

## E-HRM: HUMAN RESOURCE MANAGEMENT IN THE E- ECONOMY

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### INTRODUCTION: THE INFLUENCE OF INFORMATION TECHNOLOGIES ON HUMAN RESOURCE MANAGERS

Lately, there has been a strong interest in the relationship between Human Resource (HR) managers and the way they add value to organizational performance, surpassing the exploration of the effectiveness of single HR policies and practices [1, 2]. Even though [1] presented evidence that technology-related competences were considered less competitive than soft, relationship management issues (trust, commitment, etc.), it cannot be denied that a dramatic change is taking place in the HR area, which affects everyone within and on the fringes of the organization (applicants, retirees, outsourcing contractors...). This change is both supported and led at the same time by information technologies (IT), specifically Internet, which are permeating, slowly but surely, the HR manager's function.

The root of this change is the knowledge that a successful firm will be the one compelled to both adapt and anticipate to the current environmental changes, evolving from a solid, hierarchical and mechanical entity to a fluid, organic organization built on information flows [3].

Some consequences of the introduction of Internet in the world of HR are the following [4]:

- IT destroys traditional, intensive manual labor, but gives birth to new jobs (Webmasters, media brokers, html programmers, etc).
- Teleworking and flexible consideration of time and space are part of the job's description. Privacy has also become a relevant issue, since the distinction of personal and professional related information is blurred, as well as blending personal time and working hours.
- Geographical barriers disappear, up to the point in which some business are working 24 hours a day by using time zones appropriately.
- Multifunctional skills and teamworking are required abilities for new economy's employees.
- Modern organizational structures, flat and team-based, are taking over traditional forms (virtual organizations being the epitome of this phenomenon).

The integration of IT in the organization of work has brought certain benefits which lead to new conceptions about work relations, but not about work itself [5]. Business have to learn to "e-manage" their human resources, as opposed to simply "manage" them, in order to survive in today's digital environment. However, many organizations do not react to these environmental challenges suitably. This problem often results in policies, practices, and strategies that may be outdated.

Thus, the quest of present time HR managers is make the most of this pervasive technology while addressing the abovementioned challenges in an effective manner. And this can be achieved by implementing e-HRM functions. Strohmeier [6] defines e-HRM as the application of IT for both networking and supporting at least two individual and collectives actors in their shared performance of HR activities. Therefore, e-HRM extends outside of the HR department to the whole organization.

The chapter's purpose is to show HR managers how to boost the added value of people as a company asset by means of an adequate IT management, specifically intranets, to integrate an e-HRM perspective in their businesses. We hope this will help with making better decisions in regards to Human Resource strategies.

The layout of the chapter is as follows: the first section will approach the concepts of e-HRM and the IT supporting it. Afterwards, a practical view of e-HRM functions will be shown, finalizing with some conclusions and future lines of work for new economy's HR managers.

## **THE INTRANET AND ITS ROLE IN E-HRM**

e-HRM refers to conducting HRM transactions using Internet and other technologies. Although the 'e' part is a reflection of the 'electronic' meaning that it has in 'e-business' or 'e-commerce', it really means online HR. An e-HR system aims to provide useful information to managers and employees anytime, anywhere. For instance, it allows employees to take over some of the administrative roles of the HR department, by controlling their personal information, updating records and keeping control of timing and agenda. As for managers, it helps them to access information and data, conduct analyses, and make HR related decisions without consulting the HR department [7].

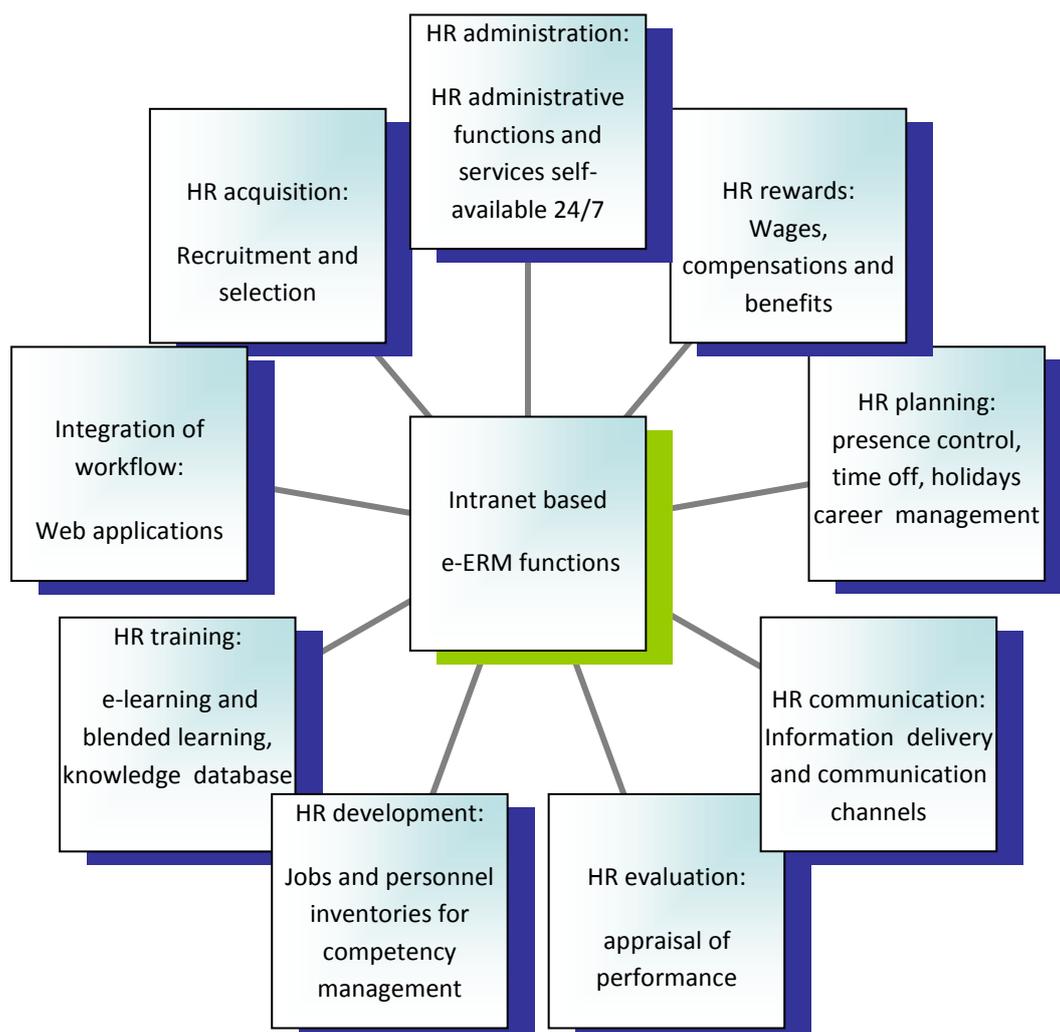
Summarizing, e-HRM is a more specific vision of how HRM and its associated processes can benefit from a rational use of IT. According to [8], there exists "*a positive relation was expected between reported ease of use, usability, user support and output quality of an IT system and the attitude towards E-HRM*". The cost of doing HR transactions is lowered and response times are improved, as well has quality and consistency of the HR information [9]. Likewise HR managers are able to focus on strategic functions instead of carrying out administrative tasks. But there are also some disadvantages: according to [10], e-HRMs "*pose a challenge that is especially significant for human resource management: they lack the personal touch of face-to-face communication*". Also, less administrative and paperwork tasks may mean less HR personnel needed, thus considering e-HRM as a blessing and a course [11].

This is the principle underlying the notion of e-HRM: IT can only support true competitive advantages in combination with soft HRM practices, knowledge management and trust relationships [12]. This means that firms must enhance their employees' skills, behaviors and attitudes towards creating and sharing knowledge in technology-based work environments, like an intranet.

The intranet is a private computer network that uses Internet protocols, network connectivity, and possibly the public telecommunication system to securely share part of an organization's information or operations with its employees. Sometimes the term refers only to the most visible service, the internal website, generally restricted to employees of the organization [13]. Intranets have inherited from Web parenting the low cost, inexpensive fees, scalability and excellent support advantages, but these will only come out if it is properly designed and managed [14]. This means that the Internet's interactivity and real-time interaction collude with the advantages of having the information on HR systematized, allowing for most efficient decision making.

### Deployment of e-HRM functions and processes

Almost every e-HRM function can be carried out by means of an intranet. Figure 1 illustrates the key e-HRM processes most commonly found on corporate intranets [7, 15, 9].



### Figure 1: Key e-HRM functions

It can be seen in Figure 1 that there is a variety of functions available for e-HRM managers. From the simple publishing of information, to the more evolved HR development practices. The depth of the e-HRM deliverance depends on several factors, like the level of commitment and qualifications of the HR manager, the IT used, the organizational culture and the expectations and demands of the employees and managers [7,9, 16]. Let us elaborate on these functions.

The **HR acquisition** function may be carried out by an applicant tracking system, a software application that enables the electronic handling of corporate recruitment needs. Most include a corporate career site, allowing companies to post jobs on to their own websites, and applicants to log on their curriculum vitae. Candidates can apply for either specific or non-specific job vacancies. Effective solutions store the candidate data into a database to allow efficient searching, filtering, and routing of applications. It can be complemented with the information provided by an online, integrated solution using Web-based management tools, that allows applicants (job seekers) to submit (upload) and manage their electronic Curriculum on the Internet [15].

**HR administration** allows for e- selfservice applications that diminish the charge of routine work for the HR department while increasing transparency and visibility for employees in regards to their personal information. This indicates an increase in information access and sharing, shifting away from the traditionally centralized and hierarchical approach. Furthermore, the operational efficiency and effectiveness of the HR area improves, leaving their managers to focus on the more strategic functions of their profession [7].

Payroll administration is known to be one of the earliest HR processes to be automatized [11].

**Wages and benefits** are easier to calculate and personalize since the information needed is mostly uploaded in the system, like time attendance and productivity figures.

This is related to **HR planning** in terms of presence control, and requests for holidays and time off. The traditional time clock often no longer makes sense and simply does not meet the needs of the current work environment. The intranet may be used to track and monitor employee attendance accurately in real-time, even if they are not working physically at the organizational premises. However, it may lead to a “Big Brother” experience for the more technophobic employees [17].

**Information dissemination and intra-organizational communication** are two of the most common purposes of the intranet [16]. However, e-HRM takes this information level up a few notches, by offering employees online access to information about HR in a self-service way. E-mail, forums, videoconferences and other applications are set up on the virtual desktop of the employee to provide them with several communication channels that break the trade-off between reach and richness of information [7].

Payne et al. [18] provide evidence that **online performance appraisal** systems are viewed as superior to paper and pencil systems in many respects, but not in terms of the perceived quality of the performance appraisal ratings. Actually, the gain comes from having the

information gathered in one system that allows for comparison and feedback of the HR manager, although not so much from the employee's point of view.

Jobs inventories and staff profiles can be loaded into the system and used as the starting point of the **HR development** function. A series of assessments are carried out to match peoples' competencies and job requirements, as well as planning promotions and careers, and detecting training needs. These databases should be kept always updated, so that HR managers are able to identify and lack or excess in any competency of any employee at any given time [15].

**HR training** has a wide scope, from an application to request courses to e-learning and e-mentoring processes. It also contributes to organizational effectiveness by managing knowledge repositories and creating social and intellectual capital [11]. According to [19], most distance education technologies can be used for training, are cheaper for the firm to use (as compared to the use of a live instructor) and trainees thus trained perform better, especially in virtual environments. However, the average trainee prefers a live trainer than any e-learning resource, unless there is a strong intercommunication among trainees.

The use of web technologies has changed the way in which data and computational resources are brought to the desktop of the employees. Since **web based solutions** are easy to establish [20], a plenty and quickly increasing number of resources can be made available on Intranet application [21]. This function refers to an e-HR form which focuses on the automation of transactions, under the principles of business process reengineering, where paperwork is replaced by electronic work flows, even integrating and combining several application programs, under ERP software.

In order to see a practical application of e-HRM, we have taken a look at the intranet that supports the e-HR functions of a Spanish university, the University of Alicante. This case is doubly interesting because it is a public administration, with its special cultural features, and center for science development itself, which means that it benefits from an advanced tailor-made IT system to support e-HRM.

## **PUTTING E-HR INTO PRACTICE. THE CASE OF THE UNIVERSITY OF ALICANTE.**

According to [22], University of Alicante (UA) had a teaching staff of 2212 people and 1240 administrative staff at December 2007. Moreover, the budget of 2007 was about 265million €. Therefore, although the UA is a "government enterprise", according to general and well-accepted definitions [23], the UA can be considered a "big-size enterprise".

Since 1995, the UA makes use of a self-made platform called Campus Virtual [24]. Campus Virtual is a web application that supports both teaching and learning processes and administrative tasks, and it is used by more than 95.000 users [25]. A proprietary IT system means that it is customized to UA staff needs and demands, and that any difficulties are being dealt with as soon as detected.

The e-HRM system of the UA is part of the Campus Virtual [24]. In order to achieve high levels of quality and performance, the e-HRM of the UA is personalized, secure, and accessible from any computer with an internet connection. Obviously, the e-HRM limits access to information to only authorized users in the UA: privacy is an important issue, because HR information is confidential and not suitable for posting on a website for everyone to see.

Currently, the e-HRM offers the following main functions to employees, but every year the features and functions of the e-HRM are improved:

- Enroll in and participate in training programs online (e-learning).
- Time attendance tracking.
- Time off request.
- Check holiday entitlements and request holiday periods.
- View and print the payroll online.

Moreover, the e-HRM system of the UA supports other functions as e-recruiting and knowledge sharing. For example, all the new job positions are made public on the UA web portal; all the information about health care and other benefits, UA's policies regarding work hours and holiday periods, and model documents are available on the UA web portal.

Besides, the employees of the UA keep their personal records up to date by themselves. For example, an employee can submit an address or bank account change through the e-HRM. With employees helping themselves to transaction information and changes, UA is able to cut the number of staff members required to administer some HR tasks and it is able to offer a more personalized and up-to-date information, which concurs with the benefits and drawbacks presented before.

We selected the abovementioned subsystems of the e-HRM of the UA because of their level of development and the ability to describe them from two perspectives, the employee and the supervisor:

- Employee: time attendance tracking, time off request, holiday period request.
- Supervisor: employee absence monitor, time off request and holiday period request approval.

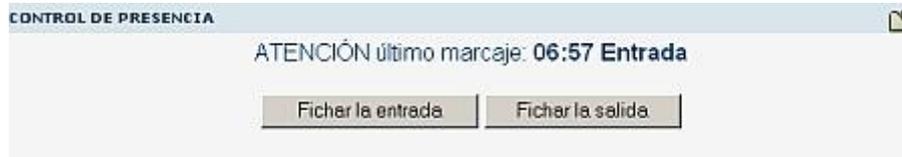
This will allow for a 360° vision of every function, as well as the interactions among both agents involved.

### **Employee**

As it was explained before, the Campus Virtual of the UA is used to track and monitor employee attendance accurately in real-time. Instead of employees punching a time-card, they simply connect to the Campus Virtual, enter their user and password and select the function to punch in. Employees can punch in only from their assigned computer; therefore, it is avoided

fraudulence: an employee cannot punch in at home or from another computer in the University.

Figure 2 shows the e-HRM interface that is used punch in both the entrance and the exit. As we can observe, the interface is very simple: the time of the last punching is shown, and two buttons allow the employee to punch in the coming in or the coming out.



**Figure 2: Punch in the entrance to work**

Sometimes, employees can make a mistake and can forget to punch in at the right time. In this case, the employee has to use the function to correct a mistaken punching: the employee has to fill up the date and time of the mistaken punching, the event (come in or come out) and the reason, as shown in Figure 3.

DNI: [REDACTED]  
 Nombre: [REDACTED]  
 Fecha: [ ] [ ] Hora: [ ] : [ ] formato: HH:MI  
 Evento: [Entrada] Motivo: [ASISTENCIA A CURSO]  
 [Rellenar marcaje]  
 Pulse el botón para guardar los datos del marcaje

Motivo dropdown menu options:  
 ASISTENCIA A CURSO  
 ASISTENCIA A CURSO  
 CONFUSION ENTRADA/SALIDA  
 CORTE SUM. ELECTRICO/CAIDA RED  
 OLVIDO EN EL MARCAJE  
 PROBLEMA TECNICO  
 TRABAJO EN OTRA INSTITUCION

**Figure 3: Correct a mistaken punching**

Moreover, the e-HRM offers an on-demand report generation that allows employees to review their own attendance data and to check their balance (theoretical and real hours), as shown in Figure 4. This is very important since for the most bureaucratic organizations, wages and productivity are usually calculated in according to working hours. In this report, special events, such as bank holidays or sick days, are shown with a different color.

LEYENDA  
 FIN DE SEMANA INCIDENCIA AUSENCIA FESTIVO AUSENCIA COMPLETA AUSENCIA PARCIAL VACACIONES  
 El sistema es consciente de que se consume más tiempo por fichar por el ordenador.

CONSULTA MARCAJES DE [REDACTED]

Mes Anterior		MAYO 2006										Mes Siguiente	
Dia	Marcajes						Horas						Saldo Acumulado
	Ent.	Sal.	Ent.	Sal.	Ent.	Sal.	Comida	Teóricas	Ampliado	Neto	Brutas		
1													
2	07:26	16:27						07:00				09:01	
3	09:20	16:37						07:00				07:17	
4	09:22	16:04						07:00				06:42	
5	09:19	16:09						07:00				06:50	

**Figure 4: Report of time attendance balance**

On the other hand, employees can make time off requests and enter time off taken through the e-HRM of the UA. Figure 5 shows the interface of this function, where the employee has to fill up the reason and the starting date and ending date of the time off.

**SOLICITAR AUSENCIAS, PERMISOS Y LICENCIAS**

Motivo: ASUNTOS PROPIOS  
Información: 6 DÍAS (1 DÍA CADA 2 MESES TRABAJADOS)  
Motivación:

Año imputación: 2006

Fecha inicio	Fecha fin
<input type="text"/>	<input type="text"/>
<input type="text"/>	<input type="text"/>
<input type="text"/>	<input type="text"/>

Días tomados (2006) = 2

**Año: 2006 Días totales disfrutados: 2**

**Solicitar**  
Pulse el botón para guardar los datos

**Figure 5: Request of time off**

The time off requests are automatically routed to their supervisors and automated email notifications notify supervisors the existence of pending time off requests. Supervisors could approve or reject with detailed comments any request. Automated email notifications notify employees when time off requests are approved or rejected.

Lastly, employees can also request holiday periods, as shown in Figure 6. The employee has to fill up the type of holiday period and the starting date and ending date of each one of the holiday periods.

**SOLICITAR VACACIONES**

Tipo de Vacaciones:  Año imputación:

Turno:  Días adicionales:

Comentario:

Rango de fechas	
Fecha inicial	Fecha final
<input type="text"/>	<input type="text"/>

Pulse el botón para guardar los datos

**Figure 6: Request holiday period**

### Supervisor

Supervisors can monitor and manage employee attendance and absence in real-time from any computer with internet connection. The e-HRM allows supervisors to note exceptions such as tardiness or absences and adopt corrective decisions.

For example, Figure 7 shows the time attendance tracking of an employee during a week (from 13<sup>th</sup> to 15<sup>th</sup>). A mistaken punching that the employee has corrected is highlighted with yellow background color. The supervisor can check the reason and can approve or reject this correction.

Día	Marcajes					
	Ent.	Sal.	Ent.	Sal.	Ent.	Sal.
13	09:08	15:08				
14	09:13	15:37				
15	09:23	17:00 [A] [D]				
16						

EN PROCESO DE ESTUDIO ASISTENCIA A CURSO  
(172.17.193.62)

**Figure 7: Time attendance tracking of an employee**

Regarding time off and holiday period requests, supervisors receive automated email notifications. Supervisors review time off and holiday period requests and approve or reject them with detailed comments according to scheduling criteria or whether balances will be available. Then, automated email notifications notify employees when time off and holiday period requests are approved or rejected. Figure 8 shows the interface of this function, where the supervisor has to fill up the reason of rejecting a time off request.

Solicitante: [REDACTED]  
 Unidad Administrativa: [REDACTED] GESTION DE PERSONAL S07021100 (833)

Motivo: EXAMENES  
 Información: PRUEB. SEL INGR. AD. PÚBL. , EX. FINALES, PRUEBAS APTITUD Y EVAL. CENT. OF.  
 Motivación: FINAL DE PRIMER CUATRIMESTRE

Motivación de la denegación: [REDACTED]

Rango de fechas		Rango de horas	
Fecha inicial	Fecha final	Hora inicio	Hora fin
20/11/2006	20/11/2006		

Estado de la solicitud		Enviada Responsable Unidad	
Fecha Solicitud:	15/11/2006	Fecha Baja:	
Enviado a Resp. de Unidad:	15/11/2006	Enviado a Resp. Final:	
Fecha visto bueno:		Fecha autorización:	
Fecha desestimación Resp. Unidad:		Fecha desestimación Resp. Unidad:	

En el año natural ha solicitado 1 ausencias y ya se le han autorizado 0 ausencias del tipo EXAMENES que hacen un total de 0 días autorizados.

Visto bueno Solicitud [REDACTED] Desestimar Solicitud [REDACTED]

Pulse el botón para guardar los datos

**Figure 8: Approve or reject a time off request**

Lastly, the e-HRM of the UA allows supervisors to generate on-demand reports. Supervisors can review the time attendance of a particular employee or can check the balance of all the members of a work group. For example, Figure 9 shows a report about the time attendance and time off requests of five employees from May to June. Different colors are used to highlight the special events, such as bank holidays, employee holidays and full and part-time time offs. It is easy to see and compare the dates of attendance and time off of every person, thus providing their supervisor with exact and relevant information concerning the work time of their employees.



**Figure 9: Report of time attendance**

## CONCLUSIONS

E-HRM refers to the provision of HR services and deployment of HR functions online. We have seen in this chapter a theoretical approach complemented with a practical deployment of e-HRM in an organization, the University of Alicante. The former aims to present a thorough vision of e-EHRM, while the latter provides the reader with illustrative examples of how e-HR technology can be strategically aligned with HR needs, even in such a big enterprise with a diverse workforce and a bureaucratic culture.

Indeed, IT offers the opportunity to combine both perspectives due to its ability to break the trade-off between reach and richness of information within the organization. A strategically planned IT system may provide for dynamicity, adaptation and low costs, saving time and providing useful information for better decision making.

The intranet is the most commonly deployed IT system for e-HRM, because of its adaptability and scalability. The intranet's main advantages are the increase in decision making efficiency and the decrease in the required time for internal and external communication. Both of these result in cutting down on coordination and communication costs, removing bottlenecks in the decision making system and eliminating duplicated and routine administrative tasks. These positive effects could also be transferred onto HR policies to lessen their subjectivity, with the help of a rigorous competency management system, as presented by [15].

HR managers now face the challenge of shifting from a bottom-line, expense control perspective towards organizational effectiveness and knowledge sharing. This is even more radical when they work for public administrations, characterized by their bureaucratic attitude against change in their work routines. Evidently, cultural issues are bound to exist and they have to be taken care of by means of training programs and other benefits. Therefore, motivation and communication programs should be in the agenda of e-HR managers to increase willingness and acceptance of changes.

Other topics that should be addressed, as we have learned from the UA example, are the possibility of correcting mistakes produced by the employees that use the system without direct surveillance, limiting the damage in time. Also, the comparison of perspectives will help the organization to understand the electronic interactions between managers and employees, preventing miscommunications and misinterpretations of information. For instance, online presence control may be considered overwhelming for the less willing employees, because they feel that they are under constant vigilances. Measures against this feeling should be set up. Besides, any reports generated by the system should be discussed between employees and managers to generate feedback on the causes and consequences of their performance.

Future lines of work in this field are the promotion of more case studies from which to learn directly the opportunities and threats of e-HRM, and the solutions provided by field-HR managers. It will be particularly interesting to see how the issues of commitment, trust, leadership and motivation are being considered, since e-HRM tends to substitute face to face interactions with screen-based communications. Furthermore, we concur with [9] in encouraging research on how to measure the effects of e-HRM performance are necessary to prove the impact of these practices on business competitiveness in comparison to those who favor traditional HRM.

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