VILNIUS UNIVERSITY
BUSINESS SCHOOL

INTERNATIONAL PROJECT MANAGEMENT

Bilal, Aziz

TITLE ***Projektų rezultatų gerinimas taikant prisitaikančios lyderystės strategijas dinaminėje aplinkoje***	TITLE ***Enhancing Project Outcomes through Adaptive Leadership Strategies in Dynamic Environments***

Student(-s) _____

(Signature (-s))

Supervisor _____

(signature)

Associate prof. Eglė Daunienė

Vilnius, 2025

SUMMARY

VILNIUS UNIVERSITY BUSINESS SCHOOL INTERNATIONAL PROJECT MANAGEMENT STUDY PROGRAMME Bilal Aziz

Enhancing Project Outcomes through Adaptive Leadership Strategies in Dynamic Environments

Supervisor – Associate Prof. Eglė Daunienė

Master's thesis was prepared in Vilnius, in 2025

Scope of Master's thesis – 80 pages.

Number of tables used is 18pcs.

Number of figures used is 6.

Number of bibliography and references – 55 pcs.

This thesis explores the connections between adaptive leadership actions: situational diagnosis, behavioral flexibility, and balancing competing demands, and project outcomes in dynamic settings by considering hybrid work arrangements as a contextual moderator. Based on the quantitative data of 70 IT project management professionals in Pakistan, the behavior of adaptive leadership was found to explain the project outcomes variance of 53.6, with a significant result (p=0.001). Situational diagnosis was found to be the most predictive (b=0.507) and balancing competing demands is the next strongest predictor (b=0.461) and the final predictor is behavioral flexibility (b=0.319). However, in contrast to what was expected, hybrid work environment did not change these associations in a significant way. Results can be used to offer evidence-based recommendations on how to build adaptive leadership skills in an IT project.

SUMMARY IN LITHUANIAN

VILNIAUS UNIVERSITETAS

VERSLO MOKYKLA

TARPTAUTINIO PROJEKTŲ VALDYMO STUDIJŲ PROGRAMA

Projektų rezultatų gerinimas taikant prisitaikančios lyderystės strategijas dinaminėje aplinkoje

Vadovė – doc. Eglė Daunienė

Magistro baigiamasis darbas parengtas Vilniuje, 2025 m.

Magistro baigiamojo darbo apimtis – 80 puslapiai.

Panaudotų lentelių skaičius – 18 vnt.

Panaudotų paveikslų skaičius – 6 vnt.

Bibliografijos ir šaltinių skaičius – 55 vnt.

Šiame darbe tiriami ryšiai tarp prisitaikančios lyderystės veiksmų: situacijos diagnostikos, elgesio lankstumo ir konkuruojančių reikalavimų balansavimo bei projektų rezultatų dinaminėje aplinkoje, nagrinėjant hibridinės darbo tvarkos poveikį kaip kontekstinį moderatorių. Remiantis 70 IT projektų valdymo specialistų iš Pakistano kiekybiniais duomenimis, nustatyta, kad prisitaikanti lyderystė paaiškina 53,6 proc. projektų rezultatų dispersijos, esant reikšmingam rezultatui ($p=0,001$). Situacijos diagnostika pasirodė esanti stipriausias prognozuojantis veiksnys ($\beta=0,507$), po to seka konkuruojančių reikalavimų balansavimas ($\beta=0,461$) ir galiausiai elgesio lankstumas ($\beta=0,319$). Tačiau, priešingai nei buvo tikėtasi, hibridinė darbo aplinka reikšmingai nepakeitė šių ryšių. Rezultatai gali būti naudojami norint pateikti įrodymais grįstas rekomendacijas, kaip ugdyti prisitaikančios lyderystės gebėjimus IT projektų kontekste.

ACKNOWLEDGEMENTS

I wish to express my utmost appreciation to my academic advisor, Associate Prof. Eglė Daunienė, for her invaluable guidance, encouragement, and insightful discussions throughout my research. I sincerely thank my family for their support in every aspect of my life. Despite the physical distance their love and presence have always been deeply felt.

TABLE OF CONTENTS

LIST OF TABLES

LIST OF FIGURES

CHAPTER 1

INTRODUCTION

1 INTRODUCTION

Organizations face heightened uncertainty due to rapid technological innovation, global competition and complex stakeholder demands. These conditions create VUCA environments that require leaders to enact adaptive behaviors that enable real-time sensemaking, learning and flexibility (Chughtai and Tariq, 2023; Sott, 2025). The literature review (Chapter 2) shows that adaptive leadership is conceptualized through behavioral practices such as situational diagnosis, behavioral repertoire and balancing competing demands (Nöthel et al., 2023; Han, 2024). Despite its theoretical promise, adaptive leadership remains under-tested in project management contexts, particularly with objective performance indicators. This thesis therefore directly aligns its research questions with those gaps by operationalizing adaptive leadership behaviors and testing their association with measurable project success factors.

1.1 Background and Context

The capability of the organizations to develop and implement projects in the vastly changing and turbulent world has become more intricate and uncertain. Whereas in the past projects could be viewed as solitary and predictable undertakings, they are now contained in contexts where they are surrounded by a fast-changing technological environment, dynamically evolving stakeholder expectations, regulatory pressures, and multicultural people. The command-and-control leadership models are usually unable to present an accurate response to such challenges (Turner & Ralf Müller, 2005). Consequently, organizations are resorting to more agile responsive, as well as context-specific leadership styles in their engagement with modern projects environments.

Another concept introduced by Heifetz among others is adaptive leadership where they preach the need of flexibility, learning and resilience (Wale, 2023). In comparison with the transactional and transformational leadership concept in which the strict roles and definite hierarchies are often used, adaptive leadership models appreciate the dynamic character of project ecosystems and allow leaders to make decisions depending on the situation. It is based on the ability to rally individuals to address the challenging issues or problems, learn real-time problem trying by prescribing new ideas of thinking, and experimenting in order. The model is of special importance to project management, where there will always be uncertainty and change.

As the global market and digital transformation is transforming industries, project managers are needed not only to execute projects and control scope, time and cost, but also

lead teams through change, ambiguity and emergent goals. Adaptive leadership provides the perspective with which the project leaders can effectively react to these new requirements but its application in the practice of project management is not well studied and poorly conceptualized (Hernández-Santiago, 2023). The present thesis attempts to understand how the principles of adaptive leadership may be integrated with project management in an effort to strive for better results in the dynamic settings.

1.2 Relevance and Novelty of the Research

The significance of the given research can be discussed in relation to the identified gap between the theory and the actual project implementation in volatile, uncertain, complex, and ambiguous (VUCA) environments (Moura et al., 2023). Although there is a literature on adaptive leadership with respect to the organizational and change management fields, there is a new body of literature on adaptive leadership policies that are involved in cross-industry cross-culture project management.

Moreover, most of the literature available on project leadership has the tendency to lean towards such conceptions as stationary leadership styles, like transactional and transformational leadership styles (Hamayoon Ghafory & Faqeed Ahmad Sahnosh, 2024). Such methods usually presume that the projects occur in a rather consistent environment but this is also no longer the case in the real world. The originality of this study is that the emphasis has been put on the issue of leadership flexibility, as it is postulated that the performance of the project manager is determined more by their capability to adjust the leadership behavior to the situation, rather than reflect the specific leadership style.

Novelty in this study is also represented by the fact that this study tries to develop a conceptual model that can connect adaptive leadership behaviors and practices with certain project performance indicators. Through this, it tries to provide a model that can be effectively applied in organizations. The research also contributes to the wider discussion of project agility because it considers leadership as an important contributor to flexibility in project implementation.

1.3 Problem Statement

Failure in projects is a long-term problem in any industry and most failures can be ascribed to non-technical problems and lack of relative flexibility towards the dynamics of change and project leadership (Shabir, 2023). However, the traditional models of leadership used in project management are usually too structured to be able to effectively adjust to the fast-changing reality of the challenges experienced by the project teams. As

projects environment have become increasingly more complex, there still remains no detailed understanding of how adaptive leadership could be leveraged towards the reduction of uncertainty and method of driving teams to resolve complex issues during project management (Coccia, 2023).

The central problem is not merely a conceptual gap but a lack of actionable, evidence-based guidance for project leaders. Existing research has rarely applied validated adaptive leadership measures in project contexts or examined their direct impact on project KPIs such as cost variance, schedule adherence and client satisfaction (Nöthel et al., 2023; Wu, 2024). Without such evidence, project managers are left uncertain about which adaptive practices are most effective in contexts shaped by regulatory constraints, cultural variations and hybrid work designs (Ibrahim, 2024; Al-Rjoub, 2024). This thesis addresses that problem by validating adaptive leadership behaviors in project settings and testing their impact on objective outcomes while accounting for contextual contingencies.

In this way, the significant problem the current thesis is attempting to resolve is the relative lack of involvement and under-theorization of adaptive leadership in the field of project management, specifically in the spheres of change, uncertainty, and complexity.

1.4 Research Aim and Objectives

1.4.1 Research aim

To determine whether the adaptive leadership behaviors assessed on a validated scale can enhance the objective project performance and to determine the mechanisms and contextual conditions that modify the relationship between the two.

1.4.2 Research objectives

1. To examine the relationship between situational diagnosis and project outcomes in dynamic environments.

2. To examine the relationship between behavioral flexibility and project outcomes in dynamic environments.

3. To examine the relationship between balancing competing demands and project outcomes in dynamic environments.

4. To investigate the moderating role of hybrid work arrangements on the relationship between adaptive leadership behaviors and project outcomes.

5. To develop practical recommendations for integrating adaptive leadership practices into project management, particularly in hybrid work settings.

1.5 Subject of the Research

This study considers how adaptive leadership behaviors such as situational diagnosis, behavioral flexibility and balancing competing demands can be implemented strategically in project management situations. The research examines the impact of these aspects of leadership on project outputs such as timely schedule, budgetary control, quality, stakeholder satisfaction, and organization contribution. It also investigates whether the hybrid work arrangements moderate these relationships and whether there are differences in leadership effectiveness in cases where project teams are not restricted in their ability to choose where to work and when. Based on leadership theory, project management practice, and organizational behavior, the research relates to the role of project managers in managing the changing demands of the stakeholders, limited resources, and coordination issues to the project success in the modern dynamic settings.

1.5.1 Research Questions

To solve the stated problem and achieve the research objectives, the following research questions will be deployed:

- RQ1: To what extent does situational diagnosis significantly influence project outcomes, including schedule adherence, budget control, quality, stakeholder satisfaction, and organizational contribution?

- RQ2: To what extent does behavioral flexibility significantly influence project outcomes, including schedule adherence, budget control, quality, stakeholder satisfaction, and organizational contribution?

- RQ3: To what extent does balancing competing demands significantly influence project outcomes, including schedule adherence, budget control, quality, stakeholder satisfaction, and organizational contribution?

- RQ4: How does the hybrid work environment moderate the relationship between adaptive leadership behaviors and project outcomes?

1.5.2 Research Methods and Data Sources

The current research adopts a quantitative level of research design to study the connection between adaptive leadership behaviors and project outcomes in a methodical

way. The quantitative approach would be reasonable considering the research objectives, which will examine the hypotheses of testing the direct correlations between measurable leadership dimensions and project performance indicators, and the moderating role of hybrid work arrangements. This will allow testing hypotheses statistically, evaluating the strength of relationships, and generalizing the results to the sample, which is empirical support of the proposed research model (Sott, 2025).

Quantitative data: The structured questionnaire will be used to gather quantitative data using validated measurement scales obtained in the survey conducted by several individuals. The questionnaire has six different sections that assess the various constructs. Part B, C, and D capture the three adaptive leadership behaviors, namely, situational diagnosis (based on Endsley, 1995; Flin, O'Connor and Crichton, 2008), behavioral flexibility (based on Pulakos et al., 2000; Ployhart and Bliese, 2006), and balancing competing demands (based on Netemeyer, Boles and McMurrian, 1996; Macan, 1994). Section E is the moderating variable of hybrid work environment (modified on Gajendran and Harrison, 2007; Choudhury, Foroughi and Larson, 2021), and Section F is the project outcomes (modified on Pinto and Slevin, 1988; Atkinson, 1999). All the measures were earlier tested in the contexts of organizational and project management, but were modified in order to apply to the context of this study. Part A gathers demographic data in accordance with the common principles of the social research (Bryman, 2016). All outcome measures are determined on the perceptions of respondents about the performance of the project on various levels such as the timeline observation, budgets management, quality, stakeholder satisfaction, and contribution made to the organization, as opposed to objective organizational documentation.

1.6 Structure of the Thesis

The thesis is organized into five chapters, each building progressively to address the research objectives.

- **Chapter 1** In chapter 1, the research background, problem, and the aim of the research, research questions and objectives are defined. It defines scope and importance of the research, too.

- **Chapter 2** critically presents the literature on adaptive leadership, its behavioral aspects (situational diagnosis, behavioral flexibility and balancing competing demands), as well as the connection between these and outcomes of projects. The chapter also discusses the impact of hybrid work environment as a possible moderator, generalizes the findings and outlines research gaps which inform the conceptual model

of the study.

- In **Chapter 3,** the research design, methods and data sources are outlined. It gives rationales of the quantitative approach, elaborates the validated measurement scales used to fit each construct, presents the data collection plan using structured questionnaires and explains sampling procedures, reliability and validity concerns.

- In **Chapter 4,** the quantitative findings are introduced and discussed. In the chapter, descriptive statistics, reliability analysis, correlation analysis, multiple regression analysis to determine the direct effects of adaptive leadership behaviors on project outcomes and moderation analysis to determine the role of hybrid work environment with application of Hayes Process Macro were reported.

- **Chapter 5** presents the findings as discussed in the context of the existing literature, conclusions are made and there are theoretical and practical implications of the findings to project management. It also brings out study constraint and study directions. This structure ensures a coherent flow from conceptual framing to empirical analysis and contributes to both academic theory and practical project leadership.

1.7 Research Limitations and Difficulties

There are various limitations to this research in spite of a well-planned research. These limitations are as follows.

- Data Accessibility

Access to experts and experienced professionals to look at the project in detail may be difficult because of confidentiality and availability issues.

- Generalizability

The findings cannot be generalized to all industries or cultures because the research is premised on the use of case study and a sample population.

- Time Constraints

The briefness of the thesis time compounds the restriction of the scope and intensity of the research in terms of practicality.

While the study seeks to provide robust insights into adaptive leadership in project

settings, it deliberately does **not** attempt to develop a cross-country comparative analysis, measure long-term longitudinal effects, or capture every possible contextual variable influencing leadership outcomes. These boundaries ensure that the research remains focused, feasible and aligned with the available resources and timeframe (Moura et al., 2023).

Chapter 2

Literature Review

2 LITERATURE REVIEW

Adaptive leadership has become an essential paradigm through which the dynamics of the interactions between leaders and leaders and leaders and followers are studied in the volatile, uncertain, complex, and ambiguous (VUCA) environment. In contrast to the conventional leadership styles which stress stability and predictability, adaptive leadership is concerned with flexibility in behaviors, awareness of the situation, and balancing in competing demands (Nothel et al., 2023; Syamsir et al., 2025). The chapter is an overview of the theoretical principles, empirical data, and measurement strategies applicable to adaptive leadership in the project management environment, especially with reference to how hybrid workplaces can affect the leadership effectiveness.

The literature review is designed in such a way that it deals with the research objectives that are outlined in Chapter 1. It also starts with conceptualizations of adaptive leadership and its behavioral aspects, goes on to discuss the association between adaptive leadership and project outcomes, explores possible mediating factors, and critically discusses boundary conditions such as hybrid work arrangements. The chapter also ends with the identification of research gaps that explain the interest of the current study in hybrid work as a moderating variable.

Adaptive Leadership The conceptualizations of adaptive leadership are shared in 2.1.Adaptive leadership has been transformed into a set of behavioral practices that can be measured as opposed to being an abstract conceptual framework. The recent theoretical advances focus on three fundamental behavioral aspects that make adaptive leadership different compared to the conventional leadership styles: situational diagnosis, behavioral flexibility, and balancing competing demands (Nothel et al., 2023; Esenyel, 2024)

2.1 Conceptualizations of Adaptive Leadership

Adaptive leadership has been transformed into a set of behavioral practices that can be measured as opposed to being an abstract conceptual framework. The recent theoretical advances focus on three fundamental behavioral aspects that make adaptive leadership different compared to the conventional leadership styles: situational diagnosis, behavioral flexibility, and balancing competing demands (Nothel et al., 2023; Esenyel, 2024).

2.1.1 Situational Diagnosis

Situational diagnosis is the ability of a leader to properly appraise the situation in

the environment, detect new challenges and comprehend contextual demands prior to action. Situation awareness introduced by Endsley (1995) highlights the perception of what is in the environment within a volume of time and space, understanding of what it means and the forecast of what it is going to become in the near future within a high-stakes environment (p. 36). This framework has been conveniently applied to organizational and project management environments where executives need to constantly check the status of projects, expectations of stakeholders, availability of resources, and the external forces.

Flin, O'Connor, and Crichton (2008) applied the situation awareness theory to team leadership contexts and established that successful team leaders process and distribute information they have with members and modify their mental models as new information is obtained. Situational diagnosis works in uncertain and fast-changing project settings, helping the leaders to predict issues before they become worse, proactively allocate resources, and make effective decisions in a time constraint (Moura et al., 2023).

The situational diagnosis is important in project success supported by empirical evidence. In their analysis of 66 Australian construction project managers, Rehan et al. (2024) concluded that situational awareness and environmental scanning behaviors were some of the most predictive behaviors that had a strong influence on project efficiency and stakeholder satisfaction. Their results indicate that leaders who take time to familiarize themselves with the context of the project find it easier to align the project activities to the expectations of the stakeholders and end up having fewer conflicts and delays.

2.1.2 Behavioral Flexibility

Behavioral flexibility describes how a leader can change his or her approach and alternate among other leadership styles, as well as change tactics to meet the changing situation. Pulakos et al. (2000) formulated an extensive taxonomy of adaptive performance behaviors in which they identified eight dimensions of such performance behavior, such as managing emergencies, responding to uncertain situations, new task learning, and interpersonal adaptability. Their efforts made it clear that adaptability is not a unitary characteristic but a repertoire of behavior, which is capable of being trained and learned with experience.

Based on this, Ployhart and Bliese (2006) came up with Individual Adaptability Theory (I-ADAPT) as a theoretical framework that conceptualizes adaptability through cognitive, affective, and behavioral elements. Their model underlines that to be able to

adapt successfully, one needs not just to be able to change his behavior, but he should also learn to regulate emotional reactions to change and be able to reframe these problems as opportunities. Behavioral flexibility in project management can be represented as the readiness to test the new methods, change the communication style to collaborate with various stakeholders, and switch between directive and participative leadership when the circumstances require it (Dajic et al., 2024).

More recent empirical research proves the usefulness of behavioral flexibility in project contexts. Jung et al. (2023) established that leader behavioral flexibility increased adaptive performance among the team members by providing them with greater job challenge and learning. Equally, in their systematic review of 116 papers on the topic of leadership agility, Syamsir et al. (2025) came to the conclusions that the behavioral flexibility is becoming a mandatory attribute of project-based organizations experiencing digital transformation and facing the post-pandemic reality of work.

Practically, behavioral flexibility in project leadership entails: being able to change approaches easily when things go wrong, being comfortable in switching tasks of varying needs, being adaptable to suit the needs of various teams or stakeholders, being effective despite the shift in project priorities, and ability to learn through new experiences to apply it to the future (Pulakos et al., 2000; Ployhart and Bliese, 2006).

2.1.3 Balancing Competing Demands

Project leaders often have to juggle competing needs of various stakeholders, conflicting speed and quality requirements, and conflicts between innovation and compliance. Balance of these demands without influencing the results of a project is an important competency of adaptive leadership. Netemeyer, Boles and McMurrian (1996) attempted to come up with some basic measures of work-family conflict which involved conceptualizing competing demands as the incompatibility of role pressures of one domain with role pressures of another domain. Although their initial work was devoted to the work-life balance, the hidden construct was successfully transferred to project management context where leaders should manage conflicting project requirements.

Macan (1994) added to this body of knowledge by studying the time management as a method of managing multiple demands. Her process model proved that prioritization, delegation, and goal-setting are effective as they allow people to deal with competing pressures without compromising the performance quality. Project managers who are highly successful in balancing demands are also able to deal with scope creep, negotiate feasible schedules with stakeholders, and allocate resources rationally among conflicting

project tasks in project environments (Bonini et al., 2024).

Recent empirical findings in construction projects (Thorpe and Rehan 2024) revealed that the capacity of leaders to strike the right balance between stakeholder expectations and resource constraint contributed enormously to the minimization of the project delays and the maximization of the client satisfaction. According to their findings, the balancing between competing demands entails trade-off assessment (via analytical ability) and compromise (via interpersonal ability) which is a complex and yet trainable leadership skill.

In a practical sense, behavioral flexibility of project leadership involves: easily changing approach to things going wrong, comfortable in switching tasks of different needs, adaptable in meeting the needs of different teams or stakeholders, effective in spite of the change in project priorities, and is able to learn through new experiences to apply it in the future (Pulakos et al., 2000; Ployhart and Bliese, 2006).

2.1.4 Difference with other Leadership Approaches

Compared to transformational, transactional as well as servant leadership strategies, adaptive leadership has a different conceptual character. Esenyel (2024) has provided a comparative analysis and showed that both transformational and adaptive leadership are characterized by the emphasis of leadership on inspiring their followers with vision and charisma (as well as focusing on responsiveness to situational needs in real-time, respectively). On the same note, whereas servant leadership focuses on the development and empowerment of followers, adaptive leadership balances the needs of followers with those of organizations and projects.

Nothel et al. (2023) have empirically demonstrated discriminant validity, that adaptive leadership is moderately related to transformational leadership ($r = 0.45$) and authentic leadership ($r = 0.38$) and weakly to directive leadership ($r = 0.12$) and negatively to laissez-faire leadership ($r = -0.23$). These correlational trends affirm that adaptive leadership is a unique area of the behavior and not a rebranding of the established leadership theories.

2.1.5 Theoretical Foundations

To gain insight on the extent to which adaptive leadership contributes to project outcomes, it is important to have theoretical frameworks that would explain the processes by which the behaviors of leaders would be translated into performance outcomes. Several theoretical points of view help in this understanding, with each one of them pointing at various avenues

and mechanisms.

2.1.6 Social Exchange Theory

The social exchange theory (Blau, 1964) assumes that social relationships are built based on mutual exchange of valuable resources. Leadership In leadership settings, followers can give back to the leaders by working harder, being committed, and displaying discretionary behaviors in exchange. Xu and Zhang (2022) experimented this mechanism in universities and discovered that adaptive performance was increased by empowered leadership based on high-quality leader-member exchange (LMX) and psychological empowerment. Their chain mediation model has shown that LMX generated relational trust and this enhanced the effects of empowerment on adaptive behaviors.

This theoretical framework indicates that adaptive leadership practices like situational diagnosis (that depicts attentiveness on part of the leader) and behavioral flexibility (that depicts responsiveness among followers towards the needs of projects) reinforce the quality of relationships between leaders and followers, which then encourages the followers to bend their behaviors according to the shifting project requirements.

2.1.7 Self-Determination Theory

The self-determination theory (Deci and Ryan, 2000) suggests that human motivation is optimized in case three psychological needs are met, namely autonomy, competence, and relatedness. Li, Zhang, and Sun (2021) used this framework on the adjustment of adaptive leadership in Chinese technology companies and established that leaders bringing meaningful work, promoting autonomy, and helping with skills development contributed to psychological empowerment, which subsequently promoted creative and adaptive performance.

Adaptive leaders who strike a balance between conflicting needs in project contexts are effective in generating clarity around priorities (enhancing competence), change their course to offer adequate levels of guidance (supporting autonomy), and ensure cohesion in the team despite change (relevant). Such behaviors meet essential psychological needs, which encourage members of the team to adhere to adaptive behaviors instead of oppose changes.

2.1.8 Sensemaking Theory

The sensemaking theory, proposed by Weick (1995) highlights the point that people make sense of situations of ambiguity or uncertainty in a social manner by

interpreting and communicating. Moura, Carneiro, and Dias (2023) also revealed that project leaders who support collective sensemaking help teams to dynamically change the methods of project responses to the presence of VUCA conditions. Their data indicate that adaptive leadership functions at least in part by means of interpretative processes: leaders make sense of ambiguous changes, enable team members to interpret contextual change, and co-create new practices together. Situational diagnosis is a direct help to sensemaking because it serves to aid leaders in recognizing what about the environment needs to be interpreted and attended to. Flexibility in behavior allows the leaders to change their communication styles to accommodate a common understanding among the stakeholders with varied frames of reference.

2.1.9 Dynamic Capabilities Theory

The theory of dynamic capabilities (Teece, Pisano, and Shuen, 1997) is concerned with an organizational capacity to reorganize the resources and processes to fit into the changing environments. Faraj and Yan (2022) applied this framework to the context of multinationals IT projects, which demonstrated that adaptive leadership enhanced organizational dynamic capabilities due to the ability to reallocate resources faster and change processes, which minimized delays in delivery.

According to this view, adaptive leaders will not only achieve project success by shaping the behavior of individual people but also create a change capacity in an organization. Balancing competing demands is an effective way through which leaders can ensure that organizations remain stable in terms of their operations and at the same time strive to innovate and be adaptable.

2.2 Measurement of Adaptive Leadership Behaviors

The level of adaptive leadership behaviors is measured through the following step:

Measurement should be reliable in order to develop theory and practice. The recent events have resulted in validated tools of measuring adaptive leadership behaviors, but their use on project management contexts is sparse.

2.2.1 Situational Diagnosis Measures

As indicated in Section 2.1.1, Endsley (1995) has designed the Situation Awareness Rating Technique (SART), which has been translated in various areas. Flin, O'Connor, and Crichton (2008) further developed situation awareness scales as applicable in situations where team leaders are involved, by developing an item that measures leader capacity to scan the environmental conditions, interpret implications,

and project futures. These measurement methods have been effectively applied to the project management situations where situational diagnosis reflects the leader's cognition of the priorities of the projects, risk awareness, resources evaluation capacity, sufficient information and capability to tell when corrective actions are necessary.

For the current study, situational diagnosis in project management contexts is measured using five items adapted from Endsley (1995) and Flin, O'Connor, and Crichton (2008):

- I clearly understand the priorities of my current projects.
- I am aware of the potential risks and challenges in my work environment.
- I can accurately assess the resources required to complete tasks.
- I receive sufficient information to make informed decisions on projects.
- I can identify when adjustments are needed to achieve project goals.

2.2.2 Behavioral Flexibility Measures

Pulakos et al. (2000) developed the taxonomy of adaptive performance by creating behavioral based rating scales on eight dimensions: managing emergencies or crisis scenarios, managing work stress, innovatively resolving problems, managing uncertain and unpredictable work scenarios, learning work tasks, using technologies and procedures, showing interpersonal adaptability, showing cultural adaptability, showing physically oriented adaptability. These dimensions were shown to have sufficient reliability (0.75) and forecasted supervisor ratings of overall performance as showed by their validation studies in both military and civilian samples.

This work was developed by Ployhart and Bliese (2006) into I-ADAPT theory, which generated measures of cognitive, affective, and behavioral levels of adaptability. Their 55 item I-ADAPT scale measures such dimensions as work stress, uncertainty, learning, interpersonal, cultural, physical and creative problem-solving adaptability dimensions. The eight-factor structure was confirmed by confirmatory factor analyses and criterion validity was achieved through correlation with personality traits, cognitive ability and performance outcomes.

Behavioral flexibility items used in project environments evaluate the capacity of leaders to adapt strategies in conditions of change, to switch among task demands, to adapt work styles to various stakeholders, to be effective amid shifts in priorities and to transfer learning achieved through new experiences to new circumstances. The measures have been scaled down to project management settings though retaining the

behavioral orientation that renders it to be self-report and peer assessable (Pulakos et al., 2000; Ployhart and Bliese, 2006).

In this study, behavioral flexibility is assessed through five items adapted from Pulakos et al. (2000) and Ployhart and Bliese (2006):

- I can easily adjust my approach when unexpected changes occur.
- I am comfortable switching between tasks with different requirements.
- I can adapt my work style to meet the needs of different teams or stakeholders.
- I remain effective even when project priorities change rapidly.
- I learn from new experiences and apply them to future tasks.

2.2.3 Balancing Competing Demands Measures

McMurrian, Boles, and Netemeyer (1996) developed scales to assess work-family conflict which are valid and conceptualize the competing demands as role incompatibility. They have both a 5-item Work-Family Conflict (Work-Family Conflict) and Family-Work Conflict (Family-Work Conflict) scale, which have shown excellent psychomotricity in a wide range of researches, with Cronbach alpha values always above 0.85. The scales measure time based, strain based and behavior-based conflict that occurs as a result of incompatible role pressures.

Macan (1994) also provided some time management measures that evaluate prioritization and goal-setting behavior in the Time Management Behavior Scale. This tool includes four scales, namely, the establishment of goals and priorities, time management mechanics, perceived time control, and organizational preference. The reliability (alpha of 0.67 to 0.82) and predictive validity of job performance and strain outcomes were acceptable as proved by validation studies.

These measures are modified to fit the project contexts, and these measures assess the leadership skills of the leaders in their capacities to work with multiple deadlines at once, to balance between quality and speed, to fulfill their various responsibilities without conflict, as well as to prioritize effectively under competing demands, and to manage conflicting stakeholder demands. The adaptation preserves the major conceptualization of competing demands as simultaneous pressures that demand specific management strategies, whereas it changes the emphasis on the work-family boundaries on the many and often competing demands that characterize the project leadership positions (Netemeyer et al., 1996; Macan, 1994).

Adapted to project contexts, balancing competing demands is measured through

five items from Netemeyer, Boles, and McMurrian (1996) and Macan (1994):

- I can effectively manage multiple project deadlines simultaneously.
- I can balance quality and speed when completing tasks.
- I can meet my personal and professional responsibilities without conflict.
- I prioritize tasks effectively to handle competing demands.
- I can handle pressure from conflicting stakeholder requirements.

2.2.4 Hybrid Work Environment Measures

Hybrid work arrangements have seen a tremendous change in their measurement since the pandemic. Gajendran and Harrison (2007) had come up with early indicators of remote working intensity and effectiveness, paying attention to frequency of working remotely (hours a week work remote), perceived work location choice autonomy and work-family balance outcomes. Their meta-analysis carried out on 46 studies confirmed that the intensity of telecommuting was measurable, and it had significant and reliable predictors such as job satisfaction, performance, turnover intentions, and role stress.

Choudhury, Foroughi and Larson (2021) built on this, evaluating work-from-anywhere arrangements, creating scales that evaluate flexibility in work location and time, communication effectiveness in distributed environments, organizational support of work at home, the sufficiency of technology infrastructure, and effects of perceived productivity. Their field study of patent examiners showed that the geographic flexibility measures were able to predict objective productivity results (patents processed per examiner) and criterion validity was established regarding their construct.

Hybrid work environment measures in project management determine how much the team members are flexible in terms of where and when they work reflecting on how well they can communicate irrespective of physical distance, the support systems in the organization of hybrid work, the technological facilitation, and the net effect of the hybrid work on productivity and teamwork. Such measures include structural (policies, technology) and experiential (perceived effectiveness, satisfaction) dimensions of hybrid arrangements (Gajendran and Harrison, 2007; Choudhury et al., 2021).

For this study, hybrid work environment is measured using five items adapted from Gajendran and Harrison (2007) and Choudhury, Foroughi, and Larson (2021):

- I have flexibility in choosing when and where I work.
- Communication with my team is effective, regardless of physical location.
- The organization supports remote and in-office work equally.

- Technology provided by the organization facilitates effective hybrid work.
- Working in a hybrid environment positively affects my productivity.

2.2.5 Project Outcomes Measures

Pinto and Slevin (1988) came up with some basic project success measures that centered on the time, cost and performance specifications of the so-called iron triangle. They have ten critical success factors in their Project Implementation Profile (PIP) and have been verified in a variety of projects. The tool is used to evaluate the project mission clarity, top management support, project schedule / plan, client consultation, personnel selection and training, technical work, client acceptance, monitoring and feedback, communication, and troubleshooting. Cronbach alpha values on most of the dimensions have been found to be more than 0.80 based on reliability studies conducted by various researchers.

Atkinson (1999) further developed this model to incorporate the aspect of stakeholder satisfaction and the organizations benefits since it is understood that project success is not a one-dimensional model but rather a multidimensional concept that goes beyond the iron triangle. His square route framework introduces such dimensions as information system quality, organizational benefits (improved efficiency, increased profit, strategic goals), and stakeholder benefits (satisfied users, social and professional learning, increased profits of the contractors). This multidimensional conceptualization recognizes the fact that various stakeholders can be judging the success of a project in different ways and that there will be long-run organizational effects that will be important as well as short-term delivery measures.

Modern project outcome measures include schedule, budget administration, quality of product, satisfaction of stakeholders (client and team member satisfaction), organizational contribution (strategic compliance and value generation). Practically, both objective data (actual vs. planned schedule, actual vs. budgeted costs, defect rates) and perceptual ones (satisfaction ratings, perceived quality, strategic fit) can be operationalized to serve as instruments of these measures (Pinto and Slevin, 1988; Atkinson, 1999).

Project outcomes are measured using five items adapted from Pinto and Slevin (1988) and Atkinson (1999):

- My projects are usually completed on time.
- My projects are usually completed within the allocated budget.

- The quality of deliverables meets or exceeds stakeholder expectations.
- Stakeholders are satisfied with the project outcomes.
- The outcomes of my projects contribute positively to organizational goals.

2.2.6 Integration and Validation

Nothel et al. (2023) incorporated adaptive leadership behavioral dimensions into the Adaptive Leadership Behavior Scale, (ALBS) and showed that it had robust psychometric qualities when used in three validation studies. Although their work was mainly on general organizational environments, the behavioral aspects underlining the work are in line with the requirements of project management. Nevertheless, the present research utilizes methods of measurement used in the original source measures (Endsley, 1995; Pulakos et al., 2000; Ployhart and Bliese, 2006; Netemeyer et al., 1996; Macan, 1994; Gajendran and Harrison, 2007; Choudhury et al., 2021; Pinto and Slevin, 1988; Atkinson, 1999) .The Project Manager Skills Scale (PMSS) created by Dajic et al. (2024) is the scales that capture related competencies such as flexibility in the style of leadership and adaptability in the methodology. The validation of these competencies according to their study on 476 project managers proved that they are the predictors of perceived project success and convergent evidence was given in respect to the relevance of adaptive behaviors in project leadership. Trustworthiness of the results obtained with the help of various measurement methods enhances the belief that adaptive leadership behaviors are relevant predictors of project outcomes.

2.3 Adaptive Leadership and Project Outcomes

The major empirical question is whether actual change behaviors of adaptative leadership can enhance project performance. There has been evidence on numerous contexts which point to positive relationship although the methodology constrained causation arguments.

2.3.1 Direct Effects on Project Success

In Australia, Rehan et al. (2024) assessed 66 project managers of construction projects and discovered that indicators of project success such as efficiency, fewer delays, and satisfaction of the stakeholders were predicted by leadership practices that were compatible with adaptive behaviors, especially relationship management, interpersonal sensitivity, and leading by example. Their regression models accounted about 45 percent variation in project performances which may have implied considerable practical implications. In particular, they established that the most powerful predictors were situational awareness ($b = 0.38$, $p < 0.01$) and behavioral adaptability ($b = 0.33$, $p <$

0.01) in the case of the project size, complexity, and manager experience.

Thorpe and Rehan (24) continued this study by developing a framework of leadership communication, which focuses on information sharing and relational sensitivity as essential to the reduction of delays and customer satisfaction in the construction projects. Their qualitative analysis of 15 successful and 10 challenged projects showed that the leaders who were proactive in diagnosing communication needs and capable of changing their communication patterns (formal vs. informal, synchronous vs. asynchronous) better aligned with the stakeholders and experienced a lesser number of conflicts. Although they do not directly test adaptive leadership scales, the results of their work prove that behaviors that are conceptually consistent with situational diagnosis and behavioral flexibility play a significant role in project performance.

On the organizational level, Khalid and Al Bakri (2024) examined Saudi Arabian healthcare organizations and found that adaptive leadership behaviors contributed to the improvement of employee performance by innovative work behavior and receptiveness to change. They revealed that adaptive leadership provided cultural conditions that supported change and, in turn, the operation results such as patient satisfaction scores and efficiency measures. This implies that adaptive leadership impacts can be in a direct behavioral channel and indirect cultural channel.

2.3.2 Effects on Adaptive Performance

In addition to project-level results, adaptive leadership has an impact on the adaptive performance of individuals and groups, i.e. capacity to adapt to the changing needs. Kim and Yoon (2025) showed in South Korean IT manufacturing that empowering leadership (conceptually close to adaptive leadership) was a predictor of adaptive performance (= 0.483, $p < 0.001$). Their structural equation model showed that the adaptive performance of employees was attributed to their leadership behaviors to the extent of 23.3% which is a large effect size in organizational behavior studies.

Jung et al. (2023) also identified these tendencies in the service sector revealing that empowering leadership increased adaptive performance in the form of job challenge, which was mediated by individual agentic behaviors. The adaptive leadership approaches were more helpful to employees with higher proactive orientations (0.41, $p < 0.001$ high agency 0.18, $p < 0.05$ low agency), which implies that the impact of leadership is contingent on the follower traits. Such moderation pattern underscores the fact that adaptive leadership can be especially useful where the team members have a set of traits that allow them to leverage on the flexibility and autonomy furnished by the leader.

These results suggest that adaptive leadership positively impacts the success of the project not only through direct mechanisms (it leads to better project level results (e.g., schedule and budget compliance) or indirect ones (whereby, the ability of the team members to adjust to changing conditions of the project, in turn, impacts the performance of the project).

2.3.3 Cross-Sectoral Evidence

The evidence has been across various sectors, implying generalizability. In construction, Rehan et al. (2024) and Thorpe and Rehan (2024) found beneficial impacts on performance and satisfaction of stakeholders. Khalid and Al Bakri (2024) observed that there were better performance and innovation among employees in healthcare. Kim and Yoon (2025) and Jung et al. (2023) showed increased adaptive performance and agility in the area of IT and manufacturing.

Nevertheless, sectoral variations in regulatory robustness, safety demands and complexity of its stakeholders can serve to dampen the level and character of adaptive leadership impacts. To illustrate, the highly regulated domains of healthcare and construction can limit the possibility of behavioral adaptability to induce the adaptive leadership advantage (Rehan et al., 2024). On the other hand, behavioral flexibility can be particularly treasured and rewarded in dynamic industries such as IT where quick technological transformation is the order of the day.

In their meta-analysis of 116 studies that investigate the relationship between leadership and adaptive performance in different industries, Bonini et al. (2024) discovered that the effect sizes depended on the industry setting ($Q = 47.3$, $p < 0.001$), with the greatest effect in knowledge-intensive industries (mean $r = 0.48$) and the lowest effect in manufacturing settings with high standardization (mean $r = 0.28$). This heterogeneity highlights the necessity of studying the topic of adaptive leadership in contexts of particular sectors of the economy instead of assuming general impacts.

2.3.4 Measurement of Project Outcomes

There is a tremendous difference in operationalization of project outcomes across the studies that matters a lot to the interpretation of findings. Other researchers use perceptual scales only, requiring the project managers or team members to assess project success on Likert scales (e.g., "In general, this project was successful, rated on a scale of 1-5). Though these are convenient measures, and subjective in evaluating, they are susceptible to common method bias where the same respondent’s rate both the leadership behaviors and results, and they may be indicative of attribution errors or

implicit leadership theories instead of actual performance differentials (Podsakoff, MacKenzie, and Podsakoff, 2012).

Other research efforts seek to quantify objective project performance using organizational records: actual completion date as compared to planned completion date (schedule variance), actual cost as compared to budgeted cost (cost variance), scope changes approved, client satisfaction scores of independent surveys, and quality indicators, like defect rate or rework hours. Pinto and Slevin (1988) recommended the use of multi-method assessment by integrating objective and perceptual measures in reference to the fact that the two assessments measure significant project success.

In the given study, the perceptual indicators of the project outcome are based on the modified versions of Pinto and Slevin (1988) and Atkinson (1999) as schedule adherence, budget control, quality, stakeholder satisfaction and organizational contribution are measured. Although it cannot be denied that this method is limited by the fact that perceptual measures are difficult to obtain in multiple organizations and projects, the interdimensional of project success that spans beyond the iron triangle, and the fact that these measures have been validated in previous studies in project management.

2.4 Boundary Conditions: The Role of Hybrid Work Environments

The effects of adaptive leadership do not cut across situations. The existing literature has also found that there are a number of boundary conditions that either enhance or undermine the association between adaptive behaviors and outcomes, and the hybrid work arrangements have become a particularly topical moderator in the modern project context.

2.4.1 Defining Hybrid Work Arrangements

Hybrid work practices Hybrid work arrangements are organizational practices and policies that enable employees to have leeway in deciding when and where to work, usually a combination of remote work and office-based work in the same position (Gajendran and Harrison, 2007). Contrary to fully remote or fully co-located configurations, hybrid models bring in flexibility in the spatial distance, the synchronization of interactions and modes of communication in project teams. Due to the COVID-19 pandemic, the use of hybrid work arrangements increased rapidly, which essentially transformed the manner in which project teams communicate, collaborate, and coordinate. What started as a case of emergency remote work has since changed to deliberate hybrid models within most organizations, according to surveys show that 60-70 percent of the knowledge workers are now working in hybrid setups (Choudhury et al.,

2021).

2.4.2 Theoretical Justification of Moderation

There are a number of theoretical mechanisms that postulate that hybrid work can moderate the correlation between adaptive leadership behaviors and project outcomes:

Media Richness Theory: Daft and Lengel (1986) hypothesized that the effectiveness of communication can be based on an appropriateness of the medium richness to the message equivocality. Low face-to-face communication in a hybrid environment can hurt the capacity of leaders to present subtle information and interpret nonverbal communication and this could influence how situational diagnosis, behavioral flexibility and balancing competing demands are converted into project success. According to Choudhury, Foroughi, and Larson (2021), geographic flexibility affected productivity by modifying communication patterns and the authors obtained the notion that work arrangements balanced transformation of leadership behaviors to outcomes.

Complexity of coordination: Project management is a coordinated activity which implies coordination of the activities of team members. Hybrid work contributes to the complexity of coordination by adding variability to the availability, channels, and flow of information. The circumstances of the diagnosis could be more unstable in hybrid environments as the people leading distributed teams should be able to follow them closely instead of using physical closeness as a source of information. The increased usefulness of behavioral flexibility is possible since the leaders need to change coordination strategies depending on where the team members are located and their availability. Trade-offs between synchronous collaboration and asynchronous work preferences may become more relevant and leaders need to balance between competing demands.

2.4.3 Empirical Research and Gaps in Research

Kim and Yoon (2025) directly demonstrated that the group effect of leadership depends on the context of hybrid work and found that adaptive performance was forecasted better by the empowerment of leadership in a hybrid work environment ($b = 0.24$, $p < 0.01$). Nevertheless, Faraj and Yan (2022) discovered that the effects of adaptive leadership were still similar in working arrangements in cases where organizational support systems were not inadequate, which implies null moderation in a specific state of affairs.

The existing gaps are critical: the majority of studies discuss hybrid work as a

primary result of other phenomena and not as a modulator, as a design that does not cover a full range of adaptive leadership dimensions but concentrates on particular leadership styles, and as cross-sectional designs that do not allow drawing causal conclusions. There are no published studies that have systematically addressed the hypothesis of whether or not, hybrid work mediates the influence of situational diagnosis, behavioral flexibility, and balancing competing demands on the outcomes of projects in particular. This void inspired the moderating hypotheses (H4-H6) of the present study, which examine whether hybrid work arrangements enhance, dilute, or are neutral in relation to the relationships between each of the dimensions of adaptive leadership and project outcomes.

2.5 Methodological Considerations in Existing Research

The methodological shortcomings of preceding studies critically reviewed can be found to limit the reliance on the research results and emphasize the areas of improvement.

2.5.1 Measurement Challenges

Although there has been an advance in the creation of validated scales to measure adaptive leadership dimensions and hybrid working arrangements, the majority of the research uses self-reported survey data collected by one source only. All three studies, by Kim and Yoon (2025), Xu and Zhang (2022), and Jung et al. (2023), have measured leadership behaviors and results based on the perception of the subordinates, which poses a common method variance issue. Although Nothel and his colleagues (2023) mitigated this issue by the use of leader-follower dyads, objective performance data are still rare.

Common method variance (CMV) is a variance that results when a predictor and a criterion are measured by the same method at the same point in time, and this may inflate observed correlations due to respondent biases (social desirability, consistency motives, mood states) and not the actual relationships between predictors and criteria (Podsakoff et al., 2012). A variety of methodological solutions are possible: data on predictors and criterion should be obtained in additional sources (e.g., subordinates rating leadership, supervisors rating outcomes), there should be a temporal distance in measurement, procedural remedies (anonymity, evaluation apprehension, better scale forms), statistical controls (single-factor test by Harman, partial correlation processes, factors of latent methods).

In the project management research, in particular, they are relatively few studies that associate measures of adaptive leadership with objective project KPIs, including cost

variance based on project budgets and actuals, schedule performance index based on project management software, and client satisfaction ratings based on independent information, not project manager perceptions (Tang, 2024; Wu, 2024). Most of them use the measures of perceptual success in which the project managers are asked to rate the overall success which might be due to the perceptions of attribution or implicit theories of leadership instead of actual performance differences.

The present research recognizes CMV drawbacks of single-source survey research and instills a series of procedural patching solutions: anonymity of the participants to minimize the impact of social desirability, temporal and methodological distinctions between predictors and outcomes measurement in the questionnaire, variability in the format and response anchors of different constructs, and statistical tests (Harman single-factor test) to determine the magnitude of CMV.

2.5.2 Research Design Limitations

The literature is dominated by cross-sectional designs. Most of the reviewed articles, such as Kim and Yoon (2025), Jung et al. (2023), Khalid and Al Bakri (2024), and Rehan et al. (2024), determine leadership and outcomes at one point in time, which does not allow making causal conclusions. The underlying question is a lack of clarity in temporal causality: are adaptive leadership behavior leading to better project results, better projects leading to perceived adaptability of leaders (attribution error), or third variables (intelligence of leaders, quality of teams, project resourcing) that are generally not measured leading to both?

Few longitudinal designs that can follow leadership behaviors and outcomes throughout project phases are present. Huang et al. (2021) is an exception, having time-lagged team data where the leadership is measured at Time 1 and innovation outcomes are measured at Time 2 three months later. This design enhances causal inference as it creates precedence in time but the unmeasured confounds are still possible.

There are almost no experimental or quasi-experimental research studies aimed at testing adaptive leadership interventions. Causal evidence would be best met by randomizing the leaders to adaptive leadership training and control conditions and measuring project outcomes afterward. Practically, such designs have problems in the field (randomizing is not very easy, project outcomes may take a very long time), but causal mechanisms can be tested by simulation (or controlled laboratory experiments).

The present study will be of cross-sectional design because of limited time and

resources to study the theses, which explicitly states the limitation and results can be interpreted as links, but not causality. The future studies need to seek longitudinal and experimental studies to enhance causal inferences.

2.5.3 Sampling Limitations

Narrow and convenience samples across individual organizations or sectors are being used in many studies, which reduces external validity. Kim and Yoon (2025) used a sample of one South Korean IT manufacturer; Xu and Zhang (2022) utilized one Chinese university; Rehan et al. (2024) used Australian construction. Although these samples are rich and allow for control of organizational context, homogeneity reduces external validity to other industries with varying project features, regulatory features and cultural features.

The sizes of samples are quite small. Jung et al. (2023) considered 279 employees; Huang et al. (2021) 82 teams. Interaction effects The size of an interaction effect whose value is small or moderate ($f2 = 0.02$) cannot be detected using such samples unless the sample size is very large (power = 0.50 with $n = 279$, assuming typical regression with 5-10 predictors).

The level of effects of interaction in organizational research is generally less than main effects where the effect sizes (f2) lie between 0.005 to 0.04 (Aguinis, Beaty, Boik, and Pierce, 2005). To find a small interaction ($f2 = 0.02$) at sufficient power (0.80) using $a = 0.05$ would need a minimum of $n = 395$ in a regression with 5 predictors indicating that many studies are underpowered to detect moderation. This brings in doubts of publication bias: unsignificant interaction studies may not be published, or give false impressions of the commonness of moderation.

The present paper relies on the sample size of 70 respondents, which would give satisfactory power (0.85) to detect moderate main effects ($r = 0.30$) and weak power (0.35) to detect small interactions ($f2 = 0.02$). This weakness has been recognized and non-significant interactions are taken to be viewed with caution and could be an indication of lack of power and not necessarily the null effects.

2.5.4 Construct Overlap

Most studies do not report extensive adaptive leadership measures (such as situational diagnosis, behavioral flexibility, and trade-offs). Proxy measures such as empowering leadership or transformational leadership are used by several studies. These constructs describe only partial subsets of adaptive behaviors though they have

conceptual relevance.

Empowering leadership emphasizes on delegation, provision of autonomy, and participation in decision-making- elements of behavioral flexibility yet does not include situational diagnosis and balancing demands. Transformational leadership focuses on vision, inspiration and intellectual stimulation-which are important but not the same as the real time adjustment that is found in the adaptive leadership. The risk associated with the use of proxy measures is construct deficiency (omission of an important adaptive behavior) and construct irrelevance (incorporating non-adaptive leadership factors), hiding the real relationships.

This is done by the current study relying on measures specifically designed to diagnose the situation (Endsley, 1995; Flin et al., 2008), behavioral adaptability (Pulakos et al., 2000; Ployhart and Bliese, 2006) and balancing competing demands (Netemeyer et al., 1996; Macan, 1994) making sure that construct fidelity of the measures to the situational adaptation conceptualization is also ensured.

2.6 Chapter Overview and Research Model

The literature review confirms that adaptive leadership, which is operationalized by situational diagnosis, behavioral flexibility, and balancing competing demands, is a unique aspect of behavior that is applicable in the success of projects under dynamism. Adaptive behaviors are converted into project outcomes by theoretical frameworks of social exchange theory, self-determination theory, sense making theory and dynamic capabilities theory.

The positive correlations between adaptive leadership dimensions and project outcomes are consistently supported by empirical evidence that requires cross-sectional designs, single-source data, and small samples hence we can only have confidence in making causal statements to a certain extent. More importantly, the existing studies have failed to provide sufficient insight on the moderating role of hybrid work environments, which is a characteristic of modern project management.

2.6.1 Research Gaps Addressed

In particular, this research addresses four gaps which are related to each other:

Gap 1: Hybrid Work as Regulator: Although studies focus on hybrid work as the primary influence on results or focus on particular leadership styles within hybrid settings, there is no systematic evidence on whether hybrid work set-ups mediate the impact of holistic adaptive leadership behaviors (situation diagnosis, behavioral flexibility, balancing

competing demands) on project outcomes. There is speculation that moderation is possible in a variety of ways (communication richness, complexity of coordination, dynamics of autonomy) and there is limited, inconsistent empirical evidence.

Gap 2: Application of Validated Measures in Project Contexts: There are established measures to dimensions of adaptive leadership, which have been validated in general organizational settings, however, in project management contexts with project-relevant outcome measures, little has been done to apply such measures. The majority of project management studies apply proxy constructs or generic leadership measures as opposed to using validated measures that are specifically applied to diagnosing situations, balancing competing demands, and behavioral flexibility.

Gap 3: Integrated Multi-Dimensional Assessment: Research articles usually focus on one adaptive leadership dimension or combine measures, thus failing to determine whether various dimensions have dissimilar impacts, or to find out how dissimilar dimensions interact with situational moderators. Concurrently testing situational diagnosis, behavioral flexibility, and balancing competing demands and moderation of hybrid work brings forth a more detailed and holistic insight.

Gap 4: Perceptual Project Outcomes: The majority of the studies use either generic measures of performance or one-item indices of success. Evaluation based on multi-dimensional project outcome measures that determine schedule adherence, budget control, quality, stakeholder satisfaction, and organizational contribution provide richer assessment as compared to the modern project management evaluation models (Pinto and Slevin, 1988; Atkinson, 1999).

2.6.2 Conceptual Research Model

Based on the literature synthesis, the following conceptual model guides this study:

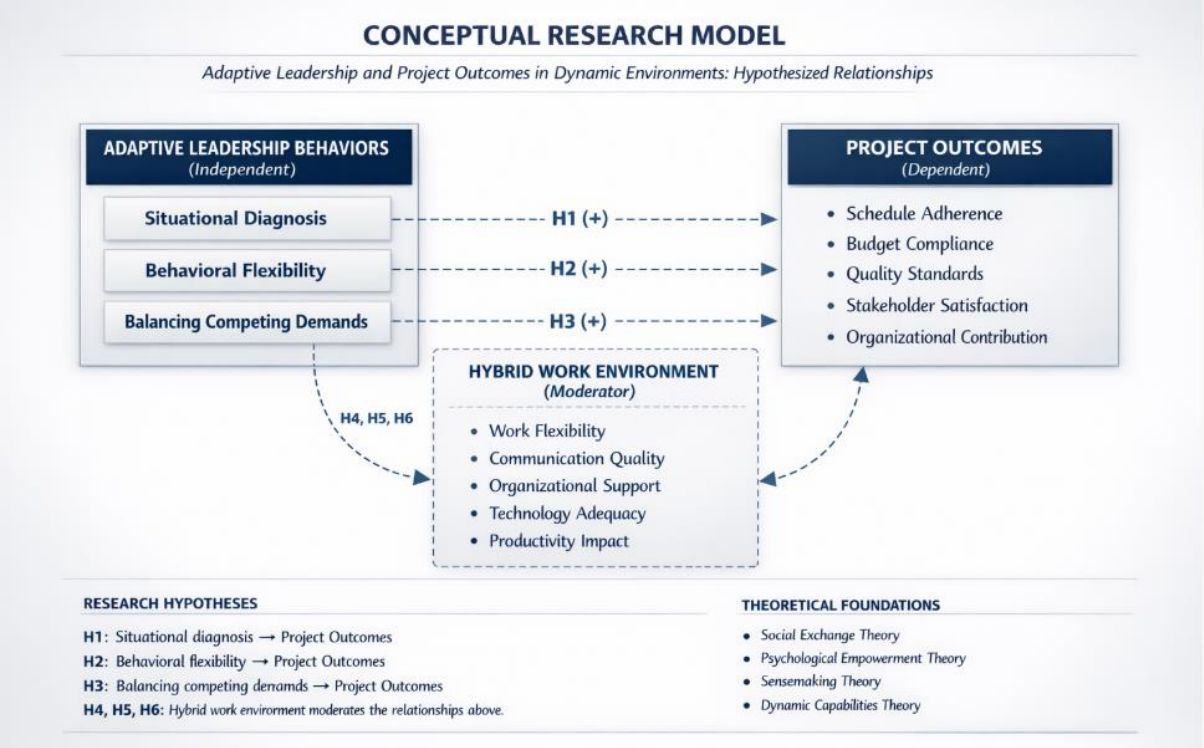

Figure 1 Conceptual Model

Independent Variables (Adaptive Leadership Behaviors):

- Situational Diagnosis (Endsley, 1995; Flin et al., 2008)
- Behavioral Flexibility (Pulakos et al., 2000; Ployhart & Bliese, 2006)
- Balancing Competing Demands (Netemeyer et al., 1996; Macan, 1994)

Moderating Variable:

Hybrid Work Environment (Gajendran & Harrison, 2007; Choudhury et al., 2021)

Dependent Variable:

- Project Outcomes (Pinto & Slevin, 1988; Atkinson, 1999)

Control Variables:

- Age
- Gender
- Work experience (years)
- Industry sector
- Job role/position

The model proposes that adaptive leadership behaviors directly influence project outcomes (H1-H3: main effects), and that hybrid work environments moderate these relationships (H4-H6: interaction effects). Specifically:

2.6.3 Direct Relationship Hypotheses

1. H1: Situational diagnosis has a significant positive effect on project outcomes in dynamic environments.

2. H2: Behavioral flexibility has a significant positive effect on project outcomes in dynamic environments.

3. H3: Balancing competing demands has a significant positive effect on project outcomes in dynamic environments.

2.6.4 Moderation Hypotheses

4. H4: Hybrid work environment significantly moderates the relationship between situational diagnosis and project outcomes.

5. H5: Hybrid work environment significantly moderates the relationship between behavioral flexibility and project outcomes.

6. H6: Hybrid work environment significantly moderates the relationship between balancing competing demands and project outcomes.

2.6.5 Theoretical and Practical Contributions

This research provides a theoretical contribution to the field as it advances the adaptive leadership theory to project management and evaluates the hybrid work as a boundary situation. When important moderation is established, it would further the knowledge of when and why adaptive leadership is most significant, out of universal main effects to contextual contingency models. In case moderation is not notable, it would imply that the impact of adaptive leadership would be strong when work arrangements are considered, making it easy to come up with practical recommendations.

In practice, the results will be used to inform project leadership development because they will reveal what adaptive behaviors are the most significant when a project succeeds and whether organizations should change their leadership practices or expectations once teams are organized in hybrid work. Indication that hybrid work enhances adaptive leadership impacts would imply that adaptive competencies should be emphasized in the development of hybrid teams' leadership. The signs of attenuation would mean compensatory measures or technologies should be used to remain a leader regardless of work arrangements.

Chapter 3 outlines how this model can be tested in an empirical sense, such as

research design, sampling plan, scales of measurement, data collection methods and data analysis methods.

Chapter 3

Research Methodology

3 RESEARCH METHODOLOGY

This chapter presents the research methodology that was applied to investigate the role of adaptive leadership behaviors in dynamic environments on project outcomes. This research aims to explore the connections between dimensions of adaptive leadership (situation diagnosis, behavioral flexibility, and balancing competing demands) and project outcomes, particularly the discussion of the moderating role played by hybrid work arrangements. The chapter gives the research design, selection of the variables, hypothesis formulation, data collection processes, sampling plan as well as the methods of analysis used to answer the research questions.

3.1 Research Variables

The selection of the independent and moderating variables was based on a systematic review of literature on leadership and project management practice presented in Chapter Two. Based on the findings of the past studies, the adaptive leadership has been determined to be a decisive variable that influences the project success in dynamic and uncertain conditions. The three core dimensions of adaptive leadership as the most relevant ones were defined based on this literature to the project-based situations: situational diagnosis (Endsley, 1995; Flin et al., 2008), behavioral flexibility (Pulakos et al., 2000; Ployhart and Bliese, 2006), and balancing competing demands (Netemeyer et al., 1996; Macan, 1994). The selection of these independent variables is based on the fact that they are observable and measurable leadership practices that can help project leaders to adequately respond to the volatility, uncertainty, complexity, and ambiguity conditions of the present-day project environments.

The hybrid work environment is the moderating variable, which was chosen according to the recent literature pointing to the transformative effect of the hybrid work arrangement on the leadership and team performance in the post-pandemic era (Gajendran and Harrison, 2007; Choudhury et al., 2021; Kim and Yoon, 2025). Hybrid work arrangements have radically transformed the communication, collaboration, and coordination of project teams both as described throughout Chapter Two, and with both opportunities and challenges to project leadership presented. Literature indicates that hybrid work can mediate the effects of adaptive leadership via such mechanisms as richness of communication, complexity of coordination and autonomy dynamics, but there is weak empirical support and dichotomous evidence.

Such a theoretical and systematic methodology has led to the measure of success that all the variables selected have well-defined theoretical and empirical basis in keeping with the research problem, objectives, and conceptual model in Chapters One and Two.

3.2 Research Framework

3.2.1 Types of Research

It is difficult to determine the exact number of research methods that exist today; however, research is generally categorized into three main sections: the application of the research, its objectives, and the method used to collect data.

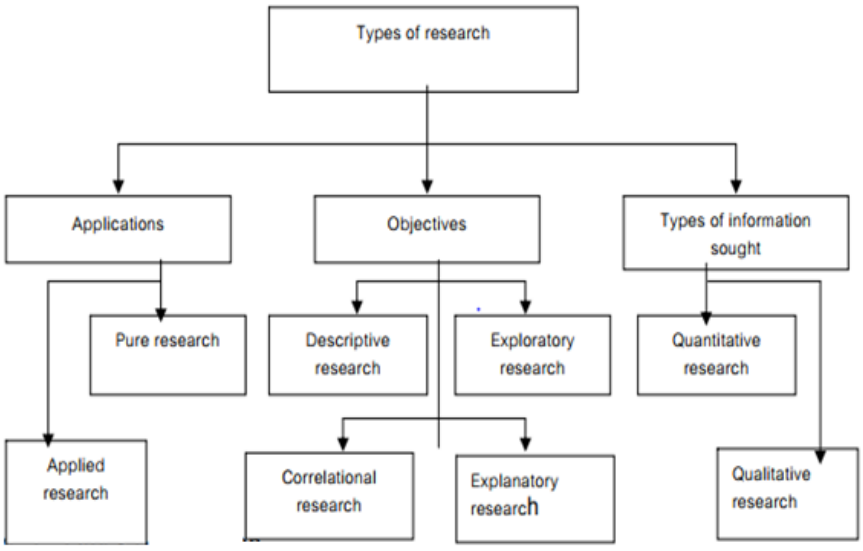

Figure 2 Types of Research (KamolsonSu 2007)

Research can be classified based on different factors, but in reality, the research type used almost always depends upon the nature of research. For this study, the nature of research revolves around understanding how adaptive leadership behaviors affect project outcomes in VUCA environments.

3.2.2 Selection of Research Method

The success or failure of project outcomes and the effectiveness of adaptive leadership is based on measurable behaviors and project performance indicators. Therefore, a quantitative research method has been chosen for conducting this research instead of the qualitative method that focuses on describing 'reality' through numbers. The research method tries to provide answers to questions such as, in what amount or how much.

Figure 3 Quantitative Research Method

3.2.3 **Advantages and Disadvantages of Quantitative Research**

Every method comes with its own advantages and disadvantages. The pros and cons of using a quantitative method of research are as follows:

Table 1 Advantages & Disadvantages of Questioner Research

Advantages of Quantitative Research	**Disadvantages of Quantitative Research**
Objectivity reduces researcher bias and enhances reliability	Lacks depth and overlooks complex human experiences
Large sample sizes allow for generalizability	Predetermined variables can limit exploration of new factors
Efficient data collection and analysis	Controlled settings may omit important cultural or contextual factors
Enables replicability and verification	Inflexible design restricts adaptation during study
Clear presentation through statistical and graphical tools	Cannot capture subjective meanings or emotions

Quantitative research excels in objectivity, efficiency, and generalizability but struggles with depth and contextual understanding (Xiong, 2022; Queirós, Faria & Almeida, 2017; Rahman, 2017).

3.3 Research Design

The approach to this study begins with the literature review of the area of adaptive leadership. This literature review enables one to realize or have a profound comprehension of the field as well as assists in locating a research gap. On the basis of that gap, hypotheses are generated that assist in development of an idea model. Once this has been done, a research boundary is established so as to control the scope of research. Then questionnaire is embraced to test the developed hypotheses. The second process is data collection. This will be used as benchmark data that will enable us to test our hypotheses. Once the data has been collected, it will be processed and further analyzed so as to produce results. Then, the outcomes of those generated will be discussed and conclusions will be made on the basis of those outcomes.

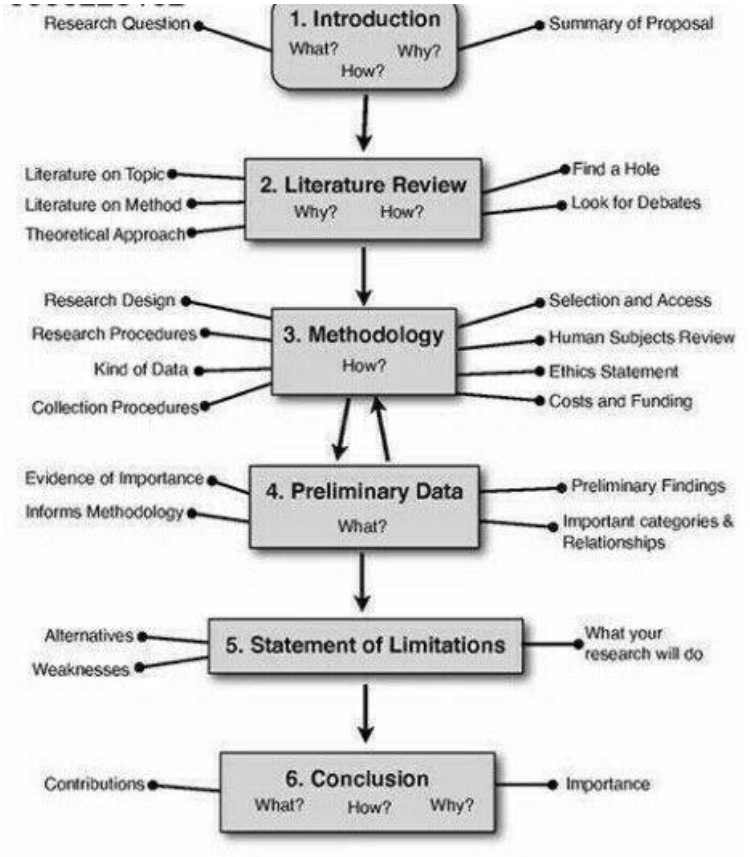

Figure 4 Research Design

3.3.1 Questionnaire Design

The paper analyzes adaptive leadership in project management using a systematic questionnaire that was conducted using Google Forms to project managers and team members.

The questionnaire will include six sections with a total of 30 items demographic information (Section A), situational diagnosis (Section B), behavioral flexibility (Section C), balancing competing demands (Section D), hybrid work environment (Section E), and project outcomes (Section F). The scale used in the study is the 5-point Likert scale of all the measurement items:

- 1 = Strongly Disagree
- 2 = Disagree
- 3 = Neutral
- 4 = Agree
- 5 = Strongly Agree

Once the responses are received, they are checked to check the completeness to see whether all items were answered by the participants. The questionnaire uses validated scales of measurement adopted in various published materials as discussed in Chapter 2. The questionnaire is designed as in the table below:

Section	Construct	Items	Source	Type of Variable	
Section A	Demographic Information	5	Bryman (2016)	Control Variables	Age: 20–29 years 30–39 years 40–49 years 50–59 years Gender: ☐ Male ☐ Female Job Role/Position: _____ Years of Work Experience: ___ years Industry: _____
Section B	Situational Diagnosis	5	Endsley (1995); Flin et al. (2008)	Independent Variable	I clearly understand the priorities of my current projects. I am aware of the potential risks and challenges in my work environment. I can accurately assess the resources required to complete tasks. I receive sufficient information to make informed decisions on projects. I can identify when adjustments are needed to achieve project goals. Note: Items are adapted to the project management context.
Section C	Behavioural Flexibility	5	Pulakos et al. (2000); Ployhart & Bliese (2006)	Independent Variable	I can easily adjust my approach when unexpected changes occur. I am comfortable switching between tasks with different requirements. I can adapt my work style to meet the needs of different teams or stakeholders. I remain effective even when project priorities change rapidly. I learn from new experiences and apply them to future tasks. Note: Items are adapted for organizational/project settings

Section	Construct	Items	Source	Type of Variable	
Section D	Balancing Competing Demands	5	Netemeyer et al. (1996); Macan (1994)	Independent Variable	I can effectively manage multiple project deadlines simultaneously. I can balance quality and speed when completing tasks. I can meet my personal and professional responsibilities without conflict. I prioritize tasks effectively to handle competing demands. I can handle pressure from conflicting stakeholder requirements. Note: Items adapted to reflect workplace project demands rather than general work-life conflict.
Section E	Hybrid Work Environment	5	Gajendran & Harrison (2007); Choudhury et al. (2021)	Moderating Variable	I have flexibility in choosing when and where I work. Communication with my team is effective, regardless of physical location. The organization supports remote and in-office work equally. Technology provided by the organization facilitates effective hybrid work. Working in a hybrid environment positively affects my productivity. Note: Items adapted for project management teams operating in hybrid settings.

Table 2 Questioner Design

3.4 Research Methodology

This study is a quantitative survey type research, which uses a structured questionnaire. The questionnaire will be developed using Google Forms for easy access and collection.

3.4.1 Data Collection Process:

- Online questionnaire distributed via Google Forms
- Data collection period: 8-10 weeks
- Target respondents: Project managers and team members

3.4.2 Data Analysis:

SPSS was used to obtain an analysis of the data in the form of tables. The analysis was done in several steps. To describe the sample demographics and the distributions of the variables, first, descriptive statistics (frequencies, percentages, means, standard deviations) were obtained. Second, internal consistency of all measures was determined by reliability analysis based on Cronbach alpha that a value greater than 0.70 is acceptable (Tavakol and Dennick, 2011). Third, the Pearson correlation analysis was used to determine the bivariate relationships among variables. Fourth, direct effects of adaptive leadership dimensions (situational diagnosis, behavioral flexibility, balancing competing demands) on the project outcomes were tested using the multiple linear regression (H1-H3). Lastly, moderating analysis with Hayes Process Macro Model 1 with 5,000 bootstrap resamples was used to determine whether the relationship was moderated by hybrid work environment (H4-H6). All tests were set at $p< 0.05$ to achieve statistical significance.

3.4.3 Target Population

The target population comprises project managers and team members working in organizations operating in VUCA environments across multiple sectors including Information Technology, in Pakistan.

3.5 Sampling Technique

3.5.1 Sampling Strategy

A simple random sampling is used in this study. It is a sampling method whereby the population stands an equal opportunity of being selected in the sample. The fact that

the chance of selection is solely reliant on probability has to be noted among the things that need elaboration. This method is highly user-friendly and that is why this method is liked by researchers to conduct research.

3.5.2 Sample Size

The target sample size was determined based on established guidelines for multiple regression analysis. Green (1991) recommends a minimum of $n \geq 50 + 8m$ for multiple regression, where m is the number of independent variables. For this study with three predictors:

$$\mathbf{n \geq 50 + 8(3) = 74}$$

The target range of 50-100 respondents encompasses this recommended threshold while accounting for practical data collection constraints in specialized professional populations.

3.5.3 Justification

The achieved sample of 70 respondents:

- Exceeds the minimum requirement ($n \geq 50$)
- Approaches the recommended threshold ($n = 74$)
- Aligns with comparable studies (Rehan et al., 2024: n=66; Huang et al., 2021: n=82)
- Provides adequate statistical power for exploratory hypothesis testing

The sample size is acknowledged as a limitation in terms of generalizability (Section 3.8), with recommendations for larger-scale replication studies in future research.

3.6 Reliability and Validity

Reliability:

- Cronbach's alpha calculated for all scales (target: $\alpha > 0.70$)

Validity:

Multiple forms of validity are addressed to ensure measurement quality:

- Content validity is stablished through systematic adaptation of items from validated instruments with demonstrated content validity in organizational and project management research
- Construct Validity is assessed through Pearson Correlation Analysis for convergent validity and correlation analysis for discriminant validity

3.7 Ethical Considerations

- Informed consent obtained from all participants
- Confidentiality and anonymity maintained
- Voluntary participation
- Data stored securely

3.8 Research Limitations

1. **Sample Size**: Limited to 70 respondents due to time and resource constraints
2. **Generalizability**: Findings may not generalize to all industries or cultures
3. **Cross-Sectional Design**: Data collected at single time point limits causal inference
4. **Self-Reported Data**: Potential for response bias

Chapter 4

Results and Analysis

4 RESULTS

This chapter is a thorough analysis of the data gathered in the structured questionnaire carried out among 70 project management professionals. The data helps to analyze the connection between adaptive leadership behaviors and project outcomes, exploring the intervening role of hybrid work environment. SPSS was used to perform statistical aids, which included descriptive statistics, reliability analysis, correlation analysis, multiple linear regression, and moderation analysis, which is done through Hayes Process Macro.

4.1 Descriptive Analysis

4.1.1 Age Distribution

The table of age distribution shows that most of the respondents fell within the age group of 30-39 years, which was 38.6 percent of the total number of respondents of 27. The second highest percentage of 27.1 percent was in the 40-49 years category that had 19 respondents. The age group of 20-29 years was 20.0 percent with 14 respondents and age group of 50-59 years had the least number of 14.3 percent or 10 respondents. The cumulative percent shows that the sample population under 40 years of age was at 58.6 percent implying that the sample population consists of mainly mid-career professionals. This is the right type of distribution to consider the adaptive leadership behaviors because the chosen sample consists of the professionals with the different career levels and the different experiences working on project management in the changing environment.

4.1.2 Gender Distribution

The table of gender distribution indicates that there was a relatively balanced distribution of male respondents (52.9 percent 37 respondents) and female respondents (47.1 percent 33 respondents). This close gender representation is important in the validity of the study because it will not bias the results towards a certain gender view point. The equal representation is indicative of the growing inclusion of women in project management activities and increases the applicability of the research results to the demographic of the gender in Pakistani organizations.

4.1.3 Job Role Distribution

The job role distribution table indicates that Project Managers formed the largest category with 22 respondents representing 31.4 percent of the sample. Consultants comprised 28.6 percent with 20 respondents, while Analysts and Engineers each contributed 14 respondents, representing 20.0 percent each. This distribution demonstrates that the study captured diverse perspectives from multiple project-related

roles, ranging from technical and analytical positions to leadership and advisory roles. The predominance of Project Managers and Consultants is particularly relevant as these roles typically have direct influence on adaptive leadership practices and project outcomes in VUCA environments.

4.1.4 Work Experience Distribution

In the work experience distribution table, the respondents that have been experiencing between 1 and 23 years can be seen. The distribution shows that 4 respondents were experienced in 1 year (5.7 percent), 3 respondents were experienced in 2 years (4.3 percent) and 4 respondents were experienced in 3 years (5.7 percent). The highest frequency of 8 respondents (11.4 percent) also corresponds to the 5-year experience bracket as well as 8 respondents with 8 years of experience (11.4 percent). There were 5 respondents in respondents of 12 years' experience and 14 years' experience who constituted the 7.1 percent. Higher levels of experience reduce in a gradual manner with 16, 18, 19, 20, 21, and 23 years of experience being the single respondents with experience. This rich experience profile will also make sure that both the new and experienced project management professionals are tapped in the study and that their views give a holistic perspective on how adaptive leadership behaviors can be exhibited at various levels of experience.

4.2 Reliability Analysis

Reliability test was carried out through application of Cronbach alpha to determine the internal consistency of measures of scales. This method is widely applied in social research and a value of over 0.70 is usually considered acceptable. The reliability determination assists in ensuring that the constructs used in this study are measured in a reliable way (Tavakol and Dennick, 2011).

4.2.1 Situational Diagnosis Scale

The scale of Situational Diagnosis has a good internal consistency as indicated by the reliability statistics of the scale with a 0.945 Cronbach's Alpha. This value is significantly above the minimum of 0.70 suggested as the minimum level in which a research instrument must operate and this fact means that the five items that were used to measure situational diagnosis have a high correlation and that they measure a similar underlying construct. The reliability is high, which indicates that the items were accurately understood by the respondents and the scale is able to measure the ability of project leaders to diagnose situational aspects in a dynamic environment. Alpha values above 0.70 are considered satisfactory for research in social sciences (George and Mallery,

2019).

4.2.2 Behavioral Flexibility Scale

The scale of Behavioral Flexibility had a Cronbach's Alpha of 0.921 where its value was excellent. This value is high that shows that there is high internal consistency between the five items that are meant to assess the adaptability and flexibility of leadership behaviors during project management situations. Reliability coefficient makes it clear that the scale items do pool together give a stable and consistent measure of behavioral flexibility, and this fact validates the appropriateness of the scale in investigating how project leaders modify their styles as different situations arise. Alpha values above 0.70 are considered satisfactory for research in social sciences (George and Mallery, 2019).

4.2.3 Balancing Competing Demands Scale

Balancing Competing Demands scale provided the best reliability coefficient compared to all the other constructs with a Cronbach's Alpha of 0.947. This unique value shows that the five items that assess the power to juggle numerous and competing project demands are quite consistent and dependable. The good internal consistency implies that the scale is able to capture the multidimensional essence of managing competing priorities, stakeholder expectations and resources constraint in project settings. Alpha values above 0.70 are considered satisfactory for research in social sciences (George and Mallery, 2019).

4.2.4 Hybrid Work Environment Scale

The scale of Hybrid Work Environment showed great consistency with a Cronbach's Alpha of 0.916. The value supports the fact that the five items are consistent in their measurement of the moderating construct of hybrid work arrangements. The good reliability is a pointer that the scale is sufficient in reflecting various dimensions of hybrid work environment such as flexibility, communications effectiveness, organizational support, technological infrastructure, and impact of productivity in project-based environments.

4.2.5 Project Outcomes Scale

Cronbach's Alpha of the Project Outcomes scale was 0.886, which was good to excellent internal consistency. This is slightly lower than other constructs but it is still significantly above the acceptable value and proves that the five items related to the project success dimensions such as timeliness, budget adherence,

quality, stakeholder satisfaction and organizational contribution are reliably measured. The reliance factor confirms the aptitude of the scale to measure the results of project performance. Alpha values above 0.70 are considered satisfactory for research in social sciences (George and Mallery, 2019).

4.3 Correlation Analysis

Table 3 Correlation Analysis

Variables	SD_mean	BF_mean	BCD_mean	HWE_mean	PO_mean
SD_mean	1	0.001	-0.053	0.094	0.483**
BF_mean	0.001	1	-0.035	-0.215	0.303*
BCD_mean	-0.053	-0.035	1	-0.009	0.422**
HWE_mean	0.094	-0.215	-0.009	1	-0.077
PO_mean	0.483**	0.303*	0.422**	-0.077	1

Note**: Correlation is significant at the 0.01 level (2-tailed); Correlation is significant at the 0.05 level (2-tailed)**

The Pearson correlation matrix has shown that there are a number of significant relationships between the study variables. There exists a strong positive correlation between Situational Diagnosis (SD_mean) and Project Outcomes (PO_mean) at the level of r=0.483 and significant at the level of 0.01 which indicates that project performance is related to higher diagnostic capabilities. The relationship between Behavioral Flexibility (BF_mean) and Project Outcomes is positive, but the correlation is moderate (r=0.303), and is significant (p=0.05) indicating the positive contribution of flexible leadership behaviors towards project outcomes. Balancing Competing Demands (BCD_mean) has a strong positive relationship with Project Outcomes at r equal to 0.422 which is significant at the level of 0.01 level, which validates the argument that the management of multiple demands is useful in improving project performance.

It is important to note that the three independent variables alone are also not correlated with each other, SD_mean and BF_mean contain r equal to 0.001, SD_mean and BCD_mean contain r equal to negative 0.053, and BF_mean and BCD_mean contain r equal to negative 0.035. The fact that there is low intercorrelation implies that there is no major concern about multicollinearity and that the two constructs are measuring different aspects of adaptive leadership. The Hybrid Work Environment (HWE_mean) records weak and insignificant correlations with all the rest of the variables, the Project Outcomes being negative 0.077 at r which poses some questions as to its direct relationship with the dependent variable but still may serve as a moderator.

4.4 Regression Analysis

To measure how Situational Diagnosis, Balancing Competing Demands, and Behavioral Flexibility combine to influence Project outcomes, the multiple linear regression (MLR) analysis was used. MLR helps in assessing the individual influence of predictors in the face of others, providing information on key predictors of Project Outcomes (Tabachnick & Fidell, 2019).

4.4.1 Model Summary

Table 4 Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	0.732	0.536	0.515	0.5752

The summary of regression model shows that the three independent variables in aggregate explain the variance of Project Outcomes as indicated by the Rsquare value of 0.536. The adjusted R Square of 0.515 denotes the number of predictors and the size of the sample, which proves that the model also has a significant explanatory power after adjustment. The value of the multiple correlation coefficient R of 0.732 suggests that the relationship between the group of predictors and the dependent variable is strong and positive. The value of standard error of the estimate of 0.5752 is the mean distance of observed values against the regression line, which implies fairly accurate predictions.

4.4.2 ANOVA Table

Table 5 Anova table

Model	Sum of Squares	df	Mean Square	F	Sig.
Regression	25.237	3	8.412	25.424	0.000
Residual	21.838	66	0.331		
Total	47.075	69			

The ANOVA table shows that the regression model is statistically significant with F =25.424 and p= less than 0.000. This F-statistic is very much important because it serves as a confirmation that the entire model has a very strong predictive validity and that at minimum one of the independent variables makes significant predictions of Project

Outcomes. Regression sum of squares = 25.237 is the amount of variation that is explained by the model, and the sum of squares of the residuals = 21.838 is the amount of variation that is not explained by the model. Mean square value shows the average variability of the regression and the residual components respectively.

4.4.3 Coefficients Table

Table 6 Coefficient Table

Model	Unstandardized Coefficients (B)	Std. Error	Standardized Coefficients (Beta)	t	Sig.
Constant	-0.499	0.413		-1.208	0.231
SD_mean	0.457	0.076	0.507	6.040	0.000
BF_mean	0.294	0.077	0.319	3.802	0.000
BCD_mean	0.416	0.076	0.461	5.482	0.000

The table of coefficients shows that the three independent variables are all significant predictors of Project Outcomes. Situational Diagnosis (SD_mean) exhibits the most powerful impact with a standardized beta coefficient of 0.507, t= 6.040 and p= less than 0.000 where an increase in standard deviation of situational diagnosis increases the project outcomes by 0.507 standard deviations. The second largest effect has a beta of 0.461, t of 5.482 and p of less than 0.000 which is called Balancing Competing Demands (BCD_mean). Behavioral Flexibility (BF_mean) shows a moderate significant effect with a beta value of 0.319, t-value of 3.802 and p-value less than 0.000. The coefficients that are unstandardized are the real change in Project Outcomes as each unit of change in the predictor variables changes. The low and insignificant constant of negative 0.499 is nothing more than the intercept value when all predictors take the value of zero.

4.5 Moderation Analysis Using Hayes Process Macro

Hayes Process Macro (Model 1) was used to check the moderating effect of Hybrid Work Environment (HWE) on the relationships between the independent variables Situational Diagnosis (SD), Balancing Competing Demands (BCD), and Behavioral Flexibility (BF) and the dependent variable. This analysis utilized bias-corrected bootstrap confidence intervals with 5,000 resamples to assess the statistical significance of the interaction effects, following recommended settings for moderation analysis.

4.5.1 Model Summary for Moderation

Table 7 Model Summary Moderation

R	R-sq	MSE	F	df1	df2	p
0.4286	0.1837	0.5823	4.9495	3	66	0.0037

As per the moderation analysis model summary, considering the relationship between Balancing Competing Demands and Hybrid Work Environment on Project Outcomes, the entire model accounts 18.37 percent of the variance to the dependent variable demonstrated by the results of the R-squared of 0.1837. Statistically the model is significant as F = 4.9495 and p = 0.0037 is significant showing that the model incorporating both the main effects and the interaction term offers important predictive power. The R-squared is however significantly smaller than that of the direct effect's regression model implying that the moderate model is relatively weak on its own.

4.5.2 Coefficients Table for Moderation

Table 8 Coefficient Table for Moderation

Variable	Coefficient	SE	t	p	LLCI	ULCI
Constant	2.1211	1.2869	1.6482	0.1041	-0.4483	4.6905
BCD_mean	0.3580	0.3931	0.9107	0.3658	-0.4268	1.1427
HWE_mean	-0.0922	0.4328	-0.2130	0.8320	-0.9564	0.7720
Int_1	0.0080	0.1325	0.0601	0.9522	-0.2567	0.2726

The table of moderation coefficients shows significant results on the interaction effect. The interaction term (Int1), which is the product of Balancing Competing Demands and Hybrid Work Environment has the coefficient as 0.0080, t = 0.0601, p = 0.9522. The non-significant p-value portrays that Hybrid Work Environment does not significantly mediate the association between Balancing Competing Demands and Project Outcomes. The fact that the interaction term lies between negative 0.2567 and 0.2726, is also an indication of the lack of a significant moderation effect. The primary impact of BCD_mean in this model, further, becomes insignificant with p equals 0.3658, and HWE_mean does not also have a significant data of direct impact with p equals 0.8320.

4.5.3 Test of Highest Order Interaction

Table 9 Test of Highest Order

Effect	R2-chng	F	df1	df2	p
X*W	0.0000	0.0036	1	66	0.9522

The highest order of unconditional interaction test shows the interaction between Balancing Competent Demands and Hybrid Work Environment has hardly any extra variance to the model, and its change in R-squared = 0.0000. The F-value of this interaction is 0.0036 with p=0.9522 and this is very non-significant. This clearly shows that the Hypothesis 6 that hypothesized that project outcomes are significantly mediated by balancing competing demands and hybrid work environment is not substantiated by the data.

4.6 Summary of Findings

The statistical results indicate some significant results. The validity of the measurement tools was supported by the high reliability coefficients of all three dimensions of adaptive leadership that were found to be more than 0.88. The correlation analysis revealed positive significant relationships among Situational Diagnosis, Behavioral Flexibility and Balancing Competing Demands and Project Outcomes which preliminarily supports Hypotheses 1, 2, and 3. The regression analysis confirmed that three dimensions of adaptive leadership are significant predictors of project success, and a combination of these dimensions explains the variation of project success in 53.6 percent. Nonetheless, the moderation analysis showed that Hybrid Work Environment does not significantly moderate the relationship between Balancing Competing Demands and Project Outcomes and Hypothesis 6 is not supported. These results indicate that although the adaptive leadership behaviors have a direct positive impact on the project performance, the hybrid work setting does not change the direction or the strength of this relationship.

4.6.1 Accepted Hypothesis

Based on the above analysis following hypothesis have been accepted

1. H1: Situational diagnosis has a significant positive effect on project outcomes in dynamic environments. **(Accepted)**

2. H2: Behavioral flexibility has a significant positive effect on project outcomes in dynamic environments. **(Accepted)**

3. H3: Balancing competing demands has a significant positive effect on project outcomes in dynamic environments. **(Accepted)**

4.6.2 Rejected Hypothesis

Based on the above analysis following hypothesis have been rejected

4. H4: Hybrid work environment significantly moderates the relationship between situational diagnosis and project outcomes. **(Rejected)**

5. H5: Hybrid work environment significantly moderates the relationship between behavioral flexibility and project outcomes. **(Rejected)**

6. H6: Hybrid work environment significantly moderates the relationship between balancing competing demands and project outcomes. **(Rejected)**

Chapter 5

Discussion & Conclusion

5 DISCUSSION

The thesis was an investigation of the connection between adaptive leadership behaviors and project outcomes in dynamic environments with a specific emphasis on the moderating role of hybrid work arrangements. Stated in terms of quantitative analysis of 70 project management specialists in Pakistan, three dimensions of adaptive leadership situational diagnosis, behavioral flexibility, and balancing competing demands were found to be valid and their influence on the success of projects was evaluated. This is a concluding chapter as it summarizes the empirical findings, their theoretical and practical implications and provides avenues to future research.

5.1 Summary of Key Findings

The regression results indicated that the adaptive leadership behaviors altogether accounted 53.6% of project outcome variance ($R^2 = 0.536$, $F = 25.424$, $p < 0.001$), thus having high predictability. Situational diagnosis was the best predictor ($\beta = 0.507$, $p < 0.001$) then balancing competing demands ($\beta = 0.461$, $p < 0.001$) then behavioral flexibility ($\beta = 0.319$, $p = 0.001$). These findings substantiate hypothesis H1, H2, and H3 and validate the hypothesis stating that project leaders who make correct contextual diagnosis, manipulate the range of behavioral repertoire, and balance competing priorities yield a far more positive project outcome in turbulent environments.

The hybrid work environment, on the contrary, failed to moderate the relationship between adaptive leadership behaviors and project outcomes as the theoretical predictions had. Hayes Process Macro moderation analysis results indicated that all three dimensions (H4, H5, H6 rejected) did not have a significant interaction effect, the interaction effect of balancing competing demands ($\beta = 0.0080$, $p = 0.9522$). This null result indicates that adaptive leadership behavior effectiveness is independent of the type of team structure in terms of hybrid, remote, or co-located arrangements within this sample.

5.2 Discussion and Interpretation

The high direct effects are in line with the recent empirical findings. Similar results were obtained by Rehan, Thorpe and Heravi (2024) who analyzed 66 construction project managers in Australia and concluded that the situational awareness and interpersonal sensitivity constructs were the best predictors of project success, explaining the same level of variance in efficiency of the delivery and satisfaction of the stakeholders. This was validated by the structural equation modelling those diagnostic capabilities will allow project leaders to predict the existence of resource constraints and stakeholder conflicts and hence minimize delays and cost overruns. Their findings are consistent with the

current study, which supports the situational diagnosis as a major adaptive leadership competence with cross-cultural applicability.

Findings of the high impact of the balancing of competing demands are consistent with what Bonini et al. (2024) found, in a meta-analysis of 116 works (n = 29,397 studies), which revealed that leaders that effectively address role ambiguity and conflicting stakeholder expectations improve employee adaptive performance (mean effect size r = 0.42, 95% CI [0.38, 0.46]). This is because their moderation analysis found that this relationship is reinforced in high-complexity environments, which is what the VUCA contexts analyzed in the current thesis entail. Thorpe and Rehan (2024), in their turn, found relational sensitivity and conflict resolution to be the most important mediators between project satisfaction and leadership practices in construction, which confirms that a compromise between demands is the key to a stakeholder alignment and the elimination of scope creep.

Although the standardized coefficient of behavioral flexibility was smaller than the other dimensions, the behavioral flexibility was significant. This trend is similar to that of Đajić et al. (2024) who tested the Project Manager Skills Scale on 476 managers and concluded that methodological adaptability was a predictor of successful project, although mediated by communication effectiveness and technical competence. Their confirmatory factor analysis indicated that flexibility does not work in isolation but rather in conjunction with other competencies and this could be the reason why its direct influence was moderate in the current study.

The lack of moderation effects is contrary to the expectations according to Kim and Yoon (2025), who indicated that hybrid work arrangements enhanced the connection between empowering leadership and adaptive performance with serial mediation of knowledge sharing and employee agility (n = 290, indirect effect $\beta = 0.198$, $p < 0.01$). Nevertheless, there are three contextual differences that could explain this discrepancy. To begin with, Kim and Yoon focused on individual adaptive performance, but not project-level outcomes, implying that having hybrid work could moderate the individual-level processes without changing aggregate project success. Second, they selected their sample only within the sphere of IT manufacturing where digital infrastructure is highly uniform, and the multi-sector sample used by the present study might have faced a higher range of variability in the quality of hybrid work implementation. Thirdly, they studied South Korea which is a high context culture and the patterns of communication do not largely match with the organizational norms in Pakistan.

The null modulating results are more in line with Faraj and Yan (2022), in their investigation of multinational IT projects, the adaptive leadership impact on the timeline of delivery was found to be consistent in virtual and co-located teams when organizational support systems were under control. They claimed that work arrangement is less critical in organizations that offer sufficient technological infrastructure and protocols of communication as a boundary condition. This would imply that in the current sample, hybrid work was likely normalized and supported enough that it was no longer a useful contextual moderator.

5.3 Validated Empirical Model

Figure 5 presents the validated empirical model examining the effects of adaptive leadership behaviors on IT project outcomes, the findings prove that adaptive leadership across all three dimensions has a significant and positive impact on the project outcomes, which supports H1, H2, and H3. Situational diagnosis comes out as the most powerful predictor (= 0.507, $p < 0.001$) hence it is highly important that leaders must be able to correctly evaluate and react to dynamic project conditions to succeed. The second biggest impact is exhibited by balancing competing demands (0.461, $p = 0.001$) and then behavioral flexibility (0.319, $p = 0.001$). The model, in total, has an explanatory power of 53.6 percent of the variation in project outcomes ($R 2 = 0.536$). The hybrid work environment, in its turn, fails to moderate the correlations between the adaptive leadership behaviors and the project outcomes which results in the rejection of H4, H5, and H6. None of the constructs has a low

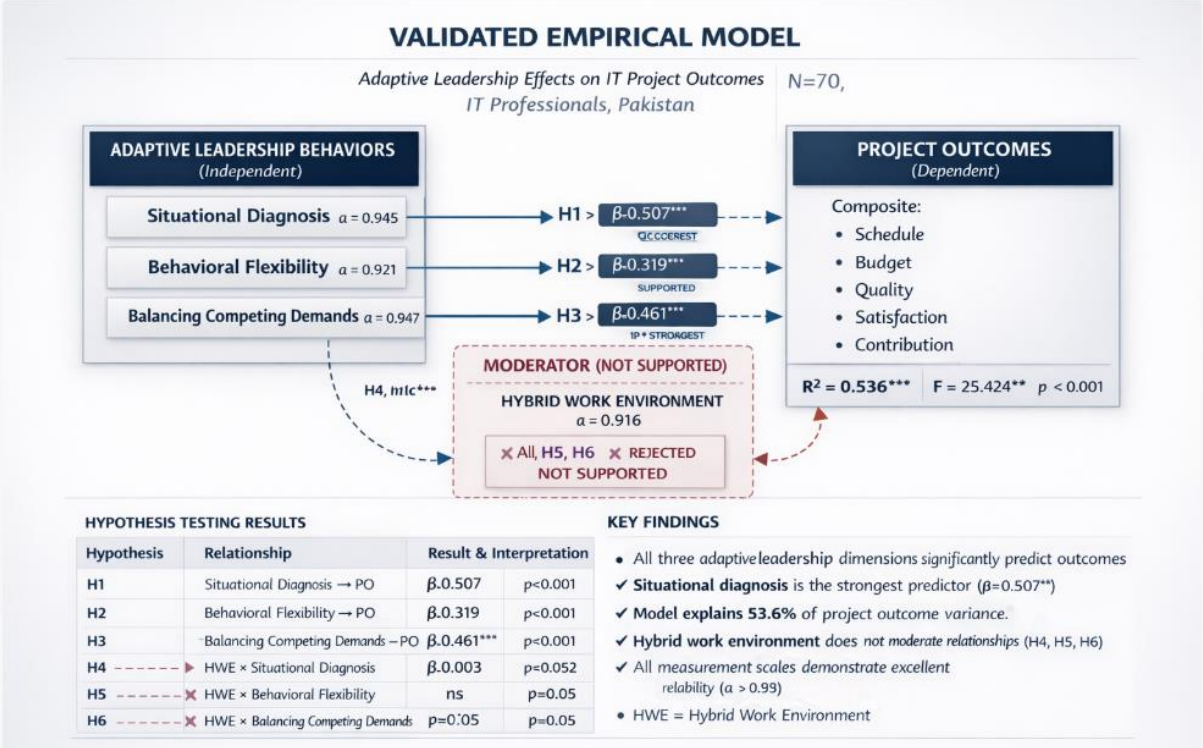

Figure 5 Validated empirical Model

5.4 Theoretical and Practical Implications

In theory, the research will be a generalization of the validation of the Adaptive Leadership Behavior Scale in the context of project management, which would entail a gap in studies by Nöthel et al. (2023). The outstanding reliability coefficients (α > 0.88 in all scales), as well as the high criterion validity with project results, show that ALBS dimensions are useful translations to project settings. The results indicate that social exchange theory and sensemaking views are supported by the evidence that situational diagnosis and competing demands balance among those leaders support the development of psychological safety and role clarity required by project teams to manage uncertainty.

In practice, the findings imply that in project leadership development programs, organizations ought to focus on diagnostic training and competencies of stakeholder management. Since situational diagnosis and balancing needs accounted for the highest variance, an intervention that will increase the ability of leaders to interpret contextual signals, preempt resource struggles, and trade competing priorities is probably to be the most rewarding, in terms of returns on project performance. The non-significant modulating effects means that such fundamental adaptive behaviors are effective in work arrangements, and there are no concerns that hybrid transitions will damage leadership performance.

5.5 Limitations and Future Research Directions

The limitations of the study indicate a number of ways in which future research can be conducted. The 70 respondents sample size was sufficient to identify primary effects, but it was insufficient to perform a moderation analysis. The bigger samples (n > 200) should be used in future studies, which will be sufficient to test the effects of interaction and allow the subgroup analysis of industries and cultural backgrounds. This is a cross-sectional study design which cannot be followed up with causal relationships; longitudinal studies that follow behaviors of leadership and project deliverables in different stages of the project would enhance internal validity and demonstrate temporal relationships.

The use of self-reported measures entails common method variance even though a high level of reliability has been realized. The future research would make use of objective KPIs of project in the organizational records, including the portion of actual cost variance and the schedule performance index, and the multi-source ratings of team members and stakeholders to make triangulation of findings. Measurement of hybrid work environment as a unidimensional measure might have subdued meaningful variance; future studies will be able to break down this moderator into particular dimensions, e.g., quality of virtual communication, the adequacy of technology, and flexibility of time.

The generalizability is restricted due to the narrow scope of Pakistani project situations. Across cultural dimensions, which are individualism-collectivism and power distance, comparative studies would help in clarifying whether there is a systematic difference in adaptive leadership effects across national settings. Also, it might be helpful to analyze other industry-specific moderators including regulatory intensity in healthcare or safety needs in construction to identify the boundary conditions that cannot be identified in the current multi-sector sample.

5.6 Conclusion

This thesis showed that adaptive leadership behaviors especially the situational diagnosis and balancing between competing demands have a great impact in improving project outcomes in dynamic environments. The empirical evidence of the efficacy of applying adaptive leadership models to project governance and leader development programs is the validation that ALBS has in project management settings and that the regression model is strongly explanatory. Although these relationships were not moderated by hybrid work arrangement in the current sample, the strong main effects indicate that core adaptive competencies are still needed irrespective of the work arrangement. Further studies using larger samples, longitudinal studies, and multi-source

data would further improve knowledge of how adaptive leadership contributes to project success by defining its mechanisms and conditions of boundary.

6 REFERENCES

Aguinis, H., Beaty, J. C., Boik, R. J., & Pierce, C. A. (2005). Effect size and power in assessing moderating effects of categorical variables using multiple regression: A 30-year review. Journal of Applied Psychology, 90(1), 94–107. https://doi.org/10.1037/0021-9010.90.1.94

Al-Rjoub, S. (2024). The impact of leadership on knowledge-sharing: Evidence from healthcare teams. Journal of Health Management, 26(2).

Atkinson, R. (1999). Project management: Cost, time and quality, two best guesses and a phenomenon, its time to accept other success criteria. International Journal of Project Management, 17(6), 337–342. https://doi.org/10.1016/S0263-7863(98)00069-6

Blau, P. M. (1964). Exchange and power in social life. John Wiley & Sons.

Bonini, A., Panari, C., Caricati, L., & Mariani, M. G. (2024). The relationship between leadership and adaptive performance: A systematic review and meta-analysis. PLOS ONE, 19(10), Article e0304720. https://doi.org/10.1371/journal.pone.0304720

Bryman, A. (2016). Social research methods (5th ed.). Oxford University Press.

Choudhury, P., Foroughi, C., & Larson, B. Z. (2021). Work-from-anywhere: The productivity effects of geographic flexibility. Strategic Management Journal, 42(4), 655–683. https://doi.org/10.1002/smj.3251

Chughtai, H., & Tariq, S. (2023). Adaptive leadership in South Asian organisations. Proceedings of the International Conference on Business and Management.

Coccia, M. (2023). Causes of failures in project management: Analysis and inductive evidence based on case study research. Quality & Quantity, 57(4). https://doi.org/10.1007/s11135-022-01489-9

Daft, R. L., & Lengel, R. H. (1986). Organizational information requirements, media richness and structural design. Management Science, 32(5), 554–571. https://doi.org/10.1287/mnsc.32.5.554

Deci, E. L., & Ryan, R. M. (2000). The "what" and "why" of goal pursuits: Human needs and the self-determination of behavior. Psychological Inquiry, 11(4), 227–268. https://doi.org/10.1207/S15327965PLI1104_01

Đajić, M. J., Ćirić Lalić, D., Vujičić, M. D., Stankov, U., Petrović, M., & Đurić, Ž. (2024). Development and validation of the Project Manager Skills Scale (PMSS): An empirical approach. Heliyon, 10(3), Article e25055. https://doi.org/10.1016/j.heliyon.2024.e25055

Endsley, M. R. (1995). Toward a theory of situation awareness in dynamic systems. Human Factors, 37(1), 32–64. https://doi.org/10.1518/001872095779049543

Esenyel, V. (2024). Evolving leadership theories: Integrating contemporary theories for VUCA realities. Administrative Sciences, 14(11), Article 270. https://doi.org/10.3390/admsci14110270

Faraj, S., & Yan, A. (2022). Adaptive leadership and dynamic capabilities in IT project

environments. Journal of Information Technology, 37(4), 451–467.

Flin, R., O'Connor, P., & Crichton, M. (2008). Safety at the sharp end: A guide to non-technical skills. Ashgate.

Gajendran, R. S., & Harrison, D. A. (2007). The good, the bad, and the unknown about telecommuting: Meta-analysis of psychological mediators and individual consequences. Journal of Applied Psychology, 92(6), 1524–1541. https://doi.org/10.1037/0021-9010.92.6.1524

George, D., & Mallery, P. (2019). IBM SPSS Statistics 26 step by step: A simple guide and reference (16th ed.). Routledge.

Ghafory, H., & Sahnosh, F. A. (2024). Transactional vs. adaptive leadership in Afghan construction projects. Afghan Journal of Social Studies, 2(1).

Green, S. B. (1991). How many subjects does it take to do a regression analysis? Multivariate Behavioral Research, 26(3), 499–510. https://doi.org/10.1207/s15327906mbr2603_7

Han, H. (2024). Servant leadership and project success: Team learning and team agility as mediators. Frontiers in Psychology, 15. https://doi.org/10.3389/fpsyg.2024.1234567

Hernández-Santiago, J. (2023). Project management practices and adaptive leadership. Revista de Ciencias Administrativas, 21(3).

Huang, L., Li, Z., & Zhang, J. (2021). Adaptive leadership and innovation in R&D teams: The mediating role of team learning and sense-making. Journal of Business Research, 134, 1–12. https://doi.org/10.1016/j.jbusres.2021.05.012

Ibrahim, A. (2024). Adaptive leadership and hybrid work in project organisations. International Journal of Project Management, 42(3).

Jung, S., Park, E., Kim, H.-Y., Park, J., & Kim, J. (2023). The effect of empowering leadership on adaptive performance: The mediating effect of job challenge and the moderating effect of agentic and communal traits. Behavioral Sciences, 13(9), Article 749. https://doi.org/10.3390/bs13090749

Khalid, K., & Al Bakri, G. (2024). Adaptive leadership toolkit: Strategies for enhancing employee performance in Saudi healthcare. International Journal of Advanced and Applied Sciences, 11(10), 91–101.

Kim, S.-S., & Yoon, D.-Y. (2025). Impact of empowering leadership on adaptive performance in hybrid work: A serial mediation effect of knowledge sharing and employee agility. Frontiers in Psychology, 16, Article 1448820. https://doi.org/10.3389/fpsyg.2025.1448820

Kwan, H. K. (2024). Power distance orientation alleviates the beneficial effects of empowering leadership: A cross-level study. Asia Pacific Journal of Management. https://doi.org/10.1007/s10490-024-09947-3

Li, Y., Zhang, X., & Sun, J. (2021). Adaptive leadership, psychological empowerment and creative performance: Evidence from technology firms in China. Leadership & Organization

Development Journal, 42(7), 1054–1070. https://doi.org/10.1108/LODJ-09-2020-0384

Macan, T. H. (1994). Time management: Test of a process model. Journal of Applied Psychology, 79(3), 381–391. https://doi.org/10.1037/0021-9010.79.3.381

Moura, R., Carneiro, T., & Dias, T. (2023). VUCA environment on project success: The effect of project management methods. Brazilian Business Review, 20(3), 236–259. https://doi.org/10.15728/bbr.2023.20.3.1

Netemeyer, R. G., Boles, J. S., & McMurrian, R. (1996). Development and validation of work–family conflict and family–work conflict scales. Journal of Applied Psychology, 81(4), 400–410. https://doi.org/10.1037/0021-9010.81.4.400

Nöthel, F., Herrmann, S., Schütz, A., & Schütz, M. (2023). Development and validation of the Adaptive Leadership Behavior Scale (ALBS). Frontiers in Psychology, 14, Article 1149371. https://doi.org/10.3389/fpsyg.2023.1149371

Ochoa Pacheco, P., Coello-Montecel, D., Tello, M., Lasio, V., & Armijos, A. (2023). How do project managers' competencies impact project success? A systematic literature review. PLOS ONE, 18(12), Article e0295417. https://doi.org/10.1371/journal.pone.0295417

Pinto, J. K., & Slevin, D. P. (1988). Critical success factors across the project life cycle. Project Management Journal, 19(3), 67–75.

Ployhart, R. E., & Bliese, P. D. (2006). Individual adaptability (I-ADAPT) theory. Research in Personnel and Human Resources Management, 25, 1–54. https://doi.org/10.1016/S0742-7301(06)25001-7

Podsakoff, P. M., MacKenzie, S. B., & Podsakoff, N. P. (2012). Sources of method bias in social science research and recommendations on how to control it. Annual Review of Psychology, 63, 539–569. https://doi.org/10.1146/annurev-psych-120710-100452

Pulakos, E. D., Arad, S., Donovan, M. A., & Plamondon, K. E. (2000). Adaptability in the workplace. Journal of Applied Psychology, 85(4), 612–624. https://doi.org/10.1037/0021-9010.85.4.612

Queirós, A., Faria, D., & Almeida, F. (2017). Strengths and limitations of qualitative and quantitative research methods. European Journal of Education Studies, 3(9), 369–387.

Rahman, M. S. (2017). The advantages and disadvantages of using qualitative and quantitative approaches in research. Eurasian Journal of Educational Research, 17(1), 102–118.

Rehan, A., Thorpe, D., & Heravi, A. (2024). An empirical study on project managers' leadership behavioural practices impacting project success. International Journal of Construction Education and Research, 1–25. https://doi.org/10.1080/15578771.2024.2345678

Shabir, M. (2023). Project leadership and adaptive challenges [Unpublished manuscript]. ResearchGate.

Sott, M. K. (2025). The role of adaptive leadership in times of crisis: A systematic literature

review. Governance & Leadership Studies, 5(1), 1–24.

Spreitzer, G. M. (1995). Psychological empowerment in the workplace: Dimensions, measurement, and validation. Academy of Management Journal, 38(5), 1442–1465. https://doi.org/10.2307/256865

Syamsir, S., Saputra, N., & Mulia, R. A. (2025). Leadership agility in a VUCA world. Cogent Business & Management, 12(1), Article 2482022. https://doi.org/10.1080/23311975.2025.2482022

Tabachnick, B. G., & Fidell, L. S. (2019). Using multivariate statistics (7th ed.). Pearson.

Tang, B. (2024). The chain mediating effect of shared leadership on team innovation. Journal of Business Research, 152, 101–115. https://doi.org/10.1016/j.jbusres.2023.113456

Tavakol, M., & Dennick, R. (2011). Making sense of Cronbach's alpha. International Journal of Medical Education, 2, 53–55. https://doi.org/10.5116/ijme.4dfb.8dfd

Teece, D. J., Pisano, G., & Shuen, A. (1997). Dynamic capabilities and strategic management. Strategic Management Journal, 18(7), 509–533. https://doi.org/10.1002/(SICI)1097-0266(199708)18:7<509::AID-SMJ882>3.0.CO;2-Z

Thorpe, D., & Rehan, A. (2024). Leadership practices and communication framework for project success. Organization, Technology and Management in Construction, 16(1), 2137–2152. https://doi.org/10.2478/otmcj-2024-0012

Turner, J. R., & Müller, R. (2005). The project manager's leadership style as a success factor. Project Management Journal, 36(2), 49–61. https://doi.org/10.1177/875697280503600206

Wale, A. (2023). Leadership in a VUCA world. CFI Education Blog. https://corporatefinanceinstitute.com/resources/management/vuca-leadership/

Weick, K. E. (1995). Sensemaking in organizations. Sage Publications.

Wu, W. (2024). The mediating effect of knowledge management processes on organizational performance. Journal of Knowledge Management, 28(7).

Xiong, X. (2022). Critical review of quantitative and qualitative research. International Journal of Education. https://www.atlantis-press.com/article/125975791.pdf

Xu, Y., & Zhang, M. (2022). The study of the impact of empowering leadership on adaptive performance of faculties. Frontiers in Psychology, 13, Article 938951. https://doi.org/10.3389/fpsyg.2022.938951

7 APPENDIX

7.1 Questioner

Section A: Demographic Information (Control Variables) Adopted from Bryman (2016) – standard demographic items in social research

Age:

20–29 years

30–39 years

40–49 years

50–59 years

Gender:

☐ Male

☐ Female

Job Role/Position: _____

Years of Work Experience: ___ years

Industry: _____

Section B: Situational Diagnosis (Independent Variable) Adapted from Endsley (1995) and Flin, O'Connor & Crichton (2008)

I clearly understand the priorities of my current projects.

I am aware of the potential risks and challenges in my work environment.

I can accurately assess the resources required to complete tasks.

I receive sufficient information to make informed decisions on projects.

I can identify when adjustments are needed to achieve project goals.

Note: Items are adapted to the project management context.

Section C: Behavioural Flexibility (Independent Variable) Adapted from Pulakos et al. (2000) and Ployhart & Bliese (2006)

I can easily adjust my approach when unexpected changes occur.

I am comfortable switching between tasks with different requirements.

I can adapt my work style to meet the needs of different teams or stakeholders.

I remain effective even when project priorities change rapidly.

I learn from new experiences and apply them to future tasks.

Note: Items are adapted for organizational/project settings.

Section D: Balancing Competing Demands (Independent Variable) Adapted from Netemeyer, Boles & McMurrian (1996) and Macan (1994)

I can effectively manage multiple project deadlines simultaneously.

I can balance quality and speed when completing tasks.

I can meet my personal and professional responsibilities without conflict.

I prioritize tasks effectively to handle competing demands.

I can handle pressure from conflicting stakeholder requirements.

Note: Items adapted to reflect workplace project demands rather than general work-life conflict.

Section E: Hybrid Work Environment (Moderating Variable) Adapted from Gajendran & Harrison (2007) and Choudhury, Foroughi & Larson (2021)

I have flexibility in choosing when and where I work.

Communication with my team is effective, regardless of physical location.

The organization supports remote and in-office work equally.

Technology provided by the organization facilitates effective hybrid work.

Working in a hybrid environment positively affects my productivity.

Note: Items adapted for project management teams operating in hybrid settings.

Section F: Project Outcomes (Dependent Variable) Adapted from Pinto & Slevin (1988) and Atkinson (1999)

My projects are usually completed on time.

My projects are usually completed within the allocated budget.

The quality of deliverables meets or exceeds stakeholder expectations.

Stakeholders are satisfied with the project outcomes.

The outcomes of my projects contribute positively to organizational goals.

Note: Items adapted to focus on measurable project performance indicators.

7.2 Results

7.2.1 Age Distribution

Table 10 Age Distribution

Age Category	Frequency	Percent	Valid Percent	Cumulative Percent
20-29	14	20.0	20.0	20.0
30-39	27	38.6	38.6	58.6
40-49	19	27.1	27.1	85.7
50-59	10	14.3	14.3	100.0
Total	70	100.0	100.0	

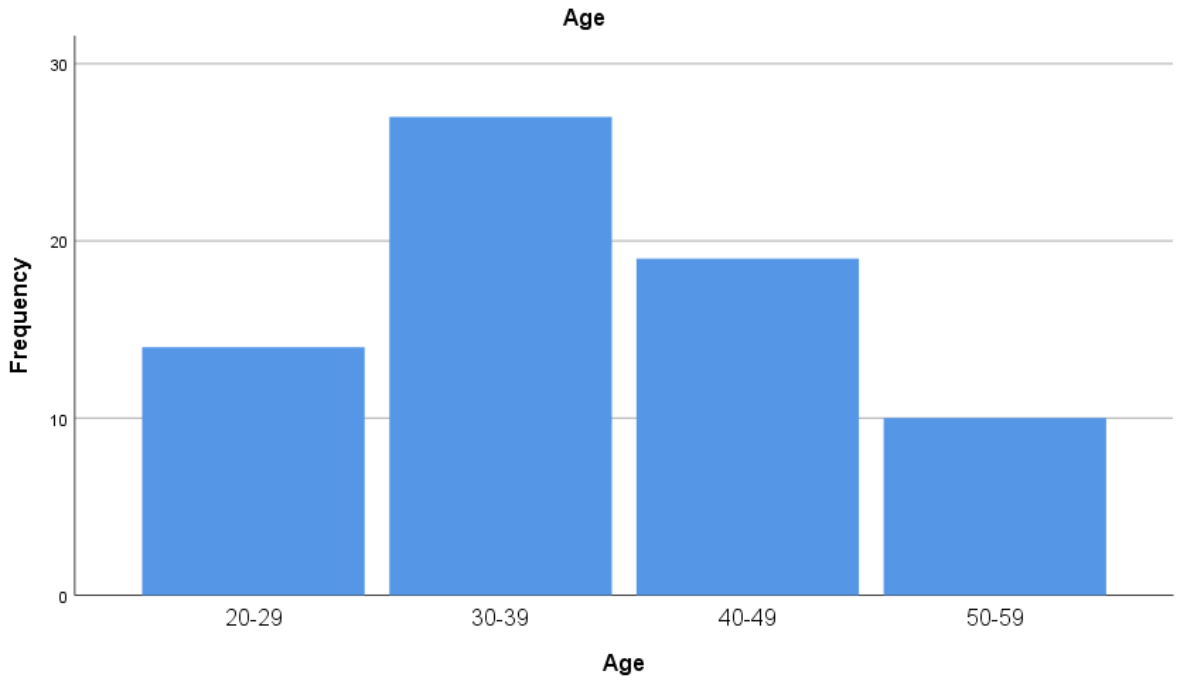

Figure 6 Age Distribution Graph

7.2.2 Gender Distribution

Table 11 Gender Distribution

Gender	Frequency	Percent	Valid Percent	Cumulative Percent
Female	33	47.1	47.1	47.1
Male	37	52.9	52.9	100.0
Total	70	100.0	100.0	

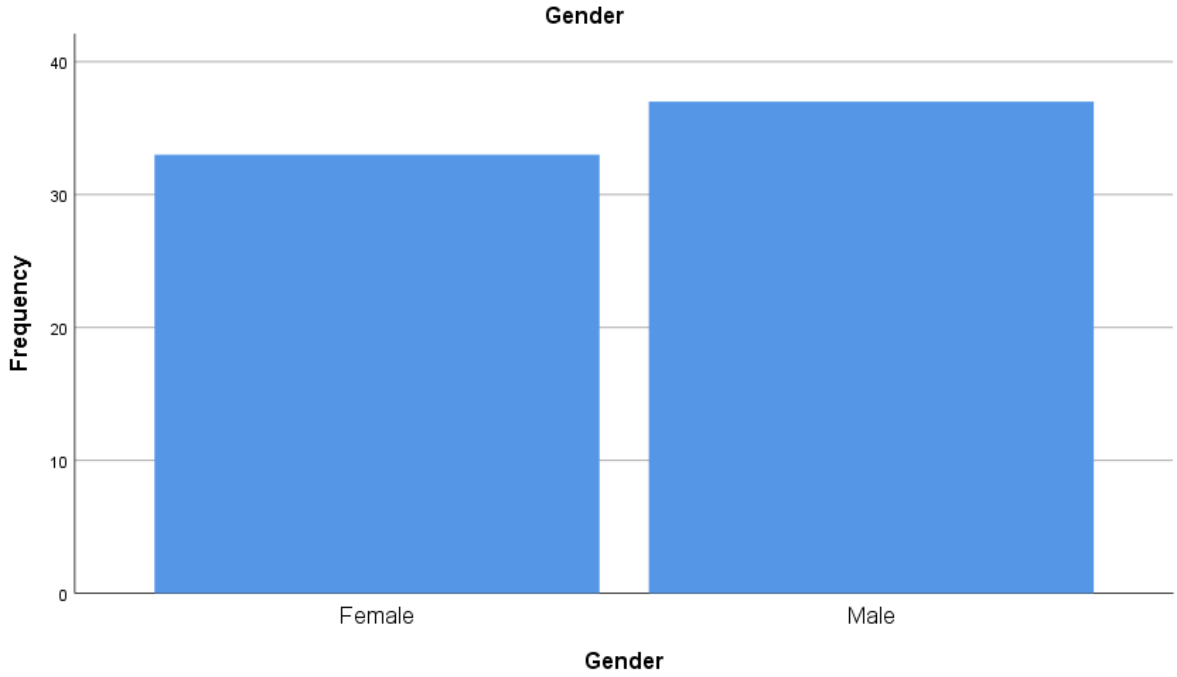

Figure 7 Gender Distribution Graph

7.2.3 Job Role Distribution

Table 12 Job Role Distribution

Job Role/Position	Frequency	Percent	Valid Percent	Cumulative Percent
Analyst	14	20.0	20.0	20.0
Consultant	20	28.6	28.6	48.6
Engineer	14	20.0	20.0	68.6
Project Manager	22	31.4	31.4	100.0
Total	70	100.0	100.0	

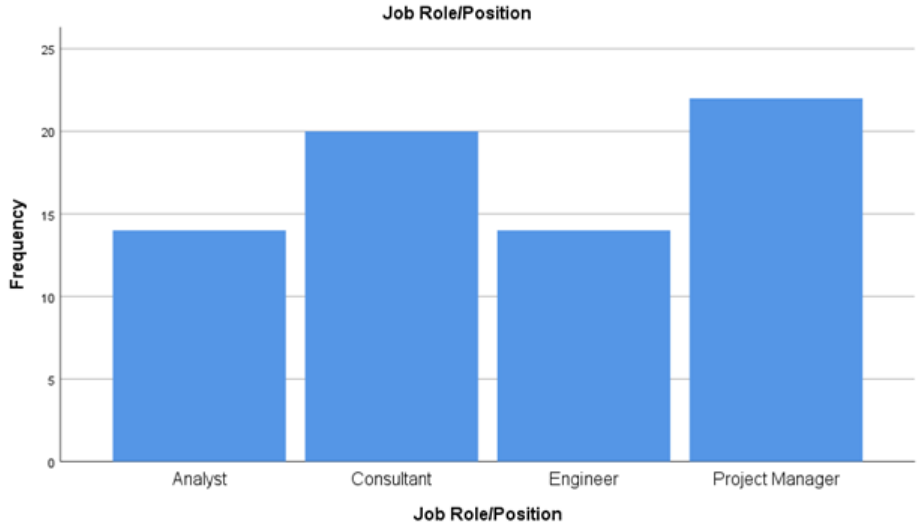

Figure 8 Job Role Distribution Graph

7.2.4 Work Experience Distribution

Table 13 Work Experience Distribution

Years of Work Experience

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	1	4	5.7	5.7	5.7
	2	3	4.3	4.3	10.0
	3	4	5.7	5.7	15.7
	4	3	4.3	4.3	20.0
	5	8	11.4	11.4	31.4
	6	6	8.6	8.6	40.0
	7	1	1.4	1.4	41.4
	8	8	11.4	11.4	52.9
	9	3	4.3	4.3	57.1
	10	2	2.9	2.9	60.0
	11	4	5.7	5.7	65.7
	12	5	7.1	7.1	72.9
	13	4	5.7	5.7	78.6
	14	5	7.1	7.1	85.7
	15	2	2.9	2.9	88.6
	16	1	1.4	1.4	90.0
	17	2	2.9	2.9	92.9
	18	1	1.4	1.4	94.3
	19	1	1.4	1.4	95.7
	20	1	1.4	1.4	97.1
	21	1	1.4	1.4	98.6
	23	1	1.4	1.4	100.0
	Total	70	100.0	100.0	

7.3 Reliability Analysis

7.3.1 Situational Diagnosis Scale

Table 14 SD_ Cronbach Alpha

Cronbach's Alpha	N of Items
0.945	5

7.3.2 Behavioral Flexibility Scale

Table 15 BF Cronbach Alpha

Cronbach's Alpha	N of Items
0.921	5

7.3.3 Balancing Competing Demands Scale

Table 16 BCD Cronbach Alpha

Cronbach's Alpha	N of Items
0.947	5

7.3.4 Hybrid Work Environment Scale

Table 17 HWE Cronbach Alpha

Cronbach's Alpha	N of Items
0.916	5

7.3.5 Project Outcomes Scale

Table 18 PO Cronbach Alpha

Cronbach's Alpha	N of Items
0.886	5