

**MS RESEARCH THESIS**

**Impact of Project Execution Planning on Agile Project Success, A study of the  
Information Technology Projects in Pakistan**

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**“Impact of Project Execution Planning on Agile Project  
Success, A study of the Information Technology Projects in  
Pakistan”**

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# Certificate

This is to certify that Ms. Namra Mubarak has incorporated all observations, suggestions and comments made by the external evaluators as well as the internal evaluators and thesis supervisor. The title of her thesis is: **Impact of Project Execution Planning on Agile Project Success, A study of the Information Technology Projects in Pakistan**

Forwarded for necessary action

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**(Namra Mubarak)**

## **Dedication**

**I would like to dedicate this work to my parents and my siblings.**

## **Abstract**

This research is conducted to analyse the impact of execution planning on agile project success along with information sharing acting as a mediator and organization effectiveness acting as a moderator in the study. This research is particularly carried out to investigate the agile mechanism planning which is usually followed in software industry so the data is collected from 287 employees of software project industries in Pakistan. Results show that execution planning significantly impacts the success of agile projects and information sharing acts on as a mediator in the relationship moreover organization effectiveness is approved to act as a moderator in the described relationship. Theoretical and practical implications are also conferred.

**Keyword:** Execution planning, Information sharing, Organization effectiveness, Agile project success

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# Chapter 1

## Introduction

### 1.1. Background

The role of agile methodology in IT based project success is gaining attention of researchers during the last few decades. The reason for this increased attention can be attributed to the failure of IT projects. This failure is generally because of mismatch between the traditional success factors which don't fit in the IT based projects (Neves, Borgman & Heier, 2017). Figures suggest that failure of IT projects is astonishing 31% IT projects fail (Whittaker, 1999). These factors forced project managers to replace the traditional project management approaches with the agile methodology (Dybå & Dingsøy, 2008).

Agile methods are reported to have more success rate than traditional approaches. It is also underlined in many of the recent researches that upfront planning is not required in agile processes. If there are fixed plans they cause delays, imperfections and dissatisfaction of the employees. It may also result in adding more features as compared to the required ones and many other challenges may be faced during the delivery of a certain kind of product required due to the fixed specifications (Boehm, 1996). So the basic principle of agile project management is not as to plan and then execute it is a shift from this strategy (Adams and Brandt's, 2008).

The agile projects need more planning than the traditional projects as most of the softwares use plan game activity and 42% of the time is being spent on the planning (Koskela & Abrahamsson, 2004). So the unexplored area of the recent studies suggest the need to study whether planning is essential during execution of agile success or not. According to the research conducted related to the planning, it's not about just one layer Planning. It is a multi-level process in agile projects. Generally it consists of different layers including the daily basic plan, iteration plan, release plan, product road map and product vision and involvement of stakeholders for the execution (Smits, 2012). There is so much focus on planning just because it is identified as one of the most important factor for the success of the project. Planning is vital for the success of the project as it is a critical success factor. More emphasis is paid on planning among high risk projects because when we already know that some project is of high risk we focus on its planning more than the low risk projects (Zwikael, Pathak, Singh & Ahmed, 2014). Most of the IT projects are of high risk because of the innovative technology and new advancements in the IT industry.

Projects can't be executed on just one pattern mostly the projects which are using agile technique need to change their planning or carry out some additional planning because of the changing requirements or some alterations by the customer so these projects need to do execution planning. Evidence is provided by some studies related to the use of execution planning. As it is narrated that rather than traditional upfront planning update of the schedules and all the variations in schedules are altered and met by using execution planning (Solanki, & Southworth, 1991). As it is because of the fact that sometimes it becomes difficult to follow the identified and set plans because the situations don't

remain same for all the time and we need to change our strategies, the way of doing things, integration and customer satisfaction. So we can't stick to the strategic plans defined previously at the start of a project.

Project execution guidelines are being widely used as course of action in many of the business processes. Many of the new situations and demands enter into the systems which need to be dealt with so that the emerging customer demands could be accomplished well (Wu & Issa, 2014). Such systems should be created which could meet the demands entering into the system. For this purpose an execution plan is generated by collaboration with the customers to comply with tasks and machine capabilities (Rajan & Nof, 1996). In each of the iteration we collaborate with our customers, stakeholders and team. After collaboration as each time we come up with something new that's why strategic planning is changed towards the execution planning so that proper implementation could be done to satisfy all the involved parties and to create successful project and company profile.

After proper execution planning the next step narrated is to communicate this plan to the whole team so that the plan could be properly understood, ready to meet the competitive advancements and adapt changes in the system. As per recent studies the planning information is shared among the team who would then execute that plan. Sharing of the information affects the performance in IT projects (Ye & Wang, 2013).

In another study the impact of information sharing was significantly proven to increase performance of supply chain. Increase in the level of information sharing results in efficient performance (Zhou & Benton, 2007). It is furthermeore investigated that level of information which is being shared vertically and horizontally also matters in efficiency

of the organization. Upward information sharing which includes confidential information sharing and downward information which includes general and technical information both are equally important to increase the improved outcome (Parker & Kyj, 2006). Recently it has been suggested that Companies moving toward agile adoption should consider the factor of sharing information for successful implementation of agile methodology (Santos, Goldman, Martins & Cortes, 2014).

Despite of the fact that pattern of the organization to plan, share information, communicate and execute the processes are different from organization to organization. Organizational effectiveness requires new systems, techniques, methodologies and strategies to modify mental models of employees to handle new demands (Sparrow & Cooper, 2014). Similarly Richard et al. (2009) relates the effectiveness of the organization to the performance of the organization. Organization effectiveness is considered as the most encouraging tool for the success of any organization.

Different organizational work practices of sharing knowledge affect the agility practice in software development industry so it's certainly very much important that affective practices should be employed (Santos, Goldman & De Souza, 2015). It is seen to be a predictor of long term success and affective performance however there are different contexts and situations where organization effectiveness is seen to affect differently (Cameron, 1986).

Literature on Organizational effectiveness inquires its impact on the success of the project and suggests that the organization should assist its employees to inculcate better

performance for affective results in information technology projects (Bryant, 2016). So it should be considered as one of the factors influencing agile project success.

## **1.1 Gap Analysis**

There is a call in recent studies e.g (Serrador & Pinto, 2015) that project planning and its execution needs to be examined with reference to the agile methodologies. Few literature studies dwell upon the fact that customer's demands are changed (Mirchandani & Lederer, 2012). So planning and execution of the projects also need to be revised. The agile approach of execution planning is being followed over the industry practically but it needs empirical evidence and further investigation so that it could be properly followed in the other industries as well.

The studies also identify gap that exact mediating and moderating mechanism that can potentially affect the relationship are also unestablished in past studies. For that purpose this study purposes the information sharing as a mediator and organization effectiveness as a moderator. Luna et al. (2014) suggests that Organization effectiveness aspect still needs to be studied and it was recommended for future research. Ghobadi (2015) narrates that there is a dearth of literature in this domain and suggest that there is a need to study impact of knowledge sharing in software development projects as well which are more diverse and using new technologies

It's been a long journey and many of the researches are conducting research in the project field since long. There is huge amount of literature found on the success factors of any project but there is little evidence of studies conducting research related to success of any

project in Pakistan so still there is a need to fill this gap (Iram, Khan, Ahmad & Sahibzada, 2017). In a latest study in which cause of delay of hydro power plants was studied it was identified that better planning is needed for effective project management in Pakistan similarly many of the aspects are still unexplored for successful implementation of projects in Pakistan (Batool, & Abbas, 2017). Pakistani industry is still following the traditional ways there is still a huge gap to investigate further causes (Ullah et al. 2017).

### **1.1 Problem Statement**

Agile success is an important aspect of project management; it addresses and gives a new and effective direction to all those failed methodologies and practices traditionally followed for the project planning and execution. Still there is a question mark that which projects mostly succeed the one following the traditional methods or the one following the latest agile methodology. Many consider the agile methodologies to be the best to be followed but what lacks is the empirical evidence to this approach and many unhidden aspect related the methodology. Along the rapid exploration of this topic the studies generally ignore its role at project execution phase, this gap still remains unexplored. In addition the exact mechanism through which project execution phase affects agile success is also unclear, hence we propose a mediating mechanism through information sharing. In addition the moderating role of organization effectiveness is also being tested which is still under charted. So this would tell us whether agile can work well without upfront planning and how planning is important during execution, how information

sharing and organization effectiveness impacts agile project success how much importance should be given to these.

### **1.1 Research Question**

The On the basis of the stated problems, the present study is indented to find answers for some questions, brief summary of the questions are as follows;

*Question 1:* How execution planning affects agile project success?

*Question 2:* What is the importance of information sharing toward agile success?

*Question 3:* How organization effectiveness affects the agile success?

### **1.1 Research objective**

The General objective of the study is to develop and test projected model to explore the relationship between planning during execution, information sharing, organization effectiveness and success of agile projects. The Organization effectiveness is further considered as the possible moderator for the relationship of the mentioned variables in the research model ( Execution planning, information sharing, agile success).

The precise objectives of the study are stated below

1. To explore the relationship between role of execution planning and success of agile projects.

2. To explore the relationship between execution planning and agile success through information sharing.
3. To examine the moderating effect of organization effectiveness on the relationship of planning and agile success.
4. To examine the effect of information sharing on the success of software development project who use agile methodology.
5. To test empirically and establish the proposed relationships in the information technology projects of Pakistan.

### **1.1 Significance of the study**

This study not only adds up to the theoretical content related to project management but it also investigates about practical implementation the agile methodologies. Study provides evidence on the cause that It would help to understand whether there is need to focus on planning phase of the project or the planning should be conducted along the execution phase by keeping in touch with the customers and sharing the planned information with the employees by sharing information. This study provides insight and a new direction toward agile project management by investigating the hidden aspects and ways to do and conduct a project successfully. It would be worldwide beneficial research because most of the traditional approaches are now being considered outdated due to which many of the projects these days are failed. Most of the Pakistani projects are failed or they face cost overrun etc to investigate the underlying cause this study will help the managers to understand and how and when planning should be conducted and what is the importance

of sharing information among employees on a particular aspect so that right amount of information could be delivered to get the desired results.

This study also throws highlight on how the organization structures and effectiveness affects the overall success of any project. Moreover it encourages the companies that are still following the traditional approaches to adopt agile methodology for execution of their projects. The synchronized planning directions are also narrated which would help to streamline the working for agile methodology implication. As many of the IT projects are being launched in Pakistan by foreigners and local business investors rapidly so this research can help them to identify the best ways to execute their software projects and produce beneficiary outcome in return causing economy boost and increased revenue of the company. Despite of the fact that execution planning and information sharing are very much important for agile success it has been found that different types of organizations have different ways to conduct projects. It is not only about the methodologies and techniques used in the projects it also depends on the efficacy of the organization that how effectively they use such methodologies and what are the performance patterns in different scenarios. On the other hand it encourages researchers to find out other aspects which are still unexplored because it is totally a new field and calls for research which could be fulfilled in this domain.

Furthermore agile methodologies are not only being used in the software IT projects they are also being used in other areas as well so their methodologies can also be extended to other lines other than the software projects e.g. vehicles, medical, food clothing, music and many others because shift these days encourages to be more customer focused and customized rather than the fixed products so this study is also applicable on other fields

of interest. Additionally some of the principles of agile are also found to have an impact on other business strategies so this novel for the project based and other organizations as well.

## **1.1 Supporting theory**

Several underpinning theories support the model of this research paper like agile governance theory, agile theory of general relativity, theory of constraints, Archives, Theory of coordination in agile software projects, Chaos theory in software projects. The best fit to this research model is agile governance theory which covers all the variables studied in this research paper.

### **1.1.1 Agile Governance Theory**

Agile governance is comparatively an emerging area in the field of IT projects which mainly focuses on the performance of the organization. The theory was represented by Luna (2015) presenting constructs, its laws of interaction, its boundary-determining conditions, and its system states. *Agile governance* can be defined, as: “*the ‘means’ by which strategic competitive advantages ought to be achieved and improved on the organizational environment, under an agile approach in order to deliver faster, better, and cheaper value to the business.*” (Alexandre, Kruchten & Moura, 2013).

In light of the aspects highlighted in the theory, governance is a vital part of agile IT projects and mainly consists of three dimensions. The first dimension stated in the theory

is planning of the project which is the independent variable of current study. Improving the governance of the systems produces better economic results (porter, 1985). Most of the companies are moving toward usage of agile methodologies governed by the agile governance theory otherwise they face challenges (Barton, 2013). Agile governance theory indicates that the proper planning and integration of the systems so that today's challenging requirements could be met. It is impossible to meet the user requirements without using the agile techniques because of the rapidly changing requirements.

According to the six Meta principles proposed in the theory the level of governance is adopted according to the organization context which illustrates that organization effectiveness affects the agile project ability. Competitiveness in the organization can only be met by good governance. There are a rare number of organizations who have yet succeeded to deploy the agile methodologies proved by many theories (Qumer & Henderson-Sellers, 2009). But it's the need of the hour to apply agile governance strategies. Many of the organizations have succeeded by applying agile governance strategies. Similarly information sharing is vital to meet the requirements of the emerging customer demands and complex IT project situations. According to Pardo, Gil-Garcia & Luna-Reyes (2010) collaborative governance and information sharing both are necessary to meet the changing IT situations. According to the Xu, Zhu, & Liao, (2011) organization context is the main factor affecting effectiveness and practice of information systems. So this theory covers all the variables which are to be studied and need further investigation.

## Chapter 2

### Literature Review

#### 1.1. Execution planning and agile success

Project planning is narrated as a part of project management, which relates to the use of schedules such as Gantt charts to plan and subsequently report progress within the project environment (Kerzner, 2013). The outputs of the project planning phase include the project requirements, the project schedule, and the project management plan (Filicetti, 2009). This definition of project planning is used because we would explore that how we are moving from the traditional planning approach toward the execution planning where we need to plan the procedures and systems according to the changing demands at each iteration phase.

Agile is the Capability of surviving and prospering in competitive environment of continuous and unpredictable change by reacting quickly and effectively to changing markets (Cho, Jung & Kim, 1996).“It advocates adaptive planning, evolutionary development, early delivery, and continuous improvement, and it encourages rapid and flexible response to change.” (Alliance, 2006).The purpose of choosing this definition is that it includes the independent variable of this research i.e. adaptive planning which is being studied as execution planning in this study. So definition is advocating that most of the projects using the agile methodology start with the proper adaptation of planning by the word adaption it’s obvious that strategic plans are not the plans to be followed. In agile methodology we need some planning after collaboration with the customers that

could be execution planning after each iteration for successful implementation of the agile methodology.

Agility is considered to be a coin shifting from traditional approaches toward those ones which are rigorous responses of the change and adopt to customer requirements (Zain, Kassim & Mokhtar, 2003). As agility is to respond to changes it is impossible for the organizations to work with the forward planning. It should be adaptive at intense speed to respond to changes (van der Vyver, Koronios, & Lane, 2003). In order to respond to complex market environment this need was felt that companies should move toward the agile methods in order to compete the global world (Morris & McManus, 2002).

Agile value for software can't be achieved by extensive documentation and previous projects. It can be a starting point to build up software but it can't lead you towards end because it would lack the knowledge about the existing technologies (Noor, Grünbacher & Hoyer, 2008) Responding to customers by following a strict plan is very difficult. Following such plan can only be followed by collaborating with the customers as its making the plan flexible i.e. not exactly a step by step approach to be followed (Noor, Rabiser & Grünbacher, 2008). Agile methods focus on a shift from upfront planning to agile methods (Dingsøyr & Moe, 2014). Likewise Conforto & Amaral (2010) Evidenced that agile methodologies are being used for planning along with the traditional standardized methods which were being used since the project management emerged because it was seen that success can only be achieved by keeping in mind the reality based feedback.

Importance of planning can be identified from the fact that along other crucial aspects required to be kept in mind planning is one of the main factors in success of agile methodology (Fry & Greene, 2007). One of the goals to successful agile practices is project planning which includes plans schedules estimations values and collaboration with the customers through story card. As the story cards are written by the onsite customers so it is ensured that customer responsiveness is being kept in mind (Patel & Ramachandran, 2009). Planning is valued but the bitter reality is something else, following a plan exactly can be very much counterproductive in agile projects (Neo & Chen, 2007)

Plan is considered to be a basic key element for success but planning for a change is quite different from strategic plans it needs continuous planning which can only be done by continuous collaboration with the customers. Response to customers is greatly linked with the collaboration and greater emphasis is being given to the plans which are responsive because agile methodology is all about iterations and customer collaboration (Paulk, 2002).

In product line engineering planning is much essential to achieve agreement of the decisions but it is important on the other hand to meet up the current emerging requirements along with collaboration with developers and maintainers (Dhungana et al., 2006). Planning is hard, many of the agile planners can't plan entirely at the start of the project. Many agile planners allocate some of the time for the allocation of iteration planning to be done for responding to change regardless of the previous plan made at the starting of the project (Leffingwell, 2010).

This fact should be accepted that market is unpredictable there are rapid changes which occur in the market and these factors are controllable and should be responded. Changes in the market limit the company's capability to follow the planned state (Zaeh, Möller & Vogl, 2005)

Agile methods are negating the use of traditional methodologies and principles which were being used in the older agile market so that customers demand could be in lined with required items. Agile methods present counter arguments than the project management principles which included planning, development, delivery and operations (Coram & Bohner, 2005). In a comparative study between the traditional and the agile methodologies is that the traditional methodologies fail to meet the current customer requirements and the traditional plan driven approaches are insignificant and outdated if we compare it with iterative agile approach (Moniruzzaman & Hossain, 2013).

Regardless of the fact that companies are moving towards agile methodology there may be some organizations which are too large to be run by the agile methodology so these companies need to stick with traditional project management approaches. Chow & Cao (2008) identified project planning as one of the failure factor in agile projects. It has been highlighted by Underdown & Talluri (2002) that only one third of the companies follow their plans and produce exactly the same thing as they planned about. So it's obvious that plans need to be set according to the customers demands. All these empirical evidences suggest that there is no traditional project management plan to be followed in agile methodology for agile projects we need to do abrupt at the spot planning along execution i.e. execution planning.

Counter arguments suggest that strategic planning at the start of the project is the most iconic thing for the success of the any information technology project. Early studies also suggest that Strategic planning is given due importance as it is considered as a key element in long term performance of the organization (Gunasekaran & Yusuf, 2002). Some studies contradict the relationship and state that planning is essential in such projects which are traditional and they don't require many changes when they have to meet customers' demands so it's not must to do proper structured planning for the agile projects but still internalized plans are prepared (Misra, Kumar & Kuma, 2009). Among the success factors identified for the success of the software development projects planning is necessary. Information systems planning is vital for information technology systems success (Peffer, Gengler & Tuunanen, 2003).

Similarly Stefik (1981) throws light on the aspect that structuring of the plans should be considered for the success of the projects. Another study indicates that planning was much helpful in achieving success ( Poister & Streib, 2005). From all these studies it is clear that planning in traditional projects is necessary for success of project but there are no clear studies highlighting the relationship between execution planning and Agile success so from the above studies a novel chapter is highlighted to be studied that what is the impact of execution planning on agile success so on the basis of previous literature this study attempts to develop and test the following hypothesis.

**H1:** Project Execution planning is positively and significantly associated with agile project success.

## **1.1. Information sharing and agile success**

It is the exchange of data between systems, organizations and people (Harvey, Kuhn, Pundt, Bishr, & Riedemann, 1999). Once we have made a plan this information needs to be shared among the team members so that we could properly execute the prepared plan. As per recent definitions and studies the changing environment and behavior of customers vitals the impact of sharing information between customers employees and the planning team. According to Maskell (2001) the most key aspect of agile industry is sharing of information, if the information is not shared success can't be achieved. For this purpose we should continuously keep ourselves in touch with the customers. In another study two dimensions of information sharing were studied connectivity and willingness and it was concluded that both of them lead to the successful performance (Fawcett et al., 2007).

Knowledge sharing is very important in telecommunication organizations and that working on software development projects this is because of the fact that software development projects are diverse, unique and different because they are almost dissimilar from their previous projects. Task related ideas, information, feedback and processes are different from the earlier projects (Cummings, 2004). Knowledge sharing is all about being in constant touch with the customers so that we could meet up the exact requirements at the end, this constant knowledge sharing can only be achieved by constant sessions, collaborations and meet ups so all these collaborations need knowledge sharing to engage with the right amount of knowledge (Pee, Kankanhalli & Kim, 2010).

Whilst of the study conducted by Ghobadi (2015) knowledge sharing derives the software development projects and helps in continues inquiry with the customers related to the

software knowledge. Evidence is found that Scrum methodology which is one of the agile methodology continuously needs to have extensive knowledge sharing and association with the customers because in such methodologies we have to cope up with the changes and share the customer updations (Terje Karlsen, Hagman, & Pedersen, 2011). Despite of the fact that agile methods promise to reduce the project life cycle and are best suited to global change but still there are software industries which are not moving toward the agile methodologies because it was identified that there are some technical and organizational issues including knowledge sharing (Srinivasan, Dobrin, & Lundqvist, 2009).

Effective knowledge sharing is the essence for the success of the agile projects as the agile project needs to have continuous customer alliance and every team member needs to communicate and collaborate with each other to ensure effective collaboration between the team members and the customers (Dorairaj, Noble, & Malik, 2012). Similarly it is seen that knowledge and social interaction increases performance of the project (Ryan & O'connor, 2009). Agile methodologies and processes were seen to be influenced by knowledge sharing and ways to do so (Neves, Rosa, Correia & de Castro Neto, 2011).

It is evidenced that knowledge sharing is seen to be a complex thing in agile software development and there are many barriers identified among them. The main barriers identified in the study were communication, project coordination and capabilities of the team. We need to bridge the communication gap to eliminate such knowledge sharing problems (Ghobadi, & Mathiassen, 2016). The results that we want at the end by eradicating such barriers is success, Kavitha & Ahmed (2011) identified that success is all about extracting creating and embedding knowledge. One of the vital element of

knowledge management is knowledge transfer in agile software development teams. Agile mainly admires the need of face to face communication to remove barriers toward the agile methods and software development.

Software development team's success is about knowledge intensive activities these can't be succeeded without effective knowledge sharing (Crawford, Castro & Monfroy, 2006). There is no single worker who has all the knowledge required for the development of the software development needs so there is a strong requirement to continuously share the knowledge required to fulfill a task (Chau, Maurer & Melnik, 2003). If we compare the traditional and the agile methodologies we come to know that agile methodologies certainly need less documentation as compared to the traditional approach so agile methodologies lead to informal communication in order to enhance effective knowledge sharing with a crucial influence on customers changing demands (Beck et al., 2001). In agile teams collaborative platforms are used in order to share knowledge (Holz & Schafer, 2003).

Dessai, Kamat & Wagh (2012) provided a solution to track the knowledge required for commencement of the agile methodologies. In order to enhance knowledge and collaboration author proposed that social media can be used for access to the emerging tacit knowledge in order to respond to quick changes and design responses accordingly. Matter of knowledge sharing in agile processes is more toward tacit knowledge rather than the explicit knowledge that relates to documentation and formal sharing (Melnik & Maurer, 2004).

Software development projects are trying to find out the innovative ways in order to ensure success of the agile projects. As the main element of the agile i.e. communication solely depends on the collaboration so in order to enrich the collaboration among the team and customers, teams need to find out the ways in order to enhance knowledge of the agile team and gain success (Razzak & Ahmed, 2014).

Moreover Rejab, Omar & Mazida Ahmad (2011) identified the knowledge sharing activities in one of the agile methodology technique through the process of socialization, internalization and combination. As according to Fengjie, Fei & Xin (2004) Knowledge sharing comprises of dual parties i.e. the contributor and the receiver, contributor provides the part of his knowledge that he has and passes on to the other party i.e. the receiver who receives the information that is required to complete the project. This is same as the process which is used in pair programming (One of the agile methodology) of where the contributor is navigator and receiver is driver. Navigator will continuously assist the receiver.

In pair programming process (One of the agile methodology) the knowledge is shared among the navigator and receiver. In agile methodologies there is a need to transfer knowledge from one end to the other. Multiple stages are involved in order to transfer knowledge effectively. (Chau, & Maurer, 2004). A strong relationship was found between the agile methodologies and the effectiveness of knowledge sharing, agile methodologies are fostering interaction and standard communication strategies by the use of knowledge sharing among the project teams. (Santos,Goldman, Martins & Cortes, 2014).

Agile methods derive knowledge sharing through face to face interactions (Boden, Avram, Bannon & Wulf, 2009). Still there are many hidden aspects related to knowledge sharing in agile software development projects (Terje Karlsen, Hagman & Pedersen, 2011). Beside all these facts it is noticed that some agile software projects use tagged emails to share knowledge which is fruitful for successful collaboration and crystal image of the customer's requirements and to gain insight about the software projects clearly (Sohan, Richter & Maurer, 2010).

In another study knowledge sharing is identified to be a factor which can lead to the success of the agile projects, knowledge is not reclined it is shared among the team members as well in the offices. Shared space is used to foster knowledge creation but it is not an easy task to create and share knowledge. Distributed team members rely on codification in software development projects (Razzak, Ahmed & Mite, 2013).

Degree to which the information is shared among the buyers can help to attain performance in diverse ways i.e. usage, output and flexibility (Yigitbasioglu, 2010). They would be aware of the product specifications in advance which means that you have achieved success along the completion process. There are many counter agreements as well which contradict the above studies and acknowledge that sometimes limited amount of information is shared for success of the projects (Fearne & Hughes, 1999).

Thus following hypothesis can be proposed from the above studies

**H2:** There is a positive association between information sharing and agile success



### **2.3. Execution planning and information sharing**

It is the exchange of data between systems, organization and people (Harvey, Kuhn, Pundt, Bishr, & Riedemann, 1999). Once we have made a plan this information needs to be shared among the team members so that we could properly execute the prepared plan. The utmost requirement of any successful system is to collect the information regarding a particular system, technology etc and create our own planning by keeping in mind the strengths and weaknesses of our system. According to Mikurak (2006) information related to the business entity is gathered and then it is planned and analyzed.

Due to changing business requirements, systems need to be changed and reengineered to meet the dynamic consumer requirements and technology changes for such purpose collaborative planning is necessary which can be achieved by sharing information from different systems and users (Sherman, 1998). So planning should not be only at the upfront level it also needs to be updated and performed during the execution of project in collaboration with the consumers.

In improved planning and budgeting model it was analyzed that the first step is planning and financial analysis of the system while the second step is to enlist and arrange the planning activities while the third step is sharing of the information and the fourth step is analyzing ( Kovács & Paganelli, 2003).

In order to get the appropriate results and effective collaborative planning it is very important aspect that participants should perform some pre defined set of activities so that for better planning information could be shared all the way through these activities (Verheij & Augenbroe, 2006) because information sharing highlights the risks of the

project and helps the management to resolve those issues which could be crucial for the project (Karadsheh, Alhawari, El-Bathy & Hadi, 2008).

The data integration model presented by Ball, Ma, Raschid & Zhao (2002) shows that data exchange also takes place during execution planning along with the other information technology components. For sharing of the data at data level all the sources of sharing information should be properly connected. D'Amours, Montreuil, Lefrancois & Soumis (1999) highlighted different planning models of make to order cases and they enlisted how information sharing will work through these processes and how the information would be exchanged. They further highlighted the impact of information sharing on schedule and designing. Different models were proposed and it was analyzed that information sharing enhances networking decisions, scheduling and the overall performance.

According to (Datta & Christopher, 2011) where there was centralized decision making there was no effect of increasing the information flow while planning but where there was decentralized decision making the increase in information flow produced effective results and it was seen that improved planning by streamlining the information systems lead to effective performance and better results. According to SISCO model the different execution actions which are designed are run in parallel along with the effective communication and information flows (Chatfield, Kim, Harrison & Hayya, 2004).

It has also been identified by the previous researches that lack of information sharing leads to misleading inadequate planning which causes inflexible production planning and control (Rupp & Ristic, 2000). If we want to deal with uncertainty and we want flexible

planning in our system and replanning to tackle uncertainty then we require smooth and seamless information systems for effective production (Christopher & Lee, 2001).

In construction projects dynamic planning is done in a way that actual data is gained and simulated for execution this is how information is shared abruptly (Lee, Pena-Mora & Park, 2006). It has been identified in the previous literature that construction and engineering projects have high maturity levels and improved performance because of the effective information systems (Cooke-Davies & Arzymanow, 2003).

Lockamy III & McCormack (2004) studied the supply chain management practices and highlighted that the performance and the decisions in this area depend on the plan, source, make and deliver and it was concluded that planning is the most important factor for the performance and along planning the most important crucial aspect is the process integration and information technology with joint planning and information sharing. Beside the planning perspectives it has also been observed that information sharing decreases the overall cost of the system i.e. almost 47.8% reduction of the system moving from traditional to the integrated flows where information is shared frequently about the systems due to coordinated economic decisions (Sahin & Robinson, 2005).

It has been analyzed that in all stages of the project life cycle i.e. planning, initiation, and execution etc the right amount of information should be shared for the effective understanding and implementation of the processes to achieve efficiency (Martinsuo & Lehtonen, 2007). On the other hand planning strengthens inter organizational information systems (Hadaya & Cassivi, 2007).

Planning is done to meet the demands of the customers and information is shared among the employees regarding the requirements of the customers so that same type of product could be delivered to the end customers (Kaipia & Hartiala, 2006). This way employees produce better results because information regarding any change and requirement results in high achievement and employees participation regarding planned change produces beneficial results (Miller, Johnson & Grau, 1994). Effective planning created shared mental models which result in better performance (Stout et al., 1999).

From above studies it is clear that planning is necessary to share among the employees and to the customers in rapidly changing environment to achieve better performance but there is no such study which investigates the need of planning during execution phase so keeping in mind the above studies following hypothesis can be proposed.

**H3:** Execution planning is positively and significantly associated with information sharing.

#### **2.4. Mediating role of Information sharing between execution planning and agile success**

Agile methodology emphasis on communication and gathering the information regarding requirements and fulfilling the customer's needs and if we don't plan regarding what we want to produce and what we want to achieve at the end, then we won't succeed but according to new trends planning during execution is more beneficial. When we talk about project management the main focus is on the planning of the project because we are going to make something unique and we are uncertain about the success of the product (Chin, 2004). Planning brings together members from varying backgrounds to share information (Verworn, Herstatt & Nagahira, 2008).

Agile methodology is not anti methodology, planning is done in agile methodology projects but planning is not the fool and final procedure and document to be followed. Replanning can be done in agile projects. Limits of planning are kept in mind for agile methodology similarly it has also been recognized that most appropriate way to share information in a agile methodology project is through face to face conversation so that everything between the parties is clear to be followed up ( Fowler & Highsmith, 2001). In a multi agent framework emphasized by (Rabelo, Camarinha-Matos & Afsarmanesh, 1999) different information sharing models are studied and its analyzed that information is very important during the execution of each task and it should be properly scheduled by sharing information.

Its also been tracked that organizational support helps the agile projects to plan and execute such processes in a better way through information steering by providing

coordination and collaboration with the technology. The information system provides information to the users and helps them understand the softwares. During the planning game the requirements are kept in mind (Bowen & Maurer, 2002). Pair programming which is one of the agile method, it's a perfect example of how to effectively share information in agile projects. It has been highlighted that sharing of information has a lot of uses and helps everyone to understand. The system is developed in such way that execution is done in smaller pieces with the task updates so that latest requirements could be met (Lindvall et al., 2004).

To properly understand the interdependency of the software development projects the project team should have mutual coordination and understanding of the planning and execution methods. They should have certain degree of knowledge and experience so that they could do task and risk estimations. They should also be aware of the minor tasks. To effectively use the mutual adjustments there should be proper system to share information with each other through communication and informal ways. There should be well connected social network to effectively share information informally and to cut the cost of communication in agile software development projects (Barlow et al., 2011).

Aligning with the agile manifesto and lean principles it has been highlighted that in agile projects the planning should be done through face to face conversation which can replace thousands of email and cost of communication so the most effective way in agile projects which can lead to project success is sharing information through face to face conversation so that everything which is to be delivered becomes clear both to the team and the customer to whom we have to deliver software ( Leffingwell, 2010). In a CMMI project method among the different steps of the process the first step is planning game through

the iterations along with a step of sharing the information which would be a success of the agile projects. The project is mapped through continues meetings and iterative planning ( Pikkarainen & Mantyniemi, 2006).

In another study it is highlighted that planning helps to achieve mass customization in industry and the amount and quality of information also matters regarding this relationship (Yinan, Tang & Zhang, 2014). Information is the most crucial thing in planning and agile success (Cheng & Choi, 2010). It is very much important for the information technology to stay in touch with the information technology and to communicate it among the employees and to share the information from their customers so that they can invent and launch a product according to the requirements of the customers so IT capabilities are mainly dependent on the information sharing and retrieval (Tallon & Pinsonneault, 2011).

So from all above stated literature it can be predicted that

**H4:** Information sharing mediates the relationship between execution planning and agile success.

## **2.5. Moderating role of Organizational effectiveness between information sharing and agile success.**

Organizational effectiveness is the concept of how effective an organization is in achieving the outcomes the organization intends to produce (Etzioni, 1964). Beside all the factors affecting any system and methodology to be followed in a project there is great impact of organization effectiveness as well, as we are clear by its definition that it helps in achieving the outcomes.

Organization demographic and cultural differences exist among different firms (Chatman et al., 1998). The means and strategies to do different work vary from organization to organization, these are due to control means of organizations management (Smircich, 1983).

As each organization is unique and cultural differences exist in organization. The ways to plan, share information and implement strategies are different from organization to organization. As according to Pettit & Beresford (2009) planning requirements of each organization are different. Due to increased competitiveness among information technology projects there is a need to develop information sharing systems keeping in mind the complex organizational situations (Lee & Pai, 2003). In another study it was identified that agile practices are admired but there are many obstacles to adopting the agile methodology. The impact of the agile methodologies is not considered effective to bring change among the organizations. The obstacles are mainly reported due to the organization and the top management leadership style (Santos, Goldman & Roriz Filho, 2013).

Effectiveness of the organization helps to sustain the business organization to adapt to innovative organizational changes and to adopt the agile methodology technique in the business processes for effective and better performance (Smith, Mills & Dion, 2012). Organization effectiveness is considered to be the most important factor in sharing and creating knowledge among the organization team members and as if all the members would be aware of the processes and customer demand the project will be an ultimate success (Bae & Lawler, 2000). Organization effectiveness is considered to be an influencing factor in sharing of the information in agile projects due to different climatic conditions and situations of the organization.

Effectiveness of sharing knowledge consists of four components. This is done to advocate the frequency of the information that needs to be communicated among the project team (Santos, Goldman, Martins & Cortes, 2014). Organizational changes should be focused for enabling the organization to stimulate the knowledge creation process. There should be continues process of questioning, identifying and responding to changes in the organizations to effectively cope up with the changes emerged in the market. There are few points where the organization needs to be transformed and adjusted to the market scenarios. Kotter & Cohen (2002) focused the need of organizational change as a response to the environment.

Its been reported that bringing change in the organization through agility is the most important breakthrough these days so that the customer collaboration could be increased to achieve effective performance (Ambler, 2012). Studies show that most of the software development organizations cause cost overruns and schedule variances because there are many changes that they have to adopt so the benefit of such methodology is

that customers are more satisfied in information technology projects (Zwikael & Globerson, 2006).

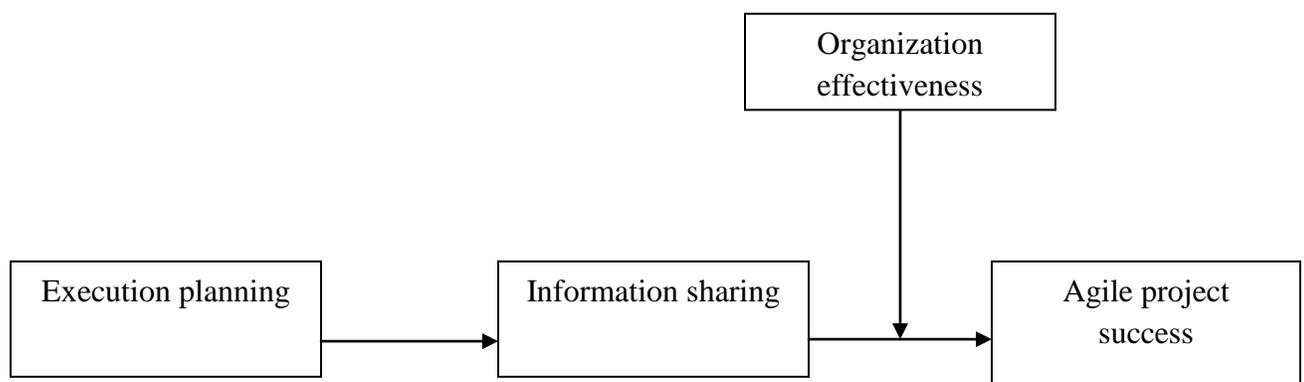
Empirical evidence is provided by Souza (2012) that the more the organization would be rigorous to organizational changes the more it would be enriched by knowledge sharing and it would be more effective to produce better performance of the software development projects.

There are numerous ways by which organizational effectiveness can be improved and in result achieve success. Lawler (1986) throws light on the aspect that increasing the organizations effectiveness by participative approach improves the organizations performance.

On the base of previous literature the present study is attempting to develop and test the following hypothesis;

**H5:** Organization effectiveness moderates the relationship between execution planning and Agile success; such that if Organization effectiveness is high than the relationship between execution planning and agile success would be strengthened.

## 1.6. Research Model



*Figure 2.1: Research Model of Execution planning impact on Agile project success through Information sharing: Moderation of organization effectiveness.*

## **1.7. Literature review summary**

The literatures have shown and support that planning is an essential part of Agile methodology implication beside this upfront planning is not just enough to carry out the execution of agile methodology and achieve success in the projects in which we are actually following the agile methodology because of the abrupt and aggressive market conditions and changing customer demands it is very much important that we should update our plans and redefine them before their implementation especially in the agile methodology. Moreover once we have defined a plan and we have upgraded it according to the customer's demands, the next thing that we have to do is to share the information amongst the team. This practice is being followed not only by the agile methodology projects but it is also evidenced by literature that many other industries and traditional project management approaches consider the importance of sharing information to the team so that they could well understand the task and produce better performance and results. Some of the studies also highlight the importance of sharing information after each iteration so that the new plans and information could be floated toward the team members to produce results. likewise some studies consider information sharing as a gazette to improve performance and quality. Beside this studies consider the importance of organization effectiveness as an important factor to implement the plan, execute it and to share information likewise many consider it as the key element of an organization performance and its importance is also appreciated in agile software projects. If the organization will be effective to run its system and produce beneficial results then the project will be an ultimate success.



## **Chapter 3**

### **Methodology**

#### **2.1. Introduction**

In this section, the methodology is illustrated which is employed to explore the relationship of Execution planning and Agile project success, with the mediating role of Information sharing and moderating role of organization effectiveness. The methodology chapter contains research design covering all data collection techniques (population and sample). Furthermore it highlights measurement and instrument reliability analysis.

#### **2.2. Research design**

Research design is usually defined as structure of the planned action of a research. In this research type of study, time horizons, scales, contextual setting, unit of analysis and how the variables are tested will be defined.

#### **2.3. Types of study**

It is a contributory research in which the relationship of Execution planning and Agile project success, with the mediating role of Information sharing and moderating role of organization effectiveness is studied by using a Likert scale with self-reporting technique. Data to be measured in this study will be analyzed by using adopted and adapted questionnaire from past valuable studies including execution planning, information sharing, organization effectiveness and agile success. The questionnaire will be filled by

the employees of the software projects who employ Agile methodology for their projects. All the questions related to the variables would be studied through 5 point likert scale with additional demographic studies measuring the respondents Gender, Age, Qualification and Experience.

#### **2.4. Study setting**

The data were collected from the software houses in their professional setting from both private and public sector organization which are using agile methodology to work out on software projects. Respondents filled the questionnaires in their natural environment.

#### **2.5. Time Horizon**

The data were collected in one and a half month for this study, the data were collected in different time lags.

#### **2.6. Unit of Analysis**

For this study unit of analysis was the employees of software houses from both private and public sector organizations.

#### **2.7. Population**

As the current study inquires about the agile methodology used in the software projects in Pakistan, the population of my study would be the employees of both managerial and subordinate level of information technology projects. The specified population is

employees of the project based organization from Islamabad, Rawalpindi, Lahore, Karachi.

## **2.8. Sample**

The sample for this study consists of employees of information technology projects. Data is collected by personally visiting the software houses and by virtually distributing the questionnaire. Approximately 400 questionnaires were distributed to collect the data out of which 322 were received back and 287 were fully filled so 287 questionnaires are analysed to study the impact. Due to shortage of time the data will be collected by convenient sampling. The respondents would be assured regarding the aspect that whatever the information they will provide will be kept highly confidential in order to encourage participants to provide authentic data related to the topic and they would be pledged that all the information which is being gathered is solely for academic purpose in order to get insight about how execution planning effects Agile success used in software projects.

## **2.9.Measurments**

In this study close ended questionnaires were used to measure four variables. The questionnaire would be measured on 5 point lickert scale where 1 (strongly disagree) to 5 (strongly agree), unless otherwise stated.

### **2.9.1. Execution planning**

This will be measured through 4 items scale which was developed by Benaroch, Lichtenstein & Robinson, (2006) to analyze impact of execution planning. The responses will be obtained through 5 point lickert scale which includes the responses to be measured as 1= **strongly disagree**, 2= **Disagree**, 3= **Neutral**, 4= **Agree**, 5= **strongly Agree**. The items of the scale are “To what extent do the execution planning conform to good project management practice, How sound is the work on cost estimates and contingency during project execution, Are there effective quality assurance processes planned during execution?, and are there effective quality assurance processes planned for the program?”.

### **2.9.2. Information sharing**

In order to analyze information sharing between Execution planning and Agile success the scale developed by De Dreu (2007) was used which included 6 items. The replies will be acquired by 5 point Likert scale ranging from 1= strongly disagree 5= Strongly Agree. The items of the scale are “Communicating is a problem in my team, Members of my team inform each other about work-related issues, Members of my team inform each other about work-related issues, The quality of information exchange in our team is good, I get new facts, insights, and ideas from my colleagues, During work meetings we tell

each other what we knew already and do not exchange new information, We do not repeat ourselves during team meetings”.

### **2.9.3. Organization effectiveness**

In order to analyze effect of organization effectiveness it is measured through 5 point likert scale developed by Roberts et al. (2004). The rating ranges from 1 (Strongly disagree) to 5 (Strongly Agree). The items of the scale are “We delegate our group work, we organize our time well, we are willing to meet on our own time, we organize our communication according to available time, and we identify the functions necessary for successful completion of group projects”.

### **2.9.4. Agile success**

This will be measured through 6 items scale which was developed by (Lu & Ramamurthy 2011). Agile success would be measured in both perspectives of market readiness and customer satisfaction regarding the required product. The responses will be obtained through 5 point Likert scale which includes the responses to be measured as 1= **strongly disagree**, 2= **Disagree**, 3= **Neutral**, 4= **Agree**, 5= **strongly Agree**. The items of the scale are “We are quick to make and implement appropriate decisions in the face of market/customer-changes, We constantly look for ways to reinvent/reengineer our organization to better serve our market place, We treat market-related changes and apparent chaos as opportunities to capitalize quickly, We fulfill demands for rapid-response, special requests of our customers whenever such demands arise; our customers have confidence in our ability, We can quickly scale up or scale down our production/service levels to support fluctuations in demand from the market, Whenever

there is a disruption in supply from our suppliers we can quickly make necessary alternative arrangements and internal adjustments”.

## **2.10. Reliability Analysis**

In order to test the reliability of the data. Reliability test was run in spss 20.0 to test the reliability of the instrument used. Reliability analysis is the procedure to gauge the level consistency result of measurement. Nunnally and Bernstein (1994) explains the standard of the cronbach alpha value .70 is considered a good reliability. The table below shows the reliability analysis when data was pilot tested.

## **2.11. Pilot testing**

**Table 1. Pilot testing of the items**

<b>Variables</b>	<b>Cronbach's alpha</b>
Execution planning	.850
Information sharing	.784
Organization effectiveness	.793
Agile project success	.755

Execution planning cronbach's alpha value is .850 in the current study, the cronbach value of Information sharing in that study is .784, the Organization effectiveness cronbach's value is in the current study is .793 and Agile project success value of cronbach's is .755.

Table 2 shows the reliability analysis results after complete data collection. Cronbach Coefficient Alpha value of Execution planning was .949, Information sharing was .857, Agile project success was .949 and Organization effectiveness was .972.

**2.12. Table 2 Reliability**

<b>Variables</b>	<b><i>Cronbach's alpha (<math>\alpha</math>)</i></b>
Execution planning	.949
Information sharing	.857
Agile project success	.949
Organization effectiveness	.972

### 2.12.1. Sample Characteristics:

The table below represents sample characteristics

#### Gender

**Table 3 Represents Gender Percentage**

	Frequency	Valid Percent	Cumulative percent
Male	205	71.1	71.3
Female	82	28.6	100
Total	287	100	

First row represents the gender composition of the sample in which 71.1% were male and 28.6% female. The male percentage is high.

## Age

**Table 4**

### **Respondent's Age Distribution**

	Frequency	Percent	Cumulative percent
18-25	67	23.3	23.3
26-33	125	43.6	66.9
34-41	53	18.5	85.4
42-49	12	4.2	89.5
50 above	30	10.5	100
Total	287	100	

Table 4 shows the composition of the sample with reference to age groups. 23.3% of respondents age is 18-25, 43.6% respondents age is 26-33 range, 18.5% respondents age are in 34-41 range, 4.2% respondents age were in 42-49 range and just 10.5% respondents were more than 50 years. In that study, the percentage of 26-33 respondents is highest.

### 2.13. Qualification

Qualification of respondents is depicted in the table below.

#### Respondents qualification

**Table 5**

	Frequency	Valid Percent
Matric	0	0
Inter	38	13.6
Bachelor	77	9.8
Master	108	26.8
MS/MPhil	60	37.6
PhD	2	20.9
Post PhD	1	1.0
Total	287	100

The above table represents the respondents qualification. Matric qualified are 0%, inter qualified people are 13.6%, bachelor qualified 9.8%, master qualified are 26.8%, MS/Mphil qualified are 37.6%, Phd qualified respondents are 20.9% and 1.0% respondents are post PhD qualified. The MS qualified percentage is high.

## 2.14. Work Experience

In below table 6 explain the respondent work experience

**Table 6**

### Experience of Respondents

	Frequency	Valid Percent	Cumulative percent
0-5	94	32.8	32.8
6-10	61	21.3	54.0
11-16	50	17.4	71.4
17-22	29	10.1	81.5
23-28	30	10.5	92.0
29 above	23	8.0	100
Total	287	100	

The above table represents the respondents experience of the work in which percentage of respondents is 32.8% in range (0-5), in range (6-10) the respondents experience is 21.3%, in category (11-16) the respondents experience is 17.4%, in category (17-22) the respondents experience is 10.1%, in category (23-28) the respondents experience is 10.5% and above 29 the experience of respondents is 8%.

# Chapter 4

## RESULTS

The current chapter includes results of the study. Discussion on study findings, theoretical and practical implications, strengths and limitations of the study, and directions for future research are also discussed. Data would be analyzed through spss 20.00 and the following tests were applied to the data to interpret the results.

- Frequency distribution
- Descriptive statistics
- Reliability analysis
- Correlation analysis
- Linear and moderated multiple regression analysis( preacher and hase)

**RESULTS FOR HYPOTHEZED VARIABLES**

### **3.1. RESULTS FOR HYPOTHEZED VARIABLES**

SPSS was used for descriptive and correlation analysis. Finally, for correlation and hypothesis testing precher and hase is used.

#### **3.1.1. Descriptive Analysis**

Descriptive statistics of the current data are shown in Table 8. First column of the table provides the features the variables. Sixth columns inform about sample size, minimum value, maximum value, mean and standard deviation correspondingly.

Table shows that sample size was 287 of the four variables. All variables (Execution planning, Information sharing, Organization effectiveness and Agile project success) are rated on a five point Likert scale, such as 1 representing “Strongly Disagree” and 5 representing “Strongly Agree”. Mean values show the quintessence of the responses. This is respondents observation regarding a particular variable. The mean value of the Information sharing (IS) is 3.31 which shows that respondents were agreed . The mean value of Execution planning is 3.8 which indicate that execution planning is very much important for project success. The mean value of Agile Project success (APS) is 3.65 which indicates that respondents succeeded in projects. Finally, the mean value of Organization effectiveness is 3.8078 that it is very much important for the project success.

### 3.2. Table 7 Descriptive Statistics

<b>Variables</b>	<b>N</b>	<b>Min</b>	<b>Max</b>	<b>Mean</b>	<b>SD</b>
Organization effectiveness .75122	287	1.3	5	4.17	
Execution planning .52363	287	1.8	4.8	3.8	
Information sharing .57095	287	1.5	4.2	3.31	
Agile Project success .60648	287	2	5	3.65	

Table 8 depicts the correlation of the identified variables. Execution planning is significantly correlated with project success ( $r=.456, p<.01$ ), Organization effectiveness ( $r=.428, p<.01$ ). Information sharing significantly correlated with Organization effectiveness ( $r=.121^{**}, p<.01$ ). And Organization effectiveness significantly correlated with Agile project success ( $r=.288^{**}, p<.00$ )

### 3.3. Table 8 Correlations

	Variables	1	2	3	4
1	Execution planning	1			
2	Information sharing	.145*	1		
4	Organization effectiveness	.428**	.121*	1	
4	Agile Project success	.456**	.197**	.288**	1

Notes: N = 287. Alpha reliabilities are given in parentheses. \*Correlation is significant at the .05 level (two-tailed).

\*\*Correlation is significant at the .01 level (two-tailed).

### 3.4. Regression Analysis

**Table 09: The mediating effect of Knowledge Sharing and moderating effect of Organization effectiveness.**

			<i>B</i>	<i>SE</i>	<i>t</i>	<i>p</i>
Execution planning	→	Agile project success	<b>0.48</b>	<b>.05</b>	<b>12.25</b>	<b>.00</b>
Execution planning	→	Information sharing	<b>0.52</b>	<b>.04</b>	<b>7.89</b>	<b>.00</b>
Information sharing	→	Agile project success	<b>0.27</b>	<b>.03</b>	<b>8.35</b>	<b>.00</b>
Int_term	→	Agile project success	<b>0.45</b>	<b>.06</b>	<b>16.44</b>	<b>.00</b>
			<b>LL 95% CI</b>		<b>UL 95% CI</b>	
		Bootstrap results for indirect effect		<b>.08</b>		<b>.12</b>

Note. Un-standardized regression coefficient reported. Bootstrap sample size 2000. LL =lower limit; CI = confidence interval; UL = upper limit.

N=287, Control variables were, Gender, Age, Experience and Qualification, \* P < .05; \*\* P <.01

Figure 2: Mediated Model

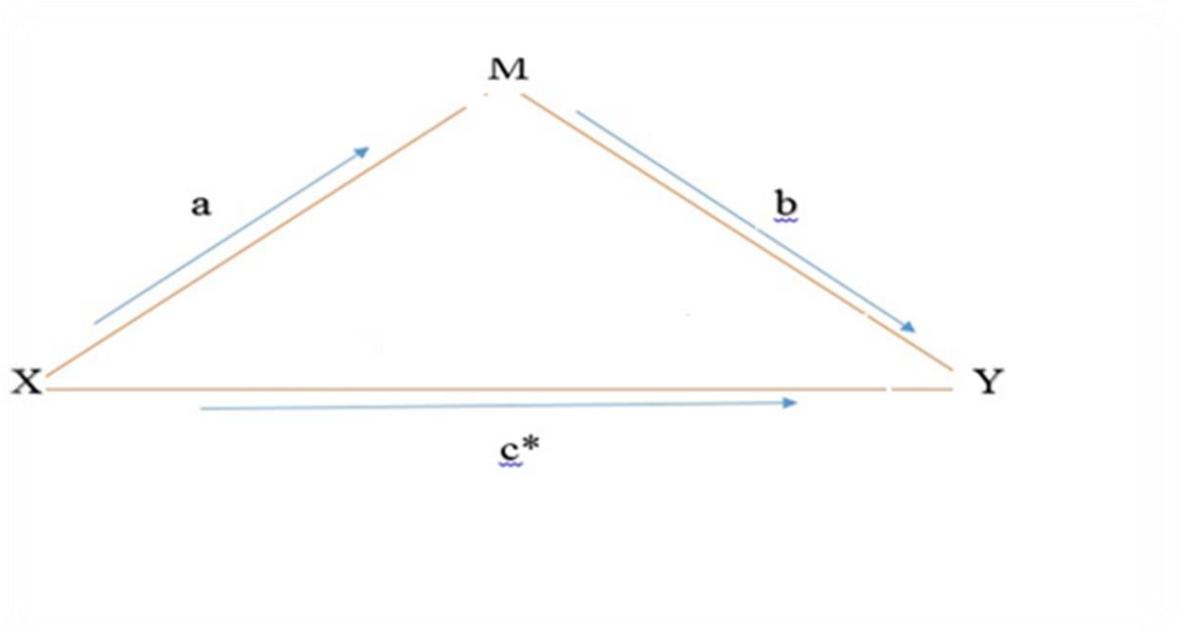
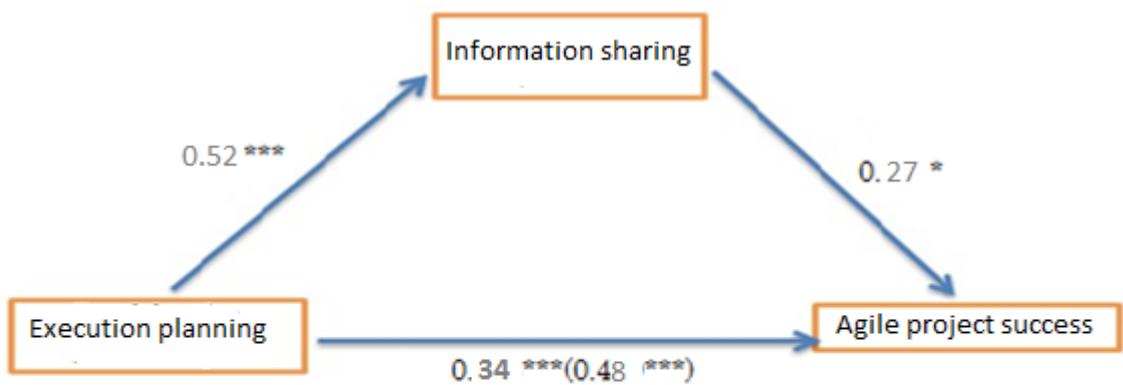


Figure 1: Coefficients of mediated model



Execution planning has a direct positive and significant relationship with the Agile project success hence the un-standardized regression co-efficient indicates that ( $B=$

.48,  $t= 12.25$ ,  $P= .00$ ). The results in the above table provides strong justification for the acceptance of hypothesis. So the hypothesis H1 i-e “There is a positive association between execution planning and agile success” is accepted. Results also show that there is a positive and significant relationship between Execution planning and Information sharing as indicated by un-standardized regression co-efficient ( $B= .52$ ,  $t= 07.89$ ,  $P= .00$ ), hence the hypothesis H2 i.e. “There is a positive association between Information sharing and agile success” is accepted.

It is forecasted from the table given above that Information sharing and Agile project success also have a significant relationship between each other. Evidence is provided through the un-standardized regression co-efficient as ( $B= .27$ ,  $t= 08.35$ ,  $P= .00$ ) and from these values it is concluded that H3 i-e “There is a positive association between execution planning and Information sharing” is totally accepted.

Results indicate that Information sharing mediates the relationship between Execution planning and Agile project success, as the indirect effect of Execution planning through Information sharing has the upper and lower limits of 0.08 and 0.12 and doesn't contain zero in the bootstrapped 95% confidence interval, thus it is concluded that the hypothesis H4 i.e. “Information sharing plays a mediating role between planning and agile success” is accepted.

It has been concluded from the **Table 09**, that Organization effectiveness acts as a moderator between Execution planning and Agile project success, as indicated by the un-standardized regression analysis ( $B= 0.45$ ,  $t= 16.44$ ,  $P= .00$ ), hence the hypothesis H5 i.e. “Organization effectiveness moderates the relationship between Information sharing and Agile success; such that if Organization effectiveness is high than the relationship between Information sharing and Agile success would be

weakened” is accepted because  $P = .00$  showing significance and the zero was not present in confident interval 95% that leads to the acceptance of the H5 hypothesis.

### **3.5. Hypothesis summary**

**H1:** There is a positive association between execution planning and agile success.(Accepted)

**H2:** There is a positive association between Information sharing and agile success.(Accepted)

**H3:** There is a positive association between execution planning and Information sharing. (Accepted)

**H4:** Information sharing plays a mediating role between planning and agile success. (Accepted)

**H5:** Organization effectiveness moderates the relationship between Information sharing and Agile success; such that if Organization effectiveness is high than the relationship between Information sharing and Agile success would be weakened.(Accepted)

## **Chapter 5**

### **DISCUSSION**

#### **4.1. Introduction**

This chapter includes hypothesis relationship details and also their justification of acceptance and rejection including the theoretical implication, practical implication, strengths and weaknesses of the study and future directions.

#### **4.2. Discussion for hypothesis, there is a positive association between execution planning and agile success**

As the results show that Execution planning is positively and significantly related for success of agile software projects. This study is supported by some of the previous researches which also contributed the same results toward the agile project industry. They considered it equally important for successful implementation of the agile methodology.

In a study conducted in software development projects it was noticed that most of the agile software projects fail, though they are using agile methodologies because there are some specifications of this method which the traditional project methodology can't comply with so this needs to be focused when the companies are moving toward the agile methodologies (Rand & Eckfeldt, 2004).

Software hubs should consider the importance of execution planning and it should be focused for successful agile methodology implementation. As in another study it is evidenced that the best practices in the software development plan work with planning on each iteration so that nothing could go wrong (Larman & Basili, 2003). This is because of the fact that most of the time upfront planning is not sufficient to meet the agile methodology implementation requirements. As a result it misleads the team to fulfill the exact demands of the customers resulting in poor reputation of the project

and company. Likewise Moran (2014) indicated that planning is required at each step of iteration resulting in minimum risk and adoption to rapid changes.

Few studies negate the relationship by highlighting that upfront planning is a crucial factor to be a player in the industry for long term (Gunasekaran & Yusuf, 2002), this study contradicts the relationship highlighted in this study which suggest that execution planning is the key aspect for success in agile software projects because of the market changes and rigorous customer demands. Similarly another study provides counter arguments that upfront planning is essential in those software projects which are traditional and they don't need any updations and changes so structured planning is more suitable for those projects (Misra, Kumar & Kuma, 2009).

But dynamic environment focuses on the need that quicker you are to understand the customer's need more you will succeed. Agile methodology is all about responding the right customers demands abruptly along with the changing environment and there is always a plan to do something but we can't stick to it because every time we will meet our customers we will have to fulfill their demands substantially to rise and stay in the market so for this purpose we definitely need a plan fulfilling customers demand,so that plan needed during execution is rightly corrected and aligned with the customers demand same is evidenced by Highsmith & Cockburn (2001) who found that agile is all about constant re planning in every phase based on the current scenarios and situations. Beside this the definite plan driven methodologies have their own definite place which are required to run a certain scenario.

So by these studies it is clear that plan of agile projects is much different from the traditional strategic plan because it requires continuous planning at each iteration responding to customer changing demands. We can't follow strict dictated plan in

agile projects. As this study is conducted in Pakistan so most of the projects get delayed because of different strikes, delayed schedules and political influences so upfront planning cant be followed here.

**4.3. Discussion for Hypothesis, there is a positive association between Information sharing and agile success.**

It is found that knowledge sharing significantly impacts the success of agile projects. It is also evidenced by many other authors. As a study dwells upon the fact that

Knowledge sharing is a key element to assure the quality in software development projects in short iterations (Cockburn, 2004). One of the parameter of success of a project is quality as it is found that project success is considered as an iron triangle including cost, time and scope (Atkinson, 1999). So this is ensured that information sharing is one of those factors which lead toward project success. Knowledge should be properly sought, communicated and endorsed so that right software could be produced while implementing the agile methodology technique.

Fearne & Hughes (1999) lessens the impact of information sharing for project success by narrating that there are few projects where we should not share much information there could be far many reasons. When each and every aspect of the project would be shared the customer may keep on customizing the software. This would be very time taking activity and may cause cost overrun and delay in schedules. So if we need to share some information its limits should be defined. But many other studies like the current study highlight the impact of information sharing on Agile project success.

Knowledge sharing greatly influences the performance of the team members as if they won't be able to get the right direction and right amount of information they will definitely will be unable to meet the requirements. They will whether come up with the wrong software or they will eventually end up with something different as compared to what was required by the customers. Same is investigated by another study which states that Knowledge sharing is an important element of knowledge management and Knowledge sharing is evidenced to be an important element for long term success and effective performance (Du, Ai & Ren, 2007).

One of the reason of this hypothesis can be that in the Pakistani organizations there is a huge gap between the industry employees and graduates. They don't have skills and

right amount of information and knowledge so when they move in the industry they need to get information and skills. Similarly for the growth of employees it is very much important to share right amount of information at all levels.

**4.4. Discussion for Hypothesis, there is a positive association between execution planning and Information sharing.**

Another major element highlighted by this study is the importance of sharing information for execution of the plans. It is essential to understand the need of the customers and fix the things according to their current emerging demands. The upfront planning would be outdated when the new demands and information will emerge. If the right information won't be communicated it will affect planning which can lead to project failure.

Many other researches emphasize the importance of information sharing for execution planning. According to Lee, Pena-Mora & Park (2006) actual data is collected and

exact amount of information is shared to properly plan and execute the projects. Likewise it's been found in the previous literature that most of the time improvement in the systems and mature performance levels are only obtained by the sharing of information (Cooke-Davies & Arzymanow, 2003). Furthermore the same is evidence in another research that plan, source, make and deliver all aspects need some amount of information being rightly shared for affective performance of the system (Lockamy III & McCormack, 2004).

Insufficient information communicated during an agile software project also affects the quality of the software which is being produced. Knowledge sharing is the most important element to succeed in a software project so the right amount of information should be properly shared among the masses so that they could successfully perform the work likewise the information should be shared during each iteration because in agile methodology as we become consistent collaborators with the customers we need to focus on the demands that are new and tricky and information should be shared as we collaborate after each iteration. The philosophy of sharing knowledge is that knowledge provider provides knowledge to the knowledge seeker and then it is the duty of the knowledge seeker to share this knowledge gained by the knowledge provider among the team members. It is very much important that tacit knowledge should be endorsed (Wang & Noe 2010). If your planning is strong you can succeed in any project but if your planning isn't strong due to any reason your project might fail so all those factors should be given due importance which affect the credibility of a project.

#### **4.5. Discussion for Hypothesis, information sharing mediates the relationship between execution planning and agile success**

This study approves the role of information sharing as a mediator between execution planning and agile success. It is the responsibility of the top management that they should understand the need of such perks essential for agile methodology success. They should spread the significance of the emerging causes needed for the project success. Managers should understand the systems, warehouses and information technology substitution (Boar, 2002). They should share the information required to their team members.

Many of the previous researches narrate the relationship of information sharing with project success. Studies established the relationship of information sharing with planning and agile success and considered it as one of the essence for productive performance (Cheng & Choi, 2010). Similarly Yinan, Tang & Zhang (2014) is of the view that planning helps the project based organization to achieve mass customization and the thing which mostly regards this relationship is the quality information shared.

The amount of knowledge required to build a thing should be properly communicated to the team so that they could float the right software needed in the market. Mostly it is seen that 90 percent of the knowledge in an organization is tacit. For sustainability and sensation, knowledge sharing becomes a vital gazette for the success of the companies (Wagner & Sternberg, 1986). As its importance is being highlighted in other industries as well it is equally important in software industry.

It is a vital gazette for successful agile project implementation. So for lasting longer in the industry and constantly appearing as the top project management companies information sharing should be properly focused. If right amount of information won't

be shared than it would be difficult to update the plan and succeed by using agile methodology because we need updation at each iteration by the right amount of information being shared.

#### **4.6. Discussion for Hypothesis, organization effectiveness moderates the relationship between information sharing and agile success**

Another very important aspect of the research is that Organization effectiveness significantly affects the agile project performance. Plus the methods which are used to share information in an organization are different so effective the organization methods they greatly influence the agile project performance. It is also evidenced by Malhotra (2005) that organization effectiveness is a very important aspect for success in all fields. In order to compete with the rapidly changing environment the organization effectiveness should be considered as an important element (Mehdibeigi, Deghani & mohammad Yaghoubi, 2016).

This research is also aligned with the other researches which say that, it also helps to manage uncertainty and ambiguity to come up successfully in the market to become more customer focused and oriented (Uhl-Bien, Marion & McKelvey, 2007). Same is narrated in another study that organization effectiveness also helps to attain goals (Hunter, Bedell-Avers & Mumford, 2007).

There is a great difference between the multiple project organizations. If few look at the successful projects being carried out in Pakistan only those are mostly successful which are being carried out by renowned companies so this shows the importance of organization effectiveness along with the fact that only the organizations with good market reputation get further projects to be executed.

#### **4.7. Practical and theoretical implication**

This study has both managerial and theoretical implications while executing the agile methodology in real time projects it should be kept in mind that execution planning is an important essence to successfully implement the agile methodology in software projects. Top management should keep the importance of knowledge sharing in mind as it is an important element to execute agile technique moreover this study highlights and provides a charming contribution toward agile methodology implication success theoretically. As market is rigorously rushing toward implementation of agile methodology so it is essential to keep these important milestones in mind essential for perfect execution of agile methodology.

#### **4.8. Strengths, limitations, and future directions**

As the social science researches can't be 100% authentic there is always a room comprising the hidden effects and faults in the study. The data collected from individuals was collected from Pakistani software project industry. Its definite that some cultural differences and contextual settings effect other factors around as well so like every other social science research this is a limitation to this study. Additionally due to limited time and resources the data were only collected from the software houses of Islamabad and Rawalpindi and sample size was 287 which is not enough to depict a true picture of software houses using agile methodology in the whole world. Like every other research there is also a limitation that respondents may not have filled up the data with complete attention blemishing the results and there is a chance of error along with the possibility that the respondents may not have particular knowledge about the study.

Though the research model and results were properly analyzed but there may be variations and choices so in future the data should be collected in different contextual setting by increasing the sample size. Secondly the research was carried out in software industry of Pakistan so in future the impact of execution planning should also be studied in other industries as well. It can be investigated that whether we should doubt the traditional upfront planning in other sectors or not. Thirdly it can be analyzed that whether other industries should shift toward agile project methodologies or not. Fourthly there are many other factors which are unexplored related to the agile methodology technique so those factors should also be studied which are impacting the agile industry and why different industries haven't still adopted the agile methodology even its worth doing.

#### **4.9. Conclusion**

This study was conducted to analyze the impact of Execution planning on Agile project success along with the mediating role of information sharing and moderating role of organizational effectiveness and this study was conducted in information technology projects in contextual setting of Pakistan results interpreted conclude that execution planning plays a vital role toward successfully implementing the agile methodology to the software industry and the information about the software etc should be properly communicated and shared likewise organization effectiveness moderates the relationship so it should also be measured when we are employing the agile methodology.

## 5. Reference

- Adams, J. R., & Barnd, S. E. (2008). Behavioral implications of the project life cycle. *Project Management Handbook, Second Edition*, 206-230.
- Alexandre, J. D. O., Kruchten, P., & de Moura, H. P. (2013, August). GAME: Governance for agile management of enterprises: A management model for agile governance. In *Global Software Engineering Workshops (ICGSEW), 2013 IEEE 8th International Conference on* (pp. 88-90). IEEE
- Alliance, A. (2006). What is agile software development. *web: <http://www.agilealliance.org>*.
- Ambler, S. (2012). *Agile database techniques: Effective strategies for the agile software developer*. John Wiley & Sons.
- Atkinson, R. (1999). Project management: cost, time and quality, two best guesses and a phenomenon, it's time to accept other success criteria. *International journal of project management*, 17(6), 337-342.
- Bae, J., & Lawler, J. J. (2000). Organizational and HRM strategies in Korea: Impact on firm performance in an emerging economy. *Academy of management journal*, 43(3), 502-517.
- Ball, M. O., Ma, M., Raschid, L., & Zhao, Z. (2002). Supply chain infrastructures: system integration and information sharing. *ACM Sigmod Record*, 31(1), 61-66.

- Barlow, J. B., Giboney, J., Keith, M. J., Wilson, D., Schuetzler, R., Lowry, P. B., & Vance, A. (2011). Overview and guidance on agile development in large organizations.
- Barton, H. (2013). 'Lean' policing? New approaches to business process improvement across the UK police service. *Public Money & Management*, 33(3), 221-224.
- Batool, A., & Abbas, F. (2017). Reasons for delay in selected hydro-power projects in Khyber Pakhtunkhwa (KPK), Pakistan. *Renewable and Sustainable Energy Reviews*, 73, 196-204.
- Beck, K., Beedle, M., Van Bennekum, A., Cockburn, A., Cunningham, W., Fowler, M., ... & Kern, J. (2001). Manifesto for agile software development.
- Benaroch, M., Lichtenstein, Y., & Robinson, K. (2006). Real options in information technology risk management: An empirical validation of risk-option relationships. *Mis Quarterly*, 827-864
- Boar, B. H. (2002). *The art of strategic planning for information technology*. John Wiley & Sons.
- Boden, A., Avram, G., Bannon, L., & Wulf, V. (2009, July). Knowledge management in distributed software development teams-does culture matter?. In *Global Software Engineering, 2009. ICGSE 2009. Fourth IEEE International Conference on* (pp. 18-27). IEEE.
- Bowen, S., & Maurer, F. (2002). Process support and knowledge management for virtual teams doing agile software development. In *Computer Software and Applications Conference, 2002. COMPSAC 2002. Proceedings. 26th Annual International* (pp. 1118-1120). IEEE.

- Bowen, S., & Maurer, F. (2002). Process support and knowledge management for virtual teams doing agile software development. In *Computer Software and Applications Conference, 2002. COMPSAC 2002. Proceedings. 26th Annual International* (pp. 1118-1120). IEEE.
- Boehm, B. (2002). Get ready for agile methods, with care. *Computer*, 35(1), 64-69.
- Bryant, R. G. (2016). *The Relationship of Management Support, Cash Incentives, Non-Cash Incentives, and Project Leadership to Project Success in Information Technology Organizations* (Doctoral dissertation, Northcentral University).
- Cameron, A. C., & Trivedi, P. K. (1986). Econometric models based on count data. Comparisons and applications of some estimators and tests. *Journal of applied econometrics*, 1(1), 29-53.
- Chau, T., Maurer, F., & Melnik, G. (2003, June). Knowledge sharing: Agile methods vs. tayloristic methods. In *Enabling Technologies: Infrastructure for Collaborative Enterprises, 2003. WET ICE 2003. Proceedings. Twelfth IEEE International Workshops on* (pp. 302-307). IEEE.
- Chau, T., & Maurer, F. (2004). Knowledge sharing in agile software teams. In *Logic versus approximation* (pp. 173-183). Springer Berlin Heidelberg.
- Chatfield, D. C., Kim, J. G., Harrison, T. P., & Hayya, J. C. (2004). The bullwhip effect—impact of stochastic lead time, information quality, and information sharing: a simulation study. *Production and Operations Management*, 13(4), 340-353.

- Chatman, J. A., Polzer, J. T., Barsade, S. G., & Neale, M. A. (1998). Being different yet feeling similar: The influence of demographic composition and organizational culture on work processes and outcomes. *Administrative Science Quarterly*, 749-780.
- Cho, H., Jung, M., & Kim, M. (1996). Enabling technologies of agile manufacturing and its related activities in Korea. *Computers & Industrial Engineering*, 30(3), 323-334.
- Chin, G. (2004). *Agile project management: how to succeed in the face of changing project requirements*. AMACOM Div American Mgmt Assn.
- Cheng, T. E., & Choi, T. M. (Eds.). (2010). *Innovative quick response programs in logistics and supply chain management*. Springer Science & Business Media.
- Christopher, M., & Lee, H. L. (2001). Supply chain confidence: the key to effective supply chains through improved visibility and reliability. *Global Trade Management*, 6.
- Chow, T., & Cao, D. B. (2008). A survey study of critical success factors in agile software projects. *Journal of systems and software*, 81(6), 961-971.
- Coram, M., & Bohner, S. (2005, April). The impact of agile methods on software project management. In *Engineering of Computer-Based Systems, 2005. ECBS'05. 12th IEEE International Conference and Workshops on the* (pp. 363-370). IEEE.
- Cockburn, A. (2004). *Crystal clear: a human-powered methodology for small teams*. Pearson Education.

- Conforto, E. C., & Amaral, D. C. (2010). Evaluating an agile method for planning and controlling innovative projects. *Project Management Journal*, 41(2), 73-80.
- Cooke-Davies, T. J., & Arzymanow, A. (2003). The maturity of project management in different industries: An investigation into variations between project management models. *International Journal of Project Management*, 21(6), 471-478.
- Cummings, J. N. (2004). Work groups, structural diversity, and knowledge sharing in a global organization. *Management science*, 50(3), 352-364.
- Crawford, B., Castro, C., & Monfroy, E. (2006, October). Knowledge management in different software development approaches. In *International Conference on Advances in Information Systems* (pp. 304-313). Springer Berlin Heidelberg.
- D'Amours, S., Montreuil, B., Lefrancois, P., & Soumis, F. (1999). Networked manufacturing:: The impact of information sharing. *International Journal of Production Economics*, 58(1), 63-79.
- Datta, P. P., & Christopher, M. G. (2011). Information sharing and coordination mechanisms for managing uncertainty in supply chains: a simulation study. *International Journal of Production Research*, 49(3), 765-803.
- Dhungana, D., Rabiser, R., Grunbacher, P., Prahofner, H., Federspiel, C., & Lehner, K. (2006, August). Architectural Knowledge in Product Line Engineering: An Industrial Case Stu. In *Software Engineering and Advanced Applications, 2006. SEAA'06. 32nd EUROMICRO Conference on* (pp. 186-197). IEEE.

- Du, R., Ai, S., & Ren, Y. (2007). Relationship between knowledge sharing and performance: A survey in Xi'an, China. *Expert systems with Applications*, 32(1), 38-46.
- Dessai, K. G., Kamat, M. S., & Wagh, R. (2012). Application of social media for tracking knowledge in agile software projects.
- Dingsøy, T., & Moe, N. B. (2014, May). Towards principles of large-scale agile development. In *International Conference on Agile Software Development* (pp. 1-8). Springer International Publishing.
- De Dreu, C. K. (2007). Cooperative outcome interdependence, task reflexivity, and team effectiveness: a motivated information processing perspective. *Journal of Applied Psychology*, 92(3), 628.
- Dorairaj, S., Noble, J., & Malik, P. (2012, August). Knowledge management in distributed agile software development. In *Agile Conference (AGILE), 2012* (pp. 64-73). IEEE.
- Dybå, T., & Dingsøy, T. (2008). Empirical studies of agile software development: A systematic review. *Information and software technology*, 50(9), 833-859.
- Etzioni, A. (1964). Modern organizations. Foundations of modern sociology series.
- Fawcett, S. E., Osterhaus, P., Magnan, G. M., Brau, J. C., & McCarter, M. W. (2007). Information sharing and supply chain performance: the role of connectivity and willingness. *Supply Chain Management: An International Journal*, 12(5), 358-368.

- Fearne, A., & Hughes, D. (1999). Success factors in the fresh produce supply chain: insights from the UK. *Supply Chain Management: An International Journal*, 4(3), 120-131.
- Fengjie, A., Fei, Q., & Xin, C. (2004, September). Knowledge sharing and web-based knowledge-sharing platform. In *E-Commerce Technology for Dynamic E-Business, 2004. IEEE International Conference on* (pp. 278-281). IEEE.
- Filicetti, J. (2009). Project Planning Overview. *PM Hut* (Last accessed 8 November 2009).
- Fowler, M., & Highsmith, J. (2001). The agile manifesto. *Software Development*, 9(8), 28-35.
- Fry, C., & Greene, S. (2007, August). Large scale agile transformation in an on-demand world. In *Agile Conference (AGILE), 2007* (pp. 136-142). IEEE.
- Fowler, M., & Highsmith, J. (2001). The agile manifesto. *Software Development*, 9(8), 28-35.
- Ghobadi, S., & Mathiassen, L. (2016). Perceived barriers to effective knowledge sharing in agile software teams. *Information Systems Journal*, 26(2), 95-125.
- Ghobadi, S. (2015). What drives knowledge sharing in software development teams: A literature review and classification framework. *Information & Management*, 52(1), 82-97.
- Gunasekaran, A., & Yusuf, Y. Y. (2002). Agile manufacturing: a taxonomy of strategic and technological imperatives. *International Journal of Production Research*, 40(6), 1357-1385.

- Hadaya, P., & Cassivi, L. (2007). The role of joint collaboration planning actions in a demand-driven supply chain. *Industrial Management & Data Systems*, 107(7), 954-978.
- Harvey, F., Kuhn, W., Pundt, H., Bishr, Y., & Riedemann, C. (1999). Semantic interoperability: A central issue for sharing geographic information. *The annals of regional science*, 33(2), 213-232.
- Harvey, F., Kuhn, W., Pundt, H., Bishr, Y., & Riedemann, C. (1999). Semantic interoperability: A central issue for sharing geographic information. *The annals of regional science*, 33(2), 213-232.
- Highsmith, J., & Cockburn, A. (2001). Agile software development: The business of innovation. *Computer*, 34(9), 120-127.
- Hunter, S. T., Bedell-Avers, K. E., & Mumford, M. D. (2007). The typical leadership study: Assumptions, implications, and potential remedies. *The Leadership Quarterly*, 18(5), 435-446.
- Holz, H., & Schafer, J. (2003, June). Collaborative, task-specific information delivery for agile processes. In *Enabling Technologies: Infrastructure for Collaborative Enterprises, 2003. WET ICE 2003. Proceedings. Twelfth IEEE International Workshops on* (pp. 320-325). IEEE.
- Iram, N., Khan, B., Ahmad, M. S., & Sahibzada, U. F. (2017). Critical Factors Influencing the Project Success: An Analysis of Projects in Manufacturing and Construction Industries in Punjab, Pakistan. *International Journal of Business Studies Review*, 1(1).

- Kaipia, R., & Hartiala, H. (2006). Information-sharing in supply chains: five proposals on how to proceed. *The International Journal of Logistics Management*, 17(3), 377-393.
- Karadsheh, L., Alhawari, S., El-Bathy, N., & Hadi, W. (2008). Incorporating knowledge management and risk management as a single process. In *Proceedings of International Conference of the Global Business Development Institute (GBDI) Las Vegas, NV, USA* (pp. 207-214)
- Kavitha, R. K., & Ahmed, M. I. (2011, July). A knowledge management framework for agile software development teams. In *Process Automation, Control and Computing (PACC), 2011 International Conference on* (pp. 1-5). IEEE.
- Kerzner, H. (2013). *Project management: a systems approach to planning, scheduling, and controlling*. John Wiley & Sons.
- Kotter, J. P., & Cohen, D. S. (2002). *The heart of change: Real-life stories of how people change their organizations*. Harvard Business Press.
- Kovács, G. L., & Paganelli, P. (2003). A planning and management infrastructure for large, complex, distributed projects—beyond ERP and SCM. *Computers in Industry*, 51(2), 165-183.
- Koskela, J., & Abrahamsson, P. (2004, November). On-site customer in an XP project: Empirical results from a case study. In *European Conference on Software Process Improvement* (pp. 1-11). Springer Berlin Heidelberg.
- Larman, C., & Basili, V. R. (2003). Iterative and incremental developments. a brief history. *Computer*, 36(6), 47-56.

- Lawler III, E. E. (1986). *High-Involvement Management. Participative Strategies for Improving Organizational Performance*. Jossey-Bass Inc., Publishers, 350 Sansome Street, San Francisco, CA 94104.
- Leffingwell, D. (2010). *Agile software requirements: lean requirements practices for teams, programs, and the enterprise*. Addison-Wesley Professional.
- Leffingwell, D. (2010). *Agile software requirements: lean requirements practices for teams, programs, and the enterprise*. Addison-Wesley Professional.
- Lee, S. H., Pena-Mora, F., & Park, M. (2006). Dynamic planning and control methodology for strategic and operational construction project management. *Automation in construction*, 15(1), 84-97.
- Lindvall, M., Muthig, D., Dagnino, A., Wallin, C., Stupperich, M., Kiefer, D., ... & Kahkonen, T. (2004). Agile software development in large organizations. *Computer*, 37(12), 26-34.
- Lockamy III, A., & McCormack, K. (2004). Linking SCOR planning practices to supply chain performance: An exploratory study. *International journal of operations & production management*, 24(12), 1192-1218.
- Lu, Y., & K.(Ram) Ramamurthy. (2011). Understanding the link between information technology capability and organizational agility: An empirical examination. *Mis Quarterly*, 931-954.
- Luna, A. J. D. O., Kruchten, P., & de Moura, H. P. (2015). Agile Governance Theory: conceptual development. *arXiv preprint arXiv:1505.06701*.

- Luna, A. J. D. O., Kruchten, P., Pedrosa, M. L. D. E., Neto, H. R., & de Moura, H. P. (2014). State of the art of agile governance: a systematic review. *arXiv preprint arXiv:1411.1922*.
- Malhotra, Y. (2005). Integrating knowledge management technologies in organizational business processes: getting real time enterprises to deliver real business performance. *Journal of knowledge management*, 9(1), 7-28.
- Maskell, B. (2001). The age of agile manufacturing. *Supply Chain Management: An International Journal*, 6(1), 5-11.
- Martinsuo, M., & Lehtonen, P. (2007). Role of single-project management in achieving portfolio management efficiency. *International journal of project management*, 25(1), 56-65.
- Melnik, G., & Maurer, F. (2004, June). Direct verbal communication as a catalyst of agile knowledge sharing. In *Agile Development Conference, 2004* (pp. 21-31). IEEE.
- Mehdibeigi, N., Dehghani, M., & mohammad Yaghoubi, N. (2016). Customer Knowledge Management and Organization's Effectiveness: Explaining the Mediator Role of Organizational Agility. *Procedia-Social and Behavioral Sciences*, 230, 94-103.
- Mirchandani, D. A., & Lederer, A. L. (2012). "Less is more:." information systems planning in an uncertain environment. *Information Systems Management*, 29(1), 13-25.
- Miller, V. D., Johnson, J. R., & Grau, J. (1994). Antecedents to willingness to participate in a planned organizational change.

- Mikurak, M. G. (2006). *U.S. Patent No. 7,130,807*. Washington, DC: U.S. Patent and Trademark Office.
- Misra, S. C., Kumar, V., & Kumar, U. (2009). Identifying some important success factors in adopting agile software development practices. *Journal of Systems and Software*, 82(11), 1869-1890.
- Moran, A. (2014). Agile risk management. In *Agile Risk Management* (pp. 33-60). Springer International Publishing.
- Morris, S. A., & McManus, D. J. (2002). Information infrastructure centrality in the agile organization. *Information Systems Management*, 19(4), 8-12.
- Moniruzzaman, A. B. M., & Hossain, D. S. A. (2013). Comparative study on agile software development methodologies. *arXiv preprint arXiv:1307.3356*.
- Neves, F., Borgman, H., & Heier, H. (2017, January). Success Lies in the Eye of the Beholder: A Quantitative Analysis of the Mismatch Between Perceived and Real IT Project Management Performance. In *Proceedings of the 50th Hawaii International Conference on System Sciences*.
- Neo, B. S., & Chen, G. (2007). Dynamic governance: Embedding culture, capabilities and change in Singapore.
- Neves, F. T., Rosa, V. N., Correia, A. M. R., & de Castro Neto, M. (2011, June). Knowledge creation and sharing in software development teams using Agile methodologies: Key insights affecting their adoption. In *Information Systems and Technologies (CISTI), 2011 6th Iberian Conference on* (pp. 1-6). IEEE.

- Noor, M. A., Grünbacher, P., & Hoyer, C. (2008). A collaborative method for reuse potential assessment in reengineering-based product line adoption. In *Balancing Agility and Formalism in Software Engineering* (pp. 69-83). Springer Berlin Heidelberg.
- Noor, M. A., Rabiser, R., & Grünbacher, P. (2008). Agile product line planning: A collaborative approach and a case study. *Journal of Systems and Software, 81*(6), 868-882.
- Nunnally, J. C., & Bernstein, I. H. (1994). The assessment of reliability. *Psychometric theory, 3*(1), 248- 292
- Pardo, T. A., Gil-Garcia, J. R., & Luna-Reyes, L. F. (2010). Collaborative governance and cross-boundary information sharing: envisioning a networked and IT-enabled public administration. *The future of public administration around the world: The Minnowbrook perspective*, 129-39.
- Parker, R. J., & Kyj, L. (2006). Vertical information sharing in the budgeting process. *Accounting, Organizations and Society, 31*(1), 27-45.
- Patel, C., & Ramachandran, M. (2009). Agile maturity model (AMM): A Software Process Improvement framework for agile software development practices. *International Journal of Software Engineering, IJSE, 2*(1), 3-28.
- Paulk, M. C. (2002). Agile methodologies and process discipline. *Institute for Software Research, 3*.
- Pettit, S., & Beresford, A. (2009). Critical success factors in the context of humanitarian aid supply chains. *International Journal of Physical Distribution & Logistics Management, 39*(6), 450-468.

- Pee, L. G., Kankanhalli, A., & Kim, H. W. (2010). Knowledge sharing in information systems development: a social interdependence perspective. *Journal of the Association for Information Systems*, 11(10), 550.
- Peppers, K., Gengler, C. E., & Tuunanen, T. (2003). Extending critical success factors methodology to facilitate broadly participative information systems planning. *Journal of Management Information Systems*, 20(1), 51-85.
- Pikkarainen, M., & Mantyniemi, A. (2006). An approach for using CMMI in agile software development assessments: experiences from three case studies.
- Porter, M. E., & Advantage, C. (1985). Creating and sustaining superior performance. *Competitive advantage*, 167.
- Poister, T. H., & Streib, G. (2005). Elements of strategic planning and management in municipal government: Status after two decades. *Public administration review*, 65(1), 45-56.
- Qumer, A., & Henderson-Sellers, B. (2009). A framework to support the evaluation, adoption and improvement of agile methods in practice. *Quality control and applied statistics*, 54(4), 391-393.
- Rand, C., & Eckfeldt, B. (2004, June). Aligning strategic planning with agile development: Extending agile thinking to business improvement. In *Agile Development Conference, 2004* (pp. 78-82). IEEE.
- Rabelo, R. J., Camarinha-Matos, L. M., & Afsarmanesh, H. (1999). Multi-agent-based agile scheduling. *Robotics and Autonomous Systems*, 27(1-2), 15-28.

- Razzak, M. A., & Ahmed, R. (2014, September). Knowledge sharing in distributed agile projects: Techniques, strategies and challenges. In *Computer Science and Information Systems (FedCSIS), 2014 Federated Conference on* (pp. 1431-1440). IEEE.
- Razzak, M. A., Ahmed, R., & Mite, D. (2013, August). Spatial knowledge creation and sharing activities in a distributed agile project. In *global software engineering workshops (ICGSEW), 2013 IEEE 8th international conference on* (pp. 24-30). IEEE.
- Rajan, V. N., & Nof, S. Y. (1996). Cooperation requirements planning (CRP) for multiprocessors: optimal assignment and execution planning. *Journal of Intelligent and Robotic Systems*, 15(4), 419-435.
- Richard, P. J., Devinney, T. M., Yip, G. S., & Johnson, G. (2009). Measuring organizational performance: Towards methodological best practice. *Journal of management*, 35(3), 718-804.
- Roberts, T. L., Cheney, P. H., Sweeney, P. D., & Hightower, R. T. (2004). The effects of information technology project complexity on group interaction. *Journal of vManagement Information Systems*, 21(3), 223-247..
- Rupp, T. M., & Ristic, M. (2000). Fine planning for supply chains in semiconductor manufacture. *Journal of Materials Processing Technology*, 107(1), 390-397.
- Ryan, S., & O'connor, R. V. (2009). Development of a team measure for tacit knowledge in software development teams. *Journal of Systems and Software*, 82(2), 229-240.

- Santos, V., Goldman, A., Martins, D., & Cortes, M. (2014, January). The Influence of Organizational Factors on Inter-team Knowledge Sharing Effectiveness in Agile Environments. In *System Sciences (HICSS), 2014 47th Hawaii International Conference on* (pp. 4729-4738). IEEE.
- Santos, V., Goldman, A., & De Souza, C. R. (2015). Fostering effective inter-team knowledge sharing in agile software development. *Empirical Software Engineering*, 20(4), 1006-1051.
- Sahin, F., & Robinson, E. P. (2005). Information sharing and coordination in make-to-order supply chains. *Journal of operations management*, 23(6), 579-598.
- Santos, V., Goldman, A., & Roriz Filho, H. (2013, January). The influence of practices adopted by agile coaching and training to foster interaction and knowledge sharing in organizational practices. In *System Sciences (HICSS), 2013 46th Hawaii International Conference on* (pp. 4852-4861). IEEE.
- Senapathi, M., & Srinivasan, A. (2012). Understanding post-adoptive agile usage: An exploratory cross-case analysis. *Journal of Systems and Software*, 85(6), 1255-1268.
- Serrador, P., & Pinto, J. K. (2015). Does Agile work?—A quantitative analysis of agile project success. *International Journal of Project Management*, 33(5), 1040-1051.
- Sherman, R. J. (1998). Collaborative planning, forecasting & replenishment (CPFR): Realizing the promise of efficient consumer response through collaborative technology. *Journal of Marketing Theory and Practice*, 6(4), 6-9.

- Smith, T. A., Mills, A. M., & Dion, P. (2012). Linking business strategy and knowledge management capabilities for organizational effectiveness. In *Conceptual Models and Outcomes of Advancing Knowledge Management: New Technologies* (pp. 186-207). IGI Global.
- Smircich, L. (1983). Concepts of culture and organizational analysis. *Administrative science quarterly*, 339-358.
- Solanki, R. S., & Southworth, F. (1991). An execution planning algorithm for military airlift. *Interfaces*, 21(4), 121-131.
- Sohan, S. M., Richter, M. M., & Maurer, F. (2010, June). Auto-tagging emails with user stories using project context. In *International Conference on Agile Software Development* (pp. 103-116). Springer Berlin Heidelberg.
- Souza, C. R. D. (2012). Fostering inter-team knowledge sharing effectiveness in agile software development.
- Sparrow, P., & Cooper, C. (2014). Organizational effectiveness, people and performance: new challenges, new research agendas. *Journal of Organizational Effectiveness: People and Performance*, 1(1), 2-13.
- Srinivasan, J., Dobrin, R., & Lundqvist, K. (2009, July). 'State of the Art'in Using Agile Methods for Embedded Systems Development. In *Computer Software and Applications Conference, 2009. COMPSAC'09. 33rd Annual IEEE International* (Vol. 2, pp. 522-527). IEEE.
- Stout, R. J., Cannon-Bowers, J. A., Salas, E., & Milanovich, D. M. (1999). Planning, shared mental models, and coordinated performance: An empirical link is

- established. *Human Factors: The Journal of the Human Factors and Ergonomics Society*, 41(1), 61-71.
- Stefik, M. (1981). Planning with constraints (MOLGEN: Part 1). *Artificial intelligence*, 16(2), 111-139.
- Tallon, P. P., & Pinsonneault, A. (2011). Competing perspectives on the link between strategic information technology alignment and organizational agility: insights from a mediation model. *Mis Quarterly*, 463-486.
- Terje Karlsen, J., Hagman, L., & Pedersen, T. (2011). Intra-project transfer of knowledge in information systems development firms. *Journal of Systems and Information Technology*, 13(1), 66-80.
- Uhl-Bien, M., Marion, R., & McKelvey, B. (2007). Complexity leadership theory: Shifting leadership from the industrial age to the knowledge era. *The leadership quarterly*, 18(4), 298-318
- Ullah, F., Ullah, F., Thaheem, M. J., Thaheem, M. J., Siddiqui, S. Q., Siddiqui, S. Q., ... & Khurshid, M. B. (2017). Influence of Six Sigma on project success in construction industry of Pakistan. *The TQM Journal*, 29(2), 276-309.
- Underdown, R., & Talluri, S. (2002). Cycle of success: a strategy for becoming agile through benchmarking. *Benchmarking: An International Journal*, 9(3), 278-292.
- van der Vyver, G., Koronios, A., & Lane, M. (2003). Agile methodologies and the emergence of the agile organization: A software development approach waiting for its time?.

- Verheij, H., & Augenbroe, G. (2006). Collaborative planning of AEC projects and partnerships. *Automation in Construction*, 15(4), 428-437.
- Verworn, B., Herstatt, C., & Nagahira, A. (2008). The fuzzy front end of Japanese new product development projects: impact on success and differences between incremental and radical projects. *R&d Management*, 38(1), 1-19.
- Wagner, R. K., & Sternberg, R. J. (1986). Tacit knowledge and intelligence in the everyday world. *Practical intelligence: Nature and origins of competence in the everyday world*, 51-83.
- Wang, S., & Noe, R. A. (2010). Knowledge sharing: A review and directions for future research. *Human Resource Management Review*, 20(2), 115-131.
- Whittaker, B. (1999). What went wrong? Unsuccessful information technology projects. *Information Management & Computer Security*, 7(1), 23-30.
- Wu, W., & Issa, R. R. (2014). BIM execution planning in green building projects: LEED as a use case. *Journal of Management in Engineering*, 31(1), A4014007.
- Xu, J., Zhu, J., & Liao, S. S. (2011, August). Organizational Context in Information Systems Research: Perspectives and Components. In *Management and Service Science (MASS), 2011 International Conference on* (pp. 1-4). IEEE.
- Ye, F., & Wang, Z. (2013). Effects of information technology alignment and information sharing on supply chain operational performance. *Computers & Industrial Engineering*, 65(3), 370-377.

- Yigitbasioglu, O. M. (2010). Information sharing with key suppliers: a transaction cost theory perspective. *International Journal of Physical Distribution & Logistics Management*, 40(7), 550-578.
- Yinan, Q., Tang, M., & Zhang, M. (2014). Mass customization in flat organization: The mediating role of supply chain planning and corporation coordination. *Journal of Applied Research and Technology*, 12(2), 171-181.
- Zain, M., Kassim, N. M., & Mokhtar, E. (2003). Use of information technology and information systems for organisational agility in Malaysian firms. *Singapore Management Review*, 25(1), 69.
- Zäh, M. F., Möller, N., & Vogl, W. (2005, September). Symbiosis of changeable and virtual production—the emperor’s new clothes or key factor for future success. In *Proceedings of the 1st Conference on Changeable, Agile, Reconfigurable and Virtual Production (CARV 2005), Munich, Germany* (pp. 3-10).
- Zhou, H., & Benton, W. C. (2007). Supply chain practice and information sharing. *Journal of Operations management*, 25(6), 1348-1365.
- Zwikael, O., Pathak, R. D., Singh, G., & Ahmed, S. (2014). The moderating effect of risk on the relationship between planning and success. *International Journal of Project Management*, 32(3), 435-441.
- Zwikael, O., & Globerson, S. (2006). Benchmarking of project planning and success in selected industries. *Benchmarking: An International Journal*, 13(6), 688-700.

<b>Execution Planning</b>						
1	Project execution plans conform to good project management practice?	1	2	3	4	5
2	Work is sound on cost estimates and contingency in project execution plan?	1	2	3	4	5
3	Are there effective quality assurance processes planned during execution?	1	2	3	4	5
4	Are there effective processes in place for decision-making and escalation of issues to allow timely and sound resolution?	1	2	3	4	5
<b>Information sharing</b>						
1	Communicating is a problem in my team.	1	2	3	4	5
2	Members of my team inform each other about work-related issues.	1	2	3	4	5
3	The quality of information exchange in our team is good.	1	2	3	4	5
4	I get new facts, insights, and ideas from my colleagues.	1	2	3	4	5
5	During work meetings we tell each other what we knew already and do not exchange new information.	1	2	3	4	5
6	We do not repeat ourselves during team meetings.	1	2	3	4	5
<b>Organization effectiveness</b>						
1	We delegate our group work.	1	2	3	4	5
2	We organize our time well.	1	2	3	4	5
3	We are willing to meet on our own time.	1	2	3	4	5
4	We organize our communication according to available time.	1	2	3	4	5
5	We identify the functions necessary for successful completion of group projects.	1	2	3	4	5
<b>Agile success</b>						
1	We are quick to make and implement appropriate decisions in the face of market/customer-changes.	1	2	3	4	5
2	We constantly look for ways to reinvent/reengineer our organization to better serve our market place.	1	2	3	4	5
3	We treat market-related changes and apparent chaos as opportunities to capitalize quickly.	1	2	3	4	5
4	We fulfill demands for rapid-response, special requests of our customers whenever such demands arise; our customers have confidence in our ability.	1	2	3	4	5
5	We can quickly scale up or scale down our production/service	1	2	3	4	5

	levels to support fluctuations in demand from the market.					
6	Whenever there is a disruption in supply from our suppliers we can quickly make necessary alternative arrangements and internal adjustments.	1	2	3	4	5

## 7. Appendix

### CAPITAL UNIVERSITY OF SCIENCE AND TECHNOLOGY

Department of Management Sciences

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#### Questionnaire

Dear Participant,

I am students of MS Project Management Sciences at **capital university of science and technology**. I am conducting a research on **Impact of execution planning on agile success; with mediating role of information sharing and moderating role of organizational effectiveness**. You can help me by completing the attached questionnaire, You will find it quite interesting. I appreciate your participation in my study and I assure that *your responses will be held confidential* and will only be used for education purposes.

Sincerely,

**Namra Mubarak**

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

**Please provide following information.**

	1	2
<b>Gender</b>	Male	Female

	1	2	3	4	5
<b>Age</b>	18- 25	26-33	34-41	42-49	50 and above

	1	2	3	4	5	6
<b>Qualification</b>	Metric	Inter	Bachelor	Master	MS/M.Phil	PhD

	1	2	3	4	5	6
<b>Experience</b>	5 – 10	11 – 16	17 – 22	23 – 28	29 – 35	36 and above