When and how does e-HRM optimize communication pace and processing time?

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Abstract

Purpose – This study aims to investigate the effects of electronic human resource management (e-HRM) on communication pace and processing time reduction through the mediation of organizational agility. The study also investigates the moderating role of technological attitude (TA) on the relationship between e-HRM and organizational agility.

Design/methodology/approach – The data was collected from 331 information and communication technology (ICT) companies – one respondent from each company working in the Human Resource Management (HRM) department. The data was analyzed through the partial least square structural equation model (PLS-SEM) using WarpPLS7.0 software to test the study’s hypotheses.

Findings – We found that e-HRM has positive significant effects on communication pace and processing time reduction through the mediation of organizational agility. Furthermore, TA is found to be positively moderating the relationship between e-HRM and organizational agility.

Research limitations/implications – The study adds significant value to the existing knowledge base on e-HRM by providing empirical insights about the role of e-HRM in optimizing the communication pace and processing time of today’s businesses.

Practical implications – The study also provides invaluable insights to practitioners to replace conventional HR systems with e-HRM to better perform HR functions by optimizing communication pace and processing time in the current fast-paced era.

Originality/value – E-HRM has become an issue of great significance in the contemporary corporate landscape to improve operational efficiency. Despite its widespread adoption in the corporate world, empirical evidence on e-HRM, particularly on its consequences, is still inconclusive.

Keywords Electronic human resource management, Organizational agility, Technological attitude, Communication pace, Processing time

Paper type Research paper

1. Introduction

Technology is a part of our daily environment and people have always simplified tasks and problems using modern information technology. Information technology can improve the efficiency of tasks by speeding up procedures (Andersen, 2001; Cheng et al., 2020; Lin et al., 2021; Melville et al., 2004; Szymkowiak et al., 2021). Its tools are vital for completing operations quickly and efficiently. To be competitive in this global market, businesses need to employ the latest technology to speed up their procedures (Al Mansoori et al., 2020; Hajimohammadi and Vafaei, 2019; Sakas et al., 2014; Soto-Acosta, 2020; Szymkowiak et al., 2021). Like other functions of an organization, Human Resource Management (HRM) has also adopted several changes and advancements, one of which is computer technology. The HRM and its record-keeping remained manually performed until the 1960s and 1970s when

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Mainframe computers were first time used in HRM to automate payroll and record-keeping (Stone and Dulebohn, 2013). By then, it emerged differently in different times such as human resource information system (HRIS) in the 1980s, microcomputers and client-server architecture providing remote access to HR databases in the late 1980s, integrated HRIS during the 1990s (Kavanagh et al., 1990; Stone et al., 2003). The evolution of the World Wide Web led to Web-enabled HR software in the late 1990s and early 2000s which gave rise to electronic HRIS (e-HRM) (Kavanagh et al., 1990; Stone et al., 2003). e-HRM is defined as “the planning, implementation and application of information technology for both networking and supporting at least two individual or collective actors in their shared performing of HR activities” (Strohmeier, 2007, p. 20). e-HRM has transformed HR processes to facilitate the centralization of the organizational and HR data and allow access to HR systems globally. All-encompassing, the evolution from manual HR and record-keeping to sophisticated e-HRM applications facilitated and empowered HR professionals and all stakeholders such as HR professionals, managers, employees, job applicants, business partners and alike (Dulebohn and Stone, 2018; Stone and Dulebohn, 2013; Stone et al., 2020; Zhou et al., 2022).

A good amount of research has been conducted in the field of e-HRM including conceptual papers (Stone and Dulebohn, 2013; Strohmeier, 2020), review papers (e.g. (Almashyakhi, 2022; Marler and Fisher, 2013; Wirtky et al., 2016; Zhou et al., 2022) and empirical papers exploring the effects of e-HRM on: firm performance (Bag et al., 2022; Shamaileh et al., 2022; Strohmeier, 2007; Zhou et al., 2021), employee performance (Nurlina et al., 2020; Nurshabrina and Adrianti, 2020), workforce management and talent management (Shamaileh et al., 2022), HRM effectiveness (Obeidat, 2016), and its antecedents related to the technology, organization and people (Bondarouk et al., 2017b; Zhou et al., 2022). However, we have identified a few issues in the literature on e-HRM which are still under-explored. First, less focus has been given to exploring the influence of e-HRM on the complex processual factors such as communication pace and reduced processing time which are of immense value to ensure the effectiveness of e-HRM (Skudiené et al., 2020). For instance, e-HRM speeds up the exchange of information within and beyond organizational boundaries and ensures that the required information is available to the user promptly (de Juana Espinosa et al., 2013). This subsequently helps make informed and timely decisions and reduces the processing time (Dulebohn and Johnson, 2013; Lengnick-Hall and Moritz, 2003; Stone and Dulebohn, 2013). However, despite extensive search on digital databases, we could not find a notable study exploring the relationship of e-HRM with communication pace and processing time, implying a substantial research gap in the existing literature. Although organizations deploy e-HRM systems to increase the communication pace and reduce the processing time, there are certain organizational mechanisms that translate the impact of e-HRM into such desired outcomes. One such mechanism is organizational agility which is “the capacity to react quickly to rapidly changing circumstances” (Brown and Agnew, 1982, p. 29). It is argued that deployment of e-HRM systems may not directly produce the required outcomes rather it is likely to contribute to organizational agility and increase the organizational capacity to quickly respond to the changing circumstances (Hamidianpour et al., 2016) which subsequently leads to communication pace and processing time. However, to the best of our knowledge, organizational agility has not been explored earlier as a mediator between e-HRM and communication pace and processing time. Thus, this research addresses this research gap and extends the existing literature by proposing a plausible mechanism that translates the effects of e-HRM into communication pace and processing time.

It is also argued that there are certain boundary conditions affecting the relationship between e-HRM and organizational agility. Although e-HRM can speed up the system and make an organization agile to respond to the changing environment (Alqarni et al., 2023; Hamidianpour et al., 2016), some boundary conditions are of great value to leverage and
maximize the benefits offered by e-HRM (Farhan et al., 2021). One such boundary condition is the technological attitude (TA) of people which is a human assessment of the introduction of new technologies in any setting, whether favorable or unfavorable (Fujihara et al., 2022). Organizational members can be of different generations and differ in terms of attitudes towards and use of technology (Fristedt et al., 2021; Morris and Venkatesh, 2000; Volkom et al., 2014). People who are more conventional and not oriented towards technological change may not be able to leverage the benefits of e-HRM for organizational agility while those who are more technology-oriented can quickly adopt e-HRM and contribute more to the organizational agility (Crocitto and Youssef, 2003; Zain et al., 2005). Technological attitude has remained under-explored whereas the existing literature paid more attention to the technological and organizational-related antecedents and outcomes of e-HRM (Bondarouk et al., 2017b; Kim et al., 2021). A notable study in this regard was conducted by Harris et al. (2003) that only examined people’s attitudes towards internet-based selection. The technological landscape has undergone a complete overhaul during the past two decades and there is a need to consider the people-related factors while studying e-HRM. This study is an attempt to address this important gap. Lastly, research on e-HRM has been mostly conducted in developed countries where the technology has been deeply institutionalized (Cascio and Montealegre, 2016; Kolesnikov et al., 2020; Yadav et al., 2020) and there is a significant difference in terms of technological advancement between developed and developing countries (Niebel, 2018). This difference may not be much visible in the IT sector because of business ties in the software industry across the world (Leung et al., 2021). However, in terms of managing human resources, even in the IT sector, organizations in developing countries like Pakistan are far behind the developed world. On the other hand, e-HRM remains under-explored in the IT sector of Pakistan indicating a notable lacuna in the existing literature.

The current research is a notable addition to the existing literature by exploring the effects of e-HRM on communication pace and processing time reduction through the mediating role of organizational agility and moderating role of TA in the information technology (IT) sector of Pakistan. In addition, this research provides valuable insights for the practitioners to leverage the benefits of e-HRM for organizational agility, enhanced communication pace and reduced processing time.

2. Theoretical framework
Electronics human resource management (e-HRM) has gained a prominent position in the contemporary business landscape and revolutionized personnel management within and beyond organizational boundaries (Almashyakhi, 2022; Marler and Fisher, 2013; Strohmeier, 2007, 2020). It has become an essential tool to enhance business efficiency and streamline processes by digitizing all functions of HRM such as recruitment, training and development (Bondarouk et al., 2017a). The role of e-HRM in the modern business world has been acknowledged in both academia and the corporate world because of its transformative role in reshaping HR functions. For instance, E-recruitment allows for a seamless hiring process by digitizing candidate sourcing, application screening, interview organizing and communication and reduces the time and resources conventionally needed for such tasks (Okolie and Iraibor, 2017; Thompson et al., 2008). Similarly, electronic capacity building offers personalized and scalable learning experiences, allowing trainees to learn at their own pace which, in turn, leads to a more adaptable and skilled workforce (Barrow, 2003; Ramayah et al., 2012). In the realm of performance and compensation management, electronic platforms offer real-time insights into people’s performance, enabling management to make data-driven decisions regarding recognition and rewards (Ahmad, 2015). Such digital transformation of HRM catalyzes operational efficiency and
empowers businesses to maximize their people management to compete in the increasingly transforming business world.

However, despite the widespread adoption of e-HRM in the modern business world, its academic literature particularly, on its consequences, is still inconclusive, with limited empirical evidence and divergent perspectives (Bondarouk et al., 2017b; Zhou et al., 2022). The limited empirical findings on e-HRM and its crucial role in reshaping the modern business landscape, according to the requirements of the current digital era, highlight the need for further exploring its novel consequences such as enhanced communication pace and reduced processing time. Communication pace is a novel variable, not well defined in existing literature. Thus, we draw this phenomenon on the existing literature as a pace at which information, notes, messages, ideas, etc. are exchanged among individuals, teams and departments within the organization as well as with the external stakeholders (Langan-Fox, 2001; Morris and Shin, 2007; Park et al., 2017). It is characterized by the efficiency, frequency and responsiveness of communication channels (Langan-Fox, 2001; Park et al., 2012). Similarly, processing time is a new phenomenon, not given attention by the existing literature. However, some relevant variables such as decision-making speed (Talaulicar et al., 2005) and cycle time (Calantone and Di Benedetto, 2000) are studied in the existing literature. Thus, we conceptualize processing time, drawing on the decision-making speed and cycle time (Calantone and Di Benedetto, 2000; Talaulicar et al., 2005), as the time needed to accomplish a specific job involving how swiftly decisions are made and processes are executed from beginning to completion in the organization.

We further believe that the effects of e-HRM on communication pace and processing time are better studied through the mediating role of organizational agility which is characterized by adaptability, flexibility and responsiveness (Brown and Agnew, 1982; Nafei, 2016a). In addition, existing literature paid more attention to the technical aspects of e-HRM while overlooking human behaviors as its relevant phenomenon (Ruël et al., 2004). Thus, the study also explores the moderating role of TAs of employees in the relationship between e-HRM and organizational agility. Thus, this research aims to offer insights on the interconnectedness of technological, human, and operational aspects of the organization to contribute to the existing literature and offer insights into the businesses navigating the evolving business landscape. The following sections develop the hypotheses and theoretical model of this research.

2.1 e-HRM and organizational agility

E-HRM is the use of information technology to network and support at least two separate people or groups in working together to complete HR-related tasks (Strohmeier, 2007, 2020). E-HRM involves performing all HR functions electronically for both internal and external stakeholders and offers a large number of advantages for the organizations (Marler and Parry, 2016; Strohmeier, 2007). We argue that like other forms of digitization (Ciampi et al., 2022), e-HRM has substantial implications for organizational agility that is the organizational ability to quickly adapt and react to environmental changes (Brown and Agnew, 1982). Change is seen as an opportunity, not a threat, by agile businesses (Highsmith and Highsmith, 2002). The ability of a company to recognize and swiftly respond to client needs is one of the main sources of competitive advantage in the modern digital era (Salmela et al., 2022; Weber and Tarba, 2014). Agility is essential for an organization to adequately and promptly address the problems in the current fast-paced era (Alqarni et al., 2023; Esty and Winston, 2009). With the help of e-HRM, organizations ensure the speedy exchange of information and provide them access to the required information (De Alwis et al., 2022; de Juana Espinosa et al., 2013). Readily available information enables employees to make informed and timely decisions and adapt quickly to changing circumstances (Kristensen and
Shafiee, 2019; Stone and Dulebohn, 2013) thus enhancing organizational agility. E-HRM also leads to organizational agility by streamlining the processes, informing, simpler and faster decision-making, and improving workforce adaptability (Marler and Fisher, 2013; Strohmeier, 2007; Zhou et al., 2022). It can optimize HR processes and reduce administrative barriers that subsequently enable people to respond quickly to organizational needs (Bondarouk et al., 2017b; Girisha and Nagendrababu, 2019). Further, e-HRM improves skills development and talent management (Parry and Tyson, 2011; Shamaileh et al., 2022), ensuring that the workforce remains agile and well-equipped to address emerging business challenges. Although previous studies explored the effects of e-HRM on organizational, HR and individual performance (Bondarouk et al., 2017b; Zhou et al., 2022), we could find only one notable study exploring the positive relationship between e-HRM and organizational agility (Hamidianpour et al., 2016) indicating that this link needs to be explored further. The above discussion leads us to develop the following hypothesis.

\[ H1. \quad \text{E-HRM has a significant effect on organizational agility.} \]

2.2 Moderating the role of technological attitude in the relationship between e-HRM and organizational agility

Different plausible boundary conditions can moderate the relationship between e-HRM and organizational agility. Existing studies explored the moderating role of different factors such as HR facilitating conditions, demographics and appropriation of e-HRM (Bondarouk et al., 2017a; Gardner et al., 2003; Ruël et al., 2004) for the relationship of e-HRM and organizational performance however, no study, according to best of our knowledge, explored the moderation of a boundary condition for e-HRM and organizational agility relationship. We argue that the positive TA of the workforce can strengthen this relationship. The attitude toward technology is a human assessment of the introduction of new technologies in any setting, whether favorable or unfavorable (Fujihara et al., 2022). Some people are at ease with it, recognize the benefits of using it, and as a result, they love the job and help others, while some people are uncomfortable with the new technology (Parasuraman and Grewal, 2000). Even if they are aware of the benefits of utilizing new technology, evidence indicates that when negative emotions prevail, people are more likely to avoid it (Meuter et al., 2000). Anxiety about computers and technophobia are examples of worst-case scenarios, whereas innovation is described as a desire to break new ground technologically (i.e. to quickly implement new technologies as soon as they reach the market) (Armstrong, 2006). All in all, people’s acceptance level and technological proficiency can result in smoother integration of e-HRM into routine operations (Strohmeier and Kabst, 2009). Their positive attitude toward technology can allow a seamless transition and better utilization of the e-HRM system (Yusliza and Haslindar, 2010) which can result in stronger effects of e-HRM on organizational agility (Esen and Özbağ, 2014; Hooi, 2013). A technologically inclined workforce can arguably better leverage an e-HRM system that consequently enables them to quickly respond to the changing environmental demands and foster an agile culture (Esen and Özbağ, 2014; Njoku et al., 2019). Further, the workforce’s higher TA improves their engagement with e-HRM systems quickens their decision-making and adapts to the changing environmental conditions. Existing studies examined TA within the technology acceptance model (Kim et al., 2009; Teo, 2009), and the outcome of technological acceptance, self-efficacy and learning motivation (Pan, 2020). The academic literature is deficient in studying the moderating role of TA in the relationship between e-HRM and its outcome variables. This gap in the literature leads us to develop the following hypothesis.

\[ H2. \quad \text{Technological attitude has a significant moderating role in the relationship between e-HRM and organizational agility.} \]
2.3 Organizational agility and communication pace

The globe experienced significant changes during the start of the twenty-first century in many spheres, particularly in the communication channels (Macnamara, 2010). Organizations must update their strategic aims and visions in response to these developments (Margherita et al., 2021). One strategy for addressing these revolution and change-related problems is organizational agility (Nafei, 2016a). Organizational agility is a new paradigm for designing faster communication channels (Nafei, 2016b) that can ensure faster exchange of information within the organization as well as with the external stakeholders, characterized by the efficiency, frequency and responsiveness of communication channels (Langan-Fox, 2001; Park et al., 2012, 2017). Organizational agility suggests giving up the traditional communication channels that are not capable of coping with the current business demands (Jafarnejad and Shahaei, 2007). Agility is argued as a solution to slowness (Prange, 2021). In the current faster world, organizational agility enhances communication pace and fosters a culture of collaboration and openness, speedy and transparent communication and quick information sharing to allow the user to speed up the response decisions (Elanany, 2023). Compared to more conventional ways, this kind of information dissemination reduces the cost of paper and increases the delivery and update speed of information by faster communication (Lengnick-Hall and Moritz, 2003). Organizational agility is of no value if it does not speed up the communication to make timely and informed decisions (Worley et al., 2014). Existing literature paid more attention to the role of ICT in enhancing organizational agility (Allhidan, 2023; Ebrahimian Jolodar and Fattahi, 2018; Park et al., 2017). In contrast, we could not find any notable study exploring the effects of organizational agility on communication. Thus, considering the above theoretical reason informing this relationship and to address this missing link in the existing literature, we abstract the following hypothesis.

H3. Organizational agility has significant positive effects on communication pace.

2.4 Organizational agility and processing time reduction

Organizational agility, i.e. organizational capacity to quickly adapt and address the changing environment has gained great importance in the contemporary business world (Nafei, 2016a; Renzl et al., 2021). Organizational agility is characterized by flexible structures, faster communication processes and employee empowerment (Prange, 2021). Such adaptability helps organizations reduce bureaucratic red tape and quickly respond to changing circumstances and evolving opportunities (Girod, 2023). As a result, the time needed to complete a process from its commencement to its completion, including decision-making, is likely to decrease significantly. Moreover, the agile methodology focuses on an iterative approach that allows continuous feedback and speedy adjustments in the processes (Kettunen, 2007). In addition, organizational agility stresses cross-hierarchical and cross-functional collaboration in the organization and breaks down long communication channels into faster and more direct ones (Elanany, 2023). Such an information flow can speed up the processing time by providing timely and needed information to the users. With readily available information, tasks are likely to pass the different stages more swiftly which results in reduced processing time. Organizational agility has been studied with various similar constructs such as competitive advantage (Almahamid et al., 2010), organizational performance (Baninam and Amirnejad, 2017; Nafei, 2016a) and innovation (Franco and Landini, 2022; Saha et al., 2020). However, its effects on reduced processing time are under-explored which leads us to abstract the below hypothesis.
Organizational agility has significant positive effects on processing time reduction.

2.5 Mediating role of organizational agility in the relationship of e-HRM with communication pace and processing time reduction

Organizational agility is known as a substantial factor in reshaping the contemporary business landscape (Walter, 2021), especially when it is used as a mediator between the relationship of e-HRM with enhanced communication speed and reduced processing time. e-HRM allows for seamless communication flows in the organization by providing a portal to HR professionals and relevant employees where they can promptly access and disseminate information necessary to perform the tasks (Ma and Ye, 2015). Such portals establish hassle-free connectivity among employees (Zhou et al., 2022). Here comes the role of organizational agility which, because of its capacity to swiftly react to changing circumstances (Brown and Agnew, 1982), helps organizations to rapidly adapt to environmental changes, ensuring that effective communication may remain in place even in a dynamic environment. Further, e-HRM is characterized by its ability to substantially cut down the processing time in HR functions including recruitment, capacity development and performance management (Strohmeier, 2007; Strohmeier and Kabst, 2009). However, e-HRM is fully leveraged through organizational agility because agile practices allow organizations to eliminate communication barriers, optimize processes and reduce processing time (Girod, 2023; Nafei, 2016a). Organizational agility acts as an accelerator and mediates the effects of e-HRM on communication pace and reduces processing time. Organizational agility is examined as a mediating variable in the relationship of e-HRM with organizational performance (Khammadee, 2023; Thathsara and Sutha, 2021) and competitive advantage (Alqarni et al., 2023). However, no previous study explored this relationship between communication pace and processing time reduction organizational. Thus, the current research addresses this research gap by conceiving the below hypothesis.

**H5.** Organizational agility has a mediating role in the relationship between e-HRM and communication pace.

**H6.** Organizational agility has a mediating role in the relationship between e-HRM and processing time reduction.

The above conceptualization of hypotheses leads us to develop a research model, presented in Figure 1, to be tested in this research. The next section presents the study’s population, sampling and measurement scales used in this research.

![Figure 1. Theoretical framework](source(s): Author)
3. Methodology

3.1 Population and sample
As the study involves testing pre-conceived hypotheses, we used a deductive quantitative research approach to test the hypotheses (Easterby-Smith et al., 2012; Saunders et al., 2009). The study is conducted in the information and communication sector (ICT) of Pakistan because the ICT sector is better equipped technologically. We used snowball and purposive sampling techniques (Saunders et al., 2009) and approached 510 ICT companies operating in Pakistan using e-HRM. These companies fall into different sub-sectors such as Software houses, class value-added services, long-distance international end-to-end communication, wireless local loop, mobile operators, telecommunication tower providers, mobile device manufacturing and local power wide area networks. Data was collected using face-to-face and online survey techniques and one respondent holding a senior position in the HR department from each company was approached for data collection. The respondents were approached through convenience and snowball sampling techniques. The questionnaire was accompanied by an information sheet comprising the purpose, methodology and potential implications of the research. Following the research ethics (Patton, 2014), it was also mentioned in the information sheet that the identities of the respondents will be kept anonymous and the data will be kept confidential and will be used for research purposes only. Any ambiguity and questions by the respondents were addressed immediately. We received 383 filled-up questionnaires however, after examining each questionnaire, we found 62 questionnaires filled up inappropriately thus, excluded from the data set. The remaining data from 332 respondents (response rate 65%) has been used for analysis and testing the hypotheses.

3.2 Measures
The quantitative data was collected using already developed measurement scales by different authors. E-HRM is measured by a 12-item scale adapted from the study conducted by Adli et al. (2014). The scale is modified according to the scope and focus of the current research. A sample item is “my company uses e-HRM applications for HR analysis and forecasting”. The scale to measure organizational agility comprises 6 items that have been adapted from the study of Al-Qaralleh and Atan (2021). A sample item is “we rapidly implement decisions to face market changes”. To measure the communication pace, a four-item scale was drawn from the previous literature (Langan-Fox, 2001; Park et al., 2012). A sample item is “required information is readily accessed by the users”. To measure processing speed, we developed an eight-item questionnaire from the relevant literature (Calantone and Di Benedetto, 2000; Talaulicar et al., 2005). A sample item is “we are able to perform our tasks speedily”. A 10-item scale to measure TA has been adapted from the study of Leng (2011). A sample item is “technology makes me feel comfortable”. All items of the survey’s scale were measured using a five-point Likert-type scale ranging from 1 = strongly disagree to 5 strongly agree.

4. Analysis and results
We used partial least square structural equation model (PLS-SEM) using WarpPLS7.0 for data analysis purpose in this study. We preferred this technique because it allows flexible modeling using robust and rigorous econometrics (Haenlein and Kaplan, 2004; Hair et al., 2017). Further, PLS-SEM also can be run with a relatively small sample as compared to the other statistical techniques (Chin et al., 2003). Another advantage of using PLS-SEM is that it can run all tests in a single model that are required in research such as reliability, validity, multicollinearity and regression analyses. Considering these added advantages and their
better compatibility with the current study, we use PLS-SEM in this research for data analysis purpose.

4.1 Measurement model
We first check the convergent validity of all constructs which is defined as how the item statements constitute their corresponding construct (Hair et al., 2019). We first present the confirmatory factor analysis (CFA) in Table 1 with the factor loading of each item statement into their respective constructs. The item statements having >0.50 cut-off value are retained for constituting the respective variables (Hair et al., 2017) because they are significantly contributing to constituting the constructs. However, two item statements, one from TA and processing time reduction each, are found to have weaker factor loading, thus removed from the model. In addition, average variance explained (AVE), as given in Table 1 is used to ensure convergent validity which is found to be > 0.50 for all variables (Byrne, 2010) implying that all variables have acceptable levels of convergent validity. We also tested discriminant validity by using the Fronel-Larcker criteria (Fornell and Larcker, 1981) and presented correlation among latent variables with square roots of AVE in Table 2. As reflected in the table, the square roots of AVE are greater than the paired correlations. This indicates that all variables have their unique identity because of their significant distinctiveness from other constructs in the model (Fornell and Larcker, 1981). Discriminant validity has also been ensured through heterotrait and monotrait (HTMT) ratios (Henseler et al., 2015), as shown in Table 3, which are less than the cut-off value (<0.85) thus, there is no issue of discriminant validity in the model. Following, we ensured that all measurement scales are reliable based on the data of this research by computing Cronbach α and composite reliability (CR), as shown in Table 1, which are found to be acceptable considering the threshold value (Henseler et al., 2015) of each latent construct. As the research is cross-sectional, we tested the common method bias (CMB) to ensure that there should not be any CMB issue in the model. We checked the CMB issue following Harman’s test (Kock, 2020) loaded all valid items into one factor in the PLS-SEM model, and checked its AVE which is found to be 0.337, quite lesser than the cut-off value of 0.50 (Kock, 2020). Thus, it is argued that the data is free of CMB issues and can be safely used for testing the hypotheses. Lastly, we tested R2 and adjusted R2 as presented in the table. Lastly, we ensured that there is no issue of multicollinearity and reported full collinearity variance inflation factor (VIF) in Table 1 which is quite less than the cut-off value of 3.30 ensuring that the data is free from the issue of multicollinearity (Aiken et al., 1991).
<table>
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<th>OA</th>
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<tr>
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<td>TA10</td>
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<td>OA1</td>
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<td>OA3</td>
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<td>CP1</td>
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<td>0.918</td>
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<tr>
<td>$R^2$</td>
<td>–</td>
<td>–</td>
<td>0.213</td>
<td>0.204</td>
<td>0.166</td>
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<tr>
<td>Adj. $R^2$</td>
<td>–</td>
<td>–</td>
<td>0.208</td>
<td>0.202</td>
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<td>1.915</td>
<td>1.655</td>
<td>1.255</td>
<td>1.455</td>
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</table>

**Note(s):** e-HRM = Electronic Human Resource Management, TA = Technological Attitude, OA = Organizational Agility, CP = Communication Pace, PTR = Processing Time Reduction, AVE = Average Variance Explained, CR = Composite Reliability, VIF = Variance Inflation Factor

**Source(s):** Author
4.2 Structural model
Before hypotheses testing, we ensured the model fitness through several model fit and quality indices produced by WarpPLS. These include average path coefficient (APC: 0.361, \( p < 0.001 \)), average adjusted R-squared (AARS: 0.191, \( p < 0.001 \)), average R-squared (ARS: 0.194, \( p < 0.001 \)), average full collinearity VIF (AFVIF: 1.594, ideal) average block VIF (AVIF: 1.044, ideal), and the Tenenhaus' GoF (0.30, acceptable) (Tenenhaus et al., 2005). These model fitness and quality indicators reveal that the structural model is fit enough to test the hypotheses in this research.

Figure 2 presents the structural equation model with the path coefficient of each relationship with significance value. e-HRM is found to have significant positive effects on organizational agility (\( \beta = 0.48; p < 0.001 \)), thus hypothesis 1 is supported. This relationship is positively moderated by TA (\( \beta = 0.13; p < 0.01 \)) leading us to support hypothesis 2. We also found significant positive effects of organizational agility on communication pace (\( \beta = 0.45; p < 0.001 \)) providing significant support for hypothesis 3. Hypothesis 4 is about the effects of organizational agility on processing time reduction which is supported by the structural model (\( \beta = 0.41; p < 0.001 \)). It is further found that organizational agility has a significant mediating role in translating the effects of e-HRM on communication pace (\( \beta = 0.22; p < 0.001 \)) and processing time reduction (\( \beta = 0.20; p < 0.001 \)). Thus, hypotheses 5 and 6 are supported. These results are also presented in Table 4 with the decisions of all hypotheses.

5. Discussion and conclusion
The current research aims to explore the effects of e-HRM on communication pace and processing time reduction through the mediation of organizational agility. The study also examines the moderating role of TA for the effects of e-HRM on organizational agility. To achieve this research goal, the study developed hypotheses and an integrated theoretical framework to be tested statistically. By studying e-HRM at the organizational level and its outcome variables and boundary conditions which were not given due attention in the

<table>
<thead>
<tr>
<th>e-HRM</th>
<th>TA</th>
<th>OA</th>
<th>CP</th>
<th>PTR</th>
</tr>
</thead>
<tbody>
<tr>
<td>e-HRM</td>
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<tr>
<td>TA</td>
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<tr>
<td>OA</td>
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<td>0.588</td>
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<tr>
<td>CP</td>
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<td>0.408</td>
<td>0.201</td>
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<tr>
<td>PTR</td>
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<td>0.359</td>
<td>0.326</td>
<td>0.153</td>
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</table>

Note(s): Square roots of average variances extracted (AVEs) are shown on diagonal
Source(s): Author

Table 2. Correlation among latent variables with square roots of AVE

<table>
<thead>
<tr>
<th>e-HRM</th>
<th>TA</th>
<th>OA</th>
<th>CP</th>
<th>PTR</th>
</tr>
</thead>
<tbody>
<tr>
<td>e-HRM</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>TA</td>
<td>0.567</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>OA</td>
<td>0.520</td>
<td>0.670</td>
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<tr>
<td>CP</td>
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<td>0.481</td>
<td>0.245</td>
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<tr>
<td>PTR</td>
<td>0.590</td>
<td>0.402</td>
<td>0.359</td>
<td>0.175</td>
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</tbody>
</table>

Note(s): good if < 0.90, best if < 0.85
Source(s): Author

Table 3. Heterotrait and monotrait (HTMT) ratio
existing literature, this research adds substantial value to the current knowledge base on the positive outcomes of e-HRM, an indispensable source of competitive advantage in the current fast-paced era.

E-HRM is found to have positive effects on organizational agility implying that an organization that deploys e-HRM systems comprising electronic recruitment, training and development, performance and compensation management, and employee relations management successfully leads to agility. Organizational agility is an organization’s ability to promptly respond to changing environmental conditions (Brown and Agnew, 1982), whether from internal or external environments. Businesses of the current era face unprecedented dynamism comprising swift changes due to global connectedness and technological advancements. These changes, on the one hand, offer a variety of opportunities for heightened efficiency, market expansion and innovation, and on the other hand, pose various threats requiring business for adaptability and swift redressal of those threats. To navigate such a dynamic terrain, organizations need to enhance digitization such as e-HRM that can lead businesses to improve agility. Such agile organizations embrace change, leverage the evolving opportunities and palliate the risks associated with environmental threats by rapidly adjusting their business operations (Nafei, 2016a; Yusuf and Gunasekaran, 2002).

Table 4.

<table>
<thead>
<tr>
<th>Hypothesis No.</th>
<th>Path Co-efficient</th>
<th>Decision</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>e-HRM $\rightarrow$ OA</td>
<td>$0.48^{***}$</td>
</tr>
<tr>
<td>2</td>
<td>e-HRM $\times$ TAI $\rightarrow$ OA</td>
<td>$0.13^{**}$</td>
</tr>
<tr>
<td>3</td>
<td>OA $\rightarrow$ CP</td>
<td>$0.45^{***}$</td>
</tr>
<tr>
<td>4</td>
<td>OA $\rightarrow$ PTR</td>
<td>$0.41^{***}$</td>
</tr>
<tr>
<td>5</td>
<td>e-HRM $\rightarrow$ OAI $\rightarrow$ CP</td>
<td>$0.22^{***}$</td>
</tr>
<tr>
<td>6</td>
<td>e-HRM $\rightarrow$ OAI $\rightarrow$ PTR</td>
<td>$0.20^{***}$</td>
</tr>
</tbody>
</table>

Note(s): $*** = p < 0.001$, $** = p < 0.01$

Source(s): Author
The findings also suggest that the relationship between e-HRM and organizational agility is strengthened by the boundary condition of TA. A positive TA of people, i.e. their acceptance of technological advancements and fluency in modern technology amplifies the effects of e-HRM on organizational agility (Parasuraman and Grewal, 2000). The findings of the positive moderating effect of TA on the relationship between e-HRM and organizational agility are crucial in negotiating the intricacies of the modern business landscape. A culture of innovation and employee empowerment can be fostered in the organization through an adaptive and proactive attitude toward technological advancements to accept and harness the evolving technologies (Denison et al., 2013). The findings of this research align with this philosophy that adaptability and proactiveness not only improve the organization’s ability to promptly respond the changing circumstances but also nurture a dynamic environment that encourages reskilling and upskilling of the employees when needed (Moh’d et al., 2024). A positive TA catalyzes the smooth integration of e-HRM tools and methodologies to amplify business agility. This seamless integration of e-HRM, agility, and TA proactively copes with challenges and harnesses opportunities, thereby helping organizations to stay ahead in an unceasingly transforming business ecosystem.

Organizational agility is found to be positively affecting communication pace and processing time reduction. As organizational agility is the ability of the organization to swiftly respond to the changing environment (Brown and Agnew, 1982), it leads to faster communication channels free from unnecessary barriers. People access the required information immediately to make timely and informed decisions. Agile organizations digitize the system and allow communication (Seiffert-Brockmann et al., 2021) that is faster than conventional paper-based communication. Required information is provided on the digital portal to the relevant users and they do not have to move here and there to get the information in hard form. Such a piece of digital information can be used quickly for its further dissemination or use in any task or decision-making. Further, organizational agility reduces processing time in performing tasks. The theoretical reason for the observed processing time reduction is that of organizational agility have the inherent features of responsiveness and adaptability (Nafei, 2016a; Prange, 2021). The finding affirms the theories on organizational agility (Brown and Agnew, 1982; Jafarnejad and Shahaei, 2007) which argue for swift decision-making and its implementation. Thus, organizational agility reduces bureaucratic impediments and embraces a responsive system that helps organizations to streamline their work arrangements, causing a significant reduction in processing time. With the help of agile methodologies, organizations take less time to adjust their structures and strategies to navigate environmental uncertainties consequently reducing the processing times. Thus, these findings substantially the agility’s underlying principles of adaptability and responsiveness (Saha et al., 2017) leading to the communication pace and processing time reduction.

Lastly, we found that the effects of e-HRM on communication pace and processing time reduction are mediation by organizational agility. Although e-HRM can improve such favorable factors, however, as per the findings of this research, these effects are translated into communication pace and processing time reduction by organizational agility. In other words, organizational agility bridges the relationship between these factors. These findings are grounded in the connectedness between technological advancements and organizational flexibility (Chang et al., 2005). E-HRM systems involving electronic management of HR functions lead to swift and responsive agile systems (Boudlaie et al., 2021) which provide a foundation for enhanced communication pace and streamlined processes. Thus, organizational agility catalyzes leveraging the benefits of e-HRM by providing quick access to critical data to the relevant users to enable the environment to respond the abrupt changes. The findings also suggest that as organizations deploy e-HRM, they are better able
to foster agility which consequently serves as a mediating mechanism and gives rise to the communication pace and reduces processing time. Such an alignment of e-HRM, agility communication and processing efficiency highlights the connected nature of technological, organizational structures and operational efficiency.

5.1 Theoretical contributions
The current research offers various valuable contributions to the theory. First, this research joins the existing debate on e-HRM by exploring its effects on its under-explored consequences, i.e. organizational agility, communication pace, and process time reduction. Existing studies mainly explored the effects of e-HRM on organizational performance and competitiveness. However, no notable study explored its effects on organizational agility. The current research moves beyond the existing body of literature and adds value by providing empirical evidence on the effects of e-HRM on organizational agility. Secondly, organizational agility is largely debated as one of the key factors for organizational performance and competitive advantage in the current dynamic business landscape (Nafei, 2016a). However, like e-HRM, its effects were mainly examined on organizational performance and competitive advantage. Existing literature paid more attention to the concrete outcomes of e-HRM and organizational agility such as HR performance, organizational performance, and competitiveness, and ignored its important processual underlying factors such as communication pace and reduced processing time. This research extends the existing literature and offers insights into the relationship of organizational agility with communication pace and processing time reduction. Thirdly, this research reorients the existing literature and adds a mediating mechanism of organizational agility that translates the effects of e-HRM into communication pace and processing time reduction. The findings suggest that the effects of e-HRM will need to be translated into the outcome factors through the mediating role of organizational agility. Fourthly, the relationship of e-HRM and organizational agility is not only under-explored but various boundary conditions that can change the strength of this relationship have also not been examined in any notable study. This research thus extends the knowledge base on this phenomenon by exploring the moderating role of TA which is found to be amplifying the effects of e-HRM on organizational agility. Lastly, research on these phenomena has largely been conducted in developed countries while the empirical findings of social sciences research conducted in one context are difficult to generalize in another context (Cheng, 1994). Having acknowledged the contextual specificity, the findings of this research will arguably be more relevant and adaptable to similar settings, where comparable institutional frameworks and socio-economic environments influence organizational functioning.

5.2 Practical implications
In addition to the theoretical contributions, this research also offers valuable practical implications for today’s businesses, especially in the context of modern workplaces experiencing ever-increasing adoption of e-HRM systems. The findings stress leveraging the potential benefits of e-HRM systems to enhance business operations. Organizations need to harness e-HRM tools to contribute to organizational agility which in turn increases communication efficiency and reduces processing time. The positive moderation of TAs for the relationship between e-HRM and organizational agility underscores the value of employees’ acceptance of and fluency in technological advancements. Thus, organizations should not only pay attention to the technical aspects of e-HRM but also invest in people-focused strategies to recognize and improve the employees’ TAs as it is found an important phenomenon to maximize the benefits of e-HRM. Different measures such as training programs, change management initiatives, and fostering a supportive technological culture
can support seamless integration of e-HRM, cultivating a culture where employees are expected to embrace and use technology efficiently.

5.3 Limitations and future research
Although we have followed a rigorous methodology to conduct this research, some limitations remained beyond our control. The study is conducted in the information and communication (ICT) sector of Pakistan where culture is somewhat different from that in the manufacturing sector. Future studies may broaden the horizon of this research by conducting such research in different sectors and presenting a cross-sector analysis of the research phenomena. Secondly, the study is cross-sectional, and data was collected at one point in time. However, harnessing benefits in the form of agility, communication pace, and processing time may take time. Thus, a time-lagged or longitudinal study is suggested to better capture the progression of events over the course of time. Lastly, a qualitative inquiry in this field may also be a valuable addition to deeper understanding of how the underlying intricacies of e-HRM can proliferate operational efficiencies.

References


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