The Role of Digital Human Resource Management on Organizational Adaptability and Sustainability in Emerging Economy

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Abstract

The research paper focused on the role of digital human resource management on organizational adaptability and sustainability in emerging economies in Karachi. This scientific study aims at examining null hypothesis which analyzes that there is no relationship between digital HRM and organization ability to be adaptable and sustainable in various organizations in Karachi. The research design is descriptive as we establish the association between dependent and independent variables. Our independent variable is Digital HRM which includes digital performance management, digital intensity, and digital transformation that are provided to organizations to improve their performance, adaptation capabilities and employee state optimization. A structured questionnaire is designed to collect approximately 100-sample size samples via online and by organizations visits. A survey forms were distributed using random sampling method among more than six different public and private sectors of Karachi. The research is quantitative in nature and analyzed through confirmatory factor analysis (CFA) and structural equation model (SEM) by using smart PLS. The findings show that digital HRM is positively and significantly correlated with organizational resilience. The study also revealed that adaptation capabilities are a strong mediator between digital HRM and organization resilience. The integration of digitalization's of HRM practices significantly enhances the organization's adaptability and productivity. The study included both quantitative and qualitative data and examined the relationship of digital HRM influences the organization's resilience from the viewpoint of public and private sector in Karachi city.

Keywords*: Digital HRM, adaptability, employee engagement, resilience, sustainability*

Introduction

In today's business environment, organizations are increasingly vulnerable to uncertainties, disruptions, and pressures of digital transformation that call on their ability to be competitive. Organizational resilience has thus become one of the key capabilities that allows firms to anticipate, absorb and adapt to unanticipated change while maintaining performance and long-term viability (Bahyan et al., 2025; Duchek, 2020). Human Resource Management (HRM) is a key enabler of resilience in that it provides the skills, motivation and flexibility of employees to cope with a turbulent environment. (Zahoor et al., 2024). The digitization of HRM - also known as Digital HRM - has reshaped the way organizations hire, manage, and retain talent. Additionally, the leveraging of the future of HR, including applications of artificial intelligence (AI), machine learning (ML), and analytics can enable HR functions to more effectively align with organizational strategies and drive resilience and innovation.(Theres & Strohmeier, 2024; Zhang et al., 2025)

The digital revolution has transformed the nature of organization management of human capital, and digital HRM tools and platforms have simplified operations, enhanced communication, and made it possible to make decisions based on data (Wahdaniah et al., 2023). This study hopes to make prescriptive suggestions that organizations can use to create a workforce that is more adaptable, resilient, and ready to face a bright, dynamic future, by looking at how the adoption of digital HRM affects the organizational resilience (Huang, 2022).

Digitalization has proven to be an effective asset to organizations during a difficult period such as the COVID-19 epidemic. Resilience can prevent additional setbacks in organizations, resolve the disruption, and come up with smart solutions when time is of the essence (He et al., 2023).

This research will explore how digitalized Human Resource Management (HRM) can help organizations to navigate complexity and to bring solutions by combining technological advancement with human adaptability. The study would explore how digital HRM contributes to building resilient, sustainable, and people-centered workplaces. Most of the previous research focuses on automation and systems and tools but this study brings attention towards the human element that how to foster a culture that will be helpful for employees to adapt the changes and to respond to them quickly. (Zhang & Chen, 2023)

Digital transformation has transformed the way organizations hire, manage, and retain talent. Adoption of cutting-edge technologies like artificial intelligence, machine learning and analytics should help HR better resonate with organizational strategies, subsequently fueling resilience and innovation.(Theres & Strohmeier, 2024; Zhang et al., 2025)

Problem Statement

In a rapid evolving business environment in today’s world, where organizations are encounter numerous challenges related to Technological disruptions, uncertainty of socio-political factors,

global crisis and vigorous market conditions. Consequently, building organizational resilience and its ability to be adaptive, recover and to be prosper despite the presence of adversity has emerged as a strategic requirement. Simultaneously, the emergence of digitalization in Human Resource Management Practices has upgraded conventional HR practices by incorporating cloud-based technologies, AI, data analytics, and online communication solutions.

The current gap is a challenge to HR leaders who not only want to use digital tools to achieve efficiency, but also to embark on strategic resilience. Therefore, research is required to find out the digital HRM factors that influence organizational performance and productivity. This research provides direction for organizations to be more resilient in a fast-changing business environment through adopting necessary advancements in the digitalization of their human resource management system.

Hence, that is why this research should be taken as it focuses on the intersection of digital HRM and organizational resilience, which depicts a critical area of research that requires an extensive review of existing literature to thoroughly ascertain key themes, research gaps, and the potential for future research. This research will add to the body of knowledge in digital HRM, offering valuable insights and theoretical frameworks for refining organizational resilience and guiding future research in this area by addressing the gap in understanding how digital HRM influences organizational resilience through the mediating mechanisms of adaptation capability, organizational performance management and employee state optimization. The findings of this research aim at providing a comprehensive structure for organizations seeking to amplify their resilience through improved digitalization HRM practices that will benefit them in the long run in the modern business world. Ensuring adaptation capabilities, digital performance management and employee state optimization.

Research objectives

The study addresses the gap to find the impact of digital HRM influence the organization resilience by reflecting its ability to adaptation capabilities, digital performance management and employee state optimization. Considering the significant challenges and disruptions that companies often find themselves fighting frequently at both internal levels of the organization and external market environment, including the turbulence of the market, technology transformations and regulatory shifts, the creation of the strong resilience in organizations and the conversion toward the digital business practices has become the main priority. (Ahmić & Ćosić, 2025). Primary data is collected through structured questionnaire developed from past studies and sampling area was Karachi city. Responses were collected from more than six organizations by both online (Google-based questionnaire format) and paper-based format (manually). Secondary sources were also consulted at the beginning to gain an insight into the problem. It was found that transformation of human resource management into digitalization may affect organization resilience.

This research aims to explore how the impact of digital HRM is linked to the resilience of organizations in new economies. With such research objectives being addressed, the study will meet a better comprehension of the mechanisms and contextual aspects of the correlation between digital HRM and organizational resilience. Essentially, it is aimed at providing a comprehensive, structured, and thoughtful review of current studies with the view to enhancing more practical and competent decision-making related to the area of digital HRM and organizational resilience

Research Questions

RQ1: How does digital intensity influence an organization's ability to adapt in a technology-driven business environment?

RQ2: How Transformational Management Intensity facilitates the development of employee adaptability during digital transformation?

RQ3: What is the relationship between adaptation capability and digital performance management practices in organizations?

RQ4: How does adaptation capability influence employees' psychological optimism during digital shifts?

RQ5: In what ways does Transformational Management Intensity shape employees' state of optimism in the context of digital HRM?

RQ6: Does employee state optimism significantly enhance organizational performance?

Significance of The Study

Technological advancement over the past few years has been increasing significantly specifically after the Covid 19 pandemic. This will affect the businesses, and its functions drastically. Digitalization in human resource management system refers to streamline HRM practices to enhance the organization resilience in modern world. Therefore, this study posits the major noteworthy to business organizations operating in Karachi, Pakistan. Which will emphasize discrete factors that may play a vital role in enhancing the organization's overall productivity and profitability due to technological advancement in its HRM system. This research will find digital HRM variables that are required to be executed to make organizations more resilient towards unpredictable situations and crisis. The relevance of this study lies in examining the complex nature of the linkage between digital HRM and organizational resilience, with valuable information on the benefits that an organization can gain by implementing digital technologies to ensure a stronger resilience capability and ability to overcome any disruptive blow (Ahmić & Ćosić, 2025; Zhang et al., 2025)

Literature Review

Digital HRM

The introduction of digital technologies in human resource systems has disrupted traditional practices, resulting a new branch of science referred to as Digital Human Resource Management being a strategic choice for organizations in order to improve efficiency, employee experience and gain a competitive advantage (Zhang & Chen, 2023) The availability of advanced software, mobile technologies, and cloud-based platforms facilitate streamlining tasks and automating workflows for HR professionals. Furthermore, these tools support making informed decisions based on analyzing data. (Prasad, 2024) Companies are now using digital tools to integrate big data analytics with an aim of enhancing business productivity, especially in the IT industry. (Haziazi, 2021).The constant growing access to more advanced software, cloud-based services, and mobile solutions which allow hiring professionals to automate their work processes, simplify the workflow, and implement data-informed choices lies in the foundation of this transformation.(Prasad, 2024).

HRM digital transformation has become a major topic of academic studies, with researchers discussing its multiple aspects, such as the influence on HR practices, attitudes of the staff or organizational performance. Bibliometric studies demonstrate that the topic of interest in the digitalization of HRM is rapidly increasing, especially after 2020 which is a sign that people have begun to realize the significance of the topic in the current business setting (Contreras et al., 2024). Although, the trend in digital transformation has encouraged the development of interest in getting the challenges and opportunities that are available to both research and practitioners in human resource management field (Reyes-Cornejo et al., 2025)

Digital Performance Management

Digital performance management is one of the essential areas of interest that a company should consider leveraging the input of an employee in a modern digital era. The omnipresent power of technology demands an in-depth analysis of the effect that digital applications and platforms have on the performance of the employees and general success of the organization (Wang et al., 2024). This literature review explores the authors taking an in-depth look at the various aspects associated with digital performance management, with respect to its theories, practice, and the corresponding threats and opportunities it poses to employees and organizations.

Digital transformation has dramatically transformed the meaning of work, as it requires employees to have the skills and competencies that will help them apply digital technologies profoundly. (Wang et al., 2024).

Digital Intensity

Digital intensity is a complex phenomenon that describes or reflects to what degree an organization whose operations, value propositions and strategic plans include digital technologies in its DNA.

It has an indicator of the intensity and extent of digital technology implementation that affect the different factors of organizational performance, innovation and competitive advantage.(Siregar & Akhter, 2024) Furthermore, Digital intensity is directly related to digital transformation and is a strategic pivot towards the use of digital technologies to develop new models of business, improve customer experiences and streamline internal processes. (Alojail & Bhatia, 2023).The ubiquitous character of digital technologies has also contributed to the high level of interest in exploring the ways in which organizations can successfully use these tools to optimize their day-to-day operations and strategic positions Crimea. (Ahmed et al., 2020)

Transformation Management Intensity

Digital transformation, which can be simply defined as introducing digital technology into every aspect of a company, brings fundamental changes to the way organizations are run and the way services are provided to the customers. The digital transformation refers to implementing and using digital technologies and solutions to streamline the processes and make customer experience and innovation more successful in the organization (Hasan et al., 2025).Digital transformation does not imply installing new technologies only; it presupposes the complete change in terms of organizational culture, processes, and strategies (Paul et al., 2024). It enables radical transformation in organizational performance with technology, qualified employees and executives, and this enhances organizational performance, particularly innovative organization, driving the impetus of innovation. (Porfírio et al., 2023). Recent research has been devoted to the definition of digital transformation, its evaluation, and the benefits it implies to businesses and the economy as it causes opportunities and challenges. (Kyurova, 2022).

Organization Adaptability and Sustainability

Organizational resilience has become an essential concept in relation to long-term prosperity and survival in the modern business environment, which is characterized by fluctuations in technological progress and other global events. (Zhang et al., 2025). The concept of organizational resilience refers to the capacity of organization to successfully anticipate, prepare, respond, recover and adjust, as it becomes the subject to disruptions and adversities, as well as evolve with the change (Bouazz & Smaoui Hachicha, 2018). In the context of defining organizational resilience, (Annarelli & Nonino, 2016) defines it as the flexibility or capacity of an organization to adapt well and respond skillfully to changes that are unexpected. In terms of crises and at the same time, being able to maintain base mission and run at an efficient level. Moreover, organizational resilience was defined as the ability of any organization to predict potential threats and to effectively react to failures as well as adapt to changing conditions. (Duchek, 2020b). This research paper focuses on three important variables outlined by (Trenerry et al.,2021) in which digital HRM can facilitate organizational resilience are adaptation capabilities, organizational performance, as well as state optimism on the part of the employees themselves. On the other hand, Adaptation capabilities refer to the capacity possessed by an organization to adjust its strategies, processes, and structures regarding the dynamic environment (Roumpi, 2023).

Digital HRM Impact on Adaptability and Sustainability in Emerging Economies

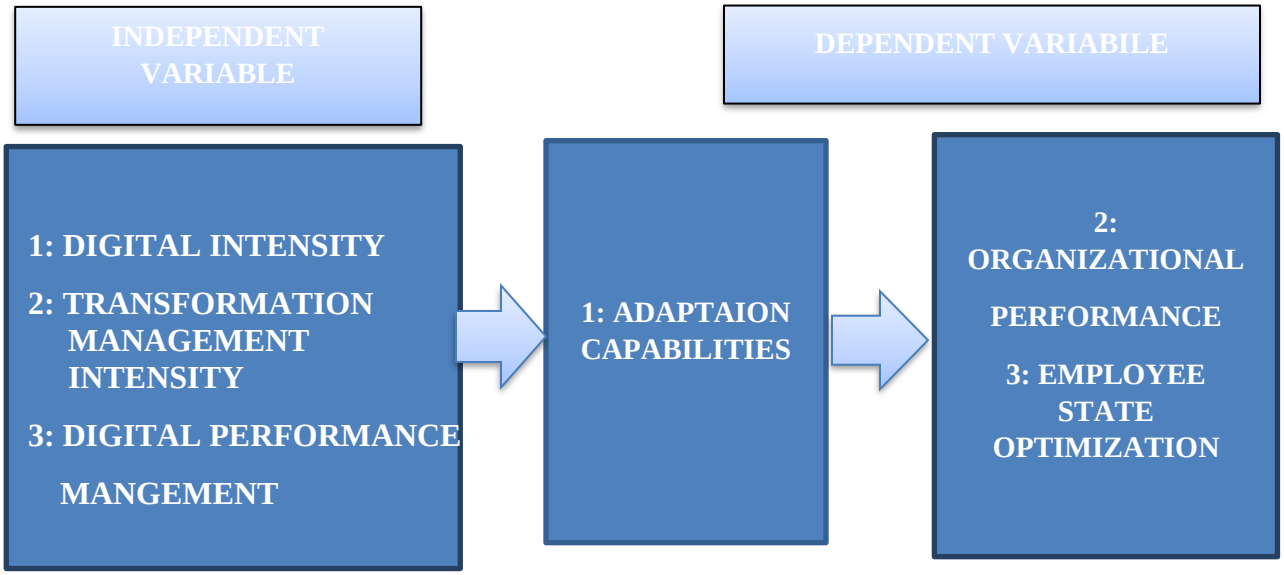
Digital HRM has a complex effect on organizational resilience, as it affects multiple domains of an organization's resilience to the challenges and its capability to survive and overcome them. There should be strategic measures taken to ascertain that the business is transformed digital in every way that counts. (Prasad, 2024). Digital HRM enables HR experts to do away with workloads and concentrate on innovative activities connected with motivation of employees, enhancement of working environment, search and retention of valuable employees. (Xiang et al., 2023)

Theoretical Framework

The purpose of the Theoretical framework justifies the overall research in a concise manner. For digital HRM there are a lot of programs to consider, but in this research, we focus on six arrangements which are digital performance management, digital intensity, and transformation management intensity. Selection of these arrangements in discrete organizations to identify their impacts on adaptation capabilities, organizational performance and employee state optimization on an organization overall ability of resilience. To briefly describe the purpose of research, the model shown below was developed and the variables are a derivative of previous research studies. Thus, the theoretical framework of this paper comprises digital performance management, digital intensity, transformation management intensity as independent variable in relation to organizational performance and employee state optimization as dependent variables, and mediating role of adaptation capabilities, which are constructed in the framework as depicted in the Figure below.

Research Model

Figure 1
Source: Author's Work



Hypothesis Development

Digital Intensity (DI) (Independent Variable)

The hypothetical development regarding the variable of digital intensity on organizational resilience may be composed based on the information that can be obtained in previous research articles. Digital intensity, which is a factor that reflects an integration level of digital technologies within the work of an organization, is hypothesized to increase organization resilience in the form of enhancing situational awareness, vulnerability management, and adaptive capacities. This hypothesis is supported by empirical evidence from various sectors. Intensity of digitalization can be used to increase the resilience of an organization's operations to external crisis and uncertainties prominently in the banking and energy industries.

H1: Digital Intensity (DI) has a significant positive impact on Adaptation Capability (AC).

Transformation Management Intensity (TMI)

Transformation management (TMI) is a composite process surrounded by digital technologies installment into every sector of a business, which irreversibly shifts the functioning of organizations and the value production in the direction of their customers. Numerous studies strongly support the hypothesis about the positive effects of digital transformation on the resilience of an organization because they have implications that digital transformation strengthens the resilience of an organization to withstand external shocks and uncertainties.

Additionally, digitalization is conducive since it helps in value co-creation and connects with customers to ensure resilience. Businesses that proactively interact with the customers and stakeholders can counter disruptions better and ensure customer satisfaction and loyalty. The culture of continuous learning and iterative prototyping, with the help of digital transformation, contributes to the development of a resilient organizational culture, if the customer-centric mindset supports it. (Bahyan et al., 2025)

H2: Transformational management intensity has a significant positive effect on Adaptation Capability.

Digital Performance Management (DPM)

Digital performance management encompasses practices that are significant and important to organizations that desire to be more effective and responsive because of the ever-growing digital world. This shift is particularly significant in the context of rapid technological advancements, where the ability of an organization to adapt is paramount for sustaining competitive advantage in the market. For instance, AI-powered analytics can be used to learn more about the performance of employees within organizations, so that the company can detect possible areas of potential improvement or apply resources more wisely, thus creating the culture of constant growth and endurance within the organization.(Ahmić & Ćosić, 2025).

H3: Digital Performance Management has a significant positive effect on Adaptation Capability.

Adaptation Capabilities (AC) (Mediating variable)

The hypothesis of the mediator variable, adaptation capabilities of an organization to embrace digital HRM practices can be derived by reflecting about the importance of adaptation capabilities in ensuring transition and integration of digital HRMS system. Adaptation capabilities may be interpreted as a fundamental mediating factor, which sees organizations in the suitable application of digital HRM practices because of an improved capacity to react to the technologies that arise in the working environment and a capacity to harmonize HRM strategy with the objectives of digital transformation. The role of adaptation abilities in the process of change and digital transformation in organizations is emphasized by numerous studies and supports this hypothesis.

H4: Adaptation Capability (AC) has a significant positive impact on Employee State Optimism (ESO).

Organizational Performance Management (OPM)

Organizational performance management refers to predicting the overall productivity of an entire organization. However, Organizational performance management (OPM) is an essential component to the overall success of organizations in ensuring high levels of organizational efficiency and organizational effectiveness in meeting its strategic goals. When performance management practices are embraced in organizational operations, there is a substantial effect that can be achieved on the financial and non-financial results of an organization. In this research we will explore the empirical studies related to organizational performance management which will enhance by the integration of digitalization of HRM practices.

Employee State Optimization (ESO)

The dependent variable which we have created to support our research is employee state optimization, which is a crucial factor while adopting digital HRM to enhance organization resilience. Employee state optimization refers to maximizing efficiency, effectiveness and job satisfaction of an organization human resource. This is a very critical process in the digital economy where modern organizations aim to ensure that they optimize the use of their human resources to attain improved productivity and organizational output. Whilst digitalization of human source management of an organization can foster the ESO of an organization significantly it can enhance the productivity of an organization in the long run. Furthermore, by considering the various effects of digital HRM on organizational processes the hypothesis of the dependent variable Employee State Optimization in connection with the performance of an organization in the case it adopts digital HRM practices can be formulated. The use of digital HRM is argued to have favorable influence on employee state optimization by promoting HRM effectiveness, adaptability, and the utilization of technological improvement.

H5: Transformational Management Intensity (TMI) has a significant positive impact on Employee State Optimism (ESO).

H6: Employee State Optimism (ESO) has a significant positive impact on Organizational Performance (OP).

Research Methodology

Research Design

In this research, the impact of one variable on the other one is focus causals research. (Chawla & Sondhi ,2011) There was use of the quantitative research methodology. The survey analysis is gathered based on the survey data a self-administered questionnaire specially constructed from existing literature and altered according to the study consideration. This study has sampled responses of 100 respondents who are represented by two genders, Male and Female Participants of this study are of the age of 25 to more than 50 and show varying degrees of employment, i.e., top management, non-management middle level to lower level, and different marital status.

Data Collection

Primary Data:

At the beginning, formal email and message the list was used to send invitations from LinkedIn and from organizations websites. The mail described the study, requesting voluntary participation. Therefore, primary data has been collected through manuals and online distribution of Questionnaires, but discussions have also been conducted to get enhancement in the comprehension of perceptions or thoughts of respondents on what this topic entails in this paper.

Table 01
Response Rate

Organizations	Questionnaire Distributed	Questionnaire Returned	Response%
Pakistan Civil Aviation Authority (PCAA)	35	30	86
Pakistan Telecommunication Company Limited (PTCL	20	15	75
Headstart School System Karachi	30	25	83
Meezan bank ltd	20	15	75
Eocean Pvt Ltd	10	8	80
PCSIR Karachi	10	7	70
Total	125	100	80%

It is a successful question-based survey. In this study about 125 questionnaires were administered to approximately six public and private sectors of Karachi where 100 questionnaires were back as a response to the questionnaires. However, 80% of the response rate is as represented in the above table.

Demographic Analysis:

Most of the respondents (60.6 %) were male. The ratio of married respondents was 59.29%. The highest percentage of the respondents in the sampled organizations worked at the middle level of management level approximately (68.72%). Most of the respondents were lower to middle level managers.

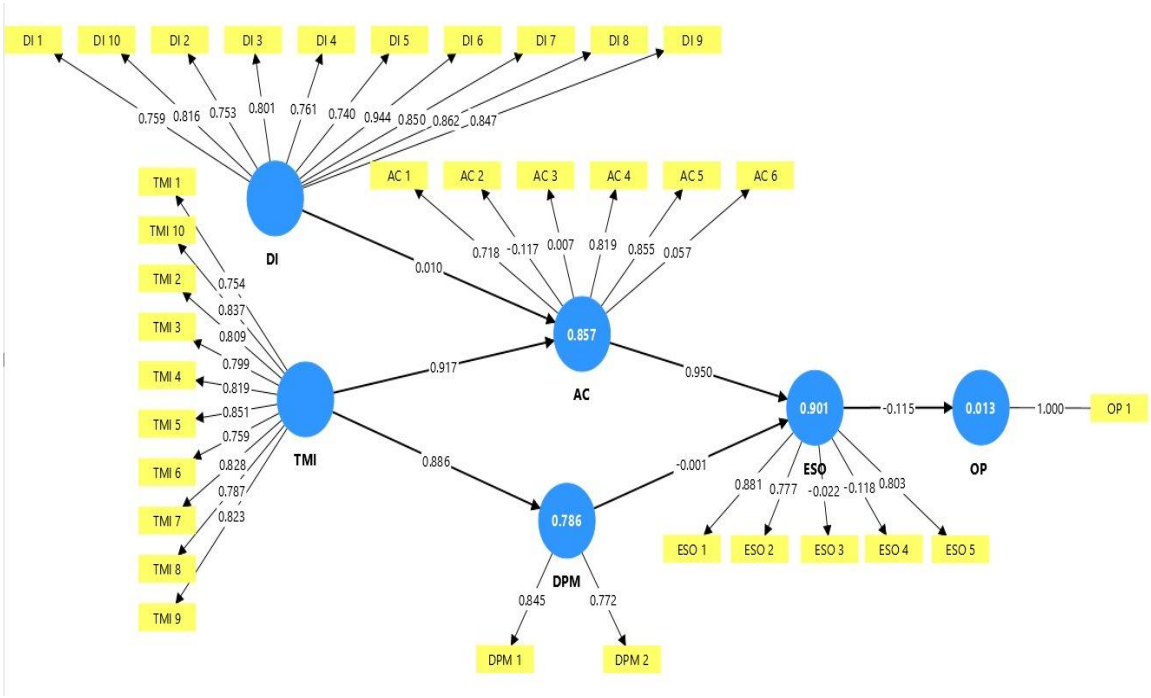
Data Analysis

To test the study hypothesis, we have been using the structural equation model (SEM) Smart PLS software has undergone testing. This technique is highly practiced in social science since it can estimate several endogenous and exogenous variables at the same time (Hair & Sarstedt, 2019; Shmueli et al., 2019) and is appropriate to small and skewed data samples and complex models (e.g., mediation, moderation and moderate mediation) (Zhu et al., 2021) . The PLS software satisfies the needs of the study (Hair et al., 2013). One model that is predominantly applied in this section is the PLS-SEM model that is used to analyze and validate the statistical measurements and relations among the variables to be studied.

Measurement model

For the measurement model we have approached SEM. Typically, SEM is a method for analyzing the structural relationships between endogenous and exogenous factors. Factor analysis and the model's multivariate analysis are both included in structural equation modelling. To determine whether the routes demonstrating the relationship between the measured and latent variables are significant or not, we need to first examine the model fitness. Furthermore, research was conducted to assess the direct and indirect effects of each construction.

Figure 02
Research Model



As a measure to guarantee reliability and convergent validity, the model has first been validated by analyzing composite reliability, factor loadings along with Average Variance Extracted. The HTMT ratios were used to confirm discriminant validity. The fit indices of the models confirmed

the consistency of theoretical model and experimental data. Such strict validation provided grounds to study structural relations among constructs using path analysis.

Table 02
Outer Loadings

	Original sample (O)	Sample mean (M)	Standard deviation (STDEV)	T statistics (|O/STDEV|)	P values
AC 1 <- AC	0.866	0.839	0.046	18.808	0.000
AC 2 <- AC	-0.126	-0.112	0.299	0.423	0.672
AC 3 <- AC	-0.070	-0.054	0.297	0.236	0.814
AC 4 <- AC	0.859	0.835	0.044	19.709	0.000
AC 5 <- AC	0.893	0.872	0.036	24.643	0.000
AC 6 <- AC	-0.008	0.007	0.300	0.027	0.979
DI 1 <- DI	0.821	0.819	0.038	21.705	0.000
DI 10 <- DI	0.819	0.819	0.041	20.095	0.000
DI 2 <- DI	0.817	0.814	0.041	20.109	0.000
DI 3 <- DI	0.830	0.829	0.038	22.075	0.000
DI 4 <- DI	0.842	0.840	0.039	21.838	0.000
DI 5 <- DI	0.731	0.729	0.054	13.428	0.000
DI 6 <- DI	0.872	0.872	0.031	28.301	0.000
DI 7 <- DI	0.843	0.843	0.038	22.000	0.000
DI 8 <- DI	0.871	0.870	0.032	27.469	0.000
DI 9 <- DI	0.905	0.904	0.020	45.723	0.000
DPM 1 <- PM	0.917	0.917	0.019	47.785	0.000
DPM 2 <-DPM	0.900	0.899	0.027	33.202	0.000
ESO 1 <- ESO	0.893	0.871	0.040	22.297	0.000
ESO 2 <- ESO	0.849	0.829	0.050	16.941	0.000
ESO 3 <- ESO	-0.019	-0.001	0.295	0.063	0.950
ESO 4 <- ESO	-0.116	-0.092	0.291	0.399	0.690
ESO 5 <- ESO	0.915	0.890	0.038	23.862	0.000
OP 1 <- OP	1.000	1.000	0.000	n/a	n/a
TMI 1 <- TMI	0.840	0.839	0.040	20.930	0.000
TMI 10 <-TMI	0.777	0.776	0.049	15.911	0.000
TMI 2 <- TMI	0.859	0.858	0.032	26.872	0.000
TMI 3 <- TMI	0.841	0.840	0.036	23.239	0.000
TMI 4 <- TMI	0.808	0.807	0.042	19.096	0.000
TMI 5 <- TMI	0.843	0.843	0.034	24.842	0.000
TMI 6 <- TMI	0.837	0.835	0.038	21.951	0.000
TMI 7 <- TMI	0.884	0.884	0.027	32.601	0.000
TMI 8 <- TMI	0.806	0.805	0.043	18.760	0.000
TMI 9 <- TMI	0.793	0.791	0.045	17.732	0.000

Outer Loadings Interpretation

Outer loading assists with the measurement and interpretation of the intensity and importance of correlation between every indicator about the construct. In most instances, the value of 0.70 has been termed strong, and when the value of p is less than 0.05, it implies that the result can be considered statistically reliable. Most of the constructions, such as AC, TMI, DPM, DI, and ESO, in this study had high and significant loadings. Conversely, most of the constructions showed loadings of about 0.86 to 0.89, including AC1, AC4, and AC5, and thus, it strongly confirms the fortitude of the AC construct. On the same line, in viewing the table above, namely, DI6, DI8, and DI9 have loadings that are more than 0.87, which strengthens the robustness of the constructs. The strong values indicate a close relationship between DPM1 and DPM2 constructs. Although such

indicators as AC2, AC3, AC6, ESO3, and ESO4 indicate negative, weak, and non-statistically significant loadings. Such elements are failing to add to their constructions. Elimination of these indicators should be regarded to enhance the reliability of the model. There is also organizational performance (OP), which is measured with one indicator, OP1. In restricting the reliability test, it is satisfactory to the model identification. The issue to be addressed in future studies is to increase the item of OP to increase its validity.

Table 03
Cross Loadings

	AC	DI	DPM	ESO	OP	TMI
AC 1	0.866	0.598	0.590	0.643	-0.075	0.638
AC 2	-0.126	-0.139	-0.056	-0.116	0.135	-0.078
AC 3	-0.070	-0.031	-0.022	-0.003	0.071	0.028
AC 4	0.859	0.711	0.647	0.725	0.009	0.729
AC 5	0.893	0.706	0.726	0.744	0.022	0.789
AC 6	-0.008	0.046	0.113	0.022	0.145	0.088
DI 1	0.603	0.821	0.627	0.665	-0.105	0.669
DI 10	0.649	0.819	0.679	0.707	-0.031	0.745
DI 2	0.599	0.817	0.640	0.692	-0.011	0.714
DI 3	0.637	0.830	0.573	0.607	0.052	0.679
DI 4	0.605	0.842	0.547	0.614	0.076	0.752
DI 5	0.588	0.731	0.386	0.575	-0.007	0.651
DI 6	0.751	0.872	0.636	0.804	-0.064	0.818
DI 7	0.676	0.843	0.582	0.721	-0.177	0.784
DI 8	0.685	0.871	0.636	0.782	-0.050	0.775
DI 9	0.674	0.905	0.634	0.730	-0.089	0.816
DPM 1	0.747	0.668	0.917	0.698	-0.018	0.719
DPM 2	0.619	0.626	0.900	0.615	-0.054	0.678
ESO 1	0.789	0.695	0.663	0.893	-0.045	0.724
ESO 2	0.656	0.682	0.657	0.849	-0.090	0.743
ESO 3	0.003	-0.023	0.019	-0.019	0.214	0.029
ESO 4	-0.068	-0.159	-0.088	-0.116	0.223	-0.103
ESO 5	0.706	0.820	0.603	0.915	-0.117	0.765
OP 1	-0.017	-0.051	-0.039	-0.107	1.000	-0.018
TMI 1	0.637	0.812	0.600	0.708	-0.014	0.840
TMI 10	0.727	0.657	0.645	0.641	0.032	0.777
TMI 2	0.702	0.753	0.623	0.792	-0.056	0.859
TMI 3	0.674	0.802	0.638	0.734	0.018	0.841
TMI 4	0.697	0.649	0.647	0.622	0.041	0.808
TMI 5	0.709	0.735	0.689	0.695	-0.054	0.843
TMI 6	0.612	0.754	0.636	0.617	0.099	0.837
TMI 7	0.706	0.799	0.652	0.750	-0.145	0.884
TMI 8	0.698	0.713	0.591	0.689	-0.083	0.806
TMI 9	0.699	0.695	0.651	0.701	0.018	0.793

Cross-Loadings Interpretation

Cross-loadings determines the discriminant validity; it determines whether the item correlates most with other things. Ideally good discriminant validity implies that each item comes nearer to its own construct and does not overlap with the other ones. The result of the above table promotes discriminant validity. AC1 loads at 0.866 upon AC that is greater than its relationship with ESO and TMI (0.866 on AC VS. 0.643 on ESO and 0.638 on TMI). DI9 has high loading on DI compared to that on TMI (0.905 on DI VS. 0.816 on TMI). The correlation between ESO and ESO5 is the highest (0.915 on ESO VS. 0.820 on DI and 0.765non TMI).
A low but moderate cross loadings are present between TMI and DI (DI6 loads 0.872 on DI and 0.818 on TMI). These values imply conceptual redundancy among the constructions that need some modification in the model or refinement in theory. Inconsistent and poor loading of the indicators AC2, AC3, ESO3, and ESO4 were observed in all constructs and as a result, these indicators are deemed not to fit in very well, hence these indicators should be dropped.

Table 04
Constructing Reliability and Validity

	Cronbach's alpha	**Composite reliability (rho_a)**	**Composite reliability (rho_c)**	**Average variance extracted (AVE)**
DI	0.952	0.954	0.959	0.699
TMI	0.949	0.950	0.957	0.688
DPM	0.790	0.794	0.905	0.826
AC	0.659	0.845	0.612	0.385
ESO	0.651	0.864	0.707	0.473

Construct Reliability and Validity Table Interpretation

The three main indices appear in the above table which is of construct reliability and validity. Cronbach Alpha, Composite Reliability (CR) and Average Variance Extracted (AVE) are the three main indices which are involved in the assessment of convergent validity and internal consistency whereby they remain a form of diagnostic indicator. Cronbachs Alpha and Composite reliability are above the acceptable limits of all constructs (> 0.70). The findings asserted that every construction was consistently measured by the items that belonged to it, and it indicates a high proportion of overall fit between observed and theoretical notions. That was done by displaying that the Average variance extracted score of the highest number of variables exhibiting convergent validity possess a steppingstone of 0.50. Nevertheless, there are also a few items that did not perform well, so both adaptation capability and employee state optimism were slightly lower (below 0.50), as they also have low loading indices. In case of removal of those indicators hence the average variance extracted value will be augmented. Such improvements will strengthen the construction of the model in terms of reliability and validity.

Table 06
R^2 Table

	R-square	R-square adjusted
AC	0.695	0.689
DPM	0.593	0.588
ESO	0.687	0.681
OP	0.011	0.001

R^2 Table Interpretation

The R^2 closure values of this study draw a demonstration of the proportion of variance of each outcome that could be described by variables that predict them. Its outcome indicates that Adaptation Capability, Employee State Optimism, and Digital Performance Management groups all have good outcomes, and the values of these groups are 0.695, 0.687 and 0.593. The implication of the outcome is that the mentioned variables (digital intensity, transformational management intensity and adaptation capability) are performing consistently in anticipating these areas. Nonetheless, the effect of organization performance is relatively insignificant (0.011), which means that only 1.1 % of its variability could be attributed to employee state optimism. It implies that the existing model has little to explain why this specific outcome occurred and the performance of an organization could be conditional on others. Although it has such limitations, in the case of more constructions, it proves to have power as an explanation.

Table 07
Model Fit

	Saturated model	Estimated model
SRMR	0.107	0.114
d_ULS	6.846	7.706
d_G	3.808	3.924
Chi-square	1532.147	1558.415
NFI	0.598	0.591

Model Fit Table Interpretation

The table of model fit indices above provides additional information to improve the working of a model. Saturated and estimated models exhibit standardized root mean square residual (SRMR) whose values are 0.107 and 0.114 respectively. The values of estimated and saturated models are rather more than 0.08, which is considered as a conservative mark. They remain in the conclusive scale of PLS-SEM model which is normally up to 0.12. Normed fit index (NFI) of less than 0.60 is not a serious issue in the given case because PLS-SEM is less concerned with fitting the model than with predictive precision. Other indicators such as d_ULS and d_G were also observed but they are merely descriptive tools in terms of making judgments on alternative models. Overall, these findings indicate that the model is adequate in performing exploratory research and can give a good foundation to study structural association of the constructs.

Conclusion and Discussion

Discussion

The results of this study indicate that digital human resource management (HRM) has an impact on both the dependent variables, namely, organizational performance management and employee state optimization, with a mediating variable being adaptation capabilities of both the public and private sectors of Karachi, Pakistan. Digital HRM practices have become a popular organizational concept over the past few years, in the recent years since the pandemic of COVID-19. It is now one of the key concerns of human resources, organizational practitioners, and senior executives in the corporate world today. According to Ahmić & Ćosić (2025) digital HRM technologies enables organizations to become more resilient, providing HR specialists with the specifics of using digital technologies to increase employee adaptability, efficiency in crisis communication, and flexibility to respond to future disruptions. However, digital Human. The following discussion will examine, through different perspectives, the aspects of digital HRM and its contribution to organizational resilience.

Many authors emphasized the organization's adaptation capabilities, to enhance the organization's resilience and ability to be adaptable to any major circumstances by prioritizing digitalization in their human resource management practices. Our results also confirm previous literature on the relationship between digital HRM practices and organizations' resilience. According to Y. Liu et al. (2024) stated digital orientation (DO) is very critical and important in providing organizational resilience because it provides firms with those capabilities of responding to uncertainties and pressures. It is especially successful outside state-owned business, where resilience can be additionally enhanced by adaptive adjustments in the leadership and culture. Organizational resilience increases due to investment in digital technologies and improvement in technological innovation capacity that is significant to sustain competitive advantages in the manufacturing industry (K. Zhang et al., 2025).

Nonetheless, digital transformation may also be a challenging game with two sides of a sword. Although it can make employees of an organization feel resilient since they are doing well at work, it can cause the feeling of job insecurity, which is why balanced implementation practices should be pursued (P. Liu et al., 2024). Furthermore, HRM systems based on flexibility also lead to resilience of an organization through incorporation of intellectual capital. Thus, digital competencies boost such relationships imply that organizations that have strong digital services are in a better way to utilize their intellectual abilities to become resilient. (Li & Lin, 2024)

Our result suggested that organizations are most likely to experience the positiveness in organizations overall productivity by adopting digital HRM system. Ahmić & Ćosić (2025) argued that the implementation of digital HRM practices can not only improve the anticipation transacting but also can substantially reinforce the coping systems in the organizations. Organizations can determine stress points and deploy resources better hence preserving the level of productivity even in complicated situations using real-time data analytics in times of crisis. The digital

transformation mediates its efficacy in increasing resilience in organizations through ambidextrous innovation, which entails both exploitative and exploratory innovation. (Zhang et al., 2021) According to the, Liu et al (2024) digital transformation is a two-edged weapon which has presented both opportunities and challenges in terms of employee resilience. It can empower and at the same time result in job insecurity. Digital transformation efforts can result in a quantum jump in organizational resilience since they assist the firms to become more adaptable and resilient to bounce back after any crisis in a stronger manner.(Browder et al., 2024).

Our results seem to indicate that adaptation capabilities of an organization play a significant role in an organization's ability to cope with difficult situations and remain resilient. Consequently, adaptive capacity is an important mediator in transforming digital efforts into organizational resilience. Since flexibility-oriented HRM systems contribute to the building of intellectual capital, which increases adaptation capacities and, therefore, the resilience of organizations, the use of HRM systems is one of the dimensions of flexibility (Li & Lin, 2024).

Previous research shows that by fostering a culture of flexibility actively, an organization is likely to withstand external forces and internal turmoil, as elements of culture like transparency of communication and collective values are powerful practical means of increasing resilience (Muadzah & Suryanto, 2024). Our results show that this effect has a strong and perdurable impact on organizational productivity. So, adaptation capabilities are full mediator between digital HRM and organization performance management and employee state optimization. Moreover, in our research Cronbach's alpha for digital intensity =0.952, transformational management intensity =0.949, digital performance management =0.790, adaptation capabilities= 0.659 employee state optimization=0.651 i.e. greater than 0.60, the minimum value sufficient for research purpose.

Conclusion

In this paper we studied the relationship between digital HRM and organization resilience. Our primary aim of the analysis was to ensure that different types of digital HRM practices, namely, digital intensity, transformational management intensity and digital performance management, produce different impact on organization performance management and employee state optimization in public and private sector of Karachi, Pakistan. This study is not only beneficial in academics but also in the various sectors such as insurance companies, banking sector, pharmaceutical companies, shopping centers etc. More than six known organizations of Karachi have been surveyed to give correct answers. We have also checked the ability to adapt as an intervener between digital HRM practices and resilience org and whether the strength of the intervener attribute of adaptation capabilities on resilience org differs across digital HRM arrangements. The article contained six sets of hypotheses. Our hypothesis is proved by the findings and discussion of all the results.

To conclude, this research paper revealed that digital HRM Practices are a strong predictor for productivity and increasing organization resilience. Since organizations are turning more to digital HRM practices, the importance of a balanced approach between technological innovation and

more human-related strategies should be prioritized. As an example, although AI can be effective in increasing efficiency of the recruitment process, it is vital to see that human intuition and judgment should also be part of the process of hiring since blindly following technological tools can be utilized to see the subtle qualities of a candidate that could be the perfect fit of the organizational culture. Furthermore, by cultivating a culture where staff members do not have to fear raising their voices to express their discontent with the use of technology at their work levels, more innovation and resilience would possibly be achieved because where there is free dialogue in an organization, it is much easier to adjust to new dynamics and challenges in the workplace environment. Such an emphasis on a two-sided strategy does not only help reduce the risks of technology dependence but also resonates with the realization that organizational resilience is fostered by a balancing of adaptive capacities and a culture that encourages them, and, in the end, increases the ability of an organization to operate successfully where uncertainty is the norm. This implies that Agile procedures support iterations and teamwork, and these are crucial to improving rapidly to face changes and unforeseen difficulties. Indicatively, companies with agile project management can respond to the market and internal fluctuations better and because of having a culture of flexibility and perpetual improvement. On the other hand, a higher percentage of employees responded to our survey were middle level managers, suggesting that digitalization of HRM practices can enhance their productivity by maximum due to automation in their work task by AI tools and software. By facilitating the flow of mental health resources and support structures, organizations which are proactive enough can ensure that it increases job satisfaction as well as the rate of retention which results in a stable workforce that can overcome disruptions.

Studies have shown that organizations keen on sharing working practices as well as the digital transformation initiatives are better placed to predict and react to disturbances and ultimately become more adaptable and sustainable in the long follow. In our research, all the employment levels were considered to have a wider picture at every level. Carrying out such research in the public and private sector highlighted that by providing employees with Digital HRM practices it not only helps them to be more productive but also to be more skillful towards their professional life. This will enhance their ability to thrive in difficult situations. Furthermore, according to the findings of recent research, the implementation of such analytical tools does not only increase the adaptability of an organization but also greatly improves the employee experience, which will result in a more resilient and empowered workforce that can better survive the changes.

Our findings extend previous digital HRM research that focused on organization resilience and its ability to be more adaptable and productive in most difficult times. In addition, adaptation capabilities have significant impact on both digital HRM and organization resilience in public and private sector of Karachi, Pakistan. Although adaptation capabilities have been linked to other constructs like organization performance management, and employee state optimization, it is the first time that we link different types of variables with Digital HRM and organization resilience together and found the mediating role of adaptation capabilities with organization adaptability, especially in public and private sector, in the digitalization of HRM literature. Previous research pointed out that digitalization of HRM has a slight influence on an organization’s ability to remain

adaptative in difficult situation but after COVID 19 there was a major shift in management practices of an organization. Our research shows that this effect is strong and has positive relation. So, adaptation capabilities are a full mediator between digital HRM and organization resilience.

Recommendations For Future Research

The study recommended the use of digital HRM practices more in organizations to enhance their productivity and ability to be adaptative in today's most difficult and unnecessary situations. In a further attempt to entrench the organizational resilience, it is important to address the aspect of cross-functional teams in promoting innovation and adaptability. Such teams that pool together people with varied expertise and outlook, can help to quickly address the problem at hand as well as increase the organizational preparedness towards unexpected issues. Furthermore, organizations can make best use of collective intelligence by creating a culture where inter-departmental collaboration is encouraged to help them find their way through complexities in a much greater way. Evidence shows that the more organizations utilize cross-functional collaboration, the better the organizations perform because they get a better capacity of integrating insights across different fields, thereby becoming more resilient in case of crises.

It is evident that as organizations adopt these adaptation capabilities, this process should consider investing in employees who are able to foster inclusiveness and encourage team workers to be more productive, building a stronger knit of resilience within the organization. Hence encourage the employee state optimization that will enhance the overall organization performance management system. Furthermore, companies are advised to focus on creating mentorships with mid-level leaders and new talent, transferring knowledge and being able to better adapt to changing circumstances and working environments

For future research, it is recommended that same study could be directed on a large-scale sample, in other cities, with a few more digital HRM factors and with more adaptation capabilities like compressed training and development of the employees to adapt technological changes and changes adaptively, risk willingness and social norms, Resource Redundancy etc. that could be incorporated in order to expand the research and in order to achieve the more reliable and valid findings or those that can be used through other data gathering method or those that could include large number of samples so that they could yield better results.

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