IMPACT OF SERVANT LEADERSHIP ON TEAM EFFECTIVENESS IN IT SECTOR: ROLE OF INTELLECTUAL STIMULATION AND PERCEIVED SUPERVISOR SUPPORT

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THESIS ACCEPTANCE CERTIFICATE

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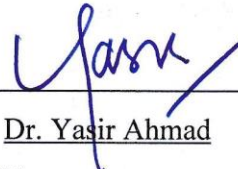
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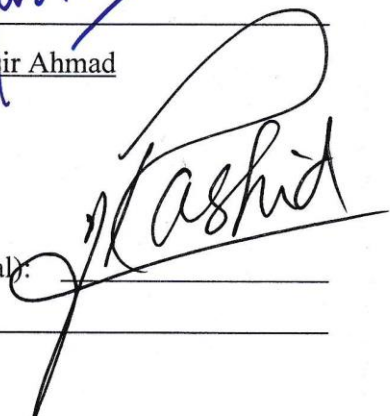Name of Supervisor: <u>Dr. Asjad Shahzad</u>

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Dedication

Dedicated to my loving parents, brothers, and caring wife whose steadfast encouragement and motivation have been the guiding stars illuminating the path to this remarkable milestone

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ABSTRACT

In the contemporary landscape of the IT sector, leadership paradigms have witnessed a notable evolution, particularly with the advent of servant leadership—an ethos that places primacy on prioritizing the needs of the team over individual interests. Supervisors in the IT industry have evolved and devised various leadership styles that are team-focused and involve various techniques to improve team satisfaction and productivity and in turn, facilitate in achieving organizational goals.

This study sought to examine the collective impact of servant leadership, intellectual stimulation, and perceived supervisor support on team effectiveness. A cohort comprising 327 IT professionals across various cities in Pakistan was engaged through structured survey instruments to gauge their perceptions regarding these leadership dimensions and their consequential effects on team effectiveness.

The findings present servant leadership as a pivotal driver of team effectiveness, exerting a statistically significant positive influence. Moreover, this effect was found to be reinforced by the presence of intellectual stimulation and perceived supervisor support, thereby contributing to fostering optimal team performance within the Agile IT sector.

This study harbors significant implications for practitioners and stakeholders within the Pakistani IT domain. It underscores the efficacy of servant leadership as a catalyst for enhancing team cohesion and productivity, thereby advocating for its widespread adoption within organizational contexts. Furthermore, the reinforcement of servant leadership with elements of intellectual stimulation and supervisor support elucidates the nuanced dynamics underpinning effective leadership within the IT sector.

The findings of this research underscore the imperative for organizational leaders to adopt a servant leadership style, one characterized by a profound commitment to the holistic well-being and professional development of their teams. By fostering a culture of servant leadership alongside intellectual stimulation and robust supervisor support, organizations can engender a climate conducive to innovation, collaboration, and sustained performance.

Keywords: Servant leadership, Team effectiveness, Intellectual stimulation, Perceived Supervisor support, Agile

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List of Abbreviations

BTS	Bartlett's Test for Sphericity
IS	Intellectual Stimulation
IT	Information Technology
KMO	Kaiser Meyer-Olkin
LMX	Leader-Member Exchange
LV	Latent Variable
PSS	Perceived Supervisor Support
SEM	Structural equation modeling
SET	Social Exchange theory
SL	Servant Leadership
TE	Team Effectiveness
VIF	Variance Inflation factor

CHAPTER 1: INTRODUCTION

1.1 Background

In today's constantly changing technology market, effective leadership is essential to drive through challenges leading to organizational success. Among the various leadership paradigms that have garnered attention in recent years, servant leadership has emerged as a compelling approach, particularly in knowledge-intensive sectors such as information technology (IT). Servant leadership, rooted in the ethos of selflessness and prioritizing the needs of others, is uniquely suited to foster collaborative environments conducive to innovation and adaptability in the IT industry, characterized by its fast-paced nature and reliance on cross-functional collaboration, the relevance of servant leadership becomes even more pronounced.

It is widely discussed in IT project management concepts that iterative development and effective collaboration are the keys to agile teams' success (Noll et al., 2017) In this context, the role of leadership in facilitating team effectiveness and ensuring project success becomes paramount. However, while the principles of servant leadership align with the values inherent in agile environments, empirical evidence regarding its impact on team effectiveness within this context remains scarce.

In IT companies, due to its rapid fast-paced nature and dependency on cross-functional teams, the requirement of servant leadership becomes even more important. In this context, the role of leadership in facilitating team effectiveness and ensuring project success becomes paramount. However, while the principles of servant leadership align with the values inherent in agile environments, empirical evidence regarding its impact on team effectiveness within this context remains scarce.

Moreover, servant leadership is mostly influenced by a number of contextual and mediating needs through understanding. Two such factors that merit attention in the IT context are intellectual stimulation and perceived supervisor support. Intellectual stimulation, defined as the extent to which leaders encourage creativity, innovation, and critical thinking among their team members (Jung et al., 2003)is particularly pertinent in agile environments where adaptability and continuous improvement are central tenets. Similarly, perceived supervisor support, reflecting employees'

perceptions of the extent to which their supervisors are supportive and caring (Eisenberger et al., 2002) plays a crucial role in shaping employee attitudes and behaviors, including their commitment to organizational goals and willingness to exert discretionary effort.

Although the theoretical importance of these constructs is undeniable, the interplay between servant leadership, intellectual stimulation, perceived supervisor support, and team effectiveness must be thoroughly studied in agile development settings. Therefore, there is a compelling need for empirical investigations to elucidate these relationships and shed light on the underlying mechanisms through which servant leadership operates in the context of agile teams.

This study is targeted to address this gap by examining the effect of servant leadership ethics on agile team effectiveness when it gets reinforced with the mediating effects of intellectual stimulation and perceived supervisor support. By leveraging a quantitative approach this research aims to provide a nuanced understanding of the dynamics at play and offer practical insights for organizational leaders seeking to enhance team effectiveness in agile settings.

1.2 Research Rationale

The motivation behind this research is critical issues faced by Pakistan's IT and software firms that are facing challenges of employee turnover, burnout, and decreased productivity. With the sector poised for continued growth and innovation, it is imperative to identify and implement effective leadership strategies that can support the diverse needs of agile teams and foster a culture of engagement, collaboration, and innovation.

The introduction of agile methodologies in software development has opened new horizons and challenges, that made reevaluation of traditional leadership practices necessary. Servant leadership, with its emphasis on a servant-first mindset, empathy, and empowerment, offers a promising framework for addressing these challenges and nurturing high-performing agile teams. By prioritizing the well-being and development of team members, servant leaders can create environments that inspire creativity, encourage collaboration, and drive organizational success.

While the theoretical advantages of servant leadership are extensively studied, there is a notable lack of empirical research specifically focusing on its effects in software development. This study aims to address this gap by exploring how servant leadership influences team effectiveness in agile environments, particularly looking at the mediating roles of intellectual stimulation and perceived supervisor support. Through providing empirical data and practical insights, this research intends to guide leadership development programs and organizational strategies that aim to boost employee engagement, lower turnover rates, and achieve organizational success in Pakistan's IT sector.

1.3 Research Objectives

Listed below are the research objectives this research will attempt to answer in the next sections:

1. To analyse the relationship between Servant leadership and Team Effectiveness

2. To analyse the relationship between Perceived Supervisor support and Team Effectiveness

3. To analyse the relationship between Intellectual Stimulation and Team Effectiveness

4. To assess whether perceived supervisor support mediates the relationship between servant leadership and team effectiveness.

5. To assess whether Intellectual stimulation mediates the relationship between servant leadership and team effectiveness.

6. To assess the impact of intellectual stimulation on perceived supervisor support.

1.4 Problem Statement

The information technology sector of Pakistan in recent years has emerged to be a vital contributor to Pakistan's GDP. According to recent statistics, the IT industry in Pakistan is projected to grow at a rate of 10% annually, with a significant portion of this growth fueled by the incorporation of agile methodologies in Agile software engineering and project management (Pakistan's IT Industry Overview, 2020). Agile

methodologies, characterized by their iterative approach and emphasis on collaboration and adaptability, have become increasingly prevalent in Pakistani IT organizations, promising faster delivery of high-quality software products in response to changing customer needs.

However, although most of the companies have somehow adopted agile methodologies in their practices, but country's IT sector still shows a potential gap for improvement. High turnover rates, employee burnout, and diminished productivity have become pervasive challenges plaguing the sector. According to a recent survey conducted by the Pakistan Software Houses Association ("P@SHA Salary Survey 2021," 2021.) employee turnover rates in the Pakistani IT industry have reached alarming levels, with an estimated 25% of employees leaving their jobs within the first year of employment ("P@SHA Salary Survey", 2021)

A deep examination of contributing factors in these problems highlights some common origins. First and foremost, many employees cite work exhaustion and burnout as primary reasons for leaving their jobs. The relentless pace of agile project delivery, coupled with long working hours and unrealistic deadlines, has taken a toll on employee well-being and morale. Furthermore, the lack of supportive leadership and mentorship exacerbates the problem, leaving employees feeling isolated and unsupported in their roles.

Furthermore, since IT professionals are not given enough opportunities that mentally challenge them it further adds to the challenges faced in this sector. Agile methodologies, while designed to promote collaboration and innovation, often fall short in providing avenues for creativity and intellectual challenge. As a result, many talented professionals feel stifled in their roles, leading to disengagement and disillusionment.

Therefore, there is a clear need for a refined leadership strategy that addresses the special demands of agile teams while also cultivating employee engagement, satisfaction, and growth. Servant leadership, with its emphasis on putting others first and nurturing a supportive and empowering work culture, presents a promising framework for addressing these issues. By prioritizing the needs of team members, providing mentorship, and encouraging intellectual stimulation, servant leaders have the potential to redefine the working climate and enhance team effectiveness in agile

environments.

Although the theoretical framework in relation with servant leadership is already established, still it requires empirical research that will analyze its impact on teams and effectiveness in IT organizations in Pakistan. Therefore, this study seeks to fill this gap by examining the impact of servant leadership on team effectiveness in agile environments in Pakistan. By investigating the mediating roles of intellectual stimulation and perceived supervisor support, this research aims to provide actionable insights for organizational leaders seeking to optimize team performance and foster a culture of innovation and collaboration within Pakistani IT organizations.

1.5 Research Questions

This thesis will target to answer the following questions:

1. How does Servant Leadership affect Team Effectiveness?

2. How does Perceived supervisor support affect Team Effectiveness?

3. How does Intellectual Stimulation affect Team Effectiveness?

4. To what extent does Perceived supervisor support mediate the relationship between Servant Leadership and Team Effectiveness?

5. To what extent does Intellectual Stimulation mediate the relationship between Servant Leadership and Team Effectiveness?

6. Does Intellectual Stimulation have any impact on Perceived supervisor support?

1.6 Definition of terms

1.6.1 Servant leadership

In 1977, Robert K. Greenleaf introduced the concept of servant leadership, a revolutionary leadership style characterized by a profound dedication to serving others and putting their needs before one's own. At its core, servant leadership emphasizes empathy, compassion, and a strong desire to support and uplift those around them. Leaders who practice this approach reject conventional top-down management in favor

of cultivating an environment of trust, cooperation, and mutual respect. By adopting a servant-first attitude, these leaders inspire and motivate their teams to reach shared objectives while also promoting personal growth and development for each individual.

1.6.2 Team Effectiveness

Team effectiveness refers to the extent to which a group of employees accomplish their objectives and fulfills the expectations of its stakeholders. It encompasses various dimensions, including task performance, cohesion, communication, and satisfaction among team members (Liu & Cross, 2016). The concept of team effectiveness was introduced by Cohen and Bailey (1997) in their seminal work, where they emphasized the importance of evaluating teams based on both quantitative performance metrics and qualitative indicators of teamwork and collaboration.

1.6.3 Perceived Supervisor Support

Perceived Supervisor Support (PSS) is an employee's perception of to what extent their supervisor displays supportive behavior. This perception is by supervisor's care for their team's well-being in an organizational setting. (Eisenberger et al., 2002). Initially introduced by Eisenberger and colleagues, PSS encompasses various supportive behaviors, including providing guidance, recognition, and emotional support, which contribute to fostering a positive work environment and enhancing employee morale and commitment (Eisenberger et al., 2002). This construct emphasize the significance of supervisors' role in shaping employees' perceptions of company's support and their overall job satisfaction and engagement.

1.6.4 Intellectual Stimulation

Intellectual stimulation, as defined by Bass in 1985, is a behavior demonstrated by supervisors that induces out-of-the-box thinking, creativity, and mental growth in their teams. (Jung et al., 2003). This factor encourages challenging assumptions, fostering a climate of curiosity, and promoting a culture of constant learning within the organization (Jung et al., 2003; Bass & Avolio, 1994)Leaders who engage in intellectual stimulation inspire their followers to explore new ideas, challenge the status

quo, and pursue intellectual endeavors that contribute to organizational innovation and success (Bass & Riggio, 2006)

1.7 Thesis Structure

This thesis is composed of five chapters the details of each chapter are discussed below.

Chapter 1 begins by providing the context and introductory overview of the research, along with its historical backdrop. This is followed by an exploration of the reasons for investigating the impacts of inadequate supervisor support and limited challenging opportunities within the IT industry. Subsequently, the thesis outlines its primary goals through research objectives and proceeds to clarify the essential terminology used in this study.

Chapters 2 In the second chapter, the study establishes its rationale and conducts a comprehensive review of relevant literature. This section critically assesses existing knowledge, building upon prior research to deepen understanding of the subject matter. It adeptly addresses key findings from previous studies, providing thorough insights into the topic. Additionally, it meticulously outlines the conceptual framework guiding the research and elucidates the methodologies employed. By identifying gaps and challenges gleaned from the literature, the study sets the stage for future research endeavors, proposing hypotheses to further advance scholarly inquiry.

Chapter 3 provides a comprehensive examination of the research methodology, delving into the study's aims, the development and utilization of research instruments, and the exploration of potential solutions to the research problem. The selection of data collection methods and the study's approach were tailored to the research context. Finally, the chapter addresses the constraints inherent in the research design

Chapter 4 includes results and their analysis using IBM SPSS

Chapter 5 presents an overview of the study's findings, conclusions, and suggestions for future research, along with their managerial, theoretical, and practical significance. Additionally, it addresses the constraints of the current research and

outlines areas for future investigation warranting deeper exploration.

CHAPTER 2: LITERATURE REVIEW

This chapter begins with examining the theoretical framework and analyzing existing literature. It provides concise introductions to the concepts of servant leadership, team effectiveness, intellectual stimulation, and perceived supervisor support, illustrating their interconnectedness. The research findings reveal several gaps warranting further exploration. To deepen understanding of this topic, it assesses previous studies' contributions and underscores remaining gaps. Furthermore, it explores various theoretical perspectives to construct the conceptual framework supporting this dissertation. Additionally, it delineates key points and methodologies employed in agile environments, which will be scrutinized in the subsequent part of this thesis. Finally, the hypothesized framework, serving as the foundation for this research, is delineated towards the chapter's conclusion.

2.1 Theoretical Ground

2.1.1 Servant Leadership Theory

The servant leadership theory as proposed by Robert K. Greenleaf has arisen as a significant framework in leadership theories due to its special emphasis on putting others first (Greenleaf, 1998). The basis of servant leadership theory revolves around the idea of leaders prioritizing the needs and well-being of their teams which in turn improves the organizational metrics and positive team outcomes.

The foundational basis of servant leadership theory requires an effort from supervisors to have a deep sense of responsibility and empathy toward their followers (Sendjaya et al., 2008). This effort comprises humility, mentorship, and a true desire to serve others in making decisions that are related to common organizational gains. Such leaders cultivate a culture that boosts ownership, cooperation, and mutual respect between leaders and their teams (Van Dierendonck & Nuijten, 2011).

Furthermore, the servant leadership style comprises various core principles that pave the way for how teams and leaders should interact. These principles include empathy, awareness, wisdom, mentorship, and commitment to the growth of followers (Spears & Wagner-Marsh, 1998). Servant leaders by incorporating these principles in their practice create a sense of support for their teams that encourages their followers

to put their best efforts into assigned goals which ultimately enhances the organizational performance.

2.1.2 Leader-Member Exchange Theory (LMX)

The existing research on Leader-member exchange theory (LMX) underscores the crucial role of enhancing team effectiveness through enhancing the relationships between leaders and employees across various organizational contexts. As highlighted by Uhl-bien et al. (2022), LMX theory stresses the importance of fostering positive relationships between leaders and employees, despite encountering several inherent challenges. Establishing high-quality LMX relationships hinges on trust, mutual respect, and shared goals within teams. These relationships cultivate a sense of belonging and dedication, ultimately enhancing team productivity (Uhl-Bien et al., 2022). Additionally, Dulebohn et al. (2012) underscore the importance of cultivating strong relationships between leaders and team members. By tailoring their interactions to individual team members, showing concern for their needs and preferences, leaders create a supportive work environment where each team member feels valued and contributes optimally toward shared objectives (Dulebohn et al., 2012).

2.1.3 Social Exchange Theory

The latest research made on Social Exchange theory (SET) has also presented a new perspective to observe team productivity. (Meira & Hancer, 2021). According to SET, individuals who engage with others with an expectation of mutual benefit, are met with a similar response. This theory solidifies the concept of servant leadership in which a leader is reciprocated with trust and commitment if they show genuine concern and empathy towards their team members.

Furthermore, various scholars have found the importance of mental support for the applications of SET in the workplace. The research by Chen and Wu (2020) demonstrated that perceived supervisor support significantly predicts employees' commitment and productivity. This also supports the idea of employees' perception of a leader's support where they feel much obliged and reciprocate the efforts and engagement of their manager (Chen & Wu, 2020)

2.1.4 Path-goal theory

The path-goal theory as a force of enhancing team effectiveness provides a clear path to achieve goals by clearing out the opposite forces that discourage progress (House, 1971). According to this theory, the managers with a motivation to ease the work of their subordinates are assigned to communicate and elaborate the success factors to their teams. This understanding of end goals effectively motivates the team members to accomplish their goals (Northouse, 2021).

For instance, if a project manager who is leading a complex development project observes that their team is struggling with understanding project requirements, they can adopt a directive leadership approach. They can hold a team session where they can communicate clear instructions on the project objectives, break down to achieve pieces, and outline the coding practices to be implemented. This application was observed by Saide et al., (2019) where the application of path-goal practice resulted in improved project knowledge in the IT sector.

2.2 Research Gap

The literature review has provided a significant research gap in understanding team KPIs and their related factors in agile environments. Firstly, existing studies predominantly focus on traditional hierarchical organizational structures rather than agile contexts. For instance, Grass et al., emphasize the need to investigate leadership styles specifically tailored to agile teams to enhance understanding of their unique dynamics. (2020) Secondly, while servant leadership has been extensively studied, its direct impact on team effectiveness within agile environments remains relatively unexplored. Recent research by Ellahi et al (2022) highlights the importance of examining servant leadership behaviors in agile settings to discern their influence on team outcomes.

In addition, there is a significant gap in how certain mediating factors will cooperate or challenge the relationship between servant leadership and team effectiveness. Although intellectual stimulation and perceived supervisor support are recognized as essential components of servant leadership, their specific roles as mediators in the agile context have not been thoroughly examined. By addressing these

gaps, this research aims to provide valuable insights into the nuanced interplay between servant leadership, team effectiveness, and the mediating roles of intellectual stimulation and perceived supervisor support in agile environments.

2.3 Hypothesis development

The review of the present literature has shown us the potential for further research in agile settings. This subject has been a topic of interest specifically for organizations using agile methodologies. Within the dynamic setting of agile environments, where adaptability, collaboration, and innovation are essential, the effect of servant leadership on team effectiveness is particularly noteworthy. Building on the foundational principles of servant leadership, this study proposes that teams led by servant-oriented leaders will demonstrate heightened levels of effectiveness in agile settings. This proposition finds support in prior research, which suggests that servant leadership contributes to positive team outcomes, such as improved cohesion, motivation, and performance (Chiniara & Bentein, 2016)

This research will focus on the relation of servant leadership and team effectiveness variables with the mediation of two predictors; intellectual stimulation and perceived supervisor support in agile companies. Servant leaders are recognized for fostering intellectual curiosity among team members and promoting critical thinking, innovation, and continuous learning. Additionally, they are perceived as supportive figures who offer guidance, encouragement, and necessary resources to their teams. Drawing upon social exchange theory and existing literature on leadership mediation, it is hypothesized that the beneficial impact of servant leadership on team effectiveness will be partly explained by the enhanced intellectual stimulation and perceived supervisor support experienced within the team (Van Dierendonck & Nuijten, 2011). The hypothesis developed in this research will open new dimensions for understanding the relationship between servant leadership and its impacts on agile team performance, and will also suggest the interplay of mediating factors that have not been deeply researched before.

2.3.1 Servant leadership and team effectiveness

The assosiation between servant leadership and team effectiveness is widely

researched in the context of implementing a productive and healthy work environment. Eva Nathan in her research for a systematic review of servant leadership has concluded that the idea of providing teams with necessary resources, guidance, and support leads them to achieve excellence in their roles (Eva et al., 2019). This supportive environment levels the ground for a culture of trust and empowerment inside teams which encourages communication, and knowledge sharing and boosts problem-solving skills ultimately improving their effectiveness.

Similar research done by Robert C. Liden, which comprised a multi-dimensional, multi-level assessment proved that servant leaders motivate their employees by an engaging vision and aligning the team objectives in sync with organizational goals (Liden et al., 2008). By involving team members in the target-setting process and focusing on the achievement of a shared company vision a sense of ownership and commitment flourishes inside team members. This shared sense of purpose promotes cooperation, interaction, and magnitude of effort, which in turn helps in achieving organizational goals.

Sendjaya et al in their research also emphasized the importance of learning growth of the team. By investing in the learning growth and mental satisfaction of the teams, servant leaders provide them with opportunities for skills improvement, and career advancement (Sendjaya et al., 2008). This idea of personal satisfaction and growth is a driving factor for increasing company loyalty and motivates the employees to perform to their full potential towards company objectives.

2.3.2 Intellectual Stimulation and Team Effectiveness

The available literature on leader-promoted intellectual stimulation is not available in larger numbers. this concept has appeared as a strategy to increase team effectiveness in recent years. According to Sony et al., 2020), leaders who encourage team members to ask questions, explore alternate solutions to problems, and encourage critical thinking, indirectly promote a mindset of continuous learning and growth. According to Țânculescu-Popa and Bostan, (2022) teams led by leaders who stimulate intellectual curiosity demonstrate a good resilience when faced with difficult challenges and are more equipped in uncertain situations. These observations highlight the importance of leader-induced intellectual stimulation in fostering a culture of

innovation and critical thinking and promoting team effectiveness.

2.3.3 Perceived Supervisor Support and Team Effectiveness

Perceived supervisor support has been observed as a key factor in developing team dynamics and performance. Studies have shown that when team members perceive strong support from their supervisors, they are probable to undergo high level of trust, satisfaction, and commitment, which in turn contribute to enhanced team performance and effectiveness (Eisenberger et al., 1986)

Furthermore, to improve the interpersonal relationships within teams, PSS is a promoting factor. When team members feel supported by their supervisors, they are more prepared to engage in cooperative behaviors, communicate openly, and collaborate effectively with their peers (Kurtessis et al., 2017)This fosters a conducive team climate characterized by mutual respect, empathy, and shared goals, which are essential for achieving collective objectives and delivering high-quality outcomes.

In addition, there are credible pieces of evidence of the psychological impacts of PSS for individual and team performance improvement. Studies have found that team members who perceive care and empathy from their supervisors are more inclined to demonstrate proactive problem-solving, initiative-taking, and task engagement within their teams (Aryee et al., 2007). These proactive behaviors contribute to increased team productivity, innovation, and adaptability, ultimately bolstering overall team effectiveness.

2.3.4 Servant Leadership and Perceived Supervisor Support

Servant leadership, characterized by leaders prioritizing the needs of their followers and fostering their development and success, has garnered attention in organizational research due to its potential to cultivate positive work environments and enhance team outcomes. Central to the effectiveness of servant leadership is the concept of perceived supervisor support (PSS), which refers to employees' perceptions of the degree to which their supervisors care about their well-being, assist, and are responsive to their needs.

Studies have demonstrated a significant association between servant leadership

and perceived supervisor support. For instance, in their analysis of correlation between servant leadership and employee outcomes, Liden, Wayne, Zhao, and Henderson (2008) found that servant leadership behaviors, such as empathy and empowerment, were positively related to perceived supervisor support. Similarly, Hu and Liden (2011) demonstrated that servant leadership was positively associated with followers' perceptions of supervisor support, which in turn influenced organizational citizenship behaviors.(Faller et al., 2020)

Furthermore, research suggests that perceived supervisor support mediates the relationship between servant leadership and various employee outcomes. In a study by Liden, Wayne, Liao, and Meuser (2014), perceived supervisor support was discovered to strengthen the relationship between servant leadership and employee engagement, indicating that when employees perceive their leaders as supportive, they are more engaged in their work. Similarly, Rego, Sousa, Marques, and Cunha (2012) found that perceived supervisor support partially mediated the relationship between servant leadership and employee performance, highlighting the importance of supportive leadership behaviors in enhancing employee outcomes.

2.3.5 Servant Leadership and Intellectual Stimulation

The research done on the interrelationship between servant leadership and intellectual stimulation is non-existent, however, there are few studies on the psychological impacts of this style. Research by Van Dierendonck and Nuijten (2011) provides empirical support for the positive relationship between servant leadership and intellectual stimulation. Their study conducted among Dutch employees demonstrated that servant leadership behaviors, such as encouraging autonomy, promoting personal development, and fostering a climate of open communication, were positively associated with employees' perceptions of intellectual stimulation within the workplace.

Similarly, Chiniara and Bentein (2016) explored the impact of servant leadership on various team outcomes, including intellectual stimulation. Their meta-analysis synthesized findings from 54 studies and revealed a significant positive relationship between servant leadership and intellectual stimulation. Specifically, servant leaders were found to stimulate creativity, critical thinking, and problem-solving skills among team members, thereby contributing to overall team effectiveness.

2.3.6 Intellectual Stimulation and Team Effectiveness

Intellectual stimulation, a fundamental aspect of transformational leadership, entails encouraging followers to think critically, innovate, and explore new ideas. In the context of team dynamics, intellectual stimulation has been recognized as a catalyst for enhanced team performance and effectiveness. By fostering an environment that promotes creativity, problem-solving, and knowledge sharing, leaders who stimulate intellectual engagement among team members can facilitate the development of innovative solutions and adaptive strategies.

Research by Zhang and Bartol (2010) demonstrated a positive relationship between intellectual stimulation and team innovation, highlighting the crucial role of leaders in stimulating creativity and idea generation within teams. Similarly, Amabile, Schatzel, Moneta, and Kramer (2004) found that environments characterized by intellectual stimulation fostered greater intrinsic motivation among team members, leading to higher levels of creativity and productivity.

Moreover, intellectual stimulation has been linked to improved team learning and knowledge creation. By encouraging members to challenge assumptions, explore new perspectives, and engage in reflective discourse, leaders can facilitate a culture of continuous learning within the team (Faller et al., 2020). This emphasis on intellectual growth and exploration not only enhances individual capabilities but also contributes to collective learning and performance improvement.

2.3.7 Perceived Supervisor Support and Team Effectiveness

Perceived supervisor support (PSS) has garnered attention in organizational research as a crucial determinant of employee attitudes, behaviors, and outcomes. Within the realm of team dynamics, PSS has been recognized for its potential impact on team effectiveness. PSS refers to employees' subjective perception of the extent to which their supervisors value their contributions, care about their well-being, and provide the necessary support (Eisenberger, Huntington, Hutchison, & Sowa, 1986). In the context of teams, PSS extends beyond individual relationships to encompass the collective perception of team members regarding the supportiveness of their shared supervisor.

Several scholars have explored the correlation between PSS and team effectiveness, shedding light on its implications for team dynamics and performance. For instance, research by Erdogan, Liden, and Kraimer (2006) found that practice of promoting PSS were directly related with increased team cohesion and dedication, ultimately leading to enhanced team performance. Similarly, Nielsen, Randall, and Albertsen (2007) demonstrated that teams with supportive supervisors exhibited higher levels of trust, communication, and collaboration, which contributed to improved team effectiveness.

Moreover, PSS has been linked to various dimensions of team effectiveness, including task performance, goal attainment, and overall team satisfaction. For example, Tabak et al (2024) found that PSS positively influenced team members' motivation and engagement, leading to better task performance and goal accomplishment. Similarly, studies by Podsakoff, MacKenzie, Paine, and Bachrach (2000) highlighted the role of PSS in fostering a positive team climate, which in turn facilitated effective teamwork and goal attainment.

2.3.8 The Mediating Role of Intellectual Stimulation

The mediating effect of intellectual stimulation in agile environments has been researched in very few studies. Being a critical factor in transformational leadership, it did not receive much attention on how and if it can be included in the servant leadership framework. It has been observed that when leaders encourage team members to question assumptions, explore new ideas, and engage in constructive debates, it cultivates an environment conducive to learning and innovation, ultimately leading to improved team performance (Shin & Zhou, 2007)

A research study by Carmeli, Atwater, and Levi (2011) found that intellectual stimulation partially mediated the association between transformational leadership and team innovation. Similarly, Huang, Iun, Liu, and Gong (2010) demonstrated that intellectual stimulation mediated the relationship between leadership and team innovation.

Furthermore, the effectiveness of intellectual stimulation as a mediator may vary depending on contextual factors such as organizational culture and team characteristics. For instance, Shin and Zhou (2007) suggested that intellectual

stimulation may be particularly beneficial in teams with high levels of task interdependence and a supportive organizational climate.

2.3.9 The Mediating Role of Perceived Supervisor Support

The available literature suggests that PSS plays a mediating role in the relationship between leadership styles and team outcomes. For instance, a study by Chen and Wu (2020) found that PSS partially mediated the relationship between transformational leadership and team productivity, indicating that team members' perceptions of supervisor support contribute to the positive effects of transformational leadership on team effectiveness. Similarly, research by Chan (2017) demonstrated that PSS mediated the relationship between empowering leadership and team creativity, highlighting the importance of supportive supervisor behaviors in facilitating team innovation and effectiveness.

Research also indicates that when team members perceive their supervisors as supportive, they experience higher levels of job satisfaction, organizational commitment, and trust in their team leaders (Eisenberger et al., 2014). Moreover, PSS has been linked to increased team cohesion, communication, and collaboration, which are essential ingredients for enhancing team effectiveness (Adil & Ab Hamid, 2020)

2.4 Research Hypothesis

The following are research hypotheses concluded from the literature review:

H1: Servant leadership positively impacts team effectiveness.

H2: Servant leadership is positively associated with perceived supervisor support.

H3: Perceived supervisor support is positively associated with team effectiveness.

H4: Perceived supervisor support mediates the relationship between servant leadership and team effectiveness.

H5: Servant leadership is positively associated with intellectual stimulation.

H6: Intellectual stimulation is positively associated with team effectiveness.

H7: Intellectual stimulation mediates the relationship between servant leadership and team effectiveness.

H8: Intellectual stimulation from supervisors is positively associated with perceived supervisor support among employees.
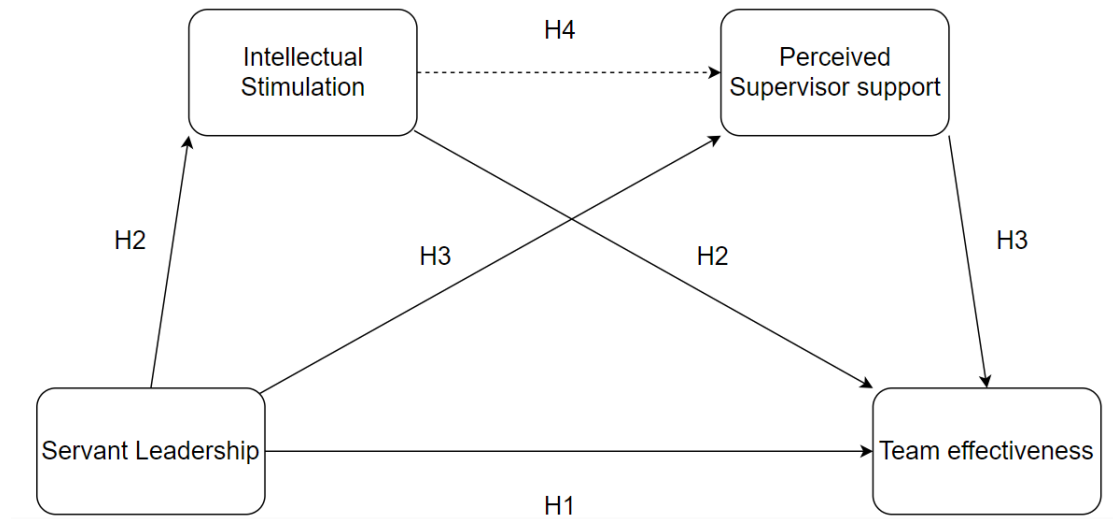
Figure 2-1 Hypothesized Framework

CHAPTER 3: RESEARCH METHODOLOGY

This chapter further provides details on the methodology used in this research to evaluate our hypotheses. It includes an explanation of the research's methodology, design structure, and justifications. It also explains how the opinions of several IT professionals have been recorded using an online questionnaire, that was further analyzed using IBM SPSS software by performing several tests. It also includes various tests to measure the accuracy of the data before it has been found perfect for further analysis. The demographical nature of the sample, sampling technique, and tests to determine questionnaire validity are also part of this section.

3.1 Research Paradigm

This research includes a quantitative analysis of 4 variables taken from the literature. All variables used in this study were measured numerically, however, the effect of some nominal variables from demographics was also part of the analysis. The research hypotheses are validated using the data collected via survey questionnaires using a deductive method. The motivation behind using a deductive research approach was the theoretical framework provided by previous studies. The data for this research was collected in 4 months using an online tool called Google Forms. This specific method was chosen to increase the reach of this survey beyond a single city and to target employees from all major cities in Pakistan.

The study was based on a questionnaire that used a 5-point Likert scale, that ranged from 1 (Strongly disagree) to 5 (Strongly Agree). The participants were asked to record their responses ensuring the anonymity of their responses and use of the collected data strictly for educational purposes. All variables in the hypothesized model were analyzed in   IT companies that have implemented Agile methodologies in their organization.

3.2 Research Settings

3.2.1 Sampling

The target sample was selected based on the purposive sampling method. This

method was chosen to target the participants who possessed engineering or computer science degrees from various universities. Out of 327 responses collected, 260 of these participants were working in the IT sector ranging from junior to senior developers, quality assurance, and technical support department, whereas 50 of these participants were in managerial positions. And lastly, a short portion of these participants were customer support representatives and graphic designers who made a total of 17 participants.

3.2.2 Sampling Procedure

The survey questionnaire was distributed among the IT employees working in various software development companies. It is composed of 4 main variables. The questionnaire used a 5-point Likert scale adopted from 4 studies to record the ideas of the sample. the idea behind using this scale was to allow freedom to target the sample in choosing the intensity of their response. This scale also benefits the audience as it gives 5 options to select from their level of agreement and in turn helps the researcher to whom it provides more accurate and detailed insights.

The selection of purposive sampling aligns strategically with the objectives and characteristics of the study's target sample. Purposive sampling, also defined as non-probability sampling or selective sampling, is particularly apt for this research endeavor due to its tailored approach to selecting participants who possess specific attributes or experiences relevant to the study's focus (Rai & Thapa, 2015)

Given the complex nature of the research topic and the specialized context of agile companies, the utilization of purposive sampling allows the researcher to select sample with firsthand experience and command in the subject matter. In this case, the target sample comprises IT employees working within agile environments, where servant leadership principles are likely to be implemented and where the dynamics of team effectiveness are of paramount importance.

Purposive sampling allows for the deliberate selection of participants who can provide rich insights and perspectives, thereby improving the depth and validity of the research findings (Palinkas et al., 2015) By specifically targeting IT employees in agile companies, the researcher can capture nuanced experiences and observations that may not be accessible through other sampling methods.

Moreover, compared to random or probability sampling techniques, purposive sampling offers greater efficiency and cost-effectiveness, as it focuses resources and efforts on recruiting participants who hold the approprite knowledge and experiences essential to the study's objectives (Rai & Thapa, 2015) This targeted approach ensures that the data collected are directly relevant to the research questions, thereby enhancing the overall effectiveness and rigor of the study. Thus, by employing purposive sampling, this research aims to generate comprehensive and insightful findings that contribute meaningfully to the understanding of servant leadership, team effectiveness, and agile methodologies in organizational settings.

3.2.3 Variables of the study

Four main variables were the focus of this research i.e. SL, TE, IS, and PSS. The survey questionnaire was designed by using questions from 4 different research studies. The variable items were collected from research papers published by Ehrhart, 2004), Lin et al (2020), Rhoades et al (2001), and Thuan (2020). The survey consisted of 33 questions which can be broken down into 4 dimensions (Servant leadership, perceived supervisor support, intellectual stimulation, and team effectiveness), and one section that had demographical questions.

- **Servant leadership**

Servant leadership is a leadership approach where leaders put the needs of their team members first, encouraging their development and empowerment. This style emphasizes working together, showing empathy, and serving others, which helps build a supportive atmosphere that improves team unity and performance. The idea was introduced by Greenleaf in 1970, who highlighted the leader's role as a servant to their followers. In the IT industry, research by Choudhary et al. (2013) and Liden et al. (2008) has examined the impact of servant leadership on enhancing team dynamics and satisfaction among software development teams. These studies discovered that when leaders practice servant leadership, team members feel valued and supported, leading to greater commitment, job satisfaction, and overall team effectiveness. This highlights the significance of servant leadership in modern organizations, especially in the dynamic and collaborative settings typical of IT and software development.

- **Team Effectiveness**

Team effectiveness encapsulates a team's ability to efficiently accomplish its goals while upholding superior outcomes. This encompasses various facets including seamless collaboration, effective communication channels, and the successful attainment of objectives. Research within the IT domain, as evidenced by studies conducted by Mathieu et al (2008), and Zhang et al (2020) have extensively explored the drivers and ramifications of team effectiveness, particularly within the realm of software development teams. These studies underscore the critical importance of fostering cohesive teamwork and establishing common objectives for achieving optimal team performance. In today's dynamic organizational landscape, where agile methodologies and rapid innovation are paramount, understanding the intricacies of team effectiveness is essential for ensuring the success and competitiveness of IT companies.

- **Perceived supervisor support**

Perceived supervisor support (PSS) pertains to the extent to which employees perceive their supervisors to provide assistance, guidance, and care. This perception significantly influences employees' attitudes, behaviors, and job outcomes. Eisenberger et al. (2001) pioneered research in this domain, elucidating its profound impact on employee well-being and performance. Within the IT sector, empirical studies conducted and Zhang et al., (2020) have further explored the effects of PSS on critical aspects such as job satisfaction and productivity among software professionals. These studies underscore the importance of supervisor support in shaping employees' experiences and organizational outcomes, particularly in fast-paced and dynamic environments like those prevalent in the software industry. By fostering a supportive work environment, supervisors can enhance employee morale, and job satisfaction, and ultimately contribute to organizational success.

- **Intellectual stimulation**

Intellectual stimulation within a team entails actively encouraging team members to think critically, innovate, and explore novel ideas. This practice cultivates a culture of creativity and continuous learning, fostering an environment where individuals feel empowered to contribute innovative solutions. Bass (1985) and Amabile et al., (2004) underscore the pivotal role of intellectual stimulation in promoting innovation and problem-solving within teams, emphasizing its positive

impact on overall team performance. Within the software sector, studies conducted by Shin et al. (2021) and Anderson and West (1998) have delved into the effects of intellectual stimulation on the creativity and productivity of software development teams. These studies highlight the significance of creating an intellectually stimulating environment to facilitate the generation of novel ideas and the effective resolution of complex challenges within software development projects.

3.3 Research Methodology

This thesis adopted a quantitative research methodology, specifically using a survey questionnaire, to examine the influence of servant leadership on team performance in agile settings, emphasizing the mediating roles of intellectual stimulation and perceived supervisor support. The survey was distributed to IT professionals working in agile companies, aiming to collect data on their views regarding servant leadership behaviors, team effectiveness, intellectual stimulation, and supervisor support.

This method facilitated the gathering of structured data from a substantial number of participants, allowing for statistical analysis to explore the relationships between these variables and test the proposed model. Data analysis employed regression techniques to investigate both the direct and mediated effects of servant leadership on team performance through intellectual stimulation and perceived supervisor support. The quantitative approach ensured systematic data collection and thorough statistical examination, providing valuable insights into the research topic and adding to the current understanding of leadership effectiveness in agile environments.

Research Design

The research as mentioned before used a quantitative design. it involved distributing a survey questionnaire to over 700 IT professionals, primarily targeting the Capital city but later expanding the radius to include multiple cities across Pakistan. Out of the distributed surveys, 327 responses were received. Expanding the research radius was crucial to ensure a representative sample and capture diverse perspectives within the IT industry across different geographical locations in Pakistan. This approach enhanced the generalizability of the findings, providing a more

comprehensive understanding of the impact of servant leadership on team effectiveness in agile environments within the broader context of the Pakistani IT sector.

The journey to develop this thesis began by selecting a research topic that is significant both nationally and internationally within the IT industry. This required an in-depth review of current literature to uncover research gaps, define the research problem, and highlight the necessity for a feasible solution. During this preliminary stage, the emphasis was on grasping the intricacies of servant leadership and team effectiveness, especially in relation to agile methodologies, with a particular focus on Pakistan's IT sector.

Research Process

Following the identification of the research area, the next step involved conducting an extensive literature review. This review delved into individual variables such as servant leadership, team effectiveness, intellectual stimulation, and perceived supervisor support. Firstly, the research problem was defined, which was in our case to identify the impact of servant leadership on team effectiveness and measure the mediation effects of perceived supervisor support and intellectual stimulation in this relationship in an agile environment.

Furthermore, it explored the interplay between these variables and their implementation in agile environments. By synthesizing existing knowledge and theories, this phase provided a solid theoretical foundation for the subsequent stages of the research process.

With the framework established, the research design was developed, and the survey questionnaire was drafted to investigate the relationship between SL, TE, PSS, and IS. The questionnaire aimed to gather insights from IT professionals across Pakistan, focusing initially on the Capital city but later expanding the research radius to include other cities. Reaching out to potential participants and collecting data constituted a significant aspect of this phase, ensuring a diverse and representative sample for analysis.

Subsequently, the collected data underwent rigorous analysis using statistical methods. Tests were conducted to assess data correctness, reliability, and validity, as

well as the presence of bias and questionnaire integrity. This critical evaluation ensured the accuracy and robustness of the findings, enhancing the credibility of the research outcomes.

In the final phase of the research process, results were extracted, and conclusions were drawn. These findings were examined in light of the research objectives, elucidating their significance and implications for IT professionals in Pakistan. By addressing the research problem and bridging existing gaps, the conclusions drawn from this study aimed to offer valuable insights and practical recommendations to enhance leadership practices and team effectiveness within the Pakistani IT industry.
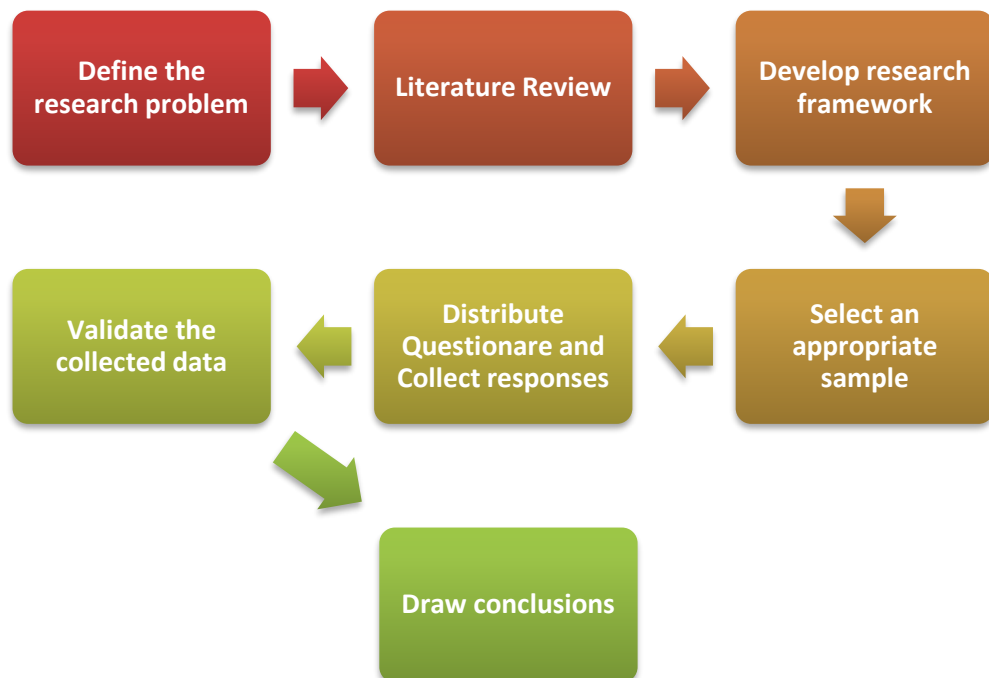
Figure 3.1: Research Process

3.3.1 Research Method

For this research, IBM SPSS software (version 22) was selected for statistical analysis. The survey data underwent regression testing in SPSS, utilizing the PROCESS v4.0 macro by Andrew F. Hayes. (PROCESS v4.0 by Andrew F. Hayes) This approach allowed for the examination of hypotheses. Specifically, macro model number 4 facilitated the articulation of hypotheses, with X representing the independent variable i.e. Servant leadership, Y indicating the dependent variable, i.e. Team Effectiveness,

and M symbolizing the mediators' Intellectual Stimulation and Perceived Supervisor support. This model enabled simultaneous analysis of mediators. Non-mediative independent variables were subjected to linear regression testing for further exploration.

3.4 Data Collection

The data collection process commenced with the careful selection of the target group, primarily focusing on IT professionals within the Pakistani context. This group was chosen due to its relevance to the research topic and the availability of potential participants who could provide valuable insights into the impact of servant leadership on team effectiveness in agile environments.

To gather data from this target group, a survey questionnaire was designed and distributed using Google Forms. This method was chosen for its accessibility, ease of administration, and ability to reach a large number of participants efficiently. Given the dispersed nature of the IT workforce, utilizing an online survey platform facilitated widespread participation and ensured geographical inclusivity.

In addition to online distribution, efforts were made to reach potential participants through direct visits to IT companies and targeted searches on LinkedIn. Direct visits allowed for face-to-face engagement with IT professionals, providing an opportunity to explain the research objectives and encourage participation. Similarly, LinkedIn searches enabled the identification and outreach to IT professionals who might not have been accessible through other channels. Leveraging both online and offline strategies enhanced the reach and diversity of the participant pool, ensuring a comprehensive representation of IT professionals across different sectors and job roles.

The survey questionnaire was designed to capture relevant insights into servant leadership behaviors, team effectiveness, and related variables within agile environments. Clear instructions and assurances of confidentiality were provided to participants to encourage candid responses. The combination of online surveys, direct visits, and LinkedIn outreach facilitated the collection of robust data that contributed to the thorough examination of the research questions and objectives.

3.5 Ethical Considerations

Ethics played a crucial role during the research, prioritizing the study's integrity and safeguarding participants' rights and welfare. The researcher committed to honesty, transparency, and objectivity, upholding these values throughout data collection and analysis. All participants were treated with equal respect and fairness, irrespective of their background or status. To prevent bias, steps were taken to keep participants anonymous, ensuring the data was used exclusively for educational purposes and not for profit.

Furthermore, the researcher acknowledged and credited previous studies from which questionnaire items were adapted, respecting intellectual property rights and contributing to the academic community. Care was taken to craft survey questions that were relevant, respectful, and non-intrusive, ensuring that participants felt comfortable and valued throughout the data collection process. By upholding these ethical standards, the research aimed to maintain the trust and confidence of participants, safeguarding their privacy and dignity while advancing knowledge in the field of leadership and team dynamics within the IT industry.

3.6 Delimitation

The study was delimited to IT professionals in Pakistan, potentially limiting the generalizability of findings to other industries or geographical locations. Additionally, the focus was primarily on servant leadership, team effectiveness, and related variables within agile environments, excluding other leadership styles and organizational contexts. Time and resource constraints may have influenced the scope and depth of data collection and analysis.

3.7 Limitations of the Research Design

Despite the meticulous approach taken in designing the research, several limitations must be acknowledged. Firstly, the reliance on a quantitative survey method may have limited the depth of understanding regarding participants' experiences and perspectives. While surveys offer broad insights into attitudes and behaviors, they may lack the richness of qualitative methods in capturing nuanced insights and contextual

factors. Additionally, the usage of self-report measures may have introduced survey bias and social desirability effects, potentially impacting the accuracy of the data collected. Participants may have been inclined to provide socially acceptable responses rather than candid reflections, leading to a potential underestimation or overestimation of certain variables.

Furthermore, the sample size, although substantial, may not fully represent the diverse range of IT professionals within the Pakistani context. Despite efforts to reach a broad audience through online and offline channels, certain segments of the population may have been underrepresented. Geographical constraints and access limitations could have influenced participation rates, potentially skewing the sample towards certain demographics or organizational settings. This limitation may restrict the generalizability of the findings beyond the specific context of the study and necessitates caution in extrapolating the results to broader populations.

The study's cross-sectional design limits its ability to determine causation or to provide insights into how servant leadership and team effectiveness change over time. Since data is collected at one specific moment, the study offers a snapshot of the relationships between variables without revealing the order of events or the causal connections. To understand how these relationships develop and to evaluate the long-term effects of servant leadership on team dynamics in agile settings, longitudinal research would be required.

CHAPTER 4: RESULTS AND DISCUSSION

In the results section, a summary of the independent, dependent, and mediator variables is presented. First, the data was exposed to equal variance and homogeneity tests of variances followed by reliability and validity tests. After the regression and validity tests, a mediation analysis is performed to determine the mediation effect of two variables. In the end, a multi-regression is performed to test the hypothesis.

4.1 Demographics

This study was conducted in the IT sector of Pakistan. The participants were technical people from various IT and software development firms. A total of 327 participants submitted the online form. The following demographics were included in the survey's descriptive analyses.

- Gender
- Education
- Work Experience
- Designation

These factors represent the demographics of the participant's personal and professional characteristics. The percentage and distribution of each demographic are shown in Table 4.1 added below.

Table 4.1 Demographics

Demographics	Options	Frequencies	Percentages
	Male	249	76.1
Gender	Female	78	23.9
	Bachelors	266	81.3
Education	Masters	59	18.0

	PhD.	2	0.6
	0 - 2 years	102	31.2
Work Experience	3 - 5 years	124	37.9
	6 - 9 years	70	21.4
	> 10 years	31	9.5
	Technical Staff	202	61.8
	Technical Lead	49	15.0
Designation	Manager	52	15.9
	CXO	2	0.6
	Other	22	6.7

The demographics and professional characteristics were collected, grouped, and sorted to allow us to get a clear picture of our target audience. The minimum criteria for the education were set to a bachelor's to target only the graduates to participate in this research. Since our entire target area was focused on people working in the private IT sector and the research included variables that can only be properly addressed by people in an employee–supervisor setup, hence we distributed the designations into 4 main categories technical staff, technical leads, managers, and CXOs. An additional option was added to account for the Non-technical resources that were resources from the Technical support.

4.1.1 Gender statistics

The gender-based distribution, as described in Table 4.1 suggests that out of 327

participants who submitted the questionnaire, male participants (76.1%) were in the majority. The female participants (23.9%) were 3 times less as compared to their male counterparts. These statistics infer that Pakistan's IT industry is still dominated by males, and although females have started to join this sector in large numbers but majority of the sector is still male-dominated. This also proves the fact that females in Pakistan are less focused on the technology sector (Idrees, F.,2019).
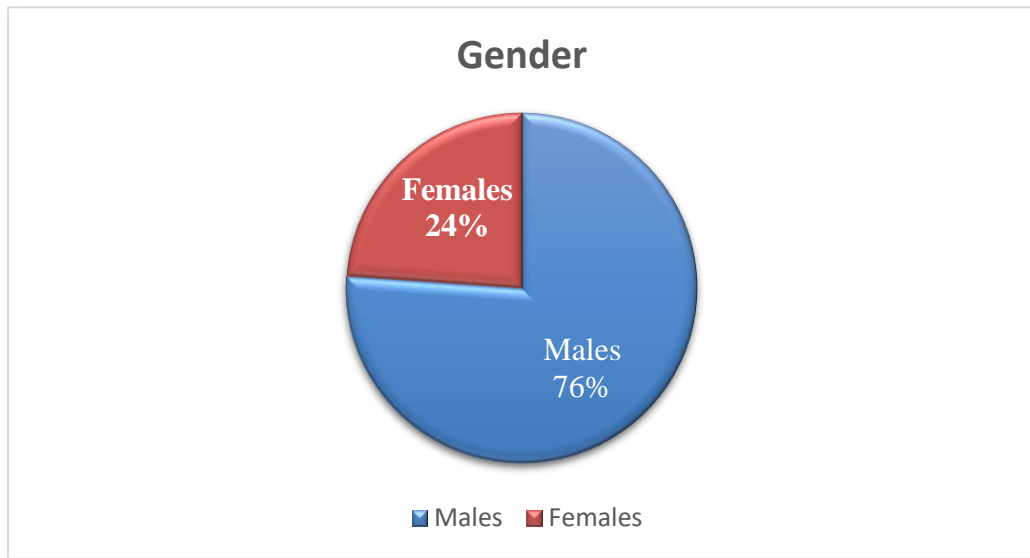
Figure 4-1 Gender Distribution

4.1.2 Education Statistics

The education statistics are concurrent with the normal distribution of graduates in our IT industry. The results indicate that the maximum percentage of the target audience had a bachelor's degree (266 respondents and 81.3% of the total). Following graduates were the postgraduate respondents who made up 18% of the total sample. While just 2 of the sample had Doctorate degrees, which made up 0.6% of our total sample. These results deduce that Pakistan's IT industry has a high demand for entry-level employees who are freshly graduated from universities. The companies prefer fresh grads since they are cost-effective, adaptable, and can be trained into future leaders.
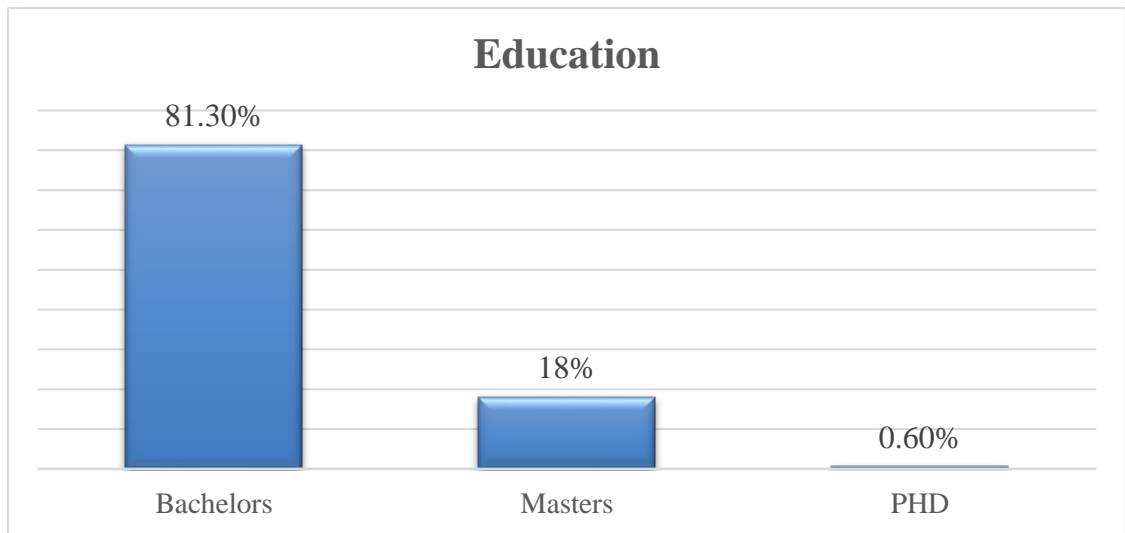
Figure 4-2 Education Statistics

The percentage of master graduates (18%) indicates that the industry has a good potential for employees having specialized skills and knowledge. The majority of the master's graduates in this study were Project Managers, who opted for a management role after a good service in the technology domain.

4.1.3 Work Experience

The work experience statistics from 0 - 2 years (31.2%) suggest a significant potential for young blood in the IT sector. This result also aligns with our previous observation of a high prevalence of individuals with bachelor's degrees. The highest proportion of individuals with medium experience (3 to 5 years, 37.9%) indicates that our industry has a significant demand for mid-level professionals who are skilled in one or more domains.
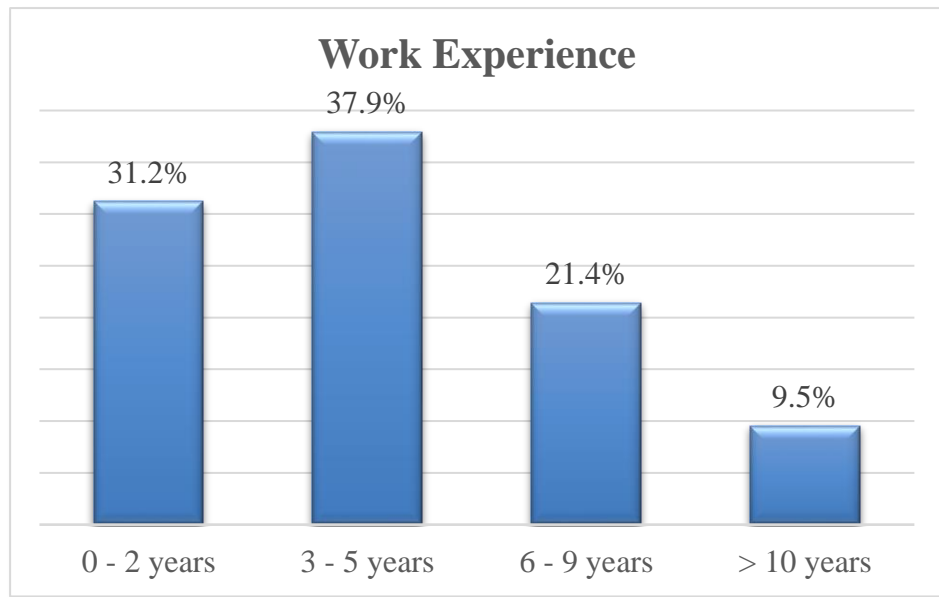
Figure 4-3 Work Experience

The combined percentage of individuals with 6-9 and above 10 years of experience (30.9%) is relatively low. This percentage suggests that there are fewer opportunities for senior-level positions in the sector. This percentage is not alarming as all companies follow a pyramid-shaped hierarchy with maximum junior employees in the teams and very few senior resources to manage them.

4.1.4 Designation

The distribution of designation in our sample completely aligns with the work experience and distribution. The sample was composed of 61.8% technical staff, 15% Technical leads, and 15.9% managers. Additionally, there were 0.6% CXOs (C-level and high authority individuals) and 6.7% individuals from the Other category, which mainly comprised Technical support representatives. These results again back to the pyramid-hierarchy in the IT companies.

Since the IT industry is rapidly changing with the addition of new technologies and programming languages, it is natural to see many technical resources shifting to managerial roles. Employees find it safer to shift to a managerial role once they have served some time in development. This result is coherent with the research made by Hall et al. (1992), which suggests that engineers are more likely to transition into managers due to high expectations of compensation and broader career scope.

4.2 Principle Component Analysis

Before we proceed with the reliability and validity analysis, we have performed the Principal Component Analysis (PCA) on all variables. The PCA analysis performed on servant leadership showed that all of the components are strongly correlated with each other (0.383 to 0.794). the determinant was found to be 0.007 (>0.0001).

The KMO and Bartlett's measure of sampling adequacy also resulted positively in the value of 0.925 (at $p<0.005$). The total variance analysis showed us that the variable consisted of 1 component which explains 67.63% of the variance.

Table 4.2 Principal Component Analysis - Servant leadership

	Component 1
Relationship Building	0.883
Selflessness	0.883
Conceptual skills	0.881
Ethical Conduct	0.881
Developmental Support	0.866
Empowerment	0.699
External Stakeholder Focus	0.621

The PCA analysis performed on the dependent variable team effectiveness showed that all of the components are strongly correlated with each other (0.370 to 0.732). The determinant was found to be 0.005 (>0.0001).

The KMO and Bartlett's measure of sampling adequacy also resulted positively in the value of 0.915 (at $p<0.005$). The total variance analysis showed us that the variable consisted of 1 component which explains 64.213% of the variance. The results also showed that the items TE4, TE8, TE6, and TE2 have the strongest positive correlations with the principle component and they contribute the most to explaining

the variance captured by this component.

Table 4.3 Principal Component Analysis – Team Effectiveness

	Component
TE4	0.863
TE8	0.853
TE6	0.840
TE2	0.837
TE3	0.815
TE5	0.773
TE7	0.758
TE1	0.648

The results of PCA analysis for servant leadership and team effectiveness show that both have a single principle component. Since all the items in both variables are highly correlated, hence they result in one dominant component which represents the variable themselves.

To test the possibility of multicollinearity, we have calculated correlation on the next step which resulted in no item having > 0.8 correlation, hence ruling out multicollinearity.

4.3 Normality test

To assess whether the collected data for this research followed a normal distribution, a normality test was conducted on the questionnaire data. The results reveal that all four variables have exhibited negative skewness, depicting that the data is distributed on the left side of the bell curve. This suggests that the data is clustered at the lower end of the range for all four variables.

The mediators' perceived supervisor support and Intellect stimulations both displayed a close to 1 kurtosis value which points toward a normal distribution. The

normality test also revealed that SL, PSS, and IS have longer tails than normal and are platokurtic in nature. Whereas, TE which is the dependent variable is found to be leptokurtic and within the normal range. This test provides several scholarly benefits and improves the credibility of our data. It suggests that our data now qualifies for the T-test and ANOVA test and we don't need to employ non-parametric tests. It also guides us that our data is more accurate and we can assess the validity using the traditional parametric tests.. the results of the normality test are added in Table 4.4.

	N	Skewness		Kurtosis	
		Statistic	Std. Error	Statistic	Std. Error
Servant Leadership	327	-1.372	0.135	1.084	0.269
Perceived supervisor support	327	-1.356	0.135	1.077	0.269
Intellectual Stimulation	327	-1.144	0.135	0.718	0.269
Team Effectiveness	327	-1.555	0.135	2.493	0.269

Table 4.4 Normality Test

4.4 Reliability and Validity

Before proceeding with the reliability analysis we tested our data on Bartlett's Test for Sphericity (BTS) and Kaiser Meyer-Olkin (KMO)to determine data validity. The analyses reveal a significant chi-square value of 639.595, and KMO test results in the value of 0.818. this test reveals that the variables used in the research are correlated.

The reliability and validity tests for our data set in Table 4.1 result in the Cronbach alpha value of <u>0.893</u> for the collective effect of the variables, which proves good reliability.

Table 4.5 Results of Reliability test of variables

Item	Mean	Std. Deviation	Variance	Cronbach's α
SL	3.5775	.58565	0.343	
PSS	3.7332	.64061	0.410	0.893
IS	3.5984	.70331	0.495	
TE	3.7408	.59459	0.354	

In the next step, we calculated the reliability of individual variables which indicates the data set is reliable since all the Cronbach alpha values are higher than 0.70.

Table 4.6 Reliability test of individual components

Item	Mean	Std. Deviation	Variance	Cronbach's α
SL1	3.70	0.777	0.603	
SL2	3.71	0.789	0.623	
SL3	3.25	0.867	0.751	
SL4	3.85	0.650	0.422	
SL5	3.43	0.904	0.817	
SL6	3.67	0.840	0.705	0.932
SL7	3.79	0.713	0.509	
SL8	3.70	0.634	0.402	
SL9	3.81	0.679	0.461	
SL10	3.80	0.798	0.636	

SL11	3.72	0.813	0.662	
SL12	3.69	0.811	0.657	
SL13	2.81	0.935	0.874	
SL14	3.15	0.974	0.948	

PSS1	3.77	0.660	0.435	
PSS2	3.70	0.739	0.547	
PSS3	3.71	0.737	0.543	0.844
PSS4	3.75	0.940	0.883	

IS1	3.68	0.742	327	
IS2	3.49	0.882	327	0.791
IS3	3.62	0.880	327	

TE1	3.71	0.635	0.403	
TE2	3.63	0.772	0.596	
TE3	3.57	0.836	0.700	
TE4	3.64	0.827	0.684	0.919
TE5	3.88	0.713	0.508	
TE6	3.80	0.778	0.606	
TE7	3.90	0.693	0.480	

TE8	3.79	0.670	0.449	

4.5 Correlation Analysis

Table 4.7 Correlation Analysis

	SL	PSS	IS	TE
SL	1			
PSS	.804**	1		
IS	.616**	.531**	1	
TE	.785**	.751**	.641**	1

The correlation of all variables was found using Pearson product correlation. According to Table 4.7, it has been found that the direct positive correlation between servant leadership and Team effectiveness was moderately positive (r = 0.785, p < 0.001). these results confirm the validity of hypothesis 1 (H1).

Similarly, servant leadership in correlation with mediator, perceived supervisor support was found to be significantly positive (r = 0.804, p < 0.001), which validates the mediation effect as hypothesized in hypothesis 2 (H2). There observed a positive correlation among mediator; employees perception of supervisor support and outcome variable team effectiveness (r = 0.751, p < 0.001), which validates hypothesis 3 (H3) of mediation.

The intellectual stimulation correlation with the independent variable was significant (r = 0.616, p < 0.001) which validates the mediation effect and validates hypothesis 4 (H4). Similarly, there is a postive correlation between Intellectual stimulation and the outcome variable, team effectiveness which came out to be of high degree (r = 0.641, p < 0.001), validating hypothesis 5 (H5).

The correlation between mediators; intellectual stimulation and perceived supervisor support is also significant which was hypothesized to be of moderate degree. But unlike our inference, the relation is calculated to be in a highly significant category

(r = 0.531, p < 0.0001).

4.6 Correlations Between Individual Components

The correlation between individual components of servant leadership (Relationship Building, Empowerment, Developmental Support, Ethical Conduct, Conceptual skills, and Selflessness) as compared to the individual components of team effectiveness show significant correlations with each other in some cases.

Table 4.8 Correlations between individual components

	RB	EM	DS	EC	CS	SS	ESF	TS	TE3	TE4	DVS	TE6	TE8
RB	1												
EM	0.527	1											
DS	0.749	0.559	1										
EC	0.741	0.536	0.734	1									
CS	0.733	0.548	0.700	0.778	1								
SS	0.765	0.534	0.693	0.749	0.794	1							
ESF	0.494	0.383	0.494	0.449	0.433	0.466	1						
TS	0.576	0.456	0.601	0.650	0.600	0.604	0.417	1					
TE3	0.578	0.475	0.507	0.591	0.547	0.573	0.410	0.684	1				
TE4	0.675	0.529	0.617	0.655	0.625	0.643	0.478	0.704	0.718	1			
DVS	0.541	0.425	0.493	0.570	0.567	0.531	0.381	0.572	0.579	0.674	1		
TE6	0.594	0.457	0.532	0.573	0.591	0.557	0.430	0.611	0.653	0.759	0.677	1	
TE8	0.596	0.506	0.547	0.622	0.639	0.613	0.408	0.692	0.626	0.726	0.656	0.726	1

The correlation between relationship building with all components of team effectiveness was significant (r=0.576, 0.578, 0.675, 0.541, 0.594, 0.596, p<0.01), which signifies the direct impact of relationship building on effective team outcomes. These results are concurrent with the results of Suknunan & Bhana, (2022) about the positive impact of the employee-manager relationship on employee performance and productivity.

The analysis reveals that the correlation between external stakeholder focus and all components of team effectiveness was less positive as compared to all others (r=

0.417, 0.410, 0.478, 0.381, 0.430, 0.408, p<0.01). this result was expected in our case since the concept of volunteer and community work and its emphasis from IT organizations on employees is non-existent in Pakistan. A similar result was deduced by Waheed Chaudhary (2010) in his research about gaps and issues in volunteer management in Pakistan.

4.7 Validity

4.7.1 Construct Validity

The questionnaire used in this research was subjected to construct validity. In this step, pre-survey pilot research was run which comprised of 10 participants from the target population and 3 experts from a software company. This pilot group was asked to review the questionnaire and rate it in terms of clarity and completeness. As per the suggestions given by the focus group the questionnaire was improved before its distribution to final sample. As per focus group's suggestion, the questions were grouped in sections and introductory paragraphs were added before each section.

4.7.2 Internal Validity

To ensure internal validity of research findings, it is crucial to ascertain that the findings accurately reflect the data collected. However, the sampling method employed in this survey may introduce internal limitations. Utilizing a purposive sampling approach, while advantageous in reaching diverse participants, could potentially introduce community bias. To mitigate this limitation, an initial group of participants was deliberately diversified across various regions of Pakistan. Nevertheless, it is acknowledged that the surveyed companies and software professionals may not fully represent the entirety of the software practitioner population. Hence, the sample was specifically targeted at professionals from all four provinces, aiming to capture a diverse range of perspectives. It is anticipated that the inclusion of a varied sample has removed the internal community bias.

4.7.3 Discriminant Validity (HTMT Ratio)

In the next step, we calculated the HTMT ratio of results collected via

correlation. Upon measurement of the HTMT ratio between 4 variables or constructs, it was found that all HTMT ratios were below the maximum desirable limit of 0.85 hence the research's discriminant validity was confirmed. Table 4.9 represents the results of the discriminant validity test.

Table 4.9 HTMT Ratio of variables

	SL	PSS	IS	TE
SL				
PSS	0.767			
IS	0.806	0.651		
TE	0.746	0.673	0.791	

4.8   Independent Sample Test (T-test)

An independent samples t-test was performed to collate the difference in team effectiveness as reported by Males and Females. There was no significant differences (t(325)=1.772, p=0.079) in the scores for Males (M=0.15, SD=0.07682) and Female participants (M=0.15, SD=0.08467). The value of the difference in average meanvalua was insignificant (mean difference = 0.15, CI = -0.1775 to 0.31776). Since the confidence interval includes "0", we can say that the magnitude of differences was insignificant.

Table 4.10 Independent sample test

Levene's Test for Equality of Variances				t-test for Equality of Means					
Mean	SD	F	Sig.	t	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	95% Confidence Interval of the Difference

										Lower	Upper
Males	3.77 66	.562 60	10.1 12	.0 02	1.9 53	325	.052	.15000	.07682	- .001 13	0.301 13
Females	3.62 66	.678 25			1.7 72	112.1 51	.079	.15000	.08467	- .017 75	0.317 76

4.9 Hypotheses Testing And Justifications

4.9.1 Regression Analysis

The regression analysis between all variables resulted in a strong positive relationship accepting all hypotheses. the values of mediators are positively related to partial mediation between the Lower and Upper bound of confidence intervals. The confidence interval in this case was set up to be 95%.

Table 4.11 Regression Analysis

Hypothesized path	β (coefficient value)	t - statistic	95% Confidence interval for β		Conclusion
			Lower Bound	Upper Bound	
SL → TE	0.797	22.816	0.728	0.865	Positive
SL → PSS	0.879	24.340	0.808	0.950	Partial Mediation
PSS → TE	0.697	20.477	0.630	0.764	Positive
SL → IS	0.739	14.082	0.636	0.843	Partial Mediation
IS → TE	0.542	15.066	0.471	0.613	Positive
IS → PSS	0.484	11.307	0.400	0.568	Positive

The analysis shows that all values of beta are positive which in turn validates our inference of positive relationships. This thesis aimed to assess the impact of servant leadership on team effectiveness. It also evaluated the impact of 2 mediating variables; perceived supervisor support and Intellectual stimulation in the relation between servant leadership and intellectual stimulation. Another target of this research was to evaluate if and how intellectual stimulation will affect the perceived supervisor support.

Our results describe a significant control of SL to TE ($\beta = 0.797$, $t = 22.816$), which proves our first hypothesis. This result validates that the teams that are led by servant leaders perform better than the ones whose leaders miss one or more of these qualities. This conclusion is concurrent with Nauman et al (2022) and Gašková, J. (2020) who have assessed the relationship between servant leadership with team performance and work effectiveness respectively.

The results found during the analysis between servant leadership and perceived supervisor support also show a strong positive control (β = 0.879, t = 24.340), which backs up H2. This concurs that servant leadership directly cultivates perceived supervisor support. This supports the idea that the employees who recognise their managers as supportive, collaborative, and empathetic towards them feel more supported by them.

The analyses also reveal an indirect effect of perceived supervisor support on team effectiveness which is a strong positive relation (β = 0.697, t = 20.477). this result points towards the concept that whenever a team perceives their supervisor to be supportive, they tend to perform better in their tasks. This result is also coherent with a study done by Shanock, L. R., & Eisenberger, R. (2006) that showed a positive relation between perceived supervisor support with in-role and extra-role performance.

The relationship between servant leadership and intellectual stimulation has given rise to some interesting results. The two variables are found to be strongly positively related (β = 0.739, t = 14.082). this highly positive relation confirms the hypothesis (H4). These results deduce that servant leaders who foster employee involvement in the decision-making process, give employees responsibility and authority, and are empathetic towards them, foster an environment that boosts creativity, growth, and intellectual engagement.

The regression analyses for the impact of intellectual stimulation on team effectiveness also resulted in strong positive results (β = 0.542, t = 15.066). this result again validates several studies done in employee-manager combination environments. As discovered by Sánchez-Cardona et al. (2018), supervisors who challenge their team intellectually, and assign tasks that promote out-of-the-box thinking results in better team performance.

Lastly, the regression analysis shows a positive but comparatively weak relation between intellectual stimulation and perceived supervisor support (β = 0.484, t = 11.307). this result indicates that when employees are given thought-provoking and intellectually stimulating tasks by their managers, they consider their managers as more supportive. This relation also suggests that exposing employees continuously to problem-solving tasks gives them a notion of learning satisfaction, which in turn results in better behavior towards their manager. Another perspective that validates the same

result can be autonomy and empowerment. Providing employees with autonomy in their work and facilitating them further strengthens the perception of supervisor support.

The overall results show that when servant leaders support their employees and foster an intellectually stimulating environment, their teams are more effective and are mentally satisfied.

4.9.2 Mediation Analysis

A mediation analysis was performed using bootstrapping to understand the effects of servant leadership (SL) on team effectiveness (TE) mediated by perceived supervisor support (PSS) and Intellectual stimulation (IS). For this purpose, we have used the SPSS PROCESS macro v4.2, by Andrew F. Hayes. (2022). Model 4 was used to test this mediation analysis at a 95% confidence interval and 5000 bootstrapping samples Our initial hypothesis was that servant leadership will positively affect the team effectiveness, and this relation will be partially mediated by perceived supervisor support and team effectiveness. This analysis is represented in Table 4.12

Table 4.12 Mediation Analysis

Effect	Coefficient (β)	Standard Error (SE)	t	p-value	Boot LLCI	Boot ULCI
Total Effect	0.797	0.035	22.82	<.001	N/A	N/A
Direct Effect	0.392	0.057	6.89	<.001	N/A	N/A
Indirect Effect: PSS	0.257	0.062	4.15	<.001	0.135	0.376
Indirect Effect: IS	0.148	0.04	3.7	<.001	0.073	0.231

The total effect of servant leadership on team effectiveness was found to be significant, β = .797, SE = .035, t(df) = 22.82, p < .001. Upon decomposing this effect, the direct effect of servant leadership on team effectiveness remained significant, β = .392, SE = .057, t(df) = 6.89, p < .001.

The analysis has revealed significant indirect effects of servant leadership on team effectiveness through mediators; perceived supervisor support and intellectual stimulation. The indirect effect through perceived supervisor support was β = .257, SE = .062, BootLLCI = .135, BootULCI = .376, and the indirect effect through intellectual stimulation was β = .148, SE = .040, BootLLCI = .073, BootULCI = .231.

4.10 Discussion

Servant leadership has emerged as a significant factor in enhancing team effectiveness within organizational settings. The findings of this research support the notion that servant leadership behaviors positively impact team outcomes. This suggests that leaders who prioritize serving their team members tend to foster environments conducive to high performance.

Moreover, the study revealed that servant leadership's influence on team effectiveness is also partially mediated by the addition of perceived supervisor support and intellectual stimulation. This implies that servant leaders not only directly contribute to team effectiveness but also indirectly through fostering supportive supervisor-team relationships and stimulating intellectual engagement among team members. This finding aligns with previous research by Seto and Sarros (2016), which emphasized the importance of servant leadership in creating a supportive and intellectually stimulating work environment.

For individuals working in Pakistan's IT sector, these findings hold several key takeaways. Firstly, they underscore the significance of adopting servant leadership behaviors among managers and leaders. By prioritizing the needs and development of their team members, leaders can enhance team effectiveness and performance. Secondly, cultivating supportive supervisor-employee relationships is crucial. Employees who perceive their supervisors as supportive are more likely to feel valued and motivated, which can positively impact their work performance (Panda et al, 2022).

In addition, promoting intellectual stimulation within teams can lead to greater innovation and problem-solving capabilities. Intellectual stimulation has a direct relationship with an increase in critical and out-of-the-box thinking skills. In the dynamic and rapidly evolving landscape of the IT sector, fostering a culture of intellectual engagement can be instrumental in driving organizational success. This aligns with the findings of a study by Chinese research (Zhang et al., 2010), which demonstrated the positive effects of creative process engagement on employee creativity.

While this research offers valuable insights, there are still many areas that warrant further investigation. Future research could examine the precise ways in which servant leadership impacts team effectiveness. Moreover, exploring how contextual elements like organizational culture and industry dynamics might moderate these effects could yield a more thorough comprehension of these relationships.

In summary, the research reveals the importance of servant leadership in enhancing team effectiveness and the positive impact of mediation by perceived supervisor support and intellectual stimulation. For professionals in Pakistan's IT sector, embracing servant leadership principles, fostering a culture of confidence and support between teams, and giving them tasks that mentally challenge them can be instrumental in driving organizational success.

CHAPTER 5: CONCLUSIONS AND FUTURE RECOMMENDATIONS

The findings of this research as explained in Chapter 4 are summarized in this chapter. In this chapter, we with provide an executive summary of our research findings, followed by the direct effect, and indirect effect of the independent variable on the dependent variable in the presence of predictors. The chapter will also shed light on the available research on the variables and their intercorrelations, followed by the organizational implications that software firms should follow to ensure company success. It will then provide comprehensively extracted results from the study and suggest future implications for agile software companies.

5.1 Summary

Our study explores how servant leadership, alongside intellectual stimulation and perceived supervisor support, impacts team effectiveness. The results indicate that servant leadership significantly enhances team effectiveness. Additionally, intellectual stimulation and perceived supervisor support play crucial roles in this dynamic, further strengthening the positive relationship between servant leadership and team effectiveness.

The findings conclude that servant leadership is an effective mode of leadership that can significantly improve agile teams' effectiveness in software development teams. By fostering a relationship of trust, empowerment, and supervised learning, servant leaders can boost the team's energy to work effectively in fast-paced and stressful work environments. This behavior not only improves team productivity but also cultivates a culture of resilience and adaptability, critical for agile software development.

Moreover, the study highlights the mediating effect of intellectual stimulation, and how it strengthens the relationship between supervisors and team members. This finding helps us understand the importance of constant learning opportunities for teams to perform better in organizations. Organizations should introduce learning programs in their company that can be in the form of internal coaching sessions or international certifications like Azure, AWS, and Google. Also, the companies by providing dynamic

learning opportunities to the employees are investing in their employees, which in turn improves organizational commitment, employee retention, and productivity.

Furthermore, improving perceived supervisor support is essential for cultivating a positive working environment. Servant leaders can improve the relationship with their employees by setting a culture of open communication, feedback process, and providing constructive feedback. It is also imperative for managers to properly communicate client expectations and feedback to their teams as it improves task ownership and decision-making. Another attitude that leaders can develop is the attitude of assistance, and leading by example. Assistance and support in challenging tasks help the team in overcoming obstacles that can potentially risk the quality of the product or even delivery.

The study's shortcomings, including the self-reported data and small sample size may create generalization issues, and its findings may not apply to all organizations, however, it serves as an effective guide for leaders and companies to improve team engagement and productivity, ultimately improving the success metrics.

5.2 Conclusion

In summary, this study highlights the essential role of servant leadership in enhancing team performance in agile settings, especially within software companies. The results clearly show a beneficial connection between servant leadership and team efficiency, indicating that leaders should embrace this leadership approach to optimize team productivity.

To successfully apply servant leadership, leaders need to emphasize several crucial factors. Primarily, they should concentrate on empowering team members and fostering a culture of cooperation, trust, and mutual responsibility. This requires actively listening to employees, including them in decision-making, and providing opportunities for both personal and professional development.

Moreover, the results highlight the significance of providing employees with challenging work, learning opportunities, and engaging collaborative tasks. When employees are intellectually stimulated and engaged in their work, they are more inclined to perform better as a team. Therefore, leaders should strive to create an

environment that encourages creativity, innovation, and continuous learning.

Another crucial finding is the importance of perceived supervisor support in driving team effectiveness. When team members perceive their managers to be helpful and supportive, they are more motivated and committed to achieving common goals. Leaders should prioritize building healthy relationships with their team members, offering support, guidance, and encouragement as needed.

Furthermore, this research reveals that the relationship between servant leadership and team effectiveness is mediated by both intellectual stimulation and perceived supervisor support. Intellectual stimulation encourages team members to think critically, innovate, and explore new ideas, thereby enhancing team performance. Similarly, perceived supervisor support acts as a catalyst, reinforcing the positive impact of servant leadership on team effectiveness.

Surprisingly, the study also uncovers a positive relationship between intellectual stimulation and supervisor support. This suggests that when supervisors actively encourage intellectual growth and provide support for employees' ideas and initiatives, it fosters a stronger sense of support and trust within the team. This underscores the interconnectedness of various leadership factors in driving team effectiveness.

In conclusion, this research highlights the multifaceted nature of servant leadership and its profound impact on team effectiveness in agile environments within software firms. By embracing servant leadership principles, leaders can create an environment where team members feel empowered, engaged, and supported, ultimately leading to improved performance and outcomes. By providing challenging work, fostering intellectual stimulation, and cultivating supportive relationships, leaders can maximize the potential of their teams and achieve greater success in today's fast-paced and competitive business landscape.

5.3 Managerial Implications

The findings of this research offer profound insights for managers in software firms seeking to optimize team effectiveness and performance. Implementing intellectual stimulation and supervisor support presents tangible opportunities for leveraging the principles of servant leadership and creating a conducive work

environment.

Managers can promote intellectual stimulation by fostering a culture of continuous learning and development within their teams. This can be achieved through initiatives such as organizing workshops, training sessions, or seminars focused on emerging technologies and industry trends. By encouraging team members to explore new ideas, experiment with different approaches, and share their knowledge, managers can stimulate intellectual curiosity and creativity. Additionally, facilitating collaborative problem-solving sessions can provide a platform for open dialogue and idea exchange, inspiring innovation and fostering a culture of intellectual engagement among team members.

Supervisor support plays a crucial role in reinforcing the positive impact of servant leadership on team effectiveness. Managers can demonstrate support by providing constructive feedback and recognition for employees' contributions. Regular performance reviews, one-on-one meetings, or informal check-ins offer opportunities for supervisors to provide guidance, encouragement, and appreciation. Furthermore, offering mentorship and guidance can empower team members to reach their full potential. By sharing their expertise, providing career development opportunities, and serving as role models, supervisors can support employees' professional growth and development, ultimately fostering a sense of trust and camaraderie within the team.

By incorporating these strategies into their leadership approach, managers can cultivate a work environment that nurtures intellectual stimulation and supervisor support. This, in turn, can lead to improved team effectiveness, enhanced performance, and greater organizational success in the fast-paced and competitive landscape of software development.

5.4 Theoretical implications

The theoretical implications of this research extend our understanding of leadership dynamics in agile environments, particularly within software firms. It reinforces the significance of servant leadership in enhancing team effectiveness, offering insights into its mechanisms and outcomes. Additionally, the study underscores the mediating roles of intellectual stimulation and perceived supervisor support, shedding light on their interplay in driving team performance. By elucidating

these relationships, the research contributes to leadership theory, emphasizing the importance of supportive leadership practices and their impact on team dynamics. These theoretical insights provide a foundation for further research and inform organizational strategies aimed at optimizing leadership approaches in agile contexts.

5.5 Practical implications

The practical implications of this research are significant for company decision-makers seeking to enhance team effectiveness and performance within their organizations. Firstly, the findings underscore the importance of adopting servant leadership principles among leaders at all levels. Decision-makers can facilitate this by providing leadership training programs and workshops that emphasize the core tenets of servant leadership, such as empowerment, collaboration, and support.

Furthermore, companies can implement measures to ensure that employees are given challenging work, learning opportunities, and engaging collaborative tasks. This may involve redesigning job roles, introducing educational initiatives and encouraging an environment of constant and dynamic learning.

Moreover, decision-makers should prioritize building strong relationships between supervisors and team members. This can be made possible through regular communication, feedback mechanisms, and creating a workplace that fosters support and encouragement. where employees feel valued and appreciated.

Additionally, companies can implement strategies to enhance intellectual stimulation and supervisor support within teams. This may include promoting knowledge-sharing initiatives, encouraging cross-functional collaboration, and recognizing and rewarding employees' contributions to intellectual growth and innovation.

By implementing these measures, company decision-makers can create a work environment that fosters servant leadership behaviors, supports employee growth and development, and ultimately enhances team effectiveness and performance.

5.6 Recommendations

Based on our findings, we can provide these recommendations for companies

and leaders.

For Companies

- Leadership development programs should be designed to administer servant leadership principles, emphasizing collaboration, empathy, and empowerment among leaders. By nurturing these qualities, companies can cultivate a culture where leaders prioritize the needs and development of their teams, ultimately enhancing overall team effectiveness.

- Providing employees with challenging work assignments, learning opportunities, and collaborative projects promotes a culture of constant learning and innovation inside the organization. This encourages employees to stretch their capabilities, explore innovative ideas, and add value meaningfully to the organization's objectives.

- Establishing mechanisms for soliciting and acting upon employee feedback demonstrates a commitment to their growth and development. By actively listening to employees' concerns and suggestions, companies can address issues promptly, boost employee morale, and strengthen the bond between employees and the organization.

For Leaders:

- Leaders should embody servant leadership principles in their interactions with team members, practicing active listening, empathy, and empowerment. By demonstrating genuine care and support for their team, leaders build trust, foster collaboration, and inspire higher levels of engagement and commitment.

- Encouraging critical thinking, innovation, and experimentation among team members stimulates intellectual growth and fosters a culture of creativity within the team. This enables teams to adapt to challenges more effectively, generate innovative solutions, and drive continuous improvement.

- Demonstrating a genuine interest in the physical and professional development of employees creates a supportive and collaborative work culture, where employees feel appreciated and motivated to outperform each other. By investing in the growth and success of their team members, leaders foster loyalty, retention, and ultimately, organizational success.

5.7 Limitations

Limitations of this research stem from its quantitative nature, reliance on self-reported data gathered through questionnaires, and its exclusive focus on software companies. Firstly, the use of self-reported data may involve response bias, where participants may have given socially desirable responses or provide information from their memory, leading to potential measurement errors and affecting the validity of the research.

Secondly, the research's narrow focus on software companies may limit the generalizability of the results to other sectors or organizational contexts. Different industries may have unique dynamics and organizational cultures that influence leadership styles and team dynamics differently, thus constraining the applicability of the results beyond the software sector.

Additionally, employing a cross-sectional design restricts the researcher's ability to develop causal relationships between independent, dependent and mediator variables. Also, longitudinal studies may offer deeper insights into the dynamics between among servant leadership, team effectiveness, and other factors over time, providing a more robust understanding of these relationships.

Moreover, the presence of social desirability bias is a notable concern. Participants may feel inclined to respond in a socially acceptable manner, particularly when reporting on their perceptions of leadership and team dynamics. This bias could potentially inflate the reported levels of servant leadership behaviors, team effectiveness, or other constructs, thus skewing the results.

Furthermore, the reliance on quantitative methods may overlook nuanced qualitative aspects of leadership and team dynamics. Future research could benefit from incorporating qualitative approaches, such as interviews or observations, to gain a richer understanding of the mechanisms underlying the relationships explored in this study.

In summary, while this research provides valuable insights into the relationships between servant leadership, team effectiveness, and related factors in software companies, its limitations underscore the need for caution in interpreting the findings and point to avenues for future research to address these shortcomings and deepen our

understanding of leadership dynamics in organizational settings.

5.8 Future Recommendations

Future research in this domain should consider several avenues to build upon the findings and address the limitations of this study. Firstly, conducting longitudinal studies would allow researchers to analyse the long-term effects of servant leadership on team effectiveness and track changes over time. This longitudinal approach would provide deeper insights into the causal relationships between variables and capture the dynamics of leadership and team dynamics more comprehensively.

Additionally, exploring the effectiveness of servant leadership interventions and training programs in improving team performance and organizational outcomes could offer practical insights for companies. By evaluating the impact of specific leadership development initiatives, researchers can identify best practices for implementing servant leadership principles in real-world settings.

Furthermore, extending research beyond the software industry to include diverse sectors and organizational contexts would enhance the generalizability of findings. Comparing leadership dynamics across industries could reveal sector-specific challenges and opportunities, informing tailored leadership strategies for different organizational environments.

Lastly, integrating qualitative approach based on expert judgment such as expert interviews, or case studies combined with quantitative approaches may provide a more holistic understanding of leadership dynamics. Qualitative research can uncover nuanced aspects of servant leadership behaviors and their impact on team dynamics, complementing quantitative findings with rich, contextual insights. By pursuing these future recommendations, researchers can advance knowledge in this field and offer practical guidance for organizations striving to cultivate effective leadership and high-performing teams.

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