

**CAPITAL UNIVERSITY OF SCIENCE AND  
TECHNOLOGY, ISLAMABAD**



**The Effect of Knowledge Absorption on  
Project Performance with Mediating  
Role of Innovation Capability and  
Moderating Role of Organizational  
Culture**

by

**Tayyab Mahmood**

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

in the

**Faculty of Management & Social Sciences**

**Department of Management Sciences**

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*This thesis is dedicated to my beloved father and mother, my wife, my lovely Sons  
and my beautiful daughter, and all my teachers.*



## CERTIFICATE OF APPROVAL

### **The Effect of Knowledge Absorption on Project Performance with Mediating Role of Innovation Capability and Moderating Role of Organizational Culture**

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## *Abstract*

This study aimed to examine the impact/effect of external knowledge absorption of project managers or any project team members on project performance with a mediating role of innovation capability and moderating role of organizational culture. This study contributed to the literature by linking the relationship of variables with absorptive capacity theory. Data was collected from 404 project managers and various team members who are working in Pakistani project-based organizations. Quantitative research was conducted. A questionnaires survey method was used, and the responses were from project-based organizations of Pakistan. Process Macro y Andrew F. Hayes version 4.0 was used in SPSS for analysis of data. Descriptive frequency test, Pilot testing, Reliability rest, correlation, mediation, and moderation tests were run for the analysis of the data. The study explained that there is an insignificant impact of Organizational Culture on the relationship between knowledge absorption and innovation capability. This hypothesis is not supported / not accepted according to the findings/results found by the analysis in this study. Furthermore, this study demonstrates that knowledge absorption is positively related to innovation capability and innovation capability is positively related to project performance. These results are aligned with conducted literature review. Results of the study demonstrated that innovation capability is a significant mediator between knowledge absorption and project performance, while organizational culture was found insignificant as a moderator. Some limitations are discussed. Future research should consider the factors which make the moderator insignificant and time-lag studies with large sample sizes.

**Keywords: Knowledge Absorption, Innovation Capability, Project Performance, Organizational Culture.**

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# Abbreviations

<b>AC</b>	Absorptive Capacity
<b>IC</b>	Innovation Capability
<b>KA</b>	Knowledge Absorption
<b>OC</b>	Organizational Culture
<b>PP</b>	Project Performance
<b>SPSS</b>	Statistical Package for Social Sciences

# Chapter 1

## Introduction

### 1.1 Theoretical Background

Today's developing economies concentrate to convert and increase their internal/-domestic capabilities by obtaining new technological knowledge, absorbing newly introduced knowledge, and supporting innovation as stated also by Ponomariov and Toivanen, in 2014 in their research. In other words, means that according to Ponomariov (2014) a lot of developing economies are moving towards technology-based working and thus it can be said that new knowledge requires new learning and support innovation.

Knowledge is a very important and helpful resource these days (Grant, 1997). Organizations are mostly run by projects therefore to keep in mind this factor most of the project managers now demanded in high demand the project management capability as stated by Bartsch et al. also in (2013, p. 239). Most of the people who had researched claimed that there are so many directions of obtaining new knowledge which may lead to various means of organizational learning as stated by (Chiang and Hung, 2010) which can be distributed into various processes, which are known as explorative, constructive, and exploitative processes (Lane et al., 2006).

As per the concept, exploratory or explorative learning is the method of gaining the newly introduced external knowledge from the competitors' firms, and it is taken

as the concept of potential absorptive capacity as stated by (Zahra & George, 2002; Enkel & Heil, 2014). Whereas transformative learning is referred to as link the exploratory learning with exploitative learning because the transformative method is the method to transform this learning into the concerned firm over time as stated by (Garud & Nayyar, 1994).

Exploitative learning is the application of that newly gained knowledge into the firm and it is referred to the basic concept of realized absorptive capacity which is described by the (Zahra & George, 2002; Patel et al., 2015). These methods are the ways of learning which make a firm able to succeed internally. As per the statement of (Eisenhardt & martin, 2000; Helfat et al., 2007). With the recent increment in changes in the field of information technology and the increasement in world competition in the market, the project teams have more importance regarding fulfillment of a firm's requirements instead of the individual's capability.

(Paris et al., 2000), to do tasks quicker, better, and with more flexibility (Thamhain, 2004), to work energetically and creatively toward the desired goal (Bhatnager, 1999; Jassawalla and Sashittal, 1999; Thamhain, 2004), whereas so many studies have been conducted to judge the performance of government projects, this study varies from others in various ways. First, it answers a basic question of "what are the key components of a large-scale government project that impact project performance?" Because project management techniques and methodologies should be utilized conditionally to the project dynamics (Shenhar and Dvir, 2007).

Currently in the most important and valuable research field which is (marketing and management research), for modern growth the major way of gaining external valuable knowledge and techniques is learning from external sources and this way is getting so much importance in the practical field. As already stated by (e.g. Berghman, Matthyssens, & Vandenbempt, 2012; Chen, Chen, & Vanhaverbeke, 2011; Chen, Lin, & Chang, 2009; Chesbrough, 2003; De Luca & Atuahene-Gima, 2007; Laursen & Salter, 2006; Zhang, Hoenig, Di Benedetto, Lancioni, & Phatak, 2009). Albeit, as suggested by Lancioni and Chandran (2009), "many industrial firms paid little attention to the topic since it was felt that knowledge was effortlessly handled internally and was a simple process" (p. 148), Nowadays the

advanced literature has given the importance to gaining the new external knowledge and moved from ‘research and develop’ towards ‘integrate and develop’ as stated by (Grimpe & Sofka, 2009; Huston & Sakkab, 2006).

“Companies that are open to a balanced amount of knowledge that flows from external sources might not derive equal benefits” (Escribano, Fosfuri, & Tribó, 2009, p. 97) and thus as earlier the external new knowledge is obtained by an organization, it is mandatory to adapt and allow it with an organizational knowledge base as stated by (Todorova & Durisin, 2007).

So, “other than the exterior relationship learning, companies need to have the internal capability–absorptive potential to ameliorate their innovation performance” (Chen et al., 2009, p. 152). Yet, knowledge absorptive capacity does not only depend on R&D investments and reserves but also quite a few other organizational traits and features as per (Easterby-Smith et al., 2008) statement.

In this way, current developments in the field of knowledge absorptive capacity have started to highlight the key role those organizational techniques which can play a major role in increasing this capacity as already stated by the (e.g. Foss, Laursen, & Pedersen, 2011; Lewin et al., 2011; Volberda et al., 2010).

According to this review we can say that this a basic need of any firm to enhance their knowledge by concentrating to other competitors, and must improve their ability of absorption to absorb the new technological knowledge and techniques and must be assimilate these technological knowledge and techniques so that this may be possible to compete the other firms in the market in competition and similarly, this may be possible to understand the customer demands because when we will to learn the new things and techniques according to the new arrivals of demands and trends in the market then this will be absolutely difficult for us to understand and pick the customer’s need and requirements, And if we will know the newly introduced terminologies in the market then we will definitely understand that what our customer is demanding and in which way and in which format the customer wants to see / receive the products. The same suggestions already have given by the various authors, according to which this is a basic fundamental need for any firm to get the success and for survival in the market

by the competition with the competitors that the firm allocate the special funds in its budget for enhancement of their employee's knowledge according to market trend and newly entered / introduced technologies by arranging training programs or seminars, because in such way the employees take much interest to absorb the new knowledge from the external source for the enhancement of their firm's performance and success rate.

But, the analytical practice for empirical analyses of the organizational backgrounds of knowledge absorptive capacity is on the very low side as stated by (Berghman et al., 2012; Foss et al., 2011; Jansen, Van den Bosch, & Volberda, 2005). This shortage is great if we keep in mind that, in their conceptual and basic involvement, Cohen and Levinthal (1990) emphasized the relevance of organizational methods for external knowledge absorption. As pointed out by these authors, "it is, therefore, crucial to consider what different aspects of knowledge absorptive capacity are distinctly organizational. An organization's knowledge absorptive capacity does not entirely depend on the organization's direct interface with the external environment. It also relies largely on transfers of knowledge across and within subunits that might be quite removed from the original point of entry" (p. 131–132).

Furthermore, most of the latest contributions have suggested that future research should analytically inspect not only the aspects that increase a firm's knowledge absorptive capacity but also those that influence its nature and outcomes as stated by (Nag & Gioia, 2012). Here, analytical proofs on the exploratory versus exploitative nature of knowledge absorptive capacity are assumptions and are limited to case studies as per (Van den Bosch et al., 1999).

So, quantitative research which highlights the various organizational techniques that influence the exploratory–exploitative introduction and orientation of knowledge absorptive capacity is too much needed. Organizational knowledge transfers refer to the mechanism through which organizational actors- such as teams, units, or organizations- exchange, receive, and are affected by the experience and knowledge of others (Van Wijk, Jansen, & Lyles, 2008).

## 1.2 Research Gap

Recent contributions have claimed that future studies should empirically investigate not only the factors that increase a firm's knowledge absorptive capacity but also those that influence its nature and outcomes, Workers with external knowledge absorption prioritize organizational broad level organizational objectives over their individual objectives. (Sulistyo, H., & Ayuni, S., 2018).

Base on this scenario we judge that most of firms are running with the old traditional way and did not change their working style and practices nor give any attention on the external market and think that they are saving their expenditures by do this so therefore mostly they fail to get success and their project or products face the failure, Because the demand of customer and market trend has been changed and improved with the new features, techniques and knowledge.

Therefore, we found this gap and deficiency that if a firm properly make attention on this thing and arrange the facilities for their employees to search out and learn the new things by the external sources and look that how the other firms are doing the working in the market then definitely the performance of the firm will increase.

For this purpose, an organization should arrange the small training events, learning gathering with the participation of other firms where the employees can meet and discuss with other firm's employees for enhance their learning and know about the new market trend and new entered & used practical techniques, By this way the employees will learn more new things and definitely this will give an significant and positive impact on the firm's performance and employees also.

So, one of the gaps is that many industrial firms and Construction organizations too paid little attention to external knowledge absorptions and apply it to the internal atmosphere of the organization to improve their performance therefore most of the projects goes to failure so we will find the basic neglected reason through a questionnaire that how can we overcome it.

Further, the latest contributions have suggested that future research should analytically inspect not only the aspects that increase a firm's knowledge absorptive

capacity but also those that influence its nature and outcomes, Workers with external knowledge absorption prioritize organizational broad level organizational objectives over their objectives.

### 1.3 Problem Statement

A major question in the field of project management research raised that why some projects get success and most of them get fail. This question has pressed the researchers to inspect potential factors that might play a major role in the success or failure of a project. Despite the newest improvements in project management knowledge, the newly established project management standards, and more accessibility of project management resources or assets to organizations under the guidance of the Project Management Institute (PMI) during the last two decades, most projects are still going fail to achieve sustainability.

For instance, Standish Group International (2009) detected the overall project failure rate to be 72% in the United State. In dynamic emerging economies, flexible and accurate strategic engagement in the market can be very crucial for attaining a competitive advantage. External factors such as competition, doubt, and needs are driving forces for strategic applications. Actions are often a result of pressures that decision-makers perceive in their outer environment. We believe that organizations take subsequent actions according to the pressures they face in a certain market.

The existing literature recommends that complementary knowledge resources provide potential opportunities for the local and foreign firms in IJVs to explore new and different ideas about product design, concepts, and development, as well as to break away from previously specified rules and procedures. From existing literature, we assume that there is a direct link between project performance and complementary knowledge resources.

The concept of knowledge absorption capacity refers to collecting, sharing, and integrating new and existing knowledge to achieve efficiency and effectiveness in

project-based organizations. It can be said that the ability of an organization to absorb new knowledge and transfer may prove as a competitive edge in this modern world.

So, the ability to apply external knowledge is, therefore, an important part of innovative capabilities. We sustain that the ability to examine and utilize external knowledge is mainly a factor of the level of previously related knowledge. At the very basic level, this previously introduced knowledge includes general skills or even a shared language but may also include knowledge of the new scientific or technological improvements in a specific field. Thus, the existing related knowledge gives an ability to understand the value of new information, integrate it, and apply it to commercial channels. Together, these abilities establish a name as a firm's "absorptive capacity."

The capacity to innovate and offer creativity is what enables companies to respond rapidly to the diversifying changes of the environment. Markets are nowadays characterized by their being volatile and having intense competition. Considering these circumstances, innovation outcomes (hereinafter, IO) have come to be regarded as one of the pivotal drivers influencing the long-term success of firms.

## 1.4 Research Questions

Based on the stated problems, the present study is intended to find answers for some questions, a summary of the questions are as follows;

### **Research Question 1:**

What is the impact of knowledge absorption on project performance?

**Research Question 2:** Does Innovation capability mediate between Knowledge absorption and project performance?

**Research Question 3:** Is there a moderating role of organizational culture between Knowledge absorption, and Innovation capability?

## 1.5 Objective of the Study

- To explore the relationship between knowledge absorption and project performance.
- To inspect the mediating role of Innovation capability between knowledge absorption and project performance.
- To examine the moderating role of organizational culture between Knowledge absorption and Innovation capability.

## 1.6 Significance of Study

We are sure that this study will be helpful for other scholars and practitioners to reduce and decrease the chances of project failures and will surely increase the hope and expectations to achieve the project performance more than their thought, and will also make such kind of work environment where employees will involve themselves and will do help more to achieve the project success and performance as well. Nowadays in global competition project management plays an important role because with the help of project management we can resolve lots of our problems in a short time, and organizations change the culture into project-based culture.

In Pakistan failures in projects are common. The reason behind this is we give less importance to the absorption of new knowledge of the employees and we depend on the regular cultural routine work and think that the employees will learn and improve their knowledge by the practices and routine work their selves. Knowledge absorption has a positive impact on organizational performance.

In the project management domain, literature about knowledge absorption on project success got limited attention. The people and organizations which have an interest to do business in Pakistan and starting projects such as multinational organizations, that study will be very helpful because the impact of knowledge absorption on project success with the presence of Organizational culture and

Innovation capability is a more beneficial study. Because this study is planned in the context of Pakistan project-based organizations.

## 1.7 Underpinning Theory

Cohen and Levinthal (1990, p.128) explain absorptive capacity theory (ACAP) in which they stated or described that as “the ability of a firm to recognize the value of new external information, assimilate it and apply it to commercial ends.” They further simplify or explained that knowledge absorptive capacity results from the collective earlier present related knowledge from earlier R&D projects that can be used to produce new products.

But in 2002 Zahra and George gave a new concept to Cohen and Levinthal’s genuine concept by presenting two major facts of knowledge absorptive capacity, which are (realized and potential ACAP) subsequently. According to which Realized ACAP is the same in concept as the original ACAP concept which is Cohen and Levinthal described that importantly affects innovation-related results and enhances competitive benefit (Kotabe et al., 2011).

Similarly, Potential ACAP allows firms to establish and sustain a strong competitive advantage for a long time. For example, Zahra and George (2002, p. 185) state that “potential capacity provides firms with the strategic durability and the degrees of freedom to adapt and progress in high-velocity environments.” Based on this expanded concept of ACAP (Zahra & George, 2002) at the project level, the realized ACAP means a project’s capacity to obtain the knowledge from an external source and to transform/assimilate and exploit the knowledge that has been absorbed/learned. Realized ACAP also enhance the project performance by giving the growth for innovation in specific tasks within the project’s given schedule (Escribano et al., 2009; Kotabe et al., 2011; Tsai, 2001).

As per this theory my model also suggests that the new techniques of working and knowledge will improve the performance of an employee as well as of an organization and give the positive affect, similarly the innovational capability will

increase its affect by producing the new things from this obtained knowledge as well as the organizational culture will also give the strength if the organizational culture will be of supportive nature.

# Chapter 2

## Literature Review

### 2.1 Definition of Variables

#### 2.1.1 Knowledge Absorption

The concept of knowledge absorption capacity refers to collecting, sharing, and integrating new and existing knowledge in order to achieve efficiency and effectiveness in project-based organizations. It can be said that the ability of an organization to absorb new knowledge and transfer may prove as a competitive edge in this modern world. (Cohen & Levinthal, 1990; Park, 2011; Tsai, 2001)

#### 2.1.2 Project Performance

Modern organizations rely increasingly on external knowledge for enhancing innovation and performance (Chesbrough, 2003; Cohen and Levinthal, 1990). Considerably, an organizations' ability to gain and use external knowledge is known as absorptive capacity (AC). It is suggested that AC is positively associated with innovation and performance (Zahra and George, 2002; Lane et al., 2006; Volberda et al., 2010); hence, to develop AC, organizations invest considerably in their R & D and T & D, networks, systems, and employees. Thus, it becomes difficult for receiver organizations to select appropriate and reasonable knowledge senders. This means we can say that the correlation between receiver and sender organizations eases valuing and gaining external knowledge.

### **2.1.3 Innovation Capability**

Innovation capability is the ability to develop new products that meet market needs, develop and adopt new products and process technologies, as well as respond to unexpected activities performed by competitors (Tsai & Tsai, 2010). Innovation capability is also an ability to absorb and use external information for then transfer it into new knowledge (Cohen & Levinthal, 1990).

### **2.1.4 Organizational Culture**

According to (Rajala et al., 2012) organizational culture is the collective programming of the mind that distinguishes the members of one organization from another. Organizational culture shapes organizations and provides a better understanding of complex organizational components, such as empowerment (Johnson & Johnson, 2009)

## **2.2 Literature Review and Hypothesis Development**

### **2.2.1 The Link between Knowledge Absorption and Project Performance**

Modern organizations now believe to increase their external knowledge assets because they know that thus they can enhance their innovation and performance as already stated by (Chesbrough, 2003; Cohen & Levinthal, 1990). According to Cohen & Levinthal's statement, absorptive capacity is the capability of any firm to obtain and use the external knowledge in their firm. Therefore Considerably, we can say according to this statement absorptive capacity (AC) is positively and significantly associated with innovation and performance (see, for example, Zahra & George, 2002; Lane et al., 2006; Volberda et al., 2010); hence, now to develop and enhance their AC, the organizations now much focus to invest considerably their

financial assets on their research and development (R&D) department, networks and systems operation sides, and on their employees.

Absorptive capacity is basically in start introduced by Cohen & Levinthal in 1990 and latterly there is a standard agreement between researchers concerning their definition (Lane et al. 2006). Infact they gave this concept about the absorptive capacity that the AC in sense of the organizational ability is to evaluate, acquire, assimilate and exploit the external knowledge to achieve their organizational result as per their expectations. This introduction or definition of the AC suggests that absorptive capacity can be completed with streamlined practices. Similarly, the existing literature also considers AC either as a dynamic capability, where the organizations give attention to their organizational routines in exact accordance with environmental turbulence, or processes of learning.

Sun and Anderson (2010) created the link between the dynamic capability perspective of AC which is proposed by Zahra & George (2002) and four various types of learnings which are commonly known as intuition, interpreting, integrating, and institutionalizing. The exploitation capability permits organizations to continually exploit external knowledge which is stated by (Zahra & George, 2002; Sun & Anderson, 2010).

Similarly, the exploitative learning process, institutionalization learning allows the organizations to create routines for recycling that external knowledge. According to this statement, we suggest that the exploratory learning process increases gaining capability, the transformative learning process allows assimilation and transformative capabilities, and thus the exploitative learning process helps exploitation capability.

Organizations are happy in gaining and reusing external knowledge when they face a lack of sufficient knowledge as stated by (Laursen & Salter, 2006). Whereas, the sender organizations share their knowledge only when they can get some benefits from it in the shape of any assets as stated by (Spender, 1996). Thus, it becomes difficult for receiver organizations to select appropriate and reasonable knowledge senders. This means we can say that the correlation between receiver and sender organizations eases valuing and gaining external knowledge. So, therefore there

is a basic need to develop such relationships or correlations, that the receiver organizations should consider and pick the signal that sender organizations send via their corporate ways i.e (images, product demonstrations, conferences) and so on to interconnect the value of their knowledge (Lin et al., 2005).

And we think that this is a best way to enhance our employee's performance and knowledge because when they interconnect with the other external firm's employees then they can know that how the other organizations are doing the working and on which new patterns these organizations are focusing and with which new practices and techniques these organization are getting the most success.

With the knowledge interchange the employees can learn more successful ways to promote their firm's performance and can compete in better way to the other firms by increase their product's features and values according to the customer's demands of new trend, practices.

Pinto and Slevin, introduced the three major dimensions in 1988; PMI, 2008 to evaluate and calculate the Project performance which are the cost–time–quality triangle. Project-oriented companies which are denoted as (POCs) are the temporary organizations that are continuously integrating diverse resources and expertise for dealing with increasingly complicated environments by the projects as stated by Hobday, in 2000; and similarly, by Sydow et al., in 2004; and by Turner et al., in 2008.

Hypothesis 1: Knowledge absorption is positively and significantly related to Project performance.

### **2.2.2 The Link between Knowledge Absorption and Innovation Capability**

According to the existing literature and researcher's opinions, we can say that Knowledge absorption is a very basic and very important factor of a knowledge management system that plays a major role in creating an effective knowledge-based system. Absorption is the name of the ability to gain knowledge from external sources in any possible way. So, thus we can also be stated that as

stated by (Radovanić and Matović (2016) knowledge absorption is the name of a processor can say that this is an activity to search out and obtain the newly introduced knowledge from any external knowledge-based resources, we can also say that knowledge absorption is a way or technic to explore, gain and convert the new expertise from other external knowledge sources to our knowledge-based systems. According to all of these phenomenal debates, we can say that Knowledge absorption and creation or innovation are the first steps in the knowledge development process as already stated by (Liao et al., 2009).

Knowledge absorption is the first movement in a series of actions of receiving knowledge from external sources or the environment and converting it into a representation or practical information that can be adopted and/or be used in an organization. Knowledge absorption has the meaning of converting the knowledge resources of information, technics between the two firms to get knowledge for their learning. knowledge absorption is a technique of a skilled method by which we can capture or gain new knowledge and information from any external knowledge sources which can be any source like (human, book, journal, database, report or computer system), etc. The knowledge absorption ability that employees own in the organization will facilitate the procedure of interaction and exchange of knowledge within the organization and which will of course give a positive impact on improving their innovation capability.

Similarly, the Liao in 2008 found this reality that knowledge absorption significantly and positively affects innovation capability. As the previous study by Liao (2008) also suggests and recommends that knowledge absorption capacity has a significant and positive effect on innovation capability. Thus, we can also say that the capacity of knowledge absorption has an important role in improving innovation capability. The capacity of knowledge absorption on the higher side will highly increase the company's innovation capability.

Because this is simply understood thing that when any person or any firm / organization will learn something new definitely he or that firm / organization will do something new and this ability to do something new is basically called the innovation. So on the basis of this scenario we can say that the new knowledge learning

or absorption is basically the main cause of invention or innovation because if the new knowledge or technique will not come a person cannot do anything new and when he learn something new he try to convert it into practical shape and thus he do something new in innovation way and make the performance better to save his project from failure. Similarly, the research taken by Cohen & Levinthal in 1990 found that increased absorption capacity of knowledge which is also found by (Nodari et al., 2016) laterally in 2016 will have a good and high impact on improving and increasing innovation. Similarly, the same research gives the same results which is performed by Muskat & Deery in 2017 which determined that the capacity of knowledge absorption is very important in predicting organizational capability and the organization's level and standard (Henttonen et al., 2016).

To promote innovation capability and innovation process, the managers should pay very close attention to knowledge creation and exploration processes in organizations for beneficial outcomes from team members. Furthermore, according to the literature review knowledge creation can be made easy by ensuring efficient and effective documentation procedures, internally and externally obtained knowledge sharing trends with each other, and acquisition and exploitation practices. Infact the documentation and knowledge sharing are especially effective and good means to promote and enhance the knowledge creation for non-knowledge intensive firms.

For this purpose, therefore Modern organizations now believe to increase their external knowledge assets because they know that thus they can enhance their innovation and performance as already stated by (Chesbrough, 2003; Cohen & Levinthal, 1990). According to Cohen & Levinthal's statement, absorptive capacity is the capability of any firm to obtain and use the external knowledge in their firm. Therefore Considerably, we can say according to this statement absorptive capacity (AC) is positively and significantly associated with innovation and performance (see, for example, Zahra & George, 2002; Lane et al., 2006; Volberda et al., 2010); hence, now to develop and enhance their AC, the organizations now much focus to invest considerably their financial assets on their research and development (R&D) department, networks and systems operation sides, and on their employees.

Hypothesis 2: Knowledge absorption is positively and significantly affects the Innovation Capability.

### **2.2.3 The Link between Innovation Capability and Project Performance**

As per the existing literature study, we reach this thought that the ability of innovation plays an important role in being a driving force in improving the performance of any organization. The Companies which want to improve their innovation performance, it is important for them that they must have innovation capability. Because the capability of innovation is the ability to develop, respond and complete the development of new products of other competitors according to the market and customer's demand and similarly respond to the technological promotions and enhanced activities undertaken by other competitors of the market. And in the same sense, we can say that the capabilities of innovation being an important driving force improve the project performance also.

The study by Tsai and Tsai (2010) found that which can demonstrate in these words that a very high innovation capability asset within the company will improve and enhance business performance / Project performance/organization's performance. The research conducted by Sulistyono and Siyamtinah (2016) also concludes that innovation capability affects very closely the improvement of employee's performance and at the same time the project performance also. Battor and Battor (2010) also narrated after their research's results, that the higher company's innovation will improve and enhance the project performance positively.

Because when an organization or any employee of any firm / organization make something new after getting new knowledge from any external source then definitely a positive and significant impact on performance come to see, and this is impossible / unbelievable that a person does struggle to learn more and he try to get the new knowledge to compete the other firms in better way and do something new in more innovative way to enhance the performance and the performance not enhance.

Innovation capability is a firm's ability to create new ideas and thinking and give them a real shape by making new products, thus here in the project management field, innovation capability is the creation of new methods and practices, and techniques to enhance and improve the project performance by the knowledge absorption from other firms or organizations.

Hypothesis 3: Innovation Capability is positively and significantly related to Project Performance.

#### **2.2.4 Mediating Role of Innovation Capability**

Innovation capability is the use and implementation of learnings and creation of new technology by applying new learning which is gained by the external sources and applied them for the creation of new organizational features like (systems, policies, programs, products, processes, and services) to an organization as stated by the (Iddris, in 2016). And as per Cohen & Levinthal, given concept in 1990, the Innovation capability is also taken as an ability to obtain and absorb and use newly described external information and then transfer it into new knowledge and new inventions. Innovation capability is a complete set of characteristics of the organization which facilitates and drives innovation strategies for that organization. Innovation is known as a modification procedure of various aspects (products, processes, services, organizational systems, and marketing systems) to create customer value as stated by (O'Cass & Weerawardena,) in 2009.

Nisula & Kanto define Innovation capability in two major categories in 2013 which are technical innovation and administrative innovation. Similarly, Liao et al. gave the concept of Innovation capability with their research efforts in 2009 that innovation capability is known as a company's performance which that company shows through various types of innovation to achieve an overall improvement in innovation capability. As per the researcher's opinion, Innovation must use the new production and marketing of technology to produce new products or services to customers or interlink the new products to customers. Kashan and Mohannak suggest in 2015 that organizational innovation includes the generation or adoption

of new ideas or behaviors to produce various new products or services, For example (new production technologies, operating procedures or new strategies or new management strategies), etc.

The innovation capability has a mediation role between the knowledge absorption and project performance because when a firm or organization learn the knowledge from the other any external source then that firm or organization can create or identify new ideas and techniques & ways of work to improve the performance of their project/product.

Because the word mediation has the meaning itself a source or element to give the impact of anything by passing through itself to other element, Similarly, here in this scenario the same thing is come to see that here we have the innovation capability as the mediator and we have two element before the mediator knowledge absorption and after the mediator project performance, Now when the knowledge improve by any means then the innovation get a positive and significant impact on itself and the same impact transfer to the project performance.

Hypothesis 4: Innovation Capability mediates the relationship between Knowledge absorption and Project Performance.

### **2.2.5 The Moderation Effect of Organizational Culture on the Relation between Knowledge Absorption and Innovation Capability**

According to (Rajala et al., 2012) research and organizational culture is a recognition tool by which the members of one organization from another are easily distinguished as per their collective programming of the mind. (Rajala et al., 2012) also defines that the organizational culture is known as a pattern of shared basic assumptions which are learned by the organization to solve its problems of external adaptation and internal integration that has worked in such a way that this taken well enough to be considered valid by everybody and, therefore, to be trained to new members as the correct way to observe, think and feel about

those problems. One thing more adding up is that the organizational culture gives shapes to the organizations and provides them a well understanding of complex and undefined organizational components, such as empowerment, this concept is taken from the Johnson & Johnson research, of 2009.

In the other sense, concerning the Competing Values Framework is a basis which is also descended by, the organizational culture is classified based on the flexibility of the relationship pattern between the members of inside the organization, and focus on conducting efforts on the way to achieve the goals. These cultures shaped various certain characteristic aspects on their dimensions, which includes (dominant character, leadership, management, organizational bonding, strategic emphasis, success criteria), etc. In this sense, the Clan culture is a very effective culture that can be defined as a family-type organization because this kind of organization promotes good aspects in which teamwork and participation in group processes are involved.

As per Nguyen & Watanabe's statement which they gave in 2017 about this kind of organization is that this form of an organization always promotes a human work environment, with the help of managerial goal of empowering employees by gaining their participation, commitment, and loyalty as well. There is another type of organizational culture is introduced by Menon in 2001 is known as an adhocracy. Adhocracy is an organizational culture that gives a lot of opportunity to the individuals to develop in their way according to their gained knowledge, as long as they are consistent with and have focused on the organization's goals.

By this statement, one thing is to take birth that within an adhocracy, the power flows from one individual to another individual or from one task team to another task team depending that what problem is being addressed at that time. By the review of these all aspects and knowledge history, we reach this result that an organizational culture that is always based on open communication and flexibility allows their employees to fully participate in decision making by expressing their ideas and opinions and supporting the feedback in the organization, such kind of culture contributes to improve and increase the innovation capability of an organization.

Harrison's organizational culture model described and maintained that organizational culture can be diagnosed in four cultural dimensions, which are known namely as power-oriented culture, rule-oriented culture, achievement-oriented culture, and support-oriented culture same thing also stated by Taştan & Türker, in 2014. As argued by (Wagner, 1995), and (Manetje & Martins, 2009) organizational culture is a contextual factor that exerts influences on employees and work-related behaviors. The undermentioned under described research hypothesis addresses the aim of this study.

Hypothesis 5: Organizational culture positively enhance the Knowledge absorption and Innovation Capability.

## 2.3 Research Model

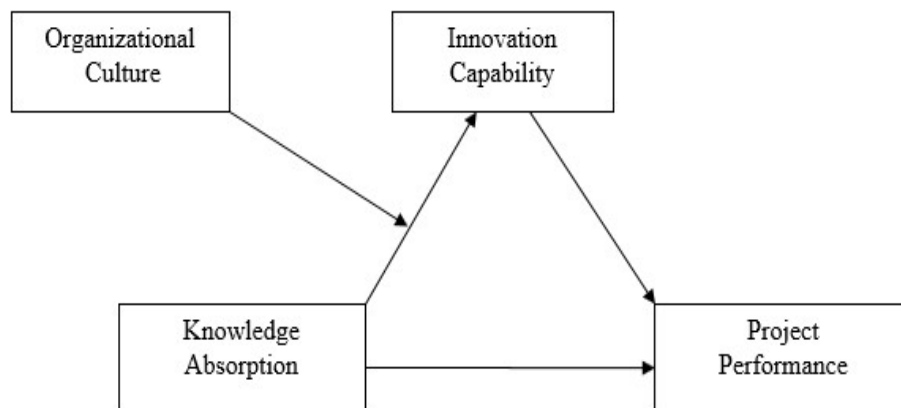


FIGURE 2.1: Research Model

## 2.4 Hypothesis of the Study

In the light of the literature review, five hypotheses are developed to study:

**Hypothesis 1:** Knowledge absorption is positively and significantly related to Project performance.

**Hypothesis 2:** Knowledge absorption is positively and significantly affects the Innovation Capability.

**Hypothesis 3:** Innovation Capability is positively and significantly related to Project Performance.

**Hypothesis 4:** Innovation Capability mediates the relationship between Knowledge absorption and Project Performance.

**Hypothesis 5:** Organizational culture positively enhance the Knowledge absorption and Innovation Capability.

# Chapter 3

## Research Methodology

### 3.1 Research Design

#### 3.1.1 Type of Study

This study aims to inspect the association between Knowledge Absorption and Project Performance. There is a cause-and-effect relationship that exists therefore the positivist approach is used. The hypothetical deductive research method is used because in a hypothetical deductive research method a problem is identified, the hypothesis is developed, measures for constructs are determined, data is collected, data is analyzed and then data is interpreted to check whether the hypothesis is accepted or rejected.

As already mentioned, constructs of the study were measured with scales to quantify and analyze them so that relation and association between these variables can be found. Hence it is quantitative research. The collection of data was carried out at a given point in time from a sample population. Hence a cross-sectional survey was carried out.

#### 3.1.2 Unit of Analysis

For this study, my unit of analysis is the project managers and all team members who are working on construction sites in Pakistani project-based organizations, all

these project managers and team members were requested to participate physically in this study. All those project managers and team members that are involved in any kind of project in project-based organizations were included in this study. Project-based organizations were selected because these organizations are involved in different projects and for these projects, they have different project managers who are assigned different responsibilities.

### **3.1.3 Sample Size**

The sample size was calculated with the help of a confidence level up to 95% and the confidence interval for which was 5. And because my population size was unknown. So, after calculation with the above-mentioned conditions, the minimum sample size required for my study was 384 (<https://www.surveysystem.com/sscalc.htm>).

Therefore, total 700 questionnaires were distributed in Pakistani project-based organizations where project managers and construction teams are continuously involved in different projects from which 404 responses were received back and used in my analysis. Hence, the sample size used for my study is 404.

## **3.2 Sampling Technique**

Non-probability sampling consists of several different types, the type of sampling which is used in my study is called convenience sampling which is used for sampling. In convenience sampling, we spread the questionnaire to the people to whom we know. convenience sampling is selected because of some of its advantages like spreading of the questionnaire is easily spread to a junction of peoples because of which it can be carried out easily, time and cost required to perform convenience sampling is lower as compared to other sampling techniques, sample data is easily accessible, and data is collected quickly.

### **3.3 Procedure of Data Collection**

For a collection of data from respondents self-administered questionnaire was developed in google forms and then that was distributed among project managers, Construction Managers, and team members on construction sites of various multinational and locally established project-based organizations which are working in the 4 big cities of Pakistan i.e (Islamabad, Rawalpindi, Lahore, Sargodha). Respondents filled out these questionnaires and returned them without worrying about their confidential information. They were told that this data is just for an academically research only and will be kept confidential without sharing any detail with anybody.

Data were calculated by distributing questionnaires via email to different project-based organizations of Pakistan in which (DHA, CDA, LDA, RDA, NLC, and GHQ) are also involved.

The email was sent to more than 25 different project sites and I was able to get 404 complete responses which fulfilled the requirement of 384 responses according to the calculated sample size. The employees were given enough time and privacy so that they can easily complete their responses.

### **3.4 Contribution to the Study**

The rate of project failure in developing countries is very high as compared to that of developed countries. Similarly in Pakistan project managers fail to achieve their objective due to different reasons, which ultimately leads to a decrease in project success rates. Some reasons for lower project success rates in Pakistan can be ignorance towards the learning of employees' new external knowledge/techniques, employee's innovation capability, organizational culture, project performance, etc.

Because the most basic element which improve the performance and success rate of any organization is innovation capability as stated by Iddris, in 2016 that the Innovation capability is the use and implementation of learnings and creation of

new technology by applying of new learning which are gained by the external sources and applied them for the creation of new organizational features like (systems, policies, programs, products, processes, and services) to an organization and whenever an employee get the confidence from the administration or top management of the organization to innovate and contribute through his newly learned knowledge then definitely the outcomes give shine in the shape of performance, and this is a big and very important mediator between the knowledge absorption and project performance, through which any organization can improve its success rate.

Similarly As discussed earlier that the new knowledge absorption capacity of an employee definitely give a better track to any organization towards the success, and the supportive organizational culture also effect as moderator to this way positively and negatively. From the review of literature, it is clear that knowledge absorption, innovation capability, and project performance are the constructs with high potential. An increase in several projects in Pakistan is observed. Similarly, in almost every developing and developed country number of projects is increasing. Our research is based on the context of Pakistani project-based organizations.

Moreover, this study will help the project-based organizations to understand and pin out the main basic reason and point of project failure, they will learn by this study that how they can improve their firm's performance in better way to compete the other competitors in the market and recognize that how much the new knowledge absorption technic is important for their performance and market value enhancement.

### **3.5 Research Instrument**

In this quantitative study for gathering data, I used close-ended questionnaires. These questionnaires contained close-ended questions that asked participants to choose from some pre-defined responses. The questionnaire contained five sections and participant was required to fill out all the questions in these sections. Sections included:

- Demographic Variables (gender, education, age, and experience)
- Knowledge Absorption
- Innovation Capability
- Organizational Culture
- Project Performance

Scales for measuring these variables were adopted from existing literature. All four constructs are rated on a five-point Likert scale type scale which ranges between (1 – 5) Where 1 is Strongly Disagree, 2 is Disagree, 3 is Neutral, 4 is Agree and 5 is Strongly Agree. Description of the scales used for each variable in this study is given below:

### **3.5.1 Knowledge Absorption**

The variable of knowledge absorption was measured by 13 items scale developed by Jansen (2005). The Cronbach's Alpha for absorption capacity was (acquisition = 0.79; assimilation = 0.76; transformation = 0.72; exploitation = 0.71). The responses were collected through 5 x points which are known as the Likert scale ranging from 1 - 5. Where 1 is Strongly Disagree, 2 is Disagree, 3 is Neutral, 4 is Agree and 5 is Strongly Agree. The components of the scale comprise "Our project stakeholders remain regular coordination with corporate headquarters to acquire new, advanced knowledge, Members of our project frequently visit other units/departments, and we gather industry information through informal means (e.g., lunch with industry friends, talks with trade partners)."

### **3.5.2 Innovation Capability**

The Innovation performance/capability of any organization was measured based on Weerawardena (2003) by asking the respondents about the evaluation of the degree of innovations of four different types (products/services, processes, management, and marketing) undertaken in the company during the past three years

(anchored by “limited” and “extensive”). The coefficient alpha for this composite is 0.738. The responses were obtained through 5 x points which are known as the Likert scale ranging from 1 - 5. Where 1 is Strongly Disagree, 2 is Disagree, 3 is Neutral, 4 is Agree and 5 is Strongly Agree. The components of the scale comprise “The external knowledge increases the innovation capability of the employees, The innovation capability enhances the project performance).”

### **3.5.3 Organizational Culture**

The organizational culture consists of 17 items used by (Dension & Neale, 1996; Denison, 2000). The organizational culture variable items consist of culture rules, policies, especially the environment in which organizations provide their employees how much they rank their organization according to their culture in which, the responses obtained through 5 x points which are known as the Likert scale ranging from 1 - 5. Where 1 is Strongly Disagree, 2 is Disagree, 3 is Neutral, 4 is Agree and 5 is Strongly Agree.

The components of the scale comprise “The Policies and the organization structure in our organization have been clearly defined In our organization time and punctuality are highly valued).”

Data collection methods”, and “Ultimately to update the ever-evolving performance measures, structures and processes that appraise such measures, need to be examined regularly”.

### **3.5.4 Project Performance**

For measuring Project performance in the organization 7 items scale by Nidumolu, S., (1995) was used. The responses will be obtained via 5 x points Likert scale ranging from (1 – 5). The items of the scale for project performance are “Projects are completed on time, Projects met budget requirements, and Projects met expectations.”

## 3.6 Method of Analysis

Data were collected using survey questionnaires. After the collection of data, it was entered, cleaned, and processed with the help of software which is known as Software Package for Social Science-21, and which abbreviation is denoted by (SPSS-21). For analyzing this data in SPSS-21 PROCESS macro by Andrew F. Hayes V.4 was used. PROCESS macro was used because many types of models can be analyzed by using PROCESS macros like Mediation, multi-mediation, mediation-moderation, and moderation-mediation. And it can test highly complex data manipulation and analysis with simple instructions. A list of tests that were conducted using SPSS are given below:

- Test of Descriptive Statistics for finding Frequencies of a demographic variable.
- Pilot testing for start-up the analysis.
- Reliability Analysis
- Correlation Analysis
- • Regression, moderation (Model 1), and mediation (Model 4) were tested using PROCESS macro version 4.0 by Andrew F Hayes.

## 3.7 Characteristics of Sample

### 3.7.1 Gender

**Table 3.1** which is given below out of 404 respondents, 310 respondents were male and 94 were females. According to this data, the achieved %age of every value is 76.7% of respondents were male and 23.3% were female. According to the results of these tests, several male respondents are higher in number than female respondents.

TABLE 3.1: Frequency by Gender

Gender	Frequency	Percentage
Male	310	76.70%
Female	94	23.30%
Total	404	100%

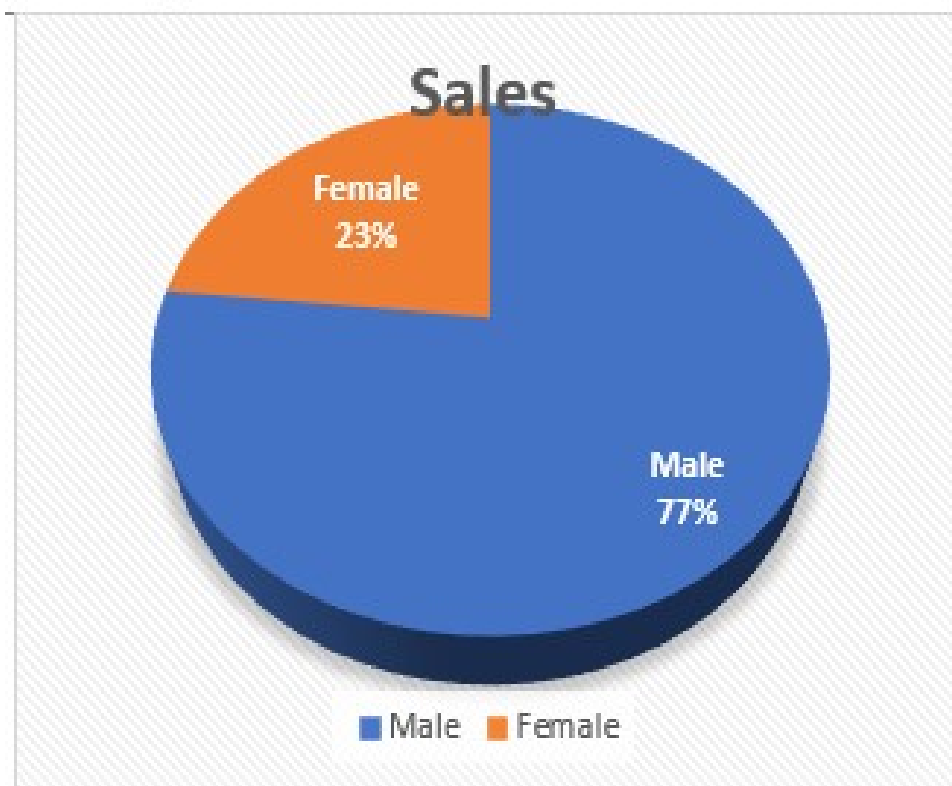


FIGURE 3.1: Gender of Respondents

### 3.7.2 Education

By looking at **Table 3.2** we can see that 193 respondents were qualify up to graduation level which is 47.7 percent of the total number of respondents. 107 responses were from respondents who have master’s level qualification which is 26.5 percent, 75 responses were from individuals who had an MS / MPhil degree

their percentage is 18.6 out of the total respondents' percentage. And a total of 29 respondents were PHDs and their percentage was 7.2.

TABLE 3.2: Frequency by Education

Education	Frequency	Percentage
Graduation	193	47.70%
Masters	107	26.50%
MS / MPhil	75	18.60%
PHD	29	7.20%
Total	404	100%



FIGURE 3.2: Education of Respondents

### 3.7.3 Age

Table 3.3 given below illustrates those 172 respondents out of 404 which is the highest number of respondents were between ages 18-25. Which is 42.6% of the total number of respondents. 147 respondents were between ages 26-34 that is

36.4%. 61 respondents were of ages 35-45 that is about 15.1%. 23 respondents were of ages more than 45 which is 5.7%.

TABLE 3.3: Frequency by Age

Age	Frequency	Percentage
18-25	173	42.80%
26-34	147	36.40%
35-45	61	15.10%
> 45	23	5.70%
Total	404	100%

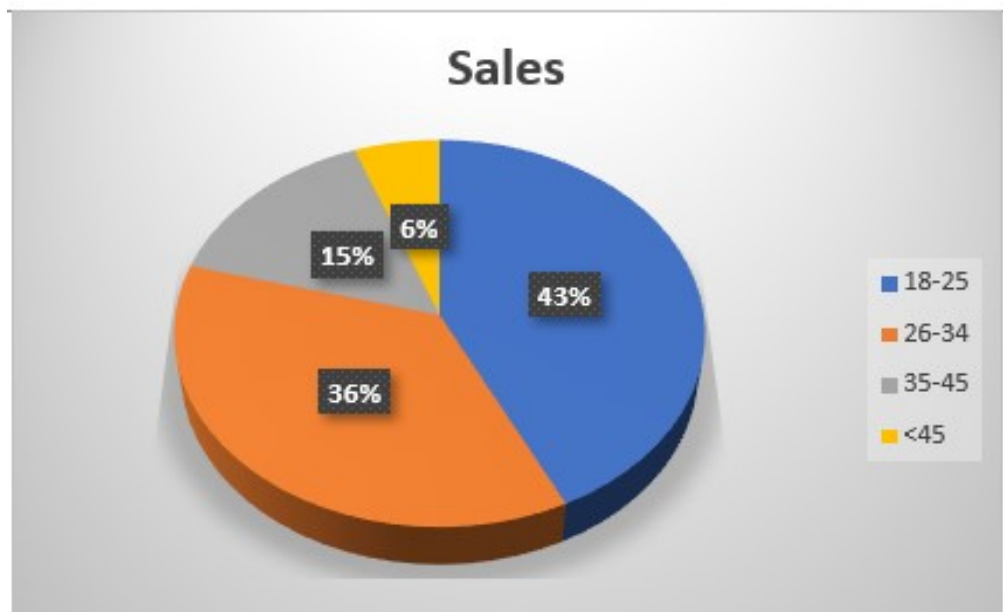


FIGURE 3.3: Age of Respondents

### 3.7.4 Experience

In the table, 3.4 Respondents with experience of 1-5 years were highest in number that is 187 which is 46.30 %. Respondents with experience of 6-10 years were 123 which is 30.40 %. 63 respondents had experience of 11-15 years that is 15.6 %. 31 respondents had the experience of more than 15 years which is 7.7 %.

TABLE 3.4: Frequency by Experience

Experience	Frequency	Percentage
01-05	187	46.30%
06-10	123	30.40%
11-15	63	15.60%
Over 15	31	7.70%
Total	404	100%

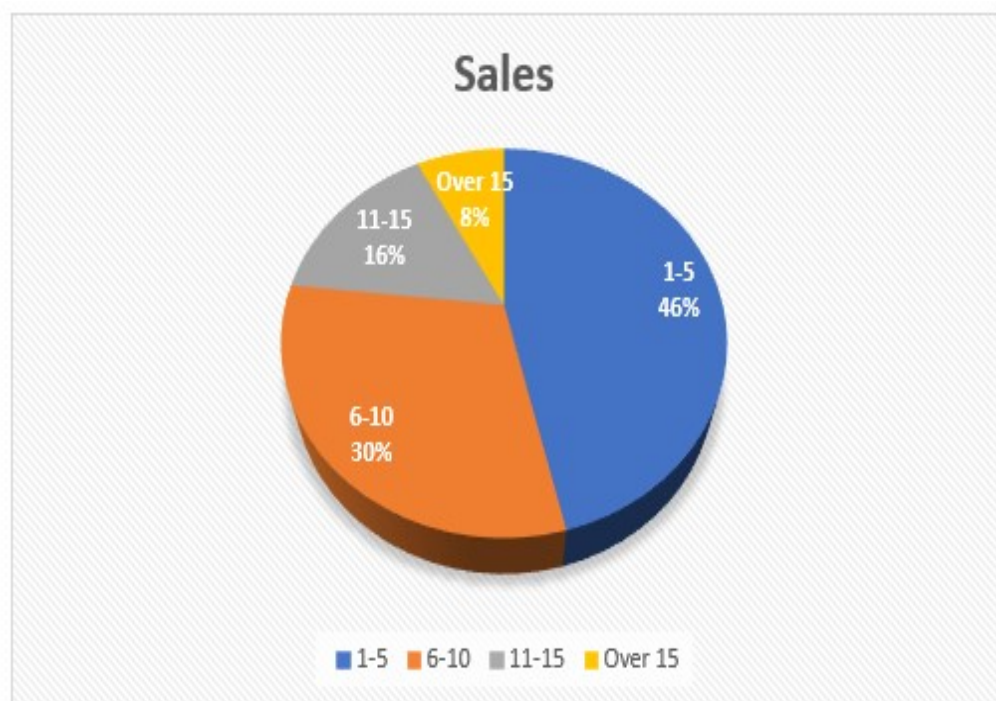


FIGURE 3.4: Experience of Respondents

### 3.8 Pilot Testing

An initial study of small scale that is carried out to examine a planned research study before a complete analysis is performed is called a pilot study. This study typically trails the precise similar procedures and methods that are used in the full-scale data analysis of the original study. A pilot study can help in examining

the validity of the variables (Van, Teijlingen & Hundley, 2001). It is carried out before gathering the actual data, to see the respondent's opinion and to check if the items of the scale are easily understood by respondents or not.

According to the previous literature, pilot testing is done on 10% of the total sample size it is mostly more than 40 respondents and of these responses' reliability is checked. According to Haier et al (2006) Cronbach's Alpha's value above 0.7 is acceptable. After performing the pilot study, I was able to identify that reliability of the scales was in an acceptable range. Results of this pilot study indicated that I can continue with my research study.

TABLE 3.5: Reliability of Pilot Testing

Variables	Items	Cronbach Alpha
Knowledge Absorption	13	0.789
Innovation Capability	4	0.697
Organizational Culture	17	0.843
Project Performance	7	0.738

N=60.

### 3.9 Reliability of Scales

The purpose of reliability analysis is to check the internally consistent the items of a variable are. It explains how items of different variables are closely related. According to Haier et al (2006), a scale is accepted as a reliable scale if Cronbach's alpha's value is above 0.7.

N=404.

According to table 3.6, each variable's Cronbach's alpha value is more than 0.7. Cronbach's alpha's value for knowledge absorption is 0.848 with 13 items. Cronbach's alpha's value for innovation capability is 0.700 with 4 items. Cronbach's alpha's value for organizational culture is 0.892 with 17 items. Cronbach's alpha's value for project performance is 0.797 with 7 items. According to this data, all

TABLE 3.6: Reliability Analysis

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<b>Variables</b>	<b>Items</b>	<b>Cronbach Alpha</b>
Knowledge Absorption	13	0.848
Innovation Capability	4	0.7
Organizational Culture	17	0.892
Project Performance	7	0.797

---

the values are in the acceptable range (i.e., above 0.7) which means that we can continue further with our analysis.

# Chapter 4

## Data Analysis and Discussion

### 4.1 Correlation Analysis

I have used the Pearson correlation test which describes the association between the variables. It is a single number that describes the relationship, from this test I can explain how strongly variables are related to each other. The satisfactory value for correlation is in the range of -1 to +1. Values that range from 0.10 to 0.29 show that there is a weak or smaller correlation between variables but there is an association between variables. Values that range from 0.30 to 0.49 show that there is a moderate correlation and values that range from 0.5 to 0.8 explains that there is a strong correlation (Cohen, West & Aiken, 2014). Values that are above 0.8 shows that the variables are highly correlated, this means that the relationship between variables is so strong that they can be represented as a single variable. Which means that there is an error of multicollinearity. Therefore, this error must be dealt with accordingly by running different tests so that it can be minimized. Otherwise, errors of multicollinearity can affect the correlation of other variables.

According to the table given below the correlation between knowledge absorption and innovation, the capability is 0.662 which is significant because it lies in the range of 0.50 to 0.80 which means that there is a high/strong correlation between these variables / Items. It is a positive value which means that increasing the knowledge absorption capacity of an employee will increase his innovation capability. The correlation between knowledge absorption and organizational culture is

0.712 which means that there is also a strong correlation between these variables. This means that the organizational culture fully supports and needs knowledge absorption on a vast scale. The correlation between knowledge absorption and project performance is 0.609 which means that there is also a strong relationship between these variables. The correlation between innovation capability and organizational culture is 0.698 which means that there is a strong relationship between these variables.

The positive value indicates that organizational culture plays a major role to increase the capability of innovation. The correlation among innovation capability and project performance is 0.550 which means that there is a strong relationship too between these variables.

This value also indicates that the increment of innovation capability will 100 % increase the project performance. The correlation between the organizational culture and project performance has also the value of .752 which means that these variables also have a strong relationship. This indicates that organizational culture can also increase project performance. P-value indicates the significance value, and it demonstrates the chance of error that might occur in data.

If the P-value is lesser the 0.01 it means that there is a 1 % chance of error in data. In the table given below values with less than 1 % error are symbolized with “\*\*\*”. These values also represent that the correlation is 99 % significant if values are less the 0.01. In the table given below, all the values are less than 0.01.

TABLE 4.1: Correlation Analysis

		<b>KA</b>	<b>IC</b>	<b>OC</b>	<b>PP</b>
KA	Pearson Correlation	1			
IC	Pearson Correlation	.662**	1		
OC	Pearson Correlation	.712**	.698**	1	
PP	Pearson Correlation	.609**	.550**	.752**	1

As we know that \*\*. Mentioned that the Correlation is significant at the 0.01 level (2-tailed).

## 4.2 Testing Theoretical Relationships

For testing the theoretical relationship between variables, I have used PROCESS Macro by Andrew F. Hayes 2012. This tool uses the technique of bootstrapping, in this technique random samples are made from data for calculation of anticipated statistics in each sample (Preacher & Hayes, 2004; Shrout & Bolger, 2002).

For testing the link among knowledge absorption and project performance, for testing the relation among knowledge absorption and innovation capability, for testing the link among innovation capability and project performance, for testing the effect of the mediator on the relationship in between the two major variables X and Y or we can also say IV and DV which are knowledge absorption and project performance, process macro's model number 4 is used for this testing, and for testing the effect of moderator on the link among knowledge absorption and innovation capability and for testing if the moderated effect exists in the model I have used model 7 of process macro.

### 4.2.1 Direct Effect of KA on PP

In the first step, the correlation/relationship in between the (IV) independent variable KA (Knowledge Absorption) which is denoted by X, and the (DV) dependent variable (project performance) which is denoted by Y is considered, and the path in between them is known as the path "c" in my case and this demonstrates the direct effect of knowledge absorption on project performance. According to Table 4.2 given below the variable of knowledge, absorption is denoted by alphabet "X" and project performance is denoted by alphabet "Y".

TABLE 4.2: Direct effect of X on Y

Predictor	Effect	SE	t	p	LLCI	ULCI
X to Y	0.486	0.057	8.519	0	0.374	0.598

N=404 Confidence Interval = CI, UL= Upper limit, LL= Lower Limit.

According to **Table 4.2** and **Figure 4.1**, the p-value is 0.000 which is less than 0.01 and similarly there is not a zero between values of LLCI i.e., 0.374, and ULCI i.e., 0.598 which means that the direct effect of knowledge absorption is significant on project performance. This means that our first hypothesis that “Knowledge absorption is positively and significantly related to Project performance” is supported.

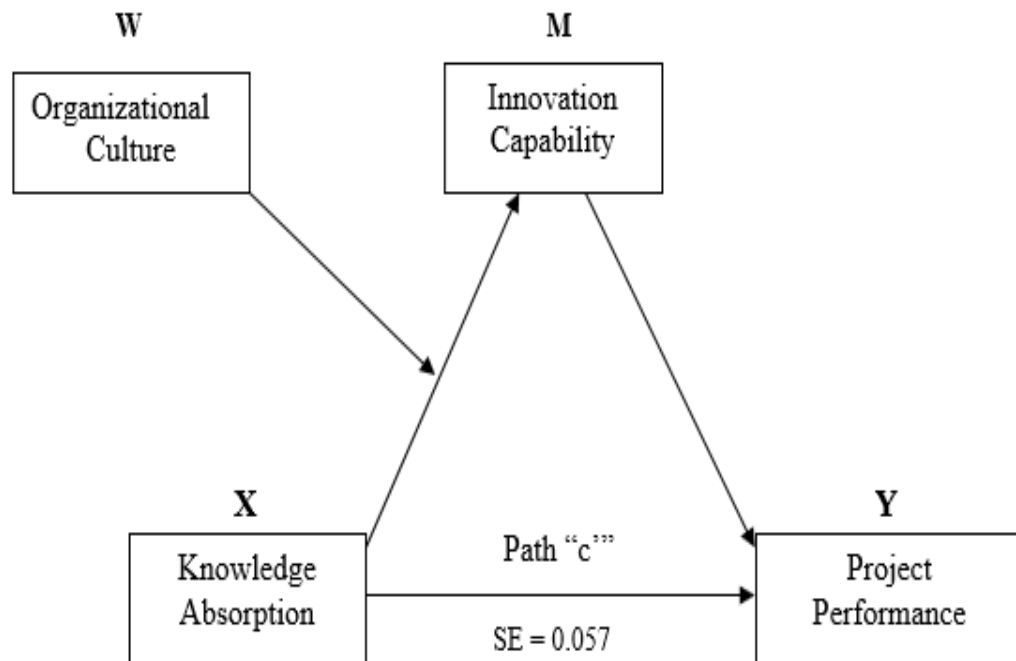


FIGURE 4.1: Direct Effect of X on Y

#### 4.2.2 Mediation Analysis

In the second step, the association between knowledge absorption and innovation capability is considered also known as path “a”. According to **Table, 4.3** and **Figure 4.2** given below the p-value is lesser than 0.01 which is .000 and there is no zero between the values of LLCI and ULCI which means that the relationship between these variables is significant.

The value of Coeff is .815 and the 0.046 value of SE suggests that the knowledge absorption will bring a change of 4.6 units in innovation capability. It means

that with every one unit increase in knowledge absorption, project performance will increase by 4.6 units. A positive value of SE indicates that if knowledge absorption will increase, innovation capability will also increase. This means that our second hypothesis that “Knowledge absorption is positively and significantly affects the Innovation Capability” is also supported.

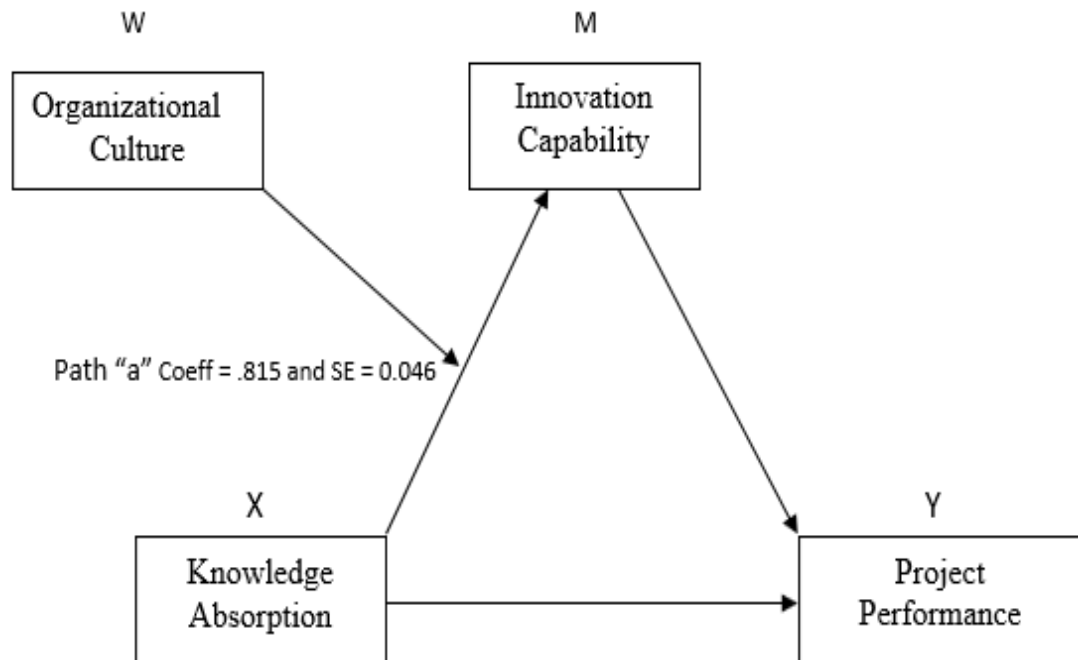


FIGURE 4.2: Direct effect of X on M

In the third step relationship between innovation capability and project performance also known as path “b” is considered. According to **Table 4.3** and Figure 4.3 given below the pp-value is 0.00 which is less than 0.001 and accordingly, if we look at the values of LLCI and ULCI there is no zero between the 2 values i.e., 0.1453 and 0.3275 which means that the relationship is significant.

The value of SE 0.046 suggests that innovation capability will bring 4.6 units to change in project performance. It means that with every 1 unit increase in innovation capability the project performance will increase by 4.6 units.

The positive value indicates that with an increase in innovation capability, project performance will also increase. This means that our third hypothesis that “Innovation Capability is positively and significantly related to Project Performance” is supported too.

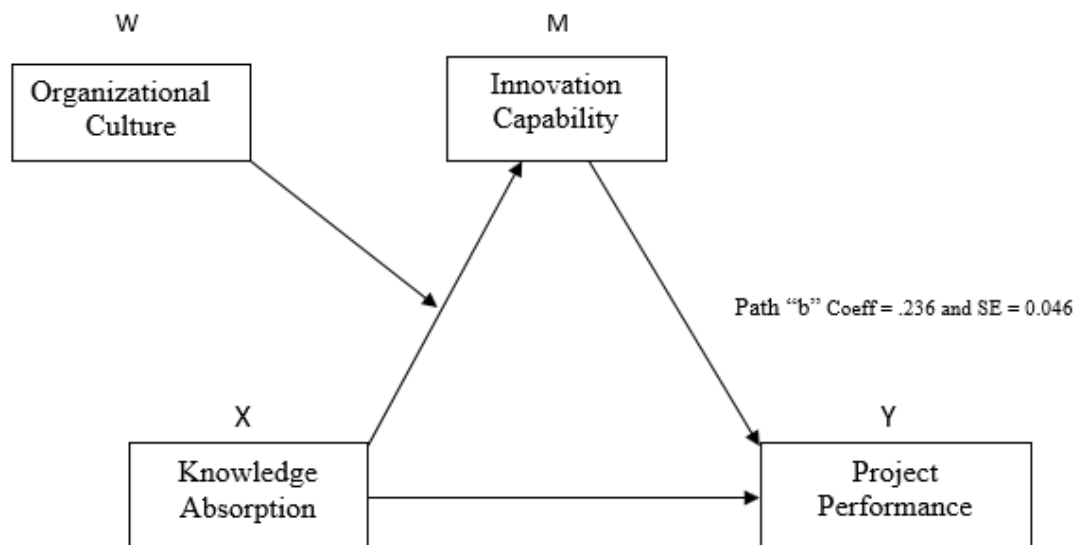


FIGURE 4.3: Direct Effect of M on Y

TABLE 4.3: Direct Effect

Predictors	Coeff	SE	T	p	LLCI	ALSO
X to M	0.815	0.046	17.69	0	0.7246	0.9058
M to Y	0.2364	0.046	5.099	0	0.145	0.327

X = Knowledge Absorption,

Y = Project Performance,

M = Innovation Capability,

N = 404,

Confidence Interval = CI,

UL= Upper limit,

LL= Lower Limit.

Now here the one of another path that considers or inspect the indirect effect of knowledge absorption (IV) on the project performance (DV) through innovation

capability (M) and also this path also demonstrate or donated by path “c” is significant as bootstrapping values (i.e., BOOTLLCI= 0.0988 and BOOTULCI=0.2951) of indirect effect doesn’t have a zero between them. And accordingly, both values are positive which confirms that there is mediation in the model.

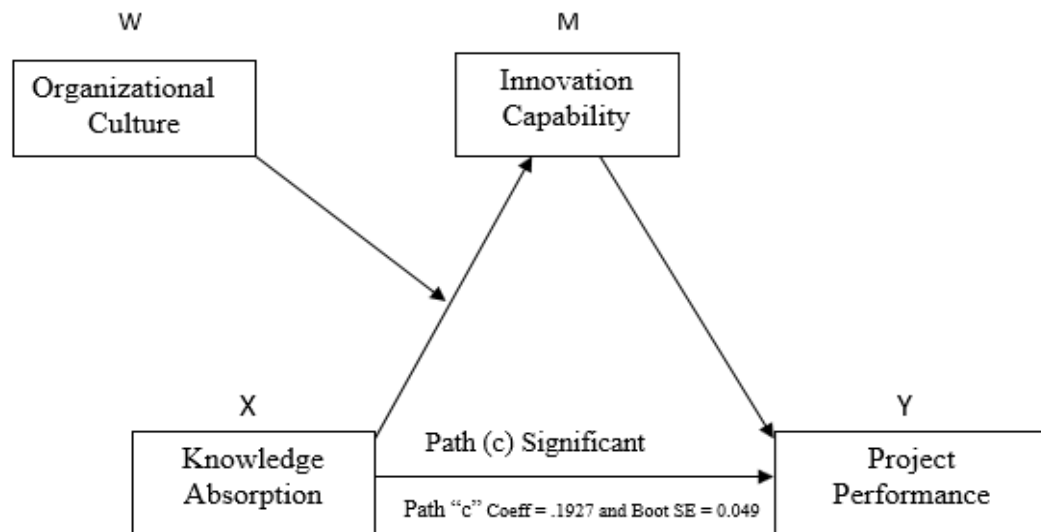


FIGURE 4.4: Mediation Analysis

TABLE 4.4: Indirect Effect of X on Y

Innovation Capability	Effect	Boot SE	Boot LLCI	Boot ULCI
	0.192	0.049	0.098	0.295

X = Knowledge Absorption,

Y = Project Performance,

M = Innovation Capability,

N = 404,

Confidence Interval = CI,

UL= Upper limit,

LL= Lower Limit.

The total value of the effect is calculated by adding direct effect and indirect effect. In my case, the value of (Effect = 0.192 and Boot SE = 0.049) of indirect effect is positive which means that with the presence of a mediator the values of total effect will increase. Hence according to **Table 4.4** and **Figure 4.4** given above the values of indirect effect are significant my fourth hypothesis that is “: Innovation Capability mediates between Knowledge absorption and Project Performance” is supported.

### 4.2.3 Moderation Analysis

For testing Organizational culture as a moderator, I have used model 1 in process macro. If we look at Table 4.5 which is given below, we will come to know that the values off LLCI and ULCI are -0.058 and 0.087 respectively which indicates that a zero exists between these two values.

TABLE 4.5: Moderation Analysis

	<b>Coeff</b>	<b>SE</b>	<b>t</b>	<b>p</b>	<b>LLCI</b>	<b>ULCI</b>
Constant	0.335	0.437	0.768	0.443	-0.523	1.194
Int-term	0.014	0.037	0.388	0.698	-0.058	0.087

N= 404, Int-term= Knowledge absorption x Organizational culture.

Along with that p-value also show the insignificance of the moderator because in my case the p-value is 0.698 which is greater than 0.01. Which means that my fifth hypothesis that “**Organizational culture positively enhance the Knowledge absorption and Innovation Capability**” is not supported.

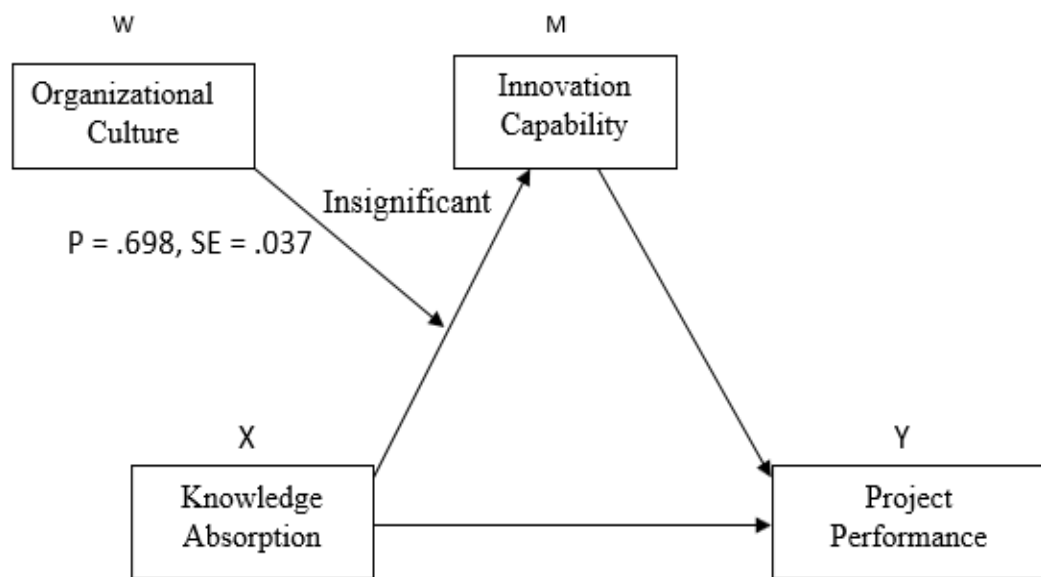


FIGURE 4.5: Moderation Analysis

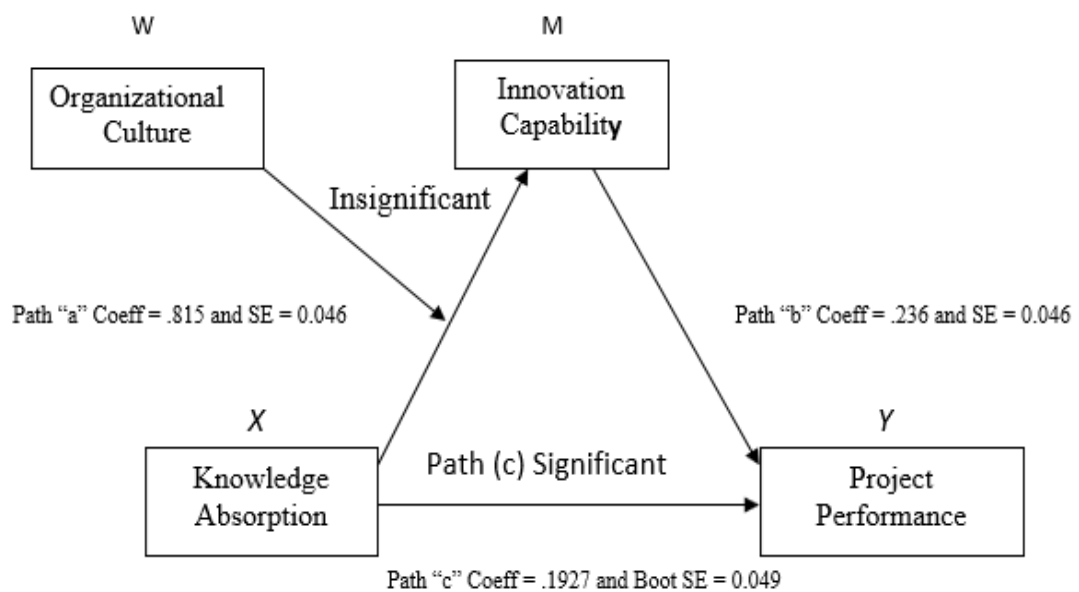


FIGURE 4.6: Research Model with Results

### 4.3 Hypothesis Results Summary

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H1	Knowledge absorption is positively and significantly related to Project performance	Supported
H2	Knowledge absorption positively and significantly affects the Innovation Capability	Supported

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H3	Innovation Capability is positively and significantly related to Project Performance	Supported
H4	H4 Innovation Capability mediates the relation between Knowledge absorption and Project Performance	Supported
H5	Organizational culture positively enhance the Knowledge absorption and Innovation Capability	Not Supported

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# Chapter 5

## Discussion and Conclusion

### 5.1 Discussion

The following research study was conducted with the aim, to test the hypothesis that was based on theoretical background. The main purpose/aim of my study was to investigate the link between Knowledge absorption and project performance. In this study, Innovation capability was considered as the mediator and Organizational culture was taken as a moderator. This chapter debates the results and findings that were displayed in the previous chapter. Accordingly, this chapter will discuss in detail the relationship that was found and the result that was created after the analysis of data. As a whole, this chapter will link my study with the previous studies that are undertaken and will help us in knowing how much the findings of our study are similar to the finding of the previous study and if the result deviates what can be the reason. In the end, previously discussed objectives will be linked with a tested hypothesis for giving direction to our discussion so that theoretical contributions and practical implications can be drawn.

#### 5.1.1 What is the Relationship between Knowledge Absorption and Project Performance?

The first hypothesis proposed for the study states that “Knowledge absorption is positively and significantly related to Project performance” and it is supported

according to the finding of studies. From existing literature, we came to an understanding that the knowledge absorption capability of any employee of an organization can affect the performance of that organization and this thing will affect the project performance too. Further, we learn from another research that the knowledge absorption capacity is the company's own ability to reuse or utilize externally gained knowledge through three following processes which are (exploration learning, transformative learning, exploitative learning).

Exploration learning or exploratory learning is the name of a process whose purpose is to identify and understand potentially valuable new knowledge from the outside of the company. Similarly, the second process includes the adaptation of valuable new obtained knowledge by transformative learning. And as well as the third process involves using assimilation and adoption of newly obtained knowledge to create new knowledge and products in the shape of commercial outcomes and this process is known as exploitative learning.

Based on these facts, we are compelled to agree with this fact that the higher level of employees to absorb the new knowledge in the organization, definitely will increase on the higher side the achievement of employee performance in the organization. Therefore, individuals with a high level of absorption may have increased work performance. Similarly, the results which were obtained by Li et al. in 2011 research conducted found that good knowledge absorption capacity will definitely improve innovation performance also and this is also stated by Liu et al. in 2015 after examining the effect of the decreased absorption capacity of knowledge on performance degradation. And he reached at this result that the higher rate of the decreased absorption capacity of knowledge will decrease the performance as well by degradation.

Another researcher which is known by name as Nodari et al. also found with his research in 2016 that highly knowledge absorption capacity always will improve performance as well. Which results show that the absorption capacity of knowledge of employees on the higher side in the organization will surely increase the ideas thinking powers of employees, and thus the new ideas of employees will come for doing the product innovations and processes that will also affect positively the performance improvement.

And similarly, according to the findings of my data analysis the association between knowledge absorption and innovation capability in project managers in Pakistani project-based organizations is significant.

Because by looking at table 4.3 given above the p-value is 0.000 which is less than 0.01 and similarly there is not a zero between values of LLCI i.e., 0.374, and ULCI i.e., 0.598 which mean that the direct effect of knowledge absorption is significant on project performance. As discussed in a chapter of the literature review that through the k knowledge absorption we can improve our project performance on an individual level and as well as organizational level too. The gaining results of the study also prove the findings of Nodari et al. which he conducts in 2016, that the capability of knowledge absorption has a significant effect on Performance.

After the overall reviews and research, we are reached on this result that to compete the competitors, this is a must for an organization that they make a mechanism of rapid development of new knowledge so that employees can absorb it well, and making it difficult also for the other competitors to imitate. And we also reach this conclusion that the high ability of knowledge absorption of an employee will encourage the emergence of new ideas, as well as unique ideas that will have a good and beneficial impact on the completion of work with more efficiently and effectively ways, and similarly thus by this ability the quantity of work can be completed according to the agreed and settled standards and definitely can be completed within a given time frame. Therefore, we thought that this is a basic need of Organizations in this way to encourage and motivate their culture and employees as well to creates of knowledge dissemination process between works in both formal and informal situations.

### **5.1.2 What is the Relationship between Knowledge Absorption and Innovation Capability?**

The second proposed hypothesis of my study states that “Knowledge absorption positively and significantly affects the Innovation Capability”. This hypothesis is accepted because according to table 4.4 the p-value is lesser than 0.01 and there is no zero between the values of LLCI and ULCI which demonstrates that the link

between these two variables is significant. The value of SE i.e., 0.046 suggests that the knowledge absorption will bring a change of 4.6 units in innovation capability. It means that with every one unit increase in knowledge absorption, project performance will increase by 4.6 units. A positive value of SE indicates that if knowledge absorption will increase, Innovation capability will also increase. According to existing literature, we reach this point and the study conducted by Liao in 2008 also recommends that knowledge absorption capacity has a significant and positive effect on innovation capability.

And thus, according to this statement and scenario, we realize one thing the capacity of an individual or an organization of knowledge absorption has an important role in the improvement of the innovation capability.

In other words, we can say that how many levels of capacity of knowledge absorption will increase the this will increase the capability of company's innovation. This thing is also proved by the research conducted by Cohen and Levinthal in 1990 and Nodari et al., in 2016 that increment in absorption capacity of knowledge will have a beneficial effect on the improvement of innovation. The same concept is also given by Muskat & Deery in 2017 through their research results which were performed by them during research conduction that the capacity of any employee/organization of knowledge absorption has a very important role to predict the capability of any organization which is also stated by Henttonen et al., in 2016.

Other researchers named Sulisty and Siyamtinah also found this result by the research conducted in 2016 that innovation capability also has an impact on the improvement of the employee's performance. In this regard, Battor and Battor also did efforts in 2010 for finding results, and they also found that the high-level capability of the company's innovation will definitely improve the performance of the company.

Similarly, the same results obtained by Li et al. in 2011 through research conducted by them that on higher side knowledge absorption capacity will surely improve innovation performance to the higher side. Because gained Knowledge of employees from external and internal sources is a very valuable and costly knowledge asset

for an organization. Therefore, nowadays most firms are investing their resources and efforts to improve their knowledge assets to maintain their sustainability in the market.

An argument also profound by Liao et al. in 2011 that the knowledge, especially when knowledge is obtained by the interaction with other external organizations, then the thinking ability of the employees or organization will also increase. According to these phenomena, we can say that the knowledge can be gained from inter-organization or intra-organization as well, and there is existence is essentially needed of major three aspects which are the (mutual trust, interaction among members, and the mental capital) for the achievement of innovation.

Through these aspects, we can know that the absorption of knowledge has an effective impact on the innovation capability of an employee or organization. Similarly, by the study, we recognized the fact that a good knowledge absorption by an employee being a capital for sharing this knowledge with other employees will enhance their innovation capability.

In any firm the Employees who are by personality and by nature always using a variety of information sources, new knowledge, and new information actively will definitely easily absorb more and more new knowledge which impact will appear on innovation capability either on product innovation, process, service or on administration.

This fact was also proved by Muskat and Deery in 2017 by their results which support the findings that knowledge absorption has a significant and positive effect on innovation.

### **5.1.3 What is the Relationship between Innovation Capability and Project Performance?**

The third proposed hypothesis of my study states that “Innovation Capability is positively and significantly related to Project Performance”. This hypothesis is supported by the conducted literature review and is also accepted by the results that are displayed in chapter 4. According to table 4.4, the p-value is 0.00 which

is less than 0.001, and accordingly, if we look at the values of LLCI and ULCI there is no zero between the 2 values i.e., 0.145 and 0.327 which means that the relationship is significant and the value of SE 0.046 suggests that innovation capability will bring 4.6 units to change in project performance. It means that with every 1 unit increase in innovation capability the project performance will increase by 4.6 units.

The positive value indicates that with an increase in Innovation capability, project performance will also increase. As per other researchers, and as per the existing literature study, we reach this thought that the ability of innovation plays an important role in being a driving force in improving the performance of any organization. The Companies which want to improve their innovation performance, it is important for them that they must have innovation capability. Because the capability of innovation is the ability to develop, respond and complete the development of new products of other competitors according to the market and customer's demand and similarly respond to the technological promotions and enhanced activities undertaken by other competitors of the market. And in the same sense, we can say that the capabilities of innovation being an important driving force improve the project performance also. The study by Tsai and Tsai (2010) found that which can demonstrate in these words that a very high innovation capability asset within the company will improve and enhance business performance / Project performance/organization's performance.

The research conducted by Sulistyono and Siyamtinah (2016) also concludes that innovation capability affects very closely the improvement of employee's performance and at the same time the project performance also. Battor and Battor (2010) also narrated after their research's results, that the higher company's innovation will improve and enhance the project performance positively. All the results also showed and support this thought that innovation capability surely has an important positive and significant impact on project/employee / organizational performance. Now we realize one thing that the organizations which are always explored and reuse externally absorbed new ideas, new methods, new ways, and new techniques will complete the work with advanced and new processes and products which will give a good impact on employee performance and organizational

performance as well.

If we talk in the context of individual employees, then we reach this point that the higher level of the capability to generate and introduce the new ideas, new methods, and techniques will definitely produce good and unexpected quantities of work according to or more than to established standards, with a more efficient and effective way, achieving the standard and timely quality and timely completion.

#### **5.1.4 What is the Role of Innovation Capability in the Relationship between Knowledge Absorption and Project Performance?**

My fourth hypothesis of the study states that “Innovation Capability mediates between Knowledge absorption and Project Performance”. This hypothesis is supported according to the results of the analysis conducted in the previous chapter. The effect of knowledge absorption on project performance indirectly via innovation capability is significant and positive as bootstrapping values in Table 4.5 (i.e., BOOTLLCI= 0.098 and BOOTULCI= 0.295) of indirect effect doesn't have a zero between them. And accordingly, both values are positive which confirms that there is mediation in the model. According to Andrew F. Hayes (2016), mediation can exist between the independent variables and dependent variables even if the direct effect among these variables is insignificant. The research conducted by Sulistyono and Siyamtinah (2016) also concludes that innovation capability affects very closely the improvement of employee's performance and at the same time the project performance also.

#### **5.1.5 What is the Impact of Organizational Culture Upon the Relationship between Knowledge Absorption and Innovation Capability?**

My fifth hypothesis of the study states that “Organizational culture moderates the relationship between knowledge absorption and innovation capability such that increase in organizational culture will strengthen the relationship”. This hypothesis

is not supported.

According to the literature review conducted for the study, it was proposed that the organizational culture will support the knowledge absorption of an employee or organization but after results found by the testing of model 1, I recognize that the knowledge absorption is a self-ability of any employee or organization weather that organization like to achieve or not but the organizational culture does not affect the knowledge absorption but on the relationship of the knowledge absorption and innovation capability it affect and give the strength to this relationship because if the organizational culture will support then the innovation capability of any employee or organization will increase, therefore in the situation of the relationship between knowledge absorption my results say that the organizational culture is not significant but for the relationship of both variables knowledge absorption and innovation capability this mediator has its significance.

But according to the findings of my study, we come to know that the values of LLCI and ULCI are -0.058 and 0.087 respectively which indicates that a between these two values. Along with that p-value also show the insignificance of the moderator because in my case the p-value is 0.698 which is greater than 0.01. this means that our results are not in line with the literature review that we conducted.

One of the reasons on which this hypothesis is rejected can be that I collect my data from such kind of organizations where the organizational culture does not support or encourage the new knowledge absorption practice and innovational behavior, Therefore, may be the employee of those organizations could not understand my questions clearly or may be give their response in not supportive manners of organizational culture.

## 5.2 Theoretical Contribution

My study contributes to the literature by discussing the link between knowledge absorption and project performance. According to the findings of the study, the link between knowledge absorption and project performance is significant. In addition to that organizational culture was considered as a moderator and Innovation

capability as a mediator. But unfortunately, the organizational culture is not a significant moderator for this link. So my study will contribute in the literature as a theoretical contribution, that it will help the organizations to understand the significance of organizational culture, May be I think so that I choose such kind of organizations which have not understanding this practice so that my this hypothesis not supported.

### **5.3 Practical Implications**

My study can help an organization in different ways. As I have already mentioned that project-based organizations in Pakistan need to focus on their human resources so that they can manage them effectively. My study will help organizations especially the human resources department in evaluating employees. Along with that, the findings of this study can help organizations in the recruitment of employees, by their abilities of knowledge absorption and innovation capacities.

Therefore, this study can help in proper management of employees, it can help organizations in the recruitment of employees, it can help in the evaluation of employees, it can help organizations in managing their projects more effectively, it can help in increasing productivity of the organization, and it can help in completing projects in time.

Management of human resources in an organization is of extreme importance. If the human resource in an organization is managed properly it can help in the successful completion of the project. Similarly, successful management of people in an organization can also help organizations in achieving their strategic objectives. Our research is focused on behavioral and social aspects of project management, with help of this research organizations can understand the personality traits of employees, their attitude towards innovation, and in getting them more engaged in their work which ultimately leads to the successful management of human resources in project-based organizations.

Every project is different from other projects, meaning that every project has its own human resources requirements because of which in every project different,

strategies policies, and procedures are used for managing human resources. This study can help in the development of such policies and procedures that can help in better management of people in a project. In this fast-moving world, there is a need to hire workers that are qualified and have the required skills to complete projects on time. So, the importance of human resource management is increasing continuously specifically in the field of project management. Organizations nowadays are putting a lot of their focus on successful projects. Accordingly, a lot of research is now focused on innovation by the new external knowledge absorption in projects. Similarly, this research is also focused on behavioral and social aspects of project management and employees as well.

We have discussed earlier that employee who is high in knowledge absorption and is more involved in innovation leads to an increased level of project performance.

In this regard, organizations should focus on developing personality traits of knowledge absorption in employees and should provide them with resources through the organizational culture that can motivate them in increasing their innovation capability and prepare them for the competition of the external market and meet the quality of their product as per customer new demands.

which will ultimately lead to more success. Along with that organizations should focus on recruiting employees who have a high-level ability of knowledge absorption. Organizations should make a comfortable environment and develop a culture that promotes innovation capability, this can be done by increasing the number of job resources for employees and through the training of their employees regarding knowledge absorption. Furthermore, organizations should evaluate employees and they should give them constructive criticism in this way employees will feel motivated and will be more engaged in their work.

Organizations can communicate with employees regarding the issues and challenges they are facing in projects and should encourage them to make physical and cognitive alterations which can lead to innovation and good performance. Organizations should tell employees about the characteristics of the job which will help them in getting motivated for their work and can lead to work engagement. Project-based organizations can implement similar activities which will help them

in getting project managers and teams more engaged which will lead to success in projects. By doing this organizations can increase their productivity which can ultimately lead to profit maximization.

## **5.4 Limitations**

Every study has some limitations because it is not possible to cover every aspect and the same is the case with my research study. My research study has filled a research gap by contributions to existing literature. Some limitations associated with this study are related to the time and resource constraints. The goal of the study was to examine the association between variables in project managers and team members of Pakistani project-based organizations but because of the time constraint, we only managed to gather data of some organizations operating in Pakistan. It was difficult to capture the target population in recent times because of the COVID situation and security reasons. Some of the results of our study were not according to what we anticipated, if we look at previous literature the results were different.

It is also important to add that the current study used the convenience sampling method because of limited time and resources. We used snowball sampling because it was less costly and can be done in lesser time. I calculated data with help of google forms randomly from different project-based organizations of Pakistan. Furthermore, most of the project managers were busy with their project activities, and because of which they were not ready to give data properly, most of the employees responded to questions without reading the statements, resulting in low generalizability of the study as the response rate was very low.

In the future studies can consider the time-lag method to collect data instead of conducting a cross-sectional study. The Time-lag method can give improved results by reducing common method biases. Lastly, we analyzed our data using the SPSS tool, in future research studies can be conducted by using advanced tools for analysis like M Plus or Smart PLS which are used for analyzing complex models in detail.

## 5.5 Future Directions

The research study was carried out to investigate the association between knowledge absorption and project performance with the use of innovation capability as a mediator and the organizational culture as a moderator.

- Future research studies can be conducted with a different unit of analysis.
- Future studies should consider a larger sample size for more accurate results.
- The current study used the cross-sectional method for the collection of the data, in the next research longitudinal study may need to be conducted.
- This research used the snowball technique for data collection, further research can use convenience technique for data collection.
- Future studies can be conducted to check why the impact of moderation is not significant.

## 5.6 Conclusion

My research is focused on one of the most important aspects of project management. A lot of research in the field of project management is now focused on the social and behavioral aspects of the projects. Human resources in a project if managed properly and given essential training can yield results that are beyond expectations which in the long run can benefit organizations immensely. A lot of studies are conducted for discussing and understanding this issue but a wide gap still exists which requires dedication so that concepts can be understood properly.

The previous study was focused on linking knowledge absorption and knowledge sharing to the performance in project settings but in my study, we had tried to inspect the effect of the W variable which is mentioned or introduced above as organizational culture as a moderator on the personality of employees and project performance while considering the mediating effect of innovation capability.

The world in current times is moving at a very fast pace. Things are changing fast because of advancements in technology with that organizations are faced with

challenges that require immediate solutions. And for dealing with these challenges there is a need to manage the resources of the organization properly. One of the most significant resources of any organization is new external knowledge absorption ability so that a firm can meet the customer needs and newly entered market trend and if human resources are managed properly it can help in dealing with issues and challenges in a proper way.

According to the literature review that was conducted knowledge absorption has a direct effect on project management meaning that if the ability of any organization or any employee is very high to identify the new techniques and information from external sources such as other competitors and organizations then definitely this ability will create a charm of innovation in that employee and this thing will increase the project performance when this knowledge will be transformed and assimilated in the organization, and similarly, according to the findings of data analysis the relationship between knowledge absorption and project performance is significant about which I have discussed earlier in this chapter.

Not only the direct effect was significant the indirect effect was also had a significant result as per my analysis, and the relation between the knowledge absorption and innovation capability was also significant according to the given responses of project managers in Pakistani project-based organizations.

Which is also supported by the literature review. Accordingly, the findings and analysis result, the relation among innovation capability and project performance were also significant according to responses given by the project managers working in Pakistani project-based organizations which is also supported by literature review because definitely when the innovation ability will be high then the project will succeed d successfully.

According to the findings of data analysis, Innovation capability can mediate the relation in between knowledge absorption and project performance which is also accepted in the literature review and has proved as significant. This means that the indirect effect of knowledge absorption through innovation capability is significant on project performance as per the project managers' thoughts working in Pakistani project-based organizations.

Furthermore, according to the findings of my study effect of moderator i.e. organizational culture on the relationship in between knowledge absorption and innovation capability was not significant as per my result's findings because knowledge absorption is a self-identification and interest ability and when anybody or firm has this ability then definitely that person and firm will have the innovative thought and this interest will bring an innovation So, therefore the organizational culture has no effect on this ability as I have discussed above in my analysis chapter.

Which ultimately tells us that moderated mediation doesn't exist in our model. My study and results highlighted that if the knowledge absorption ability of an individual or a firm is provided with proper resources, then that firm innovates things to increase its performance and successfully track itself. But if proper resources are not provided it can make innovation difficult for employees and the firm as well which will lead to an increased turnover rate that can damage organizations in the long run.

All these findings of my study can help the management of project-based organizations in properly managing project employees by getting to know about their traits, behaviors, norms, etc. it can help a firm in hiring employees by identifying their abilities to find out and assimilation the new things in their firm and who can help the organization in the long run. It can also help researchers and students in increasing their existing knowledge about variables, and it can help scholars in future research.

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# Appendix-A

## Questionnaire

**Dear Respondent**

I am a student of MS (Project Management) at Capital University of Science and Technology Islamabad. I am conducting fact-based research on the **“The Effect of Knowledge Absorption on Project Performance with Mediating Role of Innovation Capability and Moderating Role of Organizational Culture”**. For this purpose, I need your valuable feedback. You are requested to please spare some minutes. I assure you with complete confidence that this data will remain confidential and will not be used for anything other than academic purposes. It will never be shared with anyone. You need not mention your name.

Sincerely,

**Tayyab Mahmood,**

**MS (PM) Research Scholar,**

**Faculty of Management and Social Sciences,**

**Capital University Science and Technology, Islamabad.**

## Section 1: Demographics

Gender	1- Male 2- Female
Age(years)	1 (18-25), 2 (26-34), 3 (35-44), 4 (45-above)
Qualification	1 (Graduation), 2 (Master), 3 (MS/M.Phil), 4 (PhD)
Experience in Project Management (Years)	1 (1-5), 2 (6-10), 3 (11-15), 4 (15-above)

Please respond as per your situation while working on projects. Tick one option.

## Section 2: Knowledge Absorption

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

Sr. No	Questions	1	2	3	4	5
1	Our project has frequent interactions with corporate headquarters to acquire new knowledge	1	2	3	4	5
2	Members of our project regularly visit other units/departments	1	2	3	4	5
3	We collect industry information through informal means (e.g., lunch with industry friends, talks with trade partners)	1	2	3	4	5
4	Our project periodically organizes special meetings with	1	2	3	4	5
	users/customers or third parties to acquire new knowledge	1	2	3	4	5

5	New opportunities to serve our clients are quickly understood	1	2	3	4	5
6	Our project regularly considers the consequences of	1	2	3	4	5
	changing market demands in terms of new products and services	1	2	3	4	5
7	Project members record and store newly acquired knowledge for future reference	1	2	3	4	5
8	Our project team quickly recognizes the usefulness of new external knowledge to existing knowledge	1	2	3	4	5
9	Project members hardly share practical experiences	1	2	3	4	5
	(R)	1	2	3	4	5
10	We laboriously grasp the opportunities for our project from external knowledge	1	2	3	4	5
11	Our project periodically meets to discuss the consequences of market trends and new product development	1	2	3	4	5
12	It is known how activities within our project should be performed	1	2	3	4	5
13	We constantly consider how to better exploit knowledge	1	2	3	4	5

### Section 3: Innovation Capability

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

Sr. No	Questions	1	2	3	4	5
1	The external knowledge increases the innovation capability of the employees.	1	2	3	4	5

2	The innovation capability enhances the project performance.	1	2	3	4	5
3	In our organization, the people are doing concentrates to improve their innovation capability for excellent performance.	1	2	3	4	5
4	The organization's success directly depends upon the innovation capability.	1	2	3	4	5

## Section 4: Organizational Culture

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

Sr. No	Question	1	2	3	4	5
1	The Policies and the organization structure in our organization have been clearly defined.	1	2	3	4	5
2	In our organization time and punctuality are highly valued.	1	2	3	4	5
3	Around here there is a feeling of pressure to continually improve our personal and group performance.	1	2	3	4	5
4	In our organization when you are on a difficult assignment you can usually count on getting assistance from your boss and colleagues.	1	2	3	4	5
5	In our organization, people are proud of belonging to this organization.	1	2	3	4	5
6	I have significant autonomy in determining how I do my job (self-determination 1).	1	2	3	4	5

7	People in our organization are giving more ideas, information, feedback on customers, products, services, etc	1	2	3	4	5
8	In our organization trusting and friendly relations are highly valued.	1	2	3	4	5
9	In our organization people voluntarily own up their mistakes	1	2	3	4	5
10	In our organization, people take the initiatives and also preventive action on most matters.	1	2	3	4	5
11	In our organization people are always working together to solve problems with team spirit.	1	2	3	4	5
12	In our organization communication is used as an	1	2	3	4	5
	effective way of getting relevant feedback and critical information for corrective action.	1	2	3	4	5
13	In our organization leaders plan the tasks, distribute assignments and supervise the work on the organization.	1	2	3	4	5
14	In our organization supervisors are more concerned with maintaining good relations with their subordinates.	1	2	3	4	5
15	In our organization innovation or change is mainly initiated and implemented through highly result-oriented individuals.	1	2	3	4	5
16	In our organization as people know their boundaries, they respect the decisions once taken jointly by a senior and junior colleague on delegation.	1	2	3	4	5

17	In our organization, a mistake by a subordinate is treated as an experience (by the boss) from which lessons are learned to prevent failure and improve performance in the future	1	2	3	4	5
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## Section 5: Project Performance

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

Sr. No	Questions	1	2	3	4	5
1	Projects are completed on time.	1	2	3	4	5
2	Projects met budget requirements.	1	2	3	4	5
3	Projects met expectations.	1	2	3	4	5
4	Project team members are satisfied to work together.	1	2	3	4	5
5	The benefits of projects to the organization are high.	1	2	3	4	5
6	Projects helped the organization to increase market share.	1	2	3	4	5
7	Projects helped the organization improve its competitive position.	1	2	3	4	5