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The effects of operational, relational, and transformational e-HRM practices on HR service effectiveness: The mediating role of user training

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A B S T R A C T

This study aims at investigating the effects of e-HRM (operational, relational, and transformational) practices on the effectiveness of human resource service through user training. A questionnaire was used to collect data from a sample consisting of HR staff in fifteen food firms. The results showed that the influence of operational e-HRM on the effectiveness of human resource service was fully mediated by user training, and the influence of relational e-HRM on the effectiveness of human resource service was partially mediated by user training. Further, it was found that transformation has an insignificant effect on HR service effectiveness. The study contributes to the literature through identifying the effects of operational, relational, and transformational e-HRM practices on the effectiveness of human resource service and therefore help filling such a gap in literature. In addition to providing HR managers with results, acknowledge the importance of user training to implement e-HRM effectively.

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1. Introduction

One of the most important factors affecting organizational success in the digital age is to use electronic human resource management (e-HRM) practices. Such practices are divided into three types, which are transformational, operational, and relational practices (Bissola & Imperatori, 2013; Iqbal et al., 2019; Ahmed, 2020). Operational activities refer to those implemented to manage the administrative tasks of human resource functions such as employee payroll, employee benefits and employee attendance (Bissola & Imperatori, 2013; Berber et al., 2018; Galanaki et al., 2019). Relational e-HRM practices imply HR practices used to support organizational processes through practices such as employee recruitment, selection, training (Ruël et al., 2007; Bissola & Imperatori, 2013; Shah et al., 2020). Transformational e-HRM practices signify practices implemented to help firms achieve their strategic goals (Bissola & Imperatori, 2014) like e-talent management. Previous studies on e-HRM inspected the outcome of e-HRM practices on employee as well as organizational outcomes such as employee job performance (AlHamad et al., 2022; Al-Hawary & Shdefat, 2016), employee job satisfaction and turnover intention (Maier et al., 2013), employee commitment (Al-Abbadi et al., 2021) and employee organizational trust and employee productivity (Iqbal et al., 2019; Al-Lozi et al., 2017). Furthermore, the result of e-HRM practices on organizations' outcomes like business performance (Ahmed, 2020; Al-Hawary et al., 2020), organizational image (Parry & Tyson, 2011a), corporate sustainability (Alkhodary, 2021) and human resource (HR) service quality, efficiency and effectiveness (Al-Alwan et al., 2022a; Ahmed, 2020; Al-Lozi et al., 2018; Metabis & Al-Hawary, 2013; Al-Hawary & Abu-Laimon, 2013). However, few studies were conducted to investigate the effect of transformational, relational besides operational e-HRM practices on HR service effectiveness. On the other hand, scholars (e.g., Ruël and Bondarouk, 2008) highlight the importance of considering the role played by user training on using e-HRM systems in the connection between e-HRM practices and the effectiveness of human resource

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service. Accordingly, this study was conducted to reduce the research gap in this field, in addition to providing recommendations to firms with the intention of improving the effectiveness of e-HRM. It is structured as follows. The next chapter presented literature review and research hypotheses, followed by research methodology, results and discussion, conclusion, research implications, and, finally, research limitations and future research directions.

2. Literature review and hypotheses development

2.1 Definition of e-HRM

Definitions of e-HRM emphasized two key elements: HRM practices and technology. Ruël et al. (2004) outlined this concept as a web-technology based approach used by organizations to implement their HRM strategies and practices. Bondarouk and Ruël (2005: 4) defined it as "the directed and IT-networked communications from the employer to employees about HRM content". Similarly, Ruël et al. (2007) described such a concept as using web-based technologies to implement HRM policies and practices. For Iqbal et al. (2019), it refers to the combination of information technology processes with human resource management practices to value the organization and its employees through enhancing the conditions of the workplace and adding a value to the organization. Based on these definitions, e-HRM refers to carrying out HRM practices using online information technology (IT) applications. E-HRM conceptualized as a concept consists of operational, relational, and transformational practices, following prior works (Ruël et al., 2004). See a summary of these practices in Table 1.

2.2 HR service effectiveness

HR service effectiveness refers to achievement of HR department objectives (Shakil, Hassan & Qureshi, 2019). Ruël, Bondarouk, and Van der Velde (2007) divided HRM effectiveness into technical and strategic effectiveness. In the e-HRM context, HR practices are divided into transformational, relational and operational practices (Ruël et al., 2004). Therefore, HR service effectiveness represents the attainment of operational, relational, and transformational objectives of HR departments. Concerning HR service effectiveness measurement, authors used items related to HR department responsiveness to employee needs, employee access to relevant HR information, HR department role in developing the organization's human capital, and HR department role in helping employees perform their jobs (Al-Hawary & Al-Namlan , 2018). Other measurements include HR department role by way of a strategic partner in framing and executing business strategies, HR department role in developing organizational competencies, and helping managers to adapt to organizational change (Yusoff, Abdullah & Ramayah, 2009). In addition to the HR department role in encouraging high-performance HR practices (Sanders & Frenkel, 2011). High-performance HR practices include enhancing employee knowledge, skills, and abilities through practices such as compensation-based development, improving employee motivation through performance-based promotion, and employee empowerment (Al-Abbadi, 2018). Shakil, Hassan and Qureshi (2019) highlighted the importance of considering the contribution of HR professionals to organizational performance. According to Ulrich (1997), effectiveness of HR service is often measured using a survey asking employees to rate the effectiveness of HR service from their perceptions.

Table 1
Summary of operational, relational, and transformational forms of e-HRM

Operational e-HRM	
Synonyms	Transactional plus administrative e-HRM practices
Definition	HR practices used to conduct administrative tasks at HR departments (Ruël et al., 2004; Bissola & Imperatori, 2014; Ibrahim, 2021).
Goal	Reducing costs and improving efficiency of HR function, i.e., administrative HR tasks (Parry, 2011; Parry & Tyson, 2011; Bissola & Imperatori, 2014; Galanaki et al., 2019)
Examples	E-attendance registers, e-grievance, e-leave, e-payroll practices, e-personal profile, and e-benefit management (Bissola & Imperatori, 2014; Ahmed, 2020; Rahman & Hosain, 2021).
Outcomes	Workforce performance (Ibrahim, 2021), quality of HR service and employee productivity (Ahmed, 2020) and firm performance (Altaf et al., 2019).
Relational e-HRM	
Synonyms	Supportive e-HRM practices
Definition	HR practices applied to support organizational processes (Ruël et al., 2004; Shah et al., 2020).
Goal	Supporting organizational processes and improving HRM effectiveness and efficiency as well as manager empowerment (Ruël et al., 2007; Ruël and Bondarouk, 2008; Shah et al., 2020).
Examples	E-recruitment and selection, e-advertising, e-performance appraisal, e-training, e-career management, e-communication, e-learning, (Iqbal et al., 2019; Rahman & Hosain, 2021).
Outcomes	Firm financial performance (Hosain, 2017), corporate sustainability (Alkhodary, 2021; Rahman & Hosain, 2021), HR service quality and employee productivity (Ahmed, 2020), and firm performance (Altaf et al., 2019).
Transformational e-HRM	
Synonyms	Strategic e-HRM practices
Definition	HR practices implemented to enhance the achievement of strategic objectives (Ruël et al., 2007; Shah et al., 2020).
Goal	Improving organization's HRM orientation towards its strategic objectives (Bissola & Imperatori, 2014).
Examples	Web-communities, KM systems, e-talent management, organizational strategic change and strategic competence management (Ahmed, 2020; Ruel & Njoku, 2021).
Outcomes	Organizational strategic orientation, strategic objective such as firm performance (Parry & Tyson, 2011; Galanaki et al., 2019), HR service quality and employee productivity (Ahmed, 2020) and firm performance (Altaf et al., 2019).

2.3 Operational e-HRM practices and effectiveness of human resource service

Operational, transactional or administrative e-HRM practices refer to practices aimed at reducing HRM costs and increasing efficiency of HR administrative tasks (Bissola & Imperatori, 2013; Berber et al., 2018; Galanaki et al., 2019). It was defined as carrying out human resource administrative tasks using automation (Ibrahim, 2021). Berber et al. (2018, P. 24) defined e-HRM as "the configuration of computer hardware, software and electronic networks that enable the execution of HRM activities". Based on their definition, operational e-HRM can be defined as executing HR administrative tasks via computer and electronic networks. Operational e-HRM represents a basic level of HR function (Ahmed, 2020). Benefits of using information technology applications to perform HR administrative activities include reducing costs and improving efficiency of HR function as well as saving time through conducting many transactions in the same unit of time (Berber et al., 2018). Examples of operational e-HRM practices include e-attendance registers, e-grievance, e-leave, e-payroll practices, e-personal profile, and e-benefit management (Ahmed, 2020; Rahman & Hosain, 2021). Regarding the effects of operational e-HRM, Ibrahim (2021) found a positive association between operational e-HRM practices and workforce performance. Ahmed (2020) showed that operational e-HRM practices are positively related to the quality of human resource service and employee's productivity. Conducting a review of four decades of e-HRM research, Bondarouk et al. (2017) identified numerous values of operational e-HRM related to HR efficiency and effectiveness such as cost and time saving, productivity of HR staff, training flexibility. To investigate the outcome of operational e-HRM on the effectiveness of human resource service, it was hypothesized that:

H_1: *Operational e-HRM practices are positively linked to the effectiveness of human resource service.*

2.4 Relational e-HRM practices and effectiveness of human resource service

Relational or supportive e-HRM practices represent practices used to manage the relationship between the organization and its employees (Bissola & Imperatori, 2013). The ultimate goal of managing such a relationship is to support the organizational processes (Shah et al., 2020). For a firm to implement and manage its processes, the HR department must provide the firm with human resources who are capable of achieving this goal. Hence, the HR department recruits, selects, trains, and evaluates employees. From this standpoint, relational e-HRM practices can be described as practices that support the firm's processes. Using electronic practices empower HR managers to do their job tasks via digital channels and improve HR service quality (Bissola & Imperatori, 2013). Managers as well as employees are able to access HR information (Galanaki et al., 2019). Relationale-HRM practices include e-recruitment and selection, e-application tracking, e-training, e-communication, e-career management, e-performance appraisal and e-learning (Hosain, 2017; Iqbal et al., 2019; Rahman & Hosain, 2021).As regards the outcomes of relational e-HRM activities, a study by Hosain(2017) showed that e-HRM practices (e.g., e-advertising, e-application tracking, e-recruitment, e-selection, e-training, and e-learning) had a significant impact of firm's financial performance. Alkhodary (2021) pointed out that three practices, which are e-recruitment, e-performance management, and e-learning had significant effects on corporate sustainability. Ahmed (2020) found significant effects of operational e-HRM practices on the quality of human resource service and individuals 'productivity. Nevertheless, Ibrahim (2021) indicated that relational e-HRM practices had no significant effect on employee performance. In line with the hypothesized association between e-HRM and the effectiveness of human resource service, Ahmed (2020) indicated that e-HRM exerted significant effects on the quality of human resource service and employee output. To explore the outcome of relational e-HRM practices on the effectiveness of human resource service, it was suggested that:

H_2: *Relational e-HRM practices are positively linked to the effectiveness of human resource service.*

2.5 Transformational e-HRM practices and HR service effectiveness

Transformational or strategic e-HRM practices refer to HRM practices implemented to enhance the achievement of strategic objectives (Ruël et al., 2007; Shah et al., 2020). The idea behind strategic HRM came on the basis of Ulrich's model (1997) in which the HR function assumed to be transformed from being an administrative task to support organization's strategic processes (Marler & Parry, 2016). Transformational e-HRM practices contain practices related to knowledge management systems, HR decision support systems, web-communities, talent management (Fındıklı & Bayarçelik, 2015; Ahmed, 2020) in addition to strategic organizational change, strategic competence management and strategic planning and development (Ruël & Njoku, 2021). Such practices are positively related to the strategic goals of the firm (Berber et al., 2018) and enhance the overall organizational performance (Fındıklı & Bayarçelik, 2015). It was suggested that strategic orientation is a key goal of e-HRM (Ruël et al., 2007). Significant outcomes of transformational e-HRM practices include enhanced quality of human resource service and employee output (Ahmed, 2020), and improved organizational performance (Altaf et al., 2019). However, the results of Ibrahim (2021) revealed insignificant consequences of transformational e-HRM practices on workforce performance. Investigating three international companies, Ruël et al. (2007) found a positive association between e-HRM and the effectiveness of human resource management as measured by technical and strategic effectiveness. More recently, Al-Harazneh and Sila (2021) reported a significant linkage concerning-HRM implementation and the effectiveness of human resource management. Based on the above-mentioned studies, it was assumed that transformational e-HRM exerts a positive impact on the effectiveness of human resource service as stated in the following hypothesis:

H_3: *Transformational e-HRM practices are positively linked to the effectiveness of human resource service.*

2.6 User training: Mediating role

One limitation of Ruël and Bondarouk's (2008) study on the bondamongste-HRM practices and the effectiveness of human resource service is that he contextual factors such as user training were not considered, therefore, the authors recommended researchers to investigate the role of user training in such a relationship. User training is regarded as a key dimension of user participation in e-

HRM projects (Bondarouk, 2011). According to (Yusliza & Ramayah, 2012), user training plays a significant role in user acceptance of using e-HRM platforms. Consequently, it was believed that user training on using e-HRM system and should be considered in the link between e-HRM and the effectiveness of human resource service as stated in the following hypotheses:

H_4: *User training is positively linked to the effectiveness of human resource service.*

H_5: *Operational e-HRM is positively linked to user training.*

H_6: *Relational e-HRM is positively linked to user training.*

H_7: *Transformational e-HRM is positively linked to user training.*

3. Research methods

3.1 Research sample and instrument

The study was applied using a sample chosen from HR department staff working at 15 firms in the food industry. The sample consists of 225 participants from HR departments. Data were collected using a questionnaire developed for the purpose of the current study based on prior studies. Each firm received 15 questionnaires, which means that 225 questionnaires were administered to all firms. The final total number of questionnaires returned with complete response was 183 questionnaires. Out of them, 17 responses were excluded due to their extreme values. The total number of adequate questionnaires used in data analysis was 166 responses.

3.2 Measures, validity and reliability

Table 2 shows the measures used to assess research constructs as well as the results of exploratory factor analysis. Convergent validity was assessed using AVE (average variance extracted), discriminant validity was assessed using the square root of the AVE as compared to correlations between latent variables. Reliability was measured using composite reliability (CR). It can be noted that all factors loadings were greater than 0.5 (Van Sung & Savaspakdee, 2021; Alshawabkeh et al., 2022; Al-Nawafah et al., 2022; Alhalalmeh et al., 2022; AlTaweel & Al-Hawary, 2021), average variance extracted (AVE) values were higher than 0.50 (Ukeje et al., 2021; Al-Shormana et al., 2021; Al-Alwan et al., 2022b; Aityassine et al., 2021), values of AVE square root were greater than correlation coefficients between (Seqhobane & Kokt, 2021), and composite reliability (CR) values were higher than 0.70 (Hair et al., 2017). Based on these results validity and reliability were assured.

Table 2
Research measures and results of exploratory factor analysis

Variables	Code	Loadings	AVE	√AVE	CR
Operational e-HRM practices					
Availability of operational e-HRM practices	OEHR1	0.788	0.607	0.779	0.860
Cost reduction	OEHR2	0.731			
Efficiency improvement	OEHR3	0.830			
Processing many transactions	OEHR4	0.764			
Relational e-HRM practices					
Availability of relational e-HRM practices	REHR1	0.855	0.662	0.814	0.886
Easy to use and accessibility	REHR2	0.770			
Supporting organizational processes	REHR3	0.859			
Managers empowerment	REHR4	0.765			
Transformational e-HRM practices					
Availability of transformational e-HRM practices	TEHR1	0.784	0.695	0.834	0.901
Contribution to strategic objectives	TEHR2	0.883			
Employee performance improvement	TEHR3	0.879			
Organizational performance enhancement	TEHR4	0.783			
User training					
Technical training on operational e-HRM	UTR1	0.880	0.709	0.842	0.880
Technical training on relational e-HRM	UTR2	0.795			
Technical training on transformational e-HRM	UTR3	0.849			
HR service effectiveness					
Responsiveness to employee needs	HRSE1	0.839	0.669	0.818	0.890
Human capital development	HRSE2	0.823			
Employee motivation improvement	HRSE3	0.813			
HR goals attainment	HRSE4	0.796			

Correlations	(1)	(2)	(3)	(4)	(5)
(1) Operational e-HRM practices	-				
(2) Relational e-HRM practices	0.18*	-			
(3) Transformational e-HRM practices	0.082	0.106	-		
(4) User training	0.38**	0.26**	0.352	-	
(5) HR service effectiveness	0.129	0.24**	0.025	0.268**	-

3.3 Research model

The theoretical model as shown in Fig. 1 clarifies research hypotheses (H1-H7). Three key hypotheses (H1, H2, and H3) were suggested to test the effects of e-HRM dimensions. i.e., operational (O-eHRM), relational (R-eHRM), and transformational (T-eHRM) practices on HR service effectiveness (HRSE). H4 was postulated to identify the effect of user training (UT) on HRSE. O-eHRM, R-eHRM, and T-eHRM were connected to UT through H5, H6, and H7 as a basic requirement for a model used to investigate the mediating role of a variable (e.g., UT) in the relationship between independent and dependent variables.

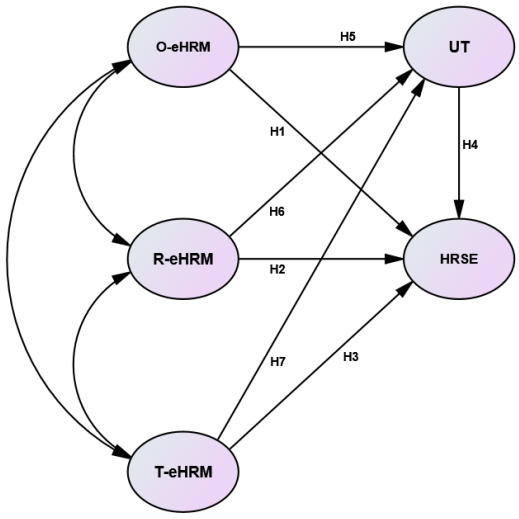

Fig. 1. Research theoretical model

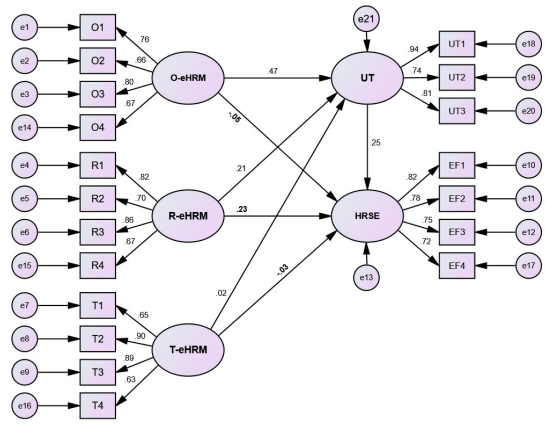

Fig. 2. Research structural method

3.4 Model fit and multicollinearity

Model fit of both measurement and structural model was tested using four indexes: Chi-square-to-degree of freedom ratio (CMIN/DF), the Goodness of Fit Index (GFI), the Comparative Fit Index (CFI), the Parsimony Normed Fit index (PNFI), and the Root Mean Squared Approximation of Error (RMSEA). The results showed that measurement and structural models had acceptable values of goodness-of-fit. CMIN/DF value was < 3.00 (CMIN = 216.279, DF = 145, P = 0.000) (Alolayyan et al., 2018), GFI was closed to 0.90 (GFI = 0.885) (Guritno & Siringoringo, 2013), CFI was higher than 0.90 (CFI = 0.951 (Tran, 2020), PNFI was greater than 0.50 (PNFI = 0.735) (Srivastava et al., 2021; Al-khawaldah et al., 2022; Tariqa et al., 2022), and RMSEA was less than 0.08 (RMSEA = 0.055) (Kim, Connerton & Park, 2022; Eldahamsheh et al., 2021). In terms of collinearity statistics, the results of variance inflation factor (VIF) and tolerance indicated that multicollinearity is not a problem. VIF values were less than 5 (Kim, 2019) and tolerance values were greater than 0.20 (Midi, Sarkar & Rana, 2010).

4. Results and discussion

Preliminary results in Fig. 2 indicate that operational e-HRM (O-eHRM) and transformational e-HRM (T-eHRM) do not affect HR service effectiveness (HRSE). Detailed results are shown in Table 3.

Table 3
Standardized effects among research constructs

H	Constructs and paths			Standardized direct effects		Standardized indirect effects	
				β	P	β	P
H1	O-eHRM	→	HRSE	0.046	0.728	0.115	0.041
H2	R-eHRM	→	HRSE	0.226	0.023	0.053	0.035
H3	T-eHRM	→	HRSE	0.030	0.683	0.005	0.824
H4	O-eHRM	→	UT	0.466	0.004	-	-
H5	R-eHRM	→	UT	0.213	0.014	-	-
H6	T-eHRM	→	UT	0.019	0.808	-	-
H7	UT	→	HRSE	0.247	0.040	-	-

Table 3 shows standardized effects among research constructs. In terms of direct effects, the results pointed out that O-eHRM (β = 0.046, P > 0.05) and T-eHRM (β = 0.030, P > 0.05) had no significant direct effects on HRSE while R-eHRM (β = 0.030, P > 0.05)

had a significant direct outcome on HRSE. On the other side, the results revealed that O-eHRM ($\beta = 0.046$, $P > 0.05$) and T-eHRM ($\beta = 0.030$, $P > 0.05$) had no significant direct effects on user training (UT) while R-eHRM ($\beta = 0.213$, $P < 0.05$) had a significant direct effect on UT. Finally, UT showed a significant direct effect on HRSE ($\beta = 0.247$, $P < 0.05$). Regarding the indirect effects, the findings indicate that there is a full mediation of UT between O-eHRM and HRSE since there is a significant indirect effect of O-eHRM on HRSE ($\beta = 0.115$, $P < 0.05$); there is a partial mediation of UT between R-eHRM ($\beta = 0.053$, $P < 0.05$) and HRSE. Further, T-eHRM ($\beta = 0.053$, $P > 0.05$) exerted insignificant indirect effect on HRSE. In summary, the results asserted that UT plays a significant mediating role (full) in the effect of O-eHRM on HRSE and a significant mediating role (partial) in the effect of R-eHRM on HRSE. In line with previous results, the current results showed that e-HRM in general has a significant outcome on the effectiveness of human resource service (Al-Harazneh & Sila, 2021; Ruël, Bondarouk & Van der Velde, 2007) either directly or indirectly. In details, Ahmed (2020) found a positive association between O-eHRM and the quality of human resource service. Bondarouk et al. (2017) indicated that O-eHRM is positively related to HR efficiency and effectiveness. For R-eHRM, Hosain (2017) showed that practices of R-eHRM such as e-advertising, e-application tracking, e-recruitment and selection, and e-training had a significant impact on organizational performance. Inconsistent with previous studies (Ruël et al., 2007; Shah et al., 2020; Marler & Parry, 2016; Ruël & Njoku, 2021), the current study found insignificant effect of T-eHRM on HRSE. Perhaps the reason behind this is that the firms in the study do not use transformational HR practices to achieve their strategic goals. It may have talent management practices that are part of the transformational practices, but it does not allocate electronic programs within the HR department for this purpose. Finally, the study found a significant mediating role of user training between O-eHRM as well as R-eHRM and HRSE. Prior works confirmed the importance of user training for e-HRM successful implementation (Ruël & Bondarouk, 2008; Bondarouk, 2011; Yusliza & Ramayah, 2012).

5. Conclusion

The study aimed at inspecting the outcome of e-HRM practices on HR service effectiveness in the presence of user training as a mediating variable. Independent variables (O-e-HRM, R-e-HRM and T-e-HRM practices) were assumed to show significant effects on the dependent variable (HR service effectiveness) through the mediating variable (user training). Seven hypotheses were presumed to address these effects. Supporting research hypotheses, the results display that O-e-HRM practices had a significant consequence on HR service effectiveness through a full mediating effect of user training. On the other hand, R-e-HRM practices had a significant influence on HR service effectiveness through a partial mediating effect of user training. Finally, T-e-HRM practices had insignificant effects on HR service effectiveness. Based on these results, it was concluded that implementing e-HRM practices is insufficient in the absence of HR staff training, which is critical to provide them with skills about how to use these electronic practices effectively. In addition to that, user training is very important for employees to benefit from e-HRM practices. Transformational e-HRM practices are not widespread among the firms under study, meaning that firms do not use these practices to achieve their strategic goals. That is why there was no effect of these practices in improving HR service effectiveness.

6. Research implications

The current results have both theoretical and practical implications. In line with what was presented by previous studies, the results of the current study showed significant effects of e-HRM practices on HR service effectiveness. However, the study expands the literature through investigating the effects of separate dimensions of e-HRM, i.e., which are operational, relational, and transformational e-HRM practices, on HR service effectiveness. Moreover, following Ruël and Bondarouk's (2008) recommendation, user training was introduced as a mediating variable. The study highlights the importance of user training for e-HRM successful implementation. It provides researchers with new insights on detailed effects of operational, relational, and transformational e-HRM practices on HR service effectiveness in presence of user training.

Practically, the study provided managers of HR departments with results stating that the operational e-HRM practices are the most influential in improving the effectiveness of HR services, nonetheless, it depends on user training. This means that training the users of human resource systems is very critical to achieve the effectiveness of human resource services. The second type of e-HRM practices (relational e-HRM practices) needs less training for end users because these electronic practices are done through easy-to-use systems and applications that are user-friendly. Finally, the study calls on firms to focus on transformative practices in human resource management because they help achieve strategic goals.

7. Limitations and future research directions

Key limitations of the study are two. First, it collects data from a small sample; therefore, future studies are required to choose larger samples. Second, data were collected from HR department staff in food firms; hence, future studies could gather data from employees from firms in different industries.

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