 2002) raise an important issue that this research will keep in mind in order to interpret the study's results. Only purchasing the technology does not guarantee success during the project execution. Organization must know how to efficiently use, how to implement and how to achieve goals in order to achieve maximum output from the technology. These steps like implementation of technology, getting maximum output require necessary action like training of the workers in order to develop necessary skills set in them. Organizations must think out of box and deals with the financial issues in order to set some budget for acquiring new and new technologies for brighter future.

It is very important that the top management encourage and support the innovation and adaptation of technology (Wang et al., 2010). Top management's support is crucial for innovation of technology that strengthens the role of using technology in organizational framework (Depietro et al., 1990). The meanings of top management support are defined as the level of understanding of top management about the technology and to what extent the organization can believe in investing in technological innovation. (Thompson, 1967). The success rate of IT tools depends upon the top management's willingness to implement and innovate the IT culture and technology in their organization. Organizations are always in the process of upgrading themselves with the environment by setting high goals and objective that can help them to cope up with the challenges. Technology also

helps organizations to align the individual goals and objectives with the organizational goals and objectives. Involvement of technology in organizational growth associated with the use of technology in the organization, challenges and remedies of technology can be growing interest for the researchers now a days (Vaccaro, et al., 2012). Top management's support not only helps in achieving the activities but also helps in smoothing operation of organization, it is an important source in achieving the core values for the organization's goals. Top management understands the organizational principles better and also have better knowledge of employee's needs. It acts as a bridge between organization's principles and organizational needs (Manna, 2012). Top management is a crucial factor in achieving a competitive advantage. The significance of top management's support is always recognized in terms of making new opportunities, making policies and taking decisions that is vital for the innovation of organization and adds value to the project as well. (Elenkov, et al., 2005) contributes in the literature by developing ways to investigate the importance and significance of top management in the projects, through the literature we came to know that the top management need to be consistent, keen and have willingly attitude and behavior in order to improve team performance and can progress effectively. Project-based organizations differ from each other, each organization has its own specialty and has different aims and objectives, they have their own ways in achieving goals and performing different tasks (Artto & Kujala, 2008). This allow these organizations to add value in the society through their diverse projects (Nightingale et al., 2011).

The focus of project-based organization is not only in achieving the monetary gains for the organization but also in achieving non-monetary benefits like organizational growth, high work performance, stake holder's satisfaction, knowledge and skills sharing and satisfaction to achieve long term values and organizational sustainability (Pinto et al., 1998). The method of value capturing utilized by the organization includes opportunities and challenges related to project quality and control to assist the organization in order to achieve high value. The actual aim of this research is upgradation of project-based organization to manage value in

wide range of project's contexts to achieve better understanding of the organizations' method and processes that need to be improved. This research would be an initial attempt in finding the impact of IT tools and Project Value with mediating role of team coordination and moderating role of top management support. This research aims to investigate the backgrounds of technological tools usage and resulting IT practices. More precisely the focus will be devoted to the project features, PM team's coordination, top management support satisfaction as determinants of technological or IT tools use. Further this paper will investigate how the satisfaction with technological tools affects the individual productivity and project value with team coordination.

1.2 Theoretical Gap

In the era of project based organizations the focus is being given to the implementation of information technology (Standish Group, 1995). IT tools are also used to improve the performance and creating value. The particular study focuses on the use of IT tools in Project based organizations. At the very same time considerable attention is paid to the comparisons of various IT tools. The agreement of user in order to accept the implementation of IT system and technology is one of the crucial factors in terms of successful IT system. (Garrity & Sanders, 1998). Till this no considerable attention has been given in creating project value using IT tools. Previous studies conducted with limited role of IT with Project Governance or interaction of IT governance, project governance lack the role of the technology in project management practices and projects (Sanders & Suresh, 2000). Marina Bos-de Vos et al., (2018) suggest to focus on firms that must capture different value dimensions (e.g. monetary, professional and social value) to attain multiple strategic goals. There is no study still conducted that could highlight the role of IT tools in creating project value..So we use Top Management Support as moderator. This tends to be a research gap that current studies did not explore impact of IT tools on project value.

In current study it is assumed that Team Coordination is mediating mechanism through which IT tools influence project value. Team coordination used as mediator between IT tools and Project Value variables and Top management's support is used as a moderator but it is yet to examine. Therefore, Team Coordination is believed to mediate the relationship between the mentioned variables. Most of the above-mentioned studies discuss the impacts of the project value on project based organizations, but this study conducted with the role of IT tools in creating project value. Many studies have focused on the influence of IT in the organization rather than to use these IT tools in order to create the project value. This particular study is focused on project value instead of project performance.

A very little research regarding project value is available in the recent literature. The aim of this study is to fill the research gap and to highlight the role of IT tools in creating project value. The study primarily focuses on the relationship related to IT tools and Project Value, through the particular mechanism of team coordination along with exploring how Top Management's Support may moderate the said relationship of IT tools and Team Coordination. The lack of any substantial empirical studies using Top Management's Support as moderator between the above mentioned relationship calls for filling this gap add the role of IT tools in creating project value with mediating variable team coordination make addition in the existing literature.

1.3 Problem Statement

There is need for value in the project by using IT Tools and focusing on project team coordination and analyzing its impacts on the project value. As these factors are important for the project value so every project team have to setup a section for team coordination in creating value that could help project team in executing top management's support effectively. This research is closely related to the field of IT tools and Team Coordination as it shows that human source practices effects on the performance and value of the project. According to Edwards & Rees (2006) training opportunities should be provided to make human

resources efficient, compatible and skillful, and to bring them at required levels so that they could coordinate in team by possessing respective skills to add value in the project.

There is the main problem with the project management firms specially in our country Pakistan that we are specifically unaware of the use of IT tools in the project. So, we often find that almost all the time we are always behind the schedule ahead the budget and resource because till now they are using conventional practices. So, the main drive of this research is to guide and aware the firms with the power and strength of the IT tools in creating project value with an appropriate use of IT tools by choosing the tools that are suitable to the situational aspects. Project managers should be able to deliver better project results. The apposite use of IT tool can lead to some latent benefits such as increased efficiency, improved project predictability, increased stakeholder assurance, increased probability of project value, and improved communication (Toney & Powers, 1997).

1.4 Research Questions

This study aims to find answers to these questions:

Question 1: Do IT tools add value to the project?

Question 2: Does Team coordination increase the productivity of IT tools?

Question 3: Does Team Coordination mediate the connection of IT tools and Project Value?

Question 4: Does Top Management Support moderates the relationship of IT tools and Team Coordination?

1.5 Research Objectives

The objective of the study is to propose and test the anticipated model and to find the relationship between IT tools and Project Value. Additionally, Top Management Support is added as the possible moderator for the relationship of the

given model and Team Coordination is mediating the variables.

The main objectives of this study are stated below:

1. To find the effect of IT tools on project value.
2. To find the effect of IT tools on team coordination.
3. To find the effect of team coordination on project value.
4. To find the mediating effect of team coordination on the relationship between IT tools and project value.
5. To find the moderating effect of top management support on the relationship between IT tools and team coordination.

1.6 Significance of the Study

In enlightening the positive effects of IT tools on project value that we took as the dependent variables in this particular study and it is anticipated that team coordination will mediate between the relationship of IT tools and project value, while the Top Management's Support will moderate the relationship between IT tools and the Team Coordination. If the research hypotheses confirm the role of IT tools in creating project value, then specific measures can be suggested to maximize the project value using IT tools. It is expected that it will contribute to the widespread global debate on the role of IT tools in creating value in the projects. It is anticipated that outcomes and recommendations of this study will update current practices and will notify the relevant specialists.

1.7 Underpinning Theory

Several theoretical perspectives have been presented by different researchers which are used worldwide to underpin the studies of IT tools and project value but Resource-Based View (RBV) theory and Stakeholder theory can cover all the variables of the present study .

1.7.1 Resource Based View Theory

According to the theory of Resource Based View (RBV), competitive advantage and organizational performance have a strong impact on corporate resources (Killen, et.al 2012), and the IT platform is basically also a resource. Important and valuable resources can benefit the firm, and can offer the organization certain temporary competitive advantages (Gerschewski, Rose & Lindsay, 2015). So by observing the situation Barney (1991) introduced the VRIO (value, rarity, imitability, and organization) framework that ruminates strategic resources those which are valuable, rare, and non-imitable and involve top management support. If a resource is valuable, infrequent, hard to replicate and involves it being exploited by the company then it is able to provide the organization to enhance their resources by effectively fixing defect and support the set of hypotheses which will be proposed in our research. According to the theoretical model that claims that top management support is utmost important in order to make the project valuable and for that IT tools are important in order to increase the project value by managing the project under given resources (Kull, 2016).

1.7.2 Stakeholder Theory

According to (Donaldson and Preston, 1995) The theory of stakeholders underlines the instrumental and normative position of values in companies and argues that when there is consensus between stakeholders on which values are relevant, value creation is improved. The position and mutual interdependence of value and values in organizations is thus unambiguously established. The most significant lapse, perhaps, is that it helps to reduce the involvement of corporations in establishing values, impacting their stakeholders' standards and expectations. The theory of stakeholders posits that there are unique values and preferences for stakeholders. In previous studies, it is noted that the key task of organizations is to fulfil them by creating value (Freeman, et al., 2010). The theory of stakeholders therefore takes values largely for granted and as such, does not describe how organizations participate in the creation of values.

1.8 Definitions of Study Variables

1.8.1 IT Tools

IT is short for information technology and is defined as distinct. letters . Information technology is a broad concern that affects all aspects of information management and processing, particularly within a large organisation or business. A programme used for software development or system maintenance is known as a tool.

1.8.2 Project Value

The process of retaining the part of the value is known to as value capture (Zott & Amit, 2010). A project's value is defined by the value a project creates for its stakeholders. The project value could be represented by a single or any combination of efficiency, technical effectiveness and the satisfaction of a project's stakeholder with emphasis on clients and shareholders Lechler (2010).

1.8.3 Team Coordination

The process of involving strategies and pattern of behavior aimed to assimilate actions, knowledge and goals of codependent members, in order to achieve common goals known as Team coordination. Team Coordination is a composite of different team members skills through which the efforts of individuals are coordinated to accomplish group goals. Coordination involved in making sure that the right things happen at the right time is known as coordination.

1.8.4 Top Management Support

Top Management Support (TMS) is defined as the willingness of management to foster entrepreneurial activity, including lobbying for creative ideas and providing individuals with the resources they need to take entrepreneurial actions.

Chapter 2

Literature Review

2.1 IT Tools and Project Value (PV)

IT Tools are used to track people, time resources and activities over a project's period (Horton, 2008). Project Management Software is a term that covers many IT tool of project planning, project management, cost control and budgeting, distribution of human resources, team work coordination, and time tracking (Pellerin, et al., 2013). According to Marti & O'Brien (2005), IT tools are used to make a project manager's job easier and quicker that assist in planning task scheduling, project cost control and monitoring schedules. IT tools enhance project data integration and facilitates collaboration with other enterprise applications and also enhances compatibility with other new technologies (Pellerin et al., 2013). In addition to maximizing the effectiveness of the project teams coordination, IT tools allows implementation of successful project management techniques, better decision making and retaining competitive advantage Horton, (2008).

Most of the managers now generally recognize the benefits and potentially strategic importance of implementing information technology (IT) in promoting a wide range of organizational activities. Moreover, the conviction that IT represents a critical organizational resource is expected to spread during the 1990s (Boynton & Victor, 1991). While the use of IT tools in many organizations varies widely in the degree to which it is implemented dynamically and to essential activities. Of

course several organizations did not intend to use IT to significantly improve the performance of the organizations. However, results still fall far short of expectations for many organizations that have attempted to use IT tools in the hope of achieving truly significant improvements in productivity and performance. From these studies it is found that the IT tools contribute positively to successful project management and create value in the project. Based on the facts presented in the literature examined, the researcher proposed that the use of IT tools would add value to the project. Technology has become the primary source of competition in today's highly competitive product and service markets, allowing faster and cheaper creativity and product differentiation. When work-intensive technologies increase in size and scope, so IT does the effect on decisions and the overall project performance. It is noted that if the organizations want to remain competitive, creative and growing then firms need to move from cost-based decision-making to interest-based decision-making, where the decisions taken are best for the overall performance of that organization and create value. Just recently, value creation has gained attention in the field of project management as a significant concept of research (Laursen & Svejvig, 2016). Researchers have specifically called for more value creation analysis in the sense of project, as method is distinct from the value-capture cycle and may add new perspectives to the perception of project value management and how project-based organizations operate (Martinsuo et al., 2017). Project-based organizations frequently face difficulties in trying to capture value in their projects, so the Value capture readings are also important as (Chang et al., 2013). Organizations need to maintain value not only at project portfolio and network level (Martinsuo & Killen, 2014). They must also assume unpredictable events (Gillier et al., 2015), so need to care of them. According to Nightingale et al. (2011), suggest that the value creation in the projects is often strongly influenced by volatile and unexpected occurrences that make businesses to forestall how the project will be implemented and how it will be beneficial for the client, whether interest is acceptable or not and how risk is misappropriated. Project-based organizations are frequently faced with payments between different values while seeking value creation in a project-based relationship (Bos-de Vos et

al., 2016). There may be analogous value pay-offs within the organization, given that projects are not only the mechanism which helps project based organizations to produce financial gain (Arvidsson, 2009). Organizations rely heavily on the formation and creation of non-monetary value in order to achieve long-term organizational sustainability. In project management literature dimensions of non-monetary value explored including project value, customer fulfilment, learning and growth, sharing of knowledge and social impact (Pinto et al., 1998). Project-based organizations therefore need to establish value-creation approaches that allow to balance diverse values across and inside projects. According to Stuart Green “Value creation in projects: Towards a narrative perspective unites new ways in the value creation landscape”. The paper may promote meaningful discussion about current value creation practices and understandings. This might even allow philosophers and professionals to focus more closely on their ideas, methods and instruments. Amit and Zott (2001) provide one of the earlier studies of value creation. We address the process of creating value that enable the value creator to collect because it lies at the root of how organizations work. For each different goal organizations create value for in different ways. (Lepak et al., 2007). Firm interest includes activities, products and services produced in market economies by organizations that are regarded as worthy by probable stakeholders such as customers, suppliers or competitors (Pitelis, 2009). Since each individual reacts to multiple logics of meaning in different ways and perceptions of what is worth differing from person to person (Venot, 2006).

Hence, organizational value is characterized in subjective and framework specific aspect. Basically, the mechanism of value creation within the organization is dynamic (Bowman and Ambrosini, 2000) and can be even more like this specially in inter-organizational projects (Hjelmbrekke & Klakegg, 2013). If in project IT tools are engaged in the production and acquisition of project value their various points of view need to be taken into account at the front end of the project and discussed during the lifecycle of the project (Veeneman et al., 2009). Powerful IT resources have become a requirement for more efficient and effective project management and help for decision-making by project managers (Havelka et.al,

2006). The benefit of IT is that it helps in promoting efficiency and productivity by efficiently storing and supplying an organization with the relevant information. With the ever-increasing rate of business activities, it is essential for each organization to use technical and IT resources for coordinating economic activities and creating value. Project focused organizations and their efficacy depend largely on their project performance. Information Technology (IT) provides adequate support tools in project planning and management while MS Project is one of the most commonly utilized software solutions. The investment in technical resources of business organizations, provides significant benefits and impacts the project value positively.

H1: IT Tools is positively and significantly related with Project Value.

2.2 IT Tools and Team Coordination

The effective realization of technological tools is strongly linked to organizational efficiency (Chih & Zwikael, 2015), and in recent years this issue has gained increasing attention as a distinct field of academic study (Hesselmann & Mohan, 2014). Nevertheless, this practice is still in its early stages; only a small number of models and methods have been developed (Doherty et al., 2012), and are not widely used across various industries (Espinoza, 2014). There are various effects of IT tools on organizations. IT tools include modern systems of governance (Dostie et al., 2008), leading to an increase in employee efficiency, thus promoting an increase in organizational profitability (Bulkley et al., 2004). IT technologies often enable the scale of organizations to be reduced and facilitate organizational coordination (Brynjolfsson et al., 1994). Moreover, applying the IT tools in project based organizations does not always contribute to expected results.

This problem, named the productivity paradox (Brynjolfsson et al., 1996). It can be caused by an inconsistency in the calculation of profitability, errors in measuring efficiency, poor management low skilled workforce, or the complexity in calculating an IT budget, which is intangible assets. Advances in IT have followed the growth of the global business powers. The reality had a tremendous impact on

how business is done today. Especially information technology and computing has improved, as well as the convergence of these two Internet technologies (Frame, 2002). Most of the available IT tools offer a wide range of unique, comprehensive project activities. The participants in the team can only operate together on the project if all of them have access to the tools. The level of communication and teamwork is the critical factor for the project's performance, particularly nowadays for e-coordination teams working in global international teams (Quade, et al., 2012). The growth and expansion of the project management field, combined through the stagnation of project budgets, shortening project timelines and growing likelihood of expensive project failure, has driven business and academics alike to examine and recognize causes of project performance. Using IT to control the day-to-day policy of the governance holds members liable for actions they are not responsible for generating, may not be in compliance with, and may not have had the chance to present an alternate argument. These situations within a corporate environment involve keeping a manager responsible for his or her subordinates' behavior while having control over what they are doing (Kakabadse, 1991). IT tools enable the monitoring of plans and personnel, the notification of job progress and the reporting of project details. There has been support for the use of IT as a way of enhancing project value. A good project management system based on a computer lets you quickly determine if your proposals are viable, identify potential risks, and monitor the project to completion. Project Management methodology is older than the personal computer but modern technology and computer make it easier to wrap around more complex projects. Black and Lynch (2000) find a positive and important relation between the proportion of non-managers utilizing IT tools and organization efficiency. IT technologies often pose broader questions regarding how governments interact with people. IT can potentially improve PM transparency and team coordination in decision making by simpler and more open communication by promoting direct communication between project team and stakeholder. The choice to rely on human factors rather than system or process data was focused on the presumption of human factors as inputs or determinants of the future system or process environment. In general, increasing use of IT tools

help in making business strategy that will lead to the project value. The quantity of academic research on the need for greater focus on soft skills in project managers training and education validates the importance of human factors as a feasible focal point for forecasting future project performance (Wirth, 1992). Technology may meet the project requirements documentation criteria of management for fast storage and retrieval, and for easy storage Organizational knowledge management in the past projects. Technology in particular will facilitate the learning of technical skills and process knowledge thereby facilitating IT-generated team coordination a poor choice of what to purchase, a badly designed deal, or ineffective team coordination will lead to problems such as a reduced ability to communicate, decreased efficiency, or the need for increased costs to adapt the continued technological change (Kouzmin & Korac- Kakabadse, 2000).

The creation of team coordination began in the pre-historic period, when huntsman banded together to pursue prey, raise families etc. (Graslund, 1987). Yet Bennis and Shepard (1956) are discussing creation as the advancement over the life span of a team. Organizational studies (Hoegl et al., 2004) have shown many hurdles in coordinated action among groups and individuals. To achieve organized actions within organizations utilizing technical tools needs frameworks to facilitate interaction and exchange of information. Coordination can be accomplished by enforcing written policies, regulations, job descriptions and standard practices which allow for an orchestrated behavior pattern (Galbraith, 1973). Many research also explored the use of multiple coordination processes, such as the use of schedules and timetables (Thompson, 1967), Output and conduct control systems (Kirsch, 1997), reward systems (Menon, Jaworski, & Kohli, 1997), electronic mail (Markus, 1994), electronic data management and engineering systems (Sicotte & Langley, 2000), colocation of key individuals (Pinto, Pinto & Prescott, 1993), direct informal contacts (Souder & Moenart, 1992), liaisons (Galbraith, 1973), integrating groups (Daft & Lengel, 1986), individuals serving in formal coordinating roles (Nihtil, 1999), workplace rotation (Ettlie, 1995), and the adoption of commonly agreed on values as mechanisms for coordination (Hart & Banbury, 1994). In many organizations around the world, teamwork is gradually implemented in an

attempt to gain project value by using IT resources, but there is little empirical evidence showing the connection between team productivity and project performance. Business economic pressures and volatility need a swift, flexible response to changing conditions, and organizations consider that they need to use technological tools to enable flexible response. Team coordination is the idea of team member perception, which generally refers to the positioned cognitive actions of an individual participating in a dynamic situation (Cooke et al., 2013) and, in particular, taking into account what is occurring in the current situation (Schmidt, 2002). This is because various team leaders in many organizations need to maintain an understanding of improvements in the current situation and the actions of their team members in regard to these adjustments, so that they could organize their tasks constantly and continually (Fiore & Salas, 2004). It is due to lack of understanding that how the multiple coordinating activities overall take place in the organizational structure, the consequences of situational factors, such as mission ambiguity, equivocality, target disputes or the use of different coordination structures or groups. Without effective team coordination among the team member having lack of technical expertise may contribute to errors and crisis needing rework (Kazanjian et al.200).

Studies on managing actions that need coordination in teams found that teams that were granted a greater degree of independence in organizing their internal resources, continuing comprehensive groundwork and switch-training were effective but and o better at sharing knowledge and teamwork (Weber, 1997). The coordination becomes more important between tasks when interdependence get high. Thus the interdependence of technological tools is necessary, by means of which advanced information technology (IT) can improve coordination within team members. Understanding the fundamental mechanisms by which IT tools strengthen teamwork is an important step in understanding how IT can maximize the value of large-scale projects. This is because IT is mostly used to handle dynamic, knowledge-intensive transactions circumstances in which information processing challenges and governance concerns occur together.

H2: IT tools have significant and positive effects on Team Coordination.

2.3 Team Coordination (TC) And Project Value (PV)

Teams are used in most sectors and organizations because of the recognition that they can outperform as compared to individuals acting alone, especially when overall performance requires multiple skills and judgments (Scarnati, 2001). For many corporate organizations, they have become the elementary building blocks (Katzenbach & Smith, 1993; Steward and Barrick, 2000). Teams can also be mobilized to meet the basic human needs of membership and identity as illustrated in Maslow's philosophy of hierarchy (Maslow & Frager, 1987).

Coordination within the work environment has replaced the design and implementation of task processes, hereby deciding whether individuals within the planned setting will be coordinated (Okhuysen & Bechky, 2009) to gain project value (Tikkanen, et al., 2005). There appears to be a range of knowledge and skills within a team which can be combined along with common information and resources (Driskell, 1992). Coordination can be obtained by enforcing written guidelines, regulations, job explanations and standard processes which allow for an incorporated pattern of behavior (Galbraith, 1973). Project management combines people with different talents, experiences, and expertise to produce dynamic and often creative results in either product or service types (Lindkvist, & DeFilippi, 2004). In team Coordination there should be a defined set of activities that contribute to the complete project priorities and benefit (Kazanjan et al., 2000). Team structure also represents the project result modules, and interdependencies between team members emerge by functional interfaces between different modules (Hippel, 1990). Such interdependencies between team members enhance the necessary cooperation and establish a need to interchange of information, share knowledge, and overcome evolving disputes (Galbraith, 1973). So we described coordination as integrating or linking various parts of the company together to accomplish a common set of tasks (Van de Ven, Delbecq, & Koenig, 1976). Gido and Clements (2011) agreed that the attributes of productive team involve higher

degree of coordination, commitment, transparent, timely collaboration and ethical behavior.

A consistent hierarchy and well-defined functions promote teamwork cohesion within a team (Molleman et al., 2004). There are fewer skirmishes and greater acceptance when team members communicate openly with each other (Ensley et al., 2000). Single-team projects cannot deal with the high complexities found in new products, thus, most often dynamic progressive projects overlapping various organizational structures and demanding technical knowledge from different areas are coordinated as projects involving multiple teams, and then teamwork becomes necessary to achieve project value. In fact, straightforward, intuitive and compatible workers with their fields of expertise contribute to project value (Camilleri, 2011). In handling task interdependencies among team member impacts project value, quality and influences project engagement and team performance by inter-team coordination (Hoegl et al., 2004). The choice of team members should be focused on the skills and expertise appropriate to the complication of the task. Value of each project is measurable before it can move into the planning phase from the exploration stage. This lets the project team concentrate on the project's final objectives. Kay (1995) defines value added as the difference between the (comprehensively accounted) value of a firm's output and the (comprehensively accounted) cost of the firm's inputs. They discuss the process of creating value and the mechanisms that allows the value creator to create it. In general, project worth can be called the and the gains and costs, and is co-created in the relationships and partnerships of project participants in inter-organizational projects (Ahola et al., 2008). From an economic viewpoint, worth is described as the quotient of the project (Laursen & Svejvig, 2016), where the project benefits may be short-term or long-term and are quantified monetarily. According to Lepak et al. Value Creation is a central concept in the literature of management and organization and that generating value is not well known (Lepak et al. 2007).

The creation of value relies on the relative amount of value subjectively realised by a target consumer (or buyer) who focuses on the creation of value (Lepak et al. 2007). People's intervention is necessary to build project values out of the

tools that have been obtained. A certain argument applies to less measurable tools, including labels and knowledge. Products do not add value on their own; they must be correlated with products or services created, and if they are not aggressively promoted by creative marketing campaigns their consumer ability will diminish. Likewise, a tool like a name could be sold and used to create greater rates of perceived consumer value. Therefore, value creation stems from the actions of people operating on and with procured using values within the organization (Wright et al., 1994). Project value creation involves defining value, creating value and collecting value during and after the project (Martinsuo et al., 2017). The words ‘value and benefit are used interchangeably (Aubry et al., 2017), and many contradictory and vague definitions tend to occur, such as value (Morris, 2013), gain (Chih & Zwikael, 2015), importance (Zwikael & Smyrk, 2012), and effect (Volden, 2018) . Organizational value includes activities, products and services produced by organizations that are regarded as worthy by potential beneficiaries such as customers, suppliers or competitors (Pitelis, 2009). Organizations creating value has not been researched in several research fields. Value creation relies on the relative amount of value that a target stakeholder who is the object of value creation subjectively knows and who is willing to exchange a monetary amount for the value obtained (Lepak et al., 2007). Janet Kottke (1999) identified the need for a team of core skills, an appropriate mechanism through which companies gain project value.

Value is at the root of how teams work. The term success in a group work system has been commonly used to represent the final consequences of the activities as well as to assess whether a person or a team is effective or not (Tabassi, et al., 2017). Team performance increases after unanimous decision-making (Jackson et al., 2003). Hartenian (2003) indicated that social action and teamwork teams are more likely to gain the objectives they set properly. It was established that teams that are qualified in conflict resolution and have shown teamwork in conflict resolution, collaborating on objectives add value to the project by hook and crook. The theory’s basic function is to acquire knowledge, teamwork, creative creativity and communication to add value in the project (Kottke 1999). Therefore, strategies

and methods assigned by the organization as a way of further strengthening the cohesion of coordination may theoretically deliver positive results to the overall team or mission interest (Tabassi et al., 2017). Therefore, strategies and methods assigned by the organization as a way of further strengthening the cohesion of coordination may theoretically deliver positive results to the overall team or mission interest (Tabassi et al., 2017). We need to take care of those elements that update the team with the current job knowledge. Team will be more productive and, will add value if team coordination exists as per the requirement. So it is concluded that coordination among team members add value in the project.

H3: Team Coordination positively effects the Project Value.

2.4 Team Coordination Mediates the Relationship between IT Tools and Project Value

Good use of teamwork helps to improve certain facets of a team such as coordination creativity, lateral contact and resilience, but it is not a solution to address all organizing challenges and bad implementation can have many negative effects. Team work develops a range of knowledge and skills within a team which can be combined along with common information and resources (Driskell, 1992). However, the idea of coordination depends on the presence of efficiencies between the different team members in order to contribute collectively and individually for project value creation (Katzenbach & Smith, 1993). Team members need to be versatile in both responsibilities and activities to respond to operating in a collaborative environment where goals are accomplished collaboratively rather than by rivalry (Tarricone & Luca, 2002).

High performing teams are reported to have clear and concise roles. The team working cohesively and high level of cooperation greatly impacts the overall performance of the team. Bettenhausen (1991) said the efficiency of projects increases greatly when everyone decides on the team's goals. When team members are

highly dependent on each other, various roles and responsibilities will be adjusted to produce further efforts as a team. Katzenbach (1997) indicated that, whenever team members assume leadership roles and responsibilities at various points of time in different directions, they help team to perform better. Integration of teams needs a sense of unity to transcend the conventional behaviors. Hartenian (2003) indicated that cooperative-behavior teams are more likely to achieve the objectives. It was concluded that teams trained in adopting IT tools show good performance in conflict resolution, goal settlement, adequate planning and adding value in project. Powerful IT resources have become a requirement for more efficient and effective project management and for helping project managers make decisions efficiently and accurately (Havelka et.al, 2006). IT tools basically helps to promote efficiency by efficiently managing and supplying an organization with the necessary information and promoting their productive performance of their work. Empirical studies have shown, according to (Francis et al, 2011), that poor human relationships at work, neglect of staff wellbeing plans and lack of motivation are often factors that cause industrial strife and decrease productivity in the work environment. Many project based organizations themselves are also discover that they can stimulate improvement in overall firm's performance by integrating IT to internal systemic change. The use of technology, according to Bay (2004), is efficiency savings with larger volumes managed at higher speeds, with fewer resources. Effectively implementing IT tools is not the only cause of people becoming more efficient but the method of handling becomes more structured naturally. It is not easy to find a good team, because a wide number of factors have to be weighed. Hence, according to Hamid Tohidi, (2006) technology plays important factor that contributes to the inspiration aspect in project management. Undoubtedly those who work and are active in this field and offer the use of this technology to others are concerned about these rapid changes themselves and necessarily need to consider ways and new methods to enhance performance and avoid potential risks and provide right and relevant solutions for organization planners and managers, for decision-making and policy-making. Project management frameworks today are fully professional and prioritize efficiency and creativity Hamid Tohidi, (2010).

Aspect of technology is included in project management team as one of the encouragement factors. Technology advancement impels project teams to get their coordination, collaboration, and team work efficiency. Adopting new technologies is critical for many organizations' sustainable profitability. Technology is critical in project management because it enhances the team coordination and productivity. IT tools meanwhile play an important role in reassuring team work. Project team will attach the best ideas for the proposed projects using the strongest interconnection of the actual latest technologies and team coordination. This not only improves the efficiency of the project but also refines each part of the team and adds value throughout the project. Pitelis (2009) defines value as the perceived worthiness of a subject matter to a socio-economic agent that is exposed to and/or can make use of the subject matter in question. Similar value market-offs that occur within the organization provided that projects are not only the process by which project-based organizations achieve financial income (Arvidsson, 2009), but are also used to fulfill other, potentially competing, strategic objectives (Martinsuo & Killen, 2014).

The creation of value happens by integrating organization capital in different ways to increase their future profitability (Schumpeter, 1934). Additional economic value as people are willing to pay more for the goods and services of businesses than the expense of their supplies (Barney, 2001). Though arbitrary market performance and value creation metrics are not optimal, there is considerable evidence that such indicators enjoy high validity rates (Ramanujan, 1987). The organization's value-creation mechanism (Bowman & Ambrosini, 2000) is vibrant and can be even more vibrant in inter-organization projects. A primary advantage deriving from a knowledge archive is the potential to harness the resources of an organization or entity by continued learning and continuous improvement. The use of tools which team members and stakeholders do not like may cause unnecessary legal barriers to the project (Hodgkinson, 2009). Furthermore, the setting or atmosphere within which a project is being performed will have a huge impact on the existence and value of the project. The challenge confronting organizations even after investing some billion dollars on IT facing difficulty that how to relate their

IT expenditures to key performance (Marchand, Kettinger & Rollins, 2000). The project team hires a range of IT resources which are applicable to a given project and its context to work efficiently. In project management IT Technologies lead to software applications used to successfully manage the project. Techniques are the approaches used in a project to efficiently use the IT tools (Schwalbe, 2010). As technological innovations have become important to organizational achievement, so the use of the right tools in the right way is essential to achieve high productivity or value (Bell, 2006).

According to the content analysis team coordination is organized in order to make workers learn the organizational truths and teach them basic rules, to give contentment to the stakeholders, give them technical skills necessary to carry out the job in order to eliminate possible defects in the workplace. In addition, team management is seen as an instrument through which organizations may assess the context within which their human capital assets are deemed secure. A particular type of team, their expertise and information sets for meeting their strategic goals was due to changes in the nature of practice and organization in which research is done as a requirement for organizations needing the constant coordination between team member to certain strategic growth.

H4: Team Coordination Mediates the Relationship among IT tools and Project Value (PV).

2.5 Top Management Support Moderates the Relationship between IT Tools and Team Coordination

For the implementation of IT Top Management Support is defined as understanding the importance of IT tools in the project based organizations (Ragu-Nathan & Tu, 2004). It reveals that top management support is importance for improving operational efficiency realizing the strategy and achieving competitive objectives using IT tools. Effective support from top management gives project managers

trust to conduct their projects for completion by effectively utilizing resources (Morgan, 2012). From the previous literature it is found that TMS is important for the implementation and integration of information technology (Chatterjee et al., 2002) and also leads to successful innovation in projects (Maidique & Zirger, 1984).

Ideal top management reveals a strong understanding of the interests of its members and provides an opportunity that allows them to learn and solve problems. Top management support was a significant concept in the literature on technology adoption (Chong et al., 2009). This in turn has a positive impact on the performance of the project and leads to better results. In a qualitative analysis in England, for example, Alshamaila et al. (2013) noticed that encouragement from top management along with other organizational technical, and social factors had a positive impact on project performance. Top management support is also a concept in innovation studies that embraced the Chen (2007) finding out that investment in information technology has led to greater decentralization through a significant reduction in the degree of formality in organizational structure. Implementing IT needs the cooperation of the top management and human influences (Iskandar, 2015). Some studies contend that a clarification for the so-called productivity paradox may occur due to an inadequate approach to internal improvements. The greatest benefits from IT solutions tend to be achieved when IT resources and other corporate assets are mixed, these include new strategies, new business methods, modern organizational structures and better skills for employees. IT tools enable firms to introduce substantial organizational improvements in the area of decentralization, reasonable work arrangements and outsourcing areas. This helps firms to grow more flexibly and to meet changing stakeholder preferences with shorter product cycles. IT performance can be measured by different methods ranging from technical, non-technical and financial approaches (Gamal, 2011). From a technology perspective, it is important to generate and select new product ideas that object at premeditated growth. W. Smith and M. Tushman (2005) and funnel them into development. Top management aids subordinates in fulfilling their empowerment requirements, enhancing appearance, gaining performance and increasing self-efficacy (Taylor, et al., 2009). Daoud & Triki (2013)

reported that the role of TMS has a positive impact on the IT in researching the impacts of top management on IT. Likewise, (Brynjolfsson, et al., 2002) noted that companies that use information technology widely are more willing to adopt work practices making the use of job units, decentralization and improve staff collaboration.

Team coordination is a process involving the use of organizational techniques and behaviors aimed at combining interdependent participants' acts, information and expectations to accomplish common goals. It is noted that rules of team effect the project value. These rules must be monitored by the top management for effective utilization of team. When top management will constantly monitor and supervise the team that will lead to team coordination. Team coordination makes sure that a team tasks as a whole, and is identified as a key process for understanding the effectiveness of the team work. It's important to be able to encourage team coordination from within the entire organization. Team coordination reflects the ability of a team that act together by predicting the task needs and the resulting behavioral adjustment without the need for direct communication between team members (Wittembaum et al., 1996). According to (Orasanu & Salas, 1993), it stresses that team members usually have different and unique positions, each of which constitutes vital contributions to collective action. To accomplish team goals, this interdependence requires coordination and communication between participants, and the incorporation of their inputs. Members need to share information and resources during team action, and track continuously the synchronization of their activities, changing individual and team behavior when cooperation breaks down (Salas et al., 1992). Successful team intervention also involves defining acceptable individual member commitments and a roadmap for the best way to incorporate such efforts into an organized team solution (Hinsz, Tindale, & Vollrath, 1997). The higher the interdependence between tasks, the greater will be the coordination. Coordinating processes are required to synchronize the different IT management team activities so that IT priorities and operations stay consistent with the firm's objectives and operations and so that efficiencies and learning will take place by knowledge sharing or new technology. According to

(Stuart D. Green & Natalya Sergeeva, 2019) there is need of determining that how project managers mobilize resources in creating value. It is also a key point that helps to find the role of top management. Top management plays a key role in integrating IT strategies by creating a suitable environment and making decisions that improve team creation and coordination (Aragón-Correa, et al., 2007). IT technologies hold prominent and critical roles in organizations, which illustrates the strategic direction for IT investments (Peffer & Saarinen, 2002). Al-Ammary and Hamad (2012) reported that some project based organizations keep basic IT and minimal technologies necessary to accomplish the expected mission and those using advanced IT faced a problem while adopting technology. Implementing a reliable information technology requires the right framework for adoption of the system and provides proper guidance for those who use, operate and build the system. Earlier researchers have recognized top management as the key actor in implementing IT for projects, and they have an important role in implementing IT. According to Mahmood and Swanberg, (2001) TMS have a greater chance of preventing organization inefficiency and loss. Zwikael (2008) acknowledged the positive effect of TMS for IT implementation and team coordination while examining management support that impact the implementation of IT.

The relationship between the IT tools and team coordination is supposed to be moderated by top management support. Help from top management has also been shown to be the most important factor in team coordination (Young & Jordan, 2008). Top management support has been supposed to be related significantly and positively with team coordination and IT tools.

H5: Top Management Support Moderates the Relationship between IT tools and Team Coordination.

2.6 Theoretical Framework

Present study aims at exploring the impact of IT tools on Project Value with considering the mediating influence of Team Coordination and Moderating Effect of Top Management Support.

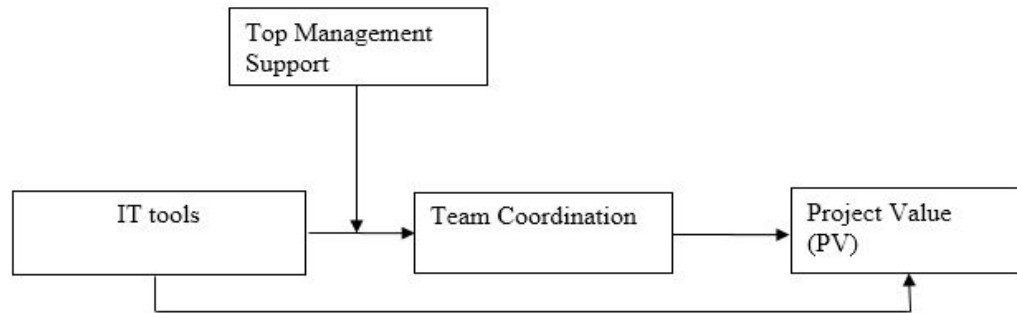


FIGURE 2.1: Research Model of Impact of IT tools on Project Value, Mediating Role of Team Coordination and Moderating Role of Top Management Support.

2.7 Research Hypothesis

H1: IT tool is positively and significantly related with Project Value.

H2: IT tools have significant and positive effects on Team Coordination.

H3: Team Coordination positively effects the Project Value.

H4: Team Coordination Mediates the Relationship among IT tools and Project Value (PV).

H5: Top Management Support Moderates the Relationship between IT tools and Team Coordination.

Chapter 3

Research Methodology

It is to be noted that research method and research methodology are different from each other. Method of research focuses each method which has been used for research orchestration. Research procedures or techniques mention the ways that a researcher utilize in conducting research options. In comparison, research methodology is a form of consistently addressing study problems. In other terms, all those procedures are defined as research methods, which researcher has used in researching about the research issue. So, as we think about methodology it does not only imply the methods but also the rationale behind the methods used in the sense of that study and describes the use of one strategy or procedure over another, so that the findings of the work can be measured either by another or by the researcher himself. This chapter contains the procedures with complete detail and methods that are applied in this study to get the valid results. The arguments contain details related to design of research, population, sampling characteristics, sampling techniques, instruments and reliability of all the variables and items involved in this study.

3.1 Research Design

A good research structure facilitates researchers in achieving outstanding results, as well as helps to improve the research's utility. There are two study design

approaches in the social sciences that are mainly known as a quantitative approach and a qualitative approach. Many researchers believe that quantitative analysis is more accurate and more effective than qualitative research design (De Vaus & de Vaus, 2001). With the help of quantitative methodology, researchers may obtain validated and trustworthy findings (Chase et al., 2016). Research design is characterized as the display of data collection and analysis of conditions in such a way that the purpose is to syndicate relevance to the study target with economy in process) (Selltiz et al., 1960). We are endorsing quantitative research methodology for the present study by using systematic techniques and tools. As reliable data is precipitated by translating observable facts into statistics, which further studied interactions, partnerships, causes and effects to be discerned.

In addition, survey techniques were performed to collect data including the use of a questionnaire that includes categories such as age, class, education and experience. In the present study, self-administered questionnaire was used to gather data.

3.1.1 Type of Study

The current study examined the Role of IT tools in creating Project Value. This is a causal or relational analysis in which project value has been measured on the basis of soul reported interpretation of these factors in the face of IT tools. In this research, Team Coordination has been used as mediator and Top Management Support as moderator. Survey is a way to obtain quantitative data in predefined and structured format to make analysis simpler. This study was conducted for industry as well as academic purpose and owing to time limitations, convenience sampling technique was used. Since project based organizations lack use of IT tools. That's why project based organizations have been selected for this study.

3.1.2 Study Setting

This present study is basically a field study so participants of the project based organizations including employees and supervisors were contacted at their work force environment and they filled the questionnaire in normal work environment.

3.1.3 Unit of Analysis

To perform main analysis on the research data is collected at unit level which basically indicates the unit of analysis. For example, an entity, an organization, can be the unit of study in a research. Even though the main attention of this study is to address the role of IT tools in creating project value in the project based organizations, the unit of review for this study is top management, individuals and stakeholders.

3.1.4 Time Horizon

Information was made up from project-based organizations for this inquiry. This took nearly two months to gather data from the respondents so it's a cross-sectional analysis.

3.1.5 Quantitative Research

Depending on the purpose of the study, researchers still have the choice of performing research qualitatively or quantitatively. This study is quantitative in existence, as the outcomes and final results are based on data collected from respondents through questionnaires. Using different statistical tools, the collected data was analyzed.

3.1.6 Cross Sectional Study

The analysis is cross sectional in scope, with respect to time horizon. The data from respondents were obtained in cross-sectional surveys only at a given point in time and is used for future study. The other form is commonly called longitudinal study. In many studies need researchers to collect data at different times to reach a conclusion, so if data is collected from respondents more than once, these studies are longitudinal. The optimal method is cross-sectional research, as the impact of IT tools examined in the study do not alter in a short time.

3.1.7 Pilot Study

Pilot study was conducted so that it could be assured that questionnaire was valid. After collecting 90 questionnaires pilot study was conducted and variables' reliability was evaluated which indicated adequate alpha coefficient values.

TABLE 3.1: Reliability Analysis

| Variables | Items | Cronbachs Alpha |
|------------------------|-------|-----------------|
| IT tools | 5 | 0.893 |
| Team Coordination | 4 | 0.880 |
| Top Management Support | 6 | 0.818 |
| Project Value | 4 | 0.801 |

3.2 Population and Sampling

3.2.1 Population

Methodology deals with data collection techniques along with population and samples. The data was collected for the purpose of looking at the effect of IT tools on project value in the context of project-based organization in Pakistan, with the mediating role of team coordination and the moderating role of Top Management Support.

3.2.2 Sample and Sampling Technique

Main goals of the sampling are to pick a significant group of elements that truly reflect demographic characteristics. Since we cannot collect data from the total population in most situations, sampling is the only feasible data gathering method. Because study findings are to be applied on the overall population, therefore, the collection of samples demands the due care. There are two main types of sampling which are probability sampling and non-probability sampling.

Probability sampling provides equal opportunities to each element of population for participation. But non-probability sampling situation is totally opposite and

probabilities are attached. A very famous type of non-probability sampling is convenience sampling in which data is collected from the member of population who are conveniently available. In the present study we also used the convenience sampling.

The explanation for using easy sampling is because of the fact that in Pakistan project-based organizations are spread across number of organizations and are in large numbers. It was certainly impossible to visit all of the organizations in a short period of time. Though every effort has been made to meet various organizations and cities throughout Pakistan to gather data from representative samples. Therefore, convenient sampling proved to be an effective strategy for the present study.

3.2.3 Data Collection Process

Although a major research work is already being carried out in our region. The overall experience and confidence of the less respondent with study is nevertheless weak. Usually, even for research purposes workers refuse to express their view. In these conditions, doing a good research remains a problem for the researchers. Therefore, the process of collecting data from project-based organizations, required significant effort.

3.2.4 Data Collection Technique

Close ended questionnaires were distributed among individuals to collect data. Almost 400 questionnaires were distributed in project based organizations and 296 responses were received with response rate of 74%. 5 surveys were rejected due to some misplaced data and 291 responses were finally used for further analysis. Questionnaires were used for data collection. The time period spends in data collection was two months. This research design of this study was cross sectional. The questionnaires were adopted from previous literature and the data was collected from project based organizations and developing sector of Pakistan including (Pir & Co, Progressive Technical Associates, Abbasian Enterprise, Al

Mahaz & CO, Mangla Construction) Development sector Organizations: NGOs, Government developing sector (NTDC and FWO). Data was collected by visiting work sites.

3.3 Sample Characteristics

There are different demographics for each study. In this questionnaire, the demographics used were the following:

Gender, Age, Qualification and Work Experience. Sample characteristics are described below:

3.3.1 Gender

Gender is also significant part of demographics. Gender dispenses population sample into male and female.

TABLE 3.2: Frequency of Gender

| Gender | Frequency | Valid Percent | Cumulative percent |
|--------|-----------|---------------|--------------------|
| Male | 269 | 92.4 | 92.4 |
| Female | 22 | 7.6 | 100 |
| Total | 291 | | |

Table 3.2 shows the frequency of the gender sample in which males are more as compare to female. It can be seen that male were 92.4% while the female appears to be only 7.6%.

3.3.2 Age

Age is also an essential part of demographics but there are some respondents who feel reluctant to reveal their age so for their convenience Range is given. Age also play an important role in project based organizations because mature individuals coordinate as a team well as compare to immature mostly.

TABLE 3.3: Frequency of Age

| Age | Frequency | Valid Percent | Cumulative Percent |
|--------------|-----------|---------------|--------------------|
| 18-25 | 129 | 44.3 | 44.3 |
| 26-33 | 73 | 25.1 | 69.4 |
| 34-41 | 52 | 17.9 | 87.7 |
| 42-49 | 28 | 9.6 | 96.9 |
| 50 and above | 9 | 3.1 | 100 |
| Total | 291 | 100 | |

Table 3.3 indicates the age-wise arrangement of the sample in which 44.3% of respondents had 18-25 years of age, 25.1% were of 26-33 years of age, 17.9% in age group of 34-41 years, 9.6% in age of 42-49 years and 3.1% of the respondents were in age set of 50 years and above. In the questionnaire five different age categories were used to gather age details.

3.3.3 Qualification

For this study as we choose the project based organizations and we found the mix of qualification. As project based organizations require competent individuals with relevant qualification. Qualification is vital part of demographics like age and gender because education is important for success of any country. It is also

TABLE 3.4: Qualification of Respondents

| Qualification | Frequency | Valid Percent | Cumulative Percent |
|---------------|-----------|---------------|--------------------|
| Matric | 24 | 8.2 | 8.2 |
| Inter | 20 | 6.9 | 15.1 |
| Bachelor | 79 | 27.1 | 42.3 |
| Master | 93 | 32 | 74.2 |
| MS/M.Phil. | 68 | 23.4 | 97.6 |
| PhD | 7 | 2.4 | 100 |
| Total | 291 | 100 | |

Table 3.4 explains that (8.2%) respondents were Matric, (6.9%) respondents were inter, (27.1%) bachelor degree holders, (32%) possesses master degree, (23.4%)

were MPhil and (2.4%) with PhD level degree. In the questionnaire six different types of qualifications were listed to collect educational data.

3.3.4 Work Experience

Work experience is total number of employees working year in various organizations. Work experience enhances human knowledge and innovation so it is an essential part of demographics. It also helps in understating the working environment and coordination with team members.

TABLE 3.5: Work Experience of Respondents

| Experience | Frequency | Valid Percent | Cumulative Percent |
|--------------|-----------|---------------|--------------------|
| 5 and Less | 119 | 40.9 | 40.9 |
| 13-Jun | 83 | 28.5 | 69.4 |
| 14-21 | 55 | 18.9 | 88.3 |
| 22-29 | 18 | 6.2 | 94.5 |
| 30-35 | 9 | 3.1 | 97.6 |
| 36 and above | 7 | 2.4 | 100 |
| Total | 291 | 100 | |

Table 3.5 shows that 40.9% of the respondents had 5 years and less experience, 28.5% were in the range of 6-13 years, 18.9% were in 14-21 years range, 6.2% respondents were in the range of 22-29 years, 30-35 years were having work experience of 3.1% and it is noted that d work experience of 36 years and above had only 2.4%.

3.4 Instrumentation

3.4.1 Measure

Questionnaires used in this research have been used previously for recent studies in highest level-tier journal articles; the details of scale used in present study for the variables IT tools Project Value (PV), Team Coordination and Top Management Support are presented below.

Questionnaires used to assess the study of these four variable are Close-ended, referred to as 5 point Likert scale from “Strongly Agree to Strongly Disagree. 1=Strongly Agree, 2=Agree, 3= Neutral, 4= Disagree, 5= Strongly Disagree”. These variables will be utilized from divers’ source.

3.4.2 IT Tools

IT tools variable represents as an independent variable in this study. It had 5 items which describes the IT tools variable. Questionnaire developed by Tallon and Paul P in (2011) is used in this study who recognize it an effective tool to find role of IT in project management.

3.4.3 Team Coordination

Team coordination consist of team communication and team collaboration which enhance the team coordination among employees and higher authority within the project for successful execution of the project. Questionnaire for team coordination was developed by (Janz, Brian, James & Davis, 1997) which consist of 4 items.

3.4.4 Project Value

Project Value represents variable as dependent variable in this study. It had 4 item which describes the training variable. Questionnaire developed by Pinto and Mantel (1990) is used in this study who consider it an effective tool to measure the project value.

3.4.5 Top Management Support

Top Management Support variable is represented as moderator variable in this study. It had 6 item which describes the training variable. Questionnaire developed by Wang, Eric T.G., Gary Klein, and James J. Jiang (2006) is used in this study who consider it an effective tool to measure the top management support effect.

TABLE 3.6: Instrumentation

| Variable | Sources | Items |
|------------------------|------------------------|-------|
| IT tools | Tallon, Paul P. (2011) | 5 |
| Team Coordination | Janz B. D., (1997) | 4 |
| Top Management Support | Wang, et al (2006) | 6 |
| Project Value | Tallon, Paul P. (2011) | 4 |

3.4.6 Data Analysis Tools

To analyze the data collected through questionnaire, the software of SPSS was used. The data has been tested for examining the correlation and regression. To evaluate how independent variable is connected with the dependent variable, correlation analysis is used. While regression is used to examine that how much change in independent variable caused change in dependent variable. Moderating and mediating variables by utilizing SPSS, Preacher and Hayes Process and Amos. These techniques and tools have some merits and demerits, but the choice of accurate tests and tools is strongly link with research model, research purpose, research type and nature of data. In the present research, Amos was utilized to check the discriminate and convergent validity. This method is not only accepted and popular in social sciences but in other disciplines also such as psychology and clinical psychology.

3.4.6.1 Analytical Techniques and Tools Used

SPSS software pack was used to gather all statistical calculations. Cronbach's alpha was calculated to measure the internal reliability of the scale. To ensure that whether the hypothesis is accepted or rejected, regression analysis was performed using Preachers & Hayes method.

3.4.7 Reliability Analysis

The table below shows the Cronbach's Alpha; it is the degree of internal consistency and reliability. Coefficient alpha value must exceed the minimum standard

of 0.70 levels to provide good estimates to retain the items (Nunnally & Bernstein, 1994).

TABLE 3.7: Reliability measurement

| Variables | No. of Items | Cronbach's alpha(α) |
|------------------------|--------------|------------------------------|
| IT tools | 5 | 0.886 |
| Team Coordination | 4 | 0.870 |
| Top Management Support | 6 | 0.892 |
| Project Value | 4 | 0.824 |

Reliability test scale refers to degree where test results are consistent and are stable to analyze what is expected from measurement. If similar results are obtained under consistent conditions, then reliability is set to be high for measurement. Reliability scale is a common test which is used to measure the validity of the scale used for research. Cronbach Alpha considered as a scale for reliability measurement with value starting from 0 to 1. Higher the value of Alpha means higher the reliability of the scale. Correlation among internal variables can also be measured through Cronbach Alpha. Mostly Alpha values more than 0.7 are considered to be reliable whereas lower value indicates lower reliability of the scale used for research. Table 3.6 gives completed details of Alpha Coefficient. IT tools Alpha is 0.886 with 5 items, Team Coordination Alpha is 0.870 with 4 items, Top Management Support Alpha is 0.892 with 6 items, and Project Value Alpha is .824 with 4 items. All scales used for this research shows reliable values.

Chapter 4

Results

4.1 Data Analysis

For data analysis different software were adopted such as SPSS and AMOS. Confirmatory factor analysis was conducted for checking the model fitness utilizing Amos. Moreover, to examine relationships between variables, descriptive statistics, Pearson correlation, mediation and moderation analysis SPSS was utilized.

4.2 Confirmatory Factor Analysis

To analyze the measurement model IBM AMOS was utilized. The model was checked via fit statistics. These statistics involve multiple indices, 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). Comparative Fit Index assumes that there is no correlation between all latent variables and compares sample covariance matrix with null model. The acceptable range is between 0 and 1 and for good model fit the value should be close to 1. Value above 0.90 shows good model fit and below exhibits poor model fit. According to (Gefen et al., 2000) Goodness of Fit Index (GFI) asserts absolute fit for measurement model. (Raykov & Marcoulides, 2000) defines GFI as degree of variance and covariance proportion. The range of GFI is between 0 and 1 and

the value should be close to 1. For good model fit the value of GFI should be greater than 0.80 and below this threshold is consider as poor model fit.

Furthermore, according to (Byrne, 1998) Root Mean Square Error of Approximation (RMSEA) evaluate model goodness with population covariance matrix. For RMSEA different authors suggest different threshold values. (Hu & Bentler, 1999) commended the acceptable range should be between 0.06-0.08, while (Lomax & Schumacker, 2004) suggested that for good model fit the value should be less than 0.05. Whereas (MacCallum et al., 1996) suggested that for good model fit the acceptable value should be equal to 0.10 or less than 0.10.

4.2.1 Measurement Model

TABLE 4.1: Measurement Model

| Model | | CMIN/DFCFI | TLI | IFI | GFI | RMSEA | |
|-----------------------------|--|------------|-------|-------|-------|-------|-------|
| Baseline Hypothesized Model | | 2.233 | 0.952 | 0.941 | 0.953 | 0.901 | 0.065 |

It is important to clarify the figure 4.1 before understanding, the table given above. The IT latent variable indicates IT tools, TC indicates Team Coordination, TMS exhibits Top Management Support and PV shows Project Value. Table 4.1 revealed the results for model fit. For getting good model, certain changes were made to the model like linking certain error terms. Therefore, as the table depicts that all values meet the threshold values suggested by Hair et al (2009). Incremental fit index (IFI) value is greater than 0.90 that was 0.953, which shows admirable fit, comparative fit index (CFI) value, should be greater than 0.90 that was 0.952, which again illustrates good model fit, root mean square error of approximation value, should be less than 0.07 that was .065, which depicts good model fit. Similarly, the value of Tucker-Lewis index should be greater than 0.90 that was 0.941, which represents good model fit. Moreover, the value of goodness of fit index should be greater than 0.80 that was .901 which indicates excellent model fit. Last but not the least the value of chi-square for model fit should be less

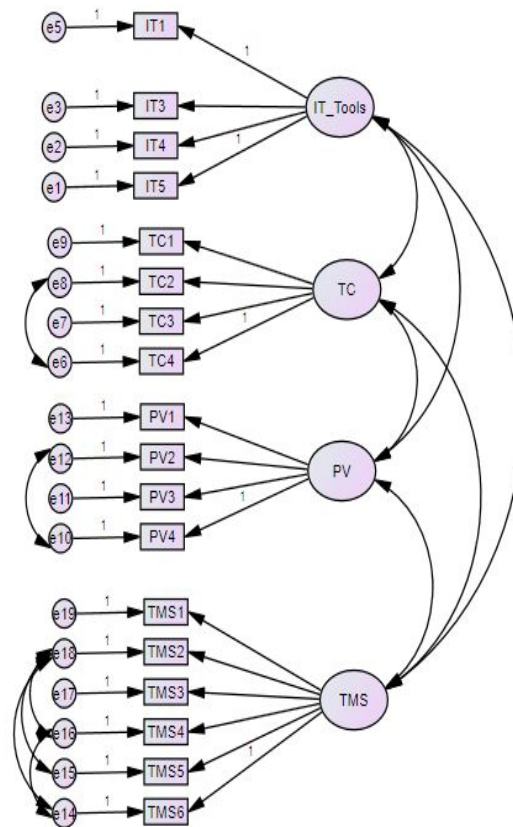


FIGURE 4.1: Measurement Model

than 3 that was 2.233 which represents good model fit. Overall, the four factor model results are good and excellent model as the values provide evidence.

4.3 Descriptive Statistics

Descriptive statistics table is the basic representation of the data collected and analyzed in this research like sample size, standard deviation and the mean value of the records. Descriptive statistics also represent large summation of data into organized and summarized form. The details of data assembled under this research study are shown below in the table.

The table 4.2 gives details about descriptive statistics for the variables under study. The details included in the table are minimum, maximum and average values for variables understudy and also shows the mean and standard deviation. Detail

TABLE 4.2: Descriptive Statistics

| Variables | N | Min | Max | Mean | SD |
|------------------------|----------|------------|------------|-------------|-----------|
| IT tools | 291 | 1.80 | 5 | 4.3237 | 0.64248 |
| Team Coordination | 291 | 1.75 | 5 | 4.2792 | 0.70985 |
| Top Management Support | 291 | 1.67 | 5 | 4.3328 | 0.63525 |
| Project Value | 291 | 2.00 | 5 | 4.3540 | 0.61914 |

of variables, sample size of the study, the columns in the above table comprise the details for the minimum value, maximum value, mean values, and standard deviation for the collected data. Mean value for IT tools is 4.3237 with standard deviation of .64248 shows that IT tools create value for the project. For Team Coordination, the table indicates the mean value 4.2792 and standard deviation of .70985 depicts that team members coordinate with each other during the project. Top Management Support is observed to have mean value of 4.3328 with standard deviation of .63525 shows that top management support the team for the implementation and effective utilization of IT tools. Project Value has mean value of 4.3540 & Standard deviation .61914 and it shows that project value is created.

4.4 Control Variables

One-way ANOVA was conducted to determine how many factors should control for the analysis. Gender, age, qualification and experience affect employee workplace deviance (Van Gils et al., 2015). Therefore, the demographics had been included in the study. To check whether these demographics variables influence on dependent variable which is Project Value in this study, we ran one-way ANOVA. If any demographic variables effect the dependent variable, its influence will be control then. Result of one-way ANOVA for demographic variables is presented below in Table.

It represents the determination of Gender as a control variable against project value (outcome variables). The F value in this case turned out to be 0.091 with insignificant result; depicting gender need to be controlled. The F value of in case of Age turned out to be .816 with insignificant result; depicting age need to be

TABLE 4.3: One Way Anova

| Control Variables | F-Value | Significance |
|-------------------|---------|--------------|
| Gender | 2.868 | 0.091 |
| Age | .389 | 0.816 |
| Qualification | .816 | 0.539 |
| Work Experience | .137 | 0.984 |

Sig. level $p < 0.05$

controlled. The F value of qualification turned out to be .539 with insignificant result; depicting qualification need to be controlled and similarly, the F value in this case turned out to be .984 with insignificant result; depicting work experience also need to be controlled.

4.5 Correlation Analysis

Correlation analysis is between two variables specified by level of significance with positive or negative signs. The current research prime objective is to carry out correlation analysis to ascertain the correlation among IT tools and Project value, the mediating role of Team Coordination and moderating role of Top Management Support, in order to make proposed hypothesis valid. To know the nature of variation between two variables correlation analysis was carried out to see that the variables vary together or not. Pearson correlation analysis determine the nature and strength of relationship via correlation range that is from -0.1-0.1. Positive sign exhibits that that variables are moving in same direction and negative variable depicts that variables are moving in opposite direction. Furthermore, value shows the strength of the association. If the value of Pearson coefficient is between the range of .1-.3 it means weak correlation, the value between .3-.5 signifies moderate correlation and the value greater than .5 means high correlation. The table 4.4 below indicates the correlation between hypothesized variables.

The above table 4.4 shows the correlation between the variables of the existing study. IT tool was found positively and moderately correlated with Team Coordination where ($r=0.418^{**}$, $p=0.000$), IT tools is moderately correlated with Top Management Support where ($r=.395^{**}$, $p=.000$), IT tool is also significantly and

TABLE 4.4: Correlation Analysis

| Variable | 1 | 2 | 3 | 4 |
|------------------------|---------|---------|---------|---|
| IT Tools | 1 | - | - | - |
| Team Coordination | 0.418** | 1 | - | - |
| Top Management Support | 0.395** | 0.396** | 1 | - |
| Project Value | 0.336** | 0.351** | 0.285** | 1 |

***p <001; **P <01; p <05

moderately correlated with Project Value where ($r=.336^{**}$, $p=.000$), Team Coordination is correlated with Top Management Support moderately where ($r=.396^{**}$, $p=.000$), Team Coordination is correlated with Project Value moderately where ($r=.351^{**}$, $p=.000$), "Top Management Support is correlated with Project Value significantly where ($r=.285^{**}$, $p=.000$) .

4.6 Regression Analysis

Correlation basically shows the relationship between the variable but it does not describe the cause and effect relationship that how a variable shows its impact on the change in variable. Regression analysis determines how a resultant variable dependent on the predictor variable. It assists in giving the basic understanding of the fact that how value of conditional variable alters when a variation occurs in independent variables. So this clarifies the informal affiliation amid the variables whereas correlation analysis just describes the link between variables. The process of regression is performed by different tools (for example, Baron & Kenny, 1986) but here due to the ease of study and for the sake of accessibility Hayes (2008) process method is utilized for investigation and analysis. According to Hayes (2008), Baron and Kenny (1986) method is outdated because it imposes a condition of total effect of causation for mediation while in some researchers' point of view, it is not necessary and even a hindrance in the way of gauging true impact (Preacher & Hayes, 2008; Preacher, Rucker & Hayes, 2007) . So conferring to these researchers, the indirect effect through mediation is also possible even if no clues of direct effect between predictor and outcome variables are found. Moreover, as the data in social sciences is always problematic due to the situation,

nature and context of respondents so the bootstrapping technique for mediation in Hayes (2008) process method increases the like ability of realistic results because the sample is divided into many small bits and pieces and analysis is run on those smaller sized sub samples. In regression analysis we check the cause and effect relationship of IV and DV .

TABLE 4.5: Regression Analysis

| Project Value | | | | |
|----------------------|----------|-----------|-------------------------------|------------|
| Predictor | B | R2 | $\Delta R2$ | Sig |
| Model | | | | |
| IT tools | 0.336 | 0.113 | 0.113 | 0.000 |

The above table 4.5 provides the model summary and shows the R2 , adjusted R2 and the change in one variable caused by other variable per unit is shown by Beta. In this table value of R2 shows the change in dependent variable which is caused by independent variable.As shown in table 4.5 that there exist a positive and significant relationship between IT tools and Project Value. Here R2 = 0.113 and Beta = 0.336 with the significant $p < 0.001$, R2 shows the coefficient of determination and explains the model is statistically significant while the value of B shows the rate of change and determines that 1 unit change in IT tools leads to 33% change in Project Value. As the value is between 0 to 1 so it's better. The p values shows that the model is significant. The association between IT tools and Project Value is statistically significant this indicates that there exists direct relationship between IT tools and Project Value. So, this indicates positive and significant relationship between IT Tools & Project Value.

H1: IT Tools have positive and significant relation with Project Value.

4.6.1 IT Tools and Team Coordination

As results have shown in the table 4.6 that there exist a positive and significant relationship between IT tools and Team Coordination. Here R2 = 0.174 and Beta = 0.418 with the significant $p < 0.001$, R2 shows the coefficient of determination and explains the model is statistically significant while the value of B shows the rate of

TABLE 4.6: Regression Analysis

| Team Coordination | | | | |
|--------------------------|----------|-----------|------------|------------|
| Predictor | B | R2 | ΔR2 | Sig |
| Model | | | | |
| IT tools | .418 | .174 | .174 | 0.000 |

change and determines that 1 unit change in IT tools leads to 41% change in team coordination. As the value lies between 0 to 1 so it's better. The p value shows that the model is significant. The F value shows that model as whole is significant. The association between IT tools and Team Coordination is statistically significant this indicates that there exists direct relationship between IT tools and Team Coordination. It is noted that by using IT tools team coordination can also exist globally. So, the hypothesis of positive and significant relationship between IT Tools & Team Coordination is recognized.

H2: IT Tools have significant and positive effects on Team Coordination.

4.6.2 Team Coordination and Project Value

TABLE 4.7: Regression Analysis

| Project Value | | | | |
|----------------------|----------|-----------|------------|------------|
| Predictor | B | R2 | ΔR2 | Sig |
| Model | | | | |
| Team Coordination | 0.351 | 0.123 | 0.123 | 0.000 |

Above table 4.7 reveals that the results are meeting threshold values (Beta= 0.351, $p < 0.001$, $R^2 = 0.123$). It determines that if there is one unit change in Team Coordination then it leads to approximately 35% change in Project Value. It shows that the values are statistically significant and there exist positive relationship between Team Coordination and Project Value that if IT tools are utilized then the value of project is evident. Hence, H3 is also accepted.

H3: Team Coordination positively effects the Project Value.

4.6.3 Mediation

For this purpose, we use the process of Andrew F. Hayes through the model 7. This model is used to show the moderated mediation. The mediator is such kind of variable that explains how or why an independent variable is related to a dependent variable. Mediation can be explained through the question of how did it work?. Its focus is to consider the mechanism, causal chain of events, or the underlying process. So, mediation is whether the predictor to outcome relationship operates by a third variable like predictor is IT tools outcome is Project Value (PV) and third variable is Team Coordination TC. The partial mediation is mostly observed than full mediation. In other words, it is less likely a mediator will explain all of the variation between IT tools and project value. When there is mediation then the relationship between the predictor and other outcome becomes 0 and this is called the case of full mediation. In the mediation there is a direct and indirect effect, in case of mediator there is the indirect effect of predictor and outcome. When mediator is excluded that is called direct effect. In our case, we have the significant relationship in the direct and indirect effect of mediation. The output of mediation has obtained through process by Andrew F. Hayes model number 7 we have boot strap at 5000.

Outcome: Team Coordination

TABLE 4.8: Model Summary

| R | R² | MTC | F | df1 | df2 | P |
|----------|----------------------|------------|----------|------------|-------------|-------------|
| 0.59 | 0.34 | 0.33 | 49.95 | 3.00 | 287 | 0.000 |
| Model | | | | | | |
| | coeff | Se | T | P | LLCI | ULCI |
| Constant | 6.30 | 0.77 | 8.25 | 0.00 | 4.80 | 7.81 |
| IT tools | -0.97 | 0.20 | -4.81 | 0.00 | -1.38 | -0.58 |

As above table 4.8 in model summary first shows the section with outcome Team Coordination. Then we see the predictor and mediator relationship here. We see the P value suggested that Team Coordination (TC) is having significant relation

with Project Value (PV) and IT tools. Where $p=0.00$ at $p<0.05$ the Beta coefficient does not carry the value of 0 as our LLCI (Lower Level Confidence Interval) and the ULCI (Upper Level Confidence Interval) does not include also and show the positive relationship. It shows that mediation exists. Similarly, in the next section of table the outcome TC to include the IT tools. IT tools are statistically significant with the coefficient value -0.9772 where $p<0.05$ also the beta value with LLCI and ULCI does not include the value of 0 that's why we can say it is statistically significant and it is evident that mediation exist between the variables. So, the hypothesis 4 is also accepted.

4.6.4 Direct, Indirect and Total Effect

The second name of mediation is also an indirect effect of X(IT tools) on Y(PV) through M(TC). The confidence interval in the table 4.9 gives the reasonable range of values for the estimates. If the 95% confidence interval does not have zero at the selected level, then it is statistically significant at $p<0.05$. If indirect effect is significant then it also supports mediation. Values for quantitative moderators are the mean and plus or minus one SD from mean.

TABLE 4.9: Direct Effect of IT tools on Project Value

| | Effect | T | P | LLCI | ULCI |
|----------|---------------|----------|----------|-------------|-------------|
| Constant | 0.22 | 0.05 | 0.0001 | 0.11 | 0.34 |

Logically, the questions of how are naturally using the process of mediation analysis (e.g., Baron & Kenny, 1986; Judd & Kenny, 1981; MacKinnon, Fairchild, & Fritz, 2007a), This is the total indirect effect of IT tools on project Value through team Coordination

TABLE 4.10: Total Indirect Effect.

| | Index | TC (Boot) | Boot LLCI | Boot ULCI |
|-----------|--------------|------------------|------------------|------------------|
| TC | 0.07 | 0.03 | 0.026 | 0.16 |

Table 4.9 depicts that there is positive and significant relationship exist between TC an PV as the p value is $.000$ and $p < .05$ its LLCI is $.11$ and ULCI is $.34$ that is

more than zero and shows the positive and direct effect between the predictor and mediating PV. This is equal to the last coefficient from above subtracted from the first coefficient above. This gives the significance; so again, we can say that the indirect effect is significant. As the LLCI is .0261 and ULCI is .1578 and is more than 0 and show the positive relationship. It proves that there is mediating effect of TC between IT tools & PV.

H4: Team Coordination Mediates the Relationship among IT tools and Project Value (PV).

4.6.5 Moderated Analysis

The moderator relationship displays that when or under what conditions an independent variable is related to a dependent variable. The question of when is mostly answered through the analysis of moderation (Jaccard & Turrisi, 2003).

TABLE 4.11: Moderation Analysis

| | coeff | Se | T | P | LLCI | ULCI |
|----------|--------------|-----------|----------|----------|-------------|-------------|
| Constant | 2.4 | 0.25 | 9.58 | 0.000 | 1.94 | 2.94 |
| TC | 0.22 | 0.05 | 4.30 | 0.000 | 0.12 | 0.32 |
| IT Tools | -0.98 | 0.20 | -4.81 | 0.000 | -1.38 | -0.58 |
| TMS | -1.02 | 0.20 | -5.00 | 0.000 | -1.42 | -0.62 |
| Int_1 | 0.35 | 0.05 | 6.78 | 0.000 | 0.25 | 0.45 |

Table 4.11 demonstrate that there is significant moderated relationship between IT tools and top management support. The relation between top management support and team coordination is also significant. As it is visible in interaction term the p value is .000 where $p < 0.05$ and LLCI is .25 and ULCI .45 which does not include zero in our case. This can be seen that with the support of top management IT resources can be hired. It is the proof that moderation exist and the assumed hypothesis that is top management support moderates the relationship between IT tools and team coordination is accepted. Hence it shows the positive significant relationship and validated the moderated mediation.

H5: Top Management Support Moderates the Relationship between IT tools and Team Coordination.

4.7 Summary of Accepted and Rejected Hypotheses

Summary of the Hypothesis acceptance and rejection is represented through the table 4.12 to show that all the hypothesis are accepted.

TABLE 4.12: Summary of Accepted and Rejected Hypotheses

| Hypotheses | Statements | Results |
|-------------------|---|----------------|
| H1 | IT Tools is positively and significantly related with Project Value. | Accepted |
| H2 | IT Tools have significant and positive effects on Team Coordination. | Accepted |
| H3 | Team Coordination positively effects the Project Value. | Accepted |
| H4 | Team Coordination Mediates the Relationship among IT tools and Project Value (PV). | Accepted |
| H5 | Top Management Support Moderates the Relationship between IT tools and Team Coordination. | Accepted |

Chapter 5

Discussion and Conclusion

5.1 Discussion

The purpose of this study is to explore the role of IT tools on the project value. Its aim is to see the how different types of IT tools create value in the project. To address the unanswered question is the specific objective of this research to find the impact of IT tools and the value of project with reference to our beloved country Pakistan. By the help of different variables, we create the link between IT tools and project value. Moreover, this research investigates the mediated role of Team Coordination between IT tools and Project Value moderated role of Top Management Support on the relationship between IT tools and Team Coordination. For this purpose, data was collected from different project-based organizations in Pakistan.

The discussion of each hypothesis in detail is following.

5.1.1 Question 01: Does IT tools Add Value to the Project?

To examine the answer of the first question that Does IT tools add value to the project hypothesis 1 was framed. Hypothesis 1 states that IT tools significantly associated with project value. The results for this particular study were found significant and hypothesis 1 was accepted as the findings suggest that IT tools was significantly linked with project value.

Likewise, previous studies have discerned that IT tools have the highest impact on the Project Value Ali & Money (2005). It was also stated that by intensive use of the IT tools itself had direct influence on the project performance. Raymond observed from his research, that many of the managers who participated in the study, a majority suggested significant impacts of the IT tools on the successful completion of their projects and project value creation while others did not (Raymond & Bergeron, 2007). The results of this study also show that, generally speaking, the poor use of IT tools relied on a process of lower quality that produced results of poorer quality; therefore, they utilized less of their system and were less assisted in their role of project management. Thus project managers who used IT tools, noticed that sufficient conditions were met and have positive effects on management performance and value. Ajam (2013) claims that calculating a project's worth at project completion is challenging, as most of the expected effects of the project will not be known till a few months later. He argues that it is a firm's duty to evaluate project value at a level that accurately utilizes IT tools where they could analyze the impact meaningfully and decide if the expected gains have been achieved. More precisely, a project has certain constraints such as time, cost and scope and within these constraints the project must be finished. Sometimes the conditions aren't same as planned, so the project timelines are tight and the project should be done in a timely manner, then there's a need to better leverage IT tools to finish on time and to deliver value.

5.1.2 Question 02: Does Team Coordination Increase the Productivity of IT Tools?

To examine answer for question 2 Does Team coordination increase the productivity of IT tools hypothesis 2 was framed. Hypothesis 2 states that IT tools positively and significantly linked with Team Coordination. The results for this hypothesis is consistent with the hypothesized situation.

The findings are also in consistent with many other scholars who remarked clarity of roles as one of the requirements for teams to be successful (Hoigaard et al.,

2006) further expressed that IT competency of members to execute their roles affect productivity greatly with the competencies. High performing teams have functions which are straightforward. The teams those act cohesively and high level of coordination perform well as compare to those which are not cohesive. This in turn greatly affects the efficiency of the overall team. Goals acceptable to all team members (Stevens & Campion, 1994) will lead to improved team performance by selecting the right IT tools. The numerous activities of the teams are expected to integrate processes so that IT tools and procedures are consistent with the organization roles to gain efficiencies and effectiveness that will arise by knowledge sharing or new technology. Bettenhausen (1991) claimed that the efficiency of activities increases dramatically when everyone agrees on the appropriate tools. Once the team productivity is assessed with the degree of coordination and communication, team managers may find it easier to realize the differences between the required level and current level to achieve maximum productivity through IT tools. The geographic distance and low visibility of processes apparently made the task of informing and reporting most essential activity for coordination of subgroups in production teams using IT tools. Moreover, the link among Team Coordination and IT tools are not studied before. As mentioned earlier the IT tools enhance the productivity and coordination of team within the specified time, budget and scope. As everything for the project is preplanned but the circumstances may change because no one can forecast everything faultlessly therefore, when unanticipated situations arise during the project the IT tools helps in coordination of team members with each other to sort out the issue or issues.

5.1.3 Question 03: Does Team Coordination Mediate the Connection of IT Tools and Project Value?

To investigate the answer for question 3, that Does Team Coordination mediate the connection of IT tools and Project Value hypothesis 4 was formulated. Hypothesis 4 states that Team Coordination will mediate the relationship between IT tools and Project Value. The results supported hypothesis 4 that Team Coordination mediates the relationship of IT tools and Project Value.

The result of the hypothesis is consistent to existing literature, that speak of a transformation of capabilities characterized by the integration of new routines with carryover of existing routines with the team coordination Lavie (2006). According to Mwai (2012), project value is a matter perception and a project will most likely be perceived as successful if it meets its technical performance specifications and mission of the project, there is a high level of satisfaction among key people on the project team and key users or clientele of the project effort. The IT resources promote usage, versatility, ease of learning and play a major role in project value creation. Teamwork was also the most efficient within these projects according to the activities followed within the teams in order to attain the project value. Indeed, the IT is a strong predictor of the project value to be obtained. So we suggest that IT tools that deliver low project performance would be a system that is easier to use, less efficient, and less compatible with other corporate IT resources used by the project manager and other managers or personnel. IT tools lose their value if they are not accessible for those who need it and accessible to those who do not have expertise (Cleland, 2004). So this this is the effective utilization of IT that will help in coordination. So we argue that technology is providing more support for team coordination of group processes thereby minimizing team losses and maximizing team gains to achieve the project value. The project managers also said they were able to effectively and efficiently manage the project resources with the help of IT tools. Project Value has increased due to the availability of team coordination that is accomplished through the use of multiple IT tools. The above reasons also offer evidence for the adoption of the theory that team coordination mediates the relation between the IT tools and project value.

5.1.4 Question 04: Does Top Management Support Moderates the Relationship of IT Tools and Team Coordination?

To investigate answer for question 4, hypothesis 4 formulated based on literature. Hypothesis 4 states that Top Management Supports moderates the relationship

between IT tools and Team Coordination; such that IT tools have positive relationship with Team Coordination. The results are supported by a review of the literature on top management supports influence on information technology tools (Daoud & Triki, 2013).

The implementation of IT tools requires the support from top management. Without top management support and dedication, implementation of IT tools may not be successful and It has to be through out of the project. This ensures help from top management is crucial in the organization to develop team planning, policies, and supervision on IT tools that are used to secure corporate assets from failure or theft, and maintain reliable team cooperation. Top Management support should include and enable staff to collaborate with team members and improve skills and recommend ways to improve other areas of work that need to be improved. In fact, the correlation between the IT tools and top management supports shows positive impact on team coordination in the presence of top managers who enhances the knowledge and processes required for team coordination. Therefore, based on this we argue that in every project, Top management Support is the most ultimate dimension which is a vital necessity of every phase in the project and along with that in projects managerial support is the most important key for any change or implementation and to increase or maintain the team coordination.

However, it is also evident from the results that top management interaction effect is significantly correlated with IT tools and Team Coordination.

I have done the analysis by recoding the reverse questions.

5.2 Theoretical Implication

The current study has many additions to the IT tools and project value for project management domain. In the previous literature, no clear information was found about the effect of IT tools on project value. The present research confirmed that IT tools is positively associated with project value. It is also concluded that Top Management should consciously look at the level and depth on the implementation

of IT tools as it is an important element in creating project value. Moreover, this study highlights and provides contribution toward Top Management importance. The present study also contributes to the literature by investigating the mediating role of team coordination between IT tools and project value was also conceptualized so it was revealed that team coordination mediates this relationship. In addition, the indirect effect of IT tools on project value through team coordination was stronger on high level of top Management Support. Particularly this contribution marked very important expand the framework by investigating, that whether different types of IT tools the process between skills and competency. To the best of our knowledge, no prior study has evaluated the relationship between technology use and project value in light of team coordination as mediator and top management support as moderator, which is a critical factor in most projects. The finding of current study also shows that the top management support moderates the relationship between IT tools and team coordination and also strengthening the relationship between IT tools and team coordination.

5.3 Practical Implication

The present study has many implications for managers. It demonstrates that IT tools implementation in project based organizations improves project value. Therefore, it is suggested that IT tools in different project based organizations should be implemented with their team members core skills. Managers should also ensure that the tools will not be misused in or out of the organization.

When project managers share knowledge with their team member they should also trust their subordinates that they will not misuse this IT. These IT tools and team coordination of the team member ultimately leads to achieve the project value. Successful implementation of IT tools, consequently enables the organization to achieve the anticipated objective of a specific project. The present study suggests that project base organization managers need to realize how to improve team coordination among team members so that they could increase the IT tool productivity for the project value. Managers can do this by empowering their

subordinates by identifying their role clarity. Employees can therefore recognize the effect of their actions and focus on the value of the project. Managers can also empower their employees by providing respective training to improve their skills which will enable them to perform their role more efficiently, effectively and confidently.

5.4 Strengths, Limitations and Future Directions

A robust methodological method has been used in the present study. To avoid the possible effects of single source bias and common methods, data related to IT tools, team coordination, top management support and project value were collected from multiple project based organizations through project managers and team members.

There are some limitations, in the present study from which researchers should be aware of. Firstly, due to time limitation, only one mediator and moderator were used in the current model. In future researchers can advance the model by checking other mediators like Role Clarity and Team Building. They can also check other moderators like structural distance and social support. From the literature it is recommended that considerable initiatives are needed to educate Project Sponsors, Project Board members and other senior executives about the importance of IT tools, their collective and individual responsibilities for effective top management support, and more generally IT tools and products. From the findings of the study the researcher therefore, recommends the following measures to improve the performance of the company. It should;

- (i) Monitor IT tools trends as they change with time.
- (ii) Time to time training of employees.
- (iii) Adoption of IT tools for every part of HR in an organization.
- (iv) Ensure team coordination at the right time, place, quality and quantity.

The data were collected once it can be collected with time lag. The future researchers can use time lag for data collection. Then, the data was collected only from only three cities of Pakistan so it was very limited. The future researcher

can improve the data collection method and collect data from more than three cities and one country. They can also check different types of IT tools and team coordination like implicit or explicit impact on project value.

5.5 Conclusion

The main objective of the study is to investigate the Impact of IT tools on project value with mediating role of Team Coordination and moderating role of Top Management support. To find the fairness of the result, we distributed 400 questionnaires and collected 296 and only 291 questionnaires were considered for analysis. According to the result of the study, all the hypothesis are accepted. Justifications of hypothesis acceptance were discussed, and implications of the study were also discussed. The results show that the projects based organizations using IT tools significantly creates value for the projects. Project based organizations must implement IT tools in the organization so that they could save the time resources and money by selecting appropriate tools. It is found that use of IT tools brings improvements, effectiveness and efficiency in managerial tasks that were observed in terms of better project planning, scheduling, monitoring, and control, improvements in productivity were also observed in terms of timelier decision-making and proper budgeting. Effective utilization of IT tools by different professionals will no doubt increase the level of satisfaction in work organizations. It is noted that the IT tools provide a reliable and accurate direction that will enable the project team perform their tasks efficiently and accurately.

Determining the major factors affecting the implementation of IT tools into organizations will also be helpful to find the cause that stops to achieve the desired results in project based organizations. To improve Organizational PM Competency, organizations need detailed guidance on how to introduce, implement and sustain IT tools from an organizational perspective. It was concluded that an organization that has a dream of fulfilling the project value, need to ensure that it has adequate human resource in place, at the right time, in right quantity and quality with their coordination. Also the human resource need to poses basic IT

skills for their potential to be realized, and lastly inclusion of on-job training facilitates the acquisition of necessary skills that are associate with the dynamic nature and IT for staying competitive and while being updated.

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Appendix A

CAPITAL UNIVERSITY OF SCIENCE AND TECHNOLOGY

ISLAMABAD

Department of Management Sciences

Questionnaire

Dear respondent,

I am a student of MS Project Management in Capital University of Sciences & Technology, Islamabad. I am conducting a research on the topic: **“Impact of IT Tools on Project Value: Mediating Role of Team Coordination and Moderating Role of Top Management Support”**. You can help me by completing the attached questionnaire. I appreciate your participation in my study and I assure that your responses will be held confidential and will only be used for education purposes.

Regards

Zulfiqar Ahmed

MPM181040

MS (PM) Research Scholar,

Faculty of Management and Social Sciences,

Capital University of Sciences and Technology, Islamabad.

| | 1 | 2 |
|---------------|----------|----------|
| Gender | Female | Male |

| | 1 | 2 | 3 | 4 | 5 |
|------------|----------|----------|----------|----------|--------------|
| Age | 18- 25 | 26–33 | 34-41 | 42-49 | 50 and above |

| | 1 | 2 | 3 | 4 | 5 | 6 |
|----------------------|----------|----------|----------|----------|-----------|----------|
| Qualification | Metric | Inter | Bachelor | Master | MS/M.Phil | PhD |

| | 1 | 2 | 3 | 4 | 5 | 6 |
|-------------------|----------|----------|----------|----------|----------|--------------|
| Experience | 0 – 5 | 6 – 10 | 11 – 16 | 17 – 22 | 23 – 28 | 29 and above |

Please tick the relevant choices: **1= Strongly disagree, 2= Disagree, 3= Neutral, 4= Agree, 5= Strongly Agree**

| Information Technology Tools | | | | | | |
|---|---|---|---|---|---|---|
| Please choose the appropriate column to indicate whether you agree or disagree with each of the following statements. | | | | | | |
| 1 | IT tools Enhance the value of project, products and services by embedding IT in them. | 1 | 2 | 3 | 4 | 5 |
| 2 | IT tools decrease the cost of designing new products and services. | 1 | 2 | 3 | 4 | 5 |
| 3 | IT tools reduce the time-to-market for new products and services. | 1 | 2 | 3 | 4 | 5 |
| 4 | IT tools enhance product and service quality. | 1 | 2 | 3 | 4 | 5 |
| 5 | IT tools support product / service innovation. | 1 | 2 | 3 | 4 | 5 |

| Team Coordination | | | | | | |
|---|--|---|---|---|---|---|
| Please choose the appropriate column to indicate whether you agree or disagree with each of the following statements. | | | | | | |
| 1 | Our team meetings are well organized. | 1 | 2 | 3 | 4 | 5 |
| 2 | We have a difficult time reaching decisions. | 1 | 2 | 3 | 4 | 5 |
| 3 | We often do not know who is responsible for important tasks. | 1 | 2 | 3 | 4 | 5 |
| 4 | Team members anticipate what they will need from me and tell me so I can plan ahead. | 1 | 2 | 3 | 4 | 5 |

| Top Management Support | | | | | | |
|---|--|---|---|---|---|---|
| Please choose the appropriate column to indicate whether you agree or disagree with each of the following statements. | | | | | | |
| 1 | Top management actively engages in selecting the IT tools. | 1 | 2 | 3 | 4 | 5 |
| 2 | Top management actively engages in recruiting the personnel needed for implementing and operating the IT tools. | 1 | 2 | 3 | 4 | 5 |
| 3 | Top management is very concerned with the performance of the IT tools. | 1 | 2 | 3 | 4 | 5 |
| 4 | Top management makes an effort to provide stable and sufficient funding for IT tools implementation and operation. | 1 | 2 | 3 | 4 | 5 |
| 5 | Top management tries to take part in deciding in what order the IT tools should be implemented. | 1 | 2 | 3 | 4 | 5 |
| 6 | Top management emphasizes managing and controlling the processes of IT tools implementation and operation effectively. | 1 | 2 | 3 | 4 | 5 |

| Project Value | | | | | | |
|---|--|---|---|---|---|---|
| Please choose the appropriate column to indicate whether you agree or disagree with each of the following statements. | | | | | | |
| 1 | The project was an economic success for the organization that completed it. | 1 | 2 | 3 | 4 | 5 |
| 2 | All things considered, the project was a success for the organization that completed it. | 1 | 2 | 3 | 4 | 5 |
| 3 | The project will achieve a positive net present value (NPV) for the organization that completed it. | 1 | 2 | 3 | 4 | 5 |
| 4 | The project will achieve a positive return on investment (ROI) for the organization that completed it. | 1 | 2 | 3 | 4 | 5 |