

New e-HRM Typology: From Broadcasting towards Supply Chain Support

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Abstract. We argue that an existing classification of e-HRM, known as a division between transactional, relational, and transformational (based on a canonical work of Lepak and Snell [11]), doesn't meet all expectations of the multidisciplinary character of e-HRM and Human Resource Information Systems. Built mainly on the ideas from the HRM field, it lacks attention to such properties as coordination of information and its exchange, capturing knowledge domain, and communication languages. We propose to broaden existing typology by inclusion insights from the field of information technologies. In the suggested typology, e-HRM / HRIS is classified along ontological, coordination, user-interface, adaptation, and HR function impact blocks; allowing for distinguishing five types of e-HRM: static and customized informational, pooled and sequential transactional, and supply chain delivery support. We see several advantages in using this typology for the practitioners, the most important is that it helps to evaluate the stage of e-HRM / HRIS development and foresee horizons for improvements.

1 Introduction

It was more than a decade ago when Lepak and Snell [11] announced that, in response to external and internal environmental pressures and extensive differentiation, Information Technologies (IT) offered to Human Resource Management structural integration through implementing Human Resource Information Systems (HRIS) are Electronic Human Resource Management (e-HRM). Three channels for IT-based structural integration of HRM were proposed. First, IT was considered as influencing *operational* aspects of HRM by helping to overcome the administrative burdens and streamlining operations. Second, IT was considered as influencing *relational* aspects of HRM, by enabling remote access to data bases, enhancing abilities to connect with different parts within dispersed organizations, and supporting information sharing with outside service providers. Third affect that IT was assumed to have on the HRM, was even called "the most dramatic" as it was linked with the *transformational* HRM integration (*ibid*, p. 220), considering IT's impact on communications, demolishing organizational boundaries, eliminating barriers of time and space, and supporting virtual HRM and network organizations [11].

Putting forward to nowadays, recent developments in IT's and WEB 2.0, increased flexibility and scope of e-tools, at one hand, and diversity of the workforce, huge

investments in intellectual capital, the war for talent, fashion and brand management, at the other hand, - are at once increasing variations in e-HRM applications, validate limitations of the conventional three-set e-HRM typology, and forcing to nuance it.

However, before proposing a new typology for the e-HRM applications, we first make an overview of existing classifications of the HR practices. This will allow us to extract the tendency in viewing HR practices, and integrate it with the e-HRM applications.

2 Existing Typologies of HR Practices

Table 1. Categorizations of (e)-HR practices (chronological order).

Snell et al., (1995) [14]	Operational Informing, making information available, and use for decision support	Relational HR databases, supporting HR-related decisions, and increasing their ability to connect with other parts of the corporation	Transformational Restructuring, reengineering, outsourcing, and strategic alliances created by organizations	
Huselid et al. (1997) [7]	Technical HRM Recruiting, selection, training, and the administration of benefits	performance measurement, compensation and	Strategic HRM Compensations systems, team-based job design, flexible work-forces, quality improvement practices, employee empowerment	
Carrig (1997) [1]	Transactional Benefits administration, record keeping, employee services, communication, performance management	Traditional Performance management, training, recruiting, employee relations, compensation, management development	Transformational Management development, business partner, strategic planning, organization development, knowledge management	
Lepak and Snell (1998) [11]	Traditional Low uniqueness, high generic value and wide spread	Peripheral Same as traditional, but of low value	Core HR activities Highly unique and highly valuable (for attaining a competitive advantage)	Idiosyncratic HR activities Highly unique with relatively low value (for attaining a competitive advantage)
Legnick-Hall and Moritz (2003) [9]	Publishing information	Automation of transactions Workflow, supply chain integration, electronic input	Transformation of the way HR is conducted in the organization Strategic partnering, centres of expertise, service centre administration	
Gardner et al. (2003) [5]	Automation	Information	Transformation	
Delmotte and Sels (2005) [3]	Transactional	Transformational (procedures)	Transformational (people)	Strategic
Lepak et al. (2005) [10]	Transactional Benefits administration, record keeping, employee services, communication, performance management	Traditional Performance management, training, recruiting, compensation, management development	Transformational Management development, business partner, strategic planning, organization development, knowledge management	

Table 1 shows some of the classifications of HR practices often used in e-HRM studies. Authors use different typologies, aiming at their “ideal” classification, to find a key for the HRM digitalization patterns and factors for the successful implementation of e-HRM. The main border positions HR practices along a continuum between technical or traditional and strategic, value-creating practices. Professional debates continue on ranking HR practices as candidates for digitalization. For example, the latest CedarCrestone survey [2] covering 828 responses from mostly North American companies (89%) distinguishes four e-HRM applications:

- Administrative and Workforce Management applications (the core HR, payroll, record-keeping systems, time management and absence management),
- Service Delivery applications (self-service transactional services),
- Strategic HR applications (talent acquisitions/services, eLearning, training enrolment, performance management, succession planning, competence planning, workforce planning), and
- Business Intelligence applications (when combined, they enable organizations to move towards metrics-based management).

According to the survey results, Administrative e-HR applications are “very mature with some movement from in-house to software-as-a-service solutions”. These e-HR applications are now seen as moving towards a hosted solution or to full outsourcing [2, p.8]. Implementation of Workforce Management applications is accelerating and, as foreseen in the survey, will be increasingly used in organizations, where flexible and agile scheduling is needed (*ibid*).

Service Delivery applications [HR-oriented help desk, employee self-service (ESS), manager self-service (MSS)] continue to be adopted with their potential ability to bring extra value through serving more employees with the same or fewer staff, and reducing transaction cycle time and costs (*ibid*). An interesting observation from the survey is that when an ESS or MSS is introduced, five more employees can be served by the same number of HR staff, and even more with the move to a call centre.

Applications are viewed as strategic in the way that they help an organization acquire, develop, and retain the right talent as well as make productive use of all workers [2, p. 14].

Reviewing the data from the CedarCrestone research [2], it is not difficult to observe symptoms or identifications of ‘practical’ e-HRM patterns, although strict conclusions are difficult to make. As stated, companies are progressively implementing more e-HRM, but recently it was observed that HRM professionals (and their companies) are no longer surprised by the e-HRM phenomenon. Whatever typology is used (“academic” or “practical”), it is clear that the adoption of e-HRM grows from technical applications towards strategic ones. Organizations have ‘grown up’ with administrative e-HRM and are ready for serious discussions about strategic applications and their implementations. Another intriguing issue is that while the effectiveness of e-HRM is justified by quantifying strategic success (operating income growth), the classification of e-HRM / HRIS applications receives less attention.

Reasons to Introduce a New Typology of e-HRM. Why do so many (differences in) classifications of HR practices exist?

First of all, these variety can be explained as reflecting the variety of (e-)HR practices in the reality of organizations. Secondly, different conceptualizations of the role of the same practices confuse the classification. Third, studies might differ in their understandings of the (e-)HR practices objectives.

We argue that the above mentioned classifications of (e-)HRM practices are not enough for modern e-HRM for four reasons:

- They mix HRM fields and activities while for e-tolls it is crucially important to focus on doing e-HRM. Thus, within such a transformational HR one can easily find administrative and relational components. For example, to conduct a strategic planning, HR specialists need to administer the data and communicate it to the business partners.
- They do not echo different levels of interdependence between stakeholders involved in e-HRM: HR professionals, line managers, employees.
- They do not consider or mix the impacts of an application of the HR function. For example, is transformational e-HRM a type of e-HRM or a result of its implementation?
- Existing typologies of e-HRM practices ignore the expertise of IT modelling as a potential to bring an extra classification criteria.

3 Five Dimensions to Distinguish e-HRM Types

We suggest that a new e-HRM typology should be based on five dimensions that integrate HRM and IT foci, instead of being linked with the names of the HRM fields:

- *Ontological Dimension.* Seen as a description of the concepts and relationships that exist in a community [6]. Ontology in e-HRM applications aims at capturing HRM domain knowledge in a generic way and provide a common understanding of HRM, which may be reused and shared across applications. Ontology as a field of philosophy exists for thousands years. It is underlying question, “What exists? What is it?” has found its way in IT and cognitive sciences in more specific forms. E-HRM has to solve the problem “Which HRM content is (to be) represented in a formal e-tool?” All in all, e-HRM types have to be distinguished on the basis of HRM language they use, and concepts as building blocks.
- *Coordination Dimension.* Seen as a process of managing dependencies between (HRM) activities [12]. Organizational and management science have since long researched coordination mechanisms with the focus on how people coordinate their activities in formal organizations. E-HRM types have to be distinguished on the basis of the coordination structure that is used among all users, information exchange mechanisms, and communication forms among e-HRM stakeholders.
- *User-Interface dimension.* Seen as the medium to support the two-way exchange of symbols and actions between humans (users) and computers. In other words, an

interface supports the communication between users (people) and computers. There are at least two metaphors that describe ways in which humans interact with computers: the conversational world and the model world. In the conversational world, the end-user describes what to do, typically using a command language. In the model world, the end-user shows what to do by “grabbing” and manipulating (e.g., with a mouse) visual representations of objects. Thus, direct manipulations are used to describe this interaction style. The research field of Human-Computer Interaction has been identifying different aspects of user-interface, focusing on the development, evaluation, and cognitive aspects of human-computer interaction [4]. E-HRM types have to be distinguished on the issues of usability of the e-tools such as the ability to change the information, display of the user-role, dependency conflicts, and the focus on the interactions between user operations.

- *Adaptability Dimension.* Seen as the capacity of e-tools to collect, save and analyze the information from end-users, and based on the analysis – to adapt it to the needs of the users. Adaptability is often concerned with personalization and customization of the content and navigation of applications. The difference between personalization and customization lays in the question, respectively, whether the technology self is designed to adapt to users’ behavior, or users themselves should adapt an application to their preferences [8]. For the distinction between different types of e-HRM it means adaptability of e-HRM tools of the HRM content, its presentation, and navigation of the applications.
- *Impact on the HR Function.* Seen as the role of e-HRM in re-dividing of the responsibilities held by different actors within the HRM (line managers, HR professionals and employees). In other words, e-HRM tools should be differentiated on the basis of who is involved (actors), at which level of an organization, and what are the HRM responsibilities performed through e-tools.

4 e-HRM Types

We distinguish three main categories of e-HRM that are further divided into five types:

- Informational e-HRM: (1) Static informational/ broadcasting support, and (2) Customized / personalized information provision
- Transactional e-HRM: (3) Pooled transactional, and (4) Sequential transactional
- Transformational: (5) Supply chain delivery support

Table 2 below unfolds the five types of e-HRM.

Table 2. Types of e-HRM.

Dimensions	Informational e-HRM		Transactional e-HRM		Transformational e-HRM
	Static informational/broadcasting support	Customized/personalized information provision	Pooled transaction support	Sequential transaction support (workflow support)	Supply chain delivery support
Ontological dimension	<ul style="list-style-type: none"> - Broadcasting/publishing of information, such as: <ul style="list-style-type: none"> - Rules and legislation - HR policies/practices - Announcements / news 	<ul style="list-style-type: none"> - Generating reports on org. unit's human capital properties, such as: <ul style="list-style-type: none"> - formation and occupation - expenditures/budgets - skill levels (compared to requirements) - (sick) leave - mobility - demographic composition - Viewing employee properties, such as: <ul style="list-style-type: none"> - personal data - classifications (education/experience) - attendances and absences - performance - appraisals 	<ul style="list-style-type: none"> - Administration of org. unit's human capital targets, such as: <ul style="list-style-type: none"> - budgets - formation - job requirements - performance targets - Administration of employee properties, such as: <ul style="list-style-type: none"> - personal data - classifications (education/experience) - attendances and absences - performance - appraisals 	<ul style="list-style-type: none"> - Approval/denial of requests, such as: <ul style="list-style-type: none"> - leave - expenses claims - Provision of feedback, such as: <ul style="list-style-type: none"> - 360° - performance - Supplementation of records to be archived, such as: <ul style="list-style-type: none"> - results of calculations made by professionals - supplementation of data with restricted access 	<ul style="list-style-type: none"> - Creation of product, such as: <ul style="list-style-type: none"> - developed career path - composition of an advice - Creation of an situation, such as: <ul style="list-style-type: none"> - fulfilled vacancy - paid workforce - Creation of an outcome: such as: <ul style="list-style-type: none"> - an equipped employee (skills and equipment) - qualified project team
Coordination model	<ul style="list-style-type: none"> - Information is published by one (type of) user, but can be consulted by whomever is granted access to the information - Information can be consulted simultaneously by multiple users - The information offered is the same for every user granted access to the information - There is no interaction between the users by means of the technology 	<ul style="list-style-type: none"> - Information is extracted from a database - Access to the information in the database is often user specified in as much detail as necessary - The information provided may be specified by user requirements - Specific information objects can be consulted by multiple users at the same time - There is no interaction between the users by means of the technology 	<ul style="list-style-type: none"> - Individual users perform operations on data in a database - Access to the information in the database is often user specified in as much detail as necessary - There is no interaction (or sequencing) between the users by means of the technology - Users cannot perform administrative operations on a specific instance of an information object simultaneously - Dependency is created as different users can access and perform operations on one specific instance of an object (not simultaneously) - A single user can be involved in operations on several instances of different objects (endeavor), these endeavors however are independent for the technology 	<ul style="list-style-type: none"> - Multiple users are involved in performing operation on an instance of an object - Access to an instance of an object is granted by a defined relationship between the users - There is sequential dependency between the operations to be made on the instance of the object by the users - The second user starts operating on the instance of the object as the first user has finished (output of the first user acts as input for the second) - A single user can be involved in multiple operations on several instances of different objects (endeavor), these endeavors can belong to each other but are not necessarily dependant - The technology provides mechanisms to provide the user status information on all the endeavors the user is involved in 	<ul style="list-style-type: none"> - Multiple users are performing operations on a single instance of an object - The interdependencies are superficially created for the operations on the specific object based on the constraints provided for the creation of the object - The systems allows the coordination between the operations of the users - Dependency is created as different users perform operations on one specific instance of the object - One user may be dependent on all other user through a complex network (intraorganizational) of dataflow - Not all the user might interact with each other, but their inputs in the system towards the end product may consist out of various combination of polled and sequential interdependency - Simultaneously operating on a specific instance of an object by different users is possible

Table 2. Types of e-HRM (continuation).

User-interface model	<ul style="list-style-type: none"> - The data is presented in a single manner - The users are unable to change the representation of the information - Context information is probably not presented by the interface as this is integrated in the information broadcasted 	<ul style="list-style-type: none"> - Users can be enabled to change the representation of the information - The presentation of the information can be made dependant of the user's role - The User-interface probably displays some structural, organizational and even social context 	<ul style="list-style-type: none"> - The opportunities for operations on the objects through the interface can be made user-dependant - The interface displays the role of the user performing the operations - The user-interface probably displays some structural, organizational and even social context - The interface displays dependency conflicts 	<ul style="list-style-type: none"> - The user interface displays the status of the object - The interface displays the role of the user performing the operations - The interface displays dependency conflicts - The user interface provides information on the participants of the operations on the object - The user-interface displays some structural, organizational and even social context 	<ul style="list-style-type: none"> - The user interface displays the status of the object - The interface displays the role and the tasks of the user performing the operations - The interface is focused on the interaction necessary between the different user performing operations on an instance of an object - The user-interface displays structural, organizational and even social context
Type adaptation	<ul style="list-style-type: none"> - Solely user-interface customization (static adaptability of presentation by user) 	<ul style="list-style-type: none"> - Adaptability (personalization) based on the user (user data) of the technology (static adaptability of the content presented) - Adaptability (customization) based on the behavior (data usage) of the user (dynamic adaptability on the content presented) - Static information support 	<ul style="list-style-type: none"> - Adaptability (personalization) based on the user (user data) of the technology (static adaptability of the content presented) - Adaptability (customization) based on the behavior (data usage) of the user (dynamic adaptability on the content presented) - Personalized information support 	<ul style="list-style-type: none"> - Adaptability (personalization) based on the user (user data) of the technology (static adaptability of the content presented) - Adaptability (customization) based on the behavior (data usage) of the user (dynamic adaptability on the content presented) - Personalized information support 	<ul style="list-style-type: none"> - Adaptability based on the surroundings of the product to be made (dynamic personalized adaptation) - Transactional support
Impact on the functioning of the HR function	<ul style="list-style-type: none"> - Minimum impact on the functioning of the HR 	<ul style="list-style-type: none"> - Medium impact - Data made transparent for employees and managers - Less need for information provision by HR professionals 	<ul style="list-style-type: none"> - Considerable impact - Devolution of tasks to line managers and employees - Less administration tasks performed by HR professionals 	<ul style="list-style-type: none"> - Considerable impact - Less face-to-face consulting necessary - Standardized IT driven procedures 	<ul style="list-style-type: none"> - Large Impact - Integrated HR function - Integrated service provision

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