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THE IMPACT OF TECHNOLOGICAL ERA
IN HUMAN RESOURCE MANAGEMENT

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ABSTRACT

The Impact of the Technological Era in Human Resource Management

This work project is a literature review, which covers current studies (theoretical and empirical) on electronic Human Resource Management, human resources analytics and telework, and discusses some implications of the adoption of technology in human resource management processes.

The Work Project presents and discusses different and contradictory perspectives between empirical and theoretical studies, demonstrating that the results obtained to the moment are not consistent. We conclude that the adoption of technology in human resources management is not yet mature enough in order to understand the real impact.

KEYWORDS: e-HRM, telework, HR analytics, data mining

1. INTRODUCTION

This work project aims at understanding how the current technological trend is affecting the human resources management function (HRM) today. This work project is therefore a literature review of the topic. Business environment and competition are changing fast and dramatically due to technology. HR, as support function, can also benefit from this to help the organization achieve a competitive advantage. In our analysis we found three major topics that result from this digital world, namely 1) electronic tools that improve HRM activities and processes 2) the impact of HRM analytics and data and 3) how employees can be managed electronically. For each of these topics we present a critical and synthetic analysis in a structured way. Some conclusions will then be drawn from this systematic analysis.

2. METHODOLOGY

The purpose of this work project is to collect and analyze different theoretical and empirical studies on e-HRM and its consequences. These studies were identified through several online databases such as B-on, Emerald and ScienceDirect. To access the literature, the following keywords were used: HRM, e-HRM, electronic, data, e-recruiting, e-learning, HR portal, employee self-service, HR analytics, data mining, telework, flexible work and their variations. For the e-HRM and digital employee's management topics, the sample consists of studies published in journals rated 3 or 4 from the Association of Business Schools (ABS) ranking. Regarding HR analytics, we extended the research scope, since there are very few publications that match the search criteria. The journals, from which the articles were selected, are focused on three disciplines: human resource management, information systems and psychology. Only articles published after 1998 were used, because the topics are new in the literature, limiting the sample to a total number of 49 papers (Please see Table 1 in the Appendix for the full list of articles).

The articles were summarized in a spreadsheet, using keywords, to make a comprehensive and critical analysis (Table 2, in the Appendix).

The following sections discuss the main topics that were the object of the reviewed articles.

3. E-HRM – ELETRONIC TOOLS

3.1. The emergence of e-HRM. The fast way information technology (IT) has developed in the recent years, affected how an enterprise conducts business, and how their support functions must act. Today, HRM has changed dramatically (Parry, 2011) towards a more technological administration, to respond to globalization, and to the “increasing demands and complexity of the fast changing environment” (Kidron *et al.*, 2013: 3). In a first phase, the integration of information systems (IS) in HRM began in the 1980s for administrative processes and payroll processing (Bondarouk & Ruël, 2009) creating the concept of human resource information system (HRIS). The systems were targeted at the HR department itself, aiming to improve the processes and, consequently, improving the service to the business (Ruël *et al.*, 2004). During the last decade (second phase), the fast development of the Internet enhanced the adoption of Electronic Human Resource Management (e-HRM) (Strohmeier, 2009). Organizations implemented web-based applications for HRM, renovating traditional HRM delivery (Wickramasinghe, 2010). According to Ruël *et al.* (2004), the difference between HRIS and e-HRM relies on the target group, which in e-HRM is not the HR staff but rather the employees and management. The authors define e-HRM as a “way of implementing HR strategies, policies, and practices in organizations through a conscious and directed support of and/or with the full use of web-technology-based channels” (Ruël, *et al.*, 2004: 2). Additionally, Strohmeier (2007) defines e-HRM as “the (planning, implementation, and) application of information systems (IS) for both networking and supporting actors in their shared performing of HR activities” (2007: 2). Martin and Reddington (2010) propose a more up to date description,

taking into account the recent changes in mobile technology, “e-HR is concerned with the application of the internet, web-based systems, including newer Web 2.0 social media technologies, and mobile communications technologies to change the nature of interactions among HR staff, line managers and employees from a pure face-to-face relationship to a technology-mediated one” (2010: 2). In general, the literature related to e-HRM is still at an early stage (Marler & Fisher, 2013) and "due to the recency of the field, studies are descriptive or explorative rather than focused on testing clearly stated hypothesis or cumulatively contributing to the state of knowledge” (Strohmeier, 2007: 5). However, and summarizing, the definitions above highlight a different HRM positioning. Through information technology, it is possible to be more service oriented, have a collaborative environment regarding HR activities, in which different stakeholders (e.g., job applicants, managers, employees, HR staff), internal and external, make part of it (Stone & James, 2013).

3.2. E-HRM goals. For Lepak and Snell (1998) HR in an organization must be efficient, flexible, strategy focused and customer-responsive. E-HRM answers these needs, trying to improve the strategic role of HRM, reducing administrative HR work, improving efficiency, standardization, reduction of costs associated with HRM, improving HR service delivery, hence, increasing employees’ satisfaction with HRM services and manager empowerment (Ruël *et al.*, 2004; Parry & Tyson, 2011). However, Marler and Fisher (2013) stress the inexistence of studies proving a direct relationship between e-HRM adoption and reduced costs, organizational performance or strategy oriented. Nonetheless, the e-HRM goals and its investments are associated with the primary HR role, either administrative, focused on cost savings, or strategic, focused on building competitive advantage (Marler, 2009).

3.2.1. *Strategic role:* E-HRM facilitates the move to a more strategic role; a study by Parry (2011) found that organizations are more likely to use e-HRM when it supports the companies’

strategy. Despite that, the introduction of e-HRM alone is not sufficient for an HR function to become ‘strategic’ (Parry & Tyson, 2011). Strategic HRM is focused on creating competitive advantage for the organization in two perspectives (Marler, 2009): based on external positioning, that is, HR policies and procedures respond to the firm’s business strategy; and based on internal resources, the resource-based view (RBV) model, which focuses on developing human capital and organizational capability. Marler (2009) positions e-HRM as an external focus, since it aims at achieving greater efficiency and cost reduction. However, the author points out that these outcomes hardly create competitive advantage because they can easily be copied and to achieve this advantage, customization must be aligned with business strategy. On the other hand, HR activities such as recruiting, training, performance management and rewards develop internal capabilities (RBV), and through electronic systems, the probability of having productive and engaged employees is higher, helping the organization to respond to fast changes in business (Maler & Fisher, 2013). Studies on the extent to which e-HRM makes HRM more strategic do not provide empirical evidence on this (Marler & Fisher, 2013; Bondarouk & Huub, 2013). In a different vein, Hussain, *et al.* (2007) found that due to the support of HRM systems, HR professionals perceive themselves as participating in strategic decision making but the other non-HR executives did not share this perception. Human resources data are required to maintain the process of strategy development in order to improve employee performance, business results (Schalk, *et al.*, 2013), but, over time e-HRM systems can degenerate into a functionality decreasing the relation with the business. In summary, the contribution of IT to the strategic role of HRM remains to be confirmed.

3.2.2. *Reduce administrative HR work, Improve Efficiency & Standardization:* e-HRM requires a large investment that might be more reachable for bigger organizations. The efficiency savings produced by e-tools are higher due to the economies of scale triggered by the larger number of employees (Parry, 2011). However, the improved efficiency depends on the design

and implementation of the system, as well as on appropriate skills of HR staff (Parry & Tyson, 2011). E-HRM allows a more efficient administration, since it speeds up transaction processing, reduces information errors, improves the tracking and control of HR actions (Bondarouk, *et al.*, 2009), and improves standardization and the management process (Parry & Tyson, 2001). The compilation and storage of categorized data enables the digital mass supply of HR information in a short time period, the re-use of information for unlimited time, such as e-training, and a virtual “customer relationship”, internal and external (Martin & Reddington, 2010). Ultimately, it is possible to deliver HR service online, without face-to-face contact, hence outsourcing HR activities and reducing costs (Marler, 2009). Additionally, web-based HR tools enable the decentralization of HR tasks because administrative tasks become standardized and easy to manage, delegating them to a line management responsibility (Ruël, *et al.*, 2004). E-HRM is part of an enterprise resource planning (ERP) system (for example, SAP or Oracle) where e-HR is a module integrated with other modules from different functions that also support the organization, such as a financial module (Bondarouk & Ruël, 2009). ERP systems improve efficiency by integrating different types of information. To sum up, improved efficiency is obtained through the standardization, which also enables decentralization of HR tasks and allows delivering HR outputs to a greater number of employees.

3.2.3. *Costs Reduction:* Considering the HR role as greatly administrative, cost reduction is the main goal for implementing e-HRM; this area of support is the most pressured for cost reduction (Francis, *et al.*, 2014). This reduction is achieved by reducing HR transactional tasks, through automation and outsourcing, and reduction of HR headcount (Marler, 2009; Bondarouk & Ruël, 2013). With technology development in HR, administrative tasks may also be in-sourced to the shared service centres (SSC), through which companies can reduce costs by standardization (Farndale, *et al.*, 2009).

3.2.4. *Improve HR Service Delivery*: e-HRM improves support to managers and employees. Employees and managers have remote access to HR communication, performance reporting, team management, knowledge management, learning and other administrative applications through self-service technology, increasing their ability to perform HR activities (Huang & Martin-Taylor, 2013; Parry & Tyson, 2011), without the limitations of time and location. E-HRM changed positively the perceptions of HRM efficiency in line managers and employees (Bondarouk *et al.* 2009), because the electronic tools increase accuracy of data entry. The creation of the SSC concept was enabled by HR systems, but their main goal is to improve quality of HR delivery (Meijerink & Bondarouk, 2013), through a customer-focused orientation and service-level agreements (SLAs) that specify and achieve quality criteria (Farndale, Paauwe & Hoeksema, 2009). Additionally, systems allow a more effective virtual ‘customer relationships’, by increasing the two-way communications, such as online-career management, employee surveys or outsourcing of HR services (Martin & Reddington 2010), increasing the value of the HR activities.

3.3. Organizational adoption. In 2014, a HR system survey by Sierra-Cedar (2014) reported the use of applications in different HR activities in which the Retail/Wholesale sector leads in most categories of application adoption. Results showed different levels of usage: administrative (92% adoption), talent management such as recruiting, performance, learning, compensation (55% adoption), service delivery such as HR help desk or portal (49% adoption) and workforce management such as absenteeism and attendance (46% adoption). The number of enterprises adopting e-HRM is continually increasing, and over 50% of the survey respondents planned to increase spending on HR technology in the following year (Sierra-Cedar, 2014). Large organizations will more frequently adopt e-HRM, as the advantage of automation is higher and the investment justifies due to economies of scale (Strohmeier &

Kabst, 2009). For instance, an organization with more than a thousand employees can save training costs with e-learning applications, while smaller organizations may have difficulties rationalizing such investment. E-HRM is a common organizational practice in Europe; a study by Strohmeier and Kabst (2009) found that two thirds of Europe's organizations apply e-HRM. The adoption of information systems in HRM is crucial to help organizations to respond to the global business changes. With the support IT tools, HR can foster employees' creativity and organizational innovation through electronic learning, training, communication, and other types of support to employee's daily activities (Liang-Hung Lin 2011). To adopt e-HRM in an organization, one must consider that new sets of skills and capabilities are required for HR professionals, such as consultancy, strategic thinking, analytical, advanced communication, negotiation, process engineering, project management, business strategy and technology (Huang & Martin-Taylor, 2013; Parry & Tyson, 2011).

3.4. HRM activities. E-HRM can be divided into two HRM activities: transactional and transformational. Transactional are those activities that involve day-to-day transactions and record keeping (Parry, 2011); it concerns the basic HRM activities in the administrative area, such as payroll and personnel data administration (Bondarouk, Ruël & van der Heijden, 2009). Transformational activities add value to the organization with a strategic component and may be used to manage HR across the whole employee life cycle (Bondarouk, Ruël & van der Heijden, 2009; Parry, 2011), i.e. HRM tools that support basic business processes such as recruitment, selection, training, compensation and performance management.

3.4.1. *Transactional.* Transactional activities can be processed through traditional systems that help HR staff directly, or self-service systems that support HR indirectly. HR self-service technology is where employees and managers can perform HR activities and get HR information (Huang & Martin-Taylor, 2013), through employee self-service (ESS), manager

self-service system (MSS) and HR portals. The ESS depends on employees to upload personal data and the MSS depends on managers to update employee's information such as time record. The employee consults by himself the HR portal to find information regarding compensation, benefits, holidays and working days (Ruta, 2009). Taking into account the amount of data, information and knowledge available on these platforms, the HR portal is a strategic tool for HR since it supports and guides employee's activities, and aligns with the company strategy (Ruta, 2009).

3.4.2. *Transformational*. In order to understand the impact of different e-tools in the HR activities, we will now elaborate on the different activities of talent management - recruiting, selection, performance, training and compensation. E-HRM tools were created to support the different traditional HR activities (Stone, *et al.*, 2015) as summarized in Table 1.

<i>HR activities</i>	<i>Traditional goal</i>	<i>e-HRM goal</i>
Recruiting	Find the best job applicant	... in a large pool with reduced costs
Selection	Predict work behavior	... with more accuracy
Performance	Align employee behavior	... more accurately
Learning	Develop employee behavior	... in mass at a reduced cost
Compensation	Reward employee behavior	... and evaluate compensation systems

Table 1 - The impact of e-HRM in HR activities

Recruiting: The majority of large companies use e-HR to attract job applicants (Stone & Lukaszewski, 2009), through job openings ads and applications. E-recruiting helps organizations to find the best job applicant in a large pool with reduced costs (Simón & Esteves, 2016); the attraction of applicants is influenced by user friendliness and system speed (Braddy *et al.*, 2003; Cober *et al.*, 2003; Sinar, Reynolds, & Paquet, 2003, in Strohmeier, 2007). With technology development, some companies (e.g., T-Mobile) use the Second Life Virtual Environments to conduct job fairs, which allow users to enter a simulated world (Stone, *et al.*, 2015). In a different vein, the increase of social media created a new way of recruiting - the social recruiting (Ouiridi, Ouiridi, Segers & Pais, 2016). Through channels such as LinkedIn, Twitter and Facebook, the process is more dynamic, relational and strengthens the employer

brand (Carrillat, D'Astous, & Morissette Gregoire, 2014; Girard & Fallery, 2011; Girard, Fallery, & Rodhain, 2013; Henderson & Bowley, 2010 in Ouiridi *et al.*, 2016).

Selection: E-selection encompasses technological tools that “increase the likelihood of incumbent’s meeting the role requirements” (Stone, Stone-Romero & Lukaszewski, 2006: 234), such as ability and personality tests. However, Strohmeier (2007) found no relationship between e-selection systems and the selection of the most talented applicants, i.e., selection validity.

Performance: We define e-performance as “an online performance appraisal system in a software program that facilitates the completion of performance evaluations online” (Payne *et al.*, 2009: 4) that is accessed by managers and employees. E-performance facilitates keeping record of employees’ performance, the evaluation with organization standards and providing feedback (Stone, *et al.*, 2015). Additionally, it can provide data to identify HR problems, outstanding performance and rating errors, e.g., central tendency (Stone, *et al.*, 2006). Payne *et al.*, (2009) studied employee reactions towards e-performance and found that employees perceive more involvement through more accurate ratings and greater participation.

Learning: One of the largest changes in training and development in the last years is delivering training digitally through computers, laptops or mobile phones (Brown & Charlier, 2013). In order to successfully implement e-learning, i.e. guarantee high usage, Brown and Charlier (2013) suggest a model with three domains 1) learner characteristics, such as learning orientation and use, 2) perceptions of the technology, such as usefulness and ease of use and 3) workplace context, such as learner workload and climate for learning. However, as other e-tools, e-learning does not yet incorporate interpersonal interaction, which can decrease the learning process. With the development of technology and Web 2.0, a blended approach will be facilitated using virtual environments, gamification and mobile technologies (Stone, *et al.*, 2015).

Compensation: E-compensation aims to support the administration and communication of compensation and benefits, to increase employees' satisfaction and to evaluate compensation system's effectiveness (Stone & James, 2013; Stone, Stone-Romero & Lukaszewski, 2006).

The future of any of these e-HRM tools is to incorporate the employee relationship management (ERM) model described by Strohmeier (2012). ERM uses the components of the definition of customer relationship management (CRM), meaning that we may add value for the customer through personalization, in order to gain his/her loyalty. Equally, ERM enables long-term relationships through consistent individualization to create mutual value for the organization and the employee in order to gain his/her loyalty, hence focusing on attraction and retention. For example, each employee can have an individualized career path. To achieve this customization, e-tools must incorporate collaborative functionalities, which some already have, and the activation and coordination of different touch points and channels (Strohmeier, 2012), which are yet not developed.

3.5. User acceptance

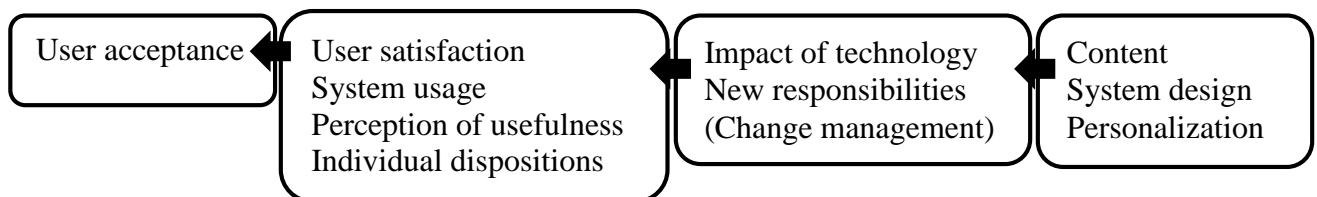


Figure 1 - Variables that influence user acceptance

The success of a system implementation depends of their user acceptance (Huang & Martin-Taylor, 2013). Therefore, the system usage and user satisfaction is a measure of success (Wickramasinghe, 2010). Different stakeholders, such as managers and employees, have different perceptions of usefulness of the same system (Bondarouk *et al.*, 2009) and employees perceived HR practices according to their individual dispositions (Katou, Budhwar & Patel,

2014). Therefore, the same HRM system can create different behaviors and therefore different levels of organizational performance.

Nevertheless, we must also consider the negative impact of a technology, which can harm user acceptance. For example, the decrease in social interactions may result in insufficient and inaccurate information, which affects users' expectations, performance and compensation (Stone, Atone-Romero & Lukaszewski, 2006). User acceptance is not just regarding the technology but also the new responsibilities for employees and managers that e-HRM enable. It means a change in mind-sets and behaviors that may take up to 3 years (Ruël, Boudarouk & Looise, 2004; Boudarouk & Ruël, 2013), in which stakeholders are now responsible for their own HR activities, such as career development. However, usage increases when change management supports e-HR implementation (Boudarouk *et al.*, 2009). When designing an application, it is crucial to consider which variables are important for users. Winkler *et al.* (2013) suggest that practitioners should focus on the relationship between users' needs and the content provided in HR systems (Marler & Fisher, 2013; Bondarouk & Ruël, 2009), since user satisfaction is influenced by information quality. To have the optimal equilibrium and influence the acceptance, the focus should be a combination between traditional HR systems and e-HR (Stone *et al.*, 2006), using e-HR to personalized messages, share rich information and have a two-way communication (Stone & Lukaszewski, 2009). For example, online job applications, plus using the systems to communicate with between recruiters and applicants. The most recent systems, however, are better designed and suited to the users' needs, as well as less complex, which increases user satisfaction (Wickramasinghe, 2010).

4. HR ANALYTICS

HR systems allow the possibility to capture and store data which can be retrieved at any time, with different kinds of information at the same moment. The increase of availability and reach

of human capital data support the company's strategy by facilitating HR to answer business challenges, through the analysis of these data (Dulebohn & Johnson, 2013; Schalk, *et al.*, 2013; Strohmeier & Piazza, 2013; Rasmussen & Ulrich, 2015). The goal of HR analytics is to relate HR data and business outcomes such as sales or customer satisfaction, in order to decide which indicators should be used to measure HR practices and outcomes (Douthitt & Mondore, 2014). The biggest challenge is to understand how employees influence a company's success (Angrave, *et al.*, 2016). For example, in order to achieve an increase in revenue of 10%, HR must increase sales training. Analyzing the relation between employee training hours and revenue results, allows the company to optimize the number of training hours. The connection between these is achieved through analytics, i.e. "database and spreadsheet-based analysis, new forms of database software that allow very large quantities of data to be stored and organized more efficiently and new techniques for representing and understanding data" (Angrave *et al.*, 2016: 2). The techniques focus mainly on reporting and statistical analysis (Dulebohn & Johnson, 2013). However, due to the big data era, these have evolved to data mining, algorithms, neural network, simulations and other methods to predict outcomes with precision (Gerard, Haas & Pentland, 2014). These advanced analyses have a critical impact on HR because they are used to predict the impact of future HR investment by calculating the return on investment, such as the employee's (current and new) performance, which is mainly used for recruitment purposes, and succession planning (Douthitt & Mondore, 2014, Strohmeier & Piazza, 2013; Chien & Chen, 2008; Rasmussen & Ulrich, 2015). Data mining refers to the process of finding patterns in a large amount of data through classification, segmentation, association and prediction, which can be translated into a final algorithm used to predict outcomes. It has several methods, but the most common one is the decision tree for classification and prediction. Regarding HR, it is mostly used for staffing, development, performance management and compensation (Strohmeier & Piazza, 2013; Chien & Chen, 2008;

Jantan, Hamdan & Othman, 2010). Chien and Chen (2008) used this technique in order to increase retention and the quality of recruitment in a high-technology the company. They analyzed work behaviors, work performance and turnover reasons and created a specific recruitment strategy focused on building a partnership with a university, implementing an employee referral, redesigning functions and implementing job rotation between functions. Jantan *et al.* (2010), through data mining, predicted performance of the employees taking account past data, which could be used for promotions. For recruitment, it is important to take into account that most companies already have requisites to hire and data mining in this context is only useful when the scope of data is larger, i.e. have diversity of applicants, in order to find unexpected patterns (Strohmeier & Piazza, 2013). Since data mining searches for patterns, legal and ethical issues might arise because the method can inconveniently create stereotypes with segments, hence raising discrimination issues (Strohmeier & Piazza, 2013). However, HR has not yet understood the application and impact of these tools. The area is too focused on simple reporting and metrics such as turnover or engagement, without knowing how to apply these metrics and incorporate them in order to measure the impact on business outcomes (Douthitt & Mondore, 2014; Dulebohn & Johnson, 2013). Additionally, HR professionals still have scarce analytical skills beyond correlations (Angrave *et al.*, 2016). On the other hand, software cannot achieve this analysis because developers lack labor knowledge, the dashboards are focused on operational reporting, vendors are too focused on selling software packages and the data needed is held in different sources making it difficult to integrate the total data (Angrave *et al.*, 2016; Dulebohn & Johnson, 2013; Douthitt & Mondore, 2014).

In terms of big data analysis, there are not many research studies and applications published (Gerard, *et al.*, 2014). In the HR domain there are even less studies, the application of data mining is still rare and research is mainly done by vendors with a commercial interest (Angrave

et al., 2016; Jantan *et al.*, 2010; Rasmussen & Ulrich, 2015). Unfortunately, the analytical capability for HR will take some years to mature.

5. EMPLOYEES WORKING AT A DISTANCE

Information and communication technologies (ICT) enabled globalization and supported the change of work arrangements such as working from anywhere and at any time (Stone, Stone-Romero & Lukaszewski, 2006) due to the increased speed and volume of information flow (Pyöriä, 2011). Today, telework, virtual teams and web-based job applications reduce the boundaries between geographies and empower organizations to work closer (Stone, *et al.*, 2015). Not only are ICT integrated in our professional lives, as in our personal, in which its tools such as hand-held devices, smartphones, email and social media are one of the main ways to communicate (Martin & MacDonnell, 2012). Telework is defined as “a broad term used to describe a variety of arrangements that involve working away from the employer’s main campus” (Morganson, *et al.*, 2010: 4) either in satellite office, client based work, modes of transportation or at home through ICT (Taskin & Bridoux, 2010). Despite telework being a concept applied for decades, the shift from traditional to this innovative way of working has not been as fast as one could expect (Pyöriä, 2011), but the process of economic globalization is increasing its demand. Working away from the main office changes quality of work and life, employee perception and attitudes, and organizational efficiency in different levels (Morganson, *et al.*, 2010; Pyöriä, 2011; Sivatte & Guadamillas, 2013).

5.1. Employee Impact

Several studies analyzed the outcomes of not working on the company premises, and the change of employees’ motivations and perceptions can be positive but also negative (Pyöriä, 2011). The major effect of ICT on employees was the flexible work arrangement, i.e. “organizational

initiatives which enhance employees' flexibility on the time and place where work has to be accomplished, and also various policies exerting influence on the number of hours worked" (Sivatte & Guadamillas, 2013: 2). These initiatives support the work life balance (Sivatte & Guadamillas, 2013), such as the decrease of work-to-family conflict (Sivatte & Guadamillas, 2013), more autonomy and flexibility hence increasing job satisfaction (Morganson, *et al.*, 2010). Employees working from home experience higher levels of concentration, work enjoyment and intrinsic motivation (Peters, *et al.*, 2014), and they view this work arrangement as gesture of trust, increasing their loyalty and appreciation for the company (Morganson, *et al.*, 2010). However, not all employees react the same way to this way of working (Sivatte & Guadamillas, 2013), some may prefer a conventional schedule. Additionally, there are gender differences, flexibility being perceived as a facilitator for women and mothers, and as a work control for men (Sullivan & Smithson, 2007). So it does not fit all situations, it depends on family situation (e.g.: small children) and the person's time management (Pyöriä, 2011). Working from home blur the lines between home and work, consequently increasing stress and overload (Morganson, *et al.*, 2010), due to employee's perception and also because of the employer that expects the employee to be available for 24 hours/day or do overtime (Pyöriä, 2011). Other less positive outcomes are social and professional isolation (Morganson, *et al.*, 2010) and social exclusion, which may raise trust issues (Pyöriä, 2011). Physical commitment also influences engagement (Pyöriä, 2011), for example, economic hubs such as New York have greater population due to this commitment. To sum up, despite flexible work arrangements being in general positive, different persons perceive it differently, resulting in diverse outcomes. The lack of labor legislation on this topic (Pyöriä, 2011) may create different perceptions for the employee and employer, indirectly harming the employee and not having an adjusted volume of work. On the other hand, with these flexible policies HR may assume that it is

beneficial to the employee and assume, for example, that it is supporting egalitarian gender policies (Sullivan & Smithson, 2007).

5.2. Organizational Impact

5.2.1. *Organizational adoption.* In order to experience the benefits of telework or flexible way of working, it is critical to guarantee that the company's culture is aligned and based on trust and high levels of autonomy (Pyöriä, 2011). Moreover, the implementation becomes challenging because of the difficulty of creating working teams and a sense of collectivity (Pyöriä, 2011). Teamworking is one way of having creativity and innovation in an organization. However, Webster and Wong (2008) compared employee's attitudes between traditional and virtual teams, and concluded that trust were the same in both teams, because in virtual teams the roles are clearer; project satisfaction was higher in virtual teams because of autonomy and work life balance. Nevertheless, geographic dispersion affects group tie strength and reduces social interaction (Suh, *et al.*, 2011) which lowers knowledge transfer between groups and employees. In order to achieve competitive advantage, hence intellectual capital Taskin and Bridoux (2010) suggest a) balance frequency between telework and office; b) selection criteria for teleworkers, because one size does not fit all; and c) create a face-to-face interaction culture, to promote trust and cooperation. Furthermore, the distance can be diminished using email, instant messaging, video/audio conferencing and group calendar since with these tools the employee increases social network, has more information and knowledge and increases group tie strength. (Suh, *et al.*, 2011).

5.2.1. *Organizational outcomes.* An empirical research review by Martin and MacDonnell (2012) questioned if telework is effective and found that it increases productivity, retention, commitment, performance, overall resulting in an increased organizational efficiency and concluding that telework is beneficial to organizations. Additionally, it contributes for a safer

and sustainable environment, because of reduced levels of pollution and traffic; lower facility management costs due to lower need of space for employees; and employer branding, because it creates positive and innovative corporate image, which attract and motivates employees (Pyöriä, 2011).

5.3. Control & Risks

With ICT and employees working away from office, the challenge of HR is that employee behavior is not manageable when it is no longer inside the premises. The blurred boundaries of home and work cease to exist, which can damage the company (Van Gramberg, Teicher & O'Rourke, 2014). There are two main challenges a) technology misuse or cyberdeviant behaviors and b) data security. The misuse of electronic communications is using corporate email for private use such as online gambling, chat, pornography and web surfing (Van Gramberg, Teicher & O'Rourke, 2014; Weatherbee, 2010). Company's data are one of the most important assets to achieve competitive advantage; and although there is access control, encryption, firewalls and anti-virus software, the weakest element are people (Pyöriä, 2011). Counterproductive behaviors are managed through policies and procedures in the workplace, monitoring and surveillance (e.g.: track of websites, blocked websites) and dismissal (Van Gramberg, *et al.*, 2014). On the other hand, these controls lead to mistrust and consequently higher turnover. Moreover, the misuse of electronic communication, albeit individually done, can harm the company as a whole such as lowering employee performance, loss of intellectual property, increased costs, loss of efficiency and legal liability (Van Gramberg, Teicher & O'Rourke, 2014; Weatherbee, 2010).

6. CONCLUSION

Technology impacted HR for the first time 45 years ago (Strohmeier, 2009), but it seems that it is not fully controlled or comprehended by academics or practitioners. Research is scarce and recent (Strohmeier, 2007), information available is contradictory and it seems that the subject has not yet reached a mature phase.

e-HRM enables automation and allowed the outsourcing of HR activities (Ruël, *et al.*, 2004) which both reduces transactional costs (Boundarouk & Ruël, 2013). Additionally, it provides HR data supporting decisions regarding the strategy (Dulebohn & Johnson, 2013).

However, the role of a strategic HR due to technology remains to be confirmed. E-HRM goals are costs and strategy (Marler, 2009), yet there is no direct relationship between them (Marler & Fisher, 2013). As mentioned, the field is recent and according to Ruël *et al.* (2004) it takes about 3 years to obtain some positive outcomes. So far, these are mainly achieved by high-technology companies that use internal capabilities (Ramirez & Fornerino, 2007).

We can conclude that HR professionals lack the right skills to deal with technology (Parry & Tyson, 2011), its e-HRM tools and data, influencing the outcomes, namely a strategic positioning.

Despite the not confirmed positive results, e-HRM adoption continues to increase (Sierra-Cedar, 2014). The future is customization, an ERM model (Strohmeier, 2012) that reaches strategy capability.

The shift to working outside the workplace is harder as expected (Pyöriä, 2011). Employees have different reactions from motivation (Peters, *et al.*, 2014) to stress (Morganson, *et al.*, 2010). We highlight the importance of understanding the conditions or variables, i.e., family, company's culture or frequency, before implementing such working conditions.

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