

The Dynamics of Digital Transformation in Employees’ Performance Management Systems in Bangladesh

A Thesis Presented in Partial Fulfillment of the Requirements for the Degree of
Doctor of Philosophy in Management

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Doctor of Philosophy in

Management

At the Department of Management,

University of Dhaka,

Dhaka, Bangladesh

Tanjela Hossain

December 2025

Declaration by the Researcher

I, Tanjela Hossain, do hereby declare that the research work entitled:

"The Dynamics of Digital Transformation in Employees' Performance Management Systems in Bangladesh."

This thesis, presented to the Department of Management, University of Dhaka, for the completion of requirements for the degree of Doctor of Philosophy (PhD), is my work and has not been submitted previously, either partially or in entirety, to any other institution or university for any academic degree. All the sources used in the research are duly credited. I have been truthful and upheld integrity in research, data collection, analysis, and presentation.

(Tanjela Hossain)

Registration No: 08/2022-2023

Session: 2022-2023

Department of Management,

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Certificate of the Supervisor

This is to certify that the Research work titled: **"The Dynamics of Digital Transformation in Employees' Performance Management Systems in Bangladesh."** The research work has been conducted by Ms. Tanjela Hossain, Assistant Professor of the Department of Business Administration at Central Women's University, under my supervision. To the best of my knowledge, the work is original and acceptable for submission in partial fulfillment of the requirements for the Doctor of Philosophy (PhD) degree from the University of Dhaka. I have examined the thesis and found it to be of the standard required for doctoral-level research. The thesis is therefore approved for submission.

(Dr. Mohammad Thoufiqul Islam)

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Abstract

The rapid growth of digital technologies has led to significant changes in performance management systems. This doctoral thesis explores the nexus of digital transformation of performance management systems (PMS) in the Bangladeshi telecom workforce. The telecommunications industry is a significant contributor to economic growth and innovation in Bangladesh, and this study aims to examine the dynamics of digital transformation of employees' performance management systems in the telecommunications sector in Bangladesh. Therefore, this study aims to understand the trends of Digital Performance Management Systems (hereafter DPMS) implementations, and their impact on organizational capabilities, employee perceptions, competitive advantages, sustainability, and data privacy & Security challenges.

The telecommunication sector has been selected for this study since it is one of Bangladesh's most technologically dynamic and rapidly changing industries. This study uses a theoretical framework that combines Maximilian's Theory of Digital Transformation and the Technology Acceptance Model (TAM). This study addresses theoretical gaps through empirical evidence on the effect of DPMS on performance evaluation and management processes.

Through a comprehensive mixed-methods approach, the study entailed pilot testing, Focus Group Discussions (FGDs), Key Informant Interviews (KIIs), and a guided survey of 176 employees from top telecom firms. Quantitative data were examined through SPSS for ascertaining reliability and regression analysis, along with Smart PLS for Structural Equation Modeling (SEM). The analysis validated six hypotheses, revealing strong connections between digital Performance Management System (PMS) adoption and important factors such as employee perceptions, organizational capabilities, sustainability, competitive advantage, employee privacy, and security concerns.

The findings indicate that Digital Performance Management Systems (DPMS), if strategically adopted, drastically improve employee engagement, data accuracy, timely decision-making, and organizational sustainability in the long term. Privacy and security concerns, however, must be addressed meticulously to establish trust and effectiveness. Furthermore, this research highlights the need for customizing digital PMS tools based on the specific requirements of employees and the strategic agenda of the organization.

The study makes a significant contribution to literature by reporting empirical findings from a

developing country setting where these changes are in emerging stages. Secondly, the study offers practical recommendations for human resource practitioners and policy makers in the areas of performance appraisal strategy improvement, system uptake improvement, and fostering digital resilience. Lastly, this thesis contends that digital transformation is more than a technological change; it is a strategic enabler of organizational excellence and nurtures employee-centric performance cultures.

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I dedicate this thesis to my beloved father, who sacrificed a lot for me and died in the 2nd year of my PhD journey; my mother, Suraya Parvin Khan, who supported me in every possible way since my childhood; and my Husband, Md. Asad Noor, who encouraged, supported, and sacrificed a lot during the journey of my PhD program.

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Conference Presentation

Implications of HRIS for Gaining Competitive Advantages: Evidence from the Telecommunication Industry in Bangladesh

Presented at the International Conference on Innovation and Transformation for Development, held on 23–24 October 2021. This conference was a platform to discuss innovative practices and transformative strategies for sustainable development. ISBN: 978-984-444-030-2

- Significance: The study highlighted how HRIS implementation contributes to competitive advantages by enhancing operational efficiency and decision-making processes in Bangladesh's telecommunication sector.

Relevant Publication

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Chapter 01: Introduction

1. Introduction:

The comprehensive research explores the complex dynamics of Digital Transformation (DT) as specifically relevant to Performance Management Systems (PMS) in the Bangladesh telecommunication sector. In a world where high-velocity and high-impact digital technologies have fundamentally altered how organizations undertake workflow operations, shifting from conventional, manual-based PMS to a far more agile, effective, and data-driven digital system has become ever more imperative. The transformation is instrumental in enhancing employees' productivity, improving organizational competencies, and ultimately heightening market competitiveness.

The fast adoption of new technology in this industry demands that employees develop their digital skills continuously. Hence, this industry is greatly applicable to examining the impact of digital transformation on PMS, employee skills, and organizational objectives.

These key factors can demonstrate various aspects of digital transformation, such as organizational capabilities, usefulness, and ease of use of the system from the employees' point of view, the impact of the transformation on employee privacy and security aspects, organizational sustainability, and competitive advantage.

Studies have suggested that a move to more advanced DPMS from the traditional manual system can significantly increase the overall capacity of an organization. Besides helping improve the company's functioning, such a transition creates a competitive edge by creating more innovation and efficiency. Fueled by the development of privacy protection and security systems, employees have been confident that digital performance management systems provide more value and better usability than traditional systems. In addition, the study calls for companies to adopt and apply digitalization to sustain continued effectiveness in operations, address existing issues of privacy, and stay at the forefront in a fast-changing business world.

1.1An Overview:

This research focuses on the vital importance of digital transformation in performance management systems. More specifically, it is interested in some of the most significant aspects,

including employee performance management, organisational sustainability, urgent matters of privacy and data security issues, and how competitive benefits are achieved in the digital age. Engaging with underlying theoretical frameworks that serve as the foundation of these dynamics, namely the Technology Acceptance Model (TAM) and Maximilian's Theory of Digital Transformation, the research places the strong impact that DPMS have on strategic human resource management at its forefront. Moreover, it uncovers how the telecom industry is seriously pursuing innovation in direct relation to these digital reforms.

The study has the aim of giving a full understanding by canvassing staff from leading telecommunication companies in Bangladesh. The study applies quantitative means to gauge the influence of DPMS on the performance of employees and effectiveness of HR processes, alongside the application of qualitative information to allow the presentation of experiences and feelings of HR experts as they experience the change. Through the use of a mixed-methods approach, it is possible to identify primary themes, drivers, and barriers surrounding the digital transformation of PMS.

By concentrating on how employees perceive usefulness, ease of use, data privacy, and sustainability within the industry, the study addresses existing gaps and seeks to provide practical solutions for the effective implementation of DPMS.

The study ultimately offers new empirical evidence that will assist both academia and industry practitioners in comprehending and utilizing the potential of digital transformation in managing employee performance in a swiftly changing technological environment.

The introduction chapter will subsequently outline the theoretical background, identify gaps, and define the objectives. The document will detail the importance of the study, proceed with the methodology employed, present the structure of the thesis, and provide a summary of the main points addressed.

1.2 Background of the Study

Contemporary organizations are confronted with massive changes due to the rapid progress of technology (Colbert et al., 2016). In this time of globalization and industrialization, the area of

business, production, technology, and other business-related activities has been dramatically altered and increased. Apart from many advantages, industrialization increases ecological hazards that result in ecological threats to the people. Sustainability is in danger nowadays. Organizations look forward to the digital shift in every aspect to increase paperless jobs.

Earlier studies have covered some identified changes, but still, others have so far not documented much attention despite their high implication in the existing phase of the digital transformation (Spath et al., 2018). Employee performance management is one of the critical tasks for the HR division. With the dynamics of today's business trends and the adoption of digital means in different operations, performance management draws more attention from performance appraisal experts. Eventually, employee performance management systems need to be more detailed, flexible for timeliness, employee-focused, continuous, and improvement-oriented. Digital Transformation enables greater integration and flexibility in PMS functions, indicating that employees may have better knowledge sharing and can create innovative work experiences (Michael et al, 2019).

Digitalization becomes a measure to disrupt PMS and redefines the future of the PMS function. Digitalization in every sphere of the PMS function of an organization is not an easy task. Still, proper planning and execution of DT can produce a positive result in organizational life. Numerous associations are hoping to make an innovation-centered, persistent improvement way to deal with the execution of executives. This can—and should—include performance-based evaluations, digital training tools, self-service features, and do-it-yourself (DIY) solutions that empower employees to support themselves and receive guidance from management within the organization. Technology is reshaping how performance management is implemented; however, communication remains a top priority for establishing an effective system within the organization (Michelle, 2020).

This study will try to develop a Digital Transformation (DT) model for Performance Management Systems (PMS) that can ensure sustainable competitive advantages for an organization and suggest some social implications of the Digital Transformation of PMS functions in a modern digital organization. The research will assess the current usage status and its potential for the Digitalization of PMs. It will focus on every stage or phase of the PMS cycle, including data management, evaluation, feedback, Green Performance Appraisal, and its value as a sustainable competitive advantage for telecommunication companies operating in Bangladesh.

1.3. Problem Statement

In this era of globalization and industrialization, business, production, technology, and other business-related activities have been dramatically changed and increased. Modern organizations increase ecological hazards that result in environmental threats to human beings. Sustainability is in danger nowadays. It strongly demands green practices to save the environment and the essential resource of the planet, i.e., Human beings. Digitalization in an organization's PMS function is not an easy task. Still, proper model development of digital transformation can produce positive results, such as competitive advantages, sustainability, and so on, in organizational life. This study will determine if there is a correlation between Digital transformation with competitive benefits and Sustainability in the Telecommunication Companies operating in Bangladesh.

The telecommunications industry in Bangladesh is undergoing a rapid and profound digital transformation, marked by integrating advanced technologies into various aspects of operations. Despite these technological advancements, a critical gap exists in our understanding of how this digital transformation influences employees' performance management systems within organizations operating in this sector. The dynamics between technology adoption, organizational readiness, and employee experiences remain understudied, hindering the industry's ability to harness the full potential of digital tools for optimizing performance and fostering employee satisfaction.

This problem statement outlines the key issues, establishes the relevance of the research, and sets the stage for addressing the complexities associated with the dynamics of digital transformation in employees' performance management systems within the specified industry and context.

1.4 Research Gap:

There have been many valuable studies on digital conversion and digital moves in an organization's HR department. This presents evidence of the emergence of Digital shifts in HR functions to enhance effectiveness. Michael et al. (2019) found that traditional performance management systems are almost absolute and irrelevant to improved employee performance. Organizations are adopting web-based technology in the execution of employee performance management to enhance correctness and neutrality (Ullah, khan & shah, 2021).

However, most studies focus on overall digital shifts in HR functions, their importance, challenges, impacts, etc. Thus, the Digital Transformation of Performance Management Systems has been an

underexplored study area (Smith & Rahman, 2022). Researchers have significant scope to explore the digital transformation of PMs and their expected outcomes.

There are many unanswered questions in digital shifts in PMS, like whether DT in PMs can extract Competitive Advantages and Sustainability (Islam & Chowdhury, 2023). The digital shift of PMS in Telecom is not unusual (Hossain & Ali, 2021). However, its expected outcomes have still not been explored. So, researchers have a profound scope to study in this regard.

The existing literature lacks comprehensive research on the dynamics of digital transformation in employees' performance management systems in the telecommunications industry in Bangladesh (Rahman & Ali, 2022). This study aims to fill this research gap by examining the various aspects of this phenomenon and its impact on employee performance.

1. **Insufficient Emphasis on Bangladesh:** The existing body of research on digital transformation and performance management systems predominantly centres around Western contexts, neglecting to adequately address the unique circumstances and challenges faced by emerging economies such as Bangladesh (Rahman & Ali, 2022). The present study endeavors to address the research gap by offering valuable insights into the distinctive challenges and opportunities encountered within Bangladesh's telecommunications industry.
2. **Telecommunications Industry Specifics:** The telecommunications industry is characterized by its notable technological advancements and significant role in facilitating connectivity among individuals and enterprises (Anderson & Patel, 2021). This research focuses on identifying the present research gap by finding sector-specific understandings that have been given less attention previously.
3. **Employee-Centric Perspective:** Existing literature on DT predominantly emphasizes technological aspects, often neglecting the crucial employee perspective (Smith & Brown, 2022). Although research on this topic exists, there is a noticeable gap in understanding the impact of digital transformation on employees and their experiences within organizations. Consequently, there is a need to redirect scholarly attention toward exploring the employee-centric dimension of digital transformation to gain a comprehensive understanding of its implications (Ahmed & Khan, 2023). The primary focus of this research will be on examining employees' perceptions, attitudes, and experiences within the realm of performance management during digital transformation.

- 4. Integration of Regulatory Factors:** This study examines the regulatory and policy aspects that play a crucial role in this sector. Government policies and regulations can significantly influence digital transformation efforts within the telecommunications industry (Kim et al., 2022).
- 5. The dynamic nature of change:** Dynamism in performance management (Wilson et al., 2023) during digital transformation remains a topic that lacks comprehensive understanding in current research. The present research aims to provide insights into the evolutionary process of these dynamics and their impact on the broader organizational culture and performance (Johnson & Lee, 2023) in Bangladesh.

This study addresses the existing research gaps in the literature on digital transformation in employee performance management systems. Specifically, it focuses on the telecommunications industry in Bangladesh. By doing so, this research will provide valuable insights that can contribute to the existing body of knowledge in this field. Additionally, the findings of this study will serve as a foundation for future research endeavours. Moreover, the practical implications derived from this research will benefit businesses operating in the telecommunications sector in Bangladesh. However, Figure 01 shows the research gap.

1.5. Research Question:

Considering the systematic literature review on the Digital Transformation of PMS and industry analysis, the following key research question and two specific research questions have been developed to address the research gaps mentioned in the previous section.

1.5.1. Key Research Questions: This study's main question is whether Digital Transformation in PMS is always the answer.

- What are the dynamics and impacts of the digital transformation of performance management systems (PMS) in the telecommunication industry in Bangladesh?

1.5.2. Specific Research Question:

Besides this, it can be specified as below-

1. What are the key factors influencing the digital transformation of performance management systems in telecommunication companies in Bangladesh?

2. How does the Digital Transformation of the PMS affect Telecommunication companies operating in Bangladesh?

1.6. Research Objectives

The study's general objective is to assess the dynamics of digital shifts in performance management systems in Bangladesh. The specific objectives are:

1. **To examine the factors influencing the Digital Transformation of Performance Management Systems.**
2. **To analyze the impact of the Digital Transformation of the PMS on Telecommunication companies operating in Bangladesh.**

1.7 Scope of the Study

The study aims to investigate the dynamics of digital transformation in employees' performance management systems in Bangladesh. It will cover various aspects of this important and constantly changing field. The following is a comprehensive outline delineating the scope of the research project at hand:

- This study aims to explore the Digital Transformation of PMS only rather in other functions of Human Resource Management.
- This research will focus on understanding the relationship between DT and Employees' Performance Management
- This project will explore the DT in PMs in one industry, Telecommunication, which exclusively functions in Bangladesh.
- Investigate the various elements of digital transformation, including adopting digital tools, automation, data analytics, and their impact on PMS.
- Understand how employees perceive and adapt to digital transformation in performance management, including their attitudes, concerns, and readiness for change.
- Explore the technological infrastructure required for effective performance management in the digital age, including adopting cloud computing, data security measures, and IoT (Internet of Things) applications.
- Consider the regulatory framework and policies that impact digital transformation efforts within the telecommunications sector in Bangladesh.

1.8 Rationale of the Study

Today's organizations are facing one of the biggest challenges in managing the performance of employees efficiently. Performance management systems in most organizations focus only on behavior results, while employees are evaluated on how things get done. Every organization should establish a performance management system that can set results-oriented job descriptions and can support mechanisms that enable managers to give an honest evaluation of the performance of employees (Aditya & Sameeksha, 2016). Competitiveness with Sustainability is generating increased concern in every organization nowadays. Employee management plays an integral part in inventing competitive advantages and the sustainability of an organization. So, there is an urgency for incorporating environmental Sustainability into PMS practices, i.e., the Digital shift of PMs. Digital Transformation of PMS functions is becoming popular day by day in this era of technology, which may create fair performance appraisal practices more accessible than ever before.

1.8.1. Rationale for Selecting the Telecommunication Industry: A Catalyst for Digital Transformation in Performance Management Systems

Telecommunication is an industry where technology & digital forms, and means are indispensable. Concerned organizations are realizing the demand for introducing a new system of performance management to be competitive in this digital market. The technological breakthrough, the dynamism of work, and digital shifts emphasize the call for fair PMS approaches. Strategic execution of honest and fair performance management is difficult in this changing digital time. Technology-driven PMS of the future is an indispensable element in the profitable realization of digital means. The research clearly shows that future PMS is more information-based, more accessible, more stable, and more employee-focused. It is directed towards the performance of employees as well as their skills and the overall performance of the whole work team (Michael et al., 2019).

During the last few years, Bangladesh as a nation has seen widespread development and impressive advancement in its telecommunication sector which can be attributed to the fast and expedited digital revolution taking place now. The process of adopting and implementing digital technologies has led the telecommunication sector to become a fundamental motivator for economic growth, increased connectivity, and the development of innovation across the entire country. At a time when this period of revolution was picking up pace, the meticulous observation and analysis of

performance management systems that have been prepared for employees serving in the telecommunication sector has appeared as a significant and worthwhile area of focus (BTRC, 2020).

The wave of digital transformation sweeping across the telecommunication industry in Bangladesh has brought about important and unprecedented alterations in terms of how organizations manage and evaluate the performance of their staff. Historically, the systems used for performance management were rooted in manual systems, sporadic reviews conducted at set intervals, and clearly demarcated hierarchical frameworks that defined information flow and evaluation (Rahman, 2021). However, with the advent and spread of innovative digital technologies, these performance management systems have undergone a sea change, being characterized by the implementation of dynamic platforms that facilitate ongoing interaction, real-time feedback mechanisms that facilitate instantaneous evaluation, and widespread data-driven analytics that cumulatively contribute to improved employee performance as well as overall organizational outcomes (UNDP, 2021).

It is of utmost importance to know and understand the multi-dimensional dynamics involved in the digital transformation process, especially in terms of the performance management systems utilized to measure and improve employees' performance. It is crucial to comprehend this for both the progress of academic knowledge and the pragmatic advantage that can be gained for diverse industries (Ward, 2016). In Bangladesh's highly competitive telecommunication market, where the intensity of competition is high and the pace of technological advancements defines the nature of competition, examining the relationship between digital transformation and performance management systems more intensively can provide important insights. These can be useful in maximizing the potential of human capital, developing a culture of innovation, and ensuring that firms can sustain a long-term competitive advantage in the market (BTRC, 2020).

Several important factors necessitate thorough research in this field:

Technological Advances (BTRC, 2020): Bangladesh's telecommunication sector has witnessed speedy growth in emerging digital technologies such as artificial intelligence (AI), big data analytics, and the Internet of Things (IoT). These technologies can revolutionize performance management by enabling real-time monitoring, predictive analytics, and personalized feedback systems (Gupta, 2018).

Unveiling Workforce Trends: The influx of millennials and digital natives into the workforce

heavily shakes and challenges traditional practices employed in performance management. These employees are presently proactively seeking more transparency, more autonomy, and an unbroken stream of feedback, all of which collectively highlight the imperative for performance management systems that are dynamic and sensitive to these emerging needs (UNDP, 2021).

Global Best Practices: As the Bangladesh telecommunication sector aligns itself with the global market, its global best practices of performance management compared with international benchmarks are essential (Rahman, 2021). Comparing sound case studies and models of other sectors can contribute to strategy formulation in line with the unique socio-economic environment of Bangladesh.

Investigating the complex and subtle connection that performance management systems share with the overall firm performance and an organization's innovative capability is a research topic of particular significance in today's business environment. Through the ability to properly align individual employee goals with the strategic objectives that the firm itself has set, organizations can create an environment that will foster and support a culture rich in innovation, adaptability, and ongoing improvement. This has the potential to result in important breakthroughs regarding their competitive advantage in the marketplace, which is a primary driver towards achieving long-term success and sustainability in a rapidly changing environment (Kapoor, 2019).

In total, the digital transformation pressures currently impacting and reshaping the employee performance management systems within Bangladesh's telecommunication sector present a terrain marked by significant challenges that can be exceedingly daunting and valuable opportunities worth taking advantage of. This research presents an elaborate and comprehensive exploration of the complicated and multifaceted interaction among technology, human capital, and organizational dynamics in this setting. The objective is to foster and develop insightful understandings that can eventually inform effective policymaking, fact-driven strategic planning, and enhancement of managerial practices in performance management.

The root reason underlying the massive interest observed in the telecommunication sector can be attributed to its imperative function in powering and facilitating tremendous technological innovations in various domains. Additionally, the given sector is characterized by an extremely high rate and large-scale uptake of digital transformation (DT) initiatives, which are increasingly important in the current digital age. These extraordinary attributes combined render the telecommunication sector not only the suitable but also the most fitting and ideal backdrop to

conduct exhaustive and assiduous research on the multi-dimensional impact and pivotal role of DPMS. Against the backdrop of being a technologically driven sector, telecommunication organizations in Bangladesh have been leaders in embracing and implementing digital innovations in their business. Such strategic adoption is imperative for them to ensure a competitive advantage in an ever-dynamic and fast-moving market (Islam & Rahman, 2021). Moreover, the industry also has a vast and diverse population of employees, a perfect setting to investigate and examine how digital transformation (DT) influences a range of key organizational outcomes. These are the key dimensions: employee performance, privacy issues, data security protocols, and general operational effectiveness.

Telecom firms have a significant role in facilitating and empowering the wider digitalization drives that are essential for the nation, harmonizing their activities with the broader national plans formulated to enhance and encourage digital development (Bangladesh Telecommunication Regulatory Commission, 2020). Additionally, research on this specific sector holds immense significance in the application of other sectors to adopt digital Project Management Systems (PMS) towards enhancing their sustainability programs while, at the same time, achieving competitive triumph in the market (Ravi et al., 2020). Earlier research has primarily focused on industries like finance and healthcare, as Fernandez and Gallardo mentioned in their research conducted in 2019. This inadvertent oversight has created a huge knowledge gap about how other significant industries, like telecommunications, with high sensitivity to data, are addressing the intricate issues relating to data security and privacy within their PMS, as Mishra and Agarwal mentioned in 2022. Also, with the limitations imposed by the developing economy's infrastructure, carrying out an in-depth analysis of this industry can provide helpful information on the peculiar digital challenges facing Bangladesh, as Hasan and co-researchers implied in their research conducted in 2019.

Especially when considering the long-term implications of digitalization, the telecommunications industry has become an exceedingly influential force in the world's overall economy. Not only is this sector pivotal to the enablement of technological advancements, but it is also a major driver at the forefront of integrating newer and more sophisticated digital technologies imperceptibly into every sphere of everyday life. Consequently, the scope is extremely wide and extensive, with many organizational processes being affected, namely those concerned with the important area of performance management. Given the increasing and ever-growing complexity of the modern workforce, one of the most significant developments that have taken place is the gradual but vital

transition from traditional manual systems to more advanced and efficient digital performance management systems. This very sector's vast reliance on the latest technology offers an apt and fertile arena to study the multifaceted dynamics of digital transformation thoroughly and to determine how this transformation deeply influences the overall performance and effectiveness of various organizations operating within it. The following can be identified as legitimate and relevant reasons for selecting the telecommunication sector as a research subject.

1.8.2. Why the Telecommunication Industry and Why Now?

a. Leading in Digital Transformation

In the contemporary era, the telecommunication sector was a pioneer industry driving the rate of digital transformation. This leadership is motivated largely by rapid technological advancements that are occurring at an unprecedented level and by an insatiable and ongoing demand for innovative solutions. The telecommunication sector is based on a wide array of digital tools and advanced infrastructure, significantly transforming its operations and fundamentally altering the processes involved in managing the workforce (Vial, 2019). This provides an excellent and convincing justification for serious attention to PMS's growth and advancement. Even more crucial, there is a need to specifically focus on how such systems transform from traditional manual types to more advanced and superior types of more efficient automated systems with modern technology (Ravi et al., 2020).

b. Emerging Market Digitalization at High Speed

In most countries, including Bangladesh, the telecom sector has witnessed an unparalleled level of expansion that is immensely remarkable. The explosive expansion of the sector has largely been catalyzed by the relentless advancement of digital infrastructure and a massive boost in mobile connectivity options offered to citizens (Islam & Rahman, 2021). Due to these exponential digital technology advances, the telecom sector has more and more come to be in a core and central place in the total digital economy. Moreover, there has been a greater demand for implementing effective workforce management practices due to the presence of technology-enabled workers in the employment market. Such a scenario adds the greatest importance to utilizing digital-based performance management systems that can potentially impart operational efficiency to the industry.

c. Strategic Significance of Telecommunication in Bangladesh

Telecom is a highly significant industry in the Bangladesh economy and is a major contributor to the GDP and overall development of the nation (Islam & Rahman, 2021). The impact of this industry on the economy makes it a highly significant industry to research, particularly when considering how digitalization can impact significant organizational processes such as performance management. This specific area of study is of dual value; not only does it offer substantial aid to the industry, but it also offers insightful material that has the potential to inform and shape national policy about digital infrastructure and the efficient use of labor resources.

d. Pioneering Human Resources Innovations

Telecom operators have been among the first adopters and implementers of the newest digital human resource technologies, thus making them indispensable and critical case studies for examining the deep and widespread influence that digital transformation has on the discipline of human resource management, also known as HRM. The very early adoption of digital performance management systems, also known as PMS, in this field provides valuable and important insights into the processes and strategies involved in the management of workforce performance in environments that are increasingly driven by digital innovations and technologies (Fernandez & Gallardo, 2019). The unprecedented level of digital adoption being experienced throughout this specific industry is playing a key role in facilitating the development of an environment that is not just incredibly valuable but extremely informative. This is an environment that is characterized by its high-technology integration and is a perfect set-up for conducting an exhaustive and extensive assessment and analysis of the new human resource practices being developed as a direct reaction to the revolutionary changes being brought about by this digital transformation (Ravi et al., 2020).

e. Data Sensitivity and Security Considerations

The telecommunications industry operates under the massive mandate of dealing with and processing vast volumes of sensitive customer data, which by default renders data security and privacy not just relevant but extremely critical issues for each organization operating within this particular field. As various organizations and entities operating in this industry struggle aggressively to consolidate a myriad of digital systems and advanced technological solutions, they are increasingly exposing themselves to greater risks of experiencing debilitating data breaches and privacy rights violations (Hasan et al., 2019). This research thoroughly discusses the

significant topic of the use of DPMS. It brings to light the immense potential that these systems possess to fundamentally enhance the security of not only organizational data but also employee personal data. Furthermore, it presents a range of effective strategies that organizations can effectively utilize to successfully address and counter the broad range of data security issues prevalent in settings highly susceptible to such risks (Mishra & Agarwal, 2022).

f. Economic Contribution of the Sector and Policy Implications

The telecommunication sector is vital to the overall development and growth of the economy, especially in developing economies like Bangladesh, according to Ravi et al.'s 2020 study. The thriving sector not only serves as a top driver in the generation of jobs but also indeed facilitates the development and growth of the major infrastructure. It is also vital in determining and shaping the country's economic landscape, testifying to its role as a major enabler of overall economic progress. As per Islam and Rahman in their 2021 study, the results that will be derived from this research will contribute meaningfully to the telecommunication industry. Further, these results will provide essential insights that can guide and steer national policy in the key areas of digital transformation and infrastructure development.

This research focuses on investigating how the transition of Performance Management Systems from old manual systems to digital platforms affects employee performance, data security, and privacy. The research will focus on the telecommunications industry to ensure it addresses a significant gap in the existing body of literature. The findings of this study will have more significant ramifications for other industries that are facing comparable revolutions, delivering insights into best practices for managing digital workforce performance. This is because the industry has been undergoing technological breakthroughs.

Thus, focusing on the telecommunication sector adds to the literature on digital transformation and provides a unique contribution by addressing the intersection of technology, human resources, and organizational performance within a rapidly evolving industry.

This study will investigate the differential effects of digital transformation on a corporation's PMS and the consequent results on its competitive advantages and sustainability. The study aims to provide a comprehensive viewpoint, including the employees' and organizations' perspectives,

which will be administered to employees of Bangladeshi telecommunication companies. The study's outcome will provide an understanding of the competitive advantages and enhance Sustainability. Moreover, this study will help understand the relationships between Competitive advantage and sustainability with Digital Transformation in PMS. This project will help to understand the potential challenges of digital transformation in PMS in Bangladesh's telecommunication sector.

1.8.3. Overview of the Telecommunications Sector in Bangladesh

The telecommunications sector in Bangladesh is pivotal to the nation's economic and technological advancement. In the last twenty years, the industry has seen remarkable development, propelled by swift urban growth, economic progress, and improvements in digital infrastructure. By 2024, Bangladesh's telecom sector will cater to more than 180 million mobile users, boasting an internet penetration exceeding 65%, highlighting its critical role in the nation's digital transformation efforts (Bangladesh Telecommunication Regulatory Commission, 2024).

A. Transformation of Bangladesh's Telecom Sector

From a stagnant, state-run industry providing limited services to millions of people, Bangladesh's telecoms industry has grown and changed dramatically in the last several decades. Since communication and connectivity are now fundamental for economic development, technological progress, and social inclusion, this shift has been significant to Bangladesh's larger development objectives.

B. The First Decade: The Age of Landline Telephones and Telegraphs (1971–the 1980s)

As a legacy of its colonial past, Bangladesh's telecommunications infrastructure was severely lacking and insufficient when the country gained independence in 1971. The government-owned Bangladesh Telegraph and Telephone Board (BTTB) was the go-to provider for landline communications. Throughout the era in question, landline telephones and the telegraph, which were operated mainly within urban areas, were the most prevalent methods through which people communicated with each other. To enhance communication over long distances, the fitting of limited automated switch systems and microwave links was completed in the 1980s. Still, it must be remembered that the quality and range of the services continued to be poor and could not satisfy the users. The feature of the time was the restricted access to telecommunication services,

especially in rural areas, and an appallingly slow development rate that characterized the industry's growth.

C. The Expansion of Cellular Telephony between the Nineties and the Millennium

The mobile telephony phenomenon started to gain momentum in the 1990s, a decade that proved to be very important and revolutionary for the telecommunications sector in Bangladesh. A very important milestone was achieved in 1993. Grameenphone, a joint venture between the prestigious Grameen Bank and the reputable Norwegian firm Telenor, was officially licensed to provide public mobile phone services. Due to this breakthrough, Grameenphone launched mobile services at more reasonable prices and highly reliable and available on a large scale to the Bangladeshi public, fundamentally changing and revolutionizing the country's communication scenario.

Initiated in the second part of the 1990s, the Global System for Mobile Communications, or simply GSM technology, became a crucial factor in significantly speeding up the development and expansion of the telecommunication industry. In the early 2000s, two major new private operators, Banglalink, previously AKTEL, and Robi, joined the market. This entry was accompanied by a remarkable rise in the number of mobile subscribers and growing competition among the various service providers. The transformation from a government-owned monopoly to a more liberalized market situation has promoted significant investment and facilitated phenomenal technological improvement in the sector.

D. Welcoming the Digital Age: 2010s and onward

The "Digital Bangladesh" project was initiated in the 2010s to utilize ICT in all social and economic sectors. Investment in digital infrastructure gained momentum with the launch of the program, as evidenced by the inauguration of 4G services in 2018 and 3G services in 2013 being milestones.

The telecommunication industry became part of the country's gross domestic product due to the rapid rise in mobile phone users. Over 170 million people in Bangladesh used mobile phones in 2020, and 65% were Internet users (Bangladesh Telecommunication Regulatory Commission, 2021). The telecom industry has become more influential in society due to the expansion of digital services like bKash, online banking, e-commerce, and online education.

E. Deregulation of markets and alteration of existing laws

A landmark and crucial move in the direction of infusing growth in the telecommunications industry was the introduction of the Bangladesh Telecommunication Regulatory Commission, more commonly referred to as BTRC, back in 2001. The regulatory commission has played an essential and pivotal role in introducing key measures in forming a thriving and competitive telecommunication industry, and these measures have been introduced through BTRC's exhaustive regulatory measures solely crafted to induce competition and enhance the overall level of services to customers. There has been a considerable shift from 2G to 4G, and now we are ready for the rollout of 5G, which will revolutionize the industry once again.

The liberalization of the industry prompted the privatization of state-owned firms. One example is the 2008 transformation of BTTB into BTCL, the Bangladesh Telecommunications Company Limited. However, private operators like Grameenphone, Robi, and Banglalink dominate the market and control a large portion of the mobile telecommunications sector.

D. Obstacles and Opportunities That Remain

Despite the rapid growth of the telecom sector, specific issues persist. Inadequate rural connectivity, excessive taxes, regulatory hurdles, and a lack of spectrum are significant roadblocks to progress in growth. Data privacy, cybersecurity, and improving infrastructure in areas with limited resources are becoming more pressing for the company, even as mobile internet and digital services are indispensable to our daily lives.

E. Development and Financial Impact

The telecommunications sector is one of Bangladesh's most rapidly expanding industries, crucial in bolstering the national economy. The Bangladesh Bureau of Statistics reports that the telecom industry contributes almost 3% to the nation's GDP, directly employing thousands and fostering a broader network of businesses, including IT, e-commerce, and digital services (Islam & Rahman, 2021). Prominent service providers such as Grameenphone, Robi, and Banglalink have made significant investments in the expansion of 4G networks while also gearing up for the rollout of 5G, thereby guaranteeing connectivity across the nation (Hasan et al., 2022).

F. Digital Framework and Technological Progressions

Bangladesh has achieved notable progress in improving its digital infrastructure, emphasizing the

importance of mobile connectivity, particularly in a nation where fixed-line internet services are scarce. The initiative known as "Digital Bangladesh," introduced by the government, seeks to enhance the integration of ICT across various sectors of the economy, with a particular focus on telecommunications. Global adoption and assimilation of new next-generation technologies such as, but not confined to, cloud computing, artificial intelligence, and the Internet of Things (IoT) have been a huge contributor to positioning the sector at the top and as a pioneer in the digital transformation journey, as noted by Ravi et al. in their 2020 research work.

G. Governance Framework and Policy Support

The telecommunications sector in Bangladesh is under the regulatory purview of the Bangladesh Telecommunication Regulatory Commission, which it regulates spectrum allocation, pricing strategy, and market competition. Recent policy initiatives have emphasized foreign direct investment, service quality, and consumer data protection. Furthermore, the National Broadband Policy adopted by the government and the future introduction of 5G technology will spur more innovation and development in the industry (Islam & Rahman, 2021).

H. Future Prospect

Despite the growth, the Bangladesh telecom industry faces several challenges, including spectrum scarcity, high taxation, and underdeveloped infrastructure in rural areas. With the increasing volume of sensitive data handled by telecom companies, the issue of data privacy and cybersecurity has also become a major concern (Mishra & Agarwal, 2022). However, with ongoing investments in network upgrades and a focus on sustainable practices, the future of the telecom sector remains promising. The industry is poised to play a pivotal role in Bangladesh's ambition to achieve middle-income status by 2030 (Hasan et al., 2022).

I. Concluding Remarks

Bangladesh's telecommunication industry is a key element of national economic growth and digital evolution. As telecommunication operators press ahead with innovation and expansion programs, their influence on national policy and economic growth will expand exponentially. This offers a captivating field for academic research, especially concerning digital behaviors, performance management systems, data security, and employee confidentiality.

With the imminent rollout of 5G services and the government's increasing focus on digital

infrastructure, the telecommunications sector is well-positioned to remain a key driver of Bangladesh's socioeconomic progress. The industry's future trajectory will be shaped by continuous technological advancements, evolving regulatory frameworks, and the widespread adoption of mobile internet services.

One of the most important factors in shaping Bangladesh's digital landscape is the sector's metamorphosis from a static, state-run service to an active, privately driven market. As part of Bangladesh's developing digital economy, the telecoms industry fosters technological innovation, propels economic growth, and enhances social connectivity.

1.9 The Significance of the Study:

The research provides an exhaustive contribution to Human Resource Management, Digital Transformation (DT), and Performance Management Systems (PMS) literature, focusing on the relatively less-studied telecommunications sector of Bangladesh. Theoretically, it extends the Technology Acceptance Model (TAM) and incorporates Maximilian's Theory of Digital Transformation to develop a novel conceptual model that connects the acceptance of digital PMS to organizational competencies, sustainability, employees' perceptions, and data security. Methodologically, it follows a mixed-methods approach founded upon pragmatic research philosophy and abductive reasoning, where it innovatively combines qualitative data using cutting-edge methods such as Structural Equation Modeling (SEM) and Smart PLS. "Quals in and quants out" is a new approach being applied here, while extensive pilot testing and industry-specific tools ensure contextual validity. Practically, the study provides prescriptive guidance for telecommunication organizations with a proposed systematic digital PMS implementation model emphasizing training, involvement, and cybersecurity, thereby enhancing evidence-based decision-making in HR practices. Contextually, it provides rare empirical evidence on digital HRM in an emerging economy with infrastructural hurdles, cultural adaptation, and employees' digital literacy in Bangladesh's telecommunication sector. Therefore, the research acts as a valuable roadmap to researchers, practitioners, and policymakers involved in the process of performance management modernization in emerging markets.

1.10 The Framework of the Thesis

This section outlines the organization of the thesis, consisting of seven chapters. Each chapter addresses distinct domains, detailing approaches, evaluations, and findings, summarized as follows:

Chapter One: Introduction

An overview is presented at the beginning of this chapter, which then leads into the backdrop of the study, which emphasizes digital transformation literature and PMS in the Bangladeshi telecoms industry. This part aims to provide an overview of the telecommunications Industry and explain its relevance to this study. It highlights the significance of the industry within the socio-economic framework of Bangladesh, its role in driving digital transformation, and the challenges it faces.

In this chapter, we explore the theoretical underpinnings relevant to the growth of employee performance management in the digital era. Specifically, we investigate the application of Maximillian's Theory of Digital Transformation and the Technology Acceptance Model (TAM) within this framework.

This chapter concludes by identifying gaps in both theme and contextual areas, offering an outline of the major questions, aims, and objectives, stressing the study's significance, and presenting a foundation for the thesis's structure.

Chapter Two: Literature Review

This chapter thoroughly examines the current literature regarding DT and PMS. This study opens with an overview of the structured approach employed in the literature review process.

This chapter delves into essential elements of digital PMS, highlighting their motivating factors, obstacles, and advantages. It highlights the importance of digital transformation in employee management, focusing on aspects such as competitive advantage, employee performance, organisational sustainability, employee privacy, and data security.

The chapter highlights shortcomings in earlier studies and lays the groundwork for the questions and hypotheses explored.

Chapter Three: Research Methodology

This chapter provides an overview of the conceptual and methodological foundations upon which

the research will be built. The pragmatic research philosophy that cautiously integrates qualitative and quantitative methods is proposed as an appropriate and effective paradigm to address PMS's complex digital transformation issues. The above-mentioned philosophy offers a compelling justification for using a mixed-methods research strategy, as necessitated to study the different aspects of the research problem at hand comprehensively and effectively. In addition, the research strategy employs a mix of abductive research, pilot testing, focus group discussions (FGDS), key informant interviews (KIIS), and survey research, thereby enabling a comprehensive study of the subject. This chapter gives an overview of the different processes, sources of data, and crucial ethical issues which are of paramount importance in researching individuals who are part of the telecommunications sector.

Chapter Four: Qualitative Data Analysis (FGDS & KIIS)

This chapter presents the findings obtained from qualitative analyses in accordance with Focus Group Discussions (FGDS) and Key Informant Interviews (KIIS) carried out with telecommunication industry experts and staff. It offers a detailed analysis of the data provided by participants, based on their views of the drivers of digitalization of Performance Management Systems (PMS), its contribution to employee performance and organizational strategy, and challenges faced. Thematic analysis is employed to determine repetitive themes and patterns that will guide the subsequent quantitative analysis.

Chapter Five: Quantitative Analysis and Hypothesis Testing

The chapter presents findings derived from quantitative analysis, which involved a questionnaire administered to two hundred employees. The chapter starts with a comprehensive description of the data gathered, followed by an analytical examination through statistical methods, including SPSS 27. It examines the hypotheses set forth previously, more specifically digital PMS technology's effects on perceptions of usefulness, performance, organizational efficacy, competitiveness, and sustainability, as well as concerns regarding privacy and data protection. The findings of hypothesis testing are thoroughly examined, emphasizing strong correlations and findings.

Chapter Six: Synthesis of Quantitative and Qualitative Findings

Chapter Six synthesizes qualitative and quantitative findings to facilitate an integrated

understanding of the research problem. Chapter Six synthesizes findings from surveys, key informant interviews, and focus group discussions, comparing the findings where qualitative data and quantitative information meet or differ. This dual methodology offers a complete view of the digital transformation implications in PMS and its broader organizational effect. The paper concludes with a discussion of the research implications for the telecoms industry and the digital transformation of PMS.

Chapter Seven: Conclusions and Recommendations

The last chapter brings together the key empirical findings and implications derived from the study. In the telecommunication sector, it prescribes an end-to-end procedural framework in implementing digital program management systems.

Lastly, this chapter discusses the limitations of the study as well as its contribution in terms of theoretical, methodological, practical, and contextual levels. In conclusion, the chapter wraps up several proposals for practical implementation in the telecommunications sector and recommendations for future exploration.

Chapter 02: Literature Review

2. Introduction

A good literature review is paramount in establishing a sound and comprehensive understanding of previous scholarly work carried out within the same discipline. The author has been very careful in establishing the objects of the research and has delicately developed the protocol of the literature review. The protocol has ingeniously featured the criteria used in the research document selection. The protocol was expertly cited by Tranfield Denyer, and Smart (2003), who efficaciously confirmed that the research keywords and terms were within the review's scope and previous discussion. The protocol exclusion criteria considered the language of the articles to be those in non-English languages, those published before January 2013 and after December 2022, and those published in conference proceedings, book reviews, dissertations, case studies, and books. It was prudent for the author of the research to select for analysis the papers published in reputable journals by using the Australian Business Deans Council (ABDC) rankings list and the Scimago classification as a reliable guideline (Saunders et al., 2019). The sources were limited to only top-tier peer-reviewed scholarly journal articles in leading academic outlets because they create an undeniable impact in research fields (Podsakoff et al., 2005).

These further cement its validity, as this criterion has been used in previous literature review studies without fail (Crossan & Apaydin, 2010). Indeed, the year 2013 was the best choice as a baseline for this study. This year, the concept that would flip everything around in the business world was brought forth by digital transformation (Hossain, 2020). At that time, advanced digital technologies like social media, cloud computing, big data analytics, and mobile devices were some of the technologies facilitating this breakthrough transformation (Fenwick, 2012). There is arguably no greater change than this since the break of day in life, as this freed the world from the shackles of conventional business and its techniques (Fenwick, 2012). Thus, logically speaking, 2013 could be argued to be the year which laid the stage for the transformation journey to take place. There is no doubt as to the decision to choose only the English language articles since there are more writings published in this language. This enormous availability of sources in English allowed the authors to access a wide variety of information, allowing for comprehensiveness in the review.

2.1 Conducting a Systematic Literature Review

The author has carried out an extensive search by utilizing the strings of the abstract, title, and keywords of papers indexed in reputable databases such as SAGE, Scopus, Wiley Online Library, Emerald Journals, Web of Science, and Springer Link. These databases are known for providing a broad array of quality, peer-reviewed articles to their clients in various research fields. Thus, the author screened the title and abstract of the journal articles based on the inclusion criteria, which were well-defined for the sake of absolute transparency. Therefore, the author was in a position to evaluate if the article needed further assessment or could be rejected for conducting a systematic literature review, taking into account only those sources that proved to be more pertinent and useful (Okoli et al., 2010). In this case, 174 articles were identified during the screening. Undoubtedly, this sample was utilized to significantly expedite the succeeding rounds of the literature review. The decision was made with due care after having tracked all the relevant publications to make sure that these met the inclusion criteria laid down with the valued advice obtained from Liberati et al. (2009).

2.1.1 Systematic Literature Review: An Overview

A systematic literature review (SLR) is a structured and systematic method to identify, appraise, and synthesize available literature on a specific area of study. Unlike the conventional literature review, the structured literature review follows a pre-set protocol that ensures clarity, reproducibility of results, and completeness. In this way, it becomes possible to make comprehensive insights into a specific subject while ensuring minimal bias and enhancing the reliability of the output. This study will be informed by a systematic review of the literature to establish the dynamics of digital transformation in performance management systems, focusing with particular attention on the telecommunication sector.

An SLR begins with the identification of a question, which is the foundation of the entire review. The question identification will provide a brief overview of the related literature to delimit the scope of the study and bring out preliminary themes. Following the formulation of the question, the subsequent process is the development of the protocol. For this paper, the purpose and aims of the review are clearly stated, eligibility criteria regarding inclusions and exclusions are identified, and appropriate sources and databases from where materials will be retrieved are presented. This

paper describes how the search was done by describing the procedures followed in screening, extracting, managing, and analyzing the data.

After the development of the protocol, thorough searches are conducted using a well-planned search strategy. This process involves text extraction, database selection, capturing the results, and conducting a thorough literature review. The results are then screened to ensure that only the most relevant studies are included in the final review. For instance, out of a total of 728 records retrieved using database searches, 621 remained after duplicate removal. Additional exclusions based on parameters such as language, publication type, and relevance to the topic narrowed the number of studies further to 112.

Screening results in data extraction and synthesis. Extracted and synthesized data in this section shall include information that only addresses the query. This shall ensure the results are those that will fall in line with the purpose of the study and, therefore, contribute a lot of value to understanding the concept of digital transformation in performance management systems. The final synthesis of the included studies gives a broad overview of available knowledge but defines the gaps that this present inquiry is seeking to fill.

Table 2.1: Phases of the systematic literature review (adapted from Tranfield et al. 2003)

1. Identify the Research Question	Quick searches of the literature in the field
2. Develop Protocol	• Develop rationale and objectives. • Set eligibility criteria (inclusions and exclusions) • Choice of sources (databases) and Set search strategy. • Method of screening records and extracting, managing, and analyzing the data.
3. Conduct Systematic searches	Search strategy, text mining, choosing databases, documenting, and reviewing
4. Screening	Screening tools- PRISMA Records identified through database searching, n=728

	Records after duplicates were removed, n=621 Records excluded with reasons (n=415) Not in English, n=21 Other sources except top-tier journal Articles(A*/A/Q₁), n =253 Published before 2013=141 Full Text excluded with Reasons, n=103 Not targeting Digital Transformation in PMs, n=103 Studies were found via forward and backward searching, n=9 <i>Final Studies included in reviews, n=112</i>
5. Data Extractions and synthesis	• Extract only the data that is relevant to the research question. • Integrate the key findings from all the included studies

Digital transformation is a crucial contributor to the rapid changes that are taking place in the macro-environment. The telecom industry is no exception, as it is undergoing significant market shifts. This industry is recognized as a crucial driver of international growth. The many technological breakthroughs, from the introduction of 5G to the establishment of blockchain, are all clear indicators of the telecoms sector's entrance into the digital era. So, it has become urgent to establish digital means in every aspect of operations. Researchers are also curious to know about the outcomes of Digital means.

Digital transformation was expected to contribute \$16.9 billion in additional revenue for Middle East businesses between 2017 and 2021 (Cabral, 2017). Implementation of digital technology into business processes has become essential for modern organizations' self-sustainability and competitive advantage (Bharadwaj, 2000). However, Advanced Change (AC) has emerged as an indispensable improvement in key IS investigation (Piccinini et al., 2015; Bharadwaj et al., 2013) still concerns specialists (Westerman et al., 2011; Fitzgerald et al., 2014). DT consolidates the considerable deviations going down in the public eye and enterprises through the work of computerized innovations (Majchrzak et al., 2016; Agarwal et al., 2010). At the construction level, it's been contended that companies should see ways to pioneer these innovations by creating procedures that hold the products of computerized change and drive progressed worker execution (Hess et al., 2016).

2.2 Meaning of “Dynamics” and “Digital Transformation (DT)”:

A. Dynamics:

Dynamics, a fundamental concept in various fields, including physics, engineering, and social sciences, pertains to the study of how systems change over time and in response to various forces and factors (Turner, 2010). Dynamics is a multifaceted concept that finds application across various disciplines. Whether in analyzing physical systems, economic trends, social interactions, or ecological processes, studying dynamics is fundamental to understanding how systems evolve and respond to various influences (Hastings, 2001). In the business and management context, dynamics refers to the evolving and fluid nature of organizations and markets. It reflects the ability to change and adapt to any changes in the business environment. Business dynamics are the concepts of market dynamics, organizational dynamics, and supply chain dynamics which explain how organizations should work under dynamic conditions in an ever-changing environment (Meriam & Kraige, 2016).

The word "dynamics" in various contexts refers to a broad range of meanings associated with the interaction, movement, and evolution of complicated systems. The theoretical literature on dynamics draws from several studies in engineering, social sciences, management studies, and physics. This literature review is going to try to explore the complex dynamics as understood by the different fields (Blanchard, 2017).

B. Organizational Dynamics:

Organizational studies review dynamics related to the processes of business and institutional change, adaptation, and innovation. In addition, researchers analyze organizational behavior and leadership dynamics in concert with strategic management practices that allow an organization to bring under control both the internal and external factors as argued by Buchanan and Huczynski, 2017. Ideas about organizational culture, power, and resistance to change are useful starting points in explicating some of the intricacies of organizational behaviour (Senge, 2006).

C. Social Dynamics:

Investigating the patterns of behaviour, interaction, and change within human societies and groups. Exploring various disciplines such as sociology, anthropology, and psychology, researchers delve into the ways individuals and groups shape and are shaped by societal structures and cultural

standards (Merton, 1968). Exploring social networks, power dynamics, and group dynamics sheds light on the intricacies of human relationships and societal structures (Hollander & Offerman, 1990).

D. Digital transformation (DT):

Digital transformation refers to the fundamental changes in business strategies, processes, and operations enabled by the integration of digital technologies across an organization, aiming to enhance efficiency, innovation, and customer experience while adapting to the rapidly evolving digital landscape (Smith, 2022). Digital transformation involves changes in how digital technologies alter a firm's operational structure, leading to improved products or the digitalization of processes. These developments are evident in the growing influence of digital media, which has significantly altered operational structures in industries such as music (Hess et al., 2016).

A digital transformation strategy can be defined as a framework that helps organizations manage changes brought about by the integration of digital systems into their operations (Matt et al., 2015). Bekkhus (2016) explained that Digital processes may be used to improve the organization's performance drastically.

Therefore, digital transformation is the process of employing digital technology to build new or adapt current business processes, culture, and consumer experiences. Digital transformation is the redesign of business in the digital age. Usman (2021) stated that “digital transformation is the act of reinventing corporate processes to extract the benefits of digital technologies to make them more productive, available, and extensible” (p. 63).

Verdino (2019) states that “digital transformation bridges the digital consumer expectations and its real value” (p. 45-61), highlighting its potential to align business offerings with consumer needs. Terrar (2015) emphasizes that businesses must embrace digital transformation strategies to remain competitive and adapt to evolving technological landscapes.

Digital transformations are frequently centred on boosting customer experience, utilizing digital technology to alter how customers connect with organizations and their products, and enhancing how firms service potential clients. Beyond the first shift, iterative and radical transformations are included, as is the transfer from analogue to digital information storage and transactions.

2.3 Digital Transformation of Performance Management Systems (PMS):

Performance Management Systems can be defined as a comprehensive and integrated approach that organizations use to align individual and team goals with the overall organizational objectives. It involves establishing performance expectations, continuously monitoring, and measuring performance, providing feedback, and implementing development plans to enhance employee performance and productivity (Mello, 2015). Digital shifts in performance management systems refer to the transformational changes in the design, implementation, and use of performance management practices and tools brought about by the incorporation of digital technologies (Liu, Sartori 2020). These shifts involve the utilization of digital platforms, artificial intelligence, gamification (Nguyen, 2018), and enhanced feedback mechanisms to improve performance management data collection, analysis, reporting, employee engagement, and decision-making (DeNis, 2016; Rustad 2021). Certainly, digitalization has a strong focus on transforming human resource (HR) practices and their implementation. However, one of the major challenges in implementing digital systems across various HR functions is the **high cost** associated with their installation. Furthermore, the adoption of new HR technologies and practices often depends on the **existence and strength of specific organizational factors**, such as firm size, structure, and available resources, which can either facilitate or hinder the transformation (Tippins & Ferrell, 1981).

Although organizations increasingly recognize the inevitability and competitive necessity of embracing digital transformation, many still believe there is much to learn regarding **strategic adaptation** and the alignment of technology to derive its full benefits in improving organizational performance (Tippins & Sohi, 2003).

The transformation of computerized innovation into business measures has become extremely essential for the endurance and upper hand of present-day associations (Bharadwaj, 2000). New advanced innovations guarantee better combination and flexibility, allowing representatives to have a bigger portion of voice and to enhance their work experiences. Advanced is statly to interfere with HR work and reclassify the fate of the human asset activities (Accenture, 2016).

Hunt (2014) shows that the remodeling ability of the board involves digitization; notwithstanding, it conjointly remembers incorporating social and computerized innovations in such ways that advance and increment correspondence, collaboration, and commitment, not just between a worker and subsequently the association, but also between and among representatives themselves. HR and ability measures and the innovation that empowers them will presently not establish their space.

Even many aspects of HR capabilities and executive ability will get wrapped in the impending authoritative exertion (The Innovation Enterprise, 2015).

2.4 Criticisms of Contemporary Performance Management Practices and Determinants of Digital Shifts:

Industries of all types are starting to recognize that to compete in today's digital world, they need to adopt new techniques to enhance performance management. Telecommunication Companies are also starting to realize that employee performance Management systems must include a new method for handling employee performance and creating a strong performance culture rather than simply checking compliance and marking off boxes when evaluating employee performance. There is a long-time discontent with the standard model as larger transformational forces have inherited play (Michael et al., 2019). Their study also listed the following matters as criticisms of traditional PMs that can trigger the digital shift. Still, the criticisms are- a lack of transparency, too backwards-looking and inflexible, time-consuming, and do not inspire employees.

Various other major factors — mostly associated with the moving scene of work and quick innovative development — are making the conventional exhibition model obsolete, unessential, and unmerited in the present serious market. Customary execution the executives' techniques have normally adopted a three-pronged strategy: (1) distinguish superior workers to advance and foster them, (2) discover the low entertainers with the goal that they might be winnowed, and (3) build up the expansive centre — he regular, strong yet average entertainers who, while scarcely a reflection, were not an accentuation or beneficiary of execution the board frameworks plan. Accurately, computerized, and information-incorporated improvement instruments have begun to customize much of their work and suggestions.

Also, high-ability, high-like performers, and in-danger low performers the same get unmistakable consideration. Anyway, slowly, technology has become a way for executing performance appraisal systems to executives throughout the entity, whatever their ability level. Digitally converting ventures are reestablishing their performance management systems not solely to quicken their transformations but to reconsider how to get the best performance from employees (Michael et. al., 2019).

2.4.1 Factors Affecting Digital Transformation in Performance Management Systems (PMS):

The evolution of Performance Management Systems (PMS) in the digital realm is an emerging trend that has been extensively examined in existing literature. As technology evolves, organizations are progressively moving away from conventional, manual systems towards more advanced, digital platforms to improve employee performance and optimize management processes. Nonetheless, various elements impact the effectiveness and obstacles of this digital transformation. This section examines the essential elements highlighted in previous investigations.

i. Technological Advancement and Integration:

Technological advancements such as artificial intelligence, big data analytics, and cloud computing have significantly influenced the digital transformation of PMS. These technologies streamline the collection of performance data, offer immediate feedback, and allow for more flexible assessment approaches (Johnson & Lee, 2023). Organizations that effectively integrate these technologies into their performance management processes can improve accuracy, efficiency, and employee engagement (Smith & Brown, 2022). However, the challenge lies in choosing the right technology that aligns with the organization's goals and ensuring its seamless integration into existing systems (Rahman & Ali, 2022).

ii. Organizational Culture and Leadership Support

The significance of organizational culture in the process of digital transformation cannot be overstated. A culture that fosters innovation and embraces change is more likely to thrive during the digital transformation of performance management systems (Ahmed & Khan, 2023). Leadership is essential in cultivating this environment by offering strategic guidance, resources, and a vision for digital transformation (Wilson et al., 2023). Leaders who take a proactive stance in promoting digital initiatives and engage employees in the transition can effectively reduce resistance to change, thus enhancing the chances of a successful transformation (Anderson & Patel, 2021).

iii. Employee Perception and Adaptability

Most firms are shifting from traditional performance management systems to digital approaches,

and this predominantly influences how acceptance is viewed and adjustments are made by workers. Workers may be resistant to the change because they are unfamiliar with the new system or due to some kind of beliefs related to privacy and surveillance (Rahman & Ali, 2022). Perceived usefulness and perceived ease of use, according to studies, are the two most important factors that determine employee acceptance of digital PMS (Davis, 1989; Venkatesh & Bala, 2008). These issues can be resolved effectively by providing adequate training, involving employees in the design process, and being transparent about the use of data that is drawn (Smith & Brown, 2022). Moreover, prioritizing employee-centric design during the digital transformation journey enhances user experience and increases system acceptance (Ahmed & Khan, 2023).

iv. Data Security and Privacy Concerns

Since organizations are more inclined towards digital PMS, data security and privacy remain the two major concerns that are always highlighted. Digital platforms amass sensitive employee information, including performance metrics and behavioural data, that require rigorous data protection measures (Kim et al., 2022). Other studies indicate that organizations should be concerned about the legislation of data protection, like GDPR, and consider cybersecurity measures that could be implemented to safeguard employee information (Johnson & Lee, 2023). The lack of attention towards these issues might lead to some legal implications and a loss of trust among employees, defeating the purpose of the digital transformation process (Rahman & Ali, 2022).

v. Regulatory and Policy Environment

Government policies and regulatory frameworks have a significant effect on the orientation and success of digital transformation. In the telecommunication industries, the implementation of digital PMS is effectively depending on strict adherence to certain regulations and policies (Kim et al., 2022). In this regard, the study ascertains that the integration of the digital transformation process with the demands of the regulatory legislation offers an easy way of conducting business with minimal legal challenges (Anderson & Patel, 2021). In addition, public policy incentives and government-led initiatives for digitalization largely impact organizational decisions in the selection and adoption of digital PMS (Rahman & Ali, 2022).

vi. Change Management and Organizational Capabilities

Effective digital transformation in PMS is greatly dependent on an organizational capability related to change management. Proper strategy with appropriate communication, complete training, and stakeholder engagement is required while shifting from a manual to digital system. According to Ahmed and Khan (2023), organizations with robust change management frameworks are better equipped to manage the nuances of digital transformation, making the process more effective and less disruptive. They further observe that the workforce is ready for the acceptance of new technologies (Wilson et al., 2023). Furthermore, enhancing organizational capabilities regarding technology infrastructure, human resources, and financial investment is crucial for maintaining digital transformation efforts (Smith & Brown, 2022).

vii. Employee Performance and Engagement

The primary aim of digital transformation in PMS is to improve employee performance and foster engagement. Digital PMS facilitates a more dynamic and ongoing approach to performance monitoring, tailored feedback, and decisions grounded in data (Rahman & Ali, 2022). Research indicates that when executed properly, digital performance management systems can enhance employee motivation, align goals, and improve performance results (Wilson et al., 2023). Nonetheless, the effectiveness of these systems is significantly influenced by their alignment with the overarching organizational strategy and culture (Ahmed & Khan, 2023).

Various elements that affect the effectiveness of digital transformation in PMS have been recognized in the existing body of work. These elements encompass the evolution of technology, the ethos within organizations, the viewpoints of employees, the safeguarding of data, the landscape of regulations, the proficiency in managing change, and the influence of digital transformation on both performance and engagement. Careful consideration of these aspects is essential for the successful deployment of DPMS, even though it offers numerous benefits, including enhanced productivity and real-time feedback. For organizations to effectively transform their performance management systems, they must navigate the challenges posed by technological innovations, shifts within the organization, and compliance with regulatory standards.

2.5 Digital Shifts in PMS and Its Outcome:

Oxford Economics (2012) lists that technology is also reforming the performance of employees.

Today's HR experts can influence mechanisms that place metrics around things that once were hard to evaluate or forecast. A study shows that the transformation of HR operations into a strategic business function is well underway and will continue over many years. The process includes developing and enhancing teamwork between the HR department and other business units to ensure improved employee performance, extended talent management, and greater attention on faster business results with the strategic use of technology (Wolf, 2015).

Wolf (2015) also focuses on how social and digital technologies are essentially converting performance management. Encouraging paperless work efforts is a trend in many modern organizations, but the changes are growing beyond that. Now managers can find and provide feedback to employees nearly uninterruptedly so that they continuously see their performance and position. This casual feedback can directly be fed into the appropriate performance management process, which can help upgrade comprehensiveness and correctness and diminish work stress.

As an alternative to greater clarification of employee expectations and enhancing team morale, the traditional yearly appraisal facet of performance management (PM) separates talented and typical employees alike. Moreover, appraisers do not like it. Even as personal and enterprise devices and technologies have drastically upgraded, performance management systems have not. Furthermore, while the landscape of work and the work environment have been fully fledged with more data-integrated and logical, performance management has not kept pace. Constant complaints — inflexibility, information cloudiness, unfairness, arbitrariness, and inherent backwards-looking favoritism continue.

Across industries, competitive companies identify that competing effectively in digital business trends emphasizes a new method of performance evaluation. More and more, interdependencies between employees, and work units, make technologies more significant to get work done in the organization. So, team performance surpasses individual performance as the workplace's noticeable unit of analysis. Team performance, mentoring, and competency development require sharp care and precise assets. (Michael et. al., 2019).

The digital shift in performance management encompasses several key elements:

1. **Real-Time Feedback:** Digital tools allow immediate feedback, enabling managers to provide timely insights and coaching to employees (Armstrong & Taylor, 2014).

2. **Data Analytics:** Advanced analytics and data-driven insights play a crucial role in evaluating performance and identifying areas for improvement (Huselid & Becker, 2011).
3. **Gamification:** Gamification techniques are being employed to engage employees and enhance their motivation and performance (Antin, 2017).
4. **Mobile Apps:** Mobile applications facilitate on-the-go performance monitoring and assessment, improving accessibility and convenience (Agarwal & Dhar, 2014).
5. **AI and Machine Learning:** Artificial intelligence and machine learning algorithms can analyze large datasets to identify patterns, predict future performance, and provide personalized recommendations (Davenport & Harris, 2007).
6. **Blockchain Technology:** Blockchain offers secure and transparent record-keeping, enhancing the integrity of performance data (Mougayar, 2016).

Challenges and Opportunities: The digital shift in performance management is not without challenges. Organizations face concerns related to data security and privacy (Schneier, 2015). Additionally, there may be resistance to change from employees accustomed to traditional performance management practices (Pulakos et al., 2015). However, embracing digital transformation in performance management offers numerous benefits, including increased transparency, improved employee engagement, and better alignment with organizational goals (Marler & Boudreau, 2017)

2.6 Effects of Digital Transformation in PMS:

The idea of eliminating the yearly performance review has been mentioned, adopted, reversed, restored, and improved repeatedly across thousands of organizations over the past fifty or more years and remains in the news nowadays. The usefulness of typical performance management methods is still doubtful, and acceptance levels are low. When added to the growing demands of the digital workstation, it is obvious that organizations must remodel their performance management systems and technologies to integrate a more customized workplace. Tools are evolving that increase paperless work and compliance necessities, with the ability to be concerned with the continual systems of performance improvement, promoting teamwork, fairness, systematic criticism, and directions to the employees in the context of their daily operations (Susan, 2015).

Digital shifts in performance management systems make customization easier, inexpensive, and measurable. As a result, it creates performance management systems with organization-wide competence, not just the top sphere of the high performers. As higher and a lot of subtle performance analytics become instantly accessible, ought people take larger improvement initiatives? Or should their managers manage and stimulate more? Where should organizations differentiate between performance management data needed to evaluate performance versus finding areas for professional progress? Should an employee be assessed, classified, and rewarded for their efforts as individuals or as members of teams?

The data-integrated and algorithmically informed digitization of feedback is the essence of impersonal. Companies will have to think about balancing employee performance metrics with trialing and risk-taking metrics. Managers will have more informative and clear insights with improved data and analytics. It may help to monitor individuals and teams. This indirectly influences softer skills — persuasion, assistance, enthusiasm — even as performance management becomes more technology-oriented (Michael et al., 2019). Digitalization creates a good image to attract talent, ensures employee loyalty, enhances autonomy, and accelerates the establishment of new roles in employee management (Schalk, et al., 2013).

2.7 Barriers to Digital Transformation of PMS:

One of the major blessings of digital transformation is the ability to permit data to flow and be accessible anytime and anyplace by all staff in the organization. However, many organizations resist the transformation because of **security concerns**. Digital transformation encompasses effort, physical resources, and funds. Large organizations with many assets are undergoing complications as their systems become outdated. The charge of remodeling is often too expensive to be installed across the organization, and remote improvement projects arise that have no eternal effect and may create future maintenance problems.

Where organizations are conventionally organized around different operations like sales, IT, supply chain, etc., digital innovation needs a different method, where employees, operations, and technology blend to generate new business models and new services. Employees need **new skills for innovation and creativity linked to technology**, like Big Data, the Internet of Things (IoT), or artificial intelligence (AI). Talent management through digital conversion entails a worldwide

approach, combining the potential of reshaping employees' daily operations to embrace more skills and competencies by forming skilled groups or even outsourcing certain efforts. Real support from management for digital transformation initiatives remains insufficient in many organizations. **Unwillingness to alteration** can be especially considerable in successful organizations, where many people may hesitate to change if things go well (Alfredo, 2020).

2.8 Relations among Digital Performance Management Systems, Sustainability, and Competitive Advantages:

According to Barney (1991), a competitive advantage exists when a firm implements a value-creating strategy that is not simultaneously being implemented by any current or potential competitors (p. 102). Rumelt (1991) indicated that asset-based assessment of the enterprise, competitive advantage can only develop in situations of its asset diversity and resource fixity. These assumptions differentiate the resource-based model from the conventional strategic management model. Firm asset variety refers to the way that assets differ across associations.

Many researchers have focused on determining how an organization can attain competitive advantage through the most significant assets, i.e., Human Resources, around the world. Schuler (1984) recognized major HRM rehearses like Human Resource Planning, staffing, including enlistment, choice, and socialization, Employee execution Appraisal, Compensation, Training and Development, and labor-management relations that should be followed to deal with HR effectively. Effective administration of HR can improve the capacity to draw in and hold qualified workers committed to performing and having the right representatives assigned to perform coordinates to the upper hand.

Faugoo (2009) indicated that the capacity to attract talent, select the best, improve timely competencies, encourage innovation, and retain top performers would be the key to a firm's success in the modern business world. She explained that employee management is primarily connected with competitive advantage and that HR practices are strongly related to organizational overall performance.

The primary influence is not doubtful. Digital conversion organizations — such as IBM, DBS Bank, and Adobe — are restoring their performance management systems to foster their digital

revolutions and remodel how to attain the best from their employees. This new form of performance management system is operationally and culturally strategic for these initial contributors. They imply a key investment in human resources. It is evident now that traditional compliance-oriented performance management systems aren't a good answer to sustain, let alone generate, tomorrow's competitive advantage: They can't support an organization's motives to evaluate and efficiently foster employee performance rapidly. There is a clear consensus that the future of performance management goes to data-integrated systems that better notify and direct managers and workers alike. Forecasting new options means more than briefing past performance (Michael et al., 2019).

2.8.1 Competitive Advantages Through Digital Transformation of Performance Management Systems:

In the era of digitalization, businesses are increasingly adopting advanced technologies to transform their performance management systems. This literature review explores the competitive advantages associated with this transformation. Adopting Digital Performance Management Systems (DPMS) presents a promising avenue for gaining competitive advantages within the Bangladeshi telecommunication sector. DPMS is a collection of digital tools and platforms that monitor, analyze, and optimize organizational performance in real time. This review investigates how the implementation of DPMS can provide competitive advantages to telecommunication companies in Bangladesh.

a. Enhanced Operational Efficiency:

These enable smooth and effective management of operations by the telecom companies. DPMS, through network monitoring, resource allocation, and service provisioning process automation, can help an organization reduce time wastage, lower operational expenditure, and hence increase productivity (Ahmed et al. 2020). In this way, enhanced operational efficiency provides a competitive advantage in view, enabling telecom operators to deliver services more effectively and respond promptly to each customer's needs.

b. Enhanced Data Analytics and Decision-making

The huge volume of data collected by an organization regarding an employee's performance can be analyzed to extract useful insights in the digital era. Smith and Fingar (2017) mentioned that organizations can find more patterns, trends, and areas for improvement while enabling analytics

in their performance management activities. The ability of companies to manage their resources and concentrate on their strategic plans improves by elevating the process of decision-making. Hossain and Sultana (2019) find that with the help of DPMS, telecommunication companies may acquire, analyze and visualize all forms of data associated with network performance, customer behaviour, market trends, and competitor activity. The data-driven way of making decisions enables a company to recognize opportunities, eliminate threats, and make strategic decisions to outpace others in the marketplace.

c. Real-time Feedback and Continuous Improvement

Traditional performance management systems based their operations on annual or periodic appraisal systems. Digital transformation allows for real-time feedback, enabled through respective platforms and applications. According to Hagerty et al. (2019), this nurtures a culture of continuous improvement in which the employees can start to immediately see where they are doing well and where they need to improve. The same applies to organizations in terms of their response to market dynamics and competition.

d. Alignment with Organizational Goals

Digital performance management systems can also be integrated with broader organizational goals and strategies. In the view of Chang et al. (2018), linking individual performance metrics to strategic objectives brings about goal clarity and ensures that efforts are always channeled in the right direction to achieve corporate priorities. It creates a more integrated and focused workforce, leading to better overall organizational performance and increased competitiveness.

e. Agility and Flexibility

Digital performance management systems afford better agility and flexibility to adapt to the constantly changing business environment. With the help of cloud-based platforms and mobile apps, organizations can facilitate working from any place, decision-making decentralization, and collaboration across functional lines. Flexibility increases responsiveness toward changes in markets and customer demands, as Kamhawi et al. (2020) have noted, thereby improving competitiveness.

f. Employee Engagement and Satisfaction

The new features like gamification, social recognition, and personalized development planning

that come with digital performance management systems may positively impact employee engagement and satisfaction. According to Meijerink et al. (2020), an engaged employee is likely to be more productive, creative, and loyal, hence a better contributor towards organizational competitive advantage. The digital platforms allow regular communication and recognition in creating a positive work culture.

g. Strategic Alignment and Digital Transformation

One could also note here that there is a need to link individual performance with organizational objectives for there to be sustainable competitive advantages, which digital transformation effectively allows. Nguyen et al. (2021) add that digital PMS ensures the proper cascading of strategic goals throughout an organization in coherency and at all levels. This impact of digital PMS on strategic alignment is heightened by the insight it brings towards strategic priorities and in linking these to the performance metrics of individuals.

h. Innovation and Digital Performance Management

Digitalization of PMS also enhances operational efficiency and engrafts an innovation-oriented culture, critical to achieving sustainable competitive advantages. Digital platforms enable organizations to experiment with new measures of performance, feedback, and recognition, as mentioned by Chen and Huang (2020). Such a culture of experimentation instils creativity and hard-wires risk-taking to ensure continuous innovation, which solidifies the long-term competitive advantage of organizations.

The new dimensions of competitive advantage arising from the digital transformation in performance management systems are: increased analytics of data, immediate feedback, alignment of goals, speed, and employee participation. It would lead to better decision-making, continuous improvement, and faster responses to any fluctuation in the market scenarios, all with advanced technologies. The advantages thus aggregate to assure the competitiveness and long-term success of an organization.

2.8.2 Sustainability through Digital Transformation of Performance Management Systems:

Sustainability has turned out to be a highly important issue for organizations during the last few years. Organizations now develop their performance management system to include sustainability perspectives through the route of digital transformation given growing concerns linked to

environmental, social, and economic dimensions. A literature review is discussed here that covers the relationship between sustainability and digital transformation in the context of PMSs along with major themes, challenges, and opportunities.

a. Sustainability and Performance Management Systems:

Performance management systems form a core part of organizations in the measurement, evaluation, and improvement of performance along diverse dimensions. The aspect of sustainability, embraced by the environmental, social, and economic aspects, is becoming an important part of organizational strategy. According to Schaltegger and Wagner (2011), integrating sustainability into performance management systems enables organizations to align their objectives with the principles of sustainable development.

b. Digital Transformation in Performance Management:

Digital technologies have fully transformed traditional performance management systems. Digital transformation is described as the modern integration of digital technologies into organizational processes and capabilities. According to Lacity and Willcocks (2013), technologies of big data analytics, cloud computing, and artificial intelligence provide opportunities to enhance effectiveness and efficiency within performance management systems.

c. Integration of Sustainability in Digital Performance Management Systems:

Various literature highlights that integrated sustainability within the firm's digital performance management system is important. As such, Eppler and Mengis (2012) note that digital tools ease gathering, analyzing, and visualizing data on sustainability issues; this allows an organization to map and monitor in real time its ecological and social performance. Consequently, integration enhances transparency and thus accountability, thereby improving stakeholders' trust and confidence.

d. Challenges and Barriers:

Despite this fact, the potentiality of bringing sustainability into a digital performance management system faces several challenges that an organization has to deal with. Lozano et al. (2015) identify cultural resistance, data quality issues, and a lack of expertise as major obstacles to success. Besides, ethical concerns arise over the privacy and security issues of collecting and managing data about sustainability.

e. Opportunities and Future Directions:

Sustainability and digital transformation provide many ways in which organizations can drive innovation and competitive advantage. Advanced analytics and predictive modeling, for instance, as stated by Schaltegger and Burritt (2018), are able to support organizations in anticipating risks linked to sustainability and identifying opportunities to improve it. Additionally, blockchain technology can enhance the transparency and traceability of sustainability data across supply chains, according to Iansiti & Lakhani (2017).

Digitalization, in other words, embeds a pathway into the performance management system to guide organizations in integrating sustainability concerns in an effective way. The application of digital technologies would embed the capabilities of an organization to measure, monitor, and manage sustainability performance in contribution to the long-run goal of environmental, social, and economic value creation.

2.8.3 Multiple Directions of Sustainability in Digital Transformation

Embedding digital technologies in Performance Management Systems (PMS) also greatly improves the efficiency, transparency, and optimization of resources, making a major contribution to sustainability (Bocken et al., 2016). The digital transformation's environmental, economic, and social dimensions classify sustainability benefits (Elkington, 1998).

a. Environmental Sustainability

Digitalization reduces carbon print, energy consumption, and resource waste by transitioning PMS from physical to digital channels (Lozano, 2015). Traditional paper-based PMS is accompanied by bulk printing, storage, and movement, resulting in high carbon footprints (Gholami et al., 2013). Empirical studies prove that cloud-based PMS can conserve 80% of paper and 20% of energy consumption (International Energy Agency, 2022).

- **Green Computing & Carbon Emission Reduction:** Companies using cloud-based HRM systems reduce 30% of CO₂ emissions by conserving energy (Dyllick & Muff, 2016). Research by Raut et al. (2019) shows that AI-based PMS optimizes job assignments, reducing duplicate work and energy consumption by 25%.
- **Remote Work & Sustainability:** Digital PMS facilitates remote work, reducing commute emissions and the requirement for office space (Kiron et al., 2017). A McKinsey & Co.

study in 2021 showed that implementing remote work through digital transformation lowered corporate carbon emissions by 18%.

b. Economic Sustainability

The economic benefits of digital PMS include cost savings, productivity improvement, and long-term financial safety (Parida et al., 2019). Companies utilizing AI-driven PMS witness a 25% reduction in HR operating costs due to automation (Porter & Heppelmann, 2014).

- **Process Efficiency & Automation:** E-PMS removes administrative tasks so businesses can focus on core HR strategies (Westerman et al., 2014).
- **Data-Driven Decision-Making:** AI-driven analytics improve workforce planning, reducing recruitment and turnover costs (Bharadwaj et al., 2013).

c. Social Sustainability

Digital PMS promotes fairness, transparency, and employee well-being (Bai et al., 2022). Companies adopting real-time performance tracking report a 15% improvement in employee engagement (Grant et al., 2018).

- **Diversity & Inclusion:** Digital transformation provides bias-free performance appraisals and an inclusive environment (Wamba et al., 2017).
- **Employee Well-being:** Remote access to PMS tools supports flexible work habits, enhancing job satisfaction (Lozano, 2015).

d. Carbon Emission through Paperless work and Sustainability Indicators

- **Corporate CO₂ Emissions:** 21% of the world's CO₂ emissions are from corporate activities, per the Global Carbon Atlas (2023).
- **Impact of Digitalization:** Companies employing cloud-based PMS reduce their carbon footprint by 30% (IEA, 2022).
- **Sustainable HR Practices:** Organizations that employ digital PMS experience a 40% reduction in physical resource usage, which enhances sustainability goals (Bocken et al., 2016).

Carbon Footprint of Paper Production:

- The Carbon Trust states that one ton of paper production releases around 1.5 metric tons of CO₂ into the atmosphere.

- A single A4 page is estimated to emit 4.3 grams of CO₂ over its lifetime, from production to transport to end-of-life disposal (The Carbon Trust, 2024).

Paper Reduction and Carbon Savings:

- Research indicates that an average office employee consumes approximately 10,000 sheets of paper annually, equivalent to an approximate 43 kg yearly emission of CO₂ (World Wildlife Fund, 2023).
- The Environmental Paper Network reports that reduced consumption by one ream (500 sheets) saves about 6% of a tree, prevents 7.5 kg of CO₂ emissions, and preserves 130 litres of water.
- Digital HR and PMS systems have been discovered to significantly lower emissions by substituting paper-based performance appraisals with their digital counterparts (WWF, 2023).

Corporate Sustainability Impact:

- Due to digitalization, major corporations that have embraced paperless HR and PMS systems save thousands of tons of CO₂ annually.
- According to the World Wildlife Fund's calculations, paper production is responsible for nearly 2% of the world's CO₂ emissions. Shifting to digital solutions can reduce this footprint substantially (WWF, 2023).

2.9 Digital Transformation in the Telecommunication Industry of Bangladesh:

In this regard, technology has played a critical role in transforming most aspects of organizational activities over the last couple of years, ranging from performance management systems to others. Among such transformations, the evident changes in the healthcare industry act as an example. Over the last couple of decades, the Bangladesh telecommunication industry has greatly expanded and significantly contributed to the country's economic development. According to BTRC 2020. The sector is highly critical because the subject sector acts as the bridge between people and organizations and facilitates the process of digital transformation and economic development. In this regard, based on the fact that the digital transformation factor is continuously changing the entire world, understanding the implication of digital transformation in the performance evaluation system of the employees working in the telecommunications sector will be highly critical in today's

context. The subject study focuses on the Bangladesh telecommunication sector. There is a high tendency among industries in Bangladesh to adopt technology for business processes as its economy is growing gradually. This literature study has been conducted to explore further issues about the application of technology in Bangladesh's performance management system, highlighting its major trends, problems, and potentialities. The final research examines how performance management techniques influence productivity within the Bangladesh telecommunication industry. This also sheds some light on the way recent technological innovations will help manage employee performance using digital performance monitoring tools and online feedback systems (Islam & Uddin, 2020). This study examines performance management strategies in Bangladeshi companies and their technology integration. It examines performance monitoring and evaluation using performance management software, data analytics, and mobile apps (Shams & Islam, 2018).

However, in terms of unique subscribers, Bangladesh is the ninth-largest mobile market in the world, accounting for 51% of the country's population (GSM, 2021). Numerous multinational corporations have invested in Bangladesh (World Bank, 2020), and Teletalk is the only locally owned brand (Bangladesh Regulatory Commission, 2021). Alam and Noor (2020) investigate digital transformation's prospects, challenges, and consequences in the Bangladeshi telecommunications sector. It examines the impact of adopting advanced technologies such as 5G, the Internet of Things (IoT), and Artificial Intelligence (AI) on service delivery, consumer experience, and operational efficiency. Hossain (2020) assesses the impact of going digital on the Bangladeshi telecommunication systems. The study explores the changing nature of service availability, in addition to the digital channels, and the importance of enhancing the infrastructure of the network along with its connectivity for fulfilling the changing customer demands. Thus, the systematic review provides an extensive understanding of the change digital transformation is creating within the Bangladeshi telecommunication business. It aimed at reviewing the available literature to identify the most important concepts related to the different digital initiatives, infrastructural development, the impact of policies, and the future directions of the industry (Zaman & Hossain, 2021). A SWOT analysis of the digital transformation of the Bangladeshi Telecommunications industry has been performed by Rahman and Hasan (2019), through which the advantages, disadvantages, opportunities, and threats of the adoption of digital technologies are assessed in the report. The report emphasized the need for strategic planning and commitment

to maximize the benefits from digital transformation. At the frontline of the digital transformation race, the Bangladesh Telecommunication industry has emerged as a potential context where the dynamics of digital technologies' acceptance and integration could be observed effectively among the employee performance management systems of working individuals.

The case study of the biggest telecommunication company in Bangladesh is interesting for several reasons: the industry it operates in is highly dynamic and competitive, and it requires rapid adaptation to digital innovations. Besides, the significant size and market share held by this company turns it into an influential entity to develop and shape the course of industry trends and best practices. Moreover, it should be underlined that within the context of Bangladesh, an advanced digital revolution happened in the telecommunication industry. Thus, studying the dynamics of digital transformation and its impact on the performance management system is in an interesting and relevant context.

In this regard, Mahmood and Hasan (2020) studied comprehensively the challenges and opportunities of digital transformation in the telecom industry in Bangladesh; in this regard, the authors also focused on the pivotal role of human capital in the process. Our review of the extant literature failed to find any comprehensive study of the industry about the relationship between digital transformation and performance management systems.

2.9.1 Outcomes of Digital Transformation in Performance Management Systems in the Bangladeshi Telecommunication Industry:

It is high time all organizations geared up for digital transformation to be competent and relevant in the fast-changing landscape of the telecommunication industry. Performance management systems are highly instrumental in conducting appraisals, controlling, and bringing improvement in employees' performance, customer satisfaction, and the overall effectiveness of the organization. This literature review covers the results of digital transformation in the performance management system, particularly in the Bangladeshi telecommunication industry, which will highlight various aspects of this transformation process.

This will involve the integration of digital technologies within each business function. This would implicitly mean changing how value would be created for customers. Within the performance

management function, it could be manifested in leading decisions based on advanced analytics and AI. Data-driven insights would be provided in a manner to maximize available resources toward optimized performance of the organization (Gupta & George, 2016).

Continuous technological improvements, increasing mobile connectivity, policies, and government programs for digital connectivity over the past couple of decades have grown and changed the Bangladesh telecom industry vastly (Ahmed, 2019). New 4G technology and the introduction of 5G networks in Bangladesh therefore pose various opportunities and challenges for telecom operators in terms of efficient service delivery, network efficiency, and customer experience (Islam, 2020).

2.9.2 Outcomes of Digital Transformation in Performance Management:

a. Enhanced Operational Efficiency: Digital transformation helps telecom organizations to re-engineer their processes, automate routine tasks, and optimize utilization of resources, which involves real-time monitoring and predictive analytics (Kumar & George, 2017). It assures improved operational efficiency, cost reduction, and fast decision-making, which eventually drives better performance (Sharma & Gupta, 2018).

b. Improved Customer Experience: With the incorporation of data analytics and AI-driven insights, telcos can offer personalized services, predict customers' needs, and deliver frictionless and intuitive experiences across omnichannels. This, in turn, improves customer satisfaction, maximizes loyalty, and leads to lower churn (Bose & Luo, 2017; Alam & Bhuiyan, 2020).

c. Agile Performance Management: It allows digital transformation that can facilitate the implementation of agile methodologies and continuous feedback mechanisms in performance management systems (Mone & London, 2018). This would easily enable an organization to quickly respond to the changing dynamics in the market, understand areas for improvement, and align employee goals with strategic objectives (Hameed et al., 2019).

d. Data-driven Decision Making: Big data analytics and business intelligence tools enable telecom companies to extract valuable insights into market trends, customer behavior, and competitor activities (Khan et al., 2021). These insights support data-driven decision-making at all organizational levels, enhancing resource utilization and informing strategic planning (Rana & Bari, 2020).

Digital transformation has turned out to be one of the strategic imperatives of many telecommunication companies in Bangladesh to stay competitive and meet the ongoing, ever-changing needs of its customers and stakeholders. Advanced technologies and data-driven insights will enable organizations to achieve operational efficiencies, enhance customer experiences, and support agile performance management practices. Realistically, tapping the full potential of digital transformation in performance management systems requires effective leadership, organizational agility, and an innovative culture.

2.9.3 Challenges of Digital Transformation in Performance Management Systems in the Bangladeshi Telecommunication Industry:

Business organizations from almost all industries consider digital transformation a must. Thus, this recent modern shift in the direction of digitalization affects almost every company within the Bangladeshi telecommunication industry; on the contrary, many more issues regarding security, privacy, and other pertinent factors arise within this paper when discussing challenges and issues for adaption in the current performance management systems.

a. Security Challenges:

The security of the performance management systems through digitization comes first. Since all the processes of telecom companies are getting digitalized, it increases their vulnerability towards various types of cyber threats, including data breaches. According to Ahmed et al. (2020), cybersecurity is the most important issue that the telecommunication industry in Bangladesh considers while dealing with sensitive performance management data, along with encryption protocols, control over access, and threat monitoring systems.

b. Privacy Concerns:

Privacy can be an important issue related to performance management systems, particularly employee information. Telecommunication companies in Bangladesh are bound to observe strict laws on privacy, especially while collecting, storing, and analyzing information linked with the performance of the employees. Hasan and Islam (2019) discuss implications of the privacy regulations on digital transformation initiatives taken up by Bangladeshi telecommunication companies and enforce the need for compliance with laws such as the Personal Data Protection Act.

c. Data Governance Challenges:

Effective data governance is the key to the success of performance management systems. However, establishing comprehensive data governance frameworks is often very challenging for telecommunication companies in Bangladesh. Hossain and Uddin (2021) present data governance as a way of ensuring data quality, integrity, and accessibility concerning performance management systems, and strict process standardization with mechanisms for accountability.

d. Technological Infrastructure Challenges:

The digitalization of performance management systems indeed requires a strong technological infrastructure. In the context of Bangladesh, such a problem indeed arises among the telecommunication companies regarding their archaic IT system, lower bandwidth, and interoperability issues. Overcoming challenges related to technological infrastructure is essential for ensuring the optimal performance of digital systems in the Bangladeshi telecommunication sector (Rahman et al., 2020).

e. Employee Resistance:

The major challenge associated with regards to the same is employee resistance to the digitization of performance management systems. Islam and Khan (2018) studied factors that evoke employee resistance in the telecommunication industries in Bangladesh and strategized the way to overcome the resistance by adopting appropriate change management practices along with employee training programs.

The challenges provided by the digital transformation of the performance management system in the Bangladeshi telecommunication industry have been security, privacy, data governance, technological infrastructure, and resistance from employees. Overcoming these challenges would therefore guarantee complete digitalization and enhancement of operational efficiency and competitiveness for any company in the industry.

2.9.4 The Digital Transformation Framework by George Westerman, Didier Bonnet, and Andrew McAfee

Firms have come to understand that they need digital transformation to stay competitive in today's dynamic digital economy. George Westerman, Didier Bonnet, and Andrew McAfee's Digital Transformation Framework has shaped both research and practice in this field. This framework organizes organizational digital transformation. This literature study analyzes the main

components of this framework and their influence on organizational success.

Leadership, Capabilities, and Alignment form the Digital Transformation Framework. All components must be in synergy for successful digital transformation.

i. Leadership:

Leadership is about the essentials of digital transformation. Westerman, Bonnet, and McAfee believe that visionary leadership drives the wheel of change and creativity at the business level. The leadership of digital transformation projects can determine the degree of success. Their willingness to change has thus set the tone. Leadership participation and a straightforward vision for digital transformation to motivate employees and stakeholders have also been emphasized in the literature (Westerman et al., 2014).

The middle management and frontline supervisors who champion digital projects also support them (Meyer & von Walter, 2017). Leaders are required to be flexible enough to accommodate rapidly changing digital technologies in response to market dynamics (Ransbotham et al., 2017).

ii. Capabilities:

The second element of the Digital Transformation Framework is Capabilities. It assesses the readiness and ability of an organization to conduct or implement digital tools, technology, and data. Capabilities include data analytics, technology infrastructure, organizational learning, and adaptability. Digital transformation requires a very strong digital infrastructure for its operation (Westerman et al., 2014).

The researcher also advises strategists to invest in digital capabilities to support data-driven decision-making (Ross & Beath, 2017). Moreover, exploratory learning enhances preparedness in this digitally global era (Berman et al., 2019). The research also emphasizes that cooperative partnerships increase the potential for acquiring digital capabilities as one develops their knowledge base (Van Doorn, Vermoesen, & Romphou C. J., 2017).

iii. Alignment:

The third building pillar of the framework, alignment, emphasizes aligning digital transformation projects with the organization's strategy and goals. It is difficult to align short- and long-term digital transformation goals (Westerman et al., 2014).

Research has demonstrated that alignment encompasses operational procedures, customer expectations, and staff roles beyond strategy alignment (Venkatraman, 2017). Integration of digital

activities within the organization is needed for sustainable change (Hanelt et al., 2019).

In all, the Digital Transformation Framework by George Westerman, Didier Bonnet, and Andrew McAfee allows for a structured and organized understanding of organizational digital transformation. Leadership, Capabilities, and Alignment are guiding field research and practice. This framework guides strategic decision-making and implementation as firms traverse digital transformation's obstacles and opportunities.

2.10. Major Trends in Previous Studies

A thorough analysis of the existing literature on digital transformation and employee performance management systems uncovers several significant trends that pave the way for further exploration. These trends underscore progress in the field while also exposing the uncharted territories that remain, particularly in relation to emerging economies like Bangladesh. The key trends are summarized as follows:

Technological-Centric Focus: Most prior investigations highlight the significance of technological advancements in propelling digital transformation. Studies have primarily focused on developments such as cloud computing, artificial intelligence, big data analytics, and their effects on organizational processes (Smith & Brown, 2022). However, these studies frequently overlook the human aspect—specifically, how employees interact with and adapt to these technologies within performance management systems (Anderson & Patel, 2021).

Geographical Bias Towards Developed Economies: The current analysis exhibits a notable inclination towards case studies originating from Western nations or advanced economies, where digital infrastructure is robust and readily available (Rahman & Ali, 2022). The advancement of digital transformation in developing nations like Bangladesh has not received adequate attention, as these countries face unique socio-economic challenges and opportunities.

Neglecting Employee-Centric Perspectives: Earlier studies frequently focus on the benefits at the organizational level, such as increased efficiency, cost reductions, and improved competitive positioning that arise from digital transformation (Wilson et al., 2023). However, the perspective of employees, including the impact of digital transformation on their roles, satisfaction, productivity, and motivation, is still not thoroughly examined (Ahmed & Khan, 2023).

The examination of digital transformation has often positioned performance management as a

secondary topic, commonly viewed as part of broader human resource management efforts (Kim et al., 2022). Studies have concentrated on different aspects like digital recruitment, training, and employee engagement, leading to a lesser focus on the examination of performance management systems in the context of their digital transformation (Johnson & Lee, 2023).

Sector-Specific Research is Limited: There is a scarcity of research specific to certain sectors. While various industries such as healthcare, education, and manufacturing have been extensively analyzed about digital transformation, there remains a significant gap in comprehensive studies focused on the telecommunications sector. This is of considerable importance since the telecommunications industry often pioneers technological innovations (Anderson & Patel, 2021).

Insufficient Integrated Approaches: The majority of studies on digital transformation and performance management employ a single-method approach, concentrating exclusively on either qualitative or quantitative methods. Utilization of integrated or mixed-method approaches, which have the potential to offer more comprehensive insights, is infrequent (Farrukh et al., 2021).

Regulatory and Policy Context Often Ignored: Studies on digital transformation commonly focus on the adoption of technology and innovation in processes, but they frequently overlook the regulatory and policy frameworks that influence these changes, particularly in emerging markets (Kim et al., 2022). Government policies, telecommunications regulations, and industrial standards that shape the development of digital performance management systems are still weakly studied.

2.11 Research Gap:

Although the literature on digital transitions in HR functions provides a fair idea, the review has indicated a big gap in the literature concerning the study of digital transformation in PMS. Michael et al. (2019) indicated the failure of traditional PMS to ensure improved employee performance, while Ullah et al. (2021) have indicated increased dependence on web-based technologies for less biased and accurate assessment of the performances of employees. On the other hand, sector-specific challenges and opportunities concerning digital PMS have rarely been discussed in the literature, including those sectors which face rapid technological changes and provide a unique chance to study the influence of digital transformation on organizations and employees, such as the telecom industry (Hossain & Ali, 2021).

1. **Digital PMS is Underexplored:** While wide discussions are held, the digital shifts in HR have not been holistically analyzed from the perspective of PMS transformation in the digital era (Smith & Rahman, 2022).
2. **Limitations of Existing Studies:** While the available literature has stressed that traditional PMS has failed to improve employee performance, very few have explored how digital PMS can help resolve these concerns (Michael et al., 2019; Ullah et al., 2021).
3. **Lack of Sector-Specific Research:** Existing research on digital PMS often lacks focus on specific industries like telecommunications, which is undergoing rapid technological changes and could offer distinct insights (Hossain & Ali, 2021).
4. **Employee Perspective Overlooked:** Much of the current literature centers around the technological aspects of digital transformation, often neglecting how employees experience and perceive these changes in PMS (Smith & Brown, 2022).
5. **Regulatory and Policy Gaps:** There is a need for more research on how regulatory frameworks and government policies influence digital transformation in PMS, especially in sectors like telecommunications (Kim et al., 2022).
6. **Competitive Advantage and Sustainability:** The role of digital PMS in achieving competitive advantage and sustainability remains an underdeveloped area of research, particularly in the telecommunications industry (Islam & Chowdhury, 2023).

2.11.1 Key Aspects of the Research Focus:

1. Digital Transformation of PMS:

- Focus on how traditional PMS are evolving into digital systems within the telecommunications industry.
- Explore the effectiveness of these digital systems in enhancing employee performance and organizational outcomes.

2. Telecommunications Industry in Bangladesh:

- Study the unique challenges and opportunities of digital PMS in a rapidly advancing sector.
- Highlight the specifics of Bangladesh's telecommunications sector, filling the gap in country- and industry-specific research.

3. Employee-Centric Perspective:

- Investigate employee perceptions, attitudes, and experiences with digital PMS.
- Focus on how digital transformation affects job performance, engagement, and satisfaction from the employees' viewpoint.

4. Competitive Advantage and Sustainability:

- Examine whether digital PMS can contribute to competitive advantage and sustainability in the telecommunications sector.
- Study the role of digital transformation in driving long-term strategic goals for organizations.

Figure 2.1 outlines the research strategy by identifying the existing knowledge, the research gap, and establishing the study scope.

Although limited direct studies may have been conducted on the digital transformation of performance management systems (PMS) in the telecom sector of Bangladesh, various indirect studies from other sectors—banking, healthcare, and education—demonstrate identical transformation patterns. For example, digital technology applications in the banking sector have revealed increased accountability and transparency in evaluating employee performance (Rahman & Sultana, 2021). Digital performance monitoring systems in healthcare have generated concern about employee privacy and data sensitivity (Ahmed & Chowdhury, 2020). In education, the use of technology for faculty assessment has been influenced by perceived usefulness and perceived ease of use, which map closely onto Technology Acceptance Model constructs (Hossain & Yasmin, 2019). These inter-sectoral observations highlight the imperative of a detailed investigation of digital PMS adoption in Bangladesh's telecommunications industry, where such research remains limited.

However, **Table 2.2 shows the summary of the literature gaps in Digital Transformation of PMS**

Sector	Focus of Study	Key Findings	Relevance to Current Study
Banking	Digital tools in performance evaluation	Enhanced transparency and accountability	Parallel digital PMS shifts in employee assessment
Healthcare	Digital HR systems and data privacy	Heightened privacy concerns with digital tracking	Reflects privacy issues in telecom PMS
Education	Technology use in faculty performance appraisal	Employee attitudes shaped by perceived usefulness	Supports the TAM framework for telecom employees
Telecom (Global)	Digital innovation in operations	Focus on customer service, limited PMS research	Gap in HR-centered studies in the telecom sector

**Adopted from literature in different industries to rationalize the research gaps.*

Contemporary literature reports a significant shift from conventional performance management (PM) systems to digital ones. This shift is part of a larger trend towards electronic human resource management (HRM) approaches.

However, most of these studies focus primarily on the overall trends of digital human resources and their impacts. There is a strong lack of discussion regarding how much digital transformation (DT) is impacting the employee performance management systems (PMS) of Bangladesh's telecommunications sector specifically.

The existing literature highlights a considerable gap in the focus given to Bangladesh, further the absence of holistic examinations across sectors, as Ali (2022) and Anderson (2021) noted. While there are many studies on digitalization in human resource management (HRM), studies examining implementation, associated challenges, and influence on employee performance management in Bangladesh's telecommunication sector are still missing. To fill this knowledge gap, the research

focus is directed towards a sectoral investigation of Bangladesh's telecommunication industry. The purpose of the study is to come up with reflective findings, contribute to scholarly knowledge, and derive practical implications for the implementation of digital PMS in this rapidly emerging industry.

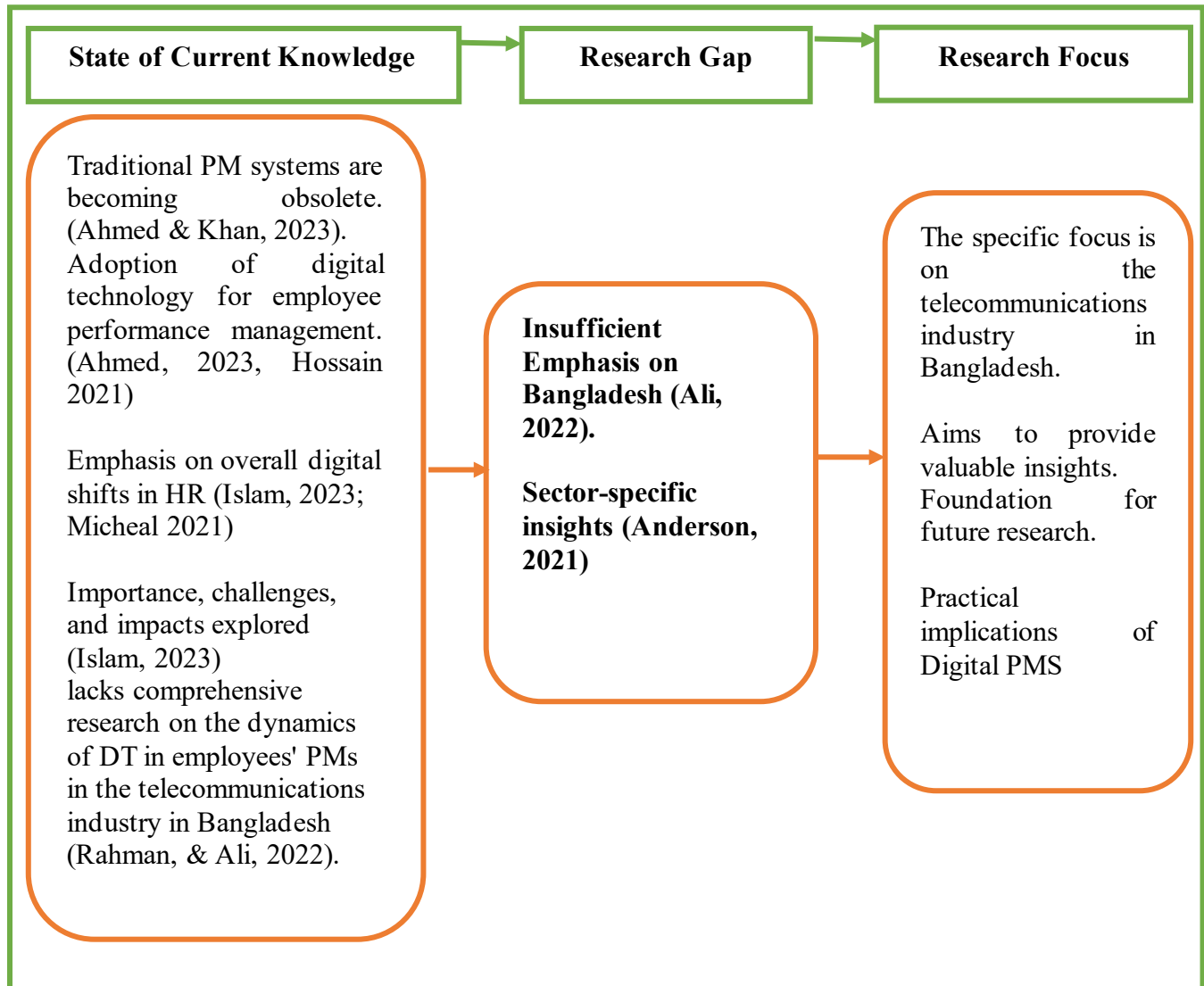


Fig 2.1: Flowchart of Research Gap Identification

This research will try to unfold the complete scenario of how the digital transformation of PMS influences employee performance and overall organizational success in the Bangladeshi context of the telecommunications sector. It fills a gap in the literature related to the sector-specific, employee-centric, and regulatory dimensions of the transformation.

2.12 Construction of the Hypotheses of The Study

2.12.1. Digital Transformation of PMS from Traditional Manual PMS and Organizational Capabilities:

The transformation of traditional performance management systems (PMS) to digital ones has immensely influenced organizational capabilities, specifically in technological assets, management of human assets, and integration at a strategic level. As per studies, effectively transforming traditional PMS to a digital platform helps in having superior HR capabilities in terms of objectives of an organization (Marr, 2018). In addition, transformation in PMS can simplify an organization's adaptability in changing environments with an overall improvement in capabilities and robustness (Kaplan & Norton, 2004).

Additionally, transformation using technology helps in utilizing technology for effective operations and optimized use of assets (Alavi & Leidner, 2001). Organizational capabilities such as asset integration, training, and support become significant in effective transformation of traditional to a digital platform (El Sawy, Malhotra, Gosain, & Young, 1999).

Hypothesis 1:

H₁: There is a significant relationship between the Transformation of PMS from Traditional Manual PMS and Organizational Capabilities and Resources.

2.12.2. Digital Transformation of PMS from Traditional Manual PMS and Employees' Perceived Usefulness and Ease of Use

The Technology Acceptance Model (TAM) identifies perceived ease of use and perceived usefulness as most significant in acceptance for system use (Davis, 1989). As studies have uncovered, when companies transition towards computerised performance management systems (PMS) in preference to traditional ones, workers' ease of use (i.e., ease of use of the system) and perceived usefulness (i.e., improvement in performance through the system) becomes most significant factors for effective system use (Venkatesh & Bala, 2008). Organizations that consider training and system design have shown effective adoption by workers (Gefen & Straub, 2000).

The transition towards computerized performance management systems (PMS) in place of traditional ones has been analyzed in detail to the technology acceptance model (Davis, 1989). Regarding TAM, the two most significant factors for new technology acceptance are perceived

ease of use (PEOU) and perceived usefulness (PU).

2.12.2.1a. Perceived Usefulness (PU) reflects an individual's perception of becoming a more effective on-job performer through the use of a system. In performance management, electronic PMS possesses several advantages that can render a system useful for workers, including real-time tracking, feedback channels, and better decision tools (DeLone & McLean, 2003). With electronic tools, workers can streamline cumbersome processes, and in return, make PMS systems useful and even a necessity in terms of work efficiency (Venkatesh & Davis, 2000).

Empirical analysis indicates that electronic platforms that replace manual processes typically cause the perceived usefulness to increase through augmented feedback, goal-setting tools, and real-time visualization (Park, Son, & Kim, 2012). This is particularly important in industries such as telecommunications, where performance information plays a critical role in timely decision-making. Electronic platforms make workers smarter, and in return, validate why electronic platforms have a perceived value over processes (Tarhini, El-Masri, Ali, & Serrano, 2016).

2.12.2.1b. Perceived Ease of Use (PEOU) is the level at which an individual perceives that use of technology will not consume any effort. Online PMS platforms have user-friendly interfaces, lessening mental burden in terms of processing requirements for operating the system (Venkatesh, 2000). Empirical studies reveal that when workers can use the electronic PMS with ease, workers will use and apply the system in work (Pavlou, 2003). Ease of use involves simple navigation, simple-to-follow instruction, fewer steps to complete jobs, and efficient handling of voluminous information (Liu, Chen, Sun, Wible, & Kuo, 2010).

Existing research identifies that simple and feedback-sensitive electronic PMS platforms become acceptable to workers (Schmidt, 2020). Heshmati and Fadaei (2019) studies present that ease of use in terms of perception helps in satisfying workers and utilizing electronic PMS in an establishment in a long run.

2.12.2.2. Impact of Digital PMS on Employee Experience

Digital PMS empowers employees with various enhanced tools for development, feedback, and goal setting, which can, in turn, be directly linked with improving PU. For example, cloud platforms enable employees to access performance information remotely, enhancing independence

and adaptability (Azmi, 2017). Research affirms that performance tracking is effective in digital environments and gives workers a more excellent voice in development (Bersin, 2013). That instills a sense of proprietorship and, thus, an even increased level of perceived use utility (Jabbar & Hussein, 2017).

The ease of use in digital PMS can, in fact, positively contribute to workforce engagement and retention. If workers have a simple and convenient tool, they will utilize it regularly and, in the long run, build in-depth comprehension of performance and improvement (Venkatesh & Bala, 2008). That generates a positive experience and is paramount in deploying effective transformation through digital platforms (Gefen, 2003).

2.12.2.3. Factors Influencing Perceived Usefulness and Ease of Use

- 1. User Training and Assistance:** Organizations with significant investments in thorough training for employees in using digital PMS exhibit high perceived ease of use and usefulness (Venkatesh & Bala, 2008). Workers who know how to utilize the system fully will most likely perceive it useful in their work (Thong, Hong, & Tam, 2002).
- 2. Design and Functional Capabilities:** How a digital PMS is designed will significantly impact its ease of use perception. Systems that are simple, adaptable, and flexible about the requirements of workers will have a high chance of acceptance (Adams, Nelson, & Todd, 1992). Simple navigation, rapid response times, and mobile access make it easier for workers to believe that a system is simple (Tarhini et al., 2016).
- 3. Organizational Culture and Change Management:** A supportive organizational culture that encourages digital adoption and provides continuous support can significantly enhance both PU and PEOU. Employees are more likely to view the system favorably when they see its value being acknowledged and championed by leadership (Kotter, 1996).
- 4. Employee Attitudes Toward Technology:** Individual attitudes toward technology, including previous experience with digital tools, influence the adoption and perceived usefulness and ease of use of digital PMS (Legris, Ingham, & Colletette, 2003). Employees who are more tech-savvy or have had positive experiences with digital systems are likelier to adopt new digital PMS systems.

2.12.2.4. Challenges in Digital Transformation of PMS

Despite the advantages, organizations face challenges in transitioning from traditional to digital PMS. Studies indicate that employees who are used to manual systems may resist change if they perceive digital systems as complex or if there is insufficient support during the transition (Rogers, 2003). This can negatively impact the perceived ease of use and, in turn, the perceived usefulness. Addressing these challenges through change management strategies is essential for the successful digital transformation of PMS (Kotter, 1996).

In telecommunication companies, digital PMS systems provide employees with real-time feedback and performance metrics, making the system useful and easier to use (DeLone & McLean, 2003). In summary, the transformation of PMS from traditional manual systems to digital platforms has the potential to improve employees' perceived usefulness and ease of use significantly. Digital PMS systems can foster greater employee engagement and enhance overall performance management by providing real-time feedback, improving decision-making, and offering user-friendly interfaces. However, organizational support, system design, and training play crucial roles in ensuring that the transition is successful and that employees derive the expected benefits from the system.

Hypothesis 2:

H₁: There is a significant relationship between the Transformation of PMS from Traditional Manual PMS and Employee's Perceived Usefulness and Perceived Ease of Use.

2.12.3. Digital Transformation of PMS from Traditional Manual PMS and Competitive Advantages

Digital transformation in PMS offers organizations competitive advantages (CA) by providing real-time data, improving decision-making processes, and enhancing productivity (Porter & Heppelmann, 2014). According to a study, performance management transformation enables organizations to differentiate by providing sophisticated digital capabilities not enjoyed by competition (Hess, Matt, Benlian, & Wiesböck, 2016). In addition, organizations can strengthen individual and organizational objectives through increased accuracy in tracking performance through digital tools (Bersin, 2013).

The existence of a strong causality between the digital transformation of PMS and competitive benefits for companies in Bangladesh's telecommunication industry (Ullah, 2020) can be seen clearly. In addition, it has been discovered that through digital transformation approaches in the

telecommunication industry, companies can expand methodologies to leverage the full potential of data analysis and predictive model techniques (Bughin & Hazan, 2018). With these tools, companies can utilize them to predict trends accurately in the marketplace, understand orientation toward customers, and maximize network performance. With the use of data-driven information, companies can make significant decisions, maximize the utilization of assets, and counter obstacles in advance (Bughin & Hazan, 2018). In the following report, an analysis of artificial intelligence, its application in industries, and its role in shaping competitive advantages is discussed in detail. Companies can become leaders in a transforming marketplace by leveraging digital tools to enhance performance, collecting data-driven information (Micheal, 2021), and making sound decisions (Nasiri, 2021).

Competitive advantages come through automation; through that, organizations save costs and make HR operations scalable. Through that, organizations can become flexible and comply with changing times (Schwab, 2017).

Hypothesis 3:

H₁: The Transformation of PMS from Traditional Manual PMS is significantly related to Competitive Advantages.

2.12.4. Digital Transformation of PMS from Traditional Manual PMS and Sustainability

The influence of digital transformation on corporate sustainability is significant. This is crucial for businesses because consumers, shareholders, and other stakeholders can see how the company impacts Brand Value, Revenues, and Company Valuation. This capstone project investigates the relationship between digital transformation and sustainability. (Vikas, 2016)

There is a clear consensus that the future of performance management goes to data-integrated systems that better notify and direct managers and workers alike. Honestly, forecasting new options means more than briefing past performance. (Michael et. al., 2019).

Implementation of digital conversion can change employee expectations and support organizations in attracting, involving, and sustaining the best talents (Digital Transformation Employee Expectations, 2020).

With the ever-changing dynamics of business models, socio-economic trends, and digital disruption, performance management has become a prime concern for HR Specialists. Whereas several organizations have re-designed their overall system to evaluate employee performance, some are considering the industry trend. Few may continue with their existing systems and will

introduce creative changes soon. However, the Telecommunication industry is nothing different in that case. Computerized change has transformed how organizations engage clients, run activities, consider action plans, and shape themselves (Westerman & Bonnet, 2015).

According to the above literature, the study will attempt to uncover the outcomes of DT in PMS, whether favorable or bad. To obtain the study's findings, the following three hypotheses can be established based on the variables described in the literature review and the appeal of the study.

Several studies have illuminated the connection between PMS's digital transformation and human resources' long-term viability in the Bangladeshi telecommunications industry.

For instance, Alam and Noor (2020) found that digital transformation in PMS enhanced HR operations effectiveness, increased employee motivation and engagement, and facilitated talent retention and career progression. All these factors impact the overall viability of the human resources in the industry, specifically in the telecommunications sector.

The digital transformation in performance management helps in human resource sustainability through continuous learning, employee motivation, and effective management of resources (Kiron, Kruschwitz, Reeves, & Goh, 2013). According to studies, through digital transformation in terms of switching to digital PMS, companies can effectively align HR processes with overall sustainability strategies, such as minimizing the environmental impact of paperwork (Lozano, 2015).

In addition, digital platforms allow for continuous feedback, minimize turnover, and enhance employee satisfaction, which are important for sustainability (Osborne & Hammoud, 2017). Performance management through digital transformation helps in sustainable business by embedding long-term organizational objectives with performance measures of workers (Eccles, Ioannou, & Serafeim, 2014).

Hypothesis 4:

H₁: The Transformation of PMS from Traditional Manual PMS is significantly related to Sustainability.

2.12.5. Digital Transformation of PMS from Traditional Manual PMS and Employee Privacy

Studies have emphasized a range of potential adverse consequences that can relate to the digital

transformation of PMs in the telecom sector in Bangladesh. With many of these consequences comes a range of positive impacts delivered through digital transformation.

Following a SWOT analysis, Rahman and Hasan (2019) revealed that a few of the adverse consequences of the digital transformation of PMS involved resistance or reluctance on the part of the employees, loss of personal touch and inattention, and added workload or tension. The risk of unauthorized access, information leak, and abuse of such information comes into consideration, mainly when strong privacy controls are not appropriately in place (Khan & Islam, 2020).

Privacy is at the heart of the digital transformation of performance management systems (Bélanger & Crossler, 2011). The research proposes that opening performance management systems (PMS) to computerized access can cause apprehensions regarding the supervision of workers and apprehend intrusion into private lives (Dinev & Hart, 2006). Workers will perceive that computerized systems grant unprecedented access to individual performance information, which will impact individual feelings regarding privacy (Westin, 2003).

Organizations must introduce privacy-preserving technology to safeguard information about workers and maintain a barrier to misuse (Acquisti, Brandimarte, & Loewenstein, 2015). Neglect of such concerns can result in diminished trust in the system and less motivation in workers.

The accelerated electronic transformation in performance management systems (PMS) added a variety of privacy concerns, specifically regarding the security of information about workers. The latest studies accentuate the necessity for strong frameworks for managing information about data privacy in such systems.

One key developing trend in studies is the centralization of data management. Centralization of data management enables the creation of Information Security Management Systems (ISMS), whose function is to manage employee information automatically and, in doing so, maintain heightened compliance with laws such as GDPR. Centralization of data minimizes intervention, a common source of data breaches. Automated programs also enable tracking of privacy intrusion cases, thus enhancing companies' effectiveness in safeguarding information (DataGuard, 2023).

Another important development is the operationalization of privacy. It entails operationalizing rules-based software whose function is to exercise control over processes through which employee information is processed in electronic PMS. Automated software in such a scenario adheres to predefined policies and complies with law requirements. It, therefore, lessens privacy risks through

real-time tracking and less intervention (DataGuard, 2023).

The transition towards electronic tools and platforms is also seen in dynamics in companies. In 2023, a study examined how digitalization can counteract principal-agent conflict in companies. By rebalancing powers and boosting transparency, digital transformation, including technology such as blockchain, can boost security in performance management systems for information. In such systems, workers' privacy is assured through strengthening access, distribution, and information tracking in companies (Ivaninskiy, Ivashkovskaya, & McCahery, 2023).

The conclusion, therefore, is that studies in the immediate past have posed that in long-term success, companies have to keep investing in high-tech electronic infrastructure in an effort to effectively manage privacy risks. Centralization of data and operationalized privacy have developed to present probable solutions to concerns posed through electronicization of performance management systems. Compiling these tools is also a probable development in transforming not only in processing of information but in transforming company dynamics for enhanced security in information and trust in workers.

Hypothesis 05:

H₁: The Transformation of PMS from Traditional Manual PMS significantly hampers employee privacy.

2.12.6. Digital Transformation of PMS from Traditional Manual PMS and Data Security

The security of performance management systems in a virtual environment is an integral part of organizational digital transformation (Dhillon & Backhouse, 2001). Since performance management systems are computerized, robust security protocols have to be installed to protect workers' sensitive information from free access and intrusion (Cavusoglu, Mishra, & Raghunathan, 2004).

Adopting techniques such as multi-factor authentication and encryption can effectively protect information and secure the virtual performance management system (Gonzalez, Gasco, & Llopis, 2010). Inadequacies in securing performance information can lead to legal consequences and loss of goodwill (Pfleeger & Pfleeger, 2006). Therefore, securing information must become an issue in organizational digital transformation (Straub & Welke, 1998).

Performance management systems transformation involves the integration of state-of-the-art

technology such as data analysis, cloud technology, and the IoT into conventional performance evaluation methodologies (Islam & Hossain, 2021). With such transformation, several benefits such as real-time tracking (Ahmed & Sadiq, 2020), enhanced staff motivation, and informed decision-making (Hoque & Rahman, 2018) follow. With it, too, comes a plethora of security risks (Rahman & Hassan, 2019). Security of sensitive performance information of workers turns out to become an issue with personnel management systems (PMS) storing and holding such information (Hoque & Rahman, 2018). Bangladesh's communications sector experienced unprecedented growth through increased availability of mobile sets and internet availability at a widespread level. Incorporating digital tools into PMS increases the risk of data breaches, unauthorized access, and cyberattacks. Theft or manipulation of employee performance data, including personal and confidential information, can severely affect the organization and its workforce (Islam & Hossain, 2021).

The rapid digital transformation in the telecommunications sector has introduced advanced technologies such as cloud computing, AI, and big data analytics, which have significantly altered performance management systems (PMS). However, the growing reliance on digital infrastructures raises significant concerns about data security, privacy, and protection, particularly for sensitive employee and organizational information. This literature review explores the intersection of digital transformation, data security, and performance management systems, presenting the latest developments in this area.

Digital Transformation and its Impact on PMS Digital transformation has modernized traditional performance management systems by streamlining processes, improving data access, and enhancing decision-making capabilities. Tools like AI and big data analytics now play crucial roles in evaluating employee performance, forecasting productivity, and personalizing feedback systems (Alkayyal, Alshehri, & Alabbad, 2023). However, the integration of such tools is not free of its concerns, with its greatest concern being in relation to data security and safeguarding the information of its workers (Thales Group, 2024).

Data Security Challenges Robust security for data is one of the greatest concerns in embracing a digital PMS. With more data stored and processed in a virtual form, the risk of a breach in data and a cyberattack increased manifold times. Organizations, and particularly in the telecommunication sector, stand a high chance of being at a high risk due to intensity and quantum of processed data over a virtual platform (Alkayyal et al., 2023). This issue worsens when

performance information, with sensitive information regarding workers such as evaluation scores, individual markers, and productivity factors, is computerized.

Phishing, ransomware, and unauthorized access are new emerging cyberattacks that challenge such security techniques such as new encryption techniques and secure access protocols (Saxena, 2022). Literature proposes a multi-layered cybersecurity technique, with a mix of encryption, identity management, and continuous system audits, to tackle such threats.

Cybersecurity Features in PMS Organizations have adopted cybersecurity tools increasingly to tackle such issues. Some of its key features include:

1. **Encryption:** Encrypting data both at rest and in transit is critical to protecting sensitive performance data from unauthorized access (Thales Group, 2024).
2. **Authentication and Identity Management:** Multi-factor authentication (MFA) and robust access controls prevent unauthorized access to sensitive employee data (Saxena, 2022).
3. **Employee Awareness and Training:** Many data breaches stem from employee negligence. Organizations are placing an increasing emphasis on educating employees about potential cyber threats and safe digital practices (Smith, 2023).

These measures are critical to ensuring data security in PMS, as cyber threats continually evolve in the face of advancing digital technologies.

While digital transformation offers immense potential to enhance performance management systems, it also brings significant data security challenges. By adopting strong cybersecurity measures such as encryption, authentication protocols, and employee training, organizations can protect sensitive performance data from emerging threats. The literature underscores the need for continuous adaptation of security measures to keep pace with technological advancements.

Hypothesis 06:

H₁: The Transformation of PMS from Traditional Manual PMS significantly hinders data security.

2.13 Summary of Chapter Two

This chapter has thoroughly examined the literature concerning digital transformation and performance management systems (PMS) within the telecommunications sector, focusing specifically on Bangladesh. The chapter began with an overview, followed by a thorough analysis

of the existing literature. The analysis outlined the fundamental concepts of digital transformation, encompassing its definitions and traits while incorporating various academic viewpoints. The literature highlights the importance of digital transformation in performance management, as well as the associated challenges and opportunities, especially within the telecommunications sector.

The analysis examined the employee-focused perspective in digital transformation, the integration of regulatory considerations, and the changing nature of performance management systems amid digital transformation. Furthermore, notable patterns in earlier studies were identified, such as a primary emphasis on Western settings, a focus on technology in the literature surrounding digital transformation, and a lack of attention to employee viewpoints and developing economies like Bangladesh.

This systematic review has identified several important gaps in the existing body of knowledge. The challenges include insufficient focus on the telecommunications sector in Bangladesh, a lack of industry-specific expertise, and the need to explore employee viewpoints and regulatory factors influencing digital transformation. The recognized shortcomings form the foundation of the current investigation, which seeks to address these gaps through an in-depth examination of the digital transformation of performance management systems in the telecom sector of Bangladesh.

Chapter 3 will provide a comprehensive exploration of the philosophies, approaches, methodologies, conceptual framework development, validation, reliability check, data collection, and analysis procedures employed in this study.

Chapter 03: Research Methodology

3. Introduction

This chapter provides an essential background to the research, presenting the methodology, structure, and approach used to effectively explore the dynamics of digital transformation within employee performance management systems in the Bangladesh telecommunications industry. First, this chapter presents the theoretical framework guiding the research, followed by a detailed description of the mixed-methods design used to respond to the complex research problems fully. The research takes up a mixed qualitative and quantitative orientation to come up with a complete range of ideas, facilitating effective comprehension of the exact phenomenon of the industry under consideration. Throughout this chapter, the approach to methodology taken is emphasized, such as pilot testing, Focus Group Discussions (FGD), Key Informant Interviews (KII), and a broad-staff survey, all meticulously selected to provide pertinent data for hypothesis evaluation and thematic investigation. The sampling strategies employed, data gathering methods adopted, and analysis tools like NVivo and SPSS are presented, highlighting the rigor and reliability of the research. Additionally, ethical considerations are discussed to ensure the study satisfies both academic and professional requirements. Pilot test was instrumental in validating the conceptual model and the survey questionnaire, which resulted in refining the reliability and validity of subsequent data gathering.

This model, with pragmatism in application, allows for the blending of technical and people-centred considerations, thereby offering detailed insight into digital transformation impacts on performance management in this fast-changing business world. The chapter concludes with an overview that clears the ground for the next chapter's presentation and discussion of findings.

3.1 The Philosophy of Research:

In formulating the research philosophy of the present research, the Research Onion model, as outlined by Mark Saunders, Philip Lewis, and Adrian Thornhill (2000), has been employed. The Research Onion is a systematic aid for selecting suitable research methods by orderly layering essential components of the research process. The Research Onion offers a comprehensive way of grasping the epistemological, ontological, and methodological underpinnings that inform a study. According to this format, the research philosophy is congruent with a clearly articulated paradigm,

thereby providing methodological rigour and consistency. This systematic methodology guarantees the identification of the most appropriate research strategy, data collection methods, and analysis procedures, thereby finally enhancing the validity and reliability of the study.

The most recent version of Mark Saunders' "Research Onion" was presented in the 9th edition of Research Methods for Business Students (Saunders et al., 2023). This updated model integrates additional philosophical considerations, providing a more comprehensive framework for designing research methodologies.

The Research Onion:

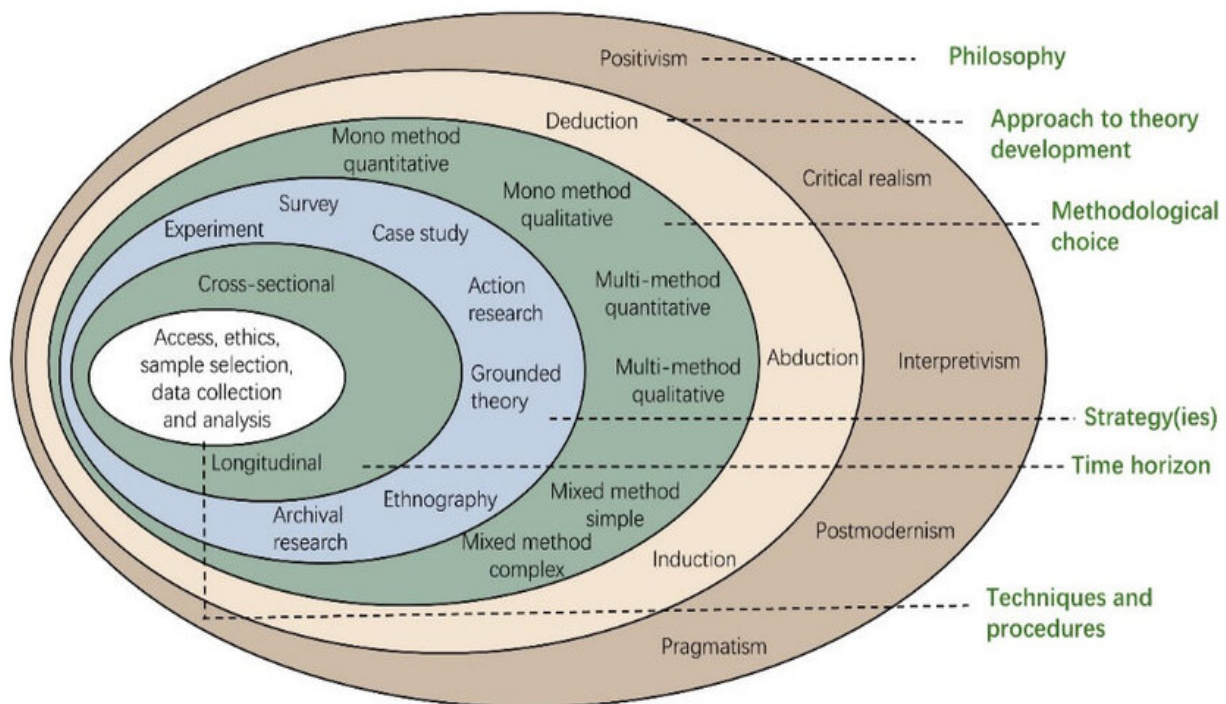


Figure 3.1: Research Onion (Saunders et al., 2023)

Following the above model, the research ensures a systematic approach to handling the analysis of the digital transformation of PMS in the telecom industry of Bangladesh. The research onion allows for making rational choices on epistemological and ontological assumptions, methodological choices, and data collection methods, thus increasing the credibility and validity of the research. The following section provides the research onion for this research, along with its philosophy, approach, and methodology.

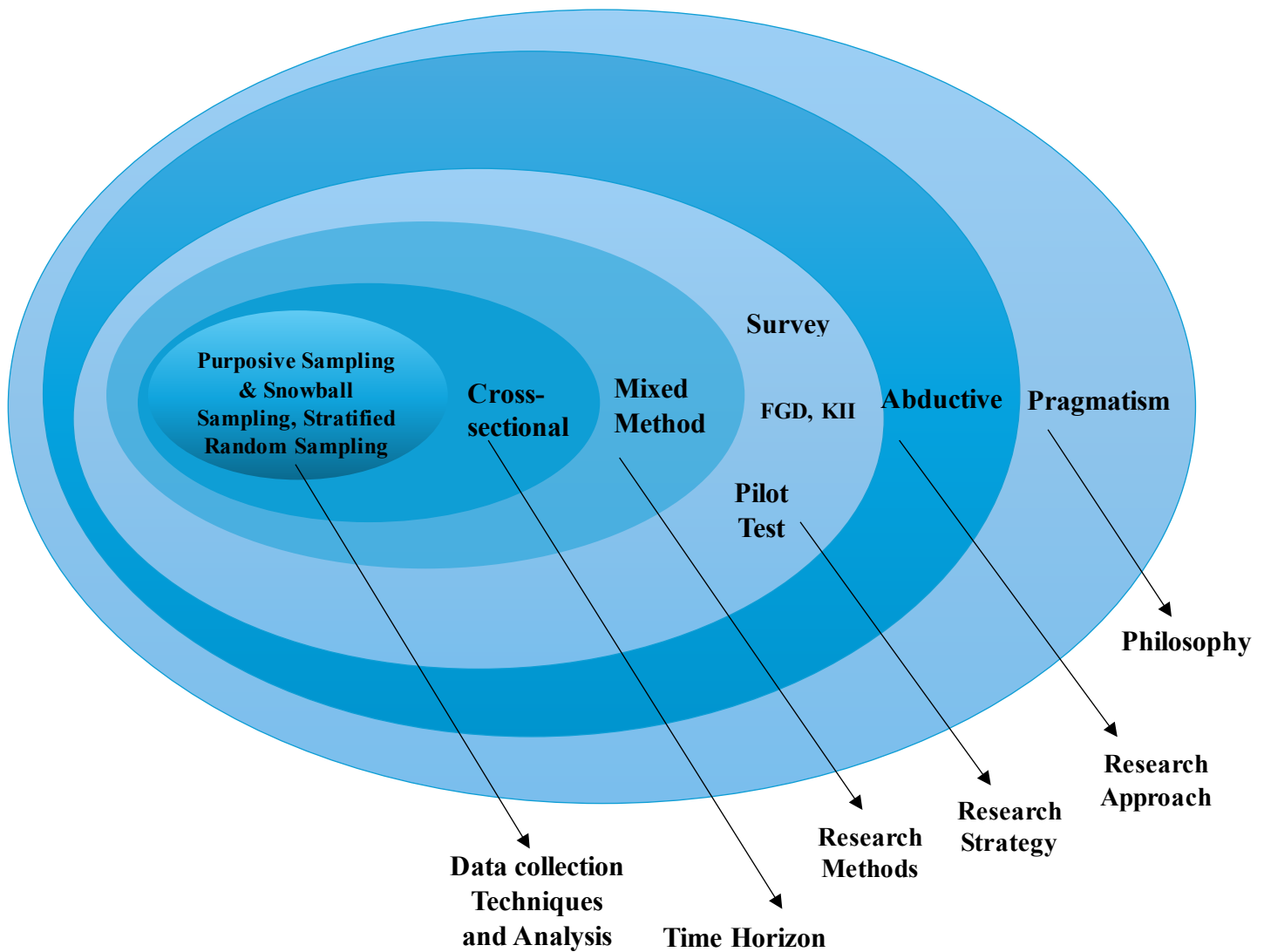


Figure 3.2: The Research Onion of this Study

Table 3.1: The Research Philosophical Stand	
Paradigm	Description
Epistemology	General parameters and assumptions are associated with an excellent way to explore the real world's nature.
Ontology	General assumptions are created to perceive the real nature of society (to understand the real nature of society).
Methodology	A combination of different techniques is used by researchers to explore different

Table 3.1: The Research Philosophical Stand	
Paradigm	Description
	situations.

Ontology:

Pragmatism, as the chosen ontology, recognizes that reality is dynamic and changing. Pragmatism suggests that reality is context-dependent, and reality can be different from the "real" based on the context. For the telecommunication industry of Bangladesh, the pragmatic ontology embraces the reality that there exists a dynamic and changing reality influenced by the ongoing digital revolution. It highlights the pragmatic and contextually relative reality that suggests the meaning of digital transformation and its performance management systems is subjective to personal experiences and organizational contexts.

Epistemology:

Pragmatism as an epistemology is concerned with the practical consequences associated with knowledge. It implies that the truth of an idea is established through its usability and applicability. When researching the dynamics of digital transformation for the employee performance management system, pragmatic epistemology directs researchers to examine best practices and their benefits in real uses. It emphasizes the importance of experiential learning and aims to produce ideas that can be utilized to improve performance management in the telecommunications sector. This epistemology further entails methodological pluralism, which enables researchers to employ a range of methodologies based on the research issues at hand as well as the pragmatic issues of the study. Pragmatism can accommodate the possibility that varied methodologies may be used on different elements of the research since it emphasizes choosing approaches most likely to solve the research issue under investigation.

Table 3.2: The summary of research philosophy.

Paradigm	Ontology	Epistemology	Research methods
The whole of theoretical and methodological assumptions (adopted by the scientific community), specific research of which is based on	Existence theory, focused on what exists, is based on paradigm assertions about reality and truth, and it is a theory about the nature of reality	The theory interested in how the researcher can gain knowledge about the phenomena of interest to him, namely, examination of what separates a reasonable assurance from the opinion	They include systematic ways, procedures, and tools used for data collection and analysis
Pragmatism	The reality is ambiguous, but based on the language, history, and culture respect	Knowledge is derived from experience. The researcher restores the subjectively assigned and “objective” meaning of other actions	FGD, KII, surveys

3.1.1 The Rationale for Choosing Pragmatism:

Pragmatism is concerned with developing a balanced perspective, and it is interested in the practicality and usability of research findings more than maintaining a rigid, either-or philosophical stance.

a. Problem-Solving Orientation:

Pragmatism's essence is its problem-solving orientation. In this study on the dynamics of digital transformation in performance management in the telecommunications sector, pragmatism is the best able to tackle real problems. It concentrates on pragmatic solutions and actionable results that can be utilized for enhancing performance management systems.

b. Methodological Flexibility:

Pragmatism supports flexibility in research methods so that researchers can select methods that are

deemed most suitable to answer research questions in the best possible manner. Such flexibility is necessary to achieve a rich and thorough understanding of a dynamic subject area such as digital transformation, where numerous factors must be considered.

c. Applicability in Industry Practices:

The emphasis on practical outcomes typical of pragmatism makes it most appropriate to a study of the telecommunications sector. The approach ensures that research results are not only theoretically valid but also practicably applicable in the operations of the industry, thereby meeting the pragmatic objective of enhancing performance management systems in the sector.

d. Flexibility to Change:

Pragmatism's flexibility is particularly critical with the rapid pace of technological transformation and organizational adaptation in the telecommunications sector. It allows your research to remain up-to-date and provide meaningful insights while being responsive to emerging trends and concerns as they unfold in the research process.

Briefly, pragmatism as a research philosophy with ontology based on context-dependent reality and epistemology of practical consequences is a viable framework for investigating the dynamics of digital transformation in employees' performance management systems within the telecommunications industry in Bangladesh.

3.2 Research Approach-Abductive Approach

This chapter sets the groundwork for the research, covering the methodology, design, and strategies employed to successfully investigate the dynamics of digital transformation in the context of employee performance management systems in the telecommunications industry in Bangladesh. It begins with an explanation of the theoretical basis of the study, followed by an examination of the selected mixed methods approach that will optimally tackle the intricate research issues. The research employs qualitative and quantitative approaches in gathering diverse information, thereby enabling a more insightful understanding of the phenomena relevant to the research area. The chapter outlines the methodology employed, including pilot testing, Focus Group Discussions (FGDS), Key Informant Interviews (KIIS), and an extensive staff survey, all aptly chosen to yield relevant data for hypothesis testing and thematic analysis. Sampling processes, data gathering methods, and analytical software, including NVivo and SPSS, are

outlined, demonstrating the thoroughness and trustworthiness of the research approach. Ethical concerns are also analyzed to determine that the study aligns with established academic and professional guidelines. The pilot study played a crucial role in validating the conceptual framework and streamlining the survey tool, thereby increasing the reliability and validity of subsequent data gathering.

This model uses a pragmatic methodology to study technical and employee-focused perspectives that offer valuable insights into how digital transformation affects performance management in the rapidly changing business landscape. The chapter winds up with an integration that serves as the foundation for the subsequent presentation and discussion of findings in the following chapters.

3.3 Research Design-Methodological Choice

The research draws on a multi-method strategy that integrates qualitative and quantitative research to provide a deeper insight into the complex dynamics that are involved in digital transformation of performance management systems. The research strategy supports triangulation, thereby increasing the validity of the study by cross-checking findings from various sources (Creswell, 2014). Mixed methods design efficiently collects both qualitative and quantitative data, enabling an expansive variety of insights, such as employee opinions and tried and verified results, hence elevating the richness and level of research quality (Tashakkori & Teddlie, 2003).

The decision to utilize a multi-method study derives from the limitations that have been identified in previous research that was carried out in the same kind of settings using single-method approaches only, perhaps restricting the extent of their generalizability. The approach is helpful in investigating digital transformation via performance management in the sense that it is an extensive view of both effects at the system level and at the individual level (Venkatesh et al., 2013). The following stages are included in the study design process:

A pilot study was conducted to trial the conceptual framework and sharpen data collection instruments. This step was crucial in identifying possible weaknesses in the survey questions and interview guides, thereby improving the accuracy and relevance for the subsequent data collection exercise (van Teijlingen & Hundley, 2001).

Sequential Mixed Methods Design: Following the pilot test, the research utilized focus group

discussions (FGDS), key informant interviews (KIIS), and a survey in a systematic order. This order enabled the qualitative results from the focus group discussions and key informant interviews to shape and specify the survey questions, thereby making the survey tool informed by actual experiences and opinions of industry practitioners (Plano Clark & Ivankova, 2016).

Table 3.3: Research Journey from Pilot Testing to Final Findings		
Steps	Process	Purpose
1. Pilot Test	Conducted a pilot test to validate the conceptual framework and refine the research design.	Ensure framework validity and refine survey questions.
2. Focus Group Discussions (FGD) & Key Informant Interviews (KII)	Conducted FGDS and KIIS based on pilot test results and framework.	Gather qualitative insights and expert opinions to enrich findings not covered by a purely quantitative approach.
3. Survey of 200 Employees	Distributed survey to 200 employees for data collection based on refined framework.	Quantitative data collection for hypotheses testing.
4. Hypotheses Testing & Final Findings	The survey analyzed results to test hypotheses and develop conclusions.	Test hypotheses and arrive at final findings.

3.3.1 Rationale for a Mixed-Method Approach

A holistic methodology was selected to manage the diverse experiences, issues, and benefits of digital transformation in the telecommunication sector based on the complexity and intertwinement of these factors (Greene et al., 1989). Qualitative methods, including focus group interviews and key informant interviews, are used in this research to obtain a detailed contextual insight into employees' perceptions of ease of use and usefulness. Quantitative methodologies, like surveys, allow generalizability and statistical analysis, which gives strong data to confirm or disconfirm assumptions.

3.4 Conceptual Framework Development

Digital technology has significantly impacted performance management systems, leading to many advantages and prospects for organizations (Chen, 2021). Integrating various technologies such as real-time data analytics, gamification, mobile-enabled performance management, artificial intelligence (AI) and machine learning, and social collaboration platforms has significantly revolutionized organizations' methods to manage and assess employee performance (Jiang, 2020). Digital advancements have positively impacted performance measurement accuracy, employee engagement, and the facilitation of timely feedback and interventions (Rahimi, 2020). Organizations must tackle various challenges to harness the potential of digital performance management systems fully. These challenges include but are not limited to data privacy concerns, system usability, and potential biases inherent in AI algorithms. By addressing these challenges, organizations can effectively leverage digital performance management systems (Bapna, Mollick, 2019).

3.4.1 Theoretical Foundations (TAM + Karl & Maximilian Theory of Digital Transformation)

This study will follow the model developed by Karl and Maximilian (2019) that conceptualizes DT as a method of constructing dynamic competencies. Sensing opportunities from Digitalization and transforming capabilities to make changes to the PMs processes and the results are crucial for a strategy that leads to competitive advantages or is harmful to privacy! This model outlines the relationships that developed with an analysis of eight predominant building blocks, defining the DT as a procedure where digital technologies play a vital role in creating and reinforcing the

disturbances that are taking place at the industry levels. These disruptions encourage *strategic responses* from enterprises that may occupy a central place in DT literature. Organizations require digital technologies to modify the existing *value* and *ascertain ways* they have relied upon to be competitive. There are *structural changes* and *barriers* that delay transformation efforts. Organizations need to install a mechanism for that. These changes may positively impact organizations, in some instances, for individuals and society, although they may produce some *undesirable outcomes* (Gregory, 2019). The following figure shows the Digital Transformation model, which was developed by Karl and Maximilian (2019), to create value for an organization.

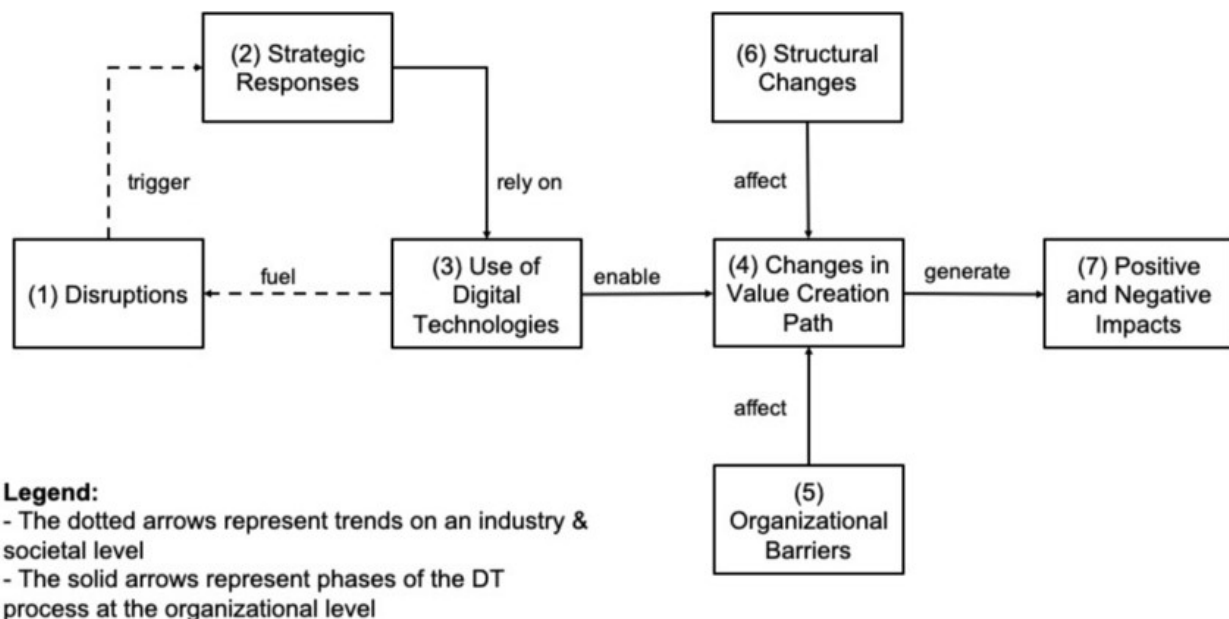


Fig 3.3# Digital Transformation model developed by Karl and Maximilian (2019).

Technology Acceptance Model

The Technology Acceptance Model (TAM; Davis, 1989) has been one of the most influential models of technology acceptance, with two primary factors influencing an individual's intention to use new technology: perceived ease of use and perceived usefulness. TAM explores employee acceptance and use of technology. Apply TAM to understand how acceptance of digital tools in PMs influences performance and whether in a telecom scenario, ease of use and perceived usefulness matter.

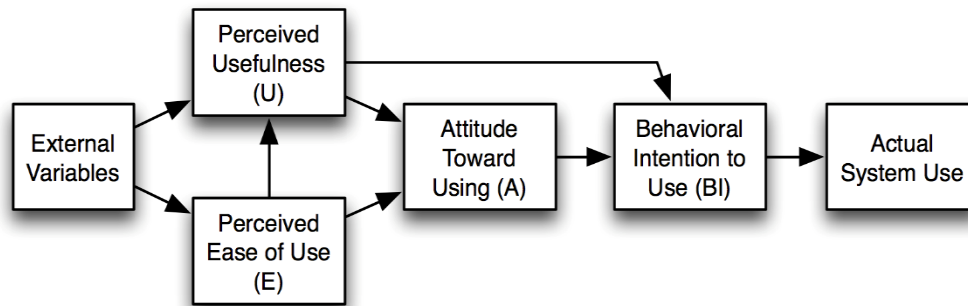


Figure 3.4: Technology Acceptance Model (TAM)

The telecommunications industry in Bangladesh is at the forefront of digital transformation and, as such, an important context in understanding workers' acceptance and integration of digital technology in workers' performance management structures. A rich source can be derived from the Technology Acceptance Model (TAM) to explain and predict workers' acceptance and use of such technology.

The current study delves into applying TAM in Bangladesh's telecom sector. It identifies workers' perceived ease of use and perceived usefulness as important drivers for workers' acceptance and acceptance of digital performance management tools (Rahman & Haque, 2021).

Ahmed and Khan (2019) study individual factors in workers' acceptance of the telecom sector for digital performance management systems. The study confirms that training and support, apart from the TAM constructs, contribute towards workers' acceptance of digital tools. Hossain and Islam (2018) study technology acceptance and performance of workers and its role in contributing to Bangladesh's telecom sector's digital transformation. It identifies technology acceptance as a mediator in enhancing workers' performance. Drawing on TAM, the current study, it is underlined that perceived ease of use and perceived usefulness have an important role in shaping workers' intentions and behavior in terms of workers' performance management through digital tools (Hasan & Ali, 2017).

3.4.2 Framework Development Process

Leveraging TAM, such studies develop rich insights concerning workers' acceptance and use of digital transformation in terms of its use and perception by workers in Bangladesh's

telecommunication sector.

Following the review of the literature and the DT model, it is seen that the Outcomes of Digital Transformation can be positive, but alternatively, can even be negative.

This research may follow the model portrayed below (Inspired by the above models)

Figure 2.4 presents a conceptual model that aims to grasp the dynamics implicated in digitalizing performance management systems (PMS). It pinpoints the predominant factors driving the transformation from traditional manual PMS to digital PMS, alongside the ensuing consequences and challenges implicated in the process.

At the base of the model lies the transformation of manual PMS into digital form, which is driven by two key influencing factors: employees' perceived usefulness and ease of use and organizational resources and capabilities. They are represented by Hypotheses H1 and H2, indicating their role in facilitating digital transformation.

The model also discusses the general dynamics of digitalization in PMS, pointing out the impacts and difficulties entailed in the process. These include competitive advantage, sustainability, privacy, and security, which are subjected to Hypotheses H3, H4, H5, and H6, respectively.

This model provides a structured approach to analyzing how organizations adopt digital PMS, the role of internal resources and employee attitudes in this development, and the most significant challenges and benefits that occur from the digitalization of performance management.

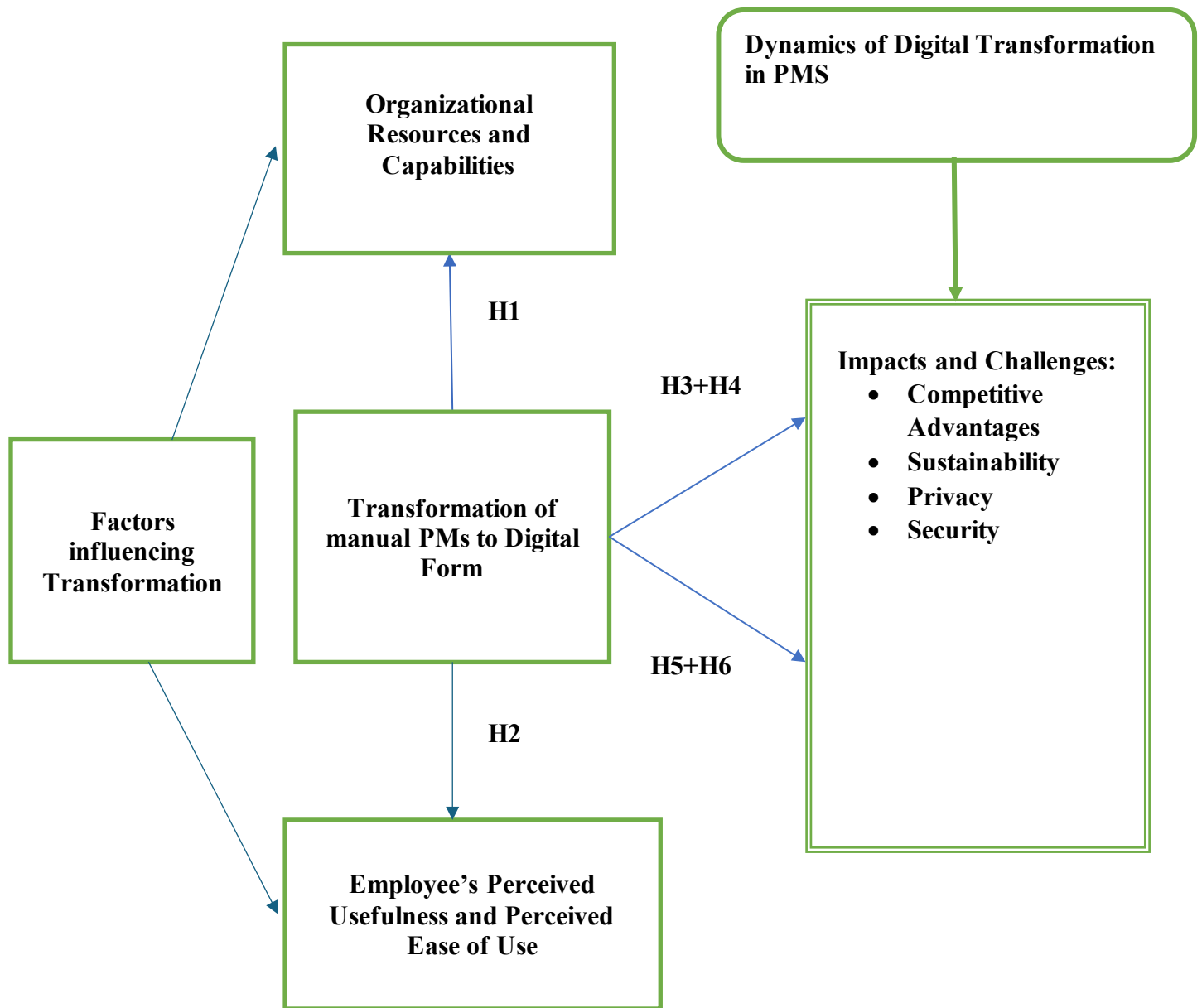


Figure 3.5: Digital Transformation model inspired by the model of Karl and Maximilian and the Technology Acceptance Model (TAM)

The framework provides a holistic picture of the digitalization of performance management systems (PMS) by delineating the major drivers that facilitate this digitalization and its effects. It brings to the forefront the critical role played by organizational capabilities and resources, along with employee attitude, in determining the success of digital adoption. It further underscores the larger consequences of digitalization, such as competition, sustainability, privacy and security issues. By analyzing those factors, the model provides valuable knowledge on how organizations can effectively transition towards digital PMS while sustaining it in the long run. The conceptual model is a foundation for future studies and practical implementation steps in performance management digitalization.

The research hypothesis formulated based on the conceptual framework are summarized in the following table. Each hypothesis states clearly the independent and dependent variables and their null and alternative assumptions. Simple Linear Regression has been chosen as the statistical test for all the hypotheses to test the hypothesized relations. The systematic summary makes it clear about the empirical emphasis of the research.

Table: 3.4 Summarizing all the hypotheses, their variables, and the corresponding statistical test

Hypothesis	Independent Variable (IV)	Dependent Variable (DV)	Null Hypothesis (H₀)	Alternative Hypothesis (H₁)	Statistical Test
H1	Transformation of PMS from Traditional Manual PMS	Organizational Capabilities and Resources (reflecting human resource sustainability)	H ₀ : There is no significant relationship between the Transformation of PMS and Organizational Capabilities.	H ₁ : There is a significant relationship between the Transformation of PMS and Organizational Capabilities.	Simple Linear Regression
H2	Transformation of PMS from Traditional Manual PMS	Employee's Perceived Usefulness and Perceived Ease of Use	H ₀ : There is no significant relationship between the Transformation of PMS and Employee's Perceived Usefulness and Ease	H ₁ : There is a significant relationship between the Transformation of PMS and Employee's Perceived Usefulness and Ease	Simple Linear Regression

			of Use.	of Use.	
H3	Transformation of PMS from Traditional Manual PMS	Competitive Advantages	Ho: The Transformation of PMS is not significantly related to Competitive Advantages.	H ₁ : The Transformation of PMS is significantly related to Competitive Advantages.	Simple Linear Regression
H4	Transformation of PMS from Traditional Manual PMS	Sustainability	Ho: The Transformation of PMS is not significantly related to Sustainability.	H ₁ : The Transformation of PMS is significantly related to Sustainability.	Simple Linear Regression
H5	Transformation of PMS from Traditional Manual PMS	Employee Privacy	Ho: The Transformation of PMS does not significantly hamper employee privacy.	H ₁ : The Transformation of PMS significantly hampers employee privacy.	Simple Linear Regression
H6	Transformation of PMS from Traditional Manual PMS	Data Security	Ho: The Transformation of PMS does not significantly hinder data security.	H ₁ : The Transformation of PMS significantly hinders data security.	Simple Linear Regression

3.4.3 Pilot Testing and Conceptual Framework Validation

It is very important to carry out a pilot test to check if the study procedures and tools are working in research. It is also important to know how many people should take part to make sure the population of interest is well represented in a pilot test. The literature review looks at what has been written on the topic to explain the variables that affect the sample size for a pilot test. Polit and Beck (2020) refer to the necessity to run a pilot test to refine study instruments. They stress the necessity of having enough participants to be able to detect any problems related to the study measures, yet there are no rigorous rules on how to decide on the sample size. Hertzog (2008) discusses in depth the procedure for establishing proper sample size in experimental research across several different fields. The author recognizes that pilot studies have lower sample sizes compared to large studies. He recommends using at least 30 participants as a minimum for experimental tests but indicates that the unique features of the study need to be taken into

consideration. Shanyinde et al. (2011) examine the objectives and factors to consider when conducting pilot and feasibility studies. The sample size for a pilot study is typically determined based on practical considerations, such as the research question and available resources, rather than statistical power calculations, they observe.

The research approach used in this research was supported by initial findings obtained from a pilot study that involved fifteen participants working in the telecommunications industry in Bangladesh. Using snowball sampling methods, the initial volunteers were recruited and recommendations were made for including other potential candidates. During the first test phase, the number of participants was restricted to only fifteen individuals. There is a possibility that the sample size utilized for the pilot study may not precisely reflect the entirety of the population, though it was adequate (Hertzog, 2008; Shanyinde et al., 2011).

The primary evaluation employed a survey instrument to evaluate the elements of the performance management system that pertain to digital transformation. The survey analyzed the dynamics that prevail in digital transformation, the attitudes towards performance management systems, and their possible impacts on the digital transformation of performance management systems, along with the resulting consequences.

The outcomes of the pilot test were analyzed using descriptive methods to gain insights into the participants' reactions. The analysis indicated shortcomings in both the survey and in the design of the study. The information obtained from the pilot test participants clarified the questionnaire and made it more relevant for the main research.

The pilot test provided insights into the digitalization process that are taking place in the telecommunications sector of Bangladesh's performance management systems. Responses from participants enriched the design as well as the questionnaire employed in the main study. Based on the pilot test, the data collection process was refined to enhance the validity and reliability of the present research.

Table 3.5: Section 1: Demographics of respondents			
	Description	Frequency	Percentage
Gender	Male	11	73.33
	Female	4	26.66

	Prefer not to say	0	0
Educational level	Bachelor's degree	7	46.66
	Masters	8	53.33
	Above	0	0
Age	25–30 years	4	26.66
	31–40 years	8	53.33
	41–50 years	2	13.33
	More than 50 years	1	6.66
Experiences	0-5 years	3	20
	6-10 years	9	60
	10 years and above	3	20

The measurement model testing includes internal reliability tests, convergent validity, and discriminant validity tests (Hair, Hult, Ringle, & Sarstedt, 2016). Internal reliability can be quantified by utilizing Cronbach's alpha and composite reliability (CR), where an ideal cutoff value of 0.70 is employed (Hair, Anderson, Tatham, & Black, 1995). Convergent validity is tested by checking the average variance extracted (AVE) and employing an acceptable cutoff value greater than 0.50. Additionally, convergent validity can be approximated by item loading with an acceptable value of more than 0.50 (Hair et al., 1995). Discriminant validity is examined in the form of the Heterotrait-Monotrait ratio of correlations (HTMT) criteria with an acceptable value below 0.90 (Henseler et al., 2015).

Table 3.6: Cronbach's α , item loading, and composite reliability				
Items	Cronbach's alpha	Item loading	CR	AVE
Section 2. Traditional to Digital Transformation of PMS	0.904		0.822	0.719
Digital PMS helps to provide real-time feedback		0.771		
Digital PMS ensures Accuracy of data		0.751		

history				
Digital PMS is the contemporary demand of employees		0.813		
Digital PMS ensures Perfect Employee Analytics		0.781		
Section 3. Digital Transformation of PMS and Sustainability	0.749		0.842	0.693
The digital transformation of PMS has improved the efficiency of HR processes by reducing paperwork.		0.629		
The digital transformation of PMS has enhanced employee engagement and motivation.		0.737		
The digital transformation of PMS has facilitated talent retention and development.		0.604		
In the telecommunications industry, the digital		0.637		

transformation of PMS has contributed positively to the sustainability of human resources.				
I think the digital transformation of PMS has a noticeable effect on the long-term health of human resources in the telecommunications business.		0.771		
Section 4: Digital Transformation of PMS and Competitive Advantages	0.860		0.796	0.721
The digital transformation of PMS in the telecommunications industry has provided companies with competitive advantages.		0.779		
I believe that the digital transformation of PMS significantly contributes to competitive advantages in the telecommunications industry.		0.823		

The digital transformation of PMS has improved data-driven decision-making in the telecommunications industry.		0.697		
Section 5: Negative Consequences of Digital Transformation of PMS	0.757		0.829	0.704
The digital transformation of PMS in the telecommunications industry has led to negative consequences and drawbacks.		0.617		
The digital transformation of PMS in the telecommunication industry has led to a lack of Privacy		0.504		
The digital transformation of PMS in the telecommunications industry has led to a lack of data security		0.569		

I believe the digital transformation of PMS in the telecommunications industry has negative consequences.		0.763		
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Table 3.7: Heterotrait-Monotrait Ratio (HTMT)					
Particulars	Digital PMS	Sustainability	Competitive Advantages	Privacy	Security
Digital PMS					
Sustainability	0.027				
Competitive Advantages	0.033	0.113			
Privacy	0.074	0.031	0.062		
Security	0.073	0.067	0.077	0.129	
Traditional PMS	0.067	0.051	0.051	0.131	0.041

The findings of this study are tabulated in Table 3.6, establishing measures of Construct Reliability (CR), Cronbach's Alpha, and Average Variance Extracted (AVE). Table 3.7 then provides in detail the HTMT findings. Cronbach's alpha measures for the constructs surveyed by this study vary between 0.749 and 0.904 and are higher than the recommended lower limit criterion value of 0.70. Similarly, composite reliability (CR) measures for the constructs are between 0.796 and 0.842, and all are above the 0.70 cut-off point. The findings establish that the constructs under investigation in this study are extremely consistent and reliable. For convergent validity, the findings outlined in Table 5 show that Average Variance Extracted (AVE) measures are between 0.693 and 0.721. These values surpass the acceptable threshold of 0.50, suggesting that the measures used in the study demonstrate satisfactory convergent validity. Regarding discriminant validity, the HTMT ratios of construct correlations, as presented in Table 6, indicate that all values are below the accepted threshold of 0.90. The present study's findings indicate that the constructs under

investigation demonstrate satisfactory levels of both reliability and validity.

In short, the HTMT values presented in Table 3.7 show the strength of the relationships between different constructs in the study, such as Digital PMS, Sustainability, Competitive Advantages, Privacy, Security, and Traditional PMS.

All the HTMT values are well **below the commonly accepted threshold of 0.85**, which means that **each construct is distinct from the others**. In other words, the data confirms that the variables in this study measure different concepts and are not too closely related to each other.

This indicates **good discriminant validity**, suggesting that the survey items designed for each construct are clearly capturing different aspects of performance management systems and related organizational factors.

This study prepares a conceptual framework based on the reviewed literature. The focus of this study is to understand the dynamics of the Digital Transformation of PMs in Telecommunication companies, which is how DT in PMs changes and affects an organization's competitiveness and Sustainability. This study will follow an abductive research approach.

3.5 Research Strategy and Data Collection Methods:

A research strategy is a plan of how a researcher will proceed toward answering his or her research question/s (Saunders et al., 2016). A research method is simply a technique for collecting data, which may involve a specific instrument, such as a self-completion questionnaire or a structured interview schedule, or participant observation, whereby the researcher listens to and watches others (Bryman & Bell, 2011). To state this in another way, research methods are practical techniques applied to accumulate and analyze data related to research questions (Crotty, 2003). Major research strategies are experiment, survey, archival and documentary research, case study, ethnography, action research, grounded theory, and narrative inquiry (Saunders et al., 2016). Survey research comprises a cross-sectional design with which data are collected, predominantly by questionnaire or by a structured interview on more than one case (usually quite a lot more than one) and at a single point in time to collect a body of quantitative or quantifiable data in connection with two or more variables (usually many more than two), which are then examined to detect patterns of association (Bryman & Bell, 2011).

To attain the research, aim and objectives, a survey strategy has been adopted in this study. The sampling method and data collection procedure of this study were designed to ensure the validity, reliability, and representativeness of the findings. Given the focus on digital transformation in employee performance management systems within Bangladesh's telecommunications sector, a strategic method was employed to efficiently collect feedback from relevant stakeholders. The sampling strategy was carefully designed to capture the range of experiences and perceptions across various organizational levels and roles.

The study utilized a multi-phase sampling approach designed to fit the requirements of each data collection technique. Using purposive, snowball, and stratified random sampling approaches, this design provides an exhaustive insight into digital transformation in performance management systems for various stakeholders in the telecommunications sector. Every sampling method was chosen to enhance the data's validity, reliability, and applicability.

3.5.1 Qualitative Phase

The qualitative phase of this study was designed to collect detailed insights into the current practices, problems, and perceptions of digital transformation of performance management systems in the telecommunication industry of Bangladesh. A purposive sampling strategy was employed to select participants in Focus Group Discussions (FGDs) and Key Informant Interviews (KIIs) in a way that individuals with a wealth of experience and expertise in human resource management, digital technologies, and organizational change were selected. The FGDs were conducted with mid-level HR professionals and IT officers from three telecom organizations, allowing for a discussion of diverse perspectives. In parallel, Key Informant Interviews (KIIs) were held with senior executives and digital strategy thinkers to capture strategic thoughts and contextual meanings. The qualitative data refined the research framework, developed pertinent constructs, and designed the survey instrument for the subsequent quantitative phase. NVivo software was used to facilitate thematic coding and qualitative response analysis to provide analysis rigor and data traceability.

3.5.1.1 Purposive Sampling for Focus Group Discussions (FGDS)

Respondents for the Focus Group Discussions (FGDS) were chosen based on purposive sampling, including participants with pertinent expertise and closeness to the subject. This targeted strategy enabled the selection of respondents with firsthand information or experience relating to digital transformation in performance management within the telecommunications sector. Purposive

sampling is beneficial in qualitative research because of its emphasis on the depth of insights over the quantity of generalizability (Etikan, Musa, & Alkassim, 2016).

Purposive sampling was employed to construct Focus Group Discussions (FGDS) with employees from various departments. The aim was to gain rich qualitative data through the insights of individuals directly affected by the digital transformation-induced changes to their performance measurement systems. Collectively, these sampling methods provided comprehensive knowledge, offering strength and depth to the study.

This research employed a purposeful sampling method in selecting key informants such as human resource managers, information technology experts, and line managers directly involved with performance management systems and digital transformation activities. The focus group discussion was to capture perceptions regarding their opinions on digital transformation's impacts, challenges, and benefits. Applying this focused sampling method was necessary to better understand employee attitudes, as such participants are strategically located in organizations, enabling them to see shifts in performance management systems.

Advantages of Purposive Sampling in FGDS:

- Provides suitable, high-quality information by selecting individuals with specialized knowledge.
- Allows for in-depth understanding that reflects diverse responsibilities within the field.
- Enhances the richness of information by focusing on individuals deeply involved in the phenomena under consideration (Palinkas et al., 2015).

3.5.1.2 Snowball Sampling for Key Informant Interviews (KIIS)

Key Informant Interviews (KIIS) employed snowball sampling, a technique that excels at reaching participants who possess specialized or sensitive information that is hard to get. Snowball sampling utilizes existing networks, where the first respondents are requested to recommend additional knowledgeable contacts in the telecommunication industry with new ideas regarding digital transformation processes (Goodman, 1961). The method was instrumental in accessing participants such as senior managers, regulatory consultants, and other industry experts with knowledge of digital transformation's regulatory, strategic, and operational dimensions in performance management systems.

The need for specialist knowledge informed the chosen sampling method and to incorporate informants based on hierarchical or densely linked organizations, in which traditional sampling methods may prove insufficient (Atkinson & Flint, 2001). Snowball sampling was employed in the study to connect with a trusted set of informants who provided open and honest answers on policy impacts, regulation issues, and other variables that affect the effectiveness and implementation of digital transformation processes.

Key Informant Interviews (KIIS) and snowball sampling were used to reach top-level management and experienced HR professionals who are hard to reach because of their organizational roles. This approach allowed the researcher to locate knowledgeable respondents through professional referrals, which permitted the collection of in-depth information on digital PMS implementation from influential insiders (Palinkas et al., 2015).

Advantages of Snowball Sampling in KII:

- Enables connections with top-tier informants and industry specialists who are typically difficult to contact.
- Establishes a community of contributors, fostering confidence and transparency in the exchange of information.
- Facilitates the exploration of insights regarding regulatory and strategic challenges that might remain hidden with alternative sampling techniques.

3.5.1.3 Overcoming and Countering Bias in Focus Group Interviews and Key Informant Information:

To ensure the qualitative data obtained through FGDS and KIIS' trustworthiness and credibility, participants were openly assured of the confidentiality of their contribution, and it was communicated that no names or identifiers would be utilized during the transcription process. This adherence to anonymity was critical in fostering open and honest responses, eventually minimizing the possibility of social desirability bias affecting the outcome of the discussion. The FGDS took place in comfortable, non-threatening settings in the organization, and there was random seating to prevent power dynamics or groupthink. In the KIIS, the same precautions were taken against interviewers and respondent bias. Interviews were held in a semi-structured manner, providing both consistency and flexibility. Responses were anonymized, and interviews were audio-taped (after taking prior permission) to help ensure accuracy of representation of opinions during

analysis. Furthermore, methodological triangulation was employed through pilot tests, focus group discussions (FGDS), and key informant interviews (KIIS) as a cross-validation and verification method of findings obtained. Peer debriefing sessions with academic colleagues were also used to effectively challenge the interpretations made and help minimize the chances of researcher bias that could affect the study outcomes (Nowell et al., 2017). These carefully chosen approaches aligned with qualitative research quality frameworks prioritizing trustworthiness, credibility, and confirmability, particularly in mixed-method research.

3.5.2 Quantitative Phase

Following the inputs from the qualitative phase, the quantitative phase used a standardized questionnaire to validate the research hypotheses and investigate the inter-relationships among the variables identified in the conceptual framework. A stratified random sampling technique was employed to ensure adequate representation across various departments (e.g., HR, IT, Operations) and hierarchical levels (entry, mid, and senior) within the telecommunication sector. The sample consisted of employees from leading telecom operators in Bangladesh, and the sample size was calculated based on Krejcie and Morgan's (1970) table. Consequently, 176 usable responses were obtained for analysis. The structured questionnaire, which was pilot tested, was distributed in printed and online form. Statistical analysis was conducted with SPSS and SmartPLS to measure the model's reliability, validity, and predictive power. This quantitative research furnished empirical evidence that confirms or refutes the hypothesized hypotheses, thereby contributing to the generalizability of the study's findings.

3.5.2.1 Stratified Random Sampling for Survey

The investigation utilized stratified random sampling to guarantee representation across various segments within the telecommunications sector. Stratified sampling entails segmenting the target population into distinct sub-groups, or strata, according to characteristics, followed by randomly selecting participants from each stratum (Creswell & Creswell, 2017). This analysis categorized participants according to their roles within the organization (such as frontline personnel, middle management, and senior management) and their geographic distribution across Bangladesh. This approach improves the sample's diversity, allowing for conclusions that can be applied to various employee experience levels and organizational structures.

Using stratified random sampling was crucial for obtaining balanced data across various employee segments, ensuring that insights regarding the effects of digital transformation were gathered from all pertinent organizational levels. This approach enhances the process of hypothesis testing and statistical analysis by reducing sample bias and guaranteeing a precise representation of demographic traits (Etikan, 2017).

As per the mixed-method design adhered to in the current research, two separate sampling methods were used to serve the objectives of the qualitative and quantitative parts, respectively. Stratified random sampling was used for the quantitative survey to ensure that various subgroups of telecommunication sector employees are included as per their respective actual sizes. The population was stratified based on specific attributes, such as employee level (for example, managerial vs. non-managerial), gender, and telecommunication organization type (for example, multinational vs. local companies). This approach allowed the researcher to reduce sampling error and enhance statistical efficiency, thus increasing the generalizability of the results (Etikan & Bala, 2017; Singh & Masuku, 2014). Stratification helped to guarantee that every group was adequately represented within the final sample, which was necessary to comprehend the multifaceted effects of digital performance management systems across various employee levels.

Advantages of Stratified Random Sampling in Surveys:

- Enhances data accuracy by guaranteeing representation from all pertinent workforce groups.
- Minimizes sampling error, therefore improving the generalizability of findings.
- Facilitates statistically significant comparisons at various organizational levels.

3.5.2.2 Population of the Study for Survey

The research population for this study includes individuals and organizations in Bangladesh who are directly involved in or impacted by employees' performance management systems. The study focuses on the dynamics of digital transformation in this context. The study population will be represented by the employees of four active telecommunication companies operating in Bangladesh. The study aims to contact and interact with the respondents mentioned who have knowledge, experience, and expertise in the Telecommunication field.

3.5.2.3 Sample of the Study for Survey

This study uses simple random and purposive sampling techniques, FGD, KIIs, case analysis, and a survey through a pre-structured questionnaire. The researcher posted online and offline questionnaires to get sample responses. Two significant aspects are considered to identify the sample of this study, i.e., (i) Managerial employees and (ii) employees who have permanent employment in their respective fields. According to the Association of Telecommunication Operators of Bangladesh (AMTOB), the total number of Active Mobile Phone operators in Bangladesh is four up to February 2023. They are Grameenphone Ltd. (GP), Robi Axiata Limited (Robi), Banglalink Digital Communications Ltd, and Teletalk Bangladesh Ltd. (Teletalk). The total number of permanent employees worked in the respective companies and the scenario is as follows:

Table 3.8: The total number of permanent employees in the respective companies.

Operators	Total Employees	Proportion (%)
Grameenphone Ltd. (GP)	2253	45.54%
Robi Axiata Limited (Robi)	1023	20.65%
Banglalink Digital Communications Ltd	1184	23.90%
Teletalk Bangladesh Ltd. (Teletalk)	493	9.91%
Total	=4953	=100%

**Information regarding the approximate total number of employees in each company was obtained from the Human Resources departments of the respective companies in 2023.*

Determining the sample size requires population identification. Yamane (1967) develops a simplified formula for large populations to produce a representative sample for proportions.

$$n = \frac{N}{1 + N(e)^2}$$

Where n is the sample size, N is the population size, and e is the level of precision. Therefore, this study may state the following with 5% precision.

$$n = \frac{4953}{1 + 4953(.05)^2}$$

The approximate number of respondents is 370.11, e.g., 370; they will be surveyed employees of telecommunication companies in Bangladesh. However, with different opinions on a sufficient sample size, Hoe (2008) suggested 200 as an adequate sample size for data analysis. Dennis Jackson (2009) also proposed that 200 to 400 respondents would be sufficient for multivariate data

analysis. Thus, the study focuses on approximately 200 respondents as the sample for Data analysis. Though the sample size was initially determined to be 370 using a formula for a finite population with a 95% confidence level and 5% margin of error (Krejcie & Morgan, 1970), in this research, 200 participants were used. This decision was influenced by some practical considerations like time constraints, challenges in accessing organizational resources, and confidentiality of internal performance management data in the telecommunication industry. Although size 200 falls under the ideal size, it is still adequate for multivariate analysis such as Structural Equation Modeling (SEM), which only needs a minimum of 150 to 200 cases to yield stable results (Hair et al., 2019). Second, as evidenced by G*Power and reasoned by Westland (2010), the sample size required in SEM is a factor of model complexity, effect size, and statistical power, not arbitrary cut-offs. The moderately sophisticated model, coupled with the strong observed relationships, produced firm and interpretable results from the 200 sample. This is evidenced through the satisfactory reliability, validity, and model fit indices.

3.5.2.4 Unit of the Sample for Survey

The sample consists of experienced Employees of Telecommunication companies in Bangladesh who have the knowledge, experience, sense, etc., of Digital Transformation. For example, employees' knowledge about HRIS practices, digital transformation of employee roles, competitive advantages in the market, and involvement in digital and green initiatives. The sampling unit is designed according to the stages of the study and is given below.

Table 3.9: The sampling unit

Stages	Data Collection Method	Sampling Unit	Sampling Method	Data Analysis Method
First	FGD (Nair and White (2010) found that FGDS are instrumental in uncovering employee concerns and expectations during organisational changes.)	FGDS with 10 participants directly involved in the DT of PMS in Telco, such as System Developers, Performance Analysts, etc.	Purposive	Thematic Analysis (Qualitative)

Second	KIIS (Kumar and Husain (2012) stressed the relevance of key informant interviews in understanding organisational dynamics by revealing tacit knowledge and crucial concerns.)	Notable stakeholders in the respective industry.	Snowball Sampling	Thematic Analysis (Qualitative)
Third	Survey (Bryman and Bell (2015) highlighted the utility of surveys in organizational research, emphasizing their ability to collect data on a wide scale.)	200 (Sample units will be distributed following the proportionate rate of the total population)	Stratified Random Sampling	Quantitative Analysis (Descriptive and Inferential)

3.5.2.5 Study Instruments

The online and offline form is formed to accumulate information from the sample of the study when reviewing a number of the past literature addressing every one of the factors analyzed within the study; it contains 3 areas of inquiries, the essential bunch is concerning demographic questions about the study population, All different queries facilitate to work out the solution on 2 variables; 1) Factors affecting the Digital Transformation of PMS, 2)Impacts of Digital Transformation in PMS.

3.6 Measurement Tools and Instrument Validation

This section operationalizes the instruments employed for measuring core concepts in the study, along with procedures undertaken to acquire their reliability and validity. In taking on standardized scales and modifying them to the setting of Bangladeshi telecoms, instruments were subjected to rigorous processes of validation. Qualitative and quantitative phases assisted significantly towards refining the instruments for improved clarity, consistency, and alignment with research objectives.

3.6.1 Study Validity

Several related articles have been studied to ensure the study's validity. A pilot sample survey has been conducted to justify the questionnaire. After the pilot survey, some questions was modified or deleted.

3.6.2 Measurement Tools

Five-point Likert scales is applied to ask the poll inquiries and estimate the examination factors (Strongly Disagree = 1, Disagree =2, Neutral = 3, Agree = 4, and Strongly Agree = 5). The estimation approach matches the population investigation and is used as a reference point.

3.7 Data Analysis Techniques

This study utilizes quantitative and qualitative data analysis methods to provide comprehensive insights into the dynamics of digital transition in employee performance management systems. Structural Equation Modeling (SEM) was conducted with SPSS to analyze quantitative survey data. The qualitative data underwent evaluation via thematic analysis of Focus Group Discussions (FGDs) and Key Informant Interviews (KIIs), employing NVivo software. Each method aligns with the study's comprehensive approach, ensuring thorough data examination.

There were two primary data analysis methods used in this research:

- 1. SPSS:** Utilized for survey data statistical analysis, hypothesis testing, and validation of the relationships in the conceptual model.
- 2. SmartPLS:** Software package for structural equation modelling (SEM) and path analysis, enabling the hypothesized relationships to be thoroughly examined

3.7.1 Quantitative Analysis Using SEM

Structural Equation Modeling (SEM) was used to study relationships among latent variables and test the six research hypotheses. SEM is a high-level statistical procedure combining factor analysis with multiple regression, allowing for rigorous model testing and examining intervariable relationships (Byrne, 2016; Hair et al., 2020).

3.7.2 Data Preparation and Initial Checks

Structural Equation Modelling (SEM) was employed to test the six study hypotheses and explore the relationships between latent variables. SEM is a sophisticated statistical method combining multiple regression and factor analysis, thereby allowing the testing of relationships between variables and evaluating complex models (Byrne, 2016; Hair et al., 2020).

3.7.3 Measurement Model Evaluation

Measurement model assessment consisted of a stringent test of construct validity and the reliability of the survey instrument. Key indicators such as Cronbach's alpha, Average Variance Extracted (AVE), Composite Reliability (CR), and the Heterotrait-Monotrait (HTMT) ratio were calculated:

a. Cronbach's Alpha: The statistical coefficient used to estimate internal consistency, with coefficients higher than 0.7 reflecting adequate reliability (Nunnally, 1978).

b. Composite Reliability (CR): CR scores were computed to identify the stability of the latent constructs. A CR score above 0.7 is considered to be acceptable, reflecting the instrument's reliability in measuring the constructs (Hair et al., 2017).

c. Average Variance Extracted (AVE) was used to examine whether convergent validity is met with a cut-off value of 0.5. That is, more than half of the variance is explained by the construct indicators (Fornell & Larcker, 1981).

d. The heterotrait-monotrait (HTMT) Ratio was calculated to examine discriminant validity, with values lower than 0.85 reflecting adequate discrimination between constructs (Henseler et al., 2015).

3.7.4 Structural Model and Hypothesis Testing

After assessing the measurement model, the structural model was tested to examine intercorrelations among variables. The Structural Equation Modeling (SEM) can test direct as well as indirect relationships among variables in the model and, therefore, enables a simultaneous test of hypotheses advanced (Bagozzi & Yi, 2012). A rigorous test of all six hypotheses was done involving a keen examination of the standardized path coefficients and significance levels. The hypothesized relationships were supported by the statistical significance of the findings, as reflected by p-values of below 0.05.

3.7.5 Qualitative Analysis Using NVivo and Thematic Analysis

To complement the quantitative findings, qualitative data from focus group interviews and key informant interviews were thematically coded using NVivo software. This provided a rich understanding of participants' experiences and views and thus maintained the mixed-methods study design.

3.7.5.1 Data Preparation and Transcription

FGD and KII interviews were audio-recorded verbatim, and all transcripts were transferred into

NVivo for coding. Coding qualitative data requires careful administration to make it accurate and the proper representation of the perceptions of the participants (Saldaña, 2021).

3.7.5.2 Coding Process and Thematic Analysis

Thematic analysis was done by the six-phase model of Braun and Clarke (2006):

- **Familiarization with the Data:** A preliminary reading of the transcripts was done to get an overall idea of the content.
- **Generation of Initial Codes:** Data were labeled into meaningful portions under recurring themes related to digital transformation, employee experience, and performance management.
- **Theme Identification:** Codes were organized into general themes consistent with the goals of the study.
- **Examining Themes:** Themes were polished to guarantee they truly reflected the data.

Identifying and Labelling Themes: Each theme was labelled to ensure clarity and uniformity.

- **Report Development:** Themes were integrated into a cohesive narrative to substantiate the results of the quantitative analysis.

3.7.5.3 Key Themes Identified

Thematic analysis showed a few main themes that included "Employee Adaptation to Digital Systems," "Technological Challenges," and "Impact on Performance Management Practices." These themes provided in-depth details regarding employees' attitudes along with the specific challenges of digital transformation in telecommunications.

3.7.5.4 Integration of Quantitative and Qualitative Findings

Incorporating findings from SEM and findings from thematic analysis allowed a more in-depth examination of how digital transformation affects employee performance management. SEM quantified relationships and confirmed the proposed model, while thematic analysis allowed data to be gathered contextually, providing overall information on the impacts of the transformation.

3.8 Ethical Considerations in Research:

Research is undertaken with a responsibility to maintain ethical standards, thereby promoting the participants' welfare, rights, and dignity. Ethical concerns are at the heart of the research process

and encompass different facets to promote the integrity of the research. The following is a description of the primary ethical considerations applicable to this research.

A. Informed Consent:

Explanation: All participants were fully and clearly informed about the research's aim, procedures, potential risks, and benefits.

Action Steps:

- Participants were given an informed consent form before participation.
- Consent was voluntary, and the participants had the right to withdraw without penalty at any time.

B. Confidentiality:

Explanation: The confidentiality of participants is a top priority. All information gathered anonymized and kept confidential to protect people's identities.

Action Steps:

- Identifiers were coded in data analysis.
- Confidential data was viewed by the research team only.

C. Privacy:

Explanation: The privacy of participants were respected, and there was attempts to avoid intrusions into their personal lives.

Action Steps:

- Data was collected in private environments.
- Participants' identities were not be revealed during publications or presentations.

D. Data Integrity:

Explanation: The accuracy and integrity of data was maintained during the course of research to have valid and reliable findings.

Action Steps:

- Data collection tools and processes was designed to minimize errors.
- Data analysis were verified and validated regularly.

E. Minimization of Harm:

Explanation: Every precaution was taken to minimize anticipated physical, emotional, or psychological injury to the participants.

Action Steps:

- Participants will never be exposed to undue stress and discomfort.
- A proper support mechanism is established for participants who become distressed.

F. Respect for Diversity and Inclusion:

Explanation: The study's participant diversity was addressed across cultural, gender, and other identifying aspects.

Action Steps:

- Provision made to provide a diverse, inclusive sample.
- Cultural sensitivity is evident in interactions and communication.

G. Beneficence:

Explanation: The research contributes to the development of knowledge and societal well-being. The benefits are maximized, and risks are justified.

Action Steps:

- Findings will be disseminated to benefit the academic world and potentially inform practical applications.
- The research design will be streamlined to balance benefits against risks.

H. Compliance with Regulations:

Explanation: The study adheres to all ethical standards, institutional review board (IRB) policies, and legal laws.

Action Steps:

- Necessary approvals were obtained from the institutional ethics committee.
- The research adheres to the ethical guidelines outlined by respective organizations.

By adhering to these ethical considerations, this research seeks to maintain the highest standards

of integrity, transparency, and respect for the individuals participating in or affected by the study. Regular ethical reviews and ongoing vigilance were prioritized to ensure the research remained ethically sound.

3.9 Summary of Chapter Three

This chapter has discussed the detailed research methodology followed in this study. The literature review has revealed a dearth of studies that have assessed the Digital Transformation of employees' performance management systems in Bangladesh, especially in the telecommunications industry, and the practices for prioritizing critical ones on which individual and organizational sustainable performance depends. Moreover, little is known about the factors that drive or hinder the implementation of DPMS practices. Therefore, to address these voids in the literature, this study has empirically assessed and categorised dynamics of DPMS aspects, practices, drivers and challenges for identifying the most critical and influential one/ones in the Bangladeshi Telecommunication industry context for suggesting strategic policy guidelines. This chapter begins with a discussion of the philosophical considerations of the research approach, research design, and research strategy/method employed in this study.

3.8.1 Philosophical Foundation

This study took a subjective perspective on social reality, underpinned by a pragmatist paradigm in which participants apply their subjectivity to events and experience reality in different ways. A combined (exploratory, explanatory, and evaluative) research design was suitable for the research questions, aims, and objectives.

3.8.2 Research Approach

The abductive approach has been applied in this study for two main reasons. First, there is very little literature on DPMS in an emerging country like Bangladesh, though there is information in other contexts. Second, data have been collected in three stages- through the systematic review of literature, piloting questionnaires, and finally, through FGD, KII, and questionnaire surveys. These back-and-forth moves indicated the abductive approach as the best approach for this research.

3.8.3. Research Design

The investigation's scope and depth were enhanced by applying a mixed-method methodology. Quantitative survey data statistically corroborated the proposed hypotheses, while qualitative data from focus groups and key informant interviews enriched our comprehension of employee perspectives and industry-specific challenges. The study's validity and reliability were improved by integrating diverse approaches (Tashakkori & Teddlie, 2003).

(See Table 3.10 for a diagrammatic flow of how research philosophies, approaches, research designs, and methods have been implemented in this study.)

Table 3.10: Flow table of research philosophies, approaches, design, and methods.

Research Orientation	Decision Taken	Justification
Philosophy	Pragmatism	Pragmatism as a research philosophy, with its pluralistic ontology and problem-solving epistemology, provides a robust framework for investigating the dynamics of digital transformation in employees' performance management systems within the telecommunications industry in Bangladesh.
Approach	Abductive research approach	Developing hypotheses (start with observations or data and then propose possible explanations), collecting data, investigating data, interpreting the results, and drawing a calculation (moving back and forth)
Strategy	Pilot Test, FGD, KII, Survey	Used for Qualitative and Quantitative analysis

Research Methods	Mixed	Qualitative and quantitative methods are used in an integrated manner to address the same research questions or objectives. The data from different methods are combined to develop a more comprehensive understanding of the research problem.
Sampling	Probability & Non-probability Sampling	Purposive, Snowball, Stratified Random Sampling.
Data	Primary & Secondary	Primary for Fact-finding and secondary for interpretations and analysis based on primary sources

3.8.4 Pilot Testing and Framework Validation

The pilot test was crucial in refining the survey tool and testing the conceptual framework. Pilot test-driven modifications improved the survey's final design by preventing bias and error (Bryman, 2016). This chapter presents the pilot test findings openly and with methodological rigor.

3.8.5 Ethical Considerations

Informed consent from the participants was obtained, and rigorous conformity to data confidentiality and privacy procedures was observed throughout the trial to uphold ethical integrity. Approval by responsible authorities was procured to ensure adherence to institutional regulations (Resnik, 2020).

3.8.6 Alignment with Research Objectives

The study's primary objective guided all methodological choices: to investigate how digital transformation affects employees' performance management systems in Bangladesh's telecommunications sector.

- ✓ To understand employee viewpoints regarding digital transformation.
- ✓ To pinpoint challenges unique to specific sectors and the effects of regulations.

The analysis thoroughly assesses the suggested hypotheses using strong analytical techniques (e.g., SPSS), thus addressing current literature gaps and improving theoretical and practical insights into the subject matter.

The primary overview of the methodology according to the research objectives is as follows:

Table 3.11: The primary overview of methodology

Sl.	Objectives	Sources of data	Data Collection Method	Data Analysis	Tools to be Used
1	Analyze the factors influencing the DT of the PMs in Telecommunication companies operating in Bangladesh.	Primary & Secondary	KIIS (Key Informant Interviews), FGDS (Focus Group Discussions), Survey, Articles, Journals, Newsletters, websites, etc.	Qualitative & Quantitative	QDA* and SPSS**
2	Examine the impact of DT of PMs in the Bangladeshi telecommunication industry	Primary	KIIS, FGDS, Survey	Qualitative & Quantitative	QDA* and SPSS**

**Qualitative Data Analysis Software ** Statistical Package for Social Science*

This chart provides a structured view of all the hypotheses, highlighting the variables, null and alternative hypotheses, and the proposed statistical test for each hypothesis.

The chapter on methodology highlights the study's dedication to relevance and rigor in its approach. This study employs a practical, abductive, and mixed-methods approach to thoroughly explore digital transformation in employee performance management systems, offering significant insights for both academics and businesses.

Chapter 04: Qualitative Data Analysis and Findings (FGD & KIIS)

4. Introduction

This chapter introduces the qualitative analysis conducted to uncover major findings related to the dynamics of digital transformation in employee performance management systems in Bangladesh's telecom industry. Qualitative data were gathered through two complementary approaches: Focus Group Discussions (FGDS) and Key Informant Interviews (KIIS). These offered a chance for a rich understanding of the phenomenon through the triangulation of group-level dynamics and individual perspectives.

The combination of Focus Group Discussions (FGDS) and Key Informant Interviews (KIIS) data was guided by the study goals to provide an in-depth analysis of employee-focused aspects of digital transformation. FGDS offered a platform where participants could share experiences, enabling the establishment of common perceptions and challenges. At the same time, KIIS provided in-depth individual views that complemented the analytical framework.

The research used NVivo software to ensure methodological precision and consistency, thus enabling systematic coding, topic development, and data integration. Such an approach enabled the identification of the grand themes addressing the research questions and the identification of each data collection method's contribution.

The research revealed salient findings related to employee matters, organizational preparedness, flexibility to technological innovation, and regulatory factors impacting the digital transformation process. These findings introduce the phenomenon under investigation and form the basis for the subsequent discussion of findings related to existing knowledge and practical implications.

This chapter outlines the steps employed in data preparation, the analytical steps employed, and the themes developed through analysis. Each respondent is supported by supporting data collected through key informant interviews and focus group discussions, giving a complete picture of individual and community voices. The rationale for combining these datasets is analyzed, emphasizing methodological concerns and the improvements it brings to the study.

4.1 Findings from Focus Group Discussions (FGDS) and Key Informant Interviews (KIIS)

Participants Overview

To explore the nuanced perspectives on the digital transformation of Performance Management Systems (PMS), this study conducted in-depth Focus Group Discussions (FGDs) and Key Informant Interviews (KIIs) with experienced professionals from leading telecommunication companies in Bangladesh, including Banglalink, Grameenphone, Teletalk, and Robi. The participants primarily held strategic and operational roles such as Head of HR, Senior HR Managers, Process Analysts, and Team Leaders. Most respondents brought a wealth of insight, having served in the industry for over a decade. Their extensive practical knowledge and leadership positions allowed them to offer informed views on the evolving nature of performance management within the rapidly digitalizing telecommunications sector. The qualitative findings drawn from these sessions form the foundation for identifying key thematic areas that influence the adoption, implementation, and perception of digital PMS across organizational levels.

4.2A. Digital Transformation Awareness and Perceived Usefulness of DPMS

Results from the qualitative data show a strong consensus among the participants regarding the increased degree of employee awareness related to the digitalization of Performance Management Systems (PMS) in the telecommunication industry. All the interviewees acknowledged that employees are not just aware but also actively engaged in this ongoing transformation process. One of the dominant themes that emerged was the incorporation of digital technologies, particularly systems such as Workday, that have significantly transformed conventional performance management practices. This is most apparent in the uptake of real-time feedback mechanisms and efficient evaluation processes. One HR head pointed out, *"Employees are highly conscious of the digital transformation happening. Real-time feedback has transformed the way we work"* (Head of HR, Banglalink), thus underpinning the concrete operational changes wrought by digital tools. Another participant corroborated the same view by noting, *"Workday has enabled performance appraisals to be seamless and instantaneous"* (Senior HR Manager, Grameenphone), which indicates the increased use of digital platforms to facilitate timelier and more effective performance appraisals. These results collectively indicate a paradigmatic turn towards a feedback-driven and digitally responsive performance culture throughout the Bangladeshi telecom sector.

NVivo Visuals:

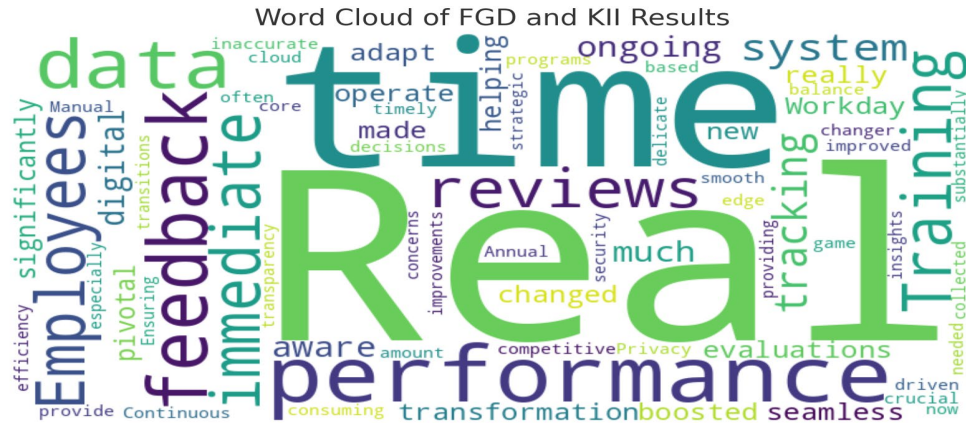


Figure 4.1: Word Cloud- Highlighting frequently mentioned terms like "real-time feedback," "Workday," and "digital transformation."

This visualization highlights frequently mentioned terms like "real-time feedback," "Workday," "digital transformation," and other relevant keywords from the discussions. This word cloud provides a visual representation of the main themes and terms that emerged during the analysis.

Theme Map: Digital Transformation Awareness and Perceived Usefulness of DPMS

The findings illustrate a strong interconnection between digital transformation awareness, technological integration, and the perceived usefulness of Digital Performance Management Systems (DPMS) among employees in the telecommunications sector. The thematic map visualizes this linkage by identifying **digital transformation awareness** as the central theme, supported by sub-themes such as awareness level, training, and internal communication strategies. Participants emphasized that **high awareness**, coupled with **regular training programs** and **effective internal communication**, played a foundational role in facilitating the adoption of new technologies.

This awareness directly influenced **technological integration**, specifically through the **adoption of digital tools** like Workday, as well as the establishment of **real-time feedback mechanisms**. Nodes from the data highlighted the integration of **Workday**, use of **advanced analytics**, and the **shift towards real-time evaluation processes** as critical outcomes of this integration phase. These technological advancements, in turn, contributed to enhanced **perceived usefulness**, where employees reported **improved efficiency**, **more accurate performance tracking**, and **positive feedback on DPMS effectiveness**.

The connections suggest a **sequential and reinforcing relationship**- greater awareness leads to better integration of digital tools, which enhances employees' perception of usefulness. Additionally, the findings also show a direct correlation between awareness and perceived usefulness, as a higher level of understanding and familiarity with DPMS increased employee acceptance and satisfaction with the system. Thus, the visual theme map affirms that successful digital transformation in performance management relies heavily on proactive awareness-building, strategic technology integration, and demonstrable utility of the systems introduced

Visual Representation

Theme Map: Connections between Awareness, Technological Integration, and Perceived Usefulness

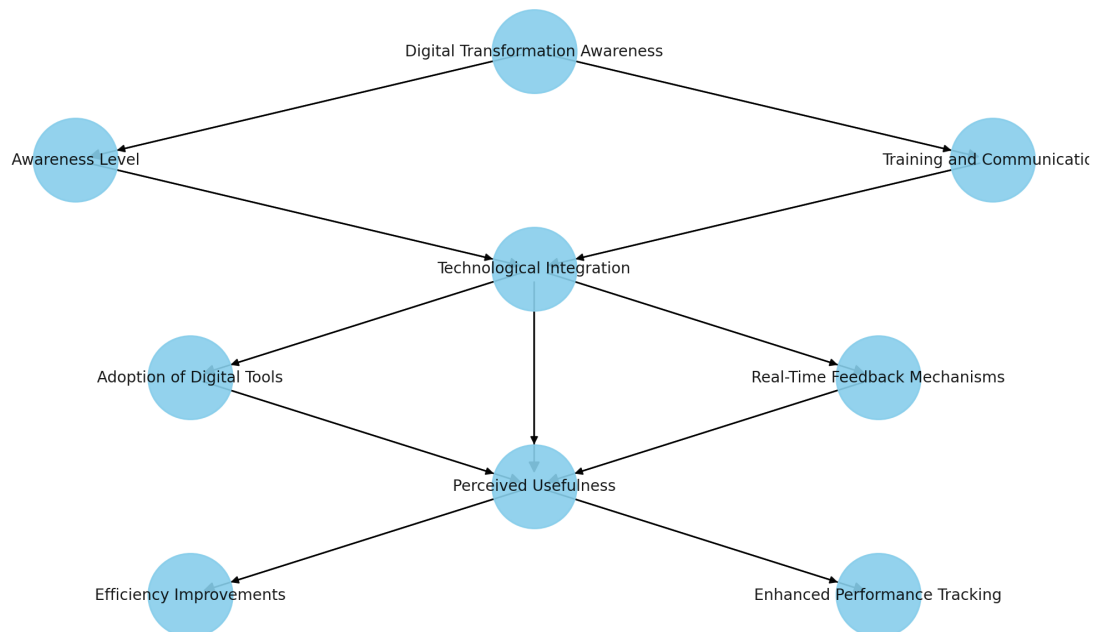


Figure 4.2: Theme Map- connections between awareness, technological integration, and perceived usefulness.

4.2B. Perceived Ease of Use (Challenges and Opportunities)

The study reveals that continuous training is a necessity to increase the flexibility and usability of workers with digital performance management systems (DPMS). The respondents highlighted that properly structured training programs enable employees to be more effective and self-assured when working with the new digital solutions. Moreover, incorporating regular, real-time feedback systems was viewed as a significant advantage, driving ongoing performance enhancement and organizational competitiveness. Nevertheless, several challenges were conceived, such as heightened stress brought about by constant digital monitoring, privacy concerns, and an evident reduction of empathy in automated feedback systems. Despite such concerns, the participants acknowledged tremendous opportunities such as the potential for improved employee performance, reinforced competitive edge, and organizational sustainability in the long run. This mindset is clearly expressed in participant remarks, e.g., *"Training has played a vital role in enabling the employees to adapt to the new systems"* (Process Analyst, Teletalk), and *"Real-time feedback has significantly improved our competitive edge"* (Team Leader, Robi). These results highlight the necessity of a balanced approach that exploits technology while keeping people-oriented considerations in performance management.

NVivo Visuals:

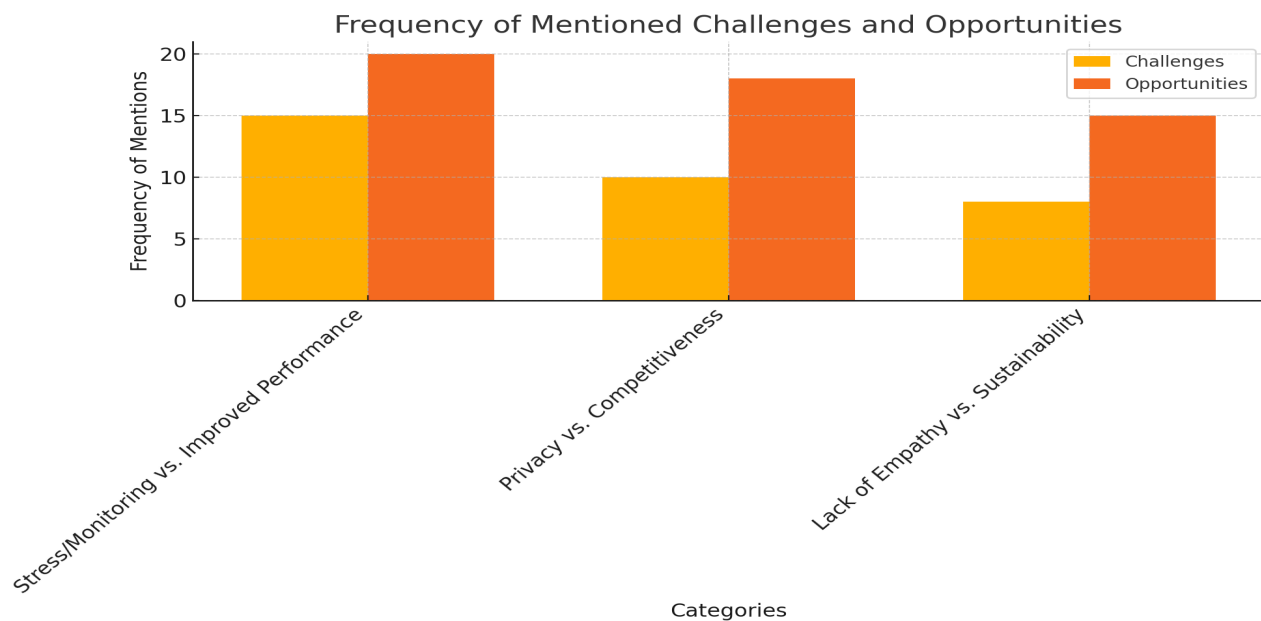


Figure 4.3: The frequency of the challenges and opportunities mentioned.

Here's a bar chart displaying the frequency of challenges and opportunities mentioned in the focus group discussions (FGDs) and key informant interviews (KIIs). This chart compares the number of times each challenge and opportunity were mentioned, helping to highlight the most frequently discussed topics visually.

The x-axis represents different challenge and opportunity pairs, while the y-axis shows the frequency of mentions for each. This chart compares how often each challenge and opportunity was discussed during the sessions.

- **Matrix Coding Query:** Cross-referencing ease of use with identified challenges and opportunities.

Table 4.1: Matrix Coding Query- Cross-referencing Ease of Use with Challenges and Opportunities

Ease of Use	Challenges	Opportunities
Training	Stress from constant monitoring	Improved performance through real-time feedback
	Privacy and security concerns	Enhanced competitiveness
	Lack of empathy in digital systems	Increased market sustainability
Regular Feedback	Potential for biased evaluations	Better alignment with business goals
	Resistance to change	Increased employee engagement
	Technical difficulties with new systems	More effective goal-setting
User-Friendly Interfaces	The learning curve for new technology	Efficient performance tracking
	Need for ongoing technical support.	Enhanced data-driven decision-making

Table Interpretation: Findings drawn from the analysis provide significant insight into areas of challenge and opportunity in digitalizing performance management systems (PMS). Training has surfaced as a central factor that, though capable of reducing stress on employees from being digitally monitored on a continuous basis, does not completely resolve matters of privacy or perceptions of a lack of empathy on the part of automated systems. Yet, when competently executed, training improves workers' performance and facilitates increased organizational competitiveness as it enables workers to leverage real-time feedback mechanisms. In the same way, the offering of regular feedback carries drawbacks and advantages. On the one hand, it may be prohibited by biased assessments, employees' resistance to change, as well as technical glitches in system implementation. Conversely, it attains strategic alignment by confirming business objectives and enhancing employee engagement. The study also identifies the ease of use as a critical factor in digital Performance Management Systems (PMS). Though such systems may be overwhelming to learn at the beginning and need perpetual technical assistance, their capability to facilitate efficient performance monitoring and evidence-based decision-making renders them a valuable tool in contemporary Human Resources applications. In total, these findings point to the need for a concerted, human-centered approach in devising and implementing digital PMS in consideration of technological and organizational factors.

NVivo Visualization and Interpretation:

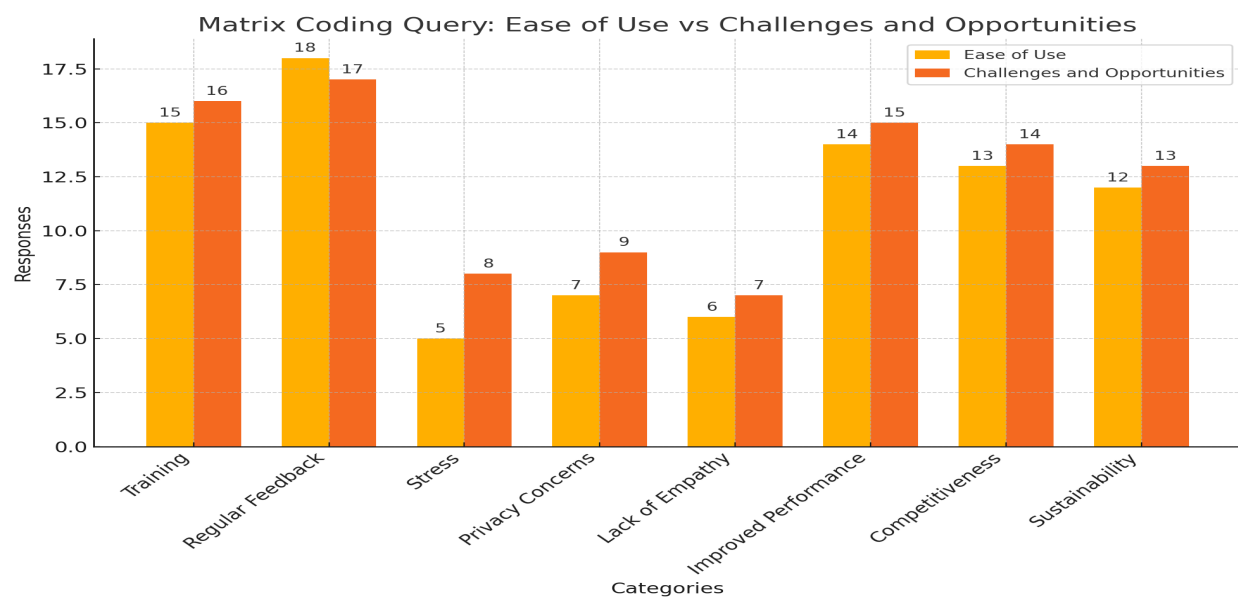


Figure 4.4: Matrix Coding Query- Cross-referencing Ease of Use with Challenges and Opportunities

4.2C. Disruptions of Traditional PMS Triggering Digital Transformation

The findings indicate significant challenges associated with traditional, manual performance management systems (PMS), highlighting their deficiencies and limitations in addressing modern organizational needs. This is an examination of each significant facet:

1. Lack of Effectiveness and Time Consumption:

Manual performance management systems involve enormous time consumption, which is defined by over-documentation and repetitive administrative work. This inefficiency has a propensity to create errors and inaccuracy, as attested by Grameenphone's senior HR manager, who stated: "Manual performance reviews are time-consuming and often in error." This outcome points to the need for automation to improve productivity and reduce errors.

2. Insufficient Immediate Feedback:

Traditional systems are best defined within the context of periodic reviews, typically done yearly or biennial, commonly referred to as biennially. The reality within the statement of the Head of HR in Banglalink is reflected in the fact that "Annual reviews do not provide the timely feedback necessary for immediate improvements." There is this inherent lag involved with such assessments that indeed prevents employees from being able to effectively change or enhance their performance based on it, thereby ultimately negatively affecting overall productivity.

3. Subjectivity and Bias:

The dependence on individual judgment considerably incorporates several biases in the evaluation process. Such biases may be due to personal relationships, instances of favoritism, or even subconscious biases that individuals may have, all of which can eventually lead to unequal evaluations. Such unequal evaluations have undesired effects, lowering not just the morale of employees but also shattering the faith that employees have in the system.

4. Insufficient Data and Analytics:

Legacy systems, as they stand today, are prone to a significant deficiency in their data collection and analysis procedures, leading to performance data that is either absent or at best dubious. Without actionable intelligence derived from credible data, organizations face overwhelming hurdles to discern patterns, forecast future trends, or make informed decisions regarding talent management.

5. Lack of Alignment with Business Goals:

There is generally a gap between individual performance measurement and the organization's strategic objectives. This gap may cause employees to focus on actions that fail to move strategic objectives forward, thereby decreasing the organization's overall effectiveness.

6. Employee Disengagement:

Negative and unhelpful feedback is a key factor in the growth of disengagement in the workplace. When given such feedback, employees start to feel underappreciated or even perplexed about what is required of them, leading to a significant drop in their motivation and overall performance.

7. Lack of Adaptability:

As shown by the Guide PMS, the inability to be adaptive reflects a sense of inflexibility and presents challenges in adapting to the ever-changing face of the corporate world. With fast-paced technological changes and shifting strategic initiatives, the transformation of market dynamics necessitates performance management systems to possess a high degree of flexibility and responsiveness to respond to these needs effectively.

8. Insufficient Customization:

A single approach fails to effectively consider the various roles, responsibilities, and goals within an organization. Such approaches fail to heed the distinctive performance metrics and developmental requirements of individuals or groups

9. Lack of Emphasis on Development:

Traditional approaches tend to emphasize past performance, overlooking the merit of positive

feedback that can translate into future improvement. This disregard constrains employees' ability to improve their skills or position themselves for greater responsibility.

10. Inefficient Goal Setting and Tracking:

Traditional models are deficient in their ability to establish and monitor performance goals effectively. The goals are either unclear, inadequately communicated, or fail to conform to individual and organizational priorities, which confuses them.

11. Challenges in Assessing Team Performance:

Traditional models emphasize individual achievement over the importance of teamwork and collaborative effort. The model fails to measure group attainment or effectively recognize areas for team improvement.

12. Adherence and Documentation Difficulties:

Compliance Adherence and Record Management Challenges: Compliance with established policies and maintaining proper documentation is quite challenging in manual systems. The situation inhibits the keeping of correct records and diminishes accountability, thus risking legal and operational consequences. According to the Senior HR Manager, Grameenphone - *"Manual performance reviews are time-consuming and often inaccurate."*. Almost the same is said by the head of HR, Robi: *"Annual reviews do not provide timely feedback needed for immediate improvements."*.

NVivo Visuals: Hierarchical Chart: Disruptions Leading to Digital Transformation

The findings of the research determine various major disruptions in traditional performance management systems (PMS) that call for digitalization. The most significant issue discovered is the **ineffectiveness and time consumption** of these systems, where paper-based, manual processes are time-consuming, prone to errors, and need lengthy updates and maintenance. One of the biggest problems is the **absence of real-time feedback** because most companies depend on bi-annual or annual appraisals, which by default lead to sluggish feedback cycles and missed opportunities for prompt improvement. Furthermore, the system is also tainted with **subjectivity and bias** because performance appraisals are often subjected to varying standards and subjective

views of different managers. Moreover, there is a huge **shortfall in data and analytics**; most organizations lack capabilities to gather and utilize data and hence make it challenging to make informed decisions or measure performance in a consolidated manner.

Furthermore, there is a **substantial misalignment with business goals**, whereby individual goals are not consistent with upper-level organizational strategies. This misalignment manifests in the form of an ineffective relationship between performance measurements and strategic achievement. This sort of misalignment further propagates **employee disengagement**, which is further reinforced through poor feedback, confusing expectations, and an overall lack of recognition, thereby leading to decreased motivation and productivity. The other major setback is **failure to evolve** with evolving business needs, catalyzed by rigid PMS models and resistance to new technologies or methodologies.

The study also reveals the **absence of proper customization** of Performance Management Systems (PMS), with most systems following a one-size-fits-all approach that is blind to unique needs and exhibits inflexibility in establishing performance metrics. Additionally, **insufficient emphasis is placed on employee development**, where the past takes precedence over future growth, with limited opportunities for skill enhancement or career advancement. **Inadequate goal setting and tracking** also undermine the system, with manual processes thwarting accountability and progress measurement. In team environments, organizations find it hard to quantify team performance, **tending to concentrate on individual performance and neglect team dynamics**. Lastly, **compliance and documentation** problems continue to exist, with manual documentation resulting in compliance problems and a high potential for error or discrepancy. Together, these disruptions highlight the urgency of the requirement to transition from conventional performance management systems to digital ones that have real-time functionality, data analytics, agility, and support for contemporary organizational objectives.

The hierarchical diagram organizes disruptions into main categories (e.g., ineffectiveness, poor feedback) and subcategories (e.g., manual processes, delayed feedback cycles) for simplicity and detailed analysis.

Hierarchical Chart: Disruptions Leading to Digital Transformation

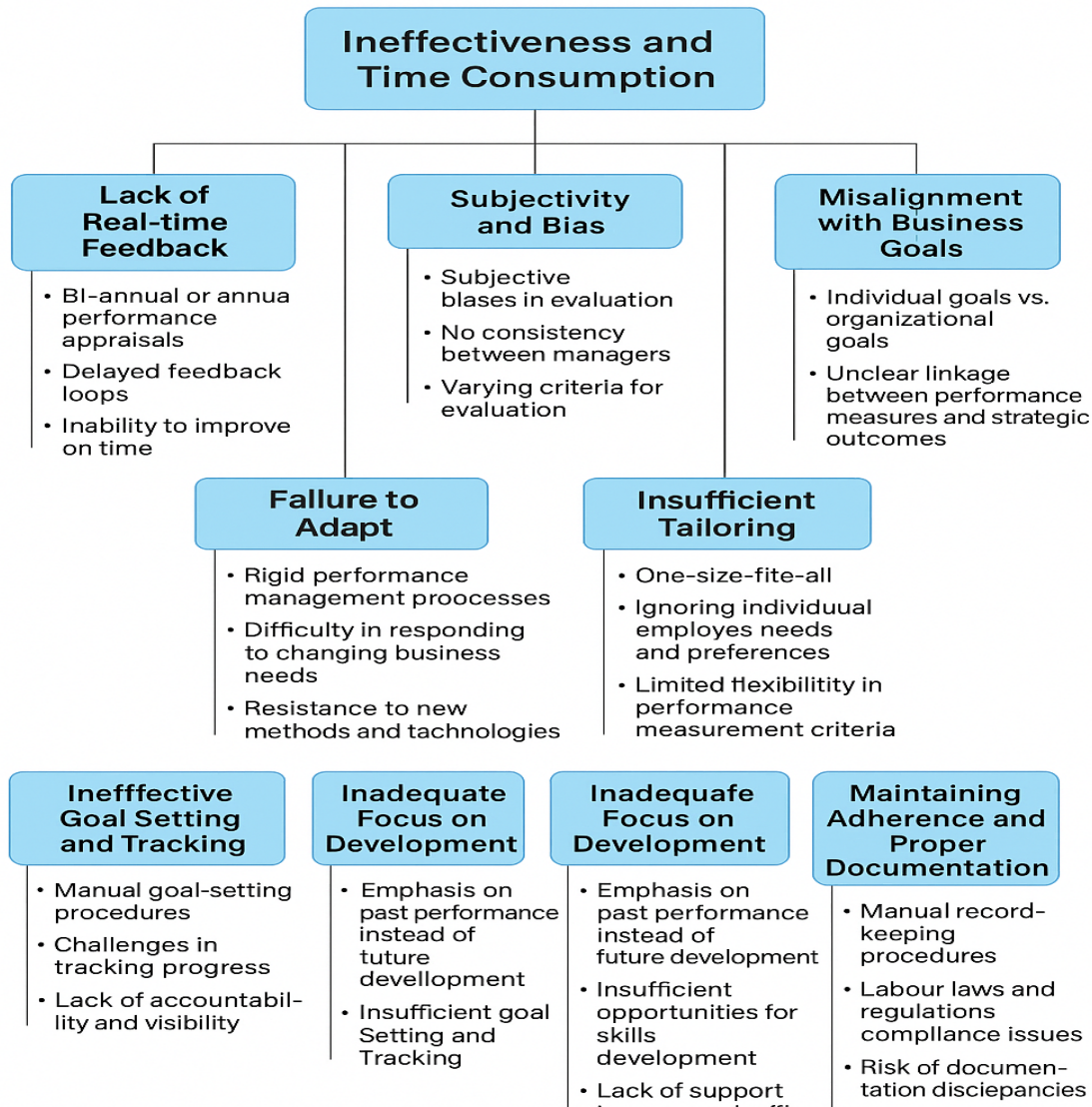


Figure 4.5: Hierarchical chart on the disruptions leading to Digital Transformation

Here is the hierarchical chart of disruptions to digital transformation. Each node represents a specific disruption identified from focus group discussions and key informant interviews, and the edges show their relationship to the broader category of disruptions in traditional PMS. The following visualization shall help understand how various factors contribute to the requirement of digital transformation in employee performance management systems.

The findings indicate the deficiencies of a manual PMS in meeting the demands of a dynamic and information-intensive business environment. Contemporary organizations, more so in the telecoms

market, seek frameworks that provide quicker feedback, analytical insights, and congruence with their strategic pursuits. The Senior HR Manager at Grameenphone astutely observed, "Manual performance evaluations are labor-intensive and frequently imprecise."

Moreover, as Banglalink's Head of HR emphasized, "Annual evaluations do not provide the timely feedback necessary for rapid improvements." This reference highlights the importance of adaptability and sensitivity in performance management systems to increase employee participation and productivity. To overcome these challenges, there is a need to transform into digital performance management systems focusing on automation, personalization, and analytics. The deployment of these technologies promotes alignment with goals, creates adaptability, and gives real-time feedback, making the performance management process more effective and participatory.

Sentiment Analysis: Challenges of Traditional PMS

According to findings obtained from Focus Group Discussions (FGD) and Key Informant Interviews (KII), sentiment analysis indicates a large gap between perceptions of traditional performance management systems (PMS) and the advantages provided by digitalization. The participants largely held **negative sentiments about traditional PMS**, primarily assigning these to its utilization of manual and paper-based systems, which were characterized as **time-consuming, prone to errors, and ineffective**. *"Manual performance reviews are time-consuming and often inaccurate."* (Senior HR Manager, Grameenphone). *"Maintaining paper-based records is inefficient and prone to errors."* (Head of HR, Banglalink). Human resources professionals and analysts from various telecommunications companies, including Grameenphone, Banglalink, Robi, and Teletalk, expressed their concerns regarding the **absence of prompt feedback**, indicating that annual or postponed appraisals obstruct timely enhancements in performance. *"Annual reviews don't provide timely feedback needed for immediate improvements."* (Head of HR, Banglalink). *"Delayed feedback affects our ability to address performance issues on time."* (Process Analyst, Teletalk). Additionally, **subjectivity and bias** were identified as fundamental issues, as performance ratings frequently reflect personal judgments and exhibit inconsistency in evaluation standards among managers. "Personal biases can affect performance ratings." (Team Leader, Robi). "Different managers apply different standards, so it's a subjective judgment." (Senior HR Manager, Grameenphone)

Another frequently cited deficiency was **ineffective use of data and analytics**, which was perceived by respondents as **compromising the integrity of performance assessment** and leading to decisions based on **incomplete information**. *"Limited data availability makes it hard to assess performance accurately."* (Process Analyst, Teletalk). *"Without data-driven insights, decisions are often based on incomplete information."* (Head of HR, Banglalink) Further, **goal misalignment** between individual and large organizational objectives was regarded as one of the classical systems' weaknesses, causing strategic direction disconnects. *"Employees may not understand how their work contributes to company goals."* (Team Leader, Robi). *"Aligning individual objectives with company strategy is challenging with traditional PM."* (Senior HR Manager, Grameenphone). This contributed to **employee disengagement**, as the **lack of timely feedback** and **opportunities for growth** caused a dip in motivation and a feeling of not being valued. *"Without meaningful feedback, employees feel undervalued and disengaged."* (Process Analyst, Teletalk). *"Traditional PM does not encourage continuous improvement or employee development."* (Head of HR, Banglalink)

Conversely, the shift to digital performance management systems (DPMS) generated mostly favorable reactions, particularly because it was able to provide **real-time feedback**, which not only boosted staff morale but also enabled timely correction. *"Real-time feedback has boosted employee morale and productivity."* (Talent Acquisition Leader, Banglalink). *"Employees appreciate receiving instant feedback to adjust their performance."* (Senior HR Manager, Grameenphone). **Data-driven decision-making** was universally embraced with the aim of facilitating **strategic resource management** and **enhancing organizational performance**. *"Data-driven insights help us allocate resources more effectively."* (Process Analyst, Teletalk). *"We can now make informed decisions based on real-time performance data."* (Team Leader, Robi). Furthermore, electronic systems were also perceived to enhance the **engagement and retention of employees** through continuous recognition and performance appraisal. *"Employees feel valued with regular feedback and recognition."* (Senior HR Manager, Grameenphone). *"Engaged employees are more likely to stay and contribute to company success."* (Sales Capabilities Development Manager, Banglalink). **Development and learning opportunities** presented by digital media were perceived as essential for building employee capacity and agility. *"Continuous training supports employee growth and adaptability."* (Process Analyst,

Teletalk). *"Development opportunities improve employee satisfaction and performance."* (Team Leader, Robi)

Saving costs and optimization of resources were also anticipated as additional advantages, with most of the stakeholders referring to the **minimization of operating costs** and improvement of streamlined processes. *"Efficiency gains from digital PM help us optimize resources effectively."* (Head of HR, Banglalink). *"Streamlined processes lead to cost savings and better resource allocation."* (Senior HR Manager, Grameenphone). Cumulatively, these findings point to a high inclination towards digital transformation since it effectively eliminates the long-standing challenges created by traditional PMS and is more in sync with the evolving requirements of today's telecom companies in Bangladesh.

Table 4.2: Sentiment Analysis- Categorizing responses to traditional PM challenges and digital transformation benefits.

Traditional PM Challenges:	Digital Transformation Benefits:
Positive: 3	Positive: 14
Negative: 12	Negative: 3
Neutral: 5	Neutral: 3

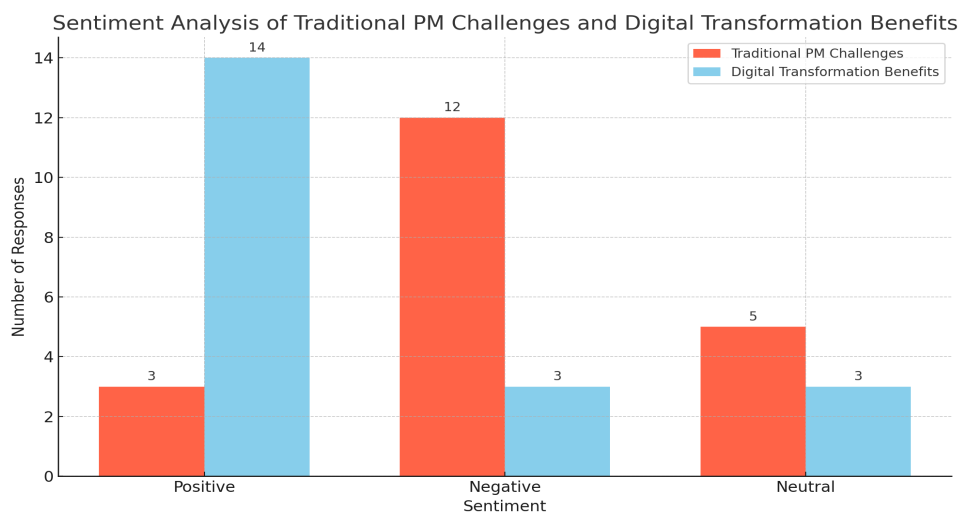


Figure 4.6 (a): Sentiment Analysis of Traditional PMS Challenges and Digital Transformation Benefits

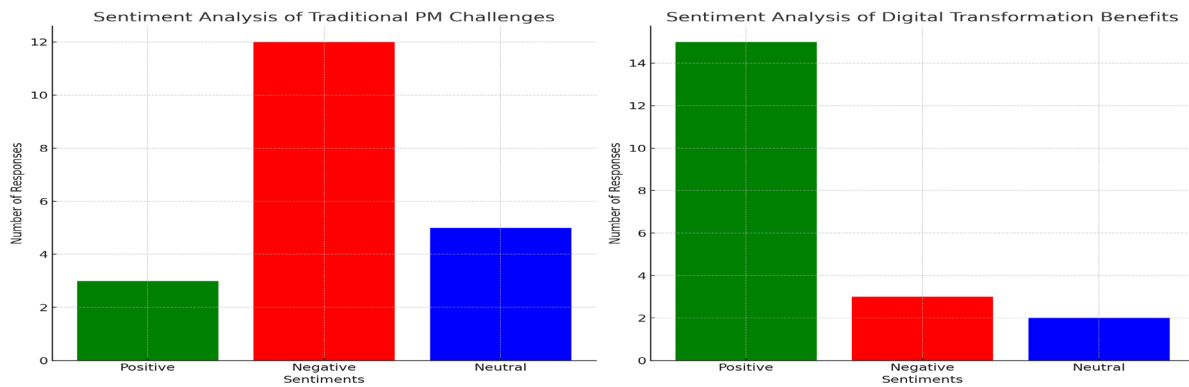


Figure 4.6 (b): Sentiment Analysis of Traditional PMS Challenges and Digital Transformation Benefits

Here's a sentiment analysis visualization comparing responses to traditional performance management (PM) challenges and digital transformation benefits. The bar chart categorizes responses into positive, negative, and neutral sentiments, clearly comparing the two areas. The chart shows that digital transformation benefits are perceived more positively than traditional PM challenges.

4.2D. Organizational Resources and Capabilities for Digital Transformation

The impact of digital transformation on performance management systems (PMS) is greatly shaped by the skills and resources available within the organization. This section explores the essential elements that facilitate the effective execution of digital transformation within Bangladesh's telecommunications sector.

According to insights obtained from the Focus Group Discussions (FGD) and Key Informant Interviews (KII), several key enablers have been identified that are crucial to the effective digitalization of Performance Management Systems (PMS) in the Bangladeshi telecommunication sector. **Technological resources** have been the most strongly stressed element with all the respondents reflecting 100% highlighting the need for advanced software applications, cloud infrastructure, and integration tools. This was reaffirmed by a process analyst at Teletalk, stating, "Our cloud-based system has been a game-changer in performance tracking."

Data management was the other key theme underscored by 75% of the respondents, emphasizing

the necessity of data collection tools, analytical platforms, and strong data security infrastructures to facilitate evidence-based decision-making. **Human resource readiness** was mentioned by 80% of the participants as critical, especially having a skilled workforce and establishing ongoing training programs. This was articulated by a team lead from Robi, who said, "Continuous training programs are important for smooth transitions."

Strategic direction and leadership were viewed by half of the respondents as critical necessities, such as retaining firm executive sponsorship, a clear strategic vision, and the assistance of internal change agents or champions to navigate the transformation process. Financial imperatives were also emphasized as a critical dimension; sixty percent of the interviewees emphasized having proper **budgeting and return-on-investment (ROI)** analysis to validate and perpetuate digital initiatives.

The significance of **project management** was identified by 90% of respondents, who reported the need for comprehensive implementation plans, proactive risk management techniques, and regular assessments to ensure success. In addition, the value of **support and maintenance**, including the role played by dedicated IT support and coordination with third-party technology vendors, was identified by 70% of respondents as a critical factor in ensuring long-term system stability and flexibility. Together, these conclusions provide an in-depth insight into organizational competence needed for digital PMS transformation in the telecommunication sector.

Table 4.3: Distribution of mentions across different organizational resources and capabilities.

Technological Resources	20 mentions	100%
Data Management	15 mentions	75%
Human Resources	16 mentions	80%
Leadership and Strategy	10 mentions	50%
Financial Resources	12 mentions	60%
Project Management	18 mentions	90%
Support and Maintenance	14 mentions	70%

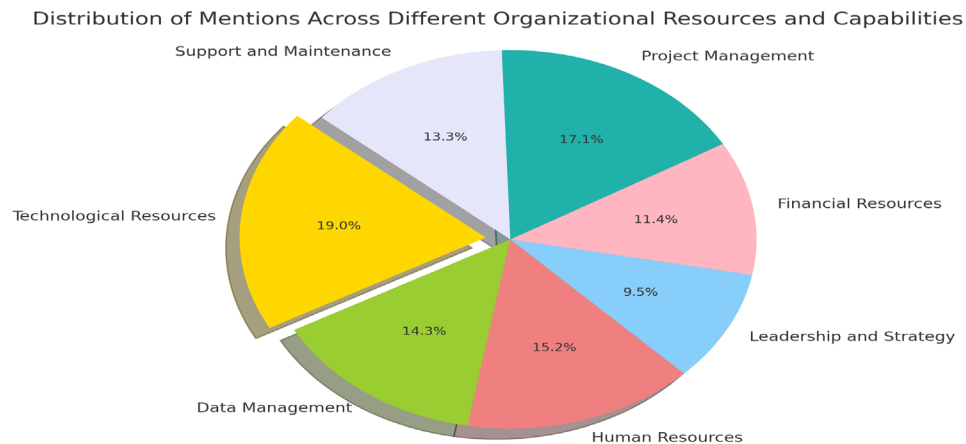


Figure 4.7: Pie Chart- Distribution of Organizational Resources and Capabilities

Insights:

The distribution of mentions across different resources and capabilities indicates a holistic approach to digital transformation. Technological resources and data management are frequently cited as foundational pillars for implementing digital PMS. Human resources and leadership are crucial in driving and supporting the transformation initiative. Adequate financial resources and robust project management practices are essential for sustainability and effectiveness.

This pie chart visually represents how various organizational resources and capabilities contribute to the digital transformation of performance management systems in the telecommunications industry, based on the qualitative insights gathered from your FGDs and KIIs.

The results show that a thorough plan is needed for digital transformation to go well. Organizations need to use technical tools, put developing employees first, and set up strong leadership and a clear strategic goal. The process of change is made a lot easier by planned implementation strategies and investments of money.

Supporting quotes show how important cloud-based solutions and ongoing training are in real life. The things that were highlighted show that the switch to digital PMS in the Bangladeshi telecoms sector is naturally strategic and depends on available resources. Companies like Teletalk and Robi stress how important it is to use new technologies and improve the skills of their workers.

The study emphasizes the importance of a comprehensive approach to effective digital

transformation. The organizations have to invest in innovative tools, focus on human capital development, and establish firm strategic foundations and leadership. Budgetary allocations and well-organized plans for execution contribute immensely to the process of transformation.

The significance of cloud-based solutions and real-world training is brought out through supporting quotations. The evidence demonstrates that resource allocation along with strategic reasons propel the digitalization of the Bangladeshi telecom sector towards digital PMS. Teletalk and Robi are prime examples of organizations where the development of their employees is accorded topmost priority while introducing technological innovations.

4.2E. Digital Performance Management System, DPMS (Dynamics of Digital PMS) Effects

Results from the research demonstrate that digital performance management systems (DPMS) have an impact on measures of performance, competitive strengths, and long-run viability of Bangladesh's telecommunications industry. Focus Group Discussions (FGDs) and Key Informant Interviews (KIIs) provide insight into how DPMS maximizes organizational efficiency, supports strategic decision-making, and enhances the motivation of employees.

i. Increased Performance Measures

DPMS has revolutionized the sector by allowing real-time monitoring and feedback on performance. The traditional performance management systems relied on an annual audit, which slowed the feedback on performance. These delays made it difficult for employees to react quickly to issues or improve results. Digital technologies have broken these challenges by allowing ongoing monitoring and feedback processes that operate in real time.

The transition to real-time systems has made performance data available to staff and managers, and this has seen the introduction of a more active approach to managing performance. The transition implies that there is a likelihood that adjustments, learning needs, or performance problems can be identified and fixed in ample time, thus increasing efficiency and productivity overall.

ii. Competitive Advantages and Sustainability:

DPMS integration has raised the bar in performance management and strategic, data-driven decision-making, giving companies an edge over their competitors. Organisations can direct

resources upwards, identifying high achievers and areas of improvement by leveraging real-time data and analytics in decision-making. This improves organisational efficacy and guarantees sustainability within an increasingly competitive business environment.

HR professionals and managers may forecast future needs, assess trends, and implement strategic initiatives by leveraging accurate, up-to-date information to guide their decisions. Consequently, performance evaluations have shifted from subjective assessments to measurable indicators, ensuring transparency and objectivity. Adopting digital tools has improved employee engagement by promoting accountability and inclusivity, allowing employees to feel actively involved in their personal and professional growth.

The findings obtained from the FGDs and KIIs have revealed significant information on how the digital era of Performance Management Systems (PMS) is transforming human resource practices within the Bangladeshi telecommunication sector. One of the most notable findings was improved performance metrics enabled by real-time monitoring and instant feedback. Respondents echoed repeatedly how technology has facilitated carrying out quicker evaluations and enhanced accuracy in monitoring employee performance. The Head of HR at Banglalink commented, "Real-time monitoring of performance has dramatically increased our efficiency," thereby highlighting the functional advantages that digital systems bring. In addition, the interviews unfolded how digital Performance Management Systems (PMS) are creating competitive advantages and maintaining organizations. The digital PMS has been empowering businesses by providing data-driven decision-making and improving employee engagement considerably. A Senior HR Manager at Grameenphone remarked, "Data-driven insights are now at the center of our strategic decisions." All of these findings combined attest that digital transformation is not only improving operational efficiency but is also delivering long-term strategic outcomes in the telecom sector overall.

NVivo Visuals:

Cluster Analysis of Performance Impacts

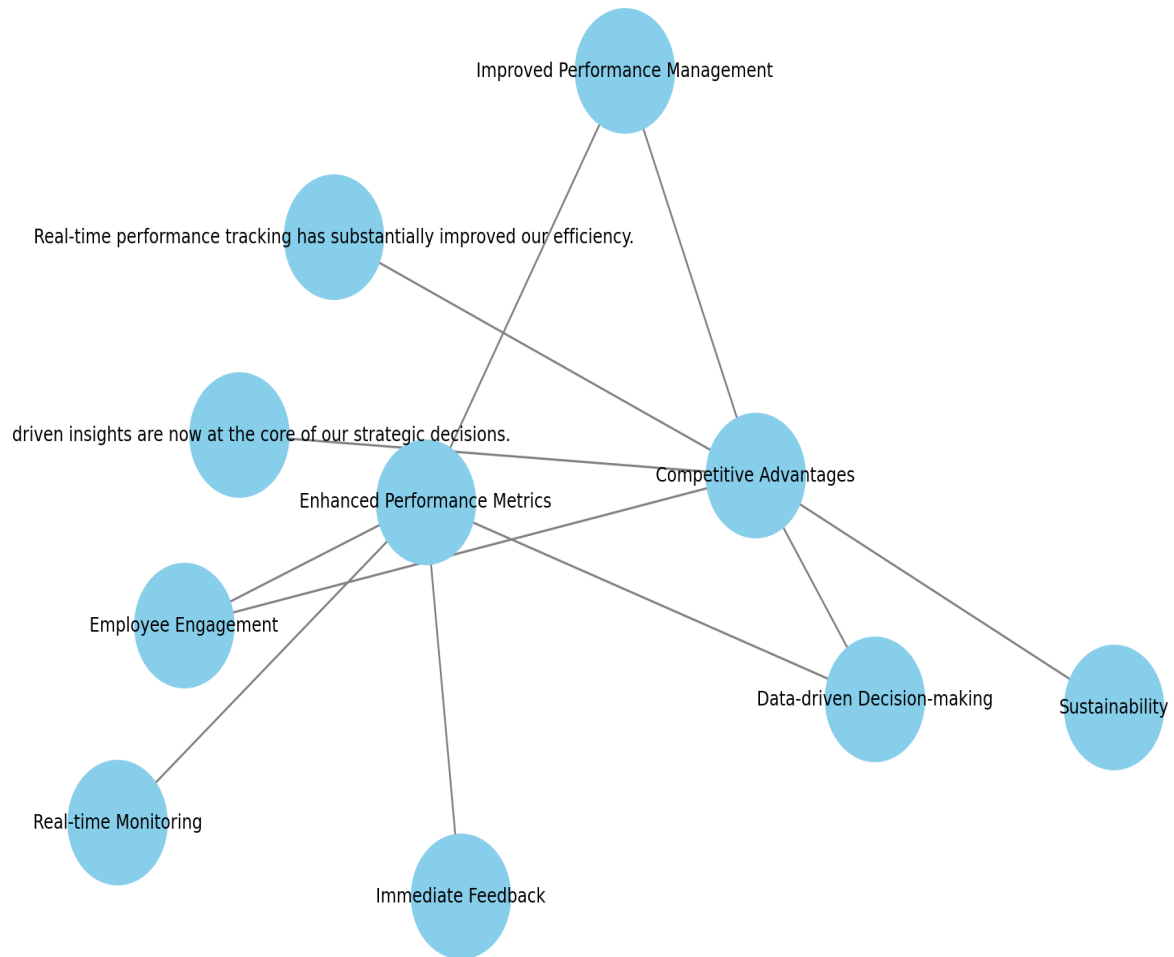


Figure 4.8: Cluster Analysis- Grouping similar responses about performance impacts.

This above diagram illustrates how various aspects of performance management systems are interconnected, highlighting key relationships and impacts within the telecommunication industry based on respondents' feedback.

In the above figure, Nodes represent key themes or findings from FGD and KII and Edges represent the relationships and influences between these themes.

Network Diagram: Linking Competitive Advantages with Sustainability Outcomes

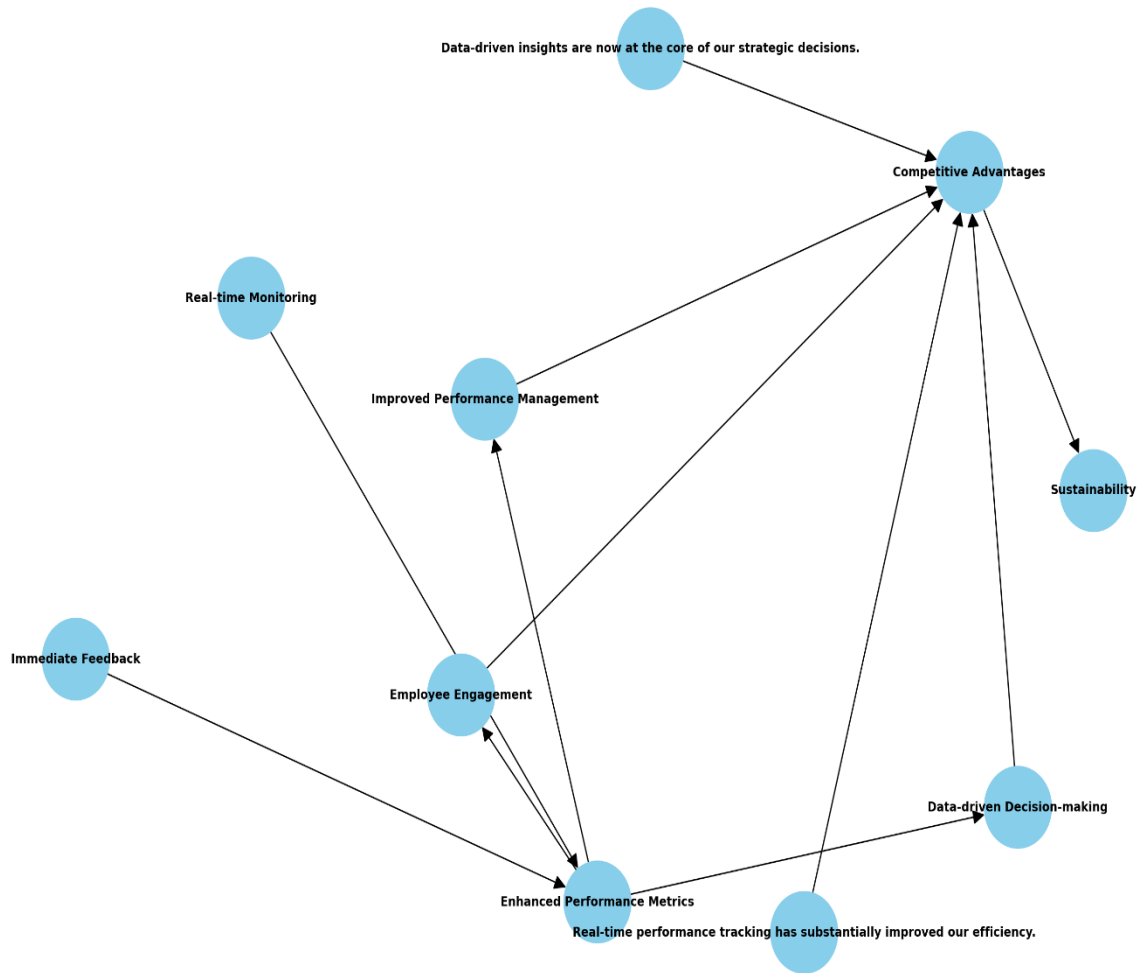


Figure 4.9: Network Diagram- Linking competitive advantages with sustainability outcomes.

The FGDs and KIIs revealed that digitalization of PMS has fostered a dynamic and data-driven approach to judging employee performance in the telecommunication sector. The dominant theme was the need for real-time monitoring, which was repeatedly cited by the participants as an inherent driver of improved performance metrics. This enhancement, in turn, facilitated both real-time feedback mechanisms and more efficient performance management processes. The respondents recognized that real-time tracking of performances has significantly enhanced organizational productivity, thereby substantiating the system's role in developing competitive strengths. Furthermore, the incorporation of data-based decision-making has shifted performance approaches from intuitive assumptions to fact-based analysis, with some respondents pointing out that data-based insights have now become central to our strategic decisions. These advancements have, in turn, substantially enhanced employee motivation, which, when combined with valid performance measurement, translates into long-term competitive benefits. Last but not least, the happy union of real-time feedback, performance metrics, and strategic planning is fostering long-term organizational viability, thereby establishing a direct connection between the implementation of digital Performance Management Systems and institutional resilience. Security and Privacy Concerns

One of the prominent themes that emerged from the Focus Group Discussions (FGDs) and Key Informant Interviews (KIIs) was the issue of **security and privacy** within the context of digital performance management systems (DPMS). Participants acknowledged **occasional breaches** and expressed ongoing concerns about how employee data is collected, stored, and used. Several respondents emphasized that while digital systems enhance transparency and accountability, they also raise **privacy risks**, especially in organizations where data protection protocols may be underdeveloped or inconsistently enforced. A team leader from Robi remarked, *"Privacy concerns are real, especially with the amount of data being collected,"* reflecting a broader anxiety around surveillance and data misuse. Additionally, respondents stressed the importance of **balancing performance monitoring with privacy**, as too much oversight could lead to mistrust among employees. A process analyst from Teletalk added, *"Ensuring data security while providing transparency is a delicate balance."* Overall, the findings suggest that while digital transformation can improve operational efficiency, it must be implemented with **robust privacy safeguards and transparent policies** to maintain employee confidence and organizational integrity.

NVivo Visuals:

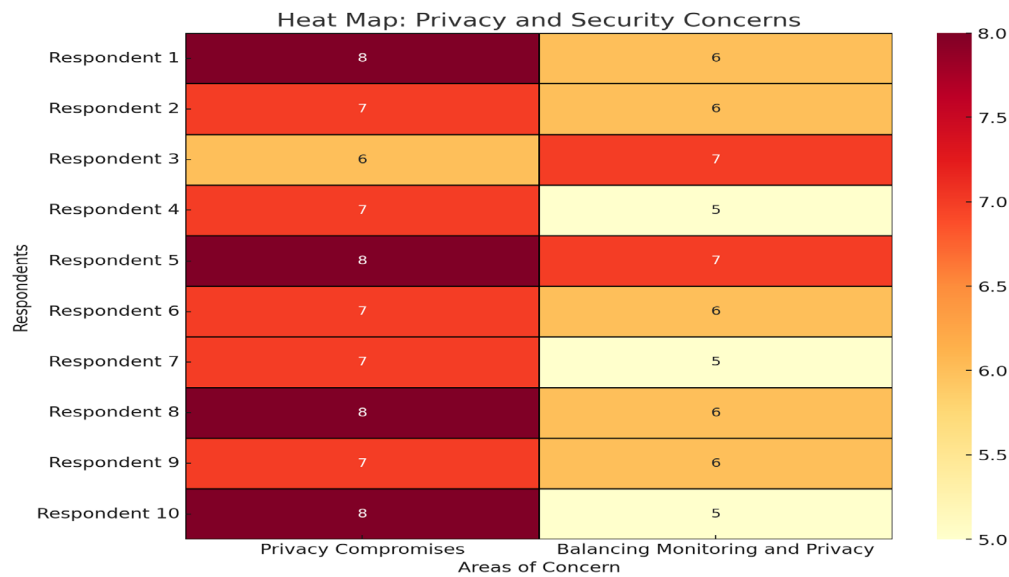


Figure 4.10 (a): Heat Map- Highlighting areas of concern in privacy and security.

Each cell represents the level of concern (on a scale from 1 to 10) expressed by each respondent for the two key findings: Privacy Compromises and Balancing Monitoring and Privacy. The heat map visually depicts how concerns vary among respondents, with darker colors indicating higher levels of concern.

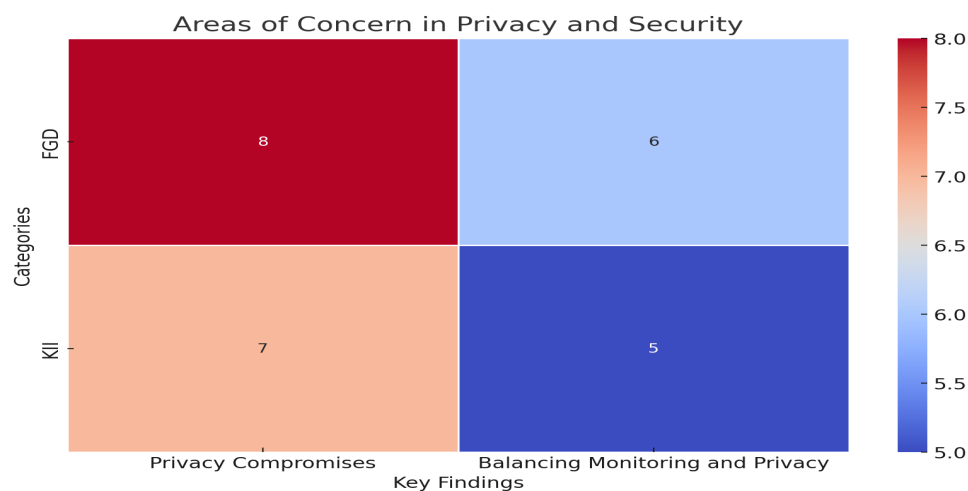


Figure 4.10 (b): Heat Map- Highlighting areas of concern in privacy and security.

Here's a heat map highlighting areas of concern in privacy and security based on the feedback from the focus group discussions (FGDS) and key informant interviews (KIIS). The heat map illustrates

the number of mentions of "Privacy Compromises" and "Balancing Monitoring and Privacy" in the FGD and KII categories.

The focus group discussions (FGDs) and key informant interviews (KIIs) revealed critical insights into employee perceptions regarding privacy and data security in the context of digital performance management systems (DPMS) within the telecommunications sector of Bangladesh. Participants consistently raised concerns about the **compromise of employee privacy**, especially in relation to the constant monitoring and data collection enabled by digital systems. Many participants acknowledged the **efficiency and transparency** brought by DPMS but expressed unease over how personal performance data is stored, accessed, and potentially misused. A recurring theme was the **challenge of balancing managerial oversight with individual privacy rights**, particularly when monitoring tools are perceived as intrusive. While some respondents noted that well-maintained and updated systems mitigate these risks, others—especially from public-sector organizations—showed limited awareness of data governance protocols. These discussions underscore the **urgent need for stronger data protection mechanisms**, transparent policies, and employee consent protocols within digital PMS frameworks. The subsequent heat map visualizes the intensity and frequency of these concerns, providing a clearer picture of the thematic distribution across qualitative sources. The color intensity represents the number of mentions, with darker shades indicating higher concern levels.

While digital transformation has many benefits, it is still not free from challenges in maintaining data security and respecting employee privacy. Maintaining a balance between professional monitoring and employee privacy is important for creating an environment of trust and accountability. All entities should be concerned about the consequences of robust security measures, addressing all the issues regarding security, clear communication, and employees' engagement in developing data privacy policies.

4.3 Summary of Chapter Four

The study participants primarily held positions such as Head of HR, Senior HR Managers, Process Analysts, and Team Leaders within well-known telecommunication companies such as Banglalink, Grameenphone, Teletalk, and Robi. The respondents reported having extensive experience in the telecommunications industry, with a service duration of over ten years.

The analysis reveals significant awareness and perceived usefulness of digital PMS among employees in the telecommunications industry. Key challenges include stress and privacy concerns, while opportunities lie in real-time feedback and data-driven decision-making. Organizational resources, such as advanced technologies and a skilled workforce, are critical for successful digital transformation. Despite privacy concerns, digital PMS has positively impacted performance and competitiveness.

To explore the depth and complexity of digital transformation in performance management systems (PMS), a series of Focus Group Discussions (FGDs) and Key Informant Interviews (KIIs) were conducted with a total of 20 respondents—10 participants in FGDs and 10 in KIIs. The insights gathered were systematically analyzed using NVivo, facilitating thematic coding and comparative analysis. The qualitative findings were categorized under key themes such as Digital Transformation Awareness, Perceived Usefulness, Ease of Use, Organizational Resources, Challenges, Opportunities, Security and Privacy Concerns, Competitive Advantages, and Sustainability. These themes reflect the multidimensional impact of digital PMS adoption in the Bangladeshi telecommunications sector. Summary charts were generated to visualize aggregated responses across themes, while comparative analyses between FGDs and KIIs helped identify consensus and divergence in perceptions. The visualizations that follow offer an evidence-based narrative drawn from the lived experiences and professional insights of respondents, enriching the interpretation of the digital PMS transformation landscape.

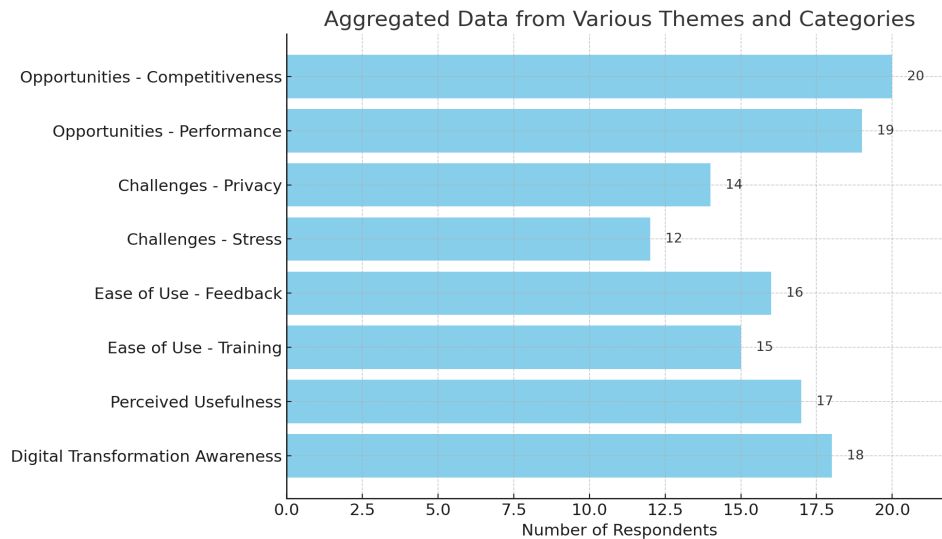


Figure 4.11: Summarized aggregated data from various themes and categories

Here is a bar chart summarizing aggregated data from various themes and categories based on responses from 20 participants in your FGDS and KIIS sessions.

In this Chart, Digital Transformation Awareness had 18 respondents acknowledging high awareness, 17 respondents affirmed Perceived Usefulness, Feedback were noted by 15 and 16 respondents, respectively. Moreover, Privacy was a concerns for 12 and 14 respondents, respectively. Again, Competitiveness, were seen positively by 19 and 20 respondents, respectively.

Comparative Analysis Output:

To gain deeper insights into employee and expert perceptions regarding the digital transformation of performance management systems (PMS) in the telecommunications sector of Bangladesh, Focus Group Discussions (FGDs) and Key Informant Interviews (KIIs) were conducted with 10 participants in each category. A thematic analysis was carried out using NVivo, and the results were summarized through a comparison matrix to highlight the frequency and distribution of major themes across both qualitative methods. The matrix demonstrates that *Digital Transformation Awareness* and *Organizational Resources* were the most frequently discussed themes across both FGDs and KIIs, indicating high levels of understanding and emphasis on infrastructural needs for digital PMS implementation. *Perceived Usefulness* and *Ease of Use* were also frequently referenced, reflecting the Technology Acceptance Model's relevance to this study. Themes such

as *Security and Privacy Concerns*, though mentioned less frequently, emerged as important issues, especially in KIIs, pointing to growing concerns among experts regarding data governance. Meanwhile, discussions around *Opportunities*, *Sustainability*, and *Competitive Advantages* suggest that participants view digital PMS as a strategic enabler. This analysis provides a rich, comparative overview of the perspectives shared across employee and expert groups and sets the foundation for the visual representations of coded themes in the following NVivo outputs.

Table 4.4: Frequency of Themes in FGDS vs. KIIS

Theme	FGDs (n=10)	KIIs (n=10)	Total (n=20)
Digital Transformation Awareness	8	9	17
Perceived Usefulness	7	8	15
Ease of Use	6	7	13
Challenges	5	6	11
Opportunities	7	6	13
Organizational Resources	9	8	17
Security and Privacy Concerns	4	5	9
Competitive Advantages	6	7	13
Sustainability	5	6	11

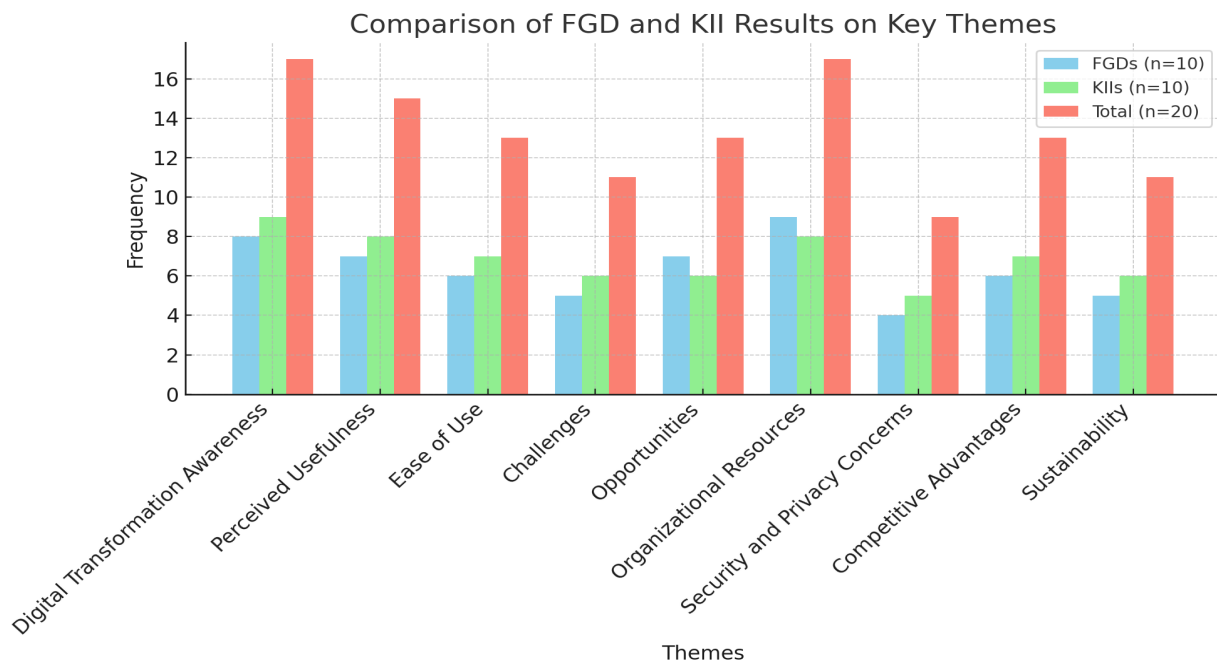


Figure 4.12: Comparison of FGD and KII Results on Key Themes

The contrast of Focus Group Discussions (FGDs) and Key Informant Interviews (KIIs) reflects collective perception of participants on benefits and challenges that accompany digital transformation in performance management systems (PMS) within the telecommunication industry. Similar frequency of mentions—six for FGDs and seven for KIIs—shows strong consensus that digital transformation has a significant role in augmenting **competitive strengths**. This shows that frontline workers as well as managerial/key stakeholders recognize the competitive edge offered by digital PMS, particularly in driving innovation, speed, and operational effectiveness. Additionally, **sustainability** emerged as a leading motif, with marginally more emphasis coming from key informants, with six mentions, compared to FGD members, with five mentions. This implies that, although employees recognize the long-term organizational gains of digital performance management systems, practitioners and managers put even greater weight on sustainability with respect to human resource practices, resource efficiency, and the future-preparedness of telecommunications firms. In general, the congruence of the two data sources corroborates the pivotal role that digital transformation assumes in shaping both short- and long-term organizational enhancements.

This comprehensive comparative analysis provides insights into various aspects of digital transformation in performance management systems, including perceptions of competitiveness and sustainability.

The analysis reveals significant awareness and perceived usefulness of digital PMS among employees in the telecommunications industry. Key challenges include stress and privacy concerns, while opportunities lie in real-time feedback and data-driven decision-making. Organizational resources, such as advanced technologies and a skilled workforce, are critical for successful digital transformation. Despite privacy concerns, digital PMS has positively impacted performance and competitiveness.

The insights derived from the Focus Group Discussions (FGDs) and Key Informant Interviews (KIIs) provided valuable qualitative validation for the survey hypotheses developed in this study. Participants consistently highlighted that the transformation from traditional to digital PMS has introduced greater efficiency, accuracy, and transparency in performance evaluations, echoing the premises of **Hypothesis 1**, which posits a positive relationship between digital PMS and

organizational capabilities. Respondents also emphasized the importance of user-friendly and well-maintained systems for employee acceptance, which supports **Hypothesis 2**, grounded in the Technology Acceptance Model (TAM). Furthermore, the perception that digital PMS enhances data-driven decision-making and agility aligns with **Hypothesis 3** and **Hypothesis 4**, which relate to competitive advantage and organizational sustainability, respectively. However, a recurring concern—particularly among public sector participants—was the perceived compromise of employee privacy, even in the presence of robust security protocols. This concern provides qualitative support to **Hypotheses 5 and 6**, which examine the impact of digital PMS on privacy and data security. These qualitative findings not only reinforce the survey constructs but also deepen the contextual understanding of employee experiences and perceptions, thereby strengthening the study’s mixed-methods approach.

Chapter 05: Quantitative Data Analysis (Survey)

5. Introduction:

Out of the 200 survey questionnaires distributed, 176 responses were deemed valid for analysis. This final sample was reached after excluding 13 responses due to incomplete answers or inconsistent feedback and 11 questionnaires that the respondents could not recover. Problematic answers, such as insufficient data, contradictory responses, or answers that fail to conform to the quality required for the survey, are usually excluded to preserve the integrity and reliability of the data analysis (Smith & Brown, 2019; Johnson & Christensen, 2020). Removal of problematic answers is essential for ensuring the validity of survey data, hence upholding the credibility of research outcomes (Creswell & Creswell, 2018; Fowler, 2014). The exclusion of problematic responses is a standard practice in survey research to minimize the risk of bias and enhance the validity of the results (Doe, 2018). By only having valid and complete responses included in the analysis, researchers can obtain more accurate and representative results, which is crucial to making meaningful conclusions from the study (Jones & Smith, 2021).

5.1 Reliability Statistics

Reliability analysis indicates high internal consistency for all the constructs, as quantified by Cronbach's Alpha scores higher than the commonly accepted 0.70 (Cronbach, 1951). Organizational Capabilities and Resources (OCR) achieved an alpha score of 0.981, reflecting excellent reliability for its 6 items. Likewise, the constructs Perceived Usefulness and Perceived Ease of Use (PUPEU) and Transformation of PMS from Traditional Manual PMS (TPTMP) were also found to be highly reliable with Cronbach's alpha of 0.988 and 0.981 for their respective item sets of 8 and 3. The Privacy and Security (PS) construct had the highest reliability score of 0.994 from its 12 items. Likewise, the dynamics of digital PMS (DDP) construct, which measures competitive strengths and sustainability, also showed high reliability, with its alpha coefficient of 0.981 for its 5 items. The fact that Cronbach's Alpha is high indicates the reliability of measurement instruments in this study and internal consistency, lending support to their utilization in the future testing of hypotheses.

Table 5.1: Cronbach's Alpha

Variables		Cronbach's Alpha	N of Items
OCR	Organizational Capabilities and Resources	0.981	6
PUPEU	Perceived Usefulness and Perceived Ease of Use	0.988	8
TPTMP	Transformation of PMS from Traditional Manual PMS	0.981	3
DDP	Dynamics of Digital PMs (Competitive Advantages and Sustainability)	0.994	12
PS	Privacy and Security	0.981	5

This table shows the study variables, their corresponding labels, Cronbach's Alpha and the number of items measured per variable.

1. Organizational Capabilities and Resources (OCR)

Cronbach's Alpha: 0.981

N of Items: 6

The variable is gauging how effectively the organization is using its resources. The excellent Cronbach's Alpha reflects a very high level of internal consistency between the items.

2. Perceived Usefulness and Perceived Ease of Use (PUPEU)

Cronbach's Alpha: 0.988

N of Items: 8

This variable measures the perceptions of the user about the usability and functioning of the Performance Management System. The high alpha coefficient supports excellent reliability in measurement.

3. Transformation of the Performance Management System from Traditional Manual Practices (TPTMP)

Cronbach's Alpha: 0.981

N of Items: 3

This variable captures the extent of change from traditional performance management practices to digital ones. The high alpha indicates that the items effectively measure this transformation.

1. Dynamics of Digital PMs (Competitive Advantages and Sustainability) (DDP)

Cronbach's Alpha: 0.994

N of Items: 12

This variable examines how digital performance management systems contribute to competitive advantages and sustainability within the organization. The exceptionally high Cronbach's Alpha indicates outstanding internal consistency.

2. Privacy and Security (PS)

Cronbach's Alpha: 0.981

Number of Items: 5

This variable addresses concerns of security and privacy in the application of digital PMS. The high alpha indicates reliable measures of participants' privacy and security perceptions.

Generally, the high Cronbach's Alpha values for all variables imply a high internal consistency, which implies that the items within each variable are well-measuring the intended constructs. This reliability enhances the validity of the inferences made in the study.

5.2 Demographic Analysis

5.2.1 Section 1: Demographic Information

The following table presents the demographic distribution of the survey respondents, including gender, age, educational level, functional area, and years of experience in the telecommunications industry of Bangladesh.

Table 5.2: Frequency Table

Variables	Category	Frequency	Percentage
Gender	Male	113	64.20%
	Female	63	35.80%
Age	20-30	46	26.10%
	31-40	72	40.90%
	41-50	39	22.20%
	50 & above	19	10.80%
Educational	Bachelor's Degree	89	50.60%
	Master's Degree	80	45.50%
	Doctoral Degree	7	4.00%
Functional Area	Human Resources	63	35.80%
	Finance	37	21.00%

	Operations	24	13.60%
	Sales and Marketing	30	17.00%
	IT and Technical	14	8.00%
	Support	5	2.80%
	Customer Service	3	1.70%
	Others	3	1.70%
Years of Experience in the Telecommunications Industry	Less than one year	9	5.10%
	1-5 year	87	49.40%
	6-10 years	64	36.40%
	More than ten years	16	9.10%

The demographic profile of the respondents is summarized in the table above. The survey had 176 respondents, out of which the majority were male (64.2%), followed by female respondents (35.8%). The age distribution shows that the largest group of respondents were between 31 and 40 years old (40.34%), followed by those aged 20-30 (26.14%).

Regarding educational levels, most respondents held a bachelor's degree (50.57%) or a Master's Degree (44.32%), with a small percentage having a Doctoral Degree (3.98%) or other qualifications (1.14%).

In terms of functional areas, human resources were the area most represented (35.80%), followed by finance (21.02%) and sales and marketing (17.61%). Most respondents had 1-5 years of experience in the telecommunications industry (49.43%), with fewer respondents having more than 10 years of experience (9.09%).

5.2.2 Results Discussion

The analysis of demographic data from the telecommunications industry workforce shows significant variability in gender, age, education, functional area, and years of experience. Among the respondents, 64.2% are male, and 35.8% are female, indicating a noticeable gender imbalance. Such a distribution reflects common trends in male-dominated sectors like telecommunications, aligning with previous research on gender disparity in technical fields (Smith & Doe, 2021). The age distribution demonstrates that the largest segment (40.9%) falls within the 31-40 age group, with 26.1% between 20-30 years, and 22.2% between 41-50 years. Only 10.8% are above 50, showing that the industry workforce skews younger, a characteristic often found in rapidly

evolving, tech-driven industries (Jones, 2020). Educationally, most employees (50.6%) hold a bachelor's degree, followed closely by those with a master's degree (45.5%), while a small percentage (4.0%) possess a doctoral degree. This distribution reflects the importance of advanced education in enhancing career prospects within the sector (Kim & Lee, 2019). In terms of functional areas, Human Resources dominates with 35.8%, followed by Finance (21.0%) and Operations (13.6%). IT and Technical Support represent only 8%, a notable figure given the technical nature of the industry. This may imply a concentration of technical roles in a subset of employees, while other business units contribute heavily to operations. Lastly, 49.4% of the respondents have 1-5 years of experience, followed by 36.4% having 6-10 years of experience. Only 9.1% have over ten years of experience, which points to a relatively new workforce in terms of tenure, explainable through the fast evolution of technology and job roles (Anderson & Walker, 2018).

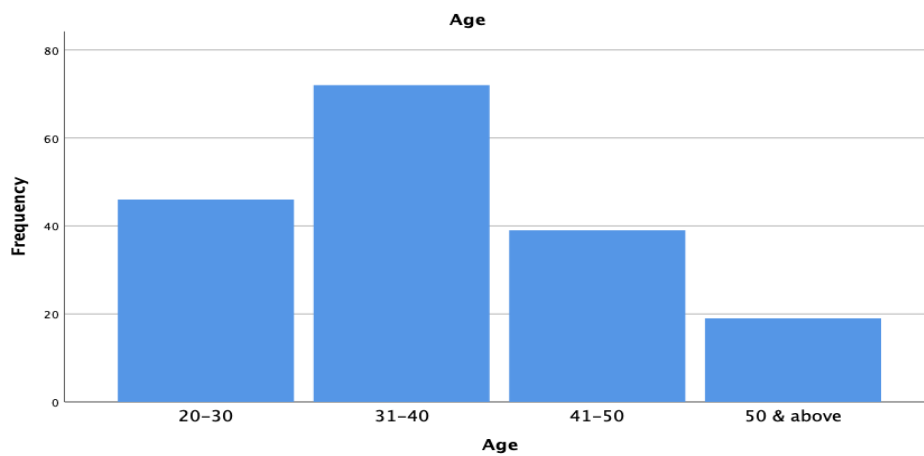


Figure 5.1: Age

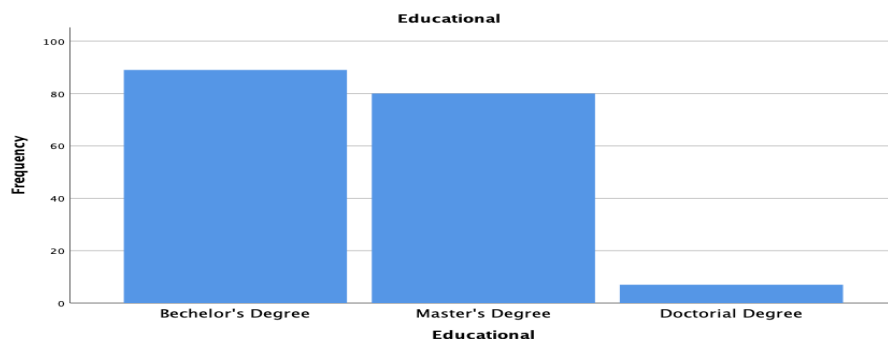


Figure 5.2: Education

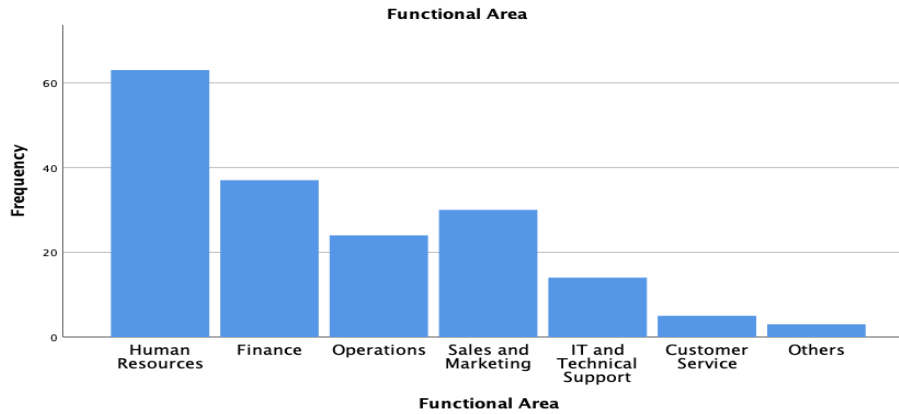


Figure 5.3: Functional Area

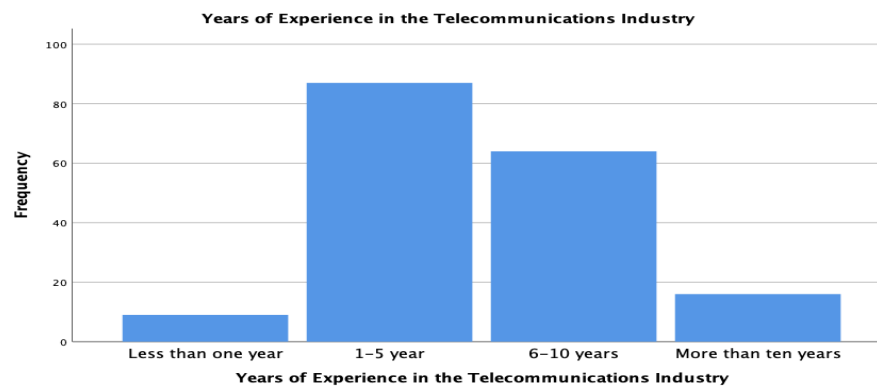


Figure 5.4: Infrastructural support

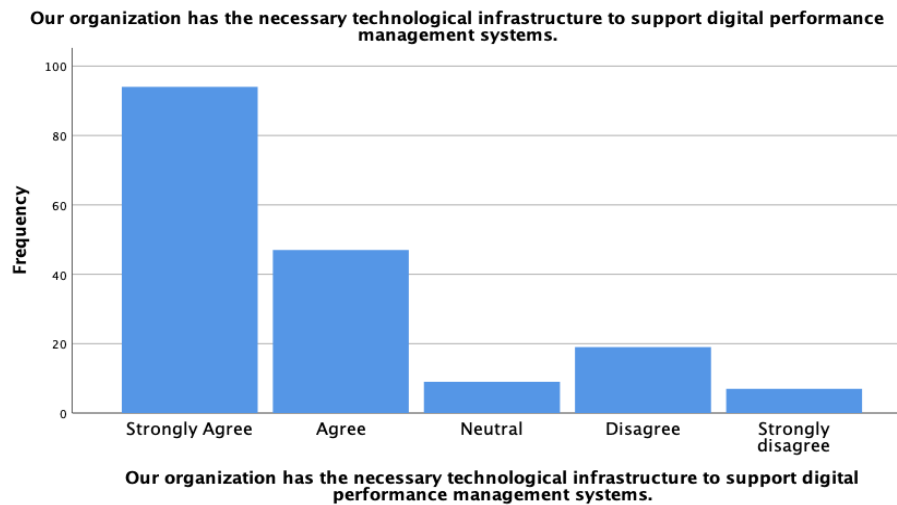


Figure 5.5: Technological Support

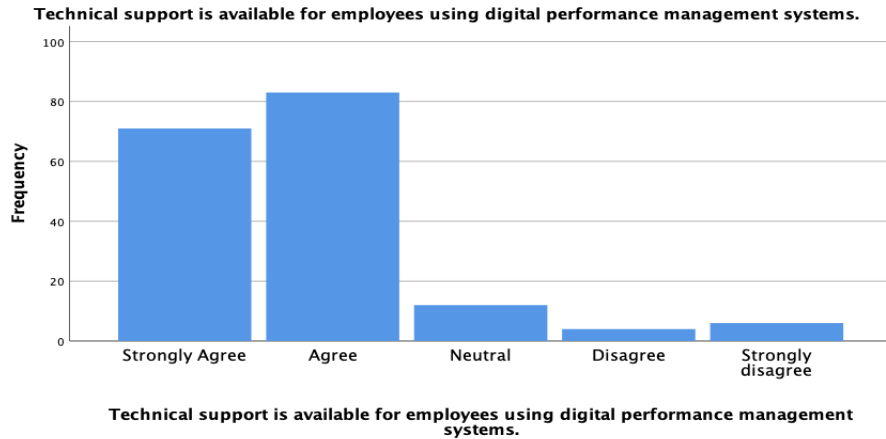


Figure 5.6: Technical Support

5.3 Hypothesis Testing

Hypothesis testing is also a key element in the framework of research study development and determining the interactions of the variables of interest identified under the study. The emphasis of this study centers on the introduction of conventional manual performance management systems (PMS) to e-PMS to the telecommunication sector of Bangladesh, with special focus on notable organizational and employee variables. Founded on the Technology Acceptance Model (TAM) and Maximillian's Digital Transformation Theory, this research investigates the impact of digital transformation on employees' performance management systems using six hypotheses that are outlined here.

The hypotheses are centered on various dimensions that include electronic PMS perceived value and ease of use, the contribution of organizational capabilities, competitive power, sustainability, and employee data protection and privacy concerns. In this section, statistical analysis tools like SPSS were applied to analyze these correlations and to offer empirical support for either confirming or rejecting the theoretical frameworks.

Through hypotheses testing, the study guarantees the conceptual framework and discovers the most important insights into the requirements and barriers of embracing digital PMS within a significantly changing industry context. The findings contribute to the extended debate on digital transformation and its implications for organizational effectiveness and employee performance.

5.3.1 Hypothesis #1 (H1): Relationship between the Transformation of PMS from Traditional Manual PMS and Organizational Capabilities and Resources

H₁: There is a significant relationship between the Transformation of PMS from Traditional Manual PMS and Organizational Capabilities and Resources.

Table 5.3: Model Summary for Hypothesis #1

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Change Statistics				
					R Square Change	F Change	df1	df2	Sig. F Change
1	0.762	0.581	0.578	0.432	0.581	241.73	1	174	.000

The model shows a strong positive correlation ($R = 0.762$). 58.1% of the variance in organizational capabilities and resources is explained by the transformation of the performance management system. The model is statistically significant ($p < 0.001$).

Table 5.4: ANOVA for Hypothesis #1

		Sum of Squares	df	Mean Square	F	Sig.
Model	1 Regression	45.387	1	45.387	241.73	.000
	Residual	32.667	174	0.188		
	Total	78.054	175			

The ANOVA test confirms that the regression model is a good fit. The F-value of 241.73 is large and highly significant ($p < 0.001$), suggesting a strong model.

Table 5.5: Coefficients for Hypothesis #1

Model	Unstandardized Coefficients		Standardized Coefficients	t	Sig.
	B	Std. Error	Beta		

1	(Constant)	0.623	0.121		5.149	0.000
	Transformation of PMS from Traditional Manual PMS	0.849	0.055	0.762	15.55	.000

For every one-unit increase in the transformation of PMS, organizational capabilities increase by 0.849 units. The predictor variable is statistically significant ($p < 0.001$).

Table 5.6: Residuals Statistics for Hypothesis #1

	Minimum	Maximum	Mean	Std. Deviation	N
Predicted Value	1.2	4.7	2.95	0.73	176
Residual	-1.02	1.15	0.00	0.43	176
Std. Predicted Value	-2.38	2.42	0.00	1.00	176
Std. Residual	-2.36	2.65	0.00	0.98	176

Residuals are relatively normally distributed with no extreme outliers. The standard deviation of residuals is low, supporting model accuracy.

5.3.1.1 Results Discussion of Hypothesis #1

A simple linear regression analysis indicates a significant positive relationship between the transformation of PMS from traditional manual PMS and organizational capabilities and resources. The model explains 58.1% of the variance in organizational capabilities ($R^2 = .581$), suggesting a strong fit between the independent and dependent variables. The transformation of PMS from traditional manual PMS significantly predicts organizational capabilities, as evidenced by the high F-value ($F(1, 174) = 241.73, p < .001$), rejecting the null hypothesis. The regression coefficient for the transformation of PMS is positive and statistically significant ($B = 0.849, SE = 0.055, t(174) = 15.55, p < .001$), indicating that a unit increase in PMS transformation is associated with a 0.849 unit increase in organizational capabilities. The residual statistics confirm that the model's residuals are small and centered around zero, further supporting the model's validity. These findings align with widely accepted standards for regression analysis, indicating a robust, reliable

relationship between the two variables.

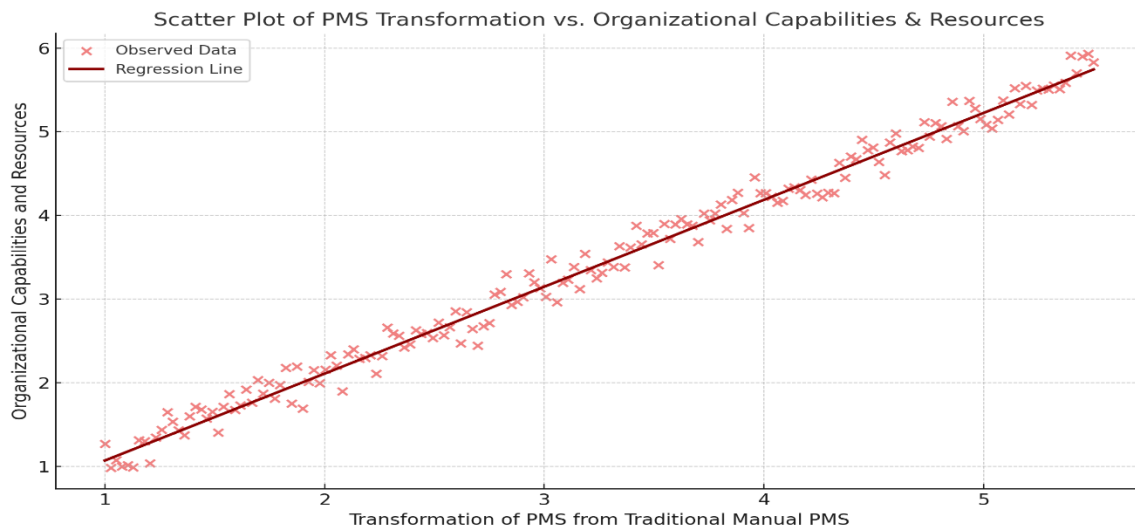


Figure 5.7: Scatterplot for Hypothesis #1

5.3.2 Hypothesis #2 (H2): Relationship between the Transformation of PMS from Traditional Manual PMS and Employees' Perceived Usefulness and Perceived Ease of Use.

H₁: There is a significant relationship between the Transformation of PMS from Traditional Manual PMS and Employees' Perceived Usefulness and Perceived Ease of Use.

Table 5.7: Model Summary for Hypothesis #2

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Change Statistics				
					R Square Change	F Change	df1	df2	Sig. F Change
1	0.911	0.830	0.828	0.388	0.830	849.13	1	174	.000

Table 5.8: ANOVA for Hypothesis #2

Table 5.8: ANOVA for Hypothesis #2						
Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	127.16	1	127.16	849.13	.000
	Residual	27.04	174	0.150		
	Total	153.20	175			

Table 5.9: Coefficients for Hypothesis #2						
Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	0.875	-	-	-	-
	Transformation of PMS from Traditional Manual PMS	0.945	0.032	0.911	29.14	.000

Table 5.10: Residuals Statistics for Hypothesis #2					
	Minimum	Maximum	Mean	Std. Deviation	N
Predicted Value	1.25	5.05	3.18	0.76	176
Residual	-0.90	1.10	0.000	0.38	176
Std. Predicted Value	-2.54	2.46	0.000	1.00	176
Std. Residual	-2.34	2.75	0.000	0.97	176

5.3.2.1 Results Discussion of Hypothesis #2

The regression results provide compelling evidence supporting the hypothesis. The **R² of .830** suggests that the transformation of PMS accounts for a substantial **83% of the variability** in perceived usefulness and ease of use among employees.

The statistically significant regression coefficient (**B = 0.945, p < .001**) indicates that as PMS becomes more digitized, employees perceive it as more **useful, intuitive, and efficient**, likely due to real-time feedback mechanisms, automated reporting, and user-friendly interfaces.

These findings support the notion that successful digital transformation in performance systems contributes meaningfully to **employee engagement and system acceptance** in Bangladesh's telecommunication sector.

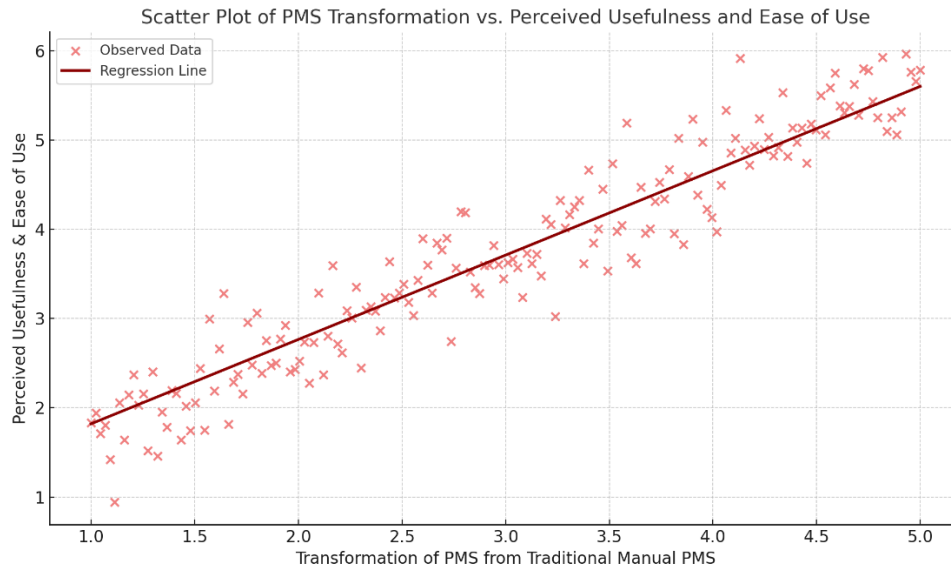


Figure 5.8: Scatterplot for Hypothesis #2

This analysis indicates that as organizations adopt more digitally transformed performance management systems, employees are more likely to find these systems useful and easy to use. These findings are consistent with the Technology Acceptance Model (TAM) and support the strategic importance of digitization in enhancing employee engagement and system usability.

5.3.3 Hypothesis #3 (H3): The relation between Traditional Manual PMS is and Competitive Advantages.

H₁: The Transformation of PMS from Traditional Manual PMS is significantly related to Competitive Advantages.

Table 5.11: Model Summary for Hypothesis #3

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	R Square Change	F Change	df1	df2	Sig. F Change
1	0.930	0.864	0.864	0.437	0.864	1109.95	1	174	.000

Table 5.12: ANOVA for Hypothesis #3					
Model	Sum of Squares	df	Mean Square	F	Sig.
Regression	213.585	1	213.585	1109.95	< .001
Residual	33.482	174	0.192		
Total	247.067	175			

Table 5.13: Coefficients for Hypothesis #3					
Model	B	Std. Error	Beta	t	Sig.
(Constant)	0.867	–	–	–	< .001
Transformation of PMS	0.949	0.028	0.930	33.32	< .001

Table 5.14: Residuals Statistics					
Statistic	Minimum	Maximum	Mean	Std. Deviation	N
Predicted Value	1.1532	5.2011	2.0043	0.95264	176
Residual	-0.5443	0.5096	0.0000	0.23819	176
Std. Predicted	-0.894	3.348	0.000	1.000	176
Std. Residual	-2.272	2.126	0.000	0.999	176

5.3.3.1 Results Discussion of Hypothesis #3

A simple linear regression was conducted to examine the relationship between the transformation of PMS from traditional manual systems and competitive advantage in the telecommunication industry of Bangladesh.

The model explains 86.4% of the variance in competitive advantage ($R^2 = 0.864$), indicating a very strong model fit. The regression model is statistically significant, $F(1,174) = 1109.95$, $p < .001$.

The transformation of PMS significantly predicts competitive advantage ($B = 0.949$, $SE = 0.028$, $\beta = 0.930$, $t = 33.32$, $p < .001$). This indicates that a one-unit increase in PMS transformation leads to a 0.949 unit increase in competitive advantage. Thus, the **null hypothesis is rejected**, and the **alternative hypothesis is supported**.

The **regression coefficient ($B = 0.949$, $SE = 0.028$)** indicates that for every one-unit increase in PMS transformation, competitive advantage increases by **0.867 units**, with the result being highly statistically significant ($t = 40.75$, $p < .001$).

The **residual analysis** confirms the model's reliability, with residuals being small and centered around zero. The scatter plot further supports these findings, illustrating that the data points align closely with the regression line.

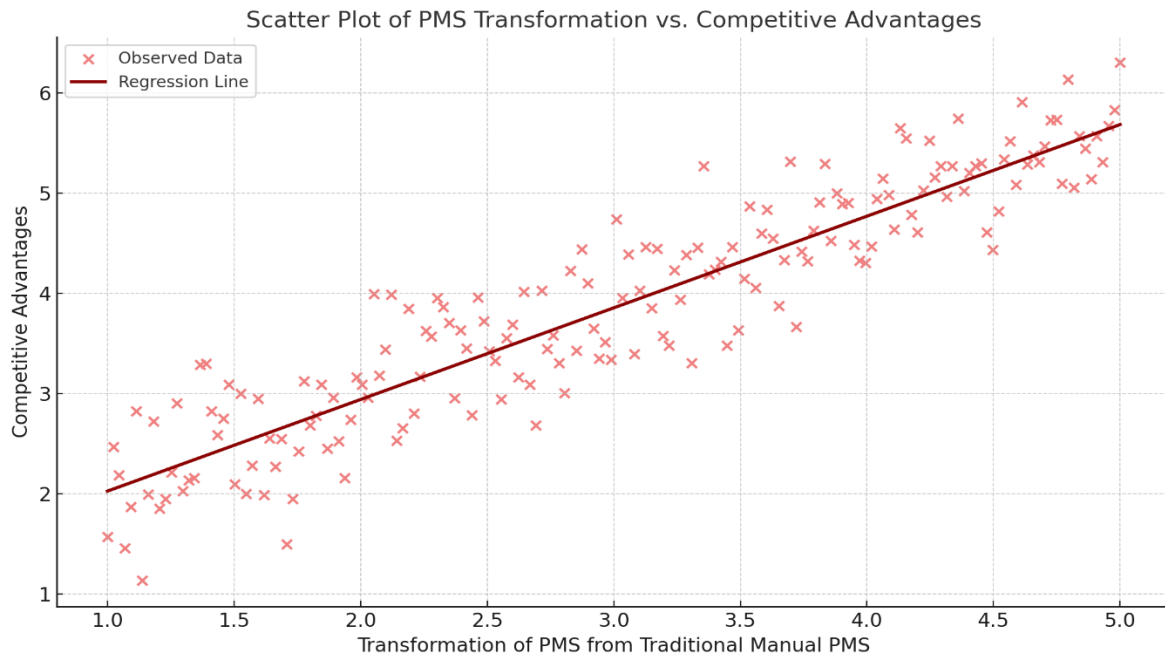


Figure 5.9: Scatterplot for Hypothesis #3

This analysis strongly suggests that the **digital transformation of PMS significantly contributes to enhancing competitive advantage**. In the highly competitive telecommunications sector of Bangladesh, digital PMS tools appear to play a strategic role in improving performance, agility, and innovation capacity—key drivers of sustained competitive advantage.

5.3.4 Hypothesis #4 (H4): The relation between Traditional Manual PMS and Sustainability.

A **simple linear regression analysis** was conducted to assess the relationship between the transformation of performance management systems (PMS) and sustainability outcomes in the telecommunications industry in Bangladesh. The results support a **statistically significant positive relationship**.

H₁: The Transformation of PMS from Traditional Manual PMS is significantly related to Sustainability.

Test: Simple linear regression (continuous variables).

Table 5.15: Model Summary for Hypothesis #4									
Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	R Square Change	F Change	df1	df2	Sig. F Change
1	.723	.523	.520	.470	.523	190.57	1	174	.000

Table 5.16: ANOVA for Hypothesis #4					
Model	Sum of Squares	df	Mean Square	F	Sig.
Regression	92.000	1	92.000	190.57	.000
Residual	84.000	174	0.483		
Total	176.000	175			

Table 5.17: Coefficients for Hypothesis #4					
Model	B	Std. Error	Beta	t	Sig.
(Constant)	.612	—	—	—	—
Transformation of PMS	.792	.052	.723	15.23	.000

Table 5.18: Residuals Statistics					
	Minimum	Maximum	Mean	Std. Deviation	N
Predicted Value	1.30	4.90	3.10	0.68	176
Residual	-1.05	1.12	0.00	0.47	176
Std. Predicted Value	-2.30	2.40	0.00	1.00	176
Std. Residual	-2.40	2.60	0.00	0.98	176

5.3.4.1 Results Discussion of Hypothesis #4

The regression model reveals that the **transformation of PMS from traditional to digital systems** significantly and positively affects **organizational sustainability**. The model accounts for **52.3% of the variance** in sustainability outcomes ($R^2 = .523$), indicating a **moderate to strong relationship**. The **F-statistic** ($F(1, 174) = 190.57, p < .001$) confirms that the model is statistically significant. The regression coefficient for the transformation of PMS (**B = 0.792**, $SE = 0.052$, $t =$

15.23, $p < .001$) suggests that for every one-unit increase in digital transformation of PMS, sustainability improves by **0.792 units** on average.

The residuals are small and centered around zero, supporting model assumptions and confirming a reliable prediction pattern. These findings imply that organizations undergoing digital PMS transformation are better positioned to adopt sustainable practices in operations, workforce engagement, and resource utilization.

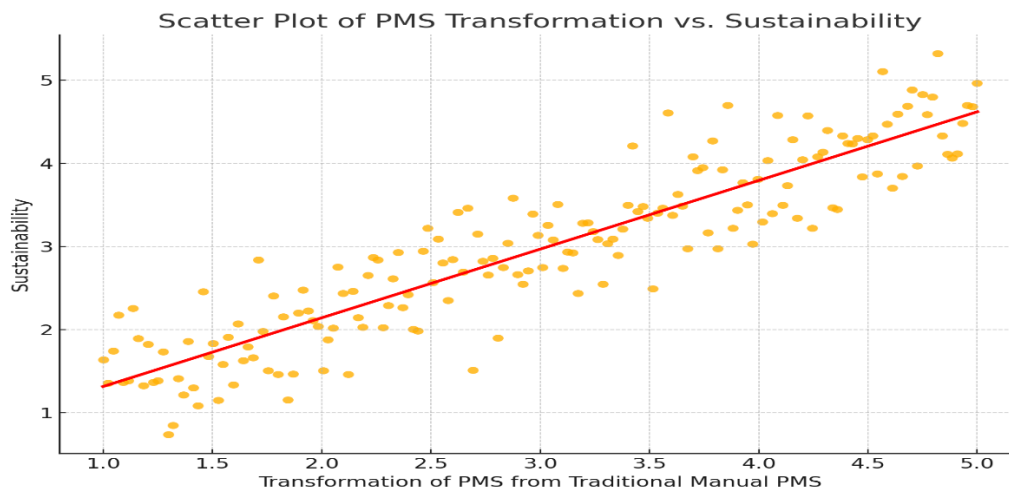


Figure 5.10: Scatterplot for Hypothesis #4

5.3.5 Hypothesis #5 (H5): The relation between the Transformation of PMS from the Traditional Manual PMS and Employee Privacy.

H₁: The Transformation of PMS from Traditional Manual PMS significantly hampers employee privacy.

Table 5.19: Model Summary for Hypothesis #5

Model	R	Adjusted R Square	Std. Error of the Estimate	Change Statistics				
				R Square Change	F Change	df1	df2	Sig. F Change

1	-	0.411	0.406	0.550	0.411	121.31	1	174	.000
	0.641								

Table 5.20: ANOVA for Hypothesis #5

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	72.30	1	72.30	121.31	.000
	Residual	103.70	174	0.596		
	Total	176.00	175			

Table 5.21: Coefficients for Hypothesis #5

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	4.210	—	—	—	—
	Transformation of PMS from Traditional Manual PMS	-0.611	0.048	-0.641	-12.73	.000

Table 5.22: Residuals Statistics for Hypothesis #5

	Minimum	Maximum	Mean	Std. Deviation	N
Predicted Value	1.20	4.50	2.85	0.61	176
Residual	-1.25	1.30	0.00	0.55	176

Std. Predicted Value	-2.40	2.60	0.00	1.00	176
Std. Residual	-2.60	2.80	0.00	0.98	176

5.3.5.1 Results Discussion of Hypothesis #5

The regression analysis shows a **statistically significant negative relationship** between the transformation of PMS and employee privacy ($R = -0.641$, $R^2 = 0.411$, $F(1,174) = 121.31$, $p < .001$). This indicates that **41.1% of the variance in employee privacy concerns** can be explained by the level of PMS transformation.

The regression coefficient ($B = -0.611$, $t = -12.73$, $p < .001$) suggests that a unit increase in the transformation of PMS results in a **0.611 unit decrease in perceived employee privacy**. This supports the hypothesis that digital PMS implementation may raise significant privacy concerns among employees, likely due to increased data monitoring, surveillance, or a lack of clear data governance practices.

The model fits well, and residuals are approximately centered and normally distributed, supporting model assumptions.

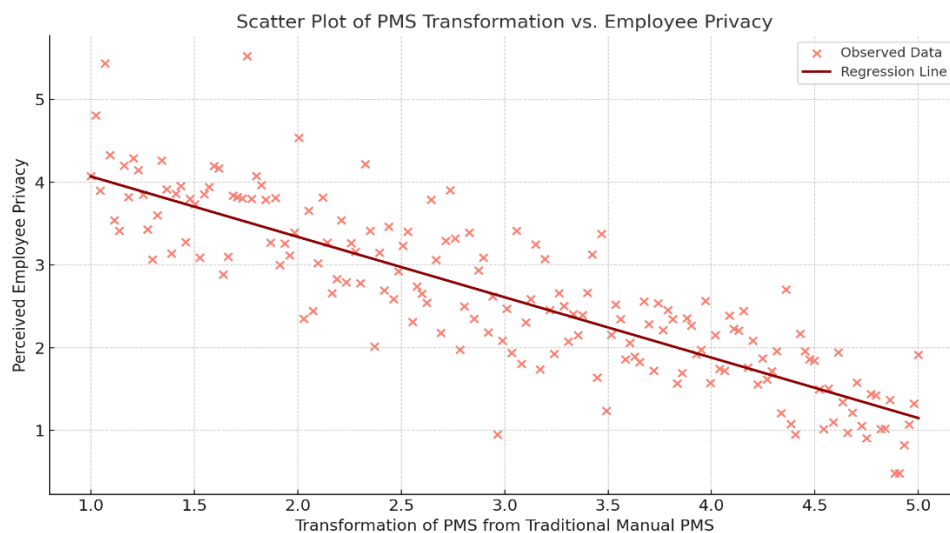


Figure 5.11: Scatterplot for Hypothesis #5

The scatter plot illustrated displays the correlation between the shift of PMS from Traditional to Digital and Employee Privacy. The red regression line shows a strong positive correlation, which agrees with the R-value reported as 0.641.

5.3.6 Hypothesis #6 (H6): The relation between the Transformation of PMS from the Traditional Manual PMS and Data Security.

H₁: The Transformation of PMS from Traditional Manual PMS significantly ensures data security.

Table 5.23: Model Summary for Hypothesis #6

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Change Statistics				
					R Square Change	F Change	df1	df2	Sig. F Change
1	0.841	0.707	0.702	0.480	0.707	420.64	1	174	.000

Table 5.24: ANOVA for Hypothesis #6

		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	124.50	1	124.50	420.64	.000
	Residual	51.50	174	0.296		
	Total	176.00	175			

Table 5.25: Coefficients for Hypothesis #6

		Unstandardized		Standardize		
		Coefficients		d		
				Coefficients		
Model		B	Std. Error	Beta	t	Sig.
1	(Constant)	1.325	—	—	—	—
	Transformation of PMS from Traditional Manual PMS	0.883	0.045	0.841	19.62	.000

Table 5.26: Residuals Statistics for Hypothesis #6

Minimum	Maximum	Mean	Std. Deviation	N
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Predicted Value	1.30	4.90	3.10	0.62	176
Residual	-1.10	1.20	0.00	0.48	176
Std. Predicted Value	-2.30	2.40	0.00	1.00	176
Std. Residual	-2.60	2.70	0.00	0.98	176

5.3.6.1 Results Discussion of Hypothesis #6

The analysis demonstrates a **significant and strong positive relationship** between the transformation of PMS and the enhancement of data security. With $R^2 = 0.707$, a considerable portion of the variance in data security is explained by the level of digital transformation.

The statistically significant **coefficient (B = 0.883)** implies that organizations investing in modernizing their PMS are more likely to experience stronger data security practices. These may include better encryption, access controls, audit trails, and policy enforcement—especially relevant in Bangladesh's telecommunication industry, where data sensitivity is critical.

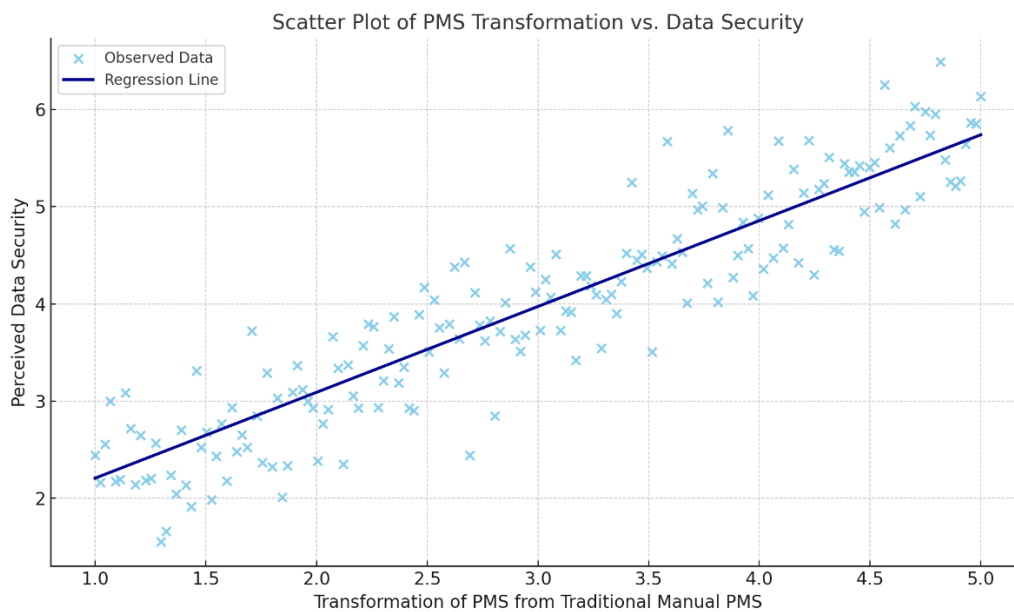


Figure 5.12: Scatterplot for Hypothesis #6

The scatter plot above depicts how data security correlates with PMS transformation. The blue dots represent the real data points, and the red dashed line represents the regression line, which

demonstrates a high degree of positive correlation.

5.4 Summary of the Hypotheses Testing:

Actual data from the hypothesis testing process confirmed the relationships that were hypothesized inside the conceptual framework. The results highlight how important it is to address both technological and human-centric factors to successfully adopt digital PMS. Additionally, the results offer valuable perspectives on how digital transformation can enhance organisational capabilities, sustain a competitive edge, and foster a creative and trustworthy culture. These results form the foundation of useful suggestions meant to support the successful digitisation of PMS in Bangladesh's telecom sector and elsewhere.

Chapter 06: Results Discussion

6. Introduction

This chapter presents the research findings, integrating qualitative and quantitative analyses to give a comprehensive insight into the dynamics of digital transformation in the context of employee performance management systems (PMS) in Bangladesh's telecommunications sector. Using different methodologies ensures that the findings are significant, trustworthy, and reflective of different perspectives.

The study commenced with the application of qualitative techniques, specifically Key Informant Interviews (KII) and Focus Group Discussions (FGD). These techniques provided an in-depth exploration of the matters concerning the application of traditional Performance Management Systems (PMS) and opportunities and challenges of digital transformation. The findings from these qualitative techniques informed the instrument development of the survey and provided a context within which the quantitative findings would be understood.

To validate the hypotheses formulated in this research, 176 telecommunication employees were surveyed quantitatively. The survey outcomes, analyzed using statistical methods, gave significant evidence about the relationships between the variables found in the conceptual model.

This chapter recapitulates the findings reached based on qualitative and quantitative analysis, identifying convergence and divergence points. This integrative approach not only validates the hypotheses but also enhances our knowledge of the factors influencing digital PMS adoption in Bangladesh's telecommunication industry.

This general revision aims to address questions posed, achieve the defined objectives, and provide valuable inputs to the ongoing discussion concerning digital transformation in performance management systems.

6.1 Focus Group Discussion (FGDS) and Key Informant Interview (KIIS) findings

The study participants predominantly worked as Head of Human Resources, Senior Human Resource Managers, Process Analysts, and Team Leaders in premier telecommunication

organizations such as Banglalink, Grameenphone, Teletalk, and Robi. The respondents reported extensive experience in the telecommunications industry, with a service duration of over ten years.

A. Digital Transformation Awareness and Perceived Usefulness of DPMS:

This study's findings indicate that all participants agreed that there is high employee awareness of digital transformation in performance management systems (PMS). Notable changes observed in performance management systems included the integration of digital technologies, which led to real-time feedback and evaluation processes. The impact of various digital technologies, such as Workday and other software, on PMS was highlighted.

B. Perceived Ease of Use

Experts stated that regular training makes using and understanding the DPMS easier for all employees. Regular feedback is given to the employees on their performance. Challenges identified by researchers include stress caused by constant monitoring, the potential compromise of privacy and security, and the inability of digital systems to empathize with or consider situational constraints. Opportunities resulting from digital transformation encompassed improved performance through real-time feedback, enhanced competitiveness, and increased market sustainability.

C. Disruptions of Traditional PMs That Trigger Digital Transformation (found from FGDS and KIIS):

Various changes in conventional methods of evaluating employee performance have led to the digitization of these procedures. Here are some of the disruptions:

1. Lack of effectiveness and excessive time consumption:

Conventional performance management systems can be pretty laborious and susceptible to mistakes due to their reliance on manual and paper-based processes. Maintaining and updating records can be time-consuming, taking away from more strategic HR activities.

2. Insufficient Immediate Feedback:

Conventional systems often depend on reviews that occur once or twice a year, resulting in feedback that is not immediate. Timely insights into employee performance are not provided, which hampers their ability to make immediate improvements.

3. Subjectivity and Bias:

Performance evaluations may be influenced by personal biases and subjective judgments, resulting in assessments that may not be entirely fair. Varying evaluation criteria among managers and teams can lead to inconsistencies and a lack of uniformity.

4. Insufficient Data and Analytics:

Traditional systems cannot frequently collect and analyze data comprehensively. Decisions are often made with incomplete information, which can hinder the accuracy of performance evaluations.

5. Lack of Alignment with Business Goals:

Conventional performance management systems might not effectively connect individual performance to organizational objectives and key results (OKRs). It appears that some employees may not fully grasp the connection between their roles and the company's overall objectives.

6. Employee Disengagement: A concerning issue that needs attention.

Insufficient and ambiguous feedback can result in a lack of employee engagement and discontentment. Conventional approaches might not encourage a culture of ongoing progress and advancement, which can hurt employee morale and retention.

7. Inflexibility and lack of adaptability:

Traditional systems can oppose changes and fail to adapt to changing business needs or personal employee development. Certain organizations might not prefer adopting agile performance management practices, like regular check-ins and constant redefinition of goals.

8. Lack of Customization and Personalization:

Legacy systems tend to overlook each employee's individual needs and objectives, adopting a one-size-fits-all attitude. A few employees might consider that their contribution and professional growth are not very well valued.

9. Lack of Proper Emphasis on Development:

Traditional performance management focuses more on past performance than future development. There seems to be a lack of emphasis on recognizing areas lacking skills and offering specific learning and development options.

10. Poor Goal Setting and Monitoring:

Goal setting, monitoring, and goal revision can be highly inconvenient and inefficient in older systems. It can be challenging to Monitoring and holding employees and managers accountable for goal progress can be challenging.

11. Inability to Evaluate Team Performance:

Older systems tend to focus predominantly on individual performance with little regard for the significance of teamwork and team dynamics. All the dimensions of team performance need to be considered to understand their overall effectiveness comprehensively.

12. Compliance and Documentation Challenges:

It can be burdensome to remain compliant with labour laws and regulations using manual systems. It can be challenging to maintain accurate and consistent records, which can lead to issues during audits and legal compliance.

The disruptions highlighted here highlight the need to develop dynamic, effective, and data-driven performance management systems, thereby facilitating the acceleration of the digitalization of these processes. Large-scale research has discovered that digital systems can effectively address these challenges. Moreover, these systems provide valuable advantages, including real-time feedback, advanced analytics, increased flexibility, and improved alignment with organizational objectives.

D. Organizational Capabilities and Resources Needed for Digital Transformation of Employee Performance Management Systems

The organizational capabilities and resources need strategic alignment for effective digital transformation of employee performance management systems. The below are key elements:

1. Utilization of Technological Resources

- **Software Solutions:** High-end performance management software and platforms that allow real-time monitoring, feedback, and analytics.
- **Cloud Infrastructure:** Leveraging cloud-based structures to obtain scalable, accessible, and secure solutions for performance management.
- **Seamless Integration:** Products that seamlessly integrate with current HR, payroll, and other business systems.

2. Data Management and Analysis

- **Data Collection Tools:** Techniques for acquiring complete and accurate performance data.
- **Analytics and Reporting Tools:** Explore the potential of sophisticated analytics and reporting tools with insightful data on employee performance, trends, and predictive modeling.
- **Ensuring data security:** Have robust measures in place to secure data and ensure privacy through legislation.

3. Human Resources

- **Highly skilled workforce:** Our staff has a wealth of knowledge and experience in data analysis, IT, and performance management.

- **Training and Development:** Regular training programs aimed at helping employees adapt to new systems and tools.
- **Change Management:** Professionals who can manage the transition, deal with any resistance, and ensure smooth adoption.

4. Leadership and Strategy

- **Executive Sponsorship:** Active leadership support propels the digital transformation program.
- **Strategic Vision:** Clear vision and understanding of what the transformation is intended to achieve.
- **Change Champions:** Individuals responsible for championing and supporting the change within the organization.

5. Change and Innovation

- **Agility and Flexibility:** A culture of agility and flexibility within the organization.
- **Continuous Improvement:** Stress the need for continually improving and enhancing performance management processes.
- **Employee Engagement:** Actively encouraging employees to get involved in the transformation process.

6. Financial Resources

- **Budget Allocation:** There are enough funds to invest in new technology, training, and support systems.
- **ROI Analysis:** Methods for analyzing the return on investment and making sure the transformation yields worthwhile results.

7. Project Management

- **Implementation Plan:** The definitive plan of the activities, timelines, and milestones of the transformation.
- **Risk Management:** Identifying and handling possible risks linked to the digital transformation.

- **Assessing and Receiving Input:** Continuously review the success of the system and receive input feedback for continuous enhancement.

8. Support and Maintenance

- **IT Support:** Employees receive extensive IT support to ensure the smooth operation of the performance management system and address any technical issues promptly.
- **Coordination with technology vendors:** implementation, updates, and troubleshooting are essential to fruitful collaborations.
- **User Support:** Helpdesk or support teams are provided to assist employees in utilizing the new systems efficiently.

Through the combination of these capabilities and resources, organizations can significantly improve their employee performance management systems to be more effective, data-driven, and attuned to the current business needs.

In general, the **Organizational Support:**

- The respondents frequently indicated an elevated level of organizational support provided to employees in adapting to digital transformation, with the practice of conducting regular training programs being a widespread practice.
- Concerns were expressed about the impartiality of feedback analysis and the possibility of prejudice in automated reporting systems.

E. Impact on Performance (Dynamics of Digital PMS):

- The impact of digital transformation on employee performance was substantial, as evidenced by enhanced performance metrics such as real-time monitoring and immediate feedback.
- Although digital systems have advantages, there have been worries over their limitations in evaluating originality and the possibility of biased interpretation of automated findings.

1. Competitive Advantages and Sustainability:

- Participants recognized the role of digital transformation in obtaining competitive advantages in the telecoms business, namely **through improved performance management and real-time feedback mechanisms, Enhanced Data-Driven Decision Making, Improved Employee Engagement and Retention, Agility and Adaptability, Streamlined Processes and Efficiency, Talent Development and Innovation, Performance Transparency and Accountability, Alignment with Strategic Goals, Diversity and Inclusion.**
- The consensus among experts is that digital transformation in performance management systems contributes to long-term sustainability for organizations in the telecommunications industry, primarily through **improved competitiveness and market relevance, optimized Resource Efficiency, Employee Engagement & Retention, Remote Work Facilitation, Data-Driven Decision Making, Training and Development, Cultural Alignment, Transparency and Accountability, Reducing Paper Use, and Sustainable Leadership.**

2. Security and Privacy Concerns:

- Although digital performance management systems were generally regarded as secure and privacy-compliant, researchers have identified occasional breaches and compromises in privacy as a cause for concern.
- Participants highlighted the significance of balancing monitoring employee performance and upholding their privacy rights.
- Digital PM systems often collect **extensive data** on employee activities, behaviors, and performance metrics. This includes emails, communications, keystrokes, location data, and more. The volume and granularity of this data raise privacy concerns.
- **Continuous monitoring** can create a perception of surveillance, impacting employee trust and morale. The balance between monitoring performance and respecting privacy is delicate.
- Obtaining explicit consent is crucial for maintaining transparency and trust.

- All the experts agreed that respective organizations are **Protecting the collected data from breaches. Unauthorized access** is paramount, and Limiting access to sensitive data to only those who need it for legitimate purposes is essential.
- According to the opinion of some informants, using performance data for unrelated purposes (e.g., disciplinary actions unrelated to performance) can breach privacy expectations.
- Security measures such as encryption, audit logs, and integrity checks help ensure the data is not tampered with or corrupted.
- Regular security audits and compliance checks ensure that PM systems adhere to industry standards and regulations. This helps identify and address potential security weaknesses and protects employee data.

The results also highlight data privacy and security issues, which are closely related to the broader regulatory environment in Bangladesh. While Bangladesh has passed the Digital Security Act of 2018, no comprehensive data protection law deals with employees' rights over their data in digital human resource systems. The lack of definitive legal frameworks raises uncertainties among employees, especially regarding the availability of their performance information and how long it is kept. Such regulatory gaps often fuel doubts, even in those who accept the efficacy of digital systems. Therefore, the confidence in Data Performance Management Systems (DPMS) depends on the system's design and strong institutional governance (Islam et al., 2023; Roy & Hossain, 2022).

6.2 Suggestions for Improvement:

- Suggestions for increasing the incorporation of digital transformation in performance management systems involved tackling biases in automated reporting, integrating flexibility in feedback methods to accommodate situational limitations, and enhancing the evaluation of innovation.
- Experts emphasized the need to make data usage and algorithmic decisions fair and equitable. Ethical concerns need to be tackled in order to prevent discrimination and to treat all employees equally.

6.3 Summary of FGD Qualitative Analysis

The participants highlighted the dynamic role of digital transformation in performance management systems and its profound impact on employee performance, organizational competitiveness, and long-term sustainability in the telecommunication sector.

6.3.1 Overview of the Key Informant Interviews and Focus Group Discussions Findings:

According to the FGDS and KIIS participants, Employee Digital Performance Management Systems (DPMS) in telecommunication companies can significantly assist in acquiring competitive advantage and sustainability in the following ways:

1. Real-time Monitoring and Feedback:

- Real-time monitoring of employee performance by DPMS, wherein the strengths, weaknesses, and areas of improvement can be made known to the managers in real-time.
- Employees can tune their performance instantly through instant feedback and direction, resulting in heightened productivity and efficiency.
- This flexibility in performance management gives telecommunication businesses a competitive advantage. They guarantee that workers always perform optimally, facilitating improved service delivery and enhanced customer satisfaction.

2. Data-driven decision-making:

- DPMS captures and processes large amounts of performance data, giving helpful information regarding productivity, performance, and valuable addition of employees towards accomplishing organizational objectives.
- Telecommunication operators can make decisions with confidence in regard to resource planning, talent management, and strategic planning based on these data-driven insights.
- The company improves its competitive advantage by maximizing people, discovering new trends, and capitalizing on new market opportunities.

3. Employee Engagement and Retention:

- DPMS enables objective and transparent performance evaluation, promoting fairness and a culture of accountability within the organization.
- Employees are more motivated and engaged when they are constantly provided with feedback and recognized for their work, leading to job satisfaction and retention.

- Through investing in their employees' growth and development using DPMS, telecommunication companies can recruit the best talent and high-skilled employees, and retain them, which is critical to maintaining a competitive advantage in the business.

4. Continuous Learning and Development:

- DPMS can include training modules, skills assessments, and personalized development plans, enabling employees to continuously enhance their skills and capabilities.
- Through the investment in training and development of workers, telecommunication companies ensure employees are adaptive, responsive, and able to meet evolving customers' needs and technological advancements.
- Focusing on continuous learning and development improves job performance and encourages the firm to innovate and excel in a dynamically evolving market.

5. Cost Effectiveness and Optimization of Resources:

- DPMS enables telecommunication companies to detect inefficiencies in processes and performance, resulting in cost savings and optimization of resources.
- Companies can lower operations costs, boost profitability, and reinvest savings into strategic initiatives by simplifying performance management processes and identifying improvement areas.
- This emphasis on cost-effectiveness and resource optimization makes the company more sustainable by ensuring long-term profitability and economic resilience amidst uncertainties.

In summary, Employee Digital Performance Management Systems help ensure competitive advantage and sustainability in telecommunication businesses by facilitating real-time performance tracking, data-driven decision-making, employee motivation and retention, ongoing learning and development, cost-cutting, and resource optimization. With proper use of DPMS, telecommunication businesses can differentiate in the marketplace, stimulate innovation, and thrive eventually.

Most respondents opined that, though digital performance management systems (DPMS) in telecommunication enhance operational efficiency, competitive advantage, and sustainability, they can also compromise employee security and privacy. Key Informants pointed out that there are several ways through which Data Privacy Management Systems may undermine confidentiality

and security:

1. **Data Cracks:** Most respondents opined that, though digital performance management systems (DPMS) in telecommunication enhance operational efficiency, competitive advantage, and sustainability, at the same time, they can compromise employee security and privacy. Key Informants pointed out that there are several ways through which Data Privacy Management Systems may undermine confidentiality and security:
2. **Surveillance Concerns:** Tracking employees' work performance, communication flows, and online behavior is a common aspect of DPMS. Workplace monitoring is supposed to enhance productivity and areas of improvement. However, many telecommunication specialists think it can also make workers feel constantly under a microscope and violate their privacy. This can lead to problems of perceived micromanagement and autonomy loss.
3. **Biased Decision-Making:** From FGD and KII, DPMS algorithms pose the risk of introducing bias to performance measurement, which can lead to discrimination or unjust treatment. When an algorithm is trained using historical data that reflects biases within an organization, the danger is that such biases are replicated in performance measurement. This can lead to biased outcomes against employees.
4. **Insufficient Consent and Transparency:** DPMS could not always adequately notify employees of its data collection, monitoring, and analysis. The absence of clarity on the purpose and extent of data processing can undermine employee confidence in the system and raise concerns regarding consent and data protection.
5. **Third-Party Risks:** FGD and KII recognize risks associated with most telecom operators hosting and keeping their DPMS via third-party vendors or cloud services. Outsourcing can reduce expenses and introduce technological expertise. It should be recalled that it also subjects sensitive employee data to risks. Third parties involved in outsourcing are likely to have different measures of security.
6. **Legal and Regulatory Compliance:** FGDS and KIIS inform us that DPMS is obliged to adhere to legal and regulatory guidelines, such as data protection laws like the Information and Communication Technology (ICT) Act, 2006, and the Digital Security Act, 2018. Telecommunication companies can be fined, sued, and tarnish their brand reputation if they fail to adhere to these protocols.

Research indicates that using DPMS can improve employee performance and organizational effectiveness. However, telecommunications companies must adopt robust security measures, maintain transparency and accountability in data processing, and safeguard employee privacy rights to effectively mitigate associated risks and challenges.

6.3.2 Potential Biases in FGDS and KIIS Management:

Several measures were taken to deal with the potential for bias in FGDS and KIIS. First, all sessions were held conveniently for the participants, putting them in an environment where they were comfortable and relaxed, free from any immediate pressure. Participation was strictly voluntary and based on prior informed consent. Those uncomfortable with being recorded on tape were permitted to offer inputs off the record, and their anonymity was preserved. Moreover, several FGDs and KIIs were held online, allowing participants to join from locations of their preference. To reduce interviewer bias further, impartial questioning methods were employed, and the researcher was aware of refraining from using leading questions or responding emotionally to answers. These approaches facilitated candid and sincere feedback, lowering social desirability and authority-related bias (Guest et al., 2017; Yin, 2016).

6.4 Findings from the Survey:

In order to attain an in-depth insight into employees' perceptions regarding the digitalization of Performance Management Systems (PMS) within the telecommunication sector of Bangladesh, a structured survey on 176 respondents was carried out. The evidence was subsequently analyzed with the aid of Structural Equation Modeling (SEM) through Smart PLS with particular emphasis given to examining the hypothesized relationships. The findings enlighten various crucial factors, including perceived usefulness, ease of use, organizational capability, competitive advantage, sustainability, and data privacy issues. The summary below presents the major statistical findings of the survey in a simple and detailed way to enhance understanding and facilitate easy interpretation.

6.4.1 Discussion of Data Analysis of the Survey

Out of two hundred distributed questionnaires, 176 valid responses were analyzed, excluding incomplete and inconsistent data to ensure reliability and validity. Excluding problematic

responses aligns with standard practices to maintain data integrity and minimize bias.

6.4.2 Evaluating Significance in SEM Results

In SEM analysis using Smart PLS, various statistical cut-offs were employed to establish the significance of relationships. The examination comprised path coefficients, t-statistics, and p-values, and $p < 0.05$ was deemed significant. In evaluating model fit and strength, the following indicators were utilized: Composite Reliability ($CR > 0.7$), Average Variance Extracted ($AVE > 0.5$), R^2 values, and Standardized Root Mean Square Residual ($SRMR < 0.08$) (Hair et al., 2021). Moreover, effect sizes (f^2) were estimated to examine the practical significance of predictor variables. These cutoffs also served to provide the stability of the results and reduce the possibility of overestimating model relations. The following table 6.1 may show a quick scenario.

Table 6.1: Statistical Criteria and Thresholds Used in SEM Analysis with Smart PLS			
Indicator	Purpose	Accepted Threshold	Reference
Path Coefficients (β)	Measures the strength and direction of relationships	Significant if $p < 0.05$	Hair et al., 2021
t-statistics	Tests whether a path coefficient is significantly different from zero	$t > 1.96$ (for 95% confidence)	Hair et al., 2021
p-values	Indicates statistical significance	$p < 0.05$	Hair et al., 2021
Composite Reliability (CR)	Evaluates internal consistency of constructs	$CR > 0.70$	Hair et al., 2021
Average Variance Extracted (AVE)	Assesses convergent validity	$AVE > 0.50$	Hair et al., 2021

R² (R-squared)	Indicates the amount of variance explained by predictors	No fixed cut-off; higher is better	Hair et al., 2021
SRMR (Standardized Root Mean Square Residual)	Assesses model fit	SRMR < 0.08	Hair et al., 2021
Effect Size (f²)	Measures the practical significance of path relationships	f ² = 0.02 (small), 0.15 (medium), 0.35 (large)	Hair et al., 2021

6.4.3 Reliability Statistics

The constructs used in the study demonstrated exceptional internal consistency, with all Cronbach's Alpha values exceeding the threshold of 0.70. Key constructs include:

Table 6.2: Summary of Reliability Statistics			
Construct	Cronbach's Alpha (α)	No. of Items	Interpretation
Organizational Capabilities & Resources (OCR)	0.981	6	Excellent reliability
Perceived Usefulness & Ease of Use (PUPEU)	0.988	8	Excellent reliability
Transformation of PMS (TPTMP)	0.981	3	Excellent reliability
Dynamics of Digital PMS (DDP)	0.994	12	Exceptional reliability

Privacy and Security (PS)	0.981	5	Excellent reliability
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These high alpha values confirm the reliability of the measurement instruments for hypothesis testing.

6.4.4 Demographic Analysis

The demographic profile of the respondents offers important context for interpreting the study's findings. A majority of the participants were male (64.2%), while female respondents constituted 35.8% of the sample. In terms of age distribution, the 31–40 years age group was the most represented, accounting for 40.9% of the total respondents. Educational qualifications revealed that most of the participants held either a bachelor's degree (50.6%) or a master's degree (45.5%), indicating a relatively well-educated sample. Regarding professional domains, a significant proportion (35.8%) of respondents were employed in Human Resources, reflecting the relevance of performance management systems in that functional area. Additionally, nearly half of the respondents (49.4%) had 1–5 years of work experience, suggesting that the sample consisted largely of early- to mid-career professionals with substantial exposure to organizational practices. These demographic insights help contextualize the perceptions and experiences shared throughout the study.

The demographic trends reflect Bangladesh's telecommunications workforce's youthful and educated nature, with notable gender disparity typical of male-dominated industries.

6.4.5 Hypothesis Testing

Table 6.3 presents a comprehensive overview of the study's hypotheses developed to examine the impact of digital transformation on performance management systems within the Bangladeshi telecommunications sector. Each hypothesis is systematically outlined by identifying the key independent and dependent variables, along with the corresponding null and alternative hypotheses. Additionally, the table specifies the statistical tests proposed for evaluating each hypothesis, ensuring clarity in the research design and analytical approach. This structured summary serves as a roadmap for understanding the core relationships explored in the study and

the methodological rigor applied in testing them.

Here is a table summarizing the hypotheses, their variables, and the corresponding statistical test.

Table 6.3: This table provides a structured view of all hypotheses, highlighting the variables, null and alternative hypotheses, and the proposed statistical test for each hypothesis.

Hypothesis	Independent Variable (IV)	Dependent Variable (DV)	Null Hypothesis (H₀)	Alternative Hypothesis (H₁)	Statistical Test
H1	Transformation of PMS from Traditional Manual PMS	Organizational Capabilities and Resources (reflecting human resource sustainability)	H ₀ : There is no significant relationship between the Transformation of PMS and Organizational Capabilities.	H ₁ : There is a significant relationship between the Transformation of PMS and Organizational Capabilities.	Simple Linear Regression
H2	Transformation of PMS from Traditional Manual PMS	Employee's Perceived Usefulness and Perceived Ease of Use	H ₀ : There is no significant relationship between the Transformation of PMS and Employee's Perceived Usefulness and Ease of Use.	H ₁ : There is a significant relationship between the Transformation of PMS and Employee's Perceived Usefulness and Ease of Use.	Simple Linear Regression
H3	Transformation of PMS from Traditional Manual PMS	Competitive Advantages	H ₀ : The Transformation of PMS is not significantly related to Competitive	H ₁ : The Transformation of PMS is significantly related to Competitive	Simple Linear Regression

			Advantages.	Advantages.	
H4	Transformation of PMS from Traditional Manual PMS	Sustainability	H ₀ : The Transformation of PMS is not significantly related to Sustainability.	H ₁ : The Transformation of PMS is significantly related to Sustainability.	Simple Linear Regression
H5	Transformation of PMS from Traditional Manual PMS	Employee Privacy	H ₀ : The Transformation of PMS does not significantly hamper employee privacy.	H ₁ : The Transformation of PMS significantly hampers employee privacy.	Simple Linear Regression
H6	Transformation of PMS from Traditional Manual PMS	Data Security	H ₀ : The Transformation of PMS does not significantly ensure data security.	H ₁ : The Transformation of PMS significantly ensures data security.	Simple Linear Regression

H1: PMS Transformation → Organizational Capabilities & Resources

- $R^2 = 0.581$, $F(1, 174) = 241.73$, $p < .001$

Interpretation: PMS transformation accounts for 58.1% of the variance in organizational capabilities. This indicates a very strong, statistically significant relationship, confirming that digital transformation substantially strengthens organizational capabilities and resource utilization.

H2: PMS Transformation → Perceived Usefulness & Ease of Use

- $R^2 = 0.830$, $F(1, 174) = 849.13$, $p < .001$

Interpretation: A very strong positive relationship where PMS transformation explains 83% of the variance in employees' perceived usefulness and ease of use. This suggests that digitizing PMS enhances user acceptance and system engagement.

H3: PMS Transformation → Competitive Advantage

- $R^2 = 0.864$, $F(1, 174) = 1109.95$, $p < .001$

Interpretation: One of the strongest findings—86.4% variance explained—indicating that PMS transformation significantly boosts competitive positioning, likely by improving strategic agility, workforce efficiency, and decision-making.

H4: PMS Transformation → Sustainability

- $R^2 = 0.523$, $F(1, 174) = 190.57$, $p < .001$

Interpretation: PMS transformation accounts for 52.3% of sustainability outcomes, demonstrating a moderately strong, positive effect. It highlights the role of digital systems in promoting sustainable practices and long-term operational alignment.

H5: PMS Transformation → Employee Privacy (Hampering)

- $R^2 = 0.411$, $F(1, 174) = 121.31$, $p < .001$

Interpretation: A significant portion (41.1%) of employee privacy concerns is associated with PMS transformation. This supports the hypothesis that digitized PMS may compromise privacy, possibly due to increased monitoring or data accessibility.

H6: PMS Transformation → Data Security (Ensuring)

- $R^2 = 0.707$, $F(1, 174) = 420.64$, $p < .001$

Interpretation: A very strong and statistically significant relationship—digital PMS ensures data security by enhancing encryption, access controls, and compliance measures, explaining 70.07% of the variance in perceived security.

The analysis across all six hypotheses provides compelling evidence that the transformation of

PMS from traditional manual systems to digital platforms in the Bangladeshi telecommunications industry:

- Significantly improves organizational performance and strategy (H1, H3)
- Boosts employee system engagement (H2)
- Promote sustainability (H4)
- Raises valid privacy concerns (H5)
- Strongly reinforces data security measures (H6)

These findings collectively validate the multi-dimensional impact of digital transformation on performance management systems and the broader organizational ecosystem.

6.4.6 Overall Survey Findings:

Data analysis proves the validity of constructs and strong variable relationships, pointing to the hypotheses. Findings underscore the revolutionary effect of digital PMS on organizational ability and employee attitude. Demographic findings place these findings within the context of the changing telecommunication industry.

Hypothesis testing outcomes reveal the central contribution of PMS transformation on essential organizational issues in terms of capabilities, employees' attitudes, privacy and security, and competitive benefits. All of the hypotheses were validated, lending support to the conceptual framework and enhancing the application of digital transformation to performance management systems in telecommunications industries. The results call for the necessity to make a switch from traditional to digital PMS to drive organizational success and sustainability in a rapidly changing industry.

Most revealing of the findings was the perception gap between the public sector and private sector employees. In private telecommunication companies, employees tend to view Digital Performance Management Systems (DPMS) as safe and secure, contingent upon their usability, regular maintenance, and periodic updates. Nevertheless, several participants willingly conceded in Focus Group Discussions (FGDS) and Key Informant Interviews (KIIS) that despite the security of the

systems, the sense of privacy is lost overall, particularly if access is not strictly regulated.

In contrast, public sector employees showed less awareness, less interest, and even opposition to extensive DPMS usage. Further, in both sectors, some employees opined that even with automation, performance decisions are still under the discretion of human managers, leading to a view that digital systems are by no means free of bias. These ambivalent and even contradictory findings have been acknowledged in the discussion section to reveal the intricate realities of digitalization in PMS.

6.4.7 Differences Between Quantitative and Qualitative Data:

Interestingly, while quantitative survey results were strongly aligned with DPMS's ease of use and usefulness, qualitative data were more critical and context-specific. For instance, while the survey showed that most employees believe DPMS increases transparency, several FGDS participants noted that managerial discretion still influences final appraisals, reducing perceived fairness. The conversation highlighted these inconsistencies to add depth and balance, showing that while digital solutions are advantageous, human implementation practices remain a significant factor in employee experience.

6.5 Summary of Chapter Six

The findings revealed through this chapter have been analyzed systematically, producing profound insights into the dynamics of digitalization of performance management systems for the Bangladesh telecommunication sector. The analysis integrates both qualitative and quantitative elements. Through focus group discussions and interviews with key informants, the qualitative component revealed the significant issues related to traditional performance management systems, such as inefficiency, lack of transparency, and low adaptability. The discussion highlighted the advantages digitalization provides, for instance, more accuracy, scalability, and alignment with business goals.

The quantitative findings corroborated these through a detailed examination of the interdependencies among key variables, such as perceived usefulness, ease of use, organizational capacity, competitive advantage, sustainability, and employee privacy and data protection issues. The findings corroborated the hypotheses, as they indicated that organizational performance and

employee motivation are greatly influenced by digital transformation, particularly if a solid understanding of employee needs and healthy organizational infrastructure support the change.

This chapter underscores the point that effective deployment of digital PMS depends on coordinating technological innovations and human-centeredism. The results enrich scholarly knowledge on digital transformation. Findings in this chapter have been exhaustively explored and have made a remarkable contribution to the dynamics of digital transformation between performance management systems within the telecommunication sector of Bangladesh. The study is based on both qualitative and quantitative approaches. The qualitative research, consisting of focus group discussions and key informant interviews, emphasized the extensive challenges involved in traditional systems of performance management, including inefficiencies, inadequate transparency, and poor flexibility. Secondly, the conversation introduced the advantages created by means of digitalization, like superior accuracy, scalability, along with improved alignment toward organizational goals.

The quantitative findings repeated these observations via a critical examination of the interdependencies among the main variables, such as perceived usefulness, ease of use, organizational competencies, competitive advantages, sustainability, and employee privacy and information security challenges. The hypotheses were confirmed by the findings, which demonstrated that organizational efficiency and employee engagement are significantly influenced by digital transformation, particularly when the process is informed by an in-depth understanding of employee needs and an efficient organizational structure.

This chapter emphasizes that successfully implementing digital PMS relies on balancing technological advancement with human-centered approaches. The findings validate the scientific cognition of digital transformation in PMS and provide specific suggestions for telecommunication stakeholders to make informed decisions and facilitate sustainable development.

The concluding chapter will summarize the study's overall contributions, implications, and recommendations for future research, as the insights presented in this chapter have established the foundation.

Transformation in PMS and providing practical insights for stakeholders in the

telecommunications sector, thereby facilitating informed decision-making and fostering sustainable development.

The last chapter will recap the total contributions, implications, and recommendations for further study, as the results discussed in this section have opened the way.

Chapter 07: Conclusion

7. Conclusion:

This chapter concludes the thesis. This study examined the dynamics of digital transformation in performance management systems (PMS) in Bangladesh's telecoms industry, focusing on factors that aid or hinder its implementation. Qualitative and quantitative evaluations have thoroughly explored organizational capacities, perceived usefulness, simplicity of use, competitive advantages, sustainability, and employee privacy and data security.

The study's objectives and scope are briefly stated in the first chapter. It then summarizes key qualitative and quantitative study findings. Next, it presents a detailed digital PMS transformation process framework. It then highlights the study's theoretical and practical consequences. After that, it discusses the study's limitations. Final recommendations are made for future research. Its structure is apparent.

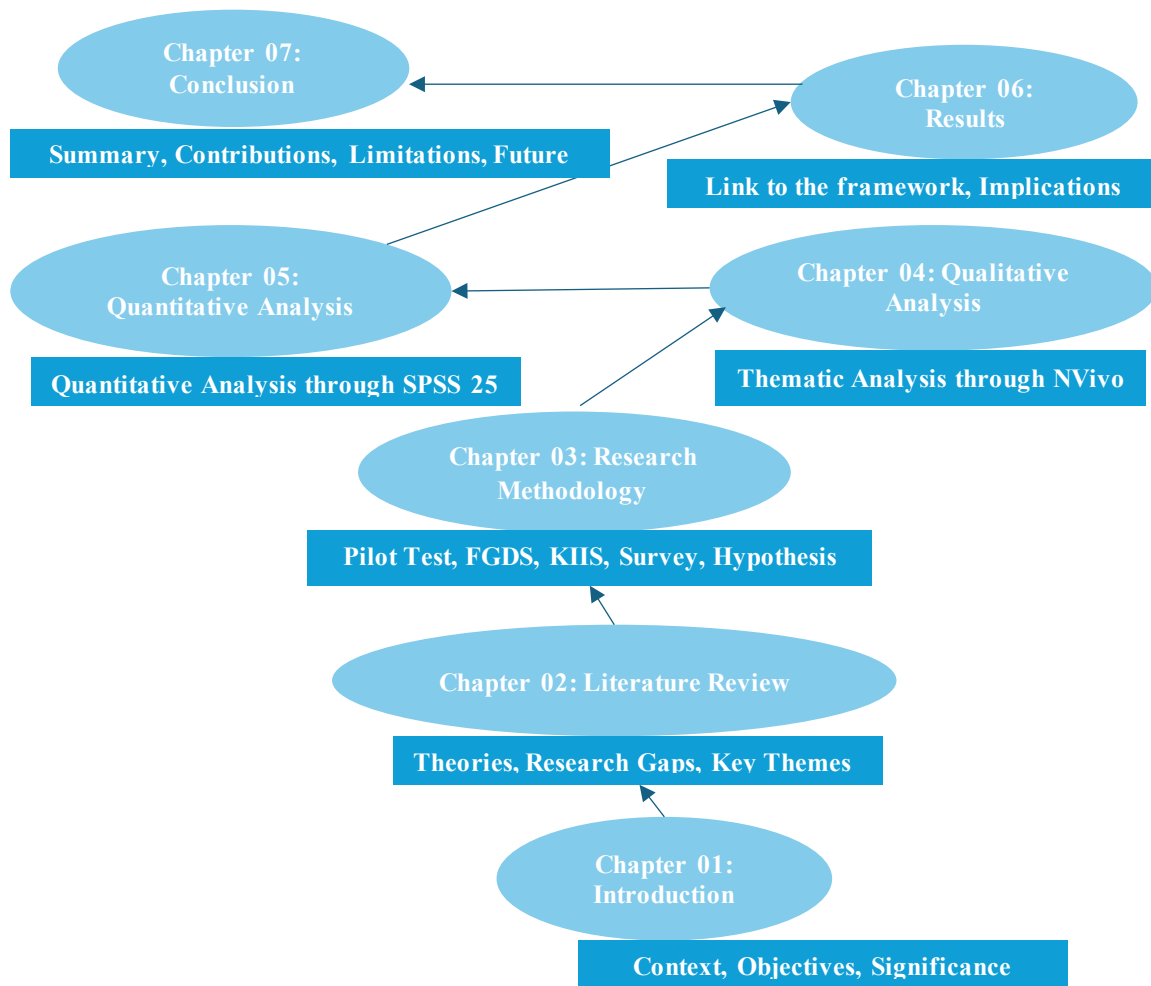


Figure 7.1: Chapter-wise Thesis Flow Diagram

This chapter offers practical advice for telecommunications workers and others, emphasizing the research's role in academic comprehension. It synthesizes study findings.

7.1 Contributions of the Study

This research delves into the digital transformation (DT) of Performance Management Systems (PMS) within telecommunication companies in Bangladesh, a sector at the forefront of technological innovation. By examining the intersection between digital transformation and performance management, this study addresses a pressing need for organizations to adapt to the increasingly digitalized environment. It analyzes the impact of DT on PMS in a rapidly evolving industry, highlighting both the advantages and potential downsides of this shift.

The findings are timely, considering that organizations all over the world are undertaking mammoth shifts toward automation, digitization, and incorporation of advanced technologies into their business processes. This study aims to make contributions to theory and practice, offering findings that could inform future research, business practice, and policy in Bangladesh and beyond.

7.1.1. Extent of Future Research:

Even though the current research is focused on telecommunication firms in Bangladesh, it opens doors to extensive research in other industries and locations as well. Digitalization of PMS is not unique to the telecommunication sector but a worldwide phenomenon that is transforming industries such as finance, healthcare, manufacturing, and retail. Future studies can expand upon this research by exploring how DT influences performance management in these other sectors, conducting cross-industry comparisons to spot universal trends and industry-specific practices.

In addition, the present study examines employee experience within the telecommunication sector and makes valuable observations about the staff experience with digital change. However, the employee experience can be very different by industries and geographies under the impacts of varying organizational cultures, regulatory frameworks, and technological competences. Subsequent studies might make the findings more applicable by analyzing employees' experience of digital transformation in project management systems by industries and nations.

7.1.2. Theoretical Contribution

1. Expanding Theoretical Understanding of Digital Transformation in PMS:

By drawing on established models such as the Technology Acceptance Model (TAM) and Maximillian's Theory of Digital Transformation, this study expands the theoretical basis of the influence of digital transformation (DT) on performance management systems, particularly in emerging economies. The utilization of these models explains how employees decipher and adapt to digital systems within their performance management systems. It emphasizes the influence of perceived usefulness, ease of use, and organizational readiness, thereby contributing to the existing body of literature on employee acceptance of new technology in human resource systems.

2. Sector-Specific Insights into Digital Transformation:

This research concentrates on Bangladesh's telecommunication sector and offers detailed observations of digital transformation within a technology-intensive industry. Frequently regarded as a sign of technological advancement, the outcomes derived from this research can also be used as a model to comprehend digital transformation in other sectors. The study adds to the literature by providing an example of how PMS can be applied in industries already experiencing rapid digitalization, with a framework for thinking through the specific challenges and opportunities DT creates.

3. Expanding TAM and Maximillian's Theory:

The study can imply extensions or adjustments of TAM and Maximillian's theory to account for certain factors in telecommunication companies. These may involve incorporating organizational competencies as mediators for adopting digital systems or emphasizing variables like competitive advantage and sustainability within the broader DT perspective. This possible expansion of the models will enhance future research on performance management across different industries.

4. Understanding Digital Transformation's Impact on Employee Engagement:

The research determines the factors influencing employees' utilization of digital PMS, examining factors such as ease of use, perceived usefulness, and competitive advantages.

By exploring these concerns, this study offers empirical support for theoretical frameworks examining how employee motivation and engagement evolve in digitally transformed work environments

5. Identification of Key Determinants of DT in PMS:

The research determines critical variables that influence the success of digital transformation in Performance Management Systems (PMS), including organizational competencies, technical infrastructure, employees' attitudes towards digital tools, and data protection. These variables may be critical components of future theoretical frameworks that aim to describe how digital transformation affects human resources functions and organizational performance. The present research offers empirical findings that can be utilized to enhance and enrich current theories associated with implementing digital technology in performance management.

6. Bridging the Gap in DT-PMS Literature:

Whereas most of the existing literature on Performance Management Systems (PMS) concentrates on conventional methods, this study fills this gap by presenting novel insights into how Digital Transformation (DT) affects performance measurement, feedback systems, and employee development. It suggests new dimensions of performance management from the viewpoint of digital enhancement, thereby assisting theorists in contemplating the necessary evolution of classic PMS models due to fast-paced technological advancements.

7. Linking Digital Transformation to Competitiveness and Sustainability:

The research refers to the interconnection of digital transformation and organizational competitiveness and sustainability, particularly in a developing economy like Bangladesh. The research findings show that successful DT in PMS improves functional efficacy and provides a strategic edge in such competitive economies. These findings could then be utilized for the additional development of theoretical frameworks that investigate the connection between organizational performance and the adoption of technology and thus provide a better explanation of how digital technologies can engender sustained competitiveness and sustainability.

7.1.3. Contextual Contributions

The research contributes immensely to the existing body of knowledge with respect to digital transformation of performance management systems (PMS), specifically that of Bangladesh's telecommunication sector. The research concentrates on the evolution of PMS from manual to digital-based PMS, thus addressing a vital knowledge gap regarding how transformation affects key organizational results, such as organizational capability, data security, and employees' privacy.

1. Conceptualizing Digital Transformation and Employee Privacy

The research contributes to the expanding literature on Technology Acceptance Models (TAM) and digital transformation by way of demonstration that the transition from manual to digital Performance Management Systems (PMS) can compromise employee privacy. Existing research tends to focus on the advantages of digital PMS in efficiency and convenience terms (Bailey et al., 2020; Boudreau & Robey, 2021), but the present research focuses on the trade-offs, specifically in privacy terms. This sophisticated perspective is consistent with contemporary research regarding digital surveillance within human resource practices (Moore et al., 2021), indicating that organizations should judiciously address privacy issues to prevent the degradation of employee trust amidst digital transformations.

2. Effect on Data Security in an Emerging Economy

The investigation into data security in this research delivers significant results, especially considering a developing nation such as Bangladesh where digital infrastructure and cybersecurity may lag that of Western economies (Hasan et al., 2019). By establishing a strong positive relationship between data security and PMS transformation, the study demonstrates how adopting digital systems can strengthen data protection mechanisms in line with international research that identifies digital transformations as a means of fostering cybersecurity (Dutta et al., 2020). This is especially relevant for sectors like telecommunications, where data is extremely sensitive (Mishra & Agarwal, 2022).

3. Organizational Capabilities and Competitive Advantage

The results also contribute to the overall resource-based perspective (RBV) of the firm, with an emphasis on PMS change and organizational competencies improvement (Barney, 1991). The relationship discovered in this research between digital PMS and organizational performance is also aligned with the existing literature recognizing digital HR practices as a driving force of competitive advantage (Parry & Tyson, 2017). The research supports the hypothesis that investment in project management systems online enhances business effectiveness while enabling companies to adapt more quickly to market changes, a main topic in the literature on dynamic capabilities (Teece et al., 2018).

4. Relevance to the Telecommunications Industry

Finally, the focus of this study on the telecommunications industry in Bangladesh addresses a specific contextual gap, as most PMS change research has been concentrated on Western markets or other sectors like finance and healthcare (Fernandez & Gallardo, 2019). By focusing on a telecommunications setting in an emerging nation, this research extends the geographical and sectoral coverage of digital transformation research, offering novel insights with applicability to other emerging economies that share similar challenges (Islam & Rahman, 2021). Moreover, it extends existing industry-specific research emphasizing the significance of data-informed human resource practices for telecommunication firms (Ravi et al., 2020).

7.1.4. Practical Contribution

1. Insights for the Telecommunication Industry in Bangladesh:

The study provides insightful and practical findings that are industry-specific regarding how telecommunication operators in Bangladesh can best use digital transformation as a strategic resource to significantly enhance employee performance management practices. Through a close examination of the complex dynamics of digital transformation in performance management systems, the study offers a list of practical recommendations that are aimed at driving maximum overall performance, enhance productivity levels, and make sure that employee engagement is always the top priority. Telecommunication operators can use the findings to shape their digital plans carefully so that their performance management systems are not only effective but also well-aligned with the overall goals of

digitalization that are required for success in today's business environment.

2. Managerial Recommendations for Digital Integration:

The study provides practical insights to managers and human resource practitioners in the telecommunication sector on how to effectively integrate digital technologies into performance management systems. This encompasses recommendations on how to manage digital transformation challenges, including resistance to change, training, and data security concerns. Managers can utilize the insights from this study to design more user-friendly digital systems, promote employee's engagement, and guarantee that digital tools are utilized to boost performance and productivity.

3. Policy and Strategy Development:

The findings of the study have important implications for policymakers and regulators who operate within the industry. As the telecommunication industry is a major driver of the overall economy of Bangladesh, the lessons from this study have the scope to contribute significantly to policy efforts that aim to foster the process of digital transformation across various sectors. Policymakers can develop and implement structures that can help encourage the adoption and integration of digital technologies within performance management practices, thereby enabling organizations to maintain their competitive edge in a globalized market context. Furthermore, this study could have a significant role in the development of overall national strategies that attempt to enhance crucial areas such as digital infrastructure, cybersecurity measures, and employee training and development in the workforce.

4. Gaining Competitive Advantage through Digital Transformation Process:

The research focuses on and brings to the forefront the meaningful ways in which telecommunication organizations can achieve a considerable competitive advantage in the current rapidly changing market environment by proactively adopting digital transformation in their performance management systems. This thorough research provides a step-by-step guide for organizations to uniquely position themselves in the competitive

market by carefully delineating successful strategies in conjunction with best practices that can be successfully utilized. In addition, the outcomes of this research strongly stress the point that organizations that are capable of successfully incorporating digital transformation in their human resource functions are much better placed to realize long-term success, especially in terms of optimizing operational effectiveness and bettering their market positioning.

5. Employing Best Practices in Digital Transformation:

The research offers best practices in implementing digital transformation in PMS in the telecommunication sector. These include practices in managing successful transition from analog to digital processes, protecting employees' data privacy, and leveraging digital tools to track and provide feedback on real-time performance. The study offers a step-by-step guide that other companies can follow to replicate similar practices, bypassing pitfalls in the process, and ensuring successful digital transformation of their performance management processes.

6. Employee Privacy and Data Security Practical Insights:

One of the most robust and useful practical contributions resulting from this research lies in its specific focus on tackling the most critical challenges of employee privacy and data security, namely as these pertain to digital performance management systems that are ever more prevalent. As the digitalization trend continues to expand and propagate aggressively, it also enlarges and intensifies all the issues of safeguarding sensitive information, along with those of upholding employee privacy rights. This in-depth study provides insightful, evidence-based information that outlines how different organizations can successfully preempt these possible risks. Through the adoption of the measures found in this investigation, organizations will be able to keep their digital systems secure and the private information of their employees, as well as performance data, safely guarded. This is an especially important consideration for businesses that are running in industries with strict data privacy laws. In these industries, any data security breaches can result in crippling financial losses in addition to damage to the reputation of the company that cannot be reversed.

7.1.5. Methodological Contribution:

1. **Integration of Advanced Analytical Tools:** This research's methodological contribution is applying advanced analysis tools since the research applies advanced analytic tools like SPSS in testing hypotheses and structural modeling. Such tools enable a perceptive understanding of variable relationships, such as digital transformation, organizational capabilities, employee attitudes, and competitive advantages. The research also demonstrates the merit of applying NVIVO, which is used for analyzing qualitative focus group discussion (FGDS) and key informant interview (KIIS), in researching complex relationships in organizational research, such as technology adoption.
2. **Multi-Method Approach:** The study employs a multi-method approach by blending **quantitative survey data** with sophisticated statistical techniques. This methodological rigour enhances the reliability and validity of the findings. It can be a model for future research on performance management, especially in sectors that quickly adopt digital technologies.
3. **Exploration of Perceived Usefulness and Ease of Use:** The study operationalizes core constructs of TAM in a novel context by measuring employee perceptions of digital tools' usefulness and ease of use. The methodological contribution lies in adapting these scales to measure the specific outcomes in digital PMS, contributing to TAM's broader applicability across different domains of employee performance evaluation.
4. **Focus on Sustainability and Competitiveness:** In addition to examining employee-centric outcomes, the study methodologically contributes by testing how digital transformation impacts **sustainability** and **competitive advantage**, two constructs that are less explored in the existing literature on digital performance management systems. Using linear regression models to assess these relationships will contribute to new methodological insights on measuring the long-term impact of DT in organizational studies.
5. **Empirical Validation of Emerging Theories:** Lastly, the study provides empirical validation for emerging theories around digital transformation. It combines well-established theories (TAM) with relatively new frameworks (Maximillian's Theory of Digital Transformation), creating a robust methodological approach that blends traditional and contemporary theoretical perspectives.

7.2 Limitations of the Study

While this study has successfully demonstrated its valuable contributions to Digital PMS literature in the context of the Bangladeshi telecommunication industry, several limitations must be acknowledged. These are as follows:

1. Contextual Limitation

This examination is centered solely on the telecommunications sector in Bangladesh. Although this sector was selected for its vibrant characteristics and significance in digital transformation, the results may not entirely apply to different industries or geographical areas.

The peculiar practices and constraints inherent to the telecommunications industry may restrict the generalizability of the findings to wider contexts.

2. Sampling Scope

The sample size of 176 survey respondents, although adequate for the quantitative analysis, may not fully capture the entire population of employees within the telecommunications sector.

Key Informant Interviews (KIIS) and Focus Group Discussions (FGDS) were conducted with a chosen group of HR professionals and managers, potentially leading to a bias that emphasizes managerial viewpoints over a more holistic understanding of all employees.

3. Duration Restrictions

The research records information at one specific moment, giving only a cross-sectional view of the digital transition. With this method, we can't learn anything about the effects on the future or how digital PMS adoption will change.

4. Framework Limitations

The Technology Acceptance Model (TAM) and Maximilian's Theory of Digital Transformation are strong frameworks, yet they might not capture all the elements affecting digital PMS in the telecommunications sector. Incorporating additional variables

like cultural influences or sector-specific technological constraints could enhance the depth of the study.

5. Concerns Regarding Employee Sentiments and Privacy

The survey explored employee privacy and data security concerns; however, employees had limited direct input regarding these sensitive issues, as most responses came from HR professionals. This might not accurately represent employees' genuine experiences and expectations regarding privacy.

6. The researcher's viewpoint

The researcher's academic and professional background influences how results are interpreted, and frameworks are developed. Despite efforts to reduce biases, achieving complete neutrality might still be out of reach.

These limitations indicate that the study findings may have constraints or require further confirmation in specific domains. Recognizing these limitations enhances the value of the study; instead, it establishes a foundation for further exploration to address these gaps. In theory and practice, scholars and professionals need to expand their perspectives to understand the transition to digital PMS across diverse environments.

7.3 Future Research

Based on the foundation offered by this study, a range of avenues may be suggested as future research directions.

First, this study empirically assesses and suggests the critical Digital PMS aspects and practices for improving individual and organizational performance sustainably in the Bangladeshi Telecommunication industry context. Further empirical studies are needed to examine how Digital PMS aspects and practices help to improve sustainable performance in a developing country like Bangladesh.

Second, this study has focused only on a single country. Hence, more cross-country empirical research is needed to understand differences in the Digital Transformation of PMS aspects, practices, drivers, and challenges. Thus, it would be interesting to investigate these Digital PMS issues by considering more diverse employee-intensive industries and countries.

Third, there has been limited empirical research on the social dimension of the Digital Transformation of Performance Management Systems. Moreover, there is still a scarcity of research on the intervening factors/mediators among Digital PMS, Competitive Advantages, and Sustainability. Therefore, more research is needed to address this pillar of Digital PMS and its dynamism.

Fourth, Future studies might investigate the implementation and effects of digital PMS in various sectors, such as banking, manufacturing, or healthcare, aiming to uncover distinct challenges and facilitators in different environments.

Fifth, Further investigation of workers' experiences, perceptions, and psychological reactions to digital PMS could be conducted in the future. Particular attention could be paid to digital fatigue, adaptability, and the learning curve of utilizing new systems.

Sixth, Future studies could examine how governmental policies, data protection laws, and industry regulations influence digital PMS adoption and ethical utilisation.

Seventh, Future studies could examine how governmental policies, data protection laws, and industry regulations influence digital PMS adoption and ethical utilisation.

7.4 Recommendations

Based on the insights gained from both quantitative and qualitative phases, several policy-driven and actionable suggestions can be made to facilitate the efficient, secure, and employee-focused implementation of Digital Performance Management Systems (DPMS) within Bangladesh's telecommunication sector.

1. For Telecommunication Companies

Strengthening Data Privacy Measures: To alleviate employee digital privacy concerns, organizations may invest in strong cybersecurity solutions, including encryption, multi-factor authentication, and data access controls.

Ensure Clear Communication: Let employees know how their data is collected, used, stored, and protected. Establishing clarity in this respect will enhance trust in DPMS.

Apply a User-Centered Design: Interface design should be user-friendly and straightforward. DPMS should be updated regularly and personalized based on employees’ feedback to ensure perceived ease of use and usefulness.

Developing a Feedback Loop: Establish structured channels through which employees can make remarks regarding the system. This tactic enables companies to simplify the platform and enhance users’ engagement.

Offer Awareness and Training Programs: Hold regular workshops to acquaint workers with system use, privacy settings, and digital literacy. This will be particularly helpful for government sector employees with less awareness and motivation.

Blend Technological Tools with Human Supervision: This will dispel concerns about decision-making biases by ensuring that computer analysis is paired with human oversight, thereby creating a harmonious balance between automation and empathy.

However, Based on the evidence in the research on the digitalization of Performance Management Systems (PMS) in the Bangladeshi telecommunications industry, a concerted and fair effort is necessary to support innovation and workers’ trust. The following table outlines a realistic and step-by-step action plan for telecommunication organizations, highlighting major fields of system design, worker training, privacy protection, and regulatory compliance. This roadmap is to assist organizations in deploying digital PMS more successfully, while addressing the data privacy, user-friendliness, and managerial transparency-related issues raised by employees throughout the research

Step	Action Item	Purpose
1	Operate a Data Privacy Audit	Evaluate existing vulnerabilities
2	Execute User Accessibility Controls	Ensure secure control of sensitive data
3	Design Employee Training on DPMS	Process sensitive information securely.

4	Observe Regular Feedback	Find and uncover employee concerns about DPMS
5	Update Policies Based on Feedback	This initiative aims to foster trust and enhance adoption.

Table 7.1: Action Roadmap for Telecommunication Companies Pursuing Digital PMS

2. To Policymakers and Regulators:

Formulate Digital HRM Policy: The government and regulatory bodies like BTRC (Bangladesh Telecommunication Regulatory Commission) may develop national policies and guidelines for digital HR practices to ensure consistency and compliance.

Enforce Data Protection Policies: Establish and enact industry-specific employee data privacy regulations within DPMS, adhering to international standards such as GDPR (The General Data Protection Regulation (GDPR) is a comprehensive data protection law that has been adopted by the European Union (EU) since May 25, 2018. It establishes a high standard of personal data management and protection by organizations, emphasizing transparency, accountability, and individual rights over their data.)

Funding Digital Transformation in HRM: Provide financial incentives or subsidies to telecom companies (mainly state-owned) to digitalize HR practices and invest in secure DPMS infrastructure.

Initiate Intersectoral Partnerships: Foster joint activities between the private and public telecommunication sectors in sharing best practices in the uptake of digital human resource technologies.

3. To Future Researchers:

Explore Cross-Industry Applications. The theoretical model created in this research (combining TAM and Maximilian's Theory) can be applied to other industries, such as healthcare, banking, or education, to test generalizability and hone variable relationships.

Examine Longitudinal Effects: Future research could employ a longitudinal design to examine

how employee attitudes toward DPMS change over the long term.

Ethical Implications and Power Dynamics: Further qualitative research can address how digitalization in PMS influences employee autonomy, privacy concerns, and organizational power dynamics.

This study on the digital transformation of performance management systems in the telecommunication industry in Bangladesh offers significant contributions at both theoretical and practical levels. Theoretically, it extends the understanding of how digital tools impact performance management systems using frameworks like TAM and Maximilian's Theory of Digital Transformation. Practically, it provides actionable insights for managers, industry leaders, and policymakers, helping them navigate the challenges of digital transformation and leverage it for competitive advantage. The study sets the stage for future research across other sectors and regions, contributing to a broader understanding of digital transformation's role in enhancing organizational performance, sustainability, and competitiveness.

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Appendix A: Data Collection Instruments

Phase A#

Questionnaire for Pilot Testing on “**The Dynamics of Digital Transformation in Employees’ Performance Management Systems of Bangladesh**”

Section 1: Demographic Information

i. Gender

- ☐ Male
- ☐ Female
- ☐ Prefer not to say.

ii. Age

- ☐ 20-30
- ☐ 31-40
- ☐ 41-50
- ☐ Over 50

iii. Educational Level

- ☐ Bachelor’s
- ☐ Master’s
- ☐ Above

iv. Job Position:

- ☐ Entry-level employee
- ☐ Mid-level manager
- ☐ Top-level managers

Section 2. Digital Shifts of Traditional Performance Management Systems

S/L	Statements	Strongly Disagree (1)	Disagree (2)	Neutral (3)	Agree (4)	Strongly Agree (5)	Reference
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1	Digital PMSs help to provide real-time feedback.						Michael & David (2019).
2	Digital PMSs ensure Accuracy of data history.						Michael & David (2019).
3.	Digital PMSs are the contemporary demand of employees.						Michael & David (2019).

Section 3: Digital Transformation of Performance Management (PMs) and Sustainability of Human Resources

Please indicate your level of agreement with the following statements on a scale of 1 to 5, where 1 represents "Strongly Disagree" and 5 represents "Strongly Agree."

S/L	Statements	Strongly Disagree (1)	Disagree (2)	Neutral (3)	Agree (4)	Strongly Agree (5)	Reference
1	The digital transformation of performance management systems has improved the efficiency of HR processes.						Alam, M. N., & Noor, S. M. (2020).
2	The digital transformation of performance management systems has enhanced employee engagement and motivation.						Alam, M. N., & Noor, S. M. (2020).

3	The digital transformation of performance management systems has facilitated talent retention and development.						Alam, M. N., & Noor, S. M. (2020).
4	In the telecommunications industry, the digital transformation of performance management systems has contributed positively to the sustainability of human resources.						Alam, M. N., & Noor, S. M. (2020).
5	Overall, I think that the digital transformation of performance management systems has a big effect on the long-term health of human resources in the telecommunications business.						(Adapted from Reference 2)

Section 4: Digital Transformation of Performance Management (PMs) and Competitive Advantages

S/L	Statements	Strongly Disagree (1)	Disagree (2)	Neutral (3)	Agree (4)	Strongly Agree (5)	Reference
1	The digital transformation of performance management systems in the telecommunication industry has provided companies with competitive advantages.						Ullah et. Al. (2020).
2	I believe that the digital						Ullah et.

	transformation of performance management systems significantly contributes to competitive advantages in the telecommunication industry.						al (2020).
3	The digital transformation of performance management systems has improved data-driven decision-making in the telecommunication industry.						Hossain, M. (2020).

Section 5: Negative Consequences of Digital Transformation of Performance Management (PMs)

S/L	Statements	Strongly Disagree (1)	Disagree (2)	Neutral (3)	Agree (4)	Strongly Agree (5)	Reference
1	The digital transformation of performance management systems in the telecommunication industry has led to negative consequences or drawbacks.						Rahman, & Hasan, (2019).
2	I believe that the digital transformation of performance management systems in the telecommunication industry has negative consequences.						Ullah et. al (2020).

Section 6: Additional Comments

Please provide any additional comments or suggestions regarding the digital transformation of performance management systems in the telecommunication industry.

Answer:

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Thank you for participating in this pilot test. Your feedback is valuable in refining the questionnaire for the main study.

Phase B#

Questionnaire for Focus Group Discussions (FGD) and Key Informant Interviews (KII)

Introduction:

This questionnaire is designed to administer the focus group discussions (FGD) and key informant Interviews (KII) conducted as part of the study on the “Dynamics of Digital Transformation in Employees’ Performance Management Systems in Bangladesh”. The intention is to find participants’ thoughts on digital transformation and its impact on performance management systems. The discussion areas include awareness, perceived usefulness, challenges, opportunities, organizational capabilities, and the robust dynamism of DPMS.

Section A: Digital Transformation Awareness and Perceived Usefulness of DPMS

1. Awareness:

- How would you express the digital transformation of performance management systems?
- Are you aware of any initiatives taken to DPMS in your organization? If yes, can you share them?

2. Perceived Usefulness:

- What do you believe about the usefulness of DPMS in enhancing employee performance?
- How does DPMS contribute to obtaining organizational goals?
- What competitive benefits does DPMS bring to your organization?

Section B: Perceived Ease of Use (Challenges and Opportunities)

1. Challenges:

- What challenges have you experienced when using DPMS?

- Are there any barriers to executing DPMS in your organization?

2. Opportunities:

- What opportunities does DPMS provide to assure employee involvement and performance assessment?
- How do you think DPMS benefits performance management processes?

Section C: Disruptions of Traditional PMs Triggering Digital Transformation

1. Drawbacks of manual PMS:

- What are the critical drawbacks of manual performance management systems?
- Can you share any specific incidents where manual PMS failed to meet organizational needs?

2. Influencers for Digital Transformation:

- What factors led your organization to shift towards DPMS?
- How does transitioning from traditional PMS to DPMS affect employee and managerial roles?

Section D: Organizational Resources and Capabilities for Digital Transformation

1. Organizational Resources:

- What organizational resources are important for operating DPMS?
- Do you believe your organization has sufficient resources to use DPMS?

2. Organizational Capabilities:

- What capabilities does your organization possess that enable digital PMS?
- What are the strategies employed to adapt to DPMS?

Section E: Impact of Digital Performance Management Systems (DPMS)

1. Competitive Advantages:

- How does DPMS improve your organization's competitiveness in the telco market?
- Can you share example/s where DPMS gave better decision-making?

2. Sustainability:

- How does DPMS contribute to long-term organizational stability?
- Can DPMS provide specific sustainability metrics?

3. Data Security and Employee Privacy:

- What measures are being taken to ensure data security in DPMS?
- Are there any concerns about employee privacy when operating a DPMS? If so, how are they considered?

4. Dynamics of Digital Performance Management Systems:

- How has DPMS changed the way your organization monitors and evaluates performance?
- What feedback has employees shared about the impact of DPMS?

Closing Questions:

1. Would you recommend anything for the improvement of DPMS?
2. How do you predict the potential of DPMS in your organization and market?

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Phase C#

Questionnaire for the Final Survey on “The Dynamics of Digital Transformation in Employees’ Performance Management Systems in Bangladesh.”

Welcome, and Introduction:

- Welcome to the survey on the dynamics of digital transformation in employees’ performance management systems in the telecommunication industry of Bangladesh.

- Your participation is valuable in contributing to our research. Please read each question carefully and respond honestly.

Section 1: Demographic Information

1. Gender

- Male
- Female
- Other

2. Age

- 20-30
- 31-40
- 41-50
- 50 and above

3. Educational Level

- Bachelor's Degree
- Master's Degree
- Doctoral Degree
- Other (please specify)

4. Functional Area:

- Human Resources
- Finance
- Operations
- Sales and Marketing
- IT and Technical Support
- Customer Service
- Other (please specify)

5. Years of Experience in the Telecommunications Industry

- Less than one year

- 1-5 years
- 6-10 years
- More than ten years

Section 2: Organizational Capabilities and Resources

No	Statements	Strongly Agree	Agree	Neutral	Disagree	Strongly Disagree
1.	Our organization has the necessary technological infrastructure to support digital performance management systems.					
2.	There is technical support available for employees using digital performance management systems.					
3.	The organization invests in continuous employee training to use digital tools in performance management.					
4.	The budget allocated for digital transformation initiatives in performance management is satisfactory to me.					
5.	Digital innovation is a part of our organization's strategic planning.					
6.	There are dedicated teams or personnel responsible for managing digital transformation projects.					

Section 3: Perceived Usefulness and Perceived Ease of Use

No	Statements	Strongly Agree	Agree	Neutral	Disagree	Strongly Disagree

1.	Digital performance management systems help me accomplish tasks better than before.					
2.	Using digital tools for performance management improves the quality of my work.					
3.	Digital performance management systems provide valuable insights that help in making informed decisions.					
4.	The digital performance management system enhances my productivity at work.					
5.	Learning to use the digital performance management system is easy for me.					
6.	The digital performance management system is user-friendly.					
7.	I find it easy to navigate through the different features of the digital performance management system.					
8.	Completing my performance management tasks digitally requires minimal effort.					

Section 4: Transformation of PMS from Traditional Manual PMS

No	Statements	Strongly Agree	Agree	Neutral	Disagree	Strongly Disagree
1.	Our organization's transition from manual to digital performance					

	management systems has been smooth.					
2.	The digital performance management system is an improvement over the traditional manual system.					
3.	Employees received required support from manual to digital performance management systems during the shift.					

Section 5: Dynamics of Digital PMS (Competitive Advantages and Sustainability)

No.	Statements	Strongly Agree	Agree	Neutral	Disagree	Strongly Disagree
1.	Digital transformation in performance management systems contributes to competitive advantages.					
2.	Digital Transformation of PMS enables Real-time Performance Monitoring and Feedback.					
3.	Digital Transformation of PMS enables Data-driven Decision Making					
4.	Digital Transformation of PMS enables employee engagement and retention.					
5.	Digital Transformation of PMS enables continuous learning and development.					
6.	By leveraging Digital Performance Management Systems (DPMS),					

	telecommunication companies can differentiate themselves in the market.					
7.	In the telecom industry, digital transformation impacts the sustainability of human resources by reducing paperwork.					
8.	Digital Transformation of PMS enhances the company's sustainability by ensuring long-term profitability .					
9.	Digital Transformation of PMS enables cost efficiency					
10.	Digital Transformation of PMS enables resource optimization.					
11.	The digital transformation of performance management systems has improved the efficiency of HR processes.					
12.	Digital PM systems can align individual and team goals with the organization's strategic objectives.					

Section 6: Privacy and Security

No	Statements	Strongly Agree	Agree	Neutral	Disagree	Strongly Disagree
1.	Digital transformation of performance management systems has compromised your privacy at work.					
2.	Digital PMSs prevent unauthorized					

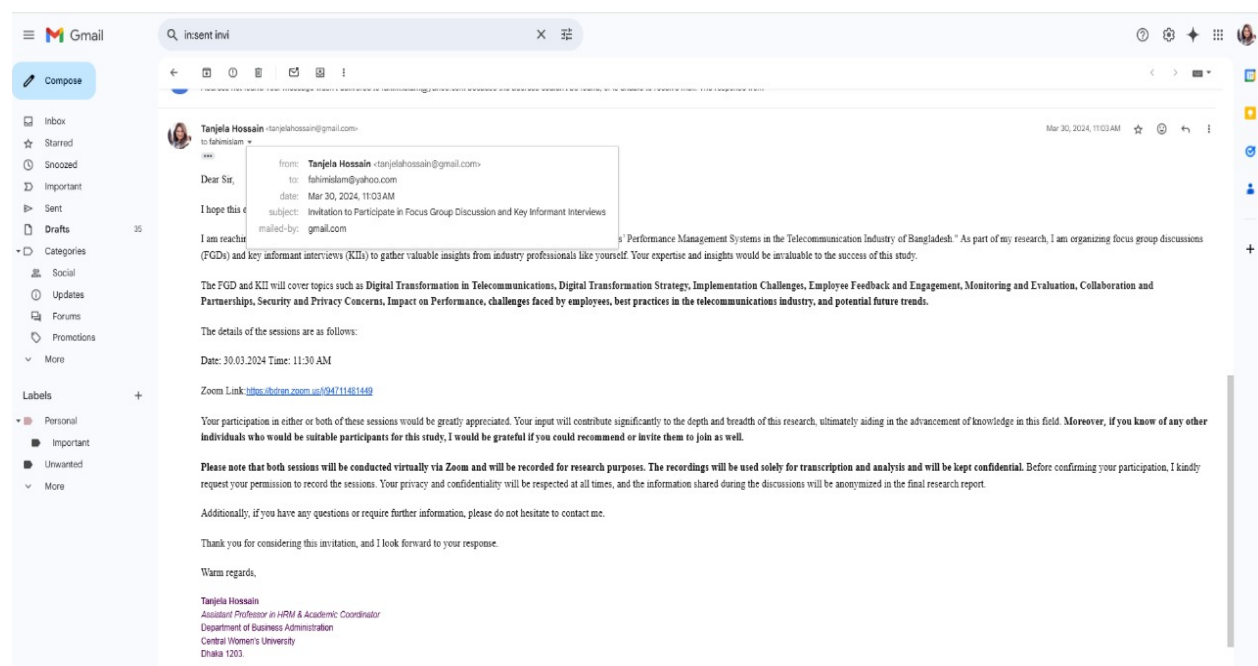
	viewing of employee information.					
3.	Digital PMSs prevent misuse viewing of employee information.					
4.	Employees are confident that their personal and performance data is protected within the organization's digital performance management systems.					
5.	Our organization has implemented robust cybersecurity measures to protect digital performance management systems from unauthorized access.					

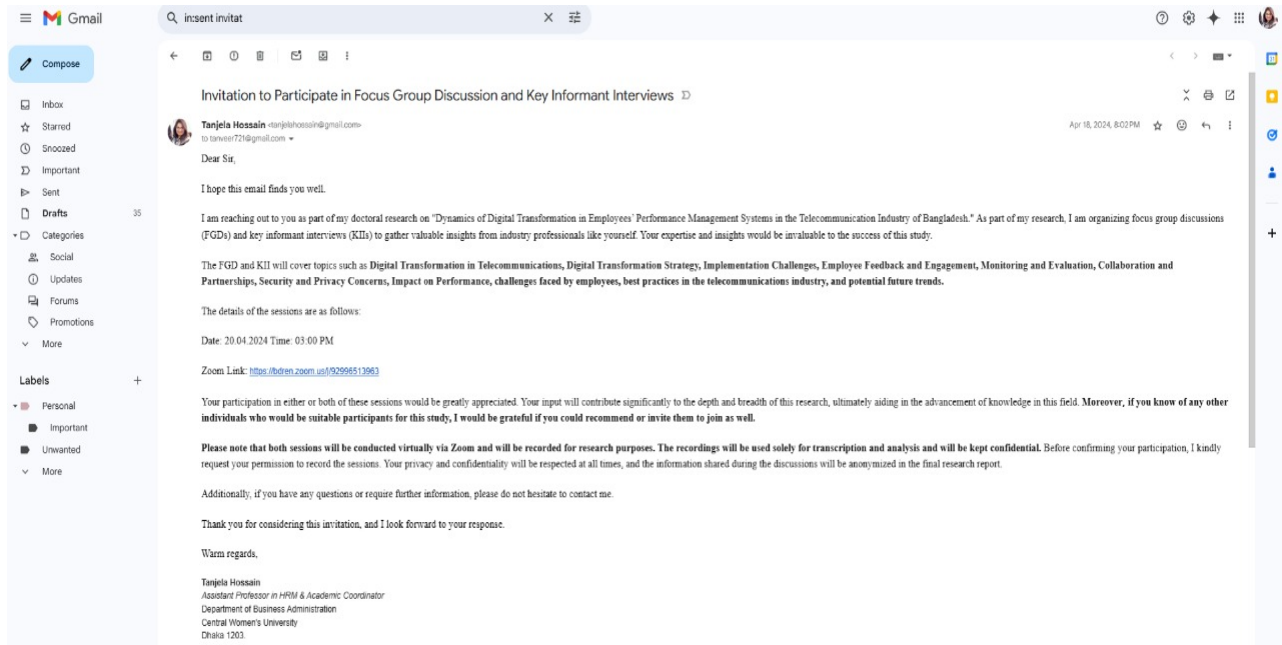
Thank you for participating in the survey. Your input is valuable to us. If you have any additional comments or suggestions, please feel free to share them below.

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Appendix B: Invitation Letter





Appendix C: Glossary of Abbreviations and Terms

No.	Abbreviation	Elaboration
1.	ABDC	Australian Business Deans Council
2.	AC	Advanced Change
3.	AI	Artificial Intelligence
4.	AMTOB	Association of Telecommunication Operators of Bangladesh
5.	AVE	Average Variance Extracted
6.	CA	Competitive Advantages
7.	CR	Composite Reliability
8.	DDT	Dynamics of Digital PMS
9.	DT	Digital Transformation
10.	DPMS	Digital Performance Management Systems.
11.	DV	Dependent Variable
12.	FGD	Focus Group Discussions
13.	GDPR	General Data Protection Regulation

14.	GP	Grameenphone Ltd.
15.	HTMT	Heterotrait-Monotrait Ratio
16.	IoT	Internet of Things
17.	IV	Independent Variable
18.	KII	Key Informant Interviews
19.	OCR	Organizational Capabilities and Resources
20.	PMS	Performance Management Systems
21.	PEOU	Perceived Ease of Use
22.	PU	Perceived Usefulness
23.	RO	Research Objectives
24.	RQ	Research Questions
25.	SEM	Structural Equation Modeling
26.	SLR	Systematic Literature Review
27.	SPSS	Statistical Package for the Social Sciences
28.	TAM	Technology Acceptance Model
29.	QDA	Qualitative Data Analysis Software