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Beyond the 'e-' in e-HRM: integrating a sociomaterial perspective

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ABSTRACT

This review paper argues that e-HRM literature has not realised the full potential of different theoretical perspectives on information technology. This paper proposes one of them, a sociomaterial perspective, which recognises the equal importance of human agency and material artefacts in the formation and reproduction of e-HRM practices. The review juxtaposes existing perspectives within e-HRM literature with that of the sociomaterial perspective to illustrate the kinds of complementary theoretical and conceptual tools that can be applied to address current limitations in our understanding of the impact of e-HRM. A research agenda is presented that suggests ways to explore the materiality of technology, wider groups of actors and their agency, and emergent practices around technology. The application of this perspective means paying closer attention to how actions and material artefacts are intertwined and constitute 'doing HRM', which therefore requires thick descriptions of the organisational context and how work is performed in order to understand how technology matters, for whom and in what ways.

Introduction

Widespread technological development and the popularisation of digital solutions across all aspects of life means research has been increasingly concerned with the effects of technology on organisations, their external environment, and internal organisational actors. Research on technology and HRM started four decades ago (Bondarouk et al., 2017) and has evolved into a stream of literature known as electronic HRM (e-HRM). e-HRM is an umbrella term that covers all possible integration mechanisms between 'doing HRM' and technology (Bondarouk & Ruël, 2009). This research has primarily concentrated on e-HRM as a tool for

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achieving increased HRM efficiency (Bell et al., 2006; Bondarouk & Ruël, 2013; Parry & Tyson, 2011), identifying the consequences of e-HRM application (Beulen, 2009; Lepak & Snell, 1998; Parry & Tyson, 2011; Ruël et al., 2004; Stone et al., 2015), and uncovering the contingency factors that support or inhibit the effective adoption of e-HRM (Heikkilä & Smale, 2011; Panayotopoulou et al., 2010; Voermans & van Veldhoven, 2007).

While this work on the consequences of technology is useful, the power and potential of technology to bring about changes in organisations and human behaviour has been largely taken for granted. This is evident in the way that e-HRM literature often conceptualises technology at the macro-level and as a 'black box', downplaying the role of important social processes in producing organisational outcomes (Ellmer & Reichel, 2018; Marler & Fisher, 2013). Such accounts of technology assume technological determinism (Misa, 1994), and consider the actor's attitudes and behaviours to be functional and following established patterns of work. At the other extreme, some e-HRM studies assume the supremacy of human activities over technology (i.e. voluntarism) (Francis et al., 2014; Tansley et al., 2013). Overall, e-HRM research tends to focus on the adoption stage of technology implementation, and on explaining underlying mechanisms in terms of user perceptions and behaviours but forgoing a detailed examination of the actual use of technology.

This paper aims to broaden the conceptualisation of technology, actors, and HRM practices in e-HRM by moving away from the extremes of determinism and voluntarism towards a more balanced perspective that recognises the equal importance of human agency, material artefacts and social context in forming and reproducing e-HRM practices. Sociomateriality, as an established stream of research within the field of technology in organisations, addresses the narrow conceptualisations of technology that can be found in the management literature, by advancing a conceptualisation that emphasises 'materiality as integral to human activities and relations' (Orlikowski & Scott, 2008, p. 438). Theories within the sociomateriality school of thought offer detailed explanations of how organisations change in relation to newly introduced technologies by drawing attention to dynamic and situated activities, which constitute and are constituted by people, actions, voices, gestures, tools, software, documents, infrastructure, hardware (Barley & Kunda, 2001; Orlikowski, 2016). As such, the sociomaterial perspective possesses significant potential to enrich our knowledge about the transformational impact of technology on HRM practice and the role of HR by moving away from the evaluation of the success of e-HRM against the intentions, towards explorations of actual emergent practices in terms of HRM activities. Whilst there are small number of studies in the e-HRM literature (Dery

et al., 2013; Ellmer & Reichel, 2020; Wiblen, 2016) that build on ideas from the sociomaterial perspective, there has not been a systematic attempt to integrate the sociomaterial perspective into a meaningful research agenda that would inform future research in e-HRM.

This paper contributes to existing e-HRM literature in two main ways. First, it introduces concepts from sociomateriality to advance theory development at the intersection of technology and HRM, namely materiality, affordances, human agency, enactment, emergent outcomes, situated and dynamic HRM practice. Through a comparative review of the e-HRM and sociomaterial literatures the paper shows how these new concepts can provide additional, complementary ways to explain the mechanisms that underlie the consequences of e-HRM. More specifically, rather than adopting a purely determinist or voluntarist perspective, scholars adopting a sociomaterial perspective recognise technology as a complex sociomaterial artefact that matters only in relation to human agency and vice-versa, and acknowledge the equal constitutive role of agency and artefacts in dynamic situated HRM practices.

Second, the paper advances an actionable research agenda that presents how the sociomaterial perspective can offer a complementary approach to answering core research questions about the impact of technology on HR roles and HRM practices. The agenda places emphasis on the enactment of materiality of technology in the production of emergent outcomes (e.g. practices), that implies a shift (i) from 'black-box' conceptualisation of technology towards understanding its materiality, possibilities and constraints it creates for actors, (ii) from actors towards human agency, acknowledging a variety of actors and their constitutive roles in HRM practices, and (iii) from normative HRM practices towards emergent practice that affects organisational processes and ways of organising. Given its focus on the continuous enactment of HRM technology and emergent outcomes, the agenda advocates longitudinal field studies which draw more heavily on observations of the activities themselves as meaningful phenomena to be analysed and understood.

e-HRM literature: core concepts and existing perspectives

The concept of e-HRM has evolved and broadened over decades of research into the intersection between HRM and technology. Several definitions exist, but one of the most cited is that by Bondarouk and Ruël (2009, p. 507):

> […] an umbrella term covering all possible integration mechanisms and contents between HRM and Information Technologies aiming at creating value within and across organisations for targeted employees and management.

According to the authors, this definition corresponds with four critical aspects of e-HRM: HRM practices, the implementation of technology, actors in those processes, and the consequences of implementation. Other definitions provided by Strohmeier (2007) and Ruël et al. (2004) similarly highlight the application of technology in order to support the performance of HR activities. Those aspects related to organisational actors using technology, organisational practices and impact of technology are not only central to e-HRM, but to nearly all studies on the intersection of technology and studies of organisation (Orlikowski & Barley, 2001).

In what follows, and building on the above definition of e-HRM, the extant e-HRM literature is critically reviewed in terms of how it conceptualises the core aspects of e-HRM: technology, actors and HRM practices. The paper then turns to the sociomaterial perspective, introduces its main defining features, key epistemological and ontological assumptions, and discusses how this perspective views the same three key aspects of e-HRM. Juxtaposing the existing perspectives and the sociomaterial perspective across these key concepts serves to highlight key differences and illustrates how the sociomaterial perspective can complement existing theory and empirical research in ways that can help to address some of the limitations raised. Table 1 provides a summary of the key points arising from this comparative review.

Given the diversity and breadth of the e-HRM literature, from HRM as a complex system to specific technological solutions and individual attitudes towards them, the purpose of this review was not to perform an exhaustive analysis of the entire field. Instead, this review builds on several, existing comprehensive reviews and conceptual papers (Bondarouk et al., 2017; Bondarouk & Brewster, 2016; Ellmer & Reichel, 2018; Marler & Fisher, 2013; Strohmeier, 2007), which provided a systematic representation of the e-HRM field covering several decades of research. These reviews served as a starting point to identify the existing perspectives of e-HRM literature on technology and its impact on HRM in organisations, as well as limitations that e-HRM suffers from as a research stream. Those reviews were complemented with an additional search for e-HRM, e-HR, digital HRM, HRM technology, and combinations of these keywords with 'use', 'implementation', 'impact', and 'sociomateriality' in the Web of Science and Scopus databases. In addition to those identified in the published literature reviews, this search produced 34 new publications, published as journals articles or book chapters between 2018 and 2020, i.e. the years that were not covered in the existing reviews, producing a total of 136 publications. The review then focused on analysing this body of literature in terms of how technology, users and e-HRM practices are conceptualised and studied empirically to

Table 1. Contrasting existing and sociomaterial perspectives on e-HRM.

Key concepts	Existing perspectives within e-HRM	Sociomaterial perspectives	Implications for future research
Technology	*Conceptualisation:* • Unspecified component of e-HRM ('black-box') • Technology is predictable and stable • Technology is priorityised in research *Causal assumptions:* • Technology and humans are distinct, interdependent entities • Technology is a purposeful tool to improve efficiency and effectiveness of HRM processes or/ and to collect and distribute information • Technology is a driving force in transforming HR practices and HR professionals *Adoption and Use:* • Technology must be adopted by users to achieve defined outcomes (intended or unintended) • Various attributes of technology are perceived by users who then decide whether to use, misuse or not to use it	*Conceptualisation:* • Technology is a complex sociomaterial entity, where material (physical or digital objects, bodies, spaces) is integral to organisational life • Technology is emergent, shifting/impermanent and relational (e.g. Leonardi, 2013; Leonardi & Barley, 2010; Orlikowski & Scott, 2008) *Casual assumptions:* • Affordances of the materiality (i.e. perceived function of technology) are relative to and unique for individuals, or groups of individuals, and can be perceived as constraints or enablers for intended actions (e.g. Bygstad et al., 2016; Faraj & Azad, 2012) *Adoption and Use:* • Materiality of technology must be enacted (i.e. integrated into work processes) in order to lead to change • Organizational life is bound by materiality, not only during the adoption period	How do material properties constitute technologies? For example, what are the material properties of HRM cloud systems? How are algorithms, inscribed practices, instructions, checklists, forms, web-technologies arranged to form materiality of technology? What are the sets of affordances that the materiality of technology can offer HR professionals, line managers, and employees? For example, what are the immediate outcomes that cloud systems such as Workday or SuccessFactors create for HR professionals? For HR professionals it may be a digital working space where human resources are administered, whereas for line managers it may mean control over employees, and for employees instant communication. What new functions are realized through the continuous use of technology? For example, the data generated through the use of technology can offer a variety of possibilities on how to work with it.

(Continued)

Table 1. Continued

Actors		
Conceptualisation: • Actors are humans characterised by their knowledge, skills, competences • Users of e-HRM are the main actors	*Conceptualisation:* • Actors can be both human and non-human • Actors are not limited to users but include any organisational actors practicing HRM, or subject to HRM	How do actors enact their roles in HRM practices/ processes? For example, what actors are involved in performance evaluation practice? Are line managers controlling and evaluating, employees doing self-assessment, or integrated software feeding in data records about everyday activities?
User behaviour: • Intentions and perceptions guide user behaviour (i.e. to use or not use technology) during the adoption phase • Users' perceptions about technology are shaped through social interactions and a desire to conform • Users institutionalise e-HRM practices by creating a shared understanding, or through the process of interpretations of e-HRM's usefulness	*User behaviour:* • Emphasis on actors' agency, i.e. "a capacity to act" (whether human or non-human) • Human agency can be constrained or afforded by material artefacts • Materiality (objects, space, technology, data etc.) is inherent in human activities (e.g. Boudreau & Robey, 2005)	How do human actors exercise their agency? How do they navigate the constraints of the materiality of technology? For example, how do line managers resolve/ avoid the constraints imposed by algorithms?
Actor roles: • Actors are functionally defined (e.g. line managers, HR professionals, employees), and assumed to have mutually distinct roles • Actor's roles are fixed	*Actor roles:* • Roles are defined by situated, patterned activities of actors • HR roles are part of the organizational work system and are related to the roles of other occupational groups (line managers, employees). (e.g. Barley, 2015; Barley & Kunda, 2001)	How do technologies exercise agency? What actions can/do technologies take without humans directly controlling them? For example, how do algorithms work in the selection process? *(Continued)*

Table 1. Continued

| **HRM practices** | *Conceptualisation:*
• Formal and predefined e.g. recruitment, performance appraisal, training and development
• Normative practices define organisational HRM activities and enable their effectiveness

HRM practice outcomes:
• Emphasis on benefits of intended HRM practices for organisations

HRM practice implementation:
• Standardised HRM practices across country borders are the path to reach strategic goals
• HRM practices are fixed (i.e. relatively stable through time and space) and normative, which organisations intend to carry out
• Appropriation (use of technology in line with its purpose) of HRM technology defines the quality and value of HRM for the organisation | *Conceptualisation:*
• HRM is 'practiced'; i.e. reflects realities of organizational work
• HRM practice is the space where material and human agency meet to produce actions and construct realities
• Practices are routinized activities. i.e. reproduced in recognisable patterns
(e.g. Schatzki, 2001)

HRM practice outcomes:
• Emphasis on emergent HRM practices
(e.g. Feldman & Orlikowski, 2011; Leonardi & Barley, 2010; Mazmanian et al., 2013)

HRM practice 'implementation':
• Practices can change, sustain, or disappear
• HRM practices as formal and fixed cannot be placed in the sociomaterial environment as it is, it will be shaped and reshaped through its enactment
(e.g. Francis et al., 2014; Pentland et al., 2012) | How are material artefacts and human agencies enacted in sociomaterial practices, i.e. what affordances are realised through agencies? For example, how are rating systems for contingent workers used by different organisational actors (internal or external)?

How do new practices that emerge in sociomaterial arrangements become patterned and routinized? For example, what new HRM practices emerge around the relationships with contingent workers?

How are normative and standardised HRM practices shaped when enacted in novel practices? For example, how will 'collecting employee feedback' as a standardised practice be shaped (e.g. different technology, processes or content) once used for reporting purposes? |

enable a comparison between existing perspectives within the extant e-HRM literature and the sociomaterial perspective.

Technology

Conceptualisation. Existing research in e-HRM has been cautious articulating in depth the specific role and function of technology in HRM activities. Instead, technology is often equated with, for example, an enterprise resource planning system with little acknowledgment of the way it functions (Ellmer & Reichel, 2018). e-HRM as a field of study is built around technology, prioritising the discovery of its implementation consequences for HR function and HRM practices. Empirical studies on e-HRM rarely make a distinction between technology and the concept of e-HRM (Farndale et al., 2009; Parry & Tyson, 2011; Stone et al., 2006) discussing it as an organisational-level concept that integrates everything and everyone into some system (Strohmeier, 2007).

To provide more clarity about the e-HRM concept as a configuration of the hardware, software and communication technology, Marler and Fisher (2013) specified IT as a physical entity that is separate from individuals but incorporates organisational processes, specifically HRM processes. According to this view, technology is recognised as an entity that carries out organisational processes, while actors' behaviour can be determined by, or determine, established e-processes. Such a formulation opens up a discussion about interdependency, who or what dominates the relationship between technology and humans, and at the same time deepens our understanding about technology as discrete from the organisation and individuals.

Causal assumptions. Concurrently, e-HRM is predominantly portrayed as a *purposeful and discrete tool* that is expected to have a positive impact on HRM practices. Technology is mainly treated as an independent variable having various effects at different levels of analysis. Some studies assume technology to be a productivity tool that should improve the efficiency and effectiveness of HRM processes (Gardner et al., 2003; Parry & Tyson, 2011; Ruël et al., 2004, 2007). The underlying idea is that e-HRM reduces costs and time through the automation of HRM processes. Reduced HR staff, decreased amounts of administrative work and increased process speed are commonly perceived as benefits of introducing e-HRM, and the most common goals for e-HRM implementation (Parry & Tyson, 2011). In the research, such improvements are classified as operational consequences. Other studies view technology as a tool that allows for relational consequences through information collection and distribution (Arjomandy, 2016; Lin, 2011; Parry & Tyson, 2011; Ruël et al., 2004), which improve HR services within the organisation through better availability of information about HR policies (Bondarouk et al., 2017; Lepak & Snell, 1998; Voermans & van Veldhoven, 2007).e-HRM is assumed

to be a *powerful driving force* behind the transformation of the role of the HR function and HR professionals in organisations. These transformational consequences of technology have attracted the most attention among e-HRM studies thus far, although the conclusions from the empirical research on the causal influence are somewhat ambiguous (Bondarouk et al., 2017; Ellmer & Reichel, 2018; Francis et al., 2014; Marler & Fisher, 2013; Marler & Parry, 2016; Strohmeier, 2007). For example, Marler and Fisher (2013) in their evidence-based review paper on strategic HRM and e-HRM, concluded that there is no evidence that e-HRM predicts strategic HRM outcomes, but there is evidence that strategic HRM predicts e-HRM outcomes and that the relationships are context dependent. All in all, the e-HRM literature has come up against difficulties in defining the conditions under which technological outcomes become positive and intended, acknowledging that this is a complex phenomenon that encompasses different social activities, perceptions, intentions and influences from the organisation's external and internal environment (Marler & Parry, 2016).

Adoption and use. The consequences of technology implementation are often linked to the adoption phase of implementation as crucial for defining technology outcomes. In their review, Bondarouk et al. (2017) identified and classified the number of technological, human and organisational factors that influence the successful adoption of technology that, in turn, influence organisational outcomes. Most studies focusing on the adoption of e-HRM acknowledge that no matter what features technology has, the role of social actions and users affect technological outcomes. The perceptions of the users, their attitudes, beliefs and cultural values have been used as a way to explain technology user behaviour, and the acceptance or resistance to the implemented technology (Heikkilä & Smale, 2011; Ruta, 2005; Stone et al., 2007; Voermans & van Veldhoven, 2007). The use of e-HRM technology is conceptualised as an appropriation, i.e. its use in line with its purpose (Bondarouk et al., 2017; Ruël & van der Kaap, 2012), which is rooted in Adaptive Structuration Theory (AST). Diffusion of Innovation (DOI) theory is another way to conceptualise the use of e-HRM technology, which explains how deeply technology is penetrated into socio-institutional systems of organisations looking at the organisational factors and institutional barriers to such penetration (Bondarouk et al., 2016; Parry & Olivas-Lujan, 2011). The work by Burbach and Royle (2013) conceptualises e-HRM technology as standardised e-HRM practices that need to be diffused across different countries within multinational corporations to be successfully implemented. The authors show the complexity and interconnection of socially constructed institutional context, organisational context with its strategies and individuals with their intentions.

Limitations. Despite being an essential component of e-HRM research, the attributes of technology have played a nominal role in empirical e-HRM studies, and the accompanying conceptualisations of technology have been fairly narrow. Indeed, technology within the e-HRM concept often remains a 'black box' (Ellmer & Reichel, 2018), which in turn restricts the study of complex, multiple, mobile, impermanent technologies. The current accumulated knowledge, theoretical perspectives and research questions within the e-HRM field have therefore not been able to capture the use of technology in organisations in sufficient detail.

While treating e-HRM and actors separately allows us to isolate factors and evaluate their significance, it precludes a discussion on how users, technology and social processes are related to each other, how the desired improvements happen or do not happen. The social dynamics and evolvement of technology are rarely captured in sufficient details in e-HRM studies which does not help to resolve the question of how users and what of technology matter for the production of successful consequences. Notable exceptions to this dominant conceptualisation (Dery et al., 2013; Ellmer & Reichel, 2020; Francis et al., 2014; Wiblen, 2016) view technology as an active actor playing an equally important role alongside social activities in producing and reproducing HRM practices while being an inseparable part of those practices (Ellmer & Reichel, 2018, 2020).

Actors

Conceptualisation. Research within e-HRM has directed considerable attention at the direct users of technology and, in particular, their competencies and skills in using the technology, and their acceptance of technology. Key factors examined include the engagement of the users, their training and skills (Bell et al., 2006; Parry & Tyson, 2011), attitudes towards e-HRM (Voermans & van Veldhoven, 2007), as well as age and gender (Gardner et al., 2003).

User behavior. The Technology Acceptance Model (TAM) and its variations have influenced e-HRM studies by explaining user behaviour based on their perceptions and behavioural intentions (Heikkilä & Smale, 2011; Marler & Dulebohn, 2005; Voermans & van Veldhoven, 2007). From this point of view, perceptions largely determine whether people will use the technology in question or not. Various studies within e-HRM explore through qualitative and quantitative studies different obstacles to and enablers of e-HRM acceptance, to name a few: standardisation of language (Heikkilä & Smale, 2011), communication strategies and activities (Cronin et al., 2006), and support of top management (Hannon et al., 1996).

The TAM model helps to explain the motivations for accepting or rejecting the technology. It does not, however, include a focus on what technology use entails or how it is affected by perceptions, which means it is not well suited to capturing the use of technology once it is adopted. A major factor behind the formation of users' perceptions about technology is social influence (Fulk et al., 1987), that is to say, technology acceptance is shaped through social interactions and a desire to conform within the work group (Heikkilä & Smale, 2011). Whilst belonging to a work group helps to determine whether technology will be used and how, still little is known about how agreement within the group is reached. In addition to TAM, studies have also applied institutional theory (Burbach & Royle, 2013), Adaptive Structuration Theory (Bondarouk et al., 2017), and Discourse theory (Wiblen, 2016) to explain how users create a shared understanding of e-HRM usefulness for HRM processes. Such interpretivist approaches to studying e-HRM are represented by a small but growing amount of studies within e-HRM that explore the implementation of e-HRM in the interaction between actors, technology and social context.

Actor roles. Another central theme within the e-HRM literature is the role of the HR function and HR professionals working within it, and the transformational consequences of technology implementation. e-HRM research has been largely concerned with whether HR assumes more strategic roles in the organisation or not. The extent of HR's strategic role has been evaluated in terms of the perceptions of other internal stakeholders in the company or in terms of the official presence of HR managers in the board of directors (Marler & Parry, 2016).

While HR professionals have received much attention, line managers—another relevant user category—have received considerably less. e-HRM studies note that due to the increased use of technology, many tasks previously performed by HR professionals are being transferred to line managers (Bondarouk & Ruël, 2013). One can argue that this process is not necessarily due to digitalisation per se, and is also related to greater overall managerial involvement in HRM (Perry & Kulik, 2008; Renwick, 2003). Nevertheless, technology is expected to play a crucial role in the successful transfer of HR responsibilities from HR professionals to line managers as it facilitates the routinisation of activities for line managers and greater control over their execution.

Limitations. Overall, the typical way of examining individual perceptions of a newly adopted technology does not allow for understanding the experiences of actors with the technology in their everyday life. We know little about how actors respond to shifts/changes in technology, and about how and why they bring some functions into use but not

others. Furthermore, neglecting the line manager perspective on e-HRM and its implementation limits our knowledge about their role in HRM practices, how HR professionals and line managers negotiate such transfer of responsibilities, how line managers cope with the transfer, and in which ways and with what intentions they use technology. e-HRM studies with an instrumental view on technology are not able to provide us with detailed accounts of interactions and connections between people and technology.

HRM practices

Conceptualisation. HRM practices in the e-HRM literature are often equated with 'traditional', formal HRM practices (Ruël et al., 2007), such as e-recruitment, e-selection, e-performance management systems, e-compensation systems (Stone et al., 2006). Studies commonly examine different subfields, focusing on the question of whether a particular HRM practice has become more efficient after applying technology, and to what extent users accept the implemented e-practices (Stone & Lukaszewski, 2009). In addition, rather than focusing on different subfields in isolation, Ruël et al. (2007) direct attention to the firm-level system of e-HRM; 'doing HRM' *via* 'business resource planning software, as in PeopleSoft and SAP HR' (Ruël et al., 2007, p. 281) to understand its overall strategic effectiveness. Overall, e-HRM practices are assumed to be predefined as those that are inscribed in the HRM technology.

HRM practice outcomes. HRM practices are often conceptualised as a path to reaching strategic HRM goals. The strategic HRM literature debates whether a universalistic 'best practice' approach leads to better performance or whether a contingency approach—the specification of HRM practices to align with company strategy—is more effective (Becker & Huselid, 2006). The literature on the strategic value of e-HRM is often based on the assumption that since standardised 'best practices' are built into HRM software and systems, the adoption of such systems may result in a more strategic role for HR professionals (Marler & Parry, 2016), along with freeing up time from non-strategic tasks.

Implementation of e-HRM practices. Studies focusing on the implementation of e-HRM in multinational companies (MNC) discuss HRM practices the most. The standardisation of HRM practices across borders within the MNC is often an ultimate goal for the implementation of e-HRM as MNCs strive for the efficient management of their foreign subsidiaries. Institutional theories have been applied to help to explain the successful implementation of e-HRM practices in an international setting (Burbach & Royle, 2013).

Studies of implementation of e-HRM include studies that look at how technology is used by the users (Bondarouk et al., 2017; Francis et al., 2014; Ruël & van der Kaap, 2012; Tansley et al., 2013). The frequency of use and the *appropriation* of e-HRM practices (i.e. the use of the software in line with its purpose) are argued to affect the quality of HRM services (Bondarouk et al., 2017), and the value created by e-HRM (Ruël & van der Kaap, 2012). Some studies take a critical perspective, focusing on the discursive practices between line managers and HR implementation team (Francis et al., 2014), and identity construction work within the implementation team (Tansley et al., 2013). While these studies open up how the social constructions of e-HRM practices unfold through interactions within different organisational actors, the role of materiality remains largely undescribed since e-HRM and HRM practices, policies and processes are viewed synonymously.

Limitations. Research on e-HRM has been predominantly concerned with the fixed, normative e-practices organisations *have or intend to carry out*, rather than on what they actually do/was actually done (Bondarouk et al., 2017; Francis et al., 2014). Although such a conceptualisation can be useful, it is not an optimal starting point for studying how e-HRM practices emerge and become established, or what actions e-HRM practices entail for the actors.

Within the e-HRM literature, only a few studies exist that employ in-depth case studies and ethnographic studies to show social processes and power dynamics in organising HRM work. For example, Francis et al. (2014) studied e-HR as a discursive practice and analysed the discourse around the implementation of e-HR, exploring the power dynamics in the relationships between HR and line managers, while Dery et al. (2013) looked at the implementation process of HRIS showing how the initial intentions about the new HRIS were lost in the process as it did not match the possibilities HRIS could provide, due to what the new HRIS could afford, and decisions and actions were made around that. Those studies make the transition from normative and prescriptive HRM practices towards the analysis of how those practices are socially constructed. However, they place technology in the background by emphasising social micro-processes.

Sociomaterial perspectives on e-HRM

While the sociomaterial perspective has already received some attention in research on e-HRM, this has mostly been in the context of broader reviews or conceptual papers discussing future research (Bondarouk et al., 2017; Bondarouk & Brewster, 2016), when speculating about conflicting results of empirical studies (Marler & Parry, 2016), or in

reference to current conceptualisations of technology (Ellmer & Reichel, 2018; Marler & Fisher, 2013; Strohmeier, 2009). However, with a couple of notable exceptions (Dery et al., 2013; Ellmer & Reichel, 2020; Wiblen, 2016), the sociomaterial perspective has not been integrated into empirical e-HRM research. Next, the sociomaterial perspective on e-HRM is presented as a promising way of reconceptualising technology, actors and HRM practices in ways that help to address many of the limitations described in the previous section.

Sociomateriality

Sociomateriality stands out as a perspective to study technology as arrangements of social and material objects, and posits that nothing is purely social or material, rather everything is sociomaterial: entities, objects, places, practices, humans. Material objects are integral to human activities, while human activities define material object's functions. Such a view implies that organisations, humans, and technology only exist in interaction with each other (Cecez-Kecmanovic et al., 2014; Leonardi, 2013; Orlikowski & Scott, 2008).

There is no one particular sociomaterial theory. Instead, there is a range of theoretical families which share sociomaterial orientations with different theoretical and ontological assumptions (Leonardi, 2013)[1]: structuration theory (Barley, 1986; Giddens, 1984), socio-technical systems (STS) (Mumford, 2006), Actor-Network Theory (Latour, 2005), duality of technology (Orlikowski, 1992), and the practice perspective (Schatzki, 1996; Suchman, 2007). The underlying ontological assumptions of sociomaterial theories vary; the fundamental dilemma is whether the social world is constituted by preformed entities (substantivism) or by dynamic, unfolding relations (relational thinking). The former is often referred to in the literature as the critical realist philosophical stance (Boudreau & Robey, 2005; Bygstad et al., 2016), and focuses on theorising materiality and its constitutive role in organising. Structuration theories, duality of technology and STS are the most pronounced theories in IS literature that view material objects as elements of the organisational sociomaterial structure, which is pre-formed and cannot be reduced to discrete entities. Such sociomaterial structures can enable (afford) or constrain human action, while human actors are at the centre of actions with their motivation, reflection and rationalisation.

Other sociomaterial theories such as Actor-Network theory and Mangle of Practice (Pickering, 1995) are derived from relational ontology (Emirbayer, 1997; Orlikowski, 2007). The relational view of sociomateriality considers organisations as assemblages of different sociomaterial practices,

where material and social are inseparable (Orlikowski & Scott, 2008). Reality is not given, but rather performed in practice through the relations of material objects and social abstracts (norms, policies, discourses, communication patterns, etc.). This implies a shift in understanding technology and people as characterised by their specific properties that interact with and impact each other, towards understanding the materiality of technology, human agency and social process as connected in the production of sociomaterial practices. All the qualities that might be commonly attributed to people—meaning-making, exercising power or control—are produced exclusively within actions or practices.

The key foundation of sociomateriality is the performative nature of practices (Barad, 2003), which explains how properties and boundaries of artefacts and people emerge out of practices. Specifically, performativity refers to when words and sentences not only describe reality, but constitute actions that change social reality (e.g. orders, vows, apologies, laws). Similarly, in some gender theories, the performativity of gender means that gender is not predefined, it is enacted when a person acts as a woman or a man (Butler, 2011). In the sociomaterial view, not only language, but also material artefacts are performative because they trigger changes in social processes through doing things. Material artefacts are thus performative when enacted in organisational life.

Enactment refers to the use of material artefacts to produce outcomes (Leonardi & Barley, 2010). Although enactment is similar in meaning to the appropriation of technology studied in e-HRM previously (Bondarouk et al., 2017; Ruël & van der Kaap, 2012), a key difference is that it is not concerned with whether users use it in line with designer intentions. In other words, when people use technology with a specific intention, they enact it by becoming entangled with it, and the result of such enactment is always uncertain since unpredictable novel patterns are always emerging. Whether being a bundle of practices, nets of activities or structural arrangements, organisations reproduce themselves in action. Actions are the main drivers for change and stability, and the main unit of analysis in sociomaterial theories.

The assumptions within sociomaterial perspectives imply a focus on the activities themselves as observable and meaningful phenomena to be analysed and understood. With the current development of artificial intelligence and workflow systems (e.g. robotic process automation, chatbots, predictive technology), it is possible to imagine modern technology performing work, but with humans and machines so closely interacting with each other, it becomes difficult to understand who or what carries out specific activities. As long as there are activities, which contribute to the sustaining of old or formation of new practices, those and the interactions within HRM are what matter the most.

What follows is a comparative review of existing e-HRM perspectives against the sociomaterial perspective to show where and how technology, actors and HRM practices differ.

Technology

Conceptualisation. Contemporary technology such as cloud IT systems, Artificial Intelligence (AI), web-platforms, and search engines, are multiple, complex, impermanent and highly interdependent of one another. These kinds of technologies are increasingly difficult to study as an abstract, macro-level entity as has often been done in previous e-HRM studies. Sociomaterialists argue that when studying the impact of technology, closer attention should be paid to its materiality and the way it enables or constrains human activities. Leonardi (2013, p. 69) defines the materiality of technology as: '[T]he arrangements of an artifacts' physical and digital materials into particular forms that endure across differences in place and time'. It follows from this definition that material does not necessarily mean physical; in fact, information technologies have digital properties that are arranged in a certain form, making technology what it is.

The notion of materiality and its conceptualisation within the sociomaterial perspective extends our thinking about the materiality of e-HRM beyond physical artefacts and illuminates its role in HRM activities without prioritising it. Materiality is part of technology, but materiality is not only about technology. Texts, inscribed processes, checklists, reports, physical and digital spaces, bodies and clothes are also examples of material artefacts. In e-HRM literature, authors discussing the sociomaterial perspective confirm and acknowledge the complexity of technology which can better explain the empirical evidence that technology does not always lead to expected outcomes (Marler & Fisher, 2013). However, authors deny the inseparability of the material and the social, which leaves the question of connectivity between material artefacts and 'organisational process' (i.e. social) open. On the contrary, sociomaterialists aim to explain how the materiality is integral to organisational life, therefore they focus on sociomaterial practices and their materiality, rather than on sociomaterial technologies (Leonardi, 2011).

Causal assumptions. While e-HRM considers the impact of technology on organisational processes, sociomaterialists examine the possibilities that materiality creates for actions, i.e. affordance (Leonardi et al., 2012). From a sociomaterial view, technology cannot determine human activities, instead it can only offer some functional possibilities that human actors need to realise (Gibson, 1979). Materiality makes certain actions possible

and constrains others (i.e. makes it impossible or difficult to achieve). Affordances thus only exist in relation to actors, which means that people need to perceive the function that material objects offer them. One example from nature that illustrates this well is that while water for most species do not afford walking on its surface, it does for some insects (Gibson, 1979).

Affordances are not obvious and do not follow from the designers of a technology, rather actors learn about affordances through their encounters with artefacts (Hutchby, 2001). For instance, keeping a record about its employees in the system creates possibilities for analysing employee data, but the full range of activities possible with the data can only be understood from working with the employee data in the system. The focus on affordance of material artefacts means a shift in focus from technological properties and features towards enactment of materiality into social processes.

Adoption and use. In comparison to existing e-HRM literature, which is largely concerned with predicting outcomes, studies within the sociomaterial perspective aim to uncover explanatory mechanisms that underlie emergent outcomes. The sociomaterial perspective is largely uninterested in whether people use, misuse or reject the technology as it is mostly the case in the existing perspectives of e-HRM. It considers organisational phenomena as emergent from the ongoing stream of activities that trigger new activities or sustain old ones.

Furthermore, organisational life is always bound by materiality and not only during the adoption period. The materiality of technology is dynamic and changes in relation to ongoing social processes outside or within the organisation (e.g. adapting functionality of technology by internal users, data protection legislation, developers' updates), which is why the adoption period is not necessarily the only period relevant for realising the change.

Actors

Conceptualisation. The sociomaterial perspective that is based on a relational ontology in which the boundaries of the social and material are blurred facilitates the acknowledgment of a wider group of actors compared to existing e-HRM perspectives. It focuses not only on users of technology, or even just internal organisational actors, but includes anyone who participates in the company's HRM activities, to whom HRM activities are directed or who designs or uses the products of HRM activities (such as data, reports, analytics). In fact, the actors are not even necessarily humans. If material and human are equally important and not prioritised, then both participate in constituting HRM activities.

'User behaviour'. In contrast to existing perspectives in e-HRM that are interested in the qualities of human actors, such as knowledge, competences and skills, sociomaterialists consider the capacity to act according to the individual's intentions, i.e. *human agency*. Human agency is the freedom to choose how to enact organisational practices by sustaining old practices or creating new practices. Humans exercise their agency in relation to social practices and material objects through their own interpretations of them (Orlikowski & Scott, 2008). Agency is a temporal and relational concept since agency is embedded in sociomaterial structures, which can afford or constrain the activities at a certain time and place. For example, in the research on mobile email technology, Mazmanian et al. (2013) analysed knowledge professionals' use of their mobile devices, in particular email applications, and the consequences for organisational processes. They found that, in their desire to become more in control of the work with the help of material artefacts that afforded connectivity 24/7, professionals enacted *a norm* of being continuously connected and accessible. This, somewhat conflictingly, increased their perceptions of flexibility, peace of mind and control over interactions, but also escalated their work engagement and made it harder for them to disconnect. This example illustrates how professionals exercised their agency to become more autonomous with the help of mobile technology and how it in fact shaped that agency and made them less in control of their own time. Paying more attention to the dynamic constitutive relationships between agency and materiality can provide valuable analytical insights into the work of HR professionals and how it reconfigures in practice.

An increased acknowledgement of the role of human agency in connection to technology enables us to gain a deeper understanding of how HRM technology is enacted in organisations, for instance, how actors resist and accept material artefacts and how they deal with constraints posed by material artefacts. Thus, in comparison to the existing view in e-HRM, the sociomaterial perspective looks at the evolution of e-HRM practices and how human agency and material agency bond together to produce emergent outcomes rather than nominal expected consequences.

Actors roles. The e-HRM literature explores whether HR function becomes more strategic or not, whereby status is evaluated on the basis of perceptions of other employees or by the HR manager's presence on the board of directors. Sociomateriality, on the other hand, may potentially contribute plausible explanations by shifting the focus from studying functional roles to studying roles defined by the 'patterned ways in which people play them' (Barley, 2015, p. 6). Roles are part of organisational work systems and are relational to other roles played

by other occupational groups. In other words, roles are about what HR does daily and how, their communication patterns, whether they have and use their influential power, how their role relates to the roles of line managers or employees rather than what is written in their job description. It offers a means to study how materiality triggers alternations in the patterned ways HR professionals complete their tasks, as well as how emergent activities of HR professionals around materiality are aligned with the activities of line managers, employees and other occupational groups within the organisation.

HRM practices

Conceptualisation. Schatzki (2001, p. 2) defines practices as 'embodied, materially mediated arrays of human activity centrally organised around shared practical understandings'. Accordingly, practice is where material agency and human agency meet to produce actions and construct realities. Action on its own cannot create significant consequences unless actions are reproduced many times and in recognisable patterns, in other words, routinised. Thus, the analytical focus of sociomaterial studies is on practices that are routinely performed through particular arrangements of tools, discourses and human bodies.

HRM practices outcomes. While e-HRM literature is concerned with organisational effectiveness after the implementation of technology and the integration of intended HRM practices into it, theories grounded in sociomateriality aim to explore in more detail the effects the enactment of technology has on HRM work. In particular, what are the new activities emerging with the use of material artefacts such as cloud HRM systems or dashboards with HR data, how and why do some activities repeated over time create new practices whereas some disappear quickly? Focusing on ongoing activities allows us to distance ourselves from the supremacy of human actions, perceptions and intentions of users or technological artefacts, and instead to try to understand the reasons behind activities becoming new norms. Like the earlier example of the study by Mazmanian et al. (2013), it is about how the new practice of being constantly connected became new normality when employees saw an opportunity in using mobile email to become more flexible and in control over work interactions. This example illustrates the emergence of unexpected outcomes through the enactment of new technological artefacts, such as mobile email.

HRM practice 'implementation'. According to the sociomaterial view, normative HRM practices as discussed in e-HRM literature are materialised in text, instructions, technologies, discourses, and artefacts

that certainly do play an important role in how real activities unfold. Given the dynamic nature of real practices, their temporality and situatedness, HRM practices implemented within the organisation would not lead to mirroring those in reality. Rather, the practices would be shaped and reshaped through their enactment. Sociomateriality provides a means for looking at how normative HRM practices are executed in real-time by allowing us to explore the power structures, the conflicts that arise in relation to material artefacts, different discursive practices that carry meanings, and intentions for the implementation of technological material artefacts.

Integrating a sociomaterial perspective: A research agenda

Against the background of the comparative review above, a future research agenda on e-HRM is presented below based on how the sociomaterial perspective can be used to extend our understanding of the interplay between HRM and technology. In the presentation of the research agenda, an artificial separation is made between technology, actors and practices to show where the focus within these three dimensions should lie when studying e-HRM from a sociomaterial perspective. The proposed research agenda is summarised in the far-right column of Table 1.

From technology to material artefacts

A sociomaterial view emphasises the need for understanding how materiality is integral to social activities and encourages exploration of how materiality and human agency configure HRM work. For example, HRM work involves human bodies (HR professionals, line managers, employees) engaged in repeated activities (consulting, advising, reporting, managing, evaluating) and a variety of material artefacts (workplaces, forms, instructions, tools, computers, software, data centres). The materiality of HRM work is reflected not only in the tangible artefacts, but also more intangible artefacts like software, which only exists in relation to computers, codes, algorithms, and specifications. Therefore, when studying sociomaterial arrangements, one needs to consider the extent to which the focal practices (e.g. performance appraisal, recruitment, development discussions) are material.

The material properties of technology as such are not as central as the affordances these properties provide people with. For empirical research, this means exploring what different material artefacts enable actors to do. Enabling is different from determining since materiality does not define actors actions; instead it provides a variety of

possibilities for actors, but also sets the limits of what is possible. Therefore, to explore affordance, one may ask, or identify through observations, what the immediate outcomes of using a particular technology are for various organisational actors. Sociomateriality offers a particular way to express HRM work through the engagement of material and social, repositioning it against the interactions of entities such as HR professionals and line managers, or line managers and employees. For instance, being integral to HRM work, cloud systems can produce digital spaces on the screen for HR professionals to administer human resources, initiate and support HRM processes' flow, and record employee activities, which in turn allows for generating data within databases, which feed into algorithms, analytical tables, and talent management systems.

From actors to agency

While materiality can be considered as fixed, with certain technical features imposed by the designers of a technology, affordance does not exist without human agency. Actors interpret material artefacts and perceive the affordance in line with their intentions. Affordance, as a function of technology, is not always visible or known until actors realise it in action. Hence, the roles, as situated patterned activities, that actors play in sociomaterial practices, need to be explored in greater detail. Considering the example of online platform organisations that offer jobs to contingent workers (gig workers) (Barley et al., 2017), examining the roles customers play in such platforms would be interesting. Do they only buy services? Are they encouraged to give feedback to the worker, which in turn not only evaluates the worker's performance but also feeds the data into the system's algorithms, making workers more visible or invisible, helping other customers to make choices.

In comparison to voluntarism where people are believed to act based on their interpretations of the situation despite technological constraints, theories within the sociomaterial perspective assume that human actions are limited by materiality. Only in relation to material artefacts can they exercise their agency. Thus, researchers exploring phenomena from a sociomaterial perspective need to question how people exercise their agency, including their goals and motivation.

What if their intentions do not fit the affordance of technology? How do they resolve or avoid those constraints? For example, how do line managers deal with algorithms that do not serve their own wants/needs? This dilemma may arise in the case of algorithms that strictly afford the maximising of the value of labour when managers need to find a balance between maximising the production, whilst ensuring employees' work-life balance.

A sociomaterial lens has the potential to become a powerful tool for studying machine learning and artificial intelligence since it assumes that material agency acts without intentions, without humans directly controlling its activities or understanding its algorithms of working and learning. For example, AI-based recruitment software can make a selection of the candidates without human involvement or control over AI. Acknowledging the way AI works and how it configures the recruitment practices together with humans will provide insights into the implications it has for organisational processes.

From HRM practice towards practicing HRM

Adopting a sociomaterial perspective on technology enables a more detailed examination of how changes in HRM work occur during the implementation of technology in organisations. Rather than conceptualising technology as a discrete and predictable technological artefact that focuses on intended adoption and organisational effects, the sociomaterial perspective considers the enactment of technology in practice as constitutive to the production of outcomes (Feldman & Orlikowski, 2011). In other words, what is consequential is not technology as a tool or material artefact itself, but the way it is used to get work done. Therefore, future e-HRM research is encouraged to focus more closely on actions and patterns of actions (Pentland et al., 2012) in connection to material artefacts that together constitute HRM practices, as situated activities of actors or groups of actors involved in HRM work (Björkman et al., 2014).

Research needs to pay closer attention to how technology is enacted in the organisation, i.e. how its different functions are realised in everyday practice. While we might think of similarities with the adoption process, it is different in that it considers the materiality of technology to be enacted on a daily basis, sometimes re-enacted every day through routinised patterns of actions and sometimes differently due to changes in the organisational sociomaterial environment, i.e. context producing emergent outcomes. Therefore, research needs to examine the outcomes that emerge from such enactments, e.g. boundaries and forms of technology, norms, routines, meanings, power dynamics, and identities. For example, the sociomaterial perspective can be a powerful lens in studying online platforms for gig-workers since those platforms disrupt traditional HRM practices and our understanding of the employment relationship in general. For instance, how do new norms of control emerge around online platforms? What is the interplay between material artefacts, such as the rating system (Kellogg et al., 2020) and the combination of different agencies, such as customers', workers and platform providers?

Methodological implications

Empirical research should focus on describing the observed activities and patterns of actions in addition striving to explain how those are connected, and what effects they produce. Examining the practice of HRM implies following HR actors in their daily activities such as meetings, training and their people management activities, and studying the material artefacts in their production of activities (Cecez-Kecmanovic et al., 2014).

Since work is highly situated, most people cannot describe the specificity of their work outside their stated context (Suchman, 1987). Fieldwork, which includes ethnographic methods, participant observation, shadowing and other qualitative methods is crucial in order to understand and appreciate the actual work that occurs. For example, comparative case studies might be valuable to further our understanding of how a technology unfolds in two or more organisations. Such case studies could highlight the mechanisms underlying how the same technology may lead to similar (or different) outcomes in different organisational contexts (Leonardi & Barley, 2010). Another way to study how HRM practices evolve as technology comes into use is to study it retrospectively, for example, by studying email archives or other archival data, and/or narratives that are constructed individually by occupational groups (see e.g. Nelson & Irwin, 2014).

Limitations and implications for practitioners

Whilst this paper has advocated the introduction of a sociomaterial perspective to e-HRM research it is itself not without criticism. Among the most common critiques is the failure by researchers to give equal importance to the material and social, leaving the material behind while 'agency and interpretations came to the fore' (Barley, 2015; Cecez-Kecmanovic et al., 2014). Commentators see at least two reasons for this: the theories used (Barley, 2015) and associated methods deployed have relied heavily on interview data (Cecez-Kecmanovic et al., 2014). Therefore, balanced decisions about the methods and theories applied that are capable of acknowledging both the material and the social are essential in pursuing a sociomaterial approach.

In order to pursue the aim of the paper—to draw a parallel between existing perspectives of e-HRM and a sociomaterial perspective—some generalisations about those perspectives had to be made. Whilst there was an attempt to acknowledge important exceptions, as well as the advantages and limitations of the existing perspective, it can nevertheless be argued that the review may have over-simplified the boundaries between the two perspectives in places.

Nevertheless, applying a sociomaterial perspective has practical as well as theoretical implications. The practical implications for organisations concern how sociomateriality directs attention towards the issue of how artefacts are used and experienced in everyday activities, instead of simply focusing on the artefacts themselves. It implies different ways of measuring success than simply counting the number of accounts created in recently installed software. By putting everyday activities at the centre, sociomateriality can support the practical relevance of research through enhanced engagement with practitioners during the data collection, bringing in the practitioners' reflections rather than producing reports and prescribing a cure.

Conclusion

Through a comparative review of the e-HRM and sociomaterial literature, the aim was to show how concepts from theories grounded in sociomateriality can provide new, complementary ways to explain the interplay between technology, actors and HRM practices. The literature review suggests that theorisation in e-HRM research mostly concentrates on exploring causal relationship between technology and user perceptions, and the influence of such relationships on HRM outcomes. As a result, e-HRM contributions have not extended far beyond the frames characterising the general HRM research.

This article argues for more research that applies theories and concepts grounded in a sociomaterial perspective, which emphasises the need to be attentive to how both the materiality of technology and the social processes occurring around it constitute HRM practices. Sociomaterial theories allow the examination of emerging patterns of activities as dynamic, multiple and indeterminate. Such an approach is critical when new ways of organising continue to emerge around technological advancements deeply embedded in everyday working experiences such as those emerging around mobile technology, platform organisations, internet communities, and monitoring technologies.

Note

1. This paper only provides a brief introduction to some shared concepts across those theories and does not aim to promote one particular theory

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