

## E-BANKING, HUMAN RESOURCE PRACTICES, AND HR PERFORMANCE: EVIDENCE FROM PAKISTAN'S BANKING SECTOR

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### Abstract

#### **Purpose:**

This study examines the relationship between e-banking adoption, human resource (HR) practices, and HR performance in Pakistan's banking sector. It aims to assess how digital banking initiatives and evolving HR practices jointly influence employee performance and to identify strategies for enhancing HR outcomes in a technology-driven banking environment.

#### **Method:**

Using a quantitative research design, data were collected from employees of commercial banks in Pakistan through a structured questionnaire. The study analyzes employees' perceptions of e-banking adoption and HR practices using statistical techniques to examine their effects on HR performance.

#### **Results:** Center for Excellence in Education & Research

The findings indicate that e-banking adoption has a positive and significant impact on HR performance. Moreover, effective HR practices—such as training, performance management, and employee involvement—strengthen this relationship by enabling employees to adapt to technological changes and perform more efficiently. The results also highlight the role of aligned HR practices in reducing employee attrition and improving workforce engagement.

#### **Conclusion:**

The study contributes to the literature by integrating e-banking and HRM perspectives within a unified performance framework in an emerging-market context. Practically, the findings offer valuable insights for policymakers and banking managers to align digital transformation initiatives with strategic HR practices. Such alignment can enhance HR performance, support talent retention, and strengthen the long-term competitiveness of Pakistan's banking industry.

### INTRODUCTION

The global banking industry has undergone a profound transformation over the past decade, driven primarily by rapid advancements in digital technologies and changing customer expectations (Holis et al., 2026; Gazi et al., 2025). Digitalization has

reshaped traditional banking models by enabling the delivery of financial services through electronic platforms such as internet banking, mobile banking applications, automated teller machines (ATMs), and electronic payment systems. Collectively referred to as

e-banking, these technologies have enhanced service accessibility, reduced operational costs, and improved transaction efficiency, thereby redefining competitive dynamics within the financial sector (Verhoef et al., 2021; Gazi et al., 2025). In emerging economies, digital banking has also been promoted as a key mechanism for financial inclusion and economic development.

In Pakistan, the adoption of e-banking has accelerated significantly in recent years, driven by increased smartphone penetration, regulatory encouragement, and national initiatives aimed at expanding digital financial services (Holis et al., 2026; Zeng & Jamaluddin, 2025). The State Bank of Pakistan has actively supported the transition toward digital banking to improve efficiency, transparency, and outreach across the banking system. As a result, banks have invested heavily in digital infrastructure to modernize service delivery and respond to growing competition from fintech firms and non-bank financial service providers (Gazi et al., 2025). However, while technological investment is essential, the effectiveness of e-banking initiatives ultimately depends on the human resources responsible for operating, managing, and innovating within these digital systems (Holis et al., 2026; Gazi et al., 2025). Human resource management (HRM) has therefore emerged as a strategic function in the digital transformation of banks. Employees are now required to possess advanced digital competencies, continuously update their skills, and perform under heightened expectations related to service speed, accuracy, and customer responsiveness (Gazi et al., 2025). HR practices such as training and development, performance management, employee involvement, and compensation—play a central role in shaping employee motivation, adaptability, and performance in technology-intensive work environments (Zeng & Jamaludin, 2025). Recent literature on digital HRM and electronic HRM suggests that organizations that align HR systems with digital transformation initiatives are better positioned to enhance employee performance and sustain competitive advantage (Sakib et al., 2025).

Despite the growing interest in digital transformation and HRM, existing research has largely examined e-banking outcomes from a **customer-centric or financial performance perspective**, focusing on

service quality, customer satisfaction, or technology acceptance. Comparatively limited attention has been given to **internal organizational outcomes**, particularly human resource performance. Employees, however, represent the primary agents through whom digital banking strategies are implemented and sustained (Zeng & Jamaluddin, 2025). Without understanding how digital banking affects employees and how HR practices support or constrain their performance, the organizational benefits of e-banking may remain underrealized (Gazi et al., 2025).

Human resource performance in digital banking contexts is multidimensional, encompassing not only task efficiency but also adaptability, service quality, innovation, and the ability to cope with technological change (Gazi et al., 2025). While e-banking systems can streamline processes and reduce manual workload, they may simultaneously increase cognitive demands, job stress, and role ambiguity if employees are insufficiently supported (Nesindande et al., 2024; Gazi et al., 2025). Recent empirical evidence suggests that digital transformation initiatives can produce mixed outcomes for employees, generating productivity gains alongside increased work pressure and performance monitoring (Amir et al., 2024; Zeng & Jamaluddin, 2025). These findings underscore the importance of examining the organizational mechanisms that enable employees to perform effectively in digital environments.

The **Resource-Based View (RBV)** provides a useful theoretical lens for understanding these dynamics. RBV posits that sustainable competitive advantage arises from valuable, rare, and inimitable resources, including human capital and organizational capabilities (Wernerfelt, 2014; Zeng & Jamaluddin, 2025). Although e-banking technologies constitute strategic organizational resources, their value can only be realized when employees possess the skills, motivation, and organizational support necessary to use them effectively. Complementing RBV, strategic HRM theory emphasizes that well-designed HR practices function as mechanisms through which organizational resources are translated into performance outcomes by shaping employee competencies and behaviors (Guest, 1997; Jiang et al., 2021).

Although recent studies have begun to acknowledge the mediating role of HR practices in digital

transformation processes, empirical research explicitly examining the **integrated relationship between e-banking, HR practices, and HR performance** remains scarce, particularly in emerging economies such as Pakistan. Existing studies in the Pakistani context often focus on digital HRM adoption or employee attitudes in isolation, without linking e-banking initiatives to HR practices and employee performance outcomes within a unified framework. This lack of integrative, employee-centered research represents a significant **research gap** in the literature. Specifically, there is insufficient empirical evidence explaining (i) how e-banking adoption influences HR practices (Gazi et al., 2025), (2) how HR practices affect HR performance in digital banking environments (Zeng & Jamaluddin, 2025), and (3) whether HR practices mediate the relationship between e-banking and HR performance (Holis et al., 2026). Addressing this gap is essential for advancing theory and providing actionable insights for managers and policymakers operating in rapidly digitalizing banking sectors.

In response to this gap, the present study aims to develop an integrated understanding of the relationships among e-banking, HR practices, and HR performance in Pakistan's banking industry. The **first objective** of this study is to examine the impact of e-banking adoption on human resource practices in the banking sector, with particular attention to training and development, performance management, employee involvement, and compensation systems. The **second objective** is to analyze the effect of human resource practices on human resource performance, focusing on employee efficiency, adaptability, service quality, and overall job performance in a digital work environment. The **third objective** is to assess the direct influence of e-banking adoption on human resource performance, determining whether digital banking systems independently enhance employee performance. The **fourth objective** is to investigate the mediating role of human resource practices in the relationship between e-banking and human resource performance. The **fifth objective** is to explore employees' perceptions regarding the integration of e-banking and HR practices in shaping their work experiences and performance outcomes.

The **significance** of this study is multifaceted. Theoretically, it contributes to the digital

transformation and HRM literature by integrating RBV and strategic HRM perspectives to explain how technological resources and HR systems jointly shape employee performance. Empirically, it enriches the literature by providing evidence from Pakistan's banking sector, an underrepresented context in high-impact research. Practically, the findings offer guidance for bank managers seeking to align HR strategies with digital initiatives to enhance employee performance and well-being. From a policy perspective, the study provides insights that can inform workforce development and digitalization policies in the financial sector. Overall, this research advances understanding of the human dimension of digital banking and offers a robust foundation for future studies on technology-driven organizational change.

## Literature Review and Hypotheses Development

### Theoretical Lense

#### The Resource-Based View (RBV)

The resource-based view (RBV) theory suggests that a firm's resources and capabilities are key sources of competitive advantage. According to this theory, firms can gain a sustainable competitive advantage by exploiting and exploiting resources that are valuable, rare, difficult to imitate, and irreplaceable (Madhani, 2009). In this study, e-banking can be considered as a valuable resource to improve its competitive advantage by providing innovative services that will enable it to attract and retain the best talent. The use of e-banking technology provides various benefits to banks, such as improved efficiency, reduced costs, increased customer satisfaction and increased revenue (Haron et al., 2014). Banks as it offers e-banking services 24/7 access to customer accounts, online bill payments, offer mobile banking, and other facilities This enables banks to attract and retain customers and improve customer satisfaction, which in turn can generate revenue as they have increased its profitability (Clulow et al., 2007).

#### E-Banking

E-banking, or electronic banking, involves using digital platforms—such as the Internet, mobile devices, and electronic payment systems—to conduct banking transactions (Holis et al., 2026). It allows customers to access accounts, check balances, transfer funds, make payments, and apply for loans online (Sathye, 1999).

Services include online banking, mobile banking, ATMs, and electronic money transfers (Nitsure, 2003). Its popularity has surged due to convenience, speed, and 24/7 accessibility (Miranda-Petronella, 2009).

### HR Practices

Human resource (HR) practices encompass policies and activities such as recruitment, training, performance management, compensation, and employee relations (Armstrong & Taylor, 2017; Holis et al., 2026). In banking, effective HR practices help attract, develop, and retain talent, align employee and organizational goals, boost motivation and performance, ensure regulatory compliance, and manage risks (Guest, 2017; Zhu & He, 2012). Overall, they are vital for enhancing employee effectiveness, organizational performance, and the bank's reputation (Wright et al., 2005; Holis et al., 2026).

### HR Performance

HR performance measures how effectively HR practices achieve organizational goals, including employee engagement, development, and retention (Lawler & Mohrman, 2003; Wright & Nishii, 2006). In banking, strong HR performance boosts customer satisfaction, profitability, and compliance while reducing turnover and regulatory risks, supporting both organizational success and competitiveness (Huselid, 1995; Chi et al., 2019; Zhu & He, 2012).

### E-Banking and HR Practices: A Resource-Based Perspective

E-banking, or electronic banking, refers to the use of digital platforms such as the Internet, mobile devices, and electronic payment systems to conduct banking transactions (Larpsiri et al., 2002; Holis et al., 2026). It allows customers to access accounts, check balances, transfer funds, make payments, and apply for loans online (Sathye, 1999). Services include online banking, mobile banking, ATMs, and electronic money transfers (Omer et al., 2022; Zeng & Jamaluddin, 2025). The popularity of e-banking has grown rapidly due to its convenience, speed, and 24/7 accessibility, enabling banks to attract and retain customers while improving operational efficiency (Omer et al., 2022; Holis et al., 2026).

From the perspective of the Resource-Based View (RBV) theory, a firm's resources and capabilities are key drivers of sustainable competitive advantage (Wernerfelt, 2014). According to RBV, resources that are valuable, rare, difficult to imitate, and irreplaceable enable firms to outperform competitors. E-banking can be considered such a resource, as it provides innovative services that enhance customer satisfaction, reduce operational costs, increase revenue, and strengthen a bank's competitive position (Haron et al., 2014; Sinha & Sardar, 2014; Zeng & Jamaluddin, 2025). By leveraging e-banking technologies, banks can attract and retain customers while delivering superior financial services efficiently (Holis et al., 2026).

Human resource (HR) practices play a critical role in supporting organizational performance, especially in the banking sector. HR practices include recruitment and selection, training and development, performance management, compensation and benefits, and employee relations (Omer et al., 2022; Armstrong & Taylor, 2017). Effective HR practices enable banks to attract talented employees, align their goals with organizational objectives, enhance motivation, and ensure regulatory compliance (Boxall & Purcell, 2011; Zhu & He, 2012). By providing employees with appropriate training and development, banks ensure that staff are well-equipped to deliver high-quality services, including e-banking offerings, which in turn enhances customer satisfaction and organizational efficiency (Guest, 2017; Mone & London, 2018; Zeng & Jamaluddin, 2025).

HR performance measures how effectively HR practices achieve organizational goals, including employee engagement, development, retention, and alignment with overall business strategy (Lawler & Mohrman, 2003; Wright & Nishii, 2006; Huselid, 1995). In banking, strong HR performance contributes to higher customer satisfaction, increased profitability, lower turnover, and reduced regulatory and operational risks (Chi et al., 2019; Guest, 1997; Zhu & He, 2012). By integrating HR practices with e-banking initiatives, banks can foster a skilled, motivated workforce capable of leveraging technology to improve service quality and achieve competitive advantage. Hence our first hypothesis will be

**H1: There is a positive relationship between E-Banking systems and HR Practices in the banking industry of Pakistan**

### Relationship between HR Practices and HR Performance

Human resource (HR) practices are policies, procedures, and activities designed to manage an organization's workforce. They play a critical role in shaping employee behavior, engagement, and organizational performance (Shaw et al., 2016; Holis et al., 2026; Gazi et al., 2025). Strategic human resource management (SHRM) aligns HR practices with organizational objectives to optimize employee capabilities, enhance motivation, and improve overall performance. Effective HR practices include recruitment and selection, training and development, performance appraisal, compensation and benefits, employee relations, talent management, and workplace wellness programs (Budhwar & Debrah, 2013; Armstrong & Taylor, 2017).

Employee engagement is a core outcome of well-implemented HR practices. Practices such as open communication, recognition programs, skills development, and career growth opportunities foster higher engagement, which positively impacts productivity, innovation, and overall organizational success (Cooke et al., 2019; Guest, 2017). Talent development programs—including training, mentoring, and career planning—enhance employee skills, motivation, and retention, contributing to organizational efficiency and performance (Noe et al., 2014; Scullion et al., 2010). Similarly, recognition and incentive systems boost morale, reward performance, and reinforce a culture of achievement, ultimately improving HR performance outcomes (Mudor, 2011; Güngör, 2011; Holis et al., 2026).

Performance appraisal systems provide structured frameworks for evaluating employee contributions, aligning individual goals with organizational objectives, and identifying areas for improvement. Effective appraisal systems increase employee development, commitment, and productivity (Gazi et al., 2025). Likewise, inclusive organizational culture and workplace diversity enhance employee satisfaction, engagement, and retention, while positive leadership styles, such as transformational

and servant leadership, influence motivation and workplace dynamics (Guest & Conway, 2011).

Employee well-being has emerged as a vital component of HR practices, affecting both individual and organizational outcomes. Wellness programs, mental health support, flexible work schedules, and work-life balance initiatives foster a positive work environment, reducing stress and increasing productivity (Zeng & Jamaluddin, 2025). Similarly, HR technology, including digital recruitment, onboarding, and performance management tools, enhances efficiency, streamlines processes, and supports strategic decision-making (Gazi et al., 2025). HR practices also influence employee retention, engagement, and satisfaction. Studies show that organizations with comprehensive HR policies and practices experience better financial performance, higher employee commitment, and reduced turnover (Huselid, 2015; Ahmad & Hanif, 2011; Gazi et al., 2025). In the banking industry, where technology adoption and changing customer expectations are accelerating, effective HR practices are critical to attracting and retaining talented employees who drive growth and innovation.

Overall, HR performance reflects the effectiveness of these practices in achieving organizational goals. Strong HR performance results from well-integrated practices, including employee engagement, talent development, recognition systems, performance appraisals, inclusive culture, and wellness initiatives. Together, these elements create a motivated, skilled, and productive workforce capable of meeting organizational objectives and sustaining competitive advantage (Wright & Boswell, 2012; Kramar et al., 2018; Zeng & Jamaluddin, 2025). Hence, we can draw hypothesis that

**H2: There is a positive relation between HR practices and HR performance.**

### Relationship between E-Banking and HR Performance

The integration of digital technologies, particularly e-banking, has significantly transformed HR performance in the banking sector. E-banking serves as an enabling technology that reshapes traditional HR processes, streamlines operations, and fosters a culture of innovation (Khattab et al., 2020). By providing real-time data, automated workflows, and

digital communication tools, e-banking enhances efficiency, employee engagement, and flexibility, which are critical indicators of HR performance (Ojokuku & Sajuyigbe, 2012; Balogun et al., 2013; Holis et al., 2026).

The adoption of e-banking necessitates agile HR practices. Recruitment now emphasizes digital literacy, training programs are adapted to technology-driven workflows, and performance metrics are increasingly data-driven (Bakhodirovich et al., 2012). Employee satisfaction improves when HR aligns practices with e-banking tools, offering user-friendly systems, seamless access, and supportive digital work environments, which in turn enhances productivity and engagement (Moraru & Duhnea, 2018; Zeng & Jamaluddin, 2025). Strategic HR leadership is essential in guiding employees through technological integration, implementing change management strategies, and fostering a culture of continuous improvement (Holis et al., 2026).

Empirical studies in various banking industries reinforce the positive impact of e-banking on HR performance. Research in Pakistan, India, Nigeria, Malaysia, Korea, Jordan, Saudi Arabia, and Egypt consistently shows that e-banking enhances recruitment, training, and employee engagement (Arshad et al., 2020; Awan et al., 2019; Park & Lee, 2020; Al-Swedi & Razak, 2021). Furthermore, HR practices mediate the relationship between e-banking and HR performance, highlighting the importance of empowering, training, and motivating employees to fully leverage technological tools (Holis et al., 2026).

While e-banking offers substantial benefits, it also presents challenges for HR departments, including the need for employee training, managing resistance to change, ensuring data security, and adapting workflows (Al-Swedi & Razak, 2021; Holis et al., 2026). Additionally, HR practices influence not only internal HR performance but also customer adoption and the quality of e-banking services, underscoring the strategic role of HR in the digital transformation of banking (Park & Lee, 2020).

### **H3: The adoption of e-banking positively impacts HR performance.**

#### **HR Practices: A Mediating Role in RBV Perspective**

The Resource-Based View (RBV) suggests that a firm's unique resources and capabilities drive sustainable competitive advantage (Wernerfelt, 2014). In banking, e-banking technology represents a valuable and hard-to-imitate resource that can enhance organizational performance. However, the full potential of e-banking depends on effective HR practices, which can act as a mediator between e-banking adoption and HR performance.

E-banking improves operational efficiency, real-time data access, and digital communication, positively influencing employee productivity, engagement, and satisfaction (Balogun et al., 2013; Bakhodirovich et al., 2012). Yet, technology alone cannot guarantee enhanced HR performance. Strategic HR practices—such as training, talent development, performance appraisal, and recognition programs—equip employees to fully utilize e-banking capabilities, translating technological potential into measurable performance outcomes (Khattab et al., 2020; Ojokuku & Sajuyigbe, 2012; Zeng & Jamaluddin, 2025).

Empirical studies support the mediating role of HR practices. Research in banking industries across Pakistan, India, and Saudi Arabia shows that e-banking positively affects recruitment, training, and engagement, with effects amplified by supportive HR interventions (Gill et al., 2023; Al-Swedi & Razak, 2021; Zeng & Jamaluddin, 2025). Training programs enhance digital literacy, while recognition and incentive systems increase motivation and productivity, demonstrating how HR practices convert technological resources into improved HR performance (Zeng & Jamaluddin, 2025).

From an RBV perspective, HR practices themselves are valuable resources. When combined with e-banking technology, they create a bundle of complementary capabilities—technology, skilled employees, and performance-driven HR systems—that are difficult for competitors to replicate, fostering sustainable competitive advantage (Gazi et al., 2025).

H4: HR practices mediate the relationship between e-banking adoption and HR performance, such that effective HR practices enhance employee

engagement, productivity, and retention, translating e-banking capabilities into improved HR outcomes.

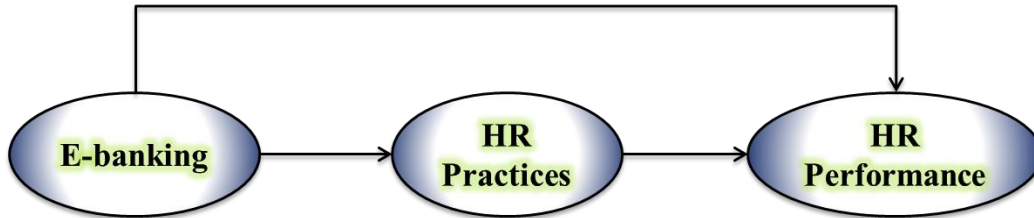


Figure 1: Conceptual Framework

**Methodology**

**Research Design**

This study uses a quantitative, cross-sectional survey design to examine the relationship between e-banking, HR practices, and HR performance in Pakistan’s banking sector. Data are collected via a structured questionnaire divided into three sections: demographics, e-banking adoption, and HR practices and performance. The survey targets 300 bankers across various institutions and job levels to ensure representative insights. Single-point data collection provides a real-time snapshot of current practices. This methodology allows systematic statistical analysis, testing of hypotheses, and generates empirical insights into how e-banking influences HR practices and performance in the banking industry.

**Population and Sample**

The study focuses on employees of commercial banks in Pakistan, targeting individuals directly involved in banking operations. A sample of 300 bankers was determined using the Morgan method, ensuring representativeness and reliability. Simple random sampling was employed, giving each employee an equal chance of selection and reducing bias (Singh, 2003). The sample includes staff from various banks and job levels, capturing diversity within the sector. This approach enhances external validity, allowing meaningful analysis of e-banking adoption, HR practices, and HR performance. The careful design ensures insights are both focused and generalizable across the banking population (Myers et al., 2013).

**Data Collection Methods**

Data were collected using a structured questionnaire developed from a comprehensive literature review. The questionnaire has three sections: demographics (age, gender, education, experience), e-banking adoption, and HR practices and performance. This structure ensures collection of relevant data to examine the relationships between e-banking, HR practices, and HR performance. Questionnaires were distributed via email, in-person meetings, and follow-ups to ensure high response rates. Participation was voluntary, and responses were kept confidential to maintain ethical standards (Sunder et al., 2018). This approach provides reliable, valid, and comprehensive insights into the Pakistani banking sector. A total of 300 questionnaires were distributed among employees of commercial banks for data collection. Of these, 290 were returned after the third distribution, with 287 usable responses, yielding a high response rate of 95.67% which is good enough (Sunder et al., 2018).

**Instruments**

A structured questionnaire was used to measure **E-Banking**, **HR Practices**, and **HR Performance**, based on validated scales from prior studies. All items are rated on a 5-point Likert scale (1 = Strongly Disagree to 5 = Strongly Agree).

**E-banking** is measured using a 6-item scale developed by Ojokuku & Sajuyigbe, 2012; Balogun et al., 2013 that covers adoption, usage, digital literacy, and efficiency. Sample item: “E-banking tools improve my work efficiency.”

**HR practices** are measured using 6 items developed by Armstrong & Taylor (2017), which include recruitment, training, performance appraisal, engagement, and recognition. Sample item: “My organization provides effective training programs.”

**HR Performance** is measured using 6-item scale developed by Lawler & Mohrman (2003) and Chi et al., (2019) measures productivity, engagement, satisfaction, and retention. Sample item: “HR practices contribute to my work efficiency.”

**Data Analysis Techniques**

The study uses descriptive statistics to summarize sample characteristics, correlation analysis to assess relationships, regression to examine direct effects, and mediation analysis (Hayes’ PROCESS) to test HR practices as a mediator between e-banking adoption and HR performance. This ensures rigorous, data-driven insights into banking HR dynamics.

**Results**

**Descriptive Analysis**

The respondents' profile presented in table 1 indicates that participants comprised employees from commercial banks with varied demographic backgrounds, including differences in gender (80% males and 20% females), age, education level, job position, and work experience. This diversity ensured a comprehensive representation of banking professionals and enhanced the generalizability of the study findings. Moreover, the dominance of male respondents (230 males vs. 57 females) indicates a clear gender imbalance in Pakistan’s e-banking sector. This highlights the need to examine male empowerment dynamics while encouraging more inclusive and diverse workplaces to address gender inequality challenges.

**Table 1. Respondent’s Profile**

| category                     | Options                            | Frequency | %age |
|------------------------------|------------------------------------|-----------|------|
| <b>Gender</b>                | Male                               | 230       | 59   |
|                              | Female                             | 57        | 15   |
| <b>Age</b>                   | Below 30 years                     | 27        | 7    |
|                              | 30-40 years                        | 127       | 33   |
|                              | 40-50 years                        | 110       | 28   |
|                              | Above 50 years                     | 23        | 6    |
| <b>Job Designation</b>       | Manager                            | 95        | 24   |
|                              | Sr. Manager                        | 102       | 26   |
|                              | G.M                                | 140       | 36   |
|                              | Other                              | 51        | 13   |
| <b>Education</b>             | BBA(Hons)/Bs (A & F) or Equivalent | 93        | 24   |
|                              | MBA/ M.CoM or Equivalent           | 161       | 41   |
|                              | MS                                 | 7         | 2    |
|                              | Other                              | 26        | 7    |
| <b>Total Work Experience</b> | Less than 5 yrs                    | 24        | 6    |
|                              | 5-10 yrs                           | 90        | 23   |
|                              | 10-15 yrs                          | 32        | 8    |
|                              | 15-20 yrs                          | 88        | 23   |
|                              | Above 20 yrs                       | 53        | 14   |



**Correlation Analysis**

The table 2 presents the correlation coefficients between three variables E-Banking (EB), HR

Practices (HRP), and HR Performance (HRPF). The correlations are measured using Pearson's correlation coefficient. Additionally, the significance (p-value) of each correlation is provided.

Table 2. Correlational Analysis

|      | EB     | HRP    | HRPF |
|------|--------|--------|------|
| EB   | 1      |        |      |
| HRP  | .667** | 1      |      |
| HRPF | .639** | .750** | 1    |

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

The results show a significant positive relationship among e-banking, HR practices, and HR performance, with moderate to strong correlations ( $r = 0.639-0.750$ ). Increased e-banking adoption is associated with stronger HR practices and improved HR performance. All correlations are significant at the 0.01 level, confirming that these relationships are meaningful and not due to chance.

**Regression Analysis by Using Andrew F. Hayes Method Model 4**

The results in table 3 indicate that e-banking significantly and positively influences HR practices ( $\beta = 0.7020, p < 0.0001$ ), supporting H1, and has a direct positive effect on HR performance ( $\beta = 0.1214, p = 0.0012$ ), supporting H3. Additionally, HR practices strongly enhance HR performance ( $\beta = 0.7089, p < 0.0001$ ), confirming H2 and highlighting the pivotal mediating role of HR practices.

Table 3: Regression Analysis

| Relationship                              | Coefficients | t      | p-value | R-Square |
|---|--------------|--------|---------|----------|
| E-banking → HR practices                  | 0.702        | 14.57  | 0.0000  | 0.5478   |
| HR Practices → HR Performance             | 0.7089       | 20.53  | 0.0000  | 0.7616   |
| E-banking → HR Performance                | 0.1214       | 3.2712 | 0.0012  | 0.7616   |
| Relationship                              | Coefficients | SE     | CI      |          |
| E-banking → HR practices → HR Performance | 0.4977       | 0.0588 | 0.3833  | 0.6178   |

Moreover, the indirect effect size is 0.4977, with a bootstrapped standard error (BootSE) of 0.0588. The bootstrap confidence interval (CI) for the indirect effect ranges from 0.3883 to 0.6178 have none zero value between them that show the mediating relationship is significant and supports hypothesis 4.

**Discussion**

This study examined how e-banking, HR practices, and HR performance interact in Pakistan’s banking sector, finding a predominantly male, well-educated, middle-aged workforce that reflects structural labor patterns. Results revealed significant positive relationships among e-banking adoption, HR practices, and HR performance, suggesting that digital banking initiatives and strategic HR systems reinforce each other to enhance organizational

outcomes (Holis et al., 2026; Gazi et al., 2025). The strong link between HR practices and HR performance highlights HRM’s pivotal role in translating technology into measurable performance gains, such as improved service quality, employee productivity, and engagement (Zeng & Jamaluddin, 2025; Holis et al., 2026). These findings align with recent research showing that integrated digital HRM practices contribute to competitive advantage and operational efficiency in financial institutions (Gazi et al., 2025; Pradhan et al., 2024; Khan & Ahmed, 2023). Overall, the study underscores the need for banks to invest in both e-banking technologies and progressive HR practices to optimize human capital value and sustain performance improvements in a rapidly evolving digital environment (Amir et al., 2024; Hassan et al., 2025; Zeng & Jamaluddin, 2025).

### Study Implications

The study offers several important theoretical implications. First, it extends the resource-based view by demonstrating that e-banking technology and HR practices jointly serve as strategic resources that enhance organizational performance, highlighting the interplay between technological and human capital in the banking sector (Barney, 2001). Second, it contributes to digital HRM literature by showing that effective HR practices mediate the relationship between e-banking adoption and HR performance, emphasizing the role of HRM as a mechanism that converts technological investment into measurable outcomes (Pradhan et al., 2025; Khan et al, 2025). Third, the findings provide empirical evidence on gender and demographic influences, offering insights for future theoretical models examining workforce diversity, technology adoption, and performance in emerging economies.

Like theoretical implications, this study provides several practical implications for the banking sector. First, banks should strategically integrate e-banking technologies with HR practices to enhance overall HR performance, as technology adoption alone is insufficient without effective human resource management. Second, HR managers should focus on developing robust training programs, performance appraisal systems, and employee engagement initiatives to leverage e-banking for improved efficiency and productivity. Third, the findings highlight the importance of promoting gender diversity and inclusive policies, as the sector remains male-dominated, which can enhance decision-making and innovation. Finally, continuous investment in employee development and digital skills is essential to maximize the benefits of technological adoption, strengthen human capital, and sustain competitive advantage in a rapidly evolving digital banking environment.

### Study Limitations and Recommendations

This study has several limitations. First, the sample was limited to employees of commercial banks in Pakistan, which may restrict the generalizability of the findings to other industries or countries. Second, the cross-sectional design captures relationships at a single point in time, limiting the ability to infer causality between e-banking, HR practices, and HR

performance. Third, data were collected using self-reported questionnaires, which may introduce response bias. Lastly, certain contextual factors, such as organizational culture or external economic conditions, were not controlled, which could influence the observed relationships.

To overcome these limitations, Future research should use longitudinal designs to examine causal relationships and include diverse industries or geographic regions to enhance generalizability. Organizations are encouraged to integrate e-banking initiatives with strategic HR practices to improve HR performance. Additionally, banks should promote gender diversity and continuous employee development to strengthen human capital and optimize the benefits of digital transformation.

### Conclusion

This study presents compelling evidence that, in Pakistan's banking industry, e-banking, HR procedures, and HR performance function as a cohesive strategic system. The results highlight the critical role of digital transformation in influencing human capital outcomes by showing how e-banking adoption greatly strengthens HR practices, which in turn improves HR performance. By enabling more effective, responsive, and performance-oriented HR systems, e-banking becomes a catalyst for organizational effectiveness rather than just a technology advancement. HR's transition from an administrative role to a strategic partner in value creation is further supported by the high correlation between HR practices and HR performance. Furthermore, as banks manage swift digital transformation, the observed workforce demographics underscore the necessity of more inclusive and forward-thinking HR policies. Overall, by presenting e-banking and HR management as complementary skills, this study enriches the literature and provides banks looking to maintain competitiveness in a more digitized and dynamic world with insightful theoretical and practical information.

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