

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



**Impact of Knowledge-Based Hrm Practices on
Project Performance With A Mediating Role of
Exploitative Innovation and Exploratory
Innovation and A Moderating Role of
Knowledge-Oriented Leadership**

by

Mahnoor Khan

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

in the

Faculty of Management & Social Sciences

Department of Management Sciences

2024

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Dedicated to my support system...

"My Family"



CERTIFICATE OF APPROVAL

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Acknowledgement

“In the name of The Omniscient, The Omnipotent, The Omnipresent and The Omnibenevolent for the blessing of choosing me for this endeavor.”

First and foremost, to my creator, my life coach, the most gracious, the most beneficent, ALLAH S.W.T., I owe it all to you, Thank you!

I would like to thank my supervisor Mr. Muhammad Irfan Mustafa for his utmost effort and precious time in the completion of my thesis. Under her guidance, I successfully overcame many difficulties throughout my thesis.

Mahnoor Khan

Abstract

In today's changing business world, it's important for the organization to do well. This is because it helps companies stay ahead, keep running, and grow financially. People working on the projects should share knowledge what they know and keep learning new things to handle any challenges that come their way. This research study aimed to examine the interactive effect of Knowledge-based HRM practices on the Project Performance of IT project employees. The proposed theoretical framework used the Social Exchange theory to explain the hypotheses. To test the model, data were collected through a survey conducted among employees of IT projects in Major cities of Pakistan Rawalpindi, and Islamabad. A cross-sectional technique was used to collect the data through adopted questionnaires. The final sample size of responses after discarding incomplete questionnaires was 392. In this study, SPSS were used to perform the tests.. Results indicated strong support for our hypotheses. The test revealed that the relationship Knowledge based HRM practices and Exploitative and Exploratory Innovation strengthen the relationship with the Project Performance of Project employees in the presence of Knowledge-oriented leadership. Moreover, managerial implications and future research directions have been discussed.

Keywords: Knowledge-Based HRM Practices, Knowledge Oriented Leadership, Exploitative Innovation, Exploratory Innovation, Project Performance, Social Exchange Theory.

Contents

Author's Declaration	iv
Plagiarism Undertaking	v
Acknowledgement	vi
Abstract	vii
List of Figures	xi
List of Tables	xii
1 Introduction	1
1.1 Background of the Study	1
1.2 Research Gap	8
1.3 Problem Statement	9
1.4 Objective of the Study	10
1.4.1 Research Objectives	11
1.5 Significance of Study	12
1.6 Supporting Theory	13
2 Literature Review	15
2.1 Knowledge-Based HRM Practices	15
2.2 Project Performance	16
2.3 Knowledge-Oriented Leadership	17
2.4 Exploitative Innovations and Exploratory Innovation	18
2.5 Hypotheses Development	19
2.5.1 Knowledge-Based HRM Practices and Project Performance	19
2.5.2 Knowledge-Based HRM Practices and Exploitative Innovation	20
2.5.3 Knowledge-Based HRM Practices and Exploratory Innovation	22
2.5.4 Exploitative Innovations and Project Performance	24
2.5.5 Exploratory Innovation and Project Performance	25
2.5.6 Mediating Effect of Exploitative Innovation between knowledge-Based HRM Practices and Project Performance	27
2.5.7 Mediating Effect of Exploratory Innovation between knowledge-Based HRM Practices and Project Performance	28

2.5.8	Moderating Effect of Knowledge-Oriented Leadership Between Knowledge-Based HRM Practices and Exploitative Innovation	29
2.5.9	Moderating Effect of Knowledge-Oriented Leadership between Knowledge-Based HRM Practices and Exploratory Innovation	32
2.5.10	Moderated Mediation Effect of Knowledge-Oriented Leadership between Knowledge-Based HRM Practices Exploitative Innovation and Project Performance	33
2.5.11	Moderated Mediation Effect of Knowledge Oriented Leadership between Knowledge Based HRM Practices, Exploratory Innovation and Project Performance	34
2.6	Research Model	36
2.7	Research Hypotheses	36
3	Methodology	38
3.1	Introduction	38
3.1.1	Research Philosophy	39
3.1.2	Research Design	39
3.1.3	Type of Study	39
3.1.4	Study Setting	39
3.2	Population and Sample	40
3.2.1	Sampling Technique	40
3.3	Measurements	41
3.3.1	Knowledge-Based HRM Practices	41
3.3.2	Innovation (Exploitative/Exploratory)	41
3.3.3	Knowledge-Oriented Leadership	42
3.3.4	Project Performance (PP)	42
4	Results	43
4.1	Techniques for Data Analysis	43
4.2	Data Screening	44
4.2.1	Data Cleaning	44
4.2.2	Missing Values	44
4.3	Demographic Data Result	44
4.3.1	Respondents by Gender	44
4.3.2	Respondent's Age	45
4.3.3	Respondent's Qualification	46
4.3.4	Respondent's Experience	47
4.4	Reliability of Scale	48
4.5	Descriptive Statistics	49
4.6	Correlation Analysis	51
4.7	Regression Analysis	53
4.7.1	Direct Effect of Knowledge Based HRM Practices on Project Performance	53
4.7.2	Mediation Analysis of Exploitative Innovation	54

4.7.3	Indirect Effect	56
4.7.4	Mediating effect of Exploratory Innovation	57
4.7.5	Indirect Effect	58
4.8	Moderating Effect of Knowledge Oriented Leadership	59
4.8.1	Moderation Analysis I	60
4.8.2	Moderation Analyses II	61
4.9	Moderated Mediation	62
4.9.1	Moderated Mediation Effect I	62
4.9.2	Moderated Mediation Effect II	62
5	Discussion and Conclusion	65
5.1	Discussion	65
5.1.1	Hypothesis 1: Knowledge Based HRM Practices Influence the Project Performance	66
5.2	Practical and Theoretical Implications	74
5.3	The Study's Strengths	76
5.4	Conclusion	77
5.5	Limitations and Future Direction	77
	Bibliography	79
	Appendix A	96

List of Figures

2.1	Research Model	36
4.1	Gender of Respondents	45
4.2	Age of Respondents	46
4.3	Qualifications of Respondents	47
4.4	Experience of Respondents	48
4.5	Direct Effect of X on Y	54
4.6	Mediation Analysis	55
4.7	Direct Effect of X on M1	55
4.8	Direct effect of M1 on Y	56
4.9	Mediation Analyses II	57
4.10	Direct effect of X on M2	58
4.11	Direct effect of M2 on Y	58
4.12	Moderation Analysis I	60
4.13	Moderation Analysis II	61

List of Tables

4.1	Gender of Respondents	45
4.2	Age of Respondents	46
4.3	Qualification of Respondents	47
4.4	Experience of Respondents	48
4.5	Exhibit Reliability Values	49
4.6	Descriptive Statistics	50
4.7	Correlations	52
4.8	Direct Effect of X on Y	54
4.9	Direct Effect	54
4.10	Direct Effect	55
4.11	Indirect Effects	56
4.12	Direct Effect	57
4.13	Direct Effect	58
4.14	Indirect Effect	59
4.15	Moderation Analysis I	60
4.16	Moderation Analysis II	61
4.17	Moderated Mediation Effect I	62
4.18	Moderated Mediation Effect II	63
4.19	Summary of Hypotheses	64

Chapter 1

Introduction

1.1 Background of the Study

Human Resource Management (HRM) is widely regarded as an important element in the organizational landscape, playing a critical role in managing employees, their skills, and their knowledge to optimize productivity and performance. As organizations face rapidly changing external environments, the need for robust management competences, including effective knowledge management, becomes apparent. This necessity involves not only acquiring knowledge but also implementing innovative HRM systems that enhance an organization's ability to utilize and integrate this information effectively ([Ponisciakova, 2020](#)).

Recognizing the significance of knowledge-based resources, modern HRM practices have shifted towards leveraging these assets to secure a competitive advantage and improve organizational performance. This strategic emphasis is supported by research indicating that knowledge-based competencies are critical tools for enhancing organizational performance ([Gupta, 2022](#)). Furthermore, the concept of "Knowledge-Based HRM" has evolved, focusing on fostering a learning culture and developing a knowledge-sharing environment, which are pivotal for enhancing project performance in project-based organizations ([Jalil et al., 2021](#)).

According to behavioral perspectives, HRM practices are fundamental in directing and energizing employee behaviors, which are crucial determinants of organizational effectiveness. Identifying and promoting the required behaviors through

knowledge-based HRM practices not only addresses competencies but also fosters employee motivation and engagement, thereby contributing to long-term organizational success (Nazarian et al., 2021).

Elayan et al. (2023) highlight that Knowledge-Based HRM practices concentrate on managing the intellectual capital within an organization to boost performance, innovation, and competitiveness. These practices emphasize the learning, sharing, and application of knowledge, essential for utilizing organizational social capital and enhancing employee knowledge exchange.

Moreover, organizations face a dichotomy in knowledge acquisition: developing current employees through training and development programs or integrating new personnel who already possess the requisite expertise. The latter often involves mergers, acquisitions, and strategic partnerships to quickly onboard essential knowledge and skills (Jackson et al., 2003). In the contemporary business landscape, the pursuit of competitive advantage is increasingly hinging on an organization's ability to innovate and manage knowledge effectively. This research delves into the impact of knowledge-based Human Resource Management (HRM) practices on project performance, particularly through the lens of exploratory innovation. Moreover, it examines the role of knowledge-oriented leadership as a moderating influence in this dynamic. Knowledge, in this context, is not merely a resource but a pivotal force that drives the operational success and competitive prowess of project-oriented organizations. Knowledge management in project-based organizations is the acquisition and application of unique knowledge which provides a significant competitive edge (Holsapple and Singh, 2003). Employees are required to engage in creative behaviors, which include identifying and solving new problems, effectively communicating these issues, and seeking relevant new information to resolve these challenges (Carneiro, 2000). Such innovative behaviors are essential for sustaining competitiveness and enhancing project performance.

Further exploration into the structure of project-based organizations reveals that their distinctive characteristics, such as organizational structure, procedural complexities, and management of project capabilities, differentiate them from non-project-based organizations (Haider et al., 2023). These organizations often excel in collaboration and innovation-oriented attitudes, though they may not always

prioritize autonomy. This research aims to build a comprehensive understanding of how knowledge-based HRM practices enhance project performance through exploitative innovation, exploratory innovation and how knowledge-oriented leadership can further influence this relationship. By integrating insights from various scholars and empirical studies, this study seeks to contribute valuable perspectives to the discourse on strategic HRM and innovation management in project-based organizational settings.

In today's competitive landscape, organizations continuously seek innovative strategies to enhance their performance and sustain growth. This pursuit has spotlighted the critical role of human resource management (HRM) practices, particularly those that are knowledge-based, in fostering organizational innovation and driving project success.

The intersection of HRM, knowledge management, and innovation forms a complex framework that influences organizational outcomes. This research delves into the impact of knowledge-based HRM practices on project performance, exploring how these practices facilitate exploratory innovation and how knowledge-oriented leadership potentially moderates these effects.

Organizational innovation, defined as the creation, acceptance, and utilization of new concepts, processes, products, or services, is a critical factor that provides long-term competitive benefits (Ferreira et al., 2020; Jiang et al., 2019). The ability to innovate, especially in a knowledge-based economy, is crucial for maintaining a competitive edge (Lu et al., 2022). Knowledge-based HRM practices and knowledge-oriented leadership play indispensable roles in fostering an environment conducive to innovation and effectively leveraging the unique knowledge that employees bring to the table.

Innovation is inherently multidimensional, blending elements of creativity, technology, and change. It represents a vital component of organizational strategy, as it dictates the ability to adapt and evolve in response to dynamic market conditions and technological advancements. The literature suggests that effective innovation processes are crucial for organizational growth and require a consistent commitment to nurturing an inventive work environment, developing staff competencies, and leveraging technological advancements (Ogalo, 2020).

Exploitative innovation involves progressing the present knowledge. Whereas exploratory innovation involves the new knowledge's creation both types of innovation are crucial for achieving the project best performance. Therefore, it was expected that knowledge-based HRM practices would gain a positive impact together on Exploitative innovation and exploratory innovation, which as a result positively influenced the overall performance of the project. (Li and Lachmayer, 2019) Exploitative innovation, characterized by its lower risk profile, leverages existing knowledge and proven frameworks, thereby reducing the uncertainty typically associated with novel innovations (Ojiako et al., 2023). Despite its conservative approach, it plays a crucial role in continuous improvement and incremental gains in organizational performance. Exploitative innovation focuses on meeting customer needs and expectations by refining existing products/services based on feedback and market demands (Nie et al., 2023).

According to (Haneda and Ono, 2023), Exploitative innovation is the process of enhancing or optimizing currently available goods, services, processes, or technologies within an organization. Instead of seeking entirely new or groundbreaking solutions, exploitative innovation focuses on refining and enhancing what already exists.

According to (Huang and Hsueh, 2023), exploratory innovation is the form of innovation encourages creativity and experimentation. It involves trying out different ideas, concepts, or methodologies to uncover novel solutions. Exploratory innovation acknowledges the need to adapt and evolve in dynamic environments. It embraces change and seeks opportunities that arise from shifts in technology, consumer behavior, or market trends (Güttel and Kleinhanns-Rollé, 2023).

Exploratory innovation, which involves seeking new information and technologies to develop novel products and services, emerges as a key mechanism through which knowledge-oriented strategies impact project performance (Jansen et al., 2006). In dynamic business environments, the development of exploratory innovation has proven particularly effective. This underscores the importance of innovative knowledge creation, which goes beyond mere knowledge acquisition and sharing within the firm (Bontis et al., 2002). A growing body of research has examined the relationship between HRM practices and innovation within organizations. Effective

HRM practices are shown to empower organizations to be more adaptive, creative, and influential, fostering a culture of achievement and collaboration (Kianto et al., 2017). These practices not only enhance the innovative capacities of organizations but are also pivotal in managing and expanding the knowledge essential for continuous innovation (Ali et al., 2020). Indeed, knowledge acts as both an input and an output in the innovation process, highlighting the symbiotic relationship between HRM and knowledge management (Kianto et al., 2017).

Moreover, the research recognizes the potential mediating role of innovation types specifically exploratory and exploitative innovation—in linking knowledge-based HRM practices with project performance. While exploitative innovation focuses on refining existing knowledge, exploratory innovation seeks to generate new ideas and approaches by venturing into uncharted territories (Li and Lachmayer, 2019). This type of innovation is crucial for adapting to changes in technology, consumer behavior, and market trends, thereby supporting the organization's growth and sustainability (Güttel and Kleinhamns-Rollé, 2023).

In today's dynamic business environment, the pursuit of innovation is not only about breaking new ground but also about optimizing existing capabilities. This dual approach is encapsulated in the concepts of exploratory and exploitative innovation. While exploratory innovation seeks novel ideas and breakthroughs, exploitative innovation emphasizes enhancing and refining current products, services, and processes to meet evolving market demands and customer needs (Nie et al., 2023; Haneda and Ono, 2023). Central to the successful implementation of these innovations are the knowledge-based Human Resource Management (HRM) practices that organizations adopt. These practices, which include targeted training, learning and development opportunities, and robust knowledge-sharing mechanisms, significantly influence project outcomes (Le and Le, 2023). The effectiveness of such practices is often enhanced or hindered by the presence of knowledge-oriented leadership—a style that prioritizes and facilitates the flow and application of knowledge within the organization (Li and Lachmayer, 2019; Bashir and Pradhan, 2023).

This study aims to provide a comprehensive analysis of how knowledge-based HRM practices influence project performance through the moderating effect of

knowledge-oriented leadership on these relationships. Through this exploration, we seek to offer valuable insights into the mechanisms through which organizations can harness their human and knowledge resources to achieve superior project outcomes and maintain a competitive edge in the marketplace.

Studies have figured out knowledge-oriented leadership as a key agent in promoting knowledge-sharing practices within organizations. Leaders who give importance and support to the creation and application of knowledge are considered knowledge-oriented leaders Knowledge-oriented leadership (Li and Lachmayer, 2019). Consequently, it is anticipated that the relationship between knowledge-based HRM practices and exploitative and exploratory innovation would be moderated by knowledge-oriented leadership.

This is due to the fact that it either increases or decreases the relationship between knowledge-based HRM practices and both exploratory and exploitative innovation. An efficient knowledge-based human resource management approach enhances the project's innovative component (Le and Le, 2023) Knowledge-oriented leadership emphasizes the effective utilization and management of knowledge within an organization to drive innovation, growth, and strategic decision-making. It involves leaders fostering a culture that encourages learning, sharing of information, and leveraging expertise across various domains (Bashir and Pradhan, 2023).

According to Jia et al. (2024), knowledge-oriented leadership involves creating an environment where knowledge is valued, shared, and applied strategically to achieve organizational goals.

A study has been done to get an insight at the features of project-based organizations and how they impact the practices of management for innovative projects, including the effect of those practices on the project performance. Organizational structure, procedure complexities, and the firm's management of project capabilities separate project-based corporations from non-project-based corporations. Project-based corporations differ in terms of cooperation and attitude to innovation, but not in terms of freedom (Haider et al., 2023). The research study details the project's performance at six different phases, including successful ratio, cost and benefit analysis, product quality, process enhancement, and technological innovation (Ho et al., 2006). It also argued that project performance or success is

usually defined by how a project is performed in the best ways and completed in a given time, costs, quality, and customer satisfaction (Irfan and Baig, 2023).

According to Mir and Rezania (2023) project performance is that how well a project achieves its objectives and delivers its intended outcomes within specified constraints of time, budget, scope, quality, and other relevant factors.

The idea of "Knowledge-based Human Resource Management (HRM)" practices has emerged as a potential approach that organizations can use to enhance their project performance. This concept, the knowledge based HRM practices has been used in project based organization.

They are very crucial for managing the overall project performance. Knowledge-based HRM interventions have been identified as the most effective practices for promoting a learning culture. They have also been recognized for developing a knowledge-sharing environment. And this environment can significantly impact the project performance of any organization (Sikandar et al., 2021).

This research seeks to delve deeper into how knowledge-based HRM practices impact project performance, specifically through the lens of exploitative and exploratory innovation. More importantly, this study examines the mediating role of these types of innovation and the moderating effect of knowledge-oriented leadership on this relationship.

Despite the recognized importance of knowledge-based HRM practices in driving innovation, few studies have systematically explored how these elements interact within the framework of project management. This gap is particularly pronounced in the context of knowledge-oriented leadership's role in modulating the effectiveness of HRM practices in fostering innovation (Jia et al., 2024).

By investigating these dynamics, this study aims to provide nuanced insights into the interplay between HRM practices, leadership styles, and innovation types, and their collective impact on the performance of projects across various phases, including cost-benefit analysis, product quality, and technological advancement.

The findings are anticipated to offer actionable strategies for enhancing project performance through informed management practices and leadership approaches.

1.2 Research Gap

Prior research has drawn the center of attention on the importance of knowledge-based HRM practices in enhancing overall project performance (Malik et al., 2020; Minbaeva, 2013). Nevertheless, there is a need to draw the center of attention of research on the specific knowledge-based HRM practices that are the most effective in improving project performance. This gap in research suggests this need to discover the effect of specific HRM practices on project performance (Belout and Gauvreau, 2004).

According to previous study there is a need to explore the mediating mechanisms through which exploitative innovation and exploratory innovation negotiate the correlation among knowledge-based HRM practices and project performance. While previous analyses have highlighted the significance of the innovation in driving project performance (Ma et al., 2019).

We need to look more into how leadership that values knowledge can change the relationship between these HRM practices and project performance. Although Than et al. (2023) touch upon this, but the literature still lacks a comprehensive examination of how this form of leadership can increase the effectiveness of HRM practices in enhancing project outcomes.

There is not much research on how leaders who focus on knowledge work with different kinds of innovation like exploitative and exploratory to improve projects. Enad Al-Qaralleh and Atan (2022) highlighted the facilitative role of knowledge-oriented leadership in adopting knowledge-based HRM practices, yet the understanding of its moderating effects on the relationship between HRM practices and different types of innovation remains under-researched.

The current study explores the correlation between knowledge-based HRM practices and project performance, with a specific focus on identifying potential innovative mechanisms. Notably, existing research, as highlighted by Sáenz, Josune et al (2017), has not revealed any unique innovative mechanisms thus far.

In conclusion, this research aims to contribute to the field by identifying the specific HRM practices that positively impact project performance. It also delves into the

moderating influence of knowledge-oriented leadership and investigates the mediating mechanisms related to exploitative innovation and exploratory innovation, which contribute to project performance within an organizational context.

The study aims to fill the current research gap concerning the "Impact of knowledge-based HRM practices on Project Performance." By incorporating discussions on the moderating and mediating impacts of exploitative and exploratory innovation, along with knowledge-oriented leadership, this research seeks to improve our comprehension of the link between knowledge-based HRM practices and project performance.

1.3 Problem Statement

Organizations are facing a big problem because more and more employees are leaving their jobs too quickly. This situation is causing trouble, as companies have to constantly hire and train new people, which is expensive and time-consuming. To solve this, organizations need to focus on giving new employees special training right after they are hired.

This training should help employees understand their jobs better and make them feel more motivated and happy at work. When employees are happy and understand their roles, they are less likely to leave, which is good for the company.

Also, there's a growing understanding that using knowledge-based methods in managing human resources (HR) can lead to better results in projects. In today's fast-changing business world, being innovative and able to adapt quickly is very important for a company's success and survival.

This study looks into how using knowledge-based HR management can improve the way projects are done and help companies keep their employees for longer. It aims to give useful advice on how companies can better manage their employees in a fast-paced and knowledge-driven environment, which in turn could help reduce the number of employees leaving and improve the overall success of the company.

Keeping in view the project performance in the organization in major cities of Pakistan (Islamabad, Rawalpindi,) the research questions are as follows:

Question 1:

How Knowledge-Based HRM Practices impact on the project performance?

Question 2:

How Knowledge-Based HRM Practices has a positive impact on Exploratory Innovation and Exploitative Innovation?

Question 3:

How Exploratory Innovation and exploitative innovation have a positive impact on project performance?

Question 4: To what extent Exploratory Innovation and exploitative innovation mediate the relationship between Knowledge-Based HRM Practices and Project Performance?

Question 4:

How Does Knowledge- Oriented Leadership moderate the relationship between Knowledge-Based HRM Practices, Exploratory Innovation and Exploitative Innovation?

Question 5:

To what extent knowledge-oriented leadership moderate the mediation effect of exploratory innovation and exploitative innovation on the relationship between knowledge-based Hrm practices and project performance?

1.4 Objective of the Study

The goal of the subsequent research is to investigate how knowledge-based HRM practices impact project performance. It also suggests researching how Knowledge Oriented Leadership moderates the effects of Exploratory and Exploitative Innovation, which have an additional influence on project performance. It also suggests researching how Knowledge Oriented Leadership moderates the effects of Exploratory and Exploitative Innovation, which have an additional influence on project performance.

1.4.1 Research Objectives

RO: 1

To examine the impact of Knowledge-Based HRM Practices on the project performance

RO: 2

To measure and analyze the effect Knowledge-Based HRM Practices on Exploitative Innovation.

RO: 3

To measure and analyze the effect of Knowledge-Based HRM Practices on Exploratory Innovation.

RO: 4

To investigate the impact of exploitative innovations on the project performance

RO: 5

To investigate the impact of exploratory innovations on the project performance

RO: 6

To examine the relationship between Knowledge-Based HRM Practices and Project Performance while mediated by Exploitative Innovation

RO: 7

To examine the relationship between Knowledge-Based HRM Practices and Project Performance while mediated by Exploratory Innovation

RO: 8

To examine the moderating role of Knowledge- Oriented Leadership between the Knowledge-Based HRM Practices and Exploitative Innovation

RO: 9

To examine the moderating role of Knowledge- Oriented Leadership between the Knowledge-Based HRM Practices and Exploratory Innovation

RO: 10

To investigate the positive indirect effect of Knowledge Based HRM practices on Project Performance, such that the indirect effect through Exploitative Innovation is stronger when Knowledge Oriented Leadership is high.

RO: 11

The objective is to investigate the positive indirect effect of Knowledge Based HRM practices on Project Performance, such that the indirect effect through Exploratory Innovation is stronger when Knowledge Oriented Leadership is high.

1.5 Significance of Study

This research will support project management on the one hand by providing more theoretical content, and on the other hand, it will provide hard data demonstrating how implementing Knowledge Base HRM practices can enhance the performance of project-based organizations. The study makes new facets of knowledge base HRM practices available for in-depth investigation. It would also assist Pakistani project-based organizations in the development sector in understanding the value of effectively and efficiently managing knowledge and intellectual capital in projects. Project managers often encounter failures and setbacks when initiating new projects or implementing phases of existing ones. This study aims to help them understand the significance of maintaining Knowledge Base HRM practices and their role in performance enhancement. Additionally, this will help decision makers understand that expanding the collection of information does not necessarily improve learning unless it is integrated and applied, which will then have an impact on the project's performance.

The importance of this study lies in its analysis of how knowledge-based HRM practices affect project performance, focusing particularly on the moderating impact of knowledge-oriented leadership and the mediating influence of both exploitative and exploratory innovation in this relationship.

Moreover, the outcomes from the following study had applied effects for organizations and decision-makers seeking to improve project performance through the

implementation of knowledge-based HRM practices. The study offered actionable insights into the optimal combination of HRM practices, leadership styles, and innovative approaches to achieve desired project outcomes.

1.6 Supporting Theory

Social behavior emerges from the exchange of material or non-material rewards, such as recognition and prestige. Homans (1958) introduced the theory of social exchange, asserting that individuals engaging in social behavior anticipate receiving reciprocal value from the other party. This reciprocal exchange is an ongoing process aimed at balancing contributions between both parties involved in the social interaction.

In the context of social exchange theory, organizations implement Knowledge-Based HRM Practices with the expectation that employees will reciprocate by contributing their expertise, skills, and efforts to the organization's goals [Le and Le \(2023\)](#). This exchange is based on the premise that employees receive benefits such as skill development, job satisfaction, and career advancement in return for their contributions [Steyn \(2010\)](#).

Exploitative and exploratory innovation can be seen as mechanisms through which the social exchange occurs. Employees engage in these innovation processes, using existing knowledge (exploitative) or seeking new knowledge (exploratory), expecting rewards in return and when there will be an implement of Knowledge-Based HRM Practices. ([Yang et al., 2023](#)) this aligns with social exchange theory, where individuals contribute their efforts anticipation of future benefits. innovation).

For instance, Blau (1964) argued that reciprocity is a fundamental aspect of social exchange. In the organizational context, employees engaging in innovation as part of Knowledge-Based HRM Practices can be viewed as a form of reciprocity, contributing to the overall success of projects. Social exchange theory would suggest that effective leadership, particularly knowledge-oriented leadership, enhances the quality of the exchange between employees and the organization ([Shariq et al,2019](#)). Leaders who value and facilitate the exchange of knowledge create a

positive environment where employees feel motivated to contribute their skills and ideas [Gressgård \(2015\)](#).

To summarize this study, social exchange theory establishes a strong link between a employee and a responsibility for what the employer has rewarded. Both parties must work together to meet expectations and share benefits, and this reciprocation of benefits represents a fair exchange of everything between the employer and the employee [Jones \(2010\)](#). Knowledge-Based HRM Practices fosters an environment in which employees participate in decision-making, making them feel more confident and valuable to the organization, which leads to project performance [Ishak et al. \(2023\)](#).

Chapter 2

Literature Review

The literature begins with a general overview of the various aspects that have an impact on project performance. The following paper presents a research framework that explains how knowledge-based HRM practices impact project performance, with knowledge-oriented leadership acting as a moderator and exploratory and exploitative innovation acting as a mediating influence. The direct, mediating, and moderating effects of these variables are explained by this study. The literature on the interactions between the variables is meant to be included in this chapter.

2.1 Knowledge-Based HRM Practices

Being able to do or avoid things, consider, demand, or reject things for precise reasons are all considered aspects of knowledge (Hyman, 1999). Being cognizant of reality and in close cognitive proximity is a highly valued condition of knowledge. It is therefore a relationship (Zagzebski, 2017). HRM methods that are knowledge-based are designed to enhance the organization's information processing systems. Knowledge and HR administration are essential preconditions that work together to support the growth of human capital (HC), which in turn encourages employee service innovation behavior (Kianto et al., 2017).

Knowledge-based HRM practices have become increasingly important for corporations to enhance their competitiveness and gain a sustainable good advantage. Such practices are related to human capital development, knowledge management,

and organizational learning. On the other hand, innovation is an essential driver of organizational performance and is crucial for companies to attain a long-term advantage over its competitors. Knowledge-based HRM practices encourage the development, sharing, and utilization of knowledge, which is required for improved innovative performance [Singh et al. \(2021\)](#).

Prior research suggests that employees' innovation performance is influenced by expertise, abilities, and inspirational features [Birdi et al. \(2016\)](#), confidence [Mumtaz and Parahoo \(2020\)](#), sharing of information [Baporikar and Shikokola \(2020\)](#), and field related commitment [Bettencourt et al. \(2017\)](#).

2.2 Project Performance

Projects are routinely designed and conducted to operationalize an organization's strategic goals. As a result, worldwide project spending is increasing at an exponential rate, and the field of project management professionals is expanding rapidly. However, many projects fall short of expectations, and there are no simple solutions for improving project performance [Anantatmula \(2015\)](#). In today's interconnected world, an ability of the manager to encourage staff members and provide a productive environment for the project team to confront increasing obstacles [Anantatmula \(2010\)](#).

These days, knowledge-based project organizations are rapidly emerging. where information and intellectual qualities are the crucial competitive differentiator. Employment in knowledge-based project organizations is distinguished by intensity, novelty, and collaborative teamwork. People enjoy working in organizations with knowledge employees. When people appreciate what they do, their productivity rises. Individual worker efficiency is the incharge for the overall efficiency of the project [Bahrami and Evans \(1997\)](#).

The overall project performance or its efficiency is greatly dependent on the efficiency of its workers working on that particular project. This is because human resource is the real core competency of any organization that distinguishes it from that of its rivals. And employees like working in the organizations where they get clear cut instructions to carry out their day to day task, where the dissemination

of knowledge isn't complicated, rather they get communicated every necessary information that they should have in order to carry out their task.

This is all due to the Knowledge-oriented leadership , carrying out knowledge-based HRM practices within the projects of any organization. Therefore, as the effect of a knowledge-oriented leader is crucial for the employees working on a certain project, so is the effect of communication in fulfilling that particular project. Leadership that is Knowledge-oriented leadership has a direct as well as positive effect on project performance [Rehman and Iqbal \(2020\)](#).

2.3 Knowledge-Oriented Leadership

One of the best ways to increase an organization's capacity for innovation is to make information and expertise more widely available Knowledge-based HRM techniques are crucial to the accomplishment of innovative projects. According to existing research, knowledge-based HRM methods are associated with improved customer demands interpretation, technical trend identification, and idea generation [Pagell and Wu \(2009\)](#).

Since the 1990s, the field of knowledge management has grown to be a respected discipline in both academia and business. It involves the creation and implementation of programs that seek to improve the quality of service and productivity of organizations ([Wiig, 1997](#)). Moreover, in real-world contexts, innovation usually follows directly from knowledge management effectiveness [Du Plessis \(2007\)](#) additionally, knowledge-creating companies prioritize innovation as a means of gaining a competitive advantage over their rivals [Nonaka and Takeuchi \(2007\)](#).

Another study identified a crucial issue, which is leadership behavior, because leaders have a major effect on the trajectory and efficacy of KM within their organizations [Donate and Guadamillas \(2015\)](#) in the contrary, leaders can establish settings in which participants can practice and develop their knowledge operation facilities, take part in their own unique resources of knowledge, or have easier approach to appropriate information [Liu et al. \(2022\)](#). Leadership behaviors, yet, could pose severe obstacles to producing and using knowledge [Bryant \(2003\)](#). As they can assume in knowledge accumulation, competition, instead of interaction,

and a variety of other adverse reactions for knowledge-creating organizations [Alhakim \(2012\)](#).

2.4 Exploitative Innovations and Exploratory Innovation

Several scholars have classified the innovation activities of any organization into two types [Chen et al. \(2021\)](#), “exploratory and exploitative innovation”. Exploratory innovation is characterized as the search of fresh information and technical advances as well as the creation of novel goods and services for rapidly growing markets or consumers. [Jansen et al. \(2006\)](#). It is the knowledge that is innovative in comparison to the firm’s existing expertise that becomes apparent in innovation [Phelps \(2010\)](#). According to the findings of a study, developing exploratory innovation is more efficient in active situations [Jansen et al. \(2006\)](#).

Exploitative innovation, in contrary to that, is described as widening existing knowledge and abilities and refining previous designs in order to fulfill the demands of existing clients or markets [Hortinha et al. \(2011\)](#). In highly competitive situations, the findings of a study seeking exploitative innovation are more helpful to financial performance of a unit e [Jansen et al. \(2006\)](#).

Project-based industries are among the world’s most significant. These sectors include the building, aerospace, film, pharmaceutical, medical, and defense industries. Additionally, becoming increasingly prevalent are project-based organizational structures in burgeoning and new sectors of the economy (such biotechnology and IT). To date, however, most innovation research has been undertaken in conventional, ranked organizations. When project-based businesses are included in innovation studies, the analyses rarely adequately address the variations in mechanisms and rates of invention that emerge between traditional, hierarchical organizational forms and project-based organizational forms. The target of this study is to figure out the disparities in rates of innovation and the structural mechanisms that produce them for various types of innovations in the project-based residential building sector [Taylor and Levitt \(2004\)](#).

2.5 Hypotheses Development

2.5.1 Knowledge-Based HRM Practices and Project Performance

Organizations in today's world face globalization, demographic shifts, advances in technology, and high client demands, all of which constantly transform the corporate landscape [Tabeau et al. \(2017\)](#) companies need plans to achieve a specific level of sustainability in order to compete effectively in a rapidly changing and intricate knowledge-based economy. Furthermore, it is gradually becoming recognized that conventional business models' significant emphasis on rather short-term efficient and effective exploitation of environmental, social [Docherty \(2002\)](#).

Projects must innovate in order to sustain advantages over their competitors and achieve higher performance [Koren and Palčič \(2015\)](#). ([Boso et al., 2017](#)) describe it as the effective deployment of innovative products, services, or methods of getting things done. Several antecedents of business innovation have been discovered in previous research, including official support [Shu et al. \(2015\)](#), organizational culture [Abdul-Halim et al. \(2019\)](#), organizational competence [Cingöz and Akdoğan \(2013\)](#) knowledge complexity [Bahl et al. \(2021\)](#), and managers' past experience [Nuruzzaman et al. \(2019\)](#). Incorporating sustainability into organizational strategy aids in the achievement of corporate sustainability goals especially in the face of progressively thought-provoking global issues such as change in climatic conditions, environmental complications, growth in global population, social difference enhancement, and scarcity [Tabatabaei et al. \(2017\)](#). According to ([Ehnert, 2014](#)), these shifts highlight the significance for environmentally friendly HRM practices, as well as sustainability is viewed to possess a strategic significance in HRM. In this context, Sustainability, according to [Ehnert \(2014\)](#), is a concept for providing innovative approaches and making socioeconomic strategies and organizations more practicable in the long term while also being less detrimental to society and global well-being [Tabatabaei et al. \(2017\)](#).

Human resource practices, followed by the acquisition and dissemination of knowledge affect the project performance as a whole. If the information and knowledge

is properly and timely spread from top management to lower management, then the employees feel valuable for the proper communication. Thus, this boosts their productivity. And hence, the project performance as a whole is increased. On the other hand, if there is a communication gap, then there was mismanagement and the efficiency as well as the performance of the project would be less. Hence, we propose the following based on above discussion:

H1: Knowledge-Based HRM Practices have positive impact on the project performance.

2.5.2 Knowledge-Based HRM Practices and Exploitative Innovation

Human resources are one of the primary handlers of organizational performance, according to the knowledge-driven viewpoint. A corporation's competence hinges on its workers' determination and their competence to perform organizational functions skillfully [Kianto et al. \(2017\)](#). Due to the rapid emergence and evolution of the information economy, many organizations have started investing in business analytics and knowledge-based HR practices in order to remain competitive in today's competitive environment. This study aims to analyze the combined effects of these practices and the agility of an organization on creative performance. This demonstrated how organizational agility, business modeling, and knowledge-based HRM techniques are important factors in predicting creative success ([Enad Al-Qaralleh and Atan, 2022](#)).

The best practices and high-performance HRM practices strategy is heavily used in research on HR practices linked with managerial levels of capacity, drive, and potential for knowledge exchange. [Minbaeva \(2013\)](#) Indeed, skills, drive, and possibilities have been extensively utilized as crucial bridge constructs in analyses of the relationships between outstanding performance human resources (HR) structures and other types of organizational performance in HRM research [Minbaeva \(2013\)](#).

Three essential knowledge-based HRM practices are expected to be particularly relevant meant for little logistics corporations. Leading, informative hiring takes a corporation appeal to recruiting fresh hires those retain not only the necessary skill

for the job but also interpersonal abilities and growth capability. Since knowledge is an internally generated issue and the acquisition of knowledge takes place largely in a collaborative environment, an aspiring employee's ability to engage is crucial. (Theriou and Chatzoglou, 2008). Knowledge has evolved into a crucial asset and key strategic resource for modern businesses. It is vital to understand how to correctly manage and integrate various sorts of knowledge resources in order to exist and claim advantages over rivals in the information-based saving. In this vein, knowledge management (KM) is viewed as a pressing and vital problem, as organizations must efficiently handle their information bases and reservoirs in order to gain a competitive edge that lasts (Chen and Huang, 2012).

Knowledge-based HRM practices prioritize filling the company's knowledge needs over vacant positions, proactive growth in staff members over evaluating performance, and reimbursement for KM-enhancing operations over fulfilling short-term in nature financial targets. On the other hand, innovation is an essential driver of organizational performance and is crucial for firms to achieve a long-term advantage over their competitors. (Singh et al., 2021). This literature review explores the positive association between knowledge-based HRM practice and Exploitative innovation.

Increasing knowledge management is a crucial issue for the long-term life of a project-based organization. This thing has enhanced the need to keep an eye on the knowledge management system within a project-based organization. Internal knowledge processes have been found to be lacking in project-oriented organizations.

(Ajmal et al., 2009) While exploitation is completely distinct approaches to innovation in organizations, current research has increasingly highlighted the necessity for SMEs to manage these methods (Wu and Peng, 2022). Exploitative innovation is termed as the incremental improvement of existing products, processes, or services. The literature suggests that knowledge-based Exploitative innovation is positively impacted by HRM practices such training and development, performance management, and employee interaction. (Wu and Peng, 2022).

Geng et al. (2018), found that knowledge management practices, such as knowledge sharing and codification, positively impact exploitative innovation. Knowledge

sharing helps to disseminate knowledge across the organization, and codification facilitates the storage and retrieval of knowledge. These practices enable organizations to leverage their knowledge assets; this can result in the creation of new goods, processes, or services. Hence, we propose the following based on above discussion:

H2: Knowledge-Based HRM Practices have a positive impact on exploitative innovation

2.5.3 Knowledge-Based HRM Practices and Exploratory Innovation

Knowledge-based HRM strategies are becoming more and more crucial for organizations looking to improve their competitiveness and obtain a long-term lead over rivals ([Alfawaire and Atan, 2021](#)).

According to [Yuan and Cao \(2022\)](#), programs for training and development help employees to adopt new knowledge and skills, which can boost up their ability to innovate. Similarly, Organizations can recognize and reward individuals that contribute to innovation with the use of performance management tools. Furthermore, employee involvement practices encourage employees to participate in problem-solving activities, which can hint to the development of new ideas and improvements.

Working efficiently under unpredictable circumstances demands the ability to gain and create new knowledge, these future-learning traits ought to be taken into account as well. Because newcomers provide supplementary information to the target organization when they can and desire to engage with existing organizations, knowledge-based recruiting encourages knowledge development and innovation ([Nonaka and Takeuchi, 2007](#)). The favorable relationship between knowledge-based HRM practices and exploratory innovation is examined in this review of the research.

Knowledge sharing expands new knowledge and organizational capacities, allowing for more innovation. Information sharing has been investigated as a mediator between leadership styles and innovation, and these leadership styles and information

sharing will improve organizational innovativeness (Noruzy et al., 2013). Knowledge sharing has been classified into two components: knowledge donation (KD) and knowledge collecting (KC). Knowledge donation is the exchange of private intellectual assets through dialogue, whereas knowledge collecting is the acquisition of intellectual capital through consultation with partners. Knowledge donation and knowledge collecting improves organizational routines, procedures, and practices for innovation (Ardi et al., 2020a). Knowledge shared and transferred inside organizations generates new information and experiences that increase linearly, while new knowledge that receives feedback or support grows exponentially (Ardi et al., 2020a).

Exploratory innovation is stated as the creation of new products, processes, or services. The literature suggests that knowledge-based HRM practices positively impact exploratory innovation. According to Joo et al. (2022), management practices for knowledge, such as creation and transfer of knowledge, positively impact exploratory innovation. While knowledge transfer is the dissemination of knowledge throughout the organization, creation of knowledge entails the formation of new knowledge through research and development activities. These practices can enhance an organization's capability to form new products, processes, or services.

To show the positive correlation between knowledge management and creative performance, a study was carried out. The findings showed a relationship between knowledge-based leadership and innovation performance as well as a positive and substantial relationship between knowledge management and innovation performance. According to Sadeghi and Rad (2018), the findings also showed a link between knowledge-oriented leadership, knowledge strategy management, and the success of innovations. Innovation's impact on corporate success has long fascinated economists and policymakers. Generally, it's believed that firms benefit in terms of competitiveness and performance through innovation. A study by Hashi and Stojčić (2013) discovered a positive link between innovative activities and productivity. The project's goal was to look into how knowledge acquisition affected innovation performance in terms of employee retention and HRM procedures. The results show that while HRM act knowledge acquisition and innovation performance, knowledge acquisition positively impacts innovation performance (Papa

et al., 2020).

Hence, we propose the following based on above discussion:

H3: Knowledge-Based HRM Practices have a positive impact on Exploratory Innovation.

2.5.4 Exploitative Innovations and Project Performance

"In today's rapidly changing market, innovation is vital for businesses to stay ahead of competitors. Companies must actively explore new opportunities while effectively utilizing their existing resources to maintain success." (Day and Schoemaker, 2016). This already present literature reviews the relationship between Exploitative innovation and project performance. "Employee knowledge and HRM practices contribute to developing innovative skills and enhancing firm performance. However, HRM procedures only impact creativity when they consider and leverage employee expertise effectively." (Jones, 2010). "The research highlights that knowledge uniqueness mediates the relationship between collaborative HRM practices and innovative activity. Knowledge-based HRM practices enhance critical information, leading to positive impacts on innovation and ultimately on business profitability." (Lopez-Cabrales et al., 2009).

Scholars have emphasized the importance of innovation as a key indicator of long-term organizational performance. Managing innovation projects effectively is a significant challenge for modern organizations. (Jansen et al., 2006). Empirical studies exploring the link between innovation and performance have found that the type of creativity significantly influences the effectiveness of this association. (Mushtaq and Peng, 2020). Cardinal (2001) The study concluded that treating incremental and radical alterations differently is not advisable. It found that input, behavior, and output control enhance exploratory (radical) innovation, whereas input and output controls specifically improve exploitative creativity. Jansen et al. (2006), Formalization is noted to have a positive impact on exploitative innovation. Innovation is widely recognized as a critical aspect of competition, as it becomes ingrained in a firm's structures, processes, products, and services Ylinen and Gullkvist (2014).

An empirical study was conducted to assess a theoretical framework linking inventions to firm performance, using integrated innovation-performance research. The results indicated a positive impact of innovations on business success within the manufacturing sector (Gunday et al., 2011). Exploitative innovation involves enhancing existing products or processes, focusing on improvements rather than radical changes. According to Atuahene-Gima and Ko (2001), exploitative innovation can improve project performance by reducing costs, improving product quality, and increasing customer satisfaction. Incremental innovations, as described by Decelle (2004), involve changes in goods and procedures that are generally of lesser importance or lack significant originality. These innovations extend existing products and services for current customers and build upon current knowledge, as noted by Ashok et al. (2016). Mol and Birkinshaw (2009) found in their study that companies with a higher level of incremental innovation experienced better project performance, while those with lower levels were more likely to face project failure. Companies with a high level of exploitative innovation were shown to have a higher chance of achieving project success in a different study conducted by Jansen et al. (2006). The study also discovered that project failure was more common in businesses with lower levels of exploitative innovation. The study examines the oversight of design innovation with regard to the degree of exploitative innovation and the flexibility of designers' decisions when creating new offers (Tushman et al., 2010). The link between process performance and design innovation is influenced by exploitation activities Tabatabaei et al. (2017). Tabatabaei et al. (2017).

Hence, we propose the following based on above discussion:

H4: Exploitative Innovation has a positive impact on Project Performance

2.5.5 Exploratory Innovation and Project Performance

Exploratory innovation involves the creation of new products or processes, emphasizing novelty and differentiation, as described by Jansen et al. (2006). Atuahene-Gima and Ko (2001) note that exploratory innovation can enhance project performance by creating new revenue streams, improving market share, and gaining

a competitive advantage. These innovations bring about significant technological transformations and depart from conventional practices, targeting new customer segments or sectors and seeking novel information, as highlighted by [Martínez-Ros and Orfila-Sintes \(2009\)](#).

According to a study by [Mol and Birkinshaw \(2009\)](#), businesses that advanced their exploratory innovation performed better on projects. The study also discovered that while organizations with a high degree of exploratory innovation were more likely to achieve project performance, those with a lower level were more likely to face project failure. The study also discovered that project failure was more common in businesses with lower levels of exploratory innovation.

[Mol and Birkinshaw \(2009\)](#) found that companies achieving a balance between exploitative and exploratory innovation tend to perform better on projects compared to those emphasizing only one type. [Jansen et al. \(2006\)](#) corroborated this, noting that companies with low levels of both types often face project failures. This underscores the significance of a balanced innovation strategy for project success. The findings of this study highlight the significance of project managers' advocating effects in being innovative ([Dulaimi et al., 2005](#)).

The concept of open innovation in new product development projects and found that the breadth and depth of external knowledge sourcing can have a significant impact on project performance [Bahemia et al. \(2017\)](#).

Furthermore, a meta-analysis by [Mueller et al. \(2013\)](#), found that exploratory innovation is generally associated with higher levels of project performance, particularly in terms of financial and market-based outcomes. The authors suggest that this is because exploratory innovation allows firms to develop new capabilities and access new markets, which can lead to increased revenue and profitability.

A study proposed propositions based on a comprehensive literature review that cooperative procurement processes typically have positive impacts on the project's outcomes ([Pulles et al., 2016](#)). The results show that design innovativeness is enhanced by exploratory activities, and market performance is enhanced by design innovativeness. Additionally,

Hence, we propose the following based on above discussion:

H5: Exploratory Innovation has a positive impact on Project Performance.

2.5.6 Mediating Effect of Exploitative Innovation between knowledge-Based HRM Practices and Project Performance

Knowledge-based HRM techniques have a significant impact on how well innovation projects work. According to the literature, knowledge-based HRM methods promote improved technological trend identification, customer demands comprehension, and idea generation. Firms can utilize innovation methodologies to achieve project performance (Sy Van Ha and Le Phong Ba, 2023).

The purpose of this review of the literature is to investigate how knowledge-based HRM practices and project performance are mediated by exploitative innovation. An investigation was conducted to determine how knowledge-based HRM practices for employees foster the development of innovative skills and, in turn, improve a company's success.

The findings show that unless HRM practices account for employee knowledge, they have no discernible impact on innovation (Rodrigo and Alieva, 2018). In particular, the research shows that innovations have a favorable effect on an organization's profitability and that knowledge-based HRM practices have a mediating role between inventive activity and vital information. (Lopez-Cabrales et al., 2009).

Exploitative innovation involves incremental improvements to existing products or processes. It focuses on efficiency, cost reduction, and process improvement. (Rodrigo and Alieva, 2018). According to Ahmed et al. (2018), a positive association between knowledge-oriented human resource management (HRM) strategies like training, knowledge exchange, and performance evaluation, and exploitative innovation.

They argue that training and development play a critical role as they help employees to adopt new skills and information that can be applied to existing products or

procedures. Knowledge sharing facilitates the exchange of information and ideas that can lead to incremental improvements, while performance appraisal provides feedback and recognition that can motivate employees to engage in Exploitative innovation. (Donate and Guadamillas, 2015).

For example, De Jong and Den Hartog (2007) found that knowledge-based HRM practices positively affect Exploitative innovation, which further positively affects project performance. They argue that the exploitation of existing knowledge and capabilities provides a foundation for the exploration of new ideas and technologies. Similarly, Liao et al. (2009) found that knowledge-based HRM practices positively affect Exploitative innovation and which in turn positively affects project performance.

Hence, we propose the following based on above discussion:

H6: Exploitative Innovation mediates the relationship between Knowledge-Based HRM Practices and Project Performance.

2.5.7 Mediating Effect of Exploratory Innovation between knowledge-Based HRM Practices and Project Performance

According to the literature, exploratory innovation may act as a mediating factor in the relationship between knowledge-based HRM practices and project performance. Knowledge-based HRM strategies, like training, development, and knowledge exchange, have been shown in several studies to positively affect innovation success. Waheed et al. (2019), for instance, discovered that organizational innovation has a mediating function in the enhancement of innovation performance through innovative HRM practices, such as knowledge-based practices.

It is not always clear how knowledge-based HRM practices, exploratory innovation, and project performance are related. According to Singh et al. (2021), managers should provide experts room to experiment for extended periods of time, promote interdisciplinary collaboration, and establish incentives and processes to make the process of fostering innovation easier¹. This implies that particular organizational

structures and procedures may be necessary for the effective application of exploratory innovation.

Empirical research has provided evidence of the significant impact of knowledge-based HRM practices on both exploratory innovation and project performance. Organizations with strong knowledge-sharing cultures and effective talent management practices were more likely to exhibit higher levels of exploratory innovation. (Lei et al., 2021) Exploratory innovation involves the creation of new products or processes that radically doesn't resemble the existing ones. It focuses on finding new market opportunities and developing new technologies. (Santoro and Usai, 2018). According to Calantone et al. (2002), knowledge-based HRM practices are positively related to exploratory innovation. They argue that recruitment and selection of employees with diverse backgrounds and skills can lead to the creation of new ideas. Compensation systems that reward creativity and risk-taking can motivate employees to engage in exploratory innovation. Finally, job design that provides autonomy and flexibility can facilitate the exploration of new ideas and technologies. (Calantone et al., 2002).

Hence, we propose the following based on above discussion:

H7: Exploratory Innovation mediates the relationship between Knowledge Based HRM Practices and Project Performance

2.5.8 Moderating Effect of Knowledge-Oriented Leadership Between Knowledge-Based HRM Practices and Exploitative Innovation

Knowledge-oriented leadership is a style of leadership that emphasizes the generation, sharing, and application of knowledge, which can positively influence organizational performance, particularly in knowledge-intensive environments. (Sadeghi and Rad, 2018) Knowledge-based HRM practices are HR practices that aim to improve employee knowledge, skills, abilities, and competencies, which can enhance the organization's knowledge base. (Singh et al., 2021).

Exploitative Innovation (ETI) is the process of improving existing products, services, or processes. Knowledge generation, transfer, storage, and application are

all aspects of knowledge-oriented leadership. Information-oriented leadership influences KM activities in technology-intensive enterprises (Bougoulia and Glykas, 2022)

The value of knowledge has recently been emphasized by numerous authors. According to Chaithanapat and Rakthin (2021), is crucial to a project's success since it enables businesses to make adjustments. Numerous studies in this field have concentrated on the idea of Knowledge-oriented leadership in recent years, particularly on how it affects various business processes, such as performance process related to the knowledge management (Donate and Guadamillas, 2015; Zia, 2020), success of the project (e.g. Latif et al. (2021), or operations that involve innovative practices (Soniewicki, 2021).

Since innovation is crucial for companies to adapt to changing conditions and to outperform rivals, an assessment of the impact of knowledge-oriented leadership on innovation performance (IP) through the intermediary function of information exchange was carried out. 2020; Gürlek and associates. The findings demonstrated that a critical prerequisite for the growth of innovation performance is the knowledge-oriented leadership's direct or indirect impact on unconscious and explicit information sharing behaviors (Le and Le, 2023).

The association between knowledge-based HRM practices and exploitative innovation is significantly influenced by the moderating effect of knowledge-oriented leadership. Mario and Fátima Guadamillas, 2015, donate Enhancing employee knowledge and abilities can result in increased performance and creativity, and this is the goal of knowledge-based HRM. Nevertheless, by fostering a culture of support that motivates staff members to share and use their expertise, knowledge-oriented leadership can magnify the effects and raise the bar for exploitative innovation Singh et al. (2021). The study by Wang and Noe (2010), which discovered that knowledge-oriented leadership in Chinese high-tech companies positively moderates the association between knowledge-based HRM practices and exploitative innovation, lends support to this.

An empirical examination of the relationships between knowledge-based HRM practices and their effect on the firm's innovation performance was the main objective of the study Singh et al. (2021). The results suggest that the association

between knowledge-based HRM practices and innovation performance is moderated by a set of knowledge-oriented leadership practices.

Although knowledge-based HRM practices are crucial for innovation purposes in and of them, when certain organizational conditions are effectively developed by managers, the firm's innovation capacity is greatly improved and more successfully utilized (Donate and Guadamillas, 2015).

Knowledge-oriented leadership also moderates the relationship between knowledge-based HRM practices and Exploitative innovation. Knowledge-based HRM practices can enhance employee knowledge, skills, and abilities, leading to higher levels of Exploitative innovation (Mariam et al., 2022).

However, Knowledge-oriented leadership can further amplify these effects by encouraging employees to explore new ideas, take risks, and experiment with new approaches.

The study by Xu et al. (2010), which discovered that knowledge-oriented leadership in Chinese manufacturing businesses positively moderates the association between knowledge-based HRM and exploitative innovation, lends support to this.

The importance of Knowledge-oriented leadership and learning in corporate innovation is highlighted in a study, which also offers an integrated framework for understanding this intricate business phenomenon. Managers need to be aware of the precise nature and internal and external sources of corporate innovation.

An "open or relational innovation framework" is suggested after external knowledge, networking, and connections are identified as important drivers of company technical innovation (Martín-de Castro et al., 2011).

Additionally, HRM practices have an impact on short-term project performance. This study provides light on the many roles that HRM practices play in a project, revealing that HRM practices enhance knowledge transfer from ongoing projects to those in the future as well as foster teamwork among project members. Knowledge-focused leadership directly and favorably affects the success of projects (Rehman and Iqbal, 2020).

Hence, we propose the following based on above discussion:

H8: Knowledge Oriented Leadership plays a moderating role between Knowledge Based HRM Practices and Exploitative Innovation in such a way that high Knowledge Oriented Leadership will strengthen the relationship between Knowledge-Based HRM Practices and Exploitative Innovation.

2.5.9 Moderating Effect of Knowledge-Oriented Leadership between Knowledge-Based HRM Practices and Exploratory Innovation

The relationship between knowledge-based HRM practices and exploratory innovation can be significantly influenced by the style of leadership within the organization. Knowledge-oriented leadership is proposed to moderate this relationship by enhancing the effectiveness of HRM practices in fostering an innovative climate (Carmeli et al., 2011). Knowledge-based HRM practices refer to the strategic deployment of HR activities that are designed to enhance the generation, sharing, and application of knowledge within an organization. These practices often include training and development, knowledge management systems, performance management, and participative decision-making. Studies indicate that these practices can significantly impact innovation capabilities by fostering an environment conducive to experimentation and learning (Zhang and Bartol, 2010).

Recent research by Obeidat et al. (2021) emphasizes that knowledge-oriented leadership can enhance the effectiveness of HRM practices by aligning organizational knowledge goals with innovative endeavors. Leaders who adopt a knowledge-oriented approach encourage an open exchange of ideas, promote experimentation, and are tolerant of failures.

The effectiveness of knowledge-based HRM practices in fostering exploratory innovation can be contingent upon the presence of knowledge-oriented leadership. This leadership style not only facilitates the appropriate dissemination and utilization of knowledge but also ensures that innovative efforts are aligned with strategic objectives. According to Cummings and Worley (2016), leaders who foster a knowledge-oriented culture can significantly enhance the organization's

capacity for innovation by moderating the relationship between HRM practices and innovation outcomes. Leaders are skilled in managing the tension between exploration and exploitation, enabling their organizations to better navigate the complexities of innovation (Bledow et al., 2009).

Recent empirical studies, such as those by Swart and Kinnie (2013), found that when leaders display strong knowledge-oriented behaviors, the impact of HRM practices on exploratory innovation is enhanced.

Hence, we propose the following based on above discussion:

H9: Knowledge- Oriented Leadership plays a moderating role between Knowledge-Based HRM Practices and Exploratory Innovation in such a way that high Knowledge Oriented Leadership will strengthen the relationship between Knowledge Based HRM Practices and Exploratory Innovation.

2.5.10 Moderated Mediation Effect of Knowledge-Oriented Leadership between Knowledge-Based HRM Practices Exploitative Innovation and Project Performance

Organizational knowledge is fundamental to knowledge-based HRM practices. These procedures include methods for hiring, developing, and training staff members with the goal of improving their knowledge, skills, and capacities. The potential for creativity and organizational knowledge are positively impacted by knowledge-based HRM practices. Jiang et al. (2019) Utilizing knowledge-based HRM practices greatly improves exploitative innovation in businesses (Liu et al., 2022).

Strong knowledge-oriented leadership enhances the connection between knowledge-based HRM practices and exploitative innovation, highlighting that competent leadership amplifies the impact of HRM strategies on innovative outcomes. Good leadership increases dedication, engagement, and knowledge-sharing behaviors among employees, which increases the efficacy of HRM programs designed to

promote innovation. (Wang and Noe, 2010) Project performance is directly affected by the Knowledge-oriented leadership. According to the findings of a study, Knowledge-oriented leadership has a dominant impact on the project success (Latif et al., 2021).

According to the hypothesis exploitative innovations' role as mediator between knowledge-based HRM practices and project performance is moderated by knowledge-oriented leadership. Studies by Liu et al. (2022) corroborate this idea, showing that innovative project success and knowledge sharing are enhanced by leadership characteristics that foster learning and creativity.

As mediators between knowledge-based HRM practices and project performance leadership behaviors that promote knowledge sharing, learning, and innovation affect the HRM practices on innovation and project success, the hypothesis suggests that knowledge-oriented leadership moderates the influence of exploitative innovations (Liu et al., 2022).

Hence, we propose the following based on above discussion:

H10: Knowledge Oriented Leadership moderates the positive indirect effect of Knowledge Based HRM practices on Project Performance; such that the indirect effect through Exploitative Innovation is stronger when Knowledge Oriented Leadership is high.

2.5.11 Moderated Mediation Effect of Knowledge Oriented Leadership between Knowledge Based HRM Practices, Exploratory Innovation and Project Performance

Knowledge-Based Organizational knowledge management techniques are greatly impacted by leadership. Effective information transfer is made possible by leadership fostering a culture of knowledge sharing, which improves organizational capacities and gives businesses a competitive edge. (Liu et al., 2022). Exploratory innovation is pushing the boundaries of technology and markets in order to bring about significant breakthroughs and extreme transformations. Innovations that

mediate the link between HRM practices and organizational performance outcomes exploratory (Liu et al., 2022).

The purpose of this study of the literature is to investigate how knowledge-oriented leadership influences the link between knowledge-based HRM practices and Exploratory innovation. It also includes pertinent citations to bolster its claims. Project performance is directly and favorably impacted by knowledge-oriented leadership (Rehman and Iqbal, 2020).

For a project to succeed Exploratory innovation is crucial. Businesses that engage in forms of innovation are more likely to succeed at a better level than those that concentrate on only one, claim (Laursen and Salter, 2006). Research has shown that the association between exploratory innovation and project performance is positive. Companies that focus on innovation tend to be more successful. (Laursen and Salter, 2006).

The effectiveness and success of project outcomes are gauged by project performance. It includes things like achieving project objectives, sticking to the budget, and satisfying stakeholders. The impact of HRM practices on project performance suggests that good project results are positively correlated with effective HRM tactics (Chen et al., 2021).

Several studies have explored aspects of this relationship. For example, A study by Christensen (2013) found that organizations with leaders who emphasize knowledge development see higher levels of innovation. Moreover, recent empirical research by Carmeli et al. (2011) supports the idea that the relationship between HRM practices and innovation can be significantly strengthened under certain types of leadership.

Hence, we propose the following based on above discussion:

H11: Knowledge oriented leadership moderates the positive indirect effect of Knowledge Based HRM practices on Project Performance; such that the indirect effect through Exploratory Innovation is stronger when Knowledge Oriented Leadership is high.

2.6 Research Model

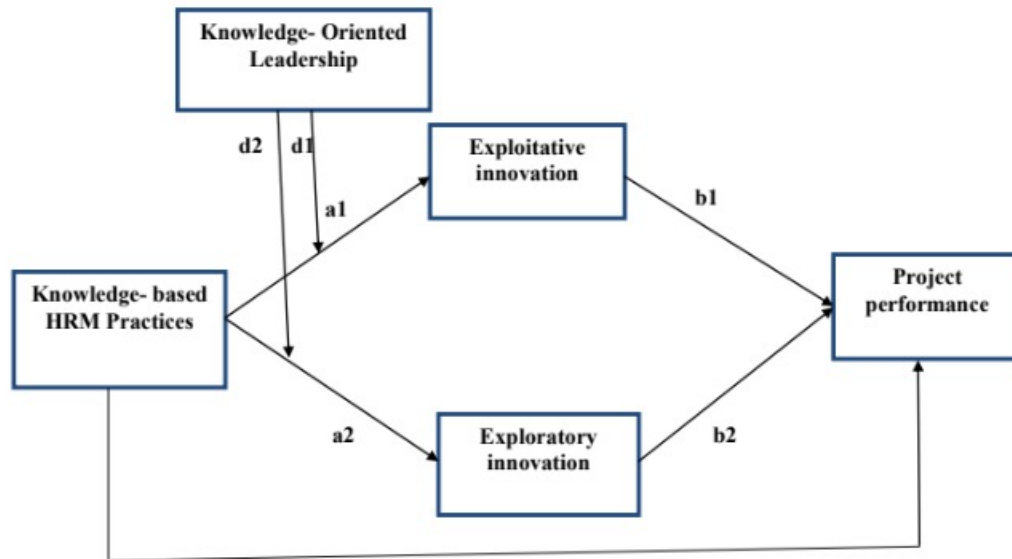


FIGURE 2.1: Research Model

2.7 Research Hypotheses

H1: Knowledge-Based HRM Practices have a positive impact on the project performance.

H2: Knowledge-Based HRM Practices have a positive impact on Exploitative Innovation

H3: Knowledge-Based HRM Practices have a positive impact on Exploratory Innovation.

H4: Exploitative Innovation has a positive impact on Project Performance.

H5: Exploratory Innovation has a positive impact on Project Performance.

H6: Exploitative Innovation mediates the relationship between Knowledge-Based HRM Practices and Project Performance.

H7: Exploratory Innovation mediates the relationship between Knowledge-Based HRM Practices and Project Performance.

H8: Knowledge- Oriented Leadership plays a moderating role between Knowledge-Based HRM Practices and Exploitative Innovation in such a way that high Knowledge-Oriented Leadership will strengthen the relationship between Knowledge-Based HRM Practices and Exploitative Innovation.

H9: Knowledge- Oriented Leadership plays a moderating role between Knowledge-Based HRM Practices and Exploratory Innovation in such a way that high Knowledge-Oriented Leadership will strengthen the relationship between Knowledge-Based HRM Practices and Exploratory Innovation

H10: Knowledge oriented leadership moderates the positive indirect effect of Knowledge Based HRM practices on Project Performance; such that the indirect effect through Exploitative Innovation is stronger when Knowledge Oriented Leadership is high.

H11: Knowledge Oriented Leadership moderates the positive indirect effect of Knowledge Based HRM practices on Project Performance; such that the indirect effect through Exploratory Innovation is stronger when Knowledge Oriented Leadership is high.

Chapter 3

Methodology

3.1 Introduction

One of the most important aspects of any research is how it approaches its aims. The selection of suitable techniques to analyze the data should be in accordance with the type of problem. By keeping in view the nature of research, research objective and theoretical problems, the application of this research is applied research.

Cross-sectional design has been selected for this research after analyzing the situational factors. On the basis of objective, this is explanatory type research. The inquiry mode used is quantitative in nature. Using questionnaires is the reliable way to get the response [Pieper et al. \(2021\)](#). In addition, the current study employs the "hypothetical deductive method" to empirically test and validate the relationships that have been suggested by or based on prior literature.

The methodological framework used in this study is adapted, to investigate the relationship between knowledge-based HRM Practices and Project Performance, with exploitative innovation and exploratory innovation acting as a mediator and knowledge-oriented leadership as a moderator between the mediating variables. In this methodology section, we discussed the research design, population, sample, measurements of variables, tools for data analysis, and all the data collection methods.

3.1.1 Research Philosophy

The Research Philosophy, which was used in this study, is a positivism research philosophy as the most suitable methodology. This philosophy assumes that reality exists independently of the observer and can be understood through systematic observation and experimentation.

Positive research philosophy is characterized by an empirical approach that aims to uncover objective truths through systematic observation and measurement of phenomena (Smith, 2010).

3.1.2 Research Design

According to (Sutton et al., 2017), the primary method for testing the theory is the 'research design'. The data for the current study was collected from information technology IT projects based organizations in the major cities of Pakistan, i.e. Islamabad, and Rawalpindi and analyzed using the quantitative method to answer the study's objective and research questions.

3.1.3 Type of Study

This is an explanatory research study. According to Creswell and Creswell (2017), Explanatory research, also known as causal research, is designed to explore and explain the relationships between variables, often to understand the cause-and-effect dynamics within a given scenario.

The study assesses the influence of "knowledge-based HRM Practices" on "Project Performance," taking into account the moderating role of "knowledge-oriented leadership" and the mediation of "exploitative and exploratory innovation."

3.1.4 Study Setting

The participants of this study were the employees working in IT project-based organizations in Islamabad and Rawalpindi. They filled out the questionnaires in their work settings.

3.2 Population and Sample

Set of individual, group or complete team under the interest of the researcher for collection of data is known to be population of the research. Every day different project are being initiated in the Pakistan but for the present study we are just focusing on IT projects that are initiated in Rawalpindi and Islamabad. For an explanatory study, a larger sample size may be appropriate to provide more statistical power and precision in detecting relationships between variables. According to [Vasileiou et al. \(2018\)](#), suggests that a sample size of 392 may be sufficient to reach saturation and provide a comprehensive understanding of the phenomenon of interest.

The survey has to be sent via email and Google Forms, so individual responses to the survey were distributed to 450 people from different organizations. As a result, 392 responses were recorded since it would be laborious to gather data from the entire population; we chose a sample that is representative of the entire population. In other words, according to [Hair et al. \(2006\)](#), the sample is a subset of the population. Employees working in IT project-based organizations in major cities of Pakistan like Islamabad and Rawalpindi and a questionnaire were given to them. In this study, the survey method was the technique we used to collect the data. Unlike other methods, it is a simple technique because it collects data from a lot of people at once. This technique is frequently used in research studies to extrapolate the findings to the entire population. Due to our limited time and resources, we decided to use this method for our research.

3.2.1 Sampling Technique

The data for this study was collected using convenient sampling Technique. The sample size was 392 for this study. The targeted sector for this study was the Information Technology Companies in Islamabad and Rawalpindi working on different projects as per their domain expertise. Only the projects carried out in IT companies are considered for this study. For data collection, survey questionnaires were distributed . All the items for the variables: “knowledge-based HRM practices, Project Performance, Knowledge-oriented leadership, Exploitative innovation and

exploratory innovation”, were filled in by the employees and supervisors working in the IT project-based organizations only.

3.3 Measurements

Data were gathered using a 5-point Likert scale by the researcher. The introduction of a 5-point Likert-type scale increased both response quantity and quality. Respondents’ ”frustration level” is lowered as a result. The researchers strongly recommended using a 5-point Likert scale, which ranges from ”strongly agree” to ”strongly disagree,” to reduce the annoyance of patient respondents and increase the rate and quality of answer [Zheng \(2022\)](#); [KILIÇ et al. \(2021\)](#).

Respondents must rate each item on a 5-point Likert scale (1 = Strongly disagree, 2 = Disagree, 3 = Neutral, 4 = Agree, and 5 = Strongly Agree).

3.3.1 Knowledge-Based HRM Practices

The ground-breaking work by [Kianto et al. \(2017\)](#) served as the basis for the scale for knowledge-based HRM practise. The scale had four components, totaling 13 items.

The scale asked candidates to respond to statements like, ”When recruiting, we pay special attention to candidates’ learning and development capabilities; our company rewards employees for creating knowledge.”

3.3.2 Innovation (Exploitative/Exploratory)

Twelve questions that were modified from [Limaj and Bernroider \(2019\)](#) research were utilized in this study to assess two distinct types of innovation. Examples of six of these items used to measure Exploitative innovation include ”our firm introduces improved but existing products and services for our local market” and six of these items used to measure exploratory innovation include ”our firm accepts demands that go beyond existing products and services.

3.3.3 Knowledge-Oriented Leadership

Items derived from [Donate and Guadamillas \(2015\)](#) work was used to gauge knowledge-oriented leadership. An example would read, "Managers encourage the acquisition of external knowledge, managers reward employees who share and apply their knowledge," etc.

3.3.4 Project Performance (PP)

Project performance was evaluated using a quick scale developed by ([Aladwani, 2002](#)) seven components were looked at based on the literature analysis. According to seven statements about their recently finished project, respondents are asked to rate how strongly they agree or disagree: operational efficiency, compliance to timetables, compliance to expenditures, amount of work produced, quality of work produced, effectiveness of interactions with consultants, and ability to meet goals [Xu et al. \(2010\)](#).

Chapter 4

Results

4.1 Techniques for Data Analysis

The data from 392 respondents has been gathered and evaluated with the use of the SPSS statistical software package. The following are the processes that were taken in order to perform the analysis:

1. Only replies that were completely finished were taken into consideration; the rest of the answers were unconsidered.
2. Each variable was coded individually for the purposes of the study.
3. In order to establish tables for the stated demographics, the frequency of samples was determined.
4. Means for all variables have been calculated.
5. Each variable's Cronbach alpha was obtained using reliability analysis, to check the reliability of the data.
6. Correlation analysis has been used to determine the relative importance of the variables. Regression analysis was done using the Hayes process macro In order to determine if a hypothesis is accepted or rejected, we have employed the Hayes process macro.
7. Hayes process macro used for additional mediation and moderation analysis.

8. The Model number 4 is selected in order to do mediation and model 7 Moderation analyses through the Hayes process macro.

4.2 Data Screening

The data considered for cleaning and missing values.

4.2.1 Data Cleaning

Data analyzed after collection to detect missing values, outliers, and normalcy, as advised by the researchers [Hair et al. \(2006\)](#). According to these experts, cleaning the data is critical for the precision of the results. As a result, this study also included data cleansing.

4.2.2 Missing Values

When a respondent willingly or unwillingly withholds the necessary information, missing values occur. This problem is frequent, especially in research that relies on surveys. Therefore, the missing value problem was also taken into account in this study. The findings in the table show that, luckily, no missing value occurred.

4.3 Demographic Data Result

During this study, questions about age, gender, qualification and experience were separated into separate parts in the questionnaire. People in the Project Based IT companies from the major cities of Islamabad and Rawalpindi participated in this study. The following is a list of more detailed sample characteristics:

4.3.1 Respondents by Gender

Gender is a key determinant of the separation of male and female representation in society. As a result, it is included in the survey's demographic data. This

study had a total of 2 gender brackets, female and male, to determine the gender of respondents. The findings of the study indicated that the dominant group in gender are the males who accounted for 204 (52%) and females accounted for 188 (48%). The findings of the study showed gender disparities (See table 4.1, Figure 4.1).

TABLE 4.1: Gender of Respondents

	Frequency	Percent	Valid Percent	Cumulative Percent
Female	188	48	48	48
Male	204	52	52	100
Total	392	100	100	

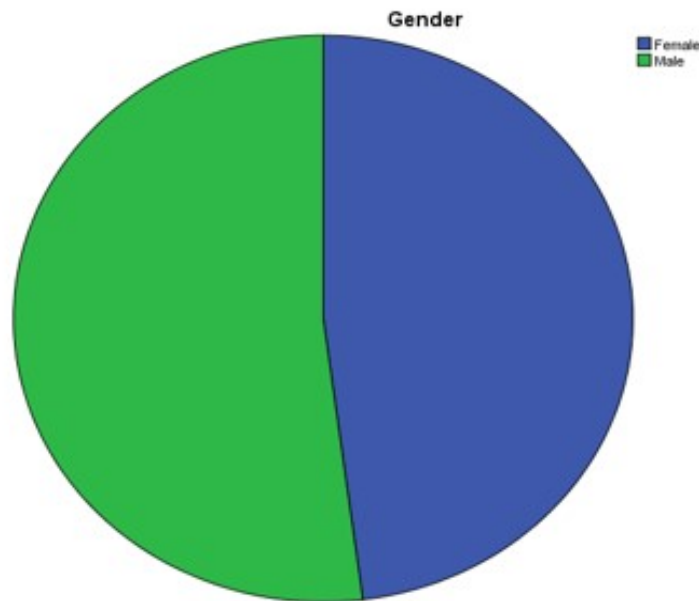


FIGURE 4.1: Gender of Respondents

4.3.2 Respondent's Age

The age of the respondents was an important consideration while compiling the demographic data in the survey. This study had a total of 5 age brackets: 18-25 years, 26-33 years, 34-41 years, 42-49 years and above 50 years. The researcher's findings on age revealed that 27.6% of the participants are aged between 18-25, 34.2% from 26-33, 17.3% from 34-41, 14.3% from 42-49 and just 6.6% aged 50 and above (See table 4.2, Figure 4.2)

TABLE 4.2: Age of Respondents

	Frequency	Percent	Valid Percent	Cumulative Percent
18 - 25	108	27.6	27.6	27.6
26 - 33	134	34.2	34.2	61.7
34 - 41	68	17.3	17.3	79.1
42 - 49	56	14.3	14.3	93.4
50 and Above	26	6.6	6.6	100
Total	392	100	100	

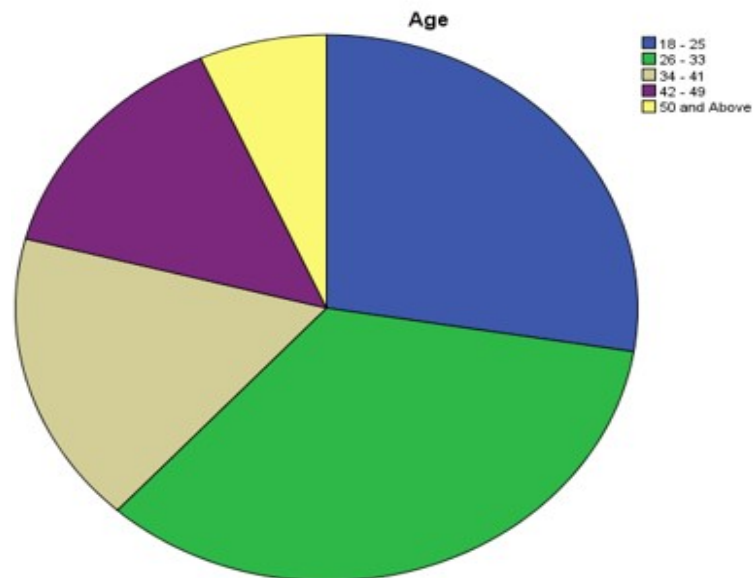


FIGURE 4.2: Age of Respondents

4.3.3 Respondent's Qualification

A qualification is an attribute, quality, or talent that qualifies someone for a job or task. So it's in the demographics section. Table 3 indicates the respondents' educational background, with 31.6% having a Matric, 2.3% having an FA/FSc, 22.7% having a Bachelor's degree. 31.6% Master level. There were 28.8% MS/M.Phil degree holders. However, there were 13.5% PhD respondents (See table 4.3, Figure 4.3).

TABLE 4.3: Qualification of Respondents

	Frequency	Percent	Valid cent	Per- cent	Cumulative Percent
Metric	4	1	1		57.7
FA/FSC	9	2.3	2.3		25
Bachelor	89	22.7	22.7		22.7
Master	124	31.6	31.6		56.6
MS / M.Phil	113	28.8	28.8		86.5
PhD	53	13.5	13.5		100
Total	392	100	100		

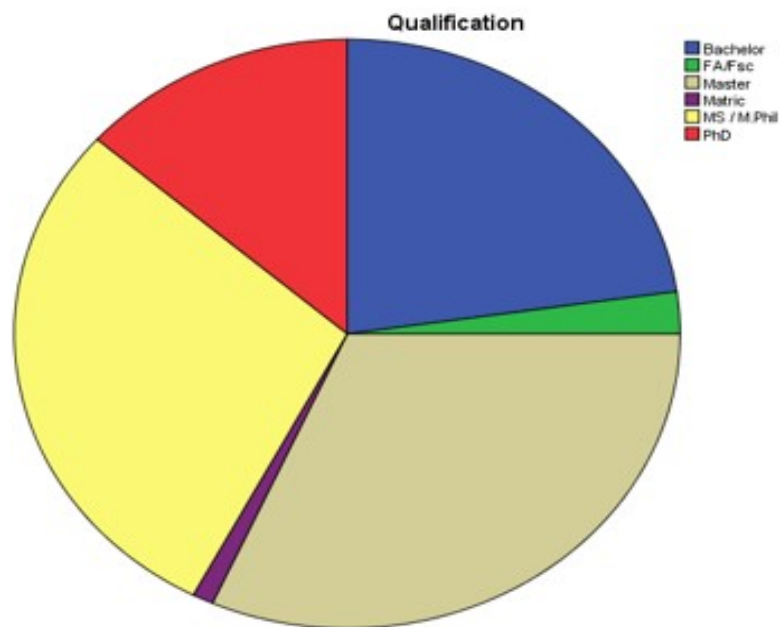


FIGURE 4.3: Qualifications of Respondents

4.3.4 Respondent's Experience

Experience is an efficient demographic since it correlates to both Knowledge based HRM Practices (knowledge-based HRM) and Project Performance (PP). Out of 392 responders, 146 (37.2%) were 5 years or less then. There were 142 respondents 6 to 13 years with a rate of 36.2%. The experience goes from 14 to 21 and has a 62 frequency. The experience ranged from 22 to 29 was 4.6%. There were 13 respondents with over 30 years of experience is 6.1% (See table 4.4, Figure 4.4).

TABLE 4.4: Experience of Respondents

	Frequency	Percent	Valid Percent	Cumulative Percent
30-Above	24	6.1	6.1	26.5
22-29	18	4.6	4.6	20.4
14-21	62	15.8	15.8	15.8
Jun-13	142	36.2	36.2	100
5 and Less	146	37.2	37.2	63.8
Total	392	100	100	

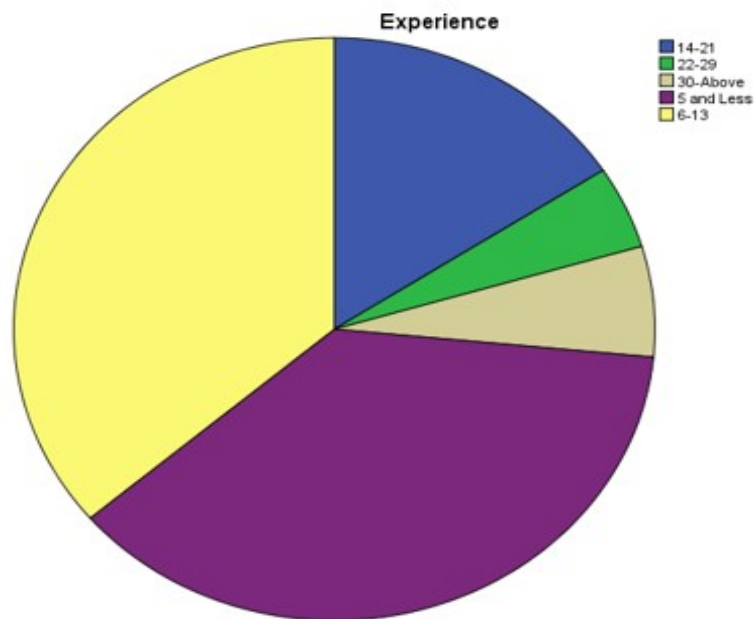


FIGURE 4.4: Experience of Respondents

4.4 Reliability of Scale

Reliability is one of the prerequisites for validity and was defined by [Walsh and Betz \(1995\)](#) as the correlation of items. Methods for evaluating reliability include internal consistency, test-retest reliability, inter-rater reliability, and split half reliability. To examine the internal consistency of instruments, composite reliability is utilized.

Reliability is tested using Cronbach's alpha method ([Hair et al., 2019](#)). Cronbach's alpha should be greater than 0.7 if the scale items are less than 10.

TABLE 4.5: Exhibit Reliability Values

Variables	Items	Cronbach's alpha(α)
Exploitative Innovation	6	0.83
Exploratory Innovation	6	0.84
knowledge-based HRM	13	0.91
Knowledge Oriented Leadership	6	0.80
Project Performance	8	0.84

For Exploitative Innovation, Cronbach's alpha is 0.83, which is greater than 0.7. A Cronbach's alpha of 0.83 is quite high and suggests a strong level of internal consistency.

For Exploratory innovation, Cronbach's alpha is 0.84, which is greater than 0.7. A Cronbach's alpha of 0.84 is quite high and suggests a strong level of internal consistency.

For knowledge-based HRM Practices, the CA is 0.91, which is greater than 0.7. A Cronbach's alpha of 0.91 is quite high and suggests a strong level of internal consistency.

For Knowledge-oriented leadership, the Cronbach's alpha is 0.80, which is greater than 0.7. A Cronbach's alpha of 0.80 is quite high and suggests a strong level of internal consistency.

For Project Performance, Cronbach's alpha is 0.84, which is greater than 0.7. A Cronbach's alpha of 0.84 is quite high and suggests a strong level of internal consistency.

4.5 Descriptive Statistics

The Descriptive statistics give us all of the pertinent information about the data that we have collected. Its species the mean, the median, the upper and lower

limit, the standard deviation (SD), and the number of questionnaires utilized in the study.

The mean or a central data value can also be referred to as "average" in this context. The mean values indicate whether or not the respondent concurs with the study's findings regarding agreements and discrepancies. A tendency for respondents to strongly agree is indicated by higher mean values, whereas a tendency for respondents to strongly disagree is indicated by lower mean values. The standard deviation (SD) is a calculated statistic that indicates how far the data is distributed or congregated around the mean of the distribution. The standard deviation, as the name implies, refers to the number of responses that deviate from their mean values.

A descriptive description of the answers is provided in tabular format. The basic data from all variables, including Knowledge Based HRM Practices, Knowledge Oriented Leadership, Exploitative Innovation, Exploratory Innovation and Project Performance are presented in table 4.6.

TABLE 4.6: Descriptive Statistics

	Min.	Max.	Mean	Std. Deviation
Exploitative Innovation	1.00	5.00	4.3321	.49557
Exploratory Innovation	1.00	5.00	4.3214	.49808
Knowledge Based HRM Practices	1.00	5.00	4.3758	.45163
Knowledge Oriented Leadership	1.00	5.00	4.3759	.44076
Project Performance	1.00	5.00	4.4162	.43690
N= 392				

A five-point scale's minimum and maximum values may be found in Table 6, which also contains the minimum, maximum, mean and Std. Deviation for the entire sample.

The above details indicate that there are 392 participants in the sample and that the average amount of Knowledge Based HRM Practices in the table is 4.3758 the maximum value is 5.00, the minimum value is 1.31, and standard deviation is 0.45163 which indicates that the employees agree that Knowledge Based HRM Practice has an impact on the Project Performance of IT project employees. Here, the mean of PP is 4.4162 and the standard deviation is 0.43690

Whereas the Exploitative Innovation have a mean value 4.3321, a minimum value of 1.33, a maximum value of 5.00, and a std. Deviation of 0.49557; this indicates that exploitative innovation has an impact on the project performance, as demonstrated by the data.

Meanwhile, the Exploratory Innovation has a mean value 4.3214, a minimum value of 1.00, a maximum value of 5.00, and a std. Deviation of 0.49808; this indicates that exploratory innovation has an impact on the project performance, as demonstrated by the data.

On the other hand, the mean value of Knowledge Oriented Leadership in the table was 4.3759, minimum value is 1.00, the maximum is 5 and Std. Deviation is 0.44076 means that employees agree Knowledge Oriented Leadership affects the project performance.

4.6 Correlation Analysis

Correlation is a statistical technique that is used to determine the connection between two different variables. The purpose of this study is to examine the relationship between the Knowledge based HRM Practices and the Project Performance, with the Exploitative and Exploratory Innovation as mediating effect and the Knowledge Oriented Leadership as a moderator. The correlation takes into account the variation across arrangements, regardless of whether they change at the same time or not.

Correlation analysis is determining the significance and severity of a relationship using Pearson correlation values. A value of -1.0 to +1.0 is assigned to the Pearson correlation coefficient, if the result is close to zero; there is likely no relationship

between the variables. When the value is higher than zero, there is a strong and positive relationship between the variables, suggesting that both are moving in the same direction and that a significant increase in one variable resulted in a significant increase in the other. The negative value sign implies that constructs move in the opposite direction of each other; this suggests that variables have indirect interactions with one another

TABLE 4.7: Correlations

	ETI	ERI	KHRM Practices	KOL	PP
ETI	1				
ERI	.805**	1			
KHRM Practices	.794**	.840**	1		
KOL	.742**	.775**	.831**	1	
PP	.672**	.764**	.783**	.817**	1

**Correlation is significant at the 0.01 level (2-tailed).

The table 11 have shown correlative findings of association between Knowledge Based HRM Practices and Knowledge Oriented Leadership as $r = 0.831$ at $p < 0.01$, and is positive and significant.

Knowledge Based HRM Practices as $r = 0.794$ at $p < 0.01$, have a positive and strong relationship with Exploitative Innovation. Similarly, Knowledge Based HRM Practices as $r = 0.840$ at $p < 0.01$, have a positive and strong relationship with Exploratory Innovation.

Knowledge Based HRM Practice with Project Performance have positive, significant relationship as $r = 0.783$ at $p < 0.01$. Project Performance has strong, significant and positive relationship with Exploitative Innovation as $r = 0.672$ at $p < 0.01$.

Meanwhile, Project Performance has strong, significant and positive relationship with Exploratory Innovation as $r = 0.764$ at $p < 0.01$.

And another hypothesis is accepted: Whereas Project Performance with Knowledge-oriented leadership is also significant and positive as $r = 0.817^{**atp} < 0.01$. Likely, Exploitative Innovation with Exploratory Innovation is significant and positive as $r = 0.805 * *atp < 0.01$. Meanwhile, Exploitative innovation and Knowledge Oriented Leadership are significant and positive as $r = 0.742^{**atp} < 0.01$.

Furthermore, Exploratory Innovation and Knowledge Oriented Leadership are significant and positive as $r = 0.775^{**atp} < 0.01$. After finding the correlation among all the variables, it is concluded that all are positively correlated and significant.

Hence, it implies that as one variable increases, the other variable tends to increase as well, and the strength of the relationship is substantial

4.7 Regression Analysis

To determine the causal relations between variables, I did a regression analysis. Through this analysis, I come to know how often the independent variable changes the dependent variable. For testing the theoretical relationship between variables, I have used PROCESS Macro by Andrew F. Hayes 2023. For the evaluation of mediation between Knowledge Based HRM Practices (IV) and Project Performance of project-based IT company's employees (DV), I used PROCESS Macro by Andrew F. Hayes 2023 model 4 in SPSS and for moderation we used model 7.

4.7.1 Direct Effect of Knowledge Based HRM Practices on Project Performance

In the first step the relationship between the Knowledge Based HRM Practices on Project Performance is considered, this is known as the path "c" in my case this is the direct effect Knowledge Based HRM Practices on Project Performance.

Table given below the variable of Knowledge Based HRM Practices is denoted by alphabet "X" and Project Performance is denoted by alphabet "Y"

Results show that p-value is 0.000 which is less than 0.05; hence we say that there is a significant relation between knowledge-based HRM and Project Performance.

TABLE 4.8: Direct Effect of X on Y

Predictor	Effect	SE	t	p	LLCI	ULCI
X to Y	0.5132	0.0750	6.8415	0.0000	0.3657	0.6606

Furthermore, the beta value is positive which indicates the positive relationship between knowledge-based HRM and Project Performance. hence, the hypothesis 1 is accepted, which is stated as below

H1: Knowledge-Based HRM Practices have positive impact on the project performance.

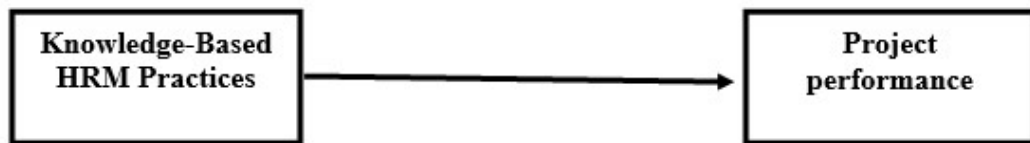


FIGURE 4.5: Direct Effect of X on Y

4.7.2 Mediation Analysis of Exploitative Innovation

Mediation testing is used to determine whether or not the mediator mediates the relationship between the independent and dependent variables. Knowledge Based HRM Practices (IV) is used as an independent variable (X), Project Performance as a dependent variable (Y), and Exploitative Innovation as a mediator (M) in the proposed study. In order to perform a mediation analysis, we looked at the following relationships: the impact of knowledge-based HRM (X) on the Exploitative innovation (M) path a; the impact of Exploitative innovation (M) on the PP (Y) path b and the indirect effect of knowledge-based HRM (X) through mediator (M) on dependent PP (Y).

TABLE 4.9: Direct Effect

Predictor	Effect	SE	t	p	LLCI	ULCI
X to M1	0.8716	0.0338	25.8180	0.0000	0.8052	0.9379

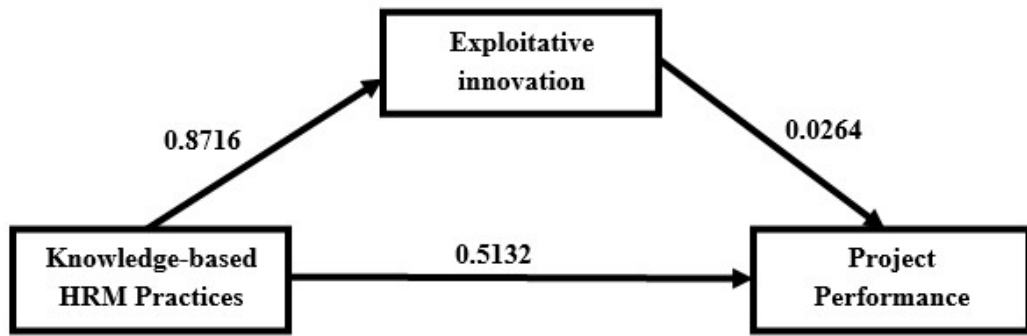


FIGURE 4.6: Mediation Analysis

Table 4.9 demonstrates that Knowledge based HRM Practices independent variable (X) to Exploitative Innovation (ETI) mediator (M1) has a value of 0.8716, which indicates that Knowledge based HRM Practices has a positive impact on Exploitative Innovation (ETI) and is significant as the p-value is less than 0.001. Therefore, the hypothesis is accepted, which

H2: Knowledge-Based HRM Practices have positive impact on Exploitative Innovation



FIGURE 4.7: Direct Effect of X on M1

TABLE 4.10: Direct Effect

Predictor	Effect	SE	t	p	LLCI	ULCI
M1 to Y	0.0264	0.0487	6.5430	0.0000	0.0692	0.1221
PP	.672**	.764**	.783**	.817**	1	

Additionally, Table 4.10 states that the Exploitative Innovation (ETI) influences Project Performance (path b) favorably, with a beta value of 0.0264 indicating significance at the p value less than 0.001. Since there is a strong and positive relationship between Exploitative Innovation (ETI) (M) and Project Performance

(Y), this effect shows that our hypothesis is supported by results. Therefore, the hypothesis is accepted, which is as follows:

H4: Exploitative Innovation has positive impact on Project Performance.

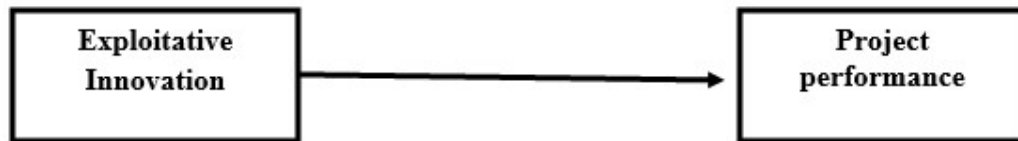


FIGURE 4.8: Direct effect of M1 on Y

4.7.3 Indirect Effect

The indirect effect signifies the connection between the independent variable (IV) and dependent variable (DV) in the presence of a mediator variable. This is illustrated in Table where the IV is KBHRM Practices, DV is PP, and the mediator variable is ETI. With the mediator considered, the computed indirect effect is 0.0230

TABLE 4.11: Indirect Effects

Predictor	Effect	BootSE	BootLLCI	BootULCI	LLCI	ULCI
Exploitative Innovation	0.0230	0.0663	0.0986	0.1618	0.0692	0.1221

The indirect effect (Path a*path b) is also positive and significant as beta value 0.0230 and bootstrap lower limit 95% confidence interval is 0.0986 bootstrap upper limit 95% confidence interval is 0.1618, where p-value indicates that it's significant. Bootstrap limits have the same signs as there is no zero between these, so the indirect effect is significant. So, the hypothesis is accepted and here is mediation as direct and indirect, also both are significant that states;

H6: Exploitative Innovation mediates the relationship between Knowledge-Based HRM Practices and Project Performance

4.7.4 Mediating effect of Exploratory Innovation

For the evaluation of mediation between Knowledge Based HRM Practices (IV) and Project Performance of project based IT companies employees (DV), we used PROCESS Macro by Andrew F. Hayes 2023 in SPSS. Mediation testing is used to determine whether or not the mediator mediates the relationship between the independent and dependent variables. Knowledge Based HRM Practices (IV) is used as an independent variable (X), Project Performance as a dependent variable (Y), and Exploratory Innovation a mediator (M2) in the proposed study.

In order to perform a mediation analysis, we looked at the following relationships: the impact of knowledge-based HRM (X) on the exploratory innovation (M2) path a; the impact of exploratory innovation (M) on the PP (Y) path b; the direct effect of knowledge-based HRM (X) on the PP (Y) path c; the combined effect of knowledge-based HRM (X) on the PP (Y) path c; and the indirect effect of knowledge-based HRM (X) through mediator (M) on dependent PP (Y)

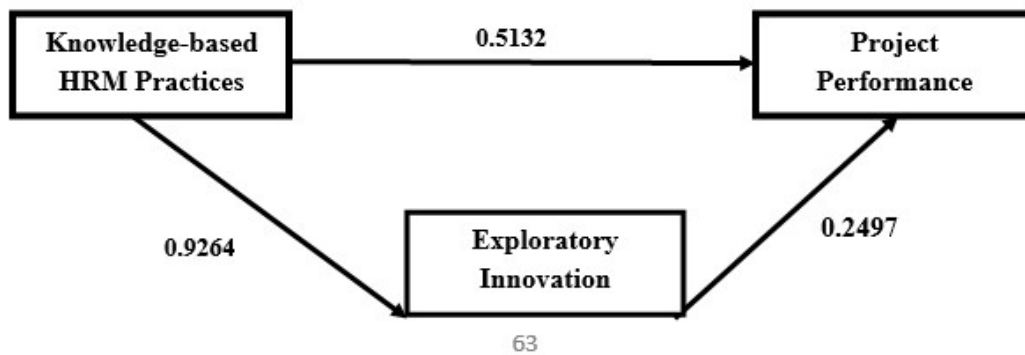


FIGURE 4.9: Mediation Analyses II

TABLE 4.12: Direct Effect

Predictor	Effect	SE	t	p	LLCI	ULCI
X to M2	0.9264	0.0303	30.5784	0.0000	0.8668	0.9860

Table 4.12 demonstrates that Knowledge based HRM Practices independent variable (X) to Exploratory Innovation mediator (M2) has a value of 0.9264, which

indicates that Knowledge based HRM Practices has a positive impact on Exploratory Innovation and is significant as the p-value is less than 0.001. Consequently, hypothesis accepted, which states that,

H3: Knowledge-Based HRM Practices have positive impact on Exploratory Innovation



FIGURE 4.10: Direct effect of X on M2

TABLE 4.13: Direct Effect

Predictor	Effect	SE	t	p	LLCI	ULCI
M2 to Y	0.2497	0.0542	4.6055	0.0000	0.1431	0.3563

Additionally, Table 4.13 states that the Exploratory Innovation (ERI) influences Project Performance (path b) favorably, with a beta value of 0.2497 indicating significance at the p value less than 0.001. Since there is a strong and positive relationship between Exploratory Innovation (ERI) (M2) and Project Performance (Y), this effect shows that our hypothesis is supported by results.

H5: Exploratory Innovation has positive impact on Project Performance

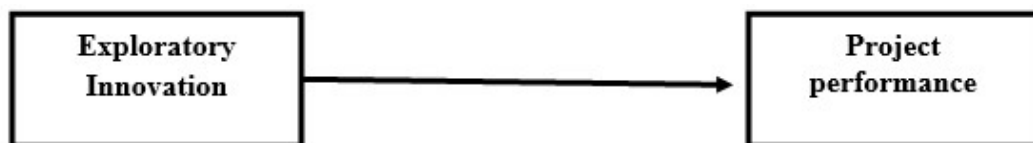


FIGURE 4.11: Direct effect of M2 on Y

4.7.5 Indirect Effect

The indirect effect signifies the connection between the independent variable (IV) and dependent variable (DV) in the presence of a mediator variable. This is

illustrated in Table where the IV is KBHRM Practices, DV is PP, and the mediator variable is ERI. With the mediator considered, the computed indirect effect is 0.2313.

TABLE 4.14: Indirect Effect

Predictor	Effect	BootSE	BootLLCI	BootULCI	LLCI	ULCI
ERI	0.2313	0.0764	0.0777	0.3843	0.1431	0.3563

The indirect effect (Path a*path b) is also positive and significant as beta value 0.2313 bootstrap lower limit 95% confidence interval is 0.0777 bootstrap upper limit 95% confidence interval is 0.3843 Results showed that the total effect of Knowledge based HRM Practice on Project Performance is positively associated and significant with having a beta value of $0.0000p < 0.001$ where p -value indicates that it's significant.

Bootstrap limits have the same signs as there is no zero between these, so the indirect effect is significant. So, the hypothesis is accepted and here is mediation as direct and indirect, also both are significant that states;

H7: Exploratory Innovation mediates the relationship between Knowledge Based HRM Practices and Project Performance

4.8 Moderating Effect of Knowledge Oriented Leadership

To determine the impact of the moderator Knowledge-oriented leadership (V) between knowledge-based HRM and Exploitative innovation, we carried out model 7 through PROCESS macros in SPSS. It is conducted to verify the moderator (V) effect, i.e., that the independent variable (X) and the mediating variable

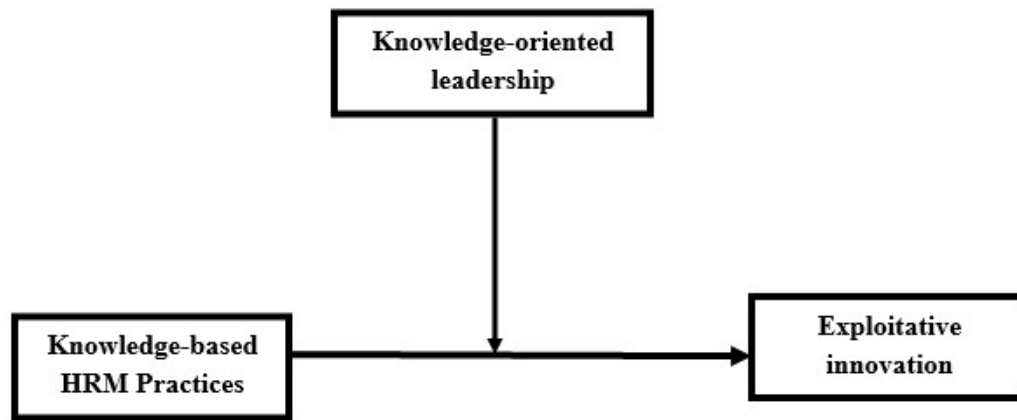


FIGURE 4.12: Moderation Analysis I

TABLE 4.15: Moderation Analysis I

	β	Se	T	p	LLCI	ULCI
Int-term 1	-0.0358	0.0295	-1.2140	0.2255	-0.0937	0.0222

Coefficient of unstandardized regression is mentioned. N=392,
 $*p < 0.05$; $**p < 0.01$; $***p < 0.001$, LLCI & ULCI = 95%.

4.8.1 Moderation Analysis I

In Table 4.15, Results from the table revealed that the knowledge-oriented leadership (KOL) does not moderates the connection as indicated by the interaction effect =b-0.0358 There is moderation exists but in opposite way. The findings demonstrated that knowledge-oriented leadership (KOL) does not moderate relationships of Knowledge based HRM Practices and Exploitative Innovation.. For instance, when knowledge-oriented leadership (KOL) is high, the association between Knowledge based HRM Practices and Exploitative Innovation will be high in negative way. Therefore, hypothesis as indicated in the table is not supported as we proposed in this study.

H8:Knowledge- Oriented Leadership plays a moderating role between Knowledge-Based HRM Practices and Exploitative Innovation in such a way that high Knowledge- Oriented Leadership will strengthen the relationship between Knowledge-Based HRM Practices and Exploitative Innovation.

4.8.2 Moderation Analyses II

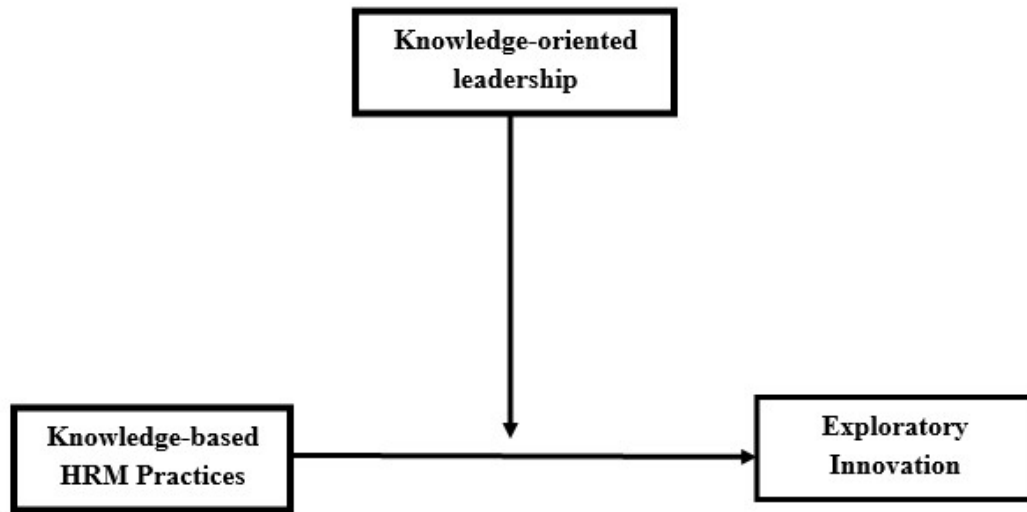


FIGURE 4.13: Moderation Analysis II

TABLE 4.16: Moderation Analysis II

	β	Se	T	p	LLCI	ULCI
Int-term 1	0.0360	0.0264	-1.3665	0.1726	-0.0878	0.0158

Coefficient of unstandardized regression is mentioned. N=392,
 $*p < 0.05$; $**p < 0.01$; $***p < 0.001$, LLCI & ULCI = 95%.

In Table, beta value is 0.0360 and p value is not significant. Findings shows that knowledge-oriented leadership does not moderate the relationship between Knowledge based HRM Practices and Exploratory Innovation.

Therefore, Hypothesis is not supported as we proposed in our study.

H9: Knowledge- Oriented Leadership plays a moderating role between Knowledge-Based HRM Practices and Exploratory Innovation in such a way that high Knowledge- Oriented Leadership will strengthen the relationship between Knowledge-Based HRM Practices and Exploratory Innovation.

4.9 Moderated Mediation

We test the role of Knowledge- Oriented Leadership is moderating the indirect effect or not. This is assessed by the index moderated mediation value.

4.9.1 Moderated Mediation Effect I

Knowledge – BasedHRM > ExploitativeInnovation > ProjectPerformance

TABLE 4.17: Moderated Mediation Effect I

Index of Moderated Mediation				
	Index	BootSE	BootLLCI	BootULCI
Knowledge- Orient leadership	-.0009	.0075	-.0207	.0108

Table 17 demonstrates the moderated mediation role Knowledge-Oriented Leadership (KOL) through mediator (M) Exploitative innovation (ETI) on dependent variable (Y) Project Performance (PP) under the Knowledge-based HRM (X). The results show that Knowledge-Oriented Leadership (KOL) is moderating this relationship but in opposite direction. Negative value shows that it's weakening the relationship between them. As the index of moderated mediation is -.0009, 95% CI= LLCI (-.0207) and ULCI (.0108).Therefore, the hypothesis is not supported

H10: Knowledge-Oriented Leadership moderates the mediation effect of Exploitative Innovation on the relationship between Knowledge-Oriented Leadership and project performance.

4.9.2 Moderated Mediation Effect II

Knowledge – BasedHRM > Exploratoryinnovation > ProjectPerformance

Table 18 demonstrates the moderated mediation role Knowledge-Oriented Leadership (KOL) through mediator (M) Exploratory innovation (ERI) on dependent variable (Y) Project Performance (PP) under the Knowledge-based HRM (X).

TABLE 4.18: Moderated Mediation Effect II

Index of Moderated Mediation				
	Index	BootSE	BootLLCI	BootULCI
Knowledge-oriented leadership	.0090	-.0164	-.0573	-.0158

The results show that Knowledge-Oriented Leadership (KOL) is moderating this relationship but in opposite direction. Negative value shows that it's weakening the relationship between them. As the index of moderated mediation is .0090, 95% CI= LLCI (-.0573) and ULCI (-.0158) Therefore, the hypothesis is not supported

H11: Knowledge-Oriented Leadership moderates the mediation effect of Exploratory Innovation on the relationship between Knowledge-Oriented Leadership and project performance.

TABLE 4.19: Summary of Hypotheses

Sr. No.	Hypotheses Statements	Results
H1	Knowledge-Based HRM Practices have positive impact on the project performance.	Supported
H2	Knowledge-Based HRM Practices have positive impact on Exploitative Innovation	Supported
H3	Knowledge-Based HRM Practices have positive impact on Exploratory Innovation.	Supported
H4	Exploitative Innovation has positive impact on Project Performance.	Supported
H5	Exploratory Innovation has positive impact on Project Performance.	Supported
H6	Exploitative Innovation mediates the relationship between Knowledge-Based HRM Practices and Project Performance.	Supported
H7	Exploratory Innovation mediates the relationship between Knowledge-Based HRM Practices and Project Performance	Supported
H8	Knowledge- Oriented Leadership plays a moderating role between Knowledge-Based HRM Practices and Exploitative Innovation in such a way that high Knowledge- Oriented Leadership will strengthen the relationship between Knowledge-Based HRM Practices and Exploitative Innovation.	Not Supported
H9	Knowledge- Oriented Leadership plays a moderating role between Knowledge-Based HRM Practices and Exploratory Innovation in such a way that high Knowledge- Oriented Leadership will strengthen the relationship between Knowledge-Based HRM Practices and Exploratory Innovation	Not Supported
H10	Knowledge Oriented Leadership moderates the positive indirect effect of Knowledge Based HRM practices on Project Performance; such that the indirect effect through Exploitative Innovation is stronger when Knowledge Oriented Leadership is high.	Not Supported
H11	Knowledge oriented leadership moderates the positive indirect effect of Knowledge Based HRM practices on Project Performance; such that the indirect effect through Exploratory Innovation is stronger when Knowledge Oriented Leadership is high.	Not Supported

Chapter 5

Discussion and Conclusion

This chapter contains justifications for hypothesized relationships. The implications for the project performance in IT project-based companies and their knowledge based HRM practices and innovative behavior under the supervision of knowledge oriented leadership have been discussed in light of the findings. Also provided are the theoretical implications, the study's weaknesses and strengths, along with suggestions for future directions.

5.1 Discussion

Organizations are working hard to adopt knowledge-oriented leadership and innovative methods as competition intensifies. "Increasing the project performance has become an intriguing topic for researchers and academicians since it produces a number of advantageous outcomes for both the project-based companies and their employees. By examining the moderation and mediation mechanisms by which knowledge based HRM practices (knowledge-based HRM) affect project performance (PP), the current study combines the field of leadership research with the behavior of employees affected by the leadership and innovative practices in the project-based organizations.

The social exchange theory served as the foundation for a research model. The methodological framework used is adapted to explore how knowledge-based HRM practices relate to the project performance of team members.

This is an explanatory research study. It applies the "hypothetical deductive method" to evaluate and validate empirically the links proposed by or derived from previous research. With a moderating influence from "knowledge-oriented Leadership" and a mediating effect from "exploitative and exploratory innovation," explores the connection between "knowledge-based HRM practices" and "project performance" within the context of "exploratory innovation."

The adopted questionnaires were used to study all variables. Data was collected from employees working for the project-based IT companies of Islamabad and Rawalpindi via a cross-sectional survey. There were total of 11 hypotheses developed. The Model number 4 is selected in order to do mediation and model 7 Moderation analyses through the Hayes process macro.

All hypotheses are affirmed and have been discussed through the research question. Thus, the research question of the study proves that all hypotheses in the study were confirmed and thoroughly discussed through the research question, validating the research question's premise.

Let's discuss all research hypothesis and the findings of study one by one:

5.1.1 Hypothesis 1: Knowledge Based HRM Practices Influence the Project Performance

The findings of our study suggested that knowledge based Human Resource Management practices; have a significant impact the overall project performance. This has been proved by the regression analysis. As the previous studies have proved the positive association between these two variables, that the increase in the knowledge based HRM practices within the organization automatically enhanced the project performance of the company, it is accepted by this study too, by contributing to the existing literature.

A study's hypothesis regarding the positive correlation between knowledge-based HRM practices (knowledge-based HRM) and project performance (PP) based on a theoretical model. The study's findings support this hypothesis, indicating a strong positive relationship between knowledge-based HRM and PP, consistent with previous research by [Gupta \(2022\)](#). Knowledge-based HRM practices impact

project performance by fostering the development, sharing, and application of knowledge, as highlighted in research by [Singh et al. \(2021\)](#). These practices, as indicated by previous studies such as [Birdi et al. \(2016\)](#), emphasize the importance of knowledge, skills, and motivational factors in enhancing innovative performance. The effectiveness of knowledge sharing, as discussed by [Guzman and Wilson \(2005\)](#), and domain-relevant commitment, as highlighted by [Bettencourt et al. \(2017\)](#), influences employees' innovation performance. This study adopts a knowledge-based theory framework to propose a conceptual model examining the influence of knowledge-based HRM practices on creative performance.

Linear modeling results underscore the critical role of knowledge-based HRM practices as precursors to a project's creative performance. Additionally, there is a documented correlation between knowledge-based HRM practices and creative project performance, as indicated by [Enad Al-Qaralleh and Atan \(2022\)](#). This is supported by evidence from studies by [Fachrunnisa et al. \(2020\)](#); [Evangelista et al. \(2023\)](#), in the literature.

Hence, acquiring the knowledge based HRM practices within the company will help the project-based IT companies to increase the efficiency of their project performance and attain sustainability and achieve a competitive edge in this world of competition. The research question number two was whether or not knowledge based HRM practices and type of innovation correlated.

The question two of the following research discusses the following two relations of knowledge-based HRM with Exploitative innovation and EPI.

Number 1: The question number one was this that whether or not knowledge based HRM practices has positive impact on Exploitative Innovation.

Number 2: The question number two was this that whether or not knowledge based HRM practices has positive impact Exploratory Innovation.

H2: Knowledge Based HRM Practices have Positive Impact on Exploitative Innovation

H3: Knowledge Based HRM Practices have Positive Impact on Exploratory Innovation

The findings of our study suggested that knowledge based HRM practices and Exploitative as well as exploratory innovation within a project-based company. This has been proved by the correlation analysis that these variables are positively and significantly correlated.

As there is positive association, by acquiring the knowledge based HRM practices within the company or organization resulted in the enhancement of the exploitative and exploratory innovation. If Knowledge based HRM practices within the organization was increased by one unit, the innovative practices i.e. exploitative and exploratory was also increased by one unit.

As the previous studies have proved the positive association between these two variables, that the increase in the knowledge based HRM practices within the organization will automatically enhance the project performance of the company, it is accepted by this study too, by contributing to the existing literature.

As innovation is necessary in order to get a competitive edge from the competitors, exploitative and exploratory innovation are necessary for the project-oriented IT companies. Studies have consistently revealed a robust, positive correlation between exploitative and exploratory innovation and project performance, aligning with previous research by [Lei et al. \(2020\)](#). This positive correlation indicates a strong association among these variables.

For evidence, [Kianto et al. \(2017\)](#); [Singh et al. \(2021\)](#); [Ardi et al. \(2020b\)](#) are available in the literature. Hence, acquiring the knowledge based HRM practices within the company helped the project-based IT companies to increase the innovation within the company or organization and attain sustainability and achieve a competitive edge in this world of competition.

The research question number three was this that whether exploitative, exploratory innovation mediates the relationship between knowledge based HRM practices and project performance.

The question three of the following research discusses the following two relations of variables with the project performance.

Number 1: Role of Exploitative innovation as a mediation between knowledge based HRM practices and project performance.

Number 2: Role of Exploratory innovation as a mediation between knowledge based HRM practices and project performance

The current study aims to test whether or not exploitative and exploratory innovation act as a mediator between knowledge based HRM practices and project performance.

H4: Exploitative Innovation Mediates the Relationship between Knowledge Based HRM Practices and Project Performance

H5: Exploratory Innovation Mediates the Relationship between Knowledge Based HRM Practices and Project Performance

Our study's results indicate that while exploitative innovation does not act as a mediator in the relationship between knowledge-based HRM practices and overall project performance in a project-based company, exploratory innovation does serve as a mediator in this relationship.

This has been proved by the mediation analysis that these variables are mediated by only exploratory innovation. Exploratory acts as a mediator, Knowledge-based HRM practices cause this and impact project performance.

The current study's results show that Exploratory Innovation serves as a mediator between knowledge-based HRM practices and Project Performance. Previous research indicates that this mediation role between knowledge-based HRM and PP is crucial. Knowledge-based HRM practices are now more critical than ever for organizations to boost their competitiveness and secure a sustainable competitive advantage. Innovation plays a vital role in organizational performance and is crucial for firms aiming for long-term competitive advantages. Hence, it acts as a mediator between these two factors [Wu and Peng \(2022\)](#).

As this study showed that explorative innovation does not mediate the relationship between knowledge based HRM practices and project performance, this is the contribution to the literature which confirms that they are not correlated, significant and mediate the relationship between the 2 variables in the same direction.

Exploitative innovation involves incremental enhancements to existing products, processes, or services. It is characterized by a focus on refining and optimizing

current organizational capabilities, fostering efficiency gains and incremental improvements. While exploitative innovation is crucial for maintaining competitiveness and ensuring sustained success. When a company focuses too much on making small, gradual improvements, it might stop its employees from trying out new and creative ideas. This can be a problem because it might make the organization less flexible and adaptable. These things are crucial for knowledge-based HRM practices, which are all about managing people to make the most of their skills and knowledge. Projects often demand a both stability and adaptability, and an unbalanced focus on incremental improvements may compromise the agility needed to navigate project complexities.

The research question number four was this that whether or not there is a relationship between exploitative, exploratory innovation and project performance.

The question four of the following research discusses the following two correlations:

Number 1: The question number one was this that whether or not there is a positive correlation between Exploitative Innovation and project performance.

Number 2: The question number two was this that whether or not there is a positive correlation between Exploratory Innovation and project performance.

The current study aims to test whether or not these variables correlate positively with the project performance.

H6: Exploratory Innovation has Positive Impact on Project Performance

H7: Exploitative Innovation has Positive Impact on Project Performance

The findings of our study suggested that Exploitative Innovation has a positive association with the project performance as well as exploratory innovation has a positive association with the project performance in a project-based company. This has been proved by the correlation analysis that these variables are positively and significantly correlated.

As there is positive association, by acquiring the exploitative and exploratory innovation within the company or organization resulted in the enhancement of

the overall performance of the project. If the innovation, either exploitative or exploratory innovation, within the organization was increased by one unit, the project performance was also increased by one unit.

As the previous studies suggest that there is positive correlation between the exploitative, exploratory innovation and project performance. According to the findings of a study, two types of team learning assessments, exploitative learning and exploratory learning, correlate positively with project performance [Huang and Li \(2012\)](#). Hence, this has been proved from the correlation analysis that both of them are positively associated. Where the innovation is high, the performance is high and vice versa.

There is evidence of positive correlation in the studies of [Li and Huang \(2013\)](#); [Tabeau et al. \(2017\)](#) and [Mueller et al. \(2013\)](#) in literature. These studies provide the same evidence as of the present study.

As this study showed that exploitative and explorative innovation and project performance are positively linked with each other, this is the contribution to the literature which confirms that they are correlated, significant and mediates the relationship between the 2 variables in the same direction.

The research question number five was this that whether or not knowledge-oriented leadership moderates the relationship between knowledge based HRM practices and exploitative as well as exploratory innovation.

The question five of the following research discusses the following two moderation:

Number 1: The question number one was this that whether Knowledge oriented leadership moderates the relationship between KHRP and Exploitative innovation

.

Number 2: The question number one was this that whether Knowledge oriented leadership moderates the relationship between KHRP and exploratory innovation.

The current study aims to test whether Knowledge-oriented leadership acts as a moderator between KHRP and Exploitative innovation and in between KHRP and exploratory innovation.

H8. Knowledge- Oriented Leadership plays a moderating role between Knowledge-Based HRM Practices and Exploitative Innovation in such

a way that high Knowledge- Oriented Leadership will strengthen the relationship between Knowledge-Based HRM Practices and Exploratory Innovation.

H9. Knowledge- Oriented Leadership plays a moderating role between Knowledge-Based HRM Practices and Exploratory Innovation in such a way that high Knowledge- Oriented Leadership will strengthen the relationship between Knowledge-Based HRM Practices and : Exploitative Innovation. Exploratory Innovation

The findings of our study suggested that Knowledge Oriented leadership does not moderates the relationship among Knowledge based HRM practices and Exploitative as well as exploratory innovation in a project-based company. This has been proved by the moderation analysis that the variables such as Knowledge based HRM practices, Exploitative innovation and exploratory innovation are not significantly moderated by the knowledge-oriented leadership.

As Knowledge-oriented leadership as a moderator, it does not strengthens the relationship between Knowledge based HRM practices and Exploitative innovation as well as Knowledge based HRM practices and Exploratory innovation.

This is supported by the study of [Zia \(2020\)](#), who found that While KOL is crucial for fostering a knowledge-sharing environment, its direct influence on Exploitative Innovation might be less pronounced than anticipated .It is also evident in the studies of [Le and Le \(2023\)](#) A study by Jiménez-Jiménez and Sanz-Valle (2011) found that HRM practices that facilitate knowledge sharing and development can lead to higher levels of innovation. However, the study also hints at potential downsides when such practices are not aligned with the overall strategic direction set by leaders, potentially leading to misaligned innovation efforts Despite the presumed moderating role of knowledge-oriented leadership between Knowledge based HRM practices and innovation, certain conditions may give rise to a negative impact, particularly in the context of innovation. (Naqshbandi Muzamil Sajjad Jasimuddin) According to [Ramezani et al. \(2017\)](#), one possible explanation is that an excessive focus on knowledge creation and innovation may divert attention from the refinement of existing practices and processes. Leaders emphasizing

continuous learning and experimentation may inadvertently discourage stability and optimization, which are integral aspects of innovation.

According to the study of [Tushman et al. \(2010\)](#), Challenges may emerge when applying this leadership style to exploratory innovation, where the focus is on creating new and groundbreaking solutions. Here is an exploration of potential challenges and consequences.

In a more directly relevant study of [Felin et al. \(2015\)](#), a high emphasis on knowledge-oriented leadership may create an expertise bias, where leaders and teams are more inclined to rely on existing knowledge and solutions. Leaders that are focused on preserving current knowledge may place a lower priority on venturing into unexplored areas due to their resistance to taking risks. The organizational culture required to support exploratory innovation may be weakened by this resistance to change. This resistance to change could be a barrier to the corporate culture that is required to support exploratory innovation [Buchen \(2015\)](#).

According to the study of [Wang and Noe \(2010\)](#), Knowledge and information barriers may result from a concentration on departmental or individual expertise. This segmented method could block cross-functional cooperation and restrict the exchange of diverse knowledge required for exploratory innovation.

A focus on exploiting existing knowledge may result in limiting the ability to perceive and address entirely new challenges. This may hinder the creative exploration required in exploratory innovation. The continuous pursuit of knowledge may contribute to information overload among employees. Employees may find it challenging to engage in the creative thinking required for exploratory innovation ([Carlgren et al., 2016](#)).

H10: Knowledge-Oriented Leadership moderates the mediation effect of Exploitative Innovation on the relationship between Knowledge-Oriented Leadership and project performance.

H11: Knowledge-Oriented Leadership moderates the mediation effect of Exploratory Innovation on the relationship between Knowledge-Oriented Leadership and project performance.

The findings of our study suggested that that KOL might not moderate the relationship between Exploratory and Exploitative Innovation through mediation and their subsequent impact on project performance. This moderation might suggest that the effectiveness of KOL could diminish the influence Exploratory and Exploitative Innovation on project performance. The findings of certain studies indicate that KOLs potentially does not moderate the relationship between Exploratory and Exploitative Innovation through mediation processes.

Researcher Christensen Clayton (2013), Found that knowledge-oriented leadership is often associated with fostering innovation, Leaders who prioritize gathering lots of knowledge might be stopping creative thinking. This can happen if they focus too much on what they already know. They might unintentionally discourage taking risks and thinking of new, different ideas. This can make innovation slow down. Also, if leaders only focus on what they already know, they might miss out on trying new and groundbreaking technologies or ways of doing things. To address the potential negative impacts of knowledge-oriented leadership, organizations should strive for a balanced approach. This involves promoting a culture that values both knowledge accumulation and the fostering of a dynamic, innovative, and inclusive environment Liu et al. (2022). Similarly, the study by Riaz et al. (2023) the context such as technological turbulence can influence the effectiveness of knowledge management capabilities in driving innovation. According to the study of Pauna et al. (2021), Leaders who focus a lot on gathering knowledge are supposed to make projects successful. But, if they only care about gaining knowledge, they might forget how important it is to communicate well, work as a team, and be adaptable. This could make the way they manage projects too strict, making it hard for the organization to handle unexpected situations and problems.

5.2 Practical and Theoretical Implications

As we know, globalization is a phenomenon that requires highly innovative products to take competitive advantage and ensure the survival of organizations, especially in the project-based companies as this sector is spreading highly and companies are adopting the project-based system. Innovative products are essential for

the better development of the IT sector and it comes from the knowledge-oriented leadership of employees working in project-based IT companies.

The contribution of study is both in practical and theoretical terms, and highlights that Knowledge based HRM Practice plays a vital effect in Project performance by putting an emphasis on Exploitative innovation and exploratory innovation as a mediating variable and moderating variable as Knowledge-oriented leadership to fulfill the Global Requirement of the IT sector.

This study has been conducted in Pakistan's information technology (IT) sector project context, in order to examine the impact of Knowledge based HRM practices on project performance, which shows that a leader's effect and proper communication is significant and essential in streamlining the efforts to enhance innovative practices to enhance the project performance. It helps the project manager or project leader interact and coordinate with the project team in an effective manner to enhance the project performance.

This study focuses on the significance of understanding how knowledge-based HRM (Human Resource Management) practices affect Project Performance. It specifically delves into how knowledge-oriented leadership can moderate the impact of these practices on exploratory and expository innovation. Additionally, it investigates the role of exploitative and exploratory innovation as mediators between knowledge-based HRM practices and project performance.

The findings of this study contribute to existing knowledge about HRM practices, project performance, and innovation. These insights are valuable for practitioners and decision-makers in various industries, highlighting the practical implications of this research.

The study contributes to the understanding of how knowledge-based HRM practices influence project performance, extending the existing literature that establishes a relationship between HRM practices and project performance. It also provides empirical evidence for the importance of knowledge-oriented HRM practices in driving successful project outcomes.

Additionally, by examining the moderating effect of knowledge-oriented leadership on exploratory and exploitative innovation, this study adds to the growing body

of research emphasizing the importance of leadership styles in shaping the effectiveness of HRM practices. The findings further clarified the effect of leadership in leveraging knowledge-based HRM practices to improve project performance.

This study illuminates how exploitative and exploratory innovation mediates the connection between knowledge-based HRM practices and project performance. It deepens our comprehension of how these forms of innovation can aid in translating HRM practices into enhanced project results. Moreover, the findings from this study had practical implications for organizations and decision-makers seeking to improve project performance through the implementation of knowledge-based HRM practices. The study offered actionable insights into the optimal combination of HRM practices, leadership styles, and innovation approaches to achieve desired project outcomes. This study also facilitates the IT sector of Pakistan in order to facilitate the knowledge based HRM practice in the IT sector. It helps to polish IT employee's skills for innovativeness to compete in global markets.

So, studying these variables in Pakistan's project-based IT context is a unique opportunity and puts a significant contribution into project performance as well.

5.3 The Study's Strengths

The strengths of the research study are given below:

1. For reporting purposes, data is collected from 392 key people who are employed in the project-based IT companies in major cities of Pakistan.
2. Data analysis is carried out through SPSS statistical software.
3. Responses are collected from the project manager, supervisors and their employees, which mean project leaders and their employees.
4. Respondents have expertise in the IT industry, and these people are employed in the project-based IT companies in Islamabad and Rawalpindi..
5. Exploitative innovation and exploratory innovation as a mediator with Knowledge-based HRM practices and Project Performance, with Knowledge-oriented

leadership as a moderator, this is studied for the very first time in the project based IT sector of Pakistan, so it is an essential humble contribution to the existing literature.

5.4 Conclusion

The study looked at how knowledge-based HRM practices affect project performance. It also examined the roles of exploitative and exploratory innovation as mediators, along with the moderating influence of knowledge-oriented leadership. The study hypothesized a correlation between knowledge-based HRM practices (KHRM) and Project Performance (PP). However, it found that Knowledge-oriented Leadership did not moderate the relationship between KHRM practices and Exploitative or Exploratory Innovation. Instead, Exploitative and Exploratory Innovation acted as mediators between knowledge-based HRM practices and project performance. The analysis was conducted using SPSS statistical software. The reliability of the questionnaire has been checked using Cronbach's alpha. These showed that the questionnaire was reliable. The effect of control variables was also checked but had no impact on the project performance. The moderation, mediation, regression and correlation tests are done in order to check the hypotheses. This was an explanatory research in which quantitative data are collected. This study contributes to the existing literature as no research has joined the model of moderation as well as mediation in KHRM practices and PP. When the KHRM practices are adopted in the project-based organizations, in the presence of Knowledge-oriented leadership, Exploitative innovation and exploratory innovation, the project performance can be increase or decrease.

5.5 Limitations and Future Direction

As every research has certain limitations, inadequacies, or restrictions, and similarly it also has. The resources and the time were constrained. Since two mediators and a single moderator are utilized. However, researchers can use more than two mediators and more than one moderator to improve the model. Beyond

exploitative and exploratory innovation, researcher can be use additional innovation types such as disruptive and incremental innovation in the future research.. This can help to understand how different kinds of innovation are influenced by knowledge-based HRM practices. Different leadership styles can be researched such as transformational and transactional within the framework of knowledge-oriented leadership to identify specific behaviors and traits that most effectively promote innovation. Due to time and resource constraints, our second limitation is that we only collected data from the major cities of Pakistan like Islamabad, and Rawalpindi,, which makes it challenging to do research in many different cities even within Pakistan and many more nations world-wide. Thus, data from several cities as well as countries can be obtained in the future. Third, we studied it only for project-based IT companies; it must be studied for other industries as well. In this perspective we studied it for Project based organization only, there is a need for other traditional firms also. Last but not least is, to increase the generalizability of the results, sample size can be increased.

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Appendix A

**CAPITAL UNIVERSITY OF SCIENCE & TECHNOLOGY
ISLAMABAD**

Dear respondent,

Respectable respondent, I am MS (Project Management) research scholar at Capital University Science and Technology (CUST), Islamabad; I am collecting data for my thesis, “Impact of Knowledge-Based Hrm Practices on Project Performance With A Mediating Role of Exploitative Innovation and Exploratory Innovation and A Moderating Role of Knowledge-Oriented Leadership” It will take you 10-15 minutes to answer the questions and to provide valuable information. I assure you that data was strictly kept confidential and will only be used for academic purposes.

Thank you

Regards,

Mahnoor Khan

Department of Management Sciences

Section I Demographic Information

Gender	1= Male, 2=Female
Age	1 (18-25) 2 (26-33), 3 (34-41), 4 (42-49), 5 (50-above)
Qualification	1 (Matric), 2 (FA/FSc), 3 (Bachelor), 4 (Master), 5 (MS/M.Phil.), 6 (PhD)
Experience	1 (5 and Less), 2 (6-13), 3 (14-21), 4 (22-29), 5 (30- above)

Section II Innovation

1= strongly disagree	2= disagree	3= neither agree or disagree	4= agree	5= strongly agree
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Exploitative innovation (ETI)					
1. Our firm frequently refines the provision of existing products and services	1	2	3	4	5
2. Our firm regularly implements small adoptions to existing products and services	1	2	3	4	5
3. Our firm introduces improved, but existing products and services for our local market	1	2	3	4	5
4. Our firm improves our provision's efficiency of products and services	1	2	3	4	5
5. Our firm increases economies of scale in existing markets	1	2	3	4	5
6. Our firm expands services for existing clients	1	2	3	4	5
Exploratory innovation (ERI)					
7. Our firm accepts demands that go beyond existing products and services	1	2	3	4	5
8. Our firm invents new products and services	1	2	3	4	5
9. Our firm experiments with new products and services in our local market	1	2	3	4	5
10. Our firm commercializes products and services that are completely new	1	2	3	4	5

11. Our firm frequently uses new opportunities in new markets	1	2	3	4	5
12. Our firm uses new distribution channels	1	2	3	4	5

Section III Knowledge Based HRM Practices

1= strongly disagree	2= disagree	3= neither agree or disagree	4= agree	5= strongly agree
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Recruiting and selection in IT project based organizations					
When recruiting, we pay special attention to IT expertise	1	2	3	4	5
When recruiting, we pay special attention to learning and development ability.	1	2	3	4	5
When recruiting, we evaluate the candidates' ability to collaborate and work in various networks.	1	2	3	4	5
Training and development					
We offer our employees opportunities to deepen and expand their IT expertise.	1	2	3	4	5
We offer training that provides employees with up-to-date knowledge about IT.	1	2	3	4	5
Our employees have an opportunity to develop their competence through training tailored to their specific needs.	1	2	3	4	5
The competence development needs of employees are discussed with them regularly.	1	2	3	4	5
Performance assessment					
The sharing of knowledge is one of our criteria for project performance assessment.	1	2	3	4	5
The creation of new knowledge is one of our criteria for project performance assessment.	1	2	3	4	5

The ability to apply knowledge acquired from others is one of our criteria for project performance assessment.	1	2	3	4	5
Compensation					
Our company rewards employees for sharing knowledge.	1	2	3	4	5
Our company rewards employees for creating new knowledge.	1	2	3	4	5
Our company rewards employees for applying the shared knowledge.	1	2	3	4	5

Section IV Knowledge Oriented Leadership

1= strongly disagree	2= disagree	3= neither agree or disagree	4= agree	5= strongly agree
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1. Leadership has been creating an environment for responsible employee behavior and teamwork.	1	2	3	4	5
2. Leadership is used to assume the role of knowledge disseminate leaders, which is mainly characterized by openness, tolerance of mistakes, and mediation for the achievement of the IT project based organization's objectives.	1	2	3	4	5
3. Knowledge oriented leadership promotes learning from experience, tolerating mistakes up to a certain point.	1	2	3	4	5
4. Knowledge oriented leaders behave as advisers, and controls are just an assessment of the accomplishment of objectives	1	2	3	4	5
5. Knowledge oriented leaders promote the acquisition of external knowledge	1	2	3	4	5
6. Knowledge oriented leaders reward employees who share and apply their knowledge.	1	2	3	4	5

Section V Project Performance (Aladwani, 2002)

1= strongly disagree	2= disagree	3= neither agree or disagree	4= agree	5= strongly agree
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1. IT project-based organizations enhance the efficiency of its operations through knowledge sharing.	1	2	3	4	5
2. Our IT projects consistently adhere to the planned schedules.	1	2	3	4	5
3. The budget for our IT projects is realistic and well-defined.	1	2	3	4	5
4. The project teams actively collaborate and coordinate to maximize project productivity.	1	2	3	4	5
5. The project teams consistently deliver work that is free from errors and defects.	1	2	3	4	5
6. Leaders provide timely and relevant guidance and support to enhance project performance.	1	2	3	4	5
7. The project teams actively collaborate and coordinate efforts to achieve project goals.	1	2	3	4	5