University of Szeged

Faculty of Economics and Business Administration

Doctoral School in Economics

Zoltán Majó

e-HRM: The world of phenomena of electronic human resource management
- The webolution of HR –

PhD thesis

Supervisor:

Dr. Gizella Sikora Dr. Tóthné
Candidate of Economic Sciences
Associate Professor
University of Miskolc
Faculty of Economics

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Table of contents

I. Research history, research objectives

The topic of my PhD thesis is electronic human resource management (abbreviated as e-HRM or e-HEM in Hungarian), towards the development of which the economist society could behave resentfully with a simple technocratic approach stating that e-HRM is the effective utilization of the internet in the personnel-related activity of organizations.

This economist approach, embedded in the increase of efficiency, has without doubt led to the electronization of human resource management activities. However, this is only one side of the coin. The internet has not only increased the efficiency of existing business procedures and processes, but has also induced new, technology-driven changes in HR fields. It has generated the formation of new structural forms of information technology, created new business models and transformed the existing procedures; the info-communication technology is, in a wider sense, the indicator of change on a global scale that has changed the social, economic and cultural establishment.

My PhD thesis presents the changes occurred in the world of labour, in relation to effects of the information society. Within that, it provides a substantial analysis of electronization in the field of human resource management, as well as the intensive changes on the sides of both employer and employee in the light of info-communication technology (ICT) achievements.

Reasons for choosing the topic

Electronic human resource management has become important for both business and public actors in the past decade. Electronization in relation to human resources, naturally with different intensity and from different aspects, has moved into the centre of attention everywhere.

Business practice, in relation to HR labour electronization, has reflected a fast improvement and permanent change for the past decade, both at global and local levels. Top enterprises with global presence have been using web solutions in the field of HR for many years. Every company on Fortune Magazine's list uses this tool in its HR activity. Job seekers, employees increasingly trust online recruitment channels. In previous years, the market of job boards has become a separate industry, the biggest ones (*e.g. monster.com*) contain millions of job offers and employee CV's. Global tendencies can be felt in Hungary as well: modern enterprise resource planning (ERP) systems have had their own e-HR modules since the turn of the century, the first internal HR portals

have appeared that have created the opportunity of self-service for employees in relation to HR service requisition. These systems can be found in more and more enterprises operating in Hungary.

Besides business developments, government efforts have also appeared in the field of e-HRM: probably the most popular among these in the European region is the e-Europe programme. The extension of employment agencies and the services of job centre to the internet in order to increase the flexibility of the labour market takes second place among the 12 online services adopted by member states and is to be implemented in every EU member state. The EURES system has come into existence as a result of this objective, which contains more than one million job offers on European level as the "official" career portal of Europe.

Besides business and government interpretation and utilization, the notion of e-HRM is related to three disciplines, it can be approached from three angles from a scientific point of view. On the one hand, from the aspect of economics, starting from the field of management and corporate economics, on the second hand, from the point of view of IT, through enterprise resource planning systems and, on the third hand, analyzed from the point of view of changes in the information society.

Keeping multidisciplinarity in view in reference to the approach of the topic field, during writing my thesis, I used the approach of the American author Stan Davis. In relation to the transformation of the "human function", Davis does not exclude the possibility of the disappearance HR departments and HR labour, as we know them today, since their life cycle has expired. Davis considers the HR department (1), the personnel department (2), and finally the human resource management directorates (3) as elements of a development chain. The human relations department, as the first piece in the chain, appeared for the management of changed labour content (e.g. development job descriptions) related to the industrial society in the early 20th century. Its aim was the consolidation of employment conditions. Its primary objective was the agreement with trade unions, representing the employees, about working time, wages, pensions, rights and obligations of the parties. The second piece was the development of the personnel department from the late 1950's, early 1960's, in which the focus was widened, and human relations, training and development became the targets of the HR work. This was followed by the third piece, human resource management, concentrating on the management of "white-collar" problems instead of "blue-collar" topics, since the lack of financial capital was replaced by the lack of talent. The manager dealing with the employees (HR manager) obtained a seat in the senior management, since

high compensation was not enough anymore for retaining well-trained colleagues with significant professional knowledge, different performance measuring and stimulating systems started to develop. According to Davis, this work has practically been done. He says that we have come to the "end of the third piece in the chain", however we do not yet see the next "piece", we do not even know its name. We feel however, that the effects of information society are transforming the world of labour. The internet is modernizing HR work, and the management of the "knowledge worker" is posing new challenges to HR.

The aim of the thesis

Concentrating on the field of human resources, in my thesis, I analyze what added value and transforming power the internet and info-communication technologies have in the world of labour beside the "efficiency approach" of economics. These types of researches can help us in interpreting HR activity in the information society. In connection with the exploration of e-HRM as a borderline field, the demand to clarify the range of impact of the notion of e-HRM has led me during my researches, and answers to the following questions were of the highest importance:

- The historical presentation of HR electronization, a coherent development of the notion of e-HRM: what was the connection and what development of stages HR electronization can we distinguish?
- The analysis of the role of ICT in the world of labour: what dominant changes has ICT induced in workplaces?
- The exploration of the world of phenomena of e-HRM, an analytic presentation of the most important factors related (models, procedures, solutions, institutional system): which HR function generated an explosive change, what global tendencies can be observed and what effect mechanisms describe them?
- The exploration of Hungarian e-HRM specialties: what specialties, what dissimilarities can be found in Hungary?

II. Research methods and sources, thesis structure

Besides the literature published in the field of the thesis, the main information sources for researches grounding the thesis were websites of companies, organizations, enterprises, and business and official reports on these portals. The processing of these has been carried out in a research database made through data mining. The new data needed for the empiric research are

based on time-series data tables of previous personal data collections. **From a methodological point of view, for a complex analysis of the topic field, I used the quantitative and qualitative instrument system in a complementary way.** The research programme is illustrated in the following table.

Table 1: The structure of the complex e-HRM research programme

Levels of analysis	CONTEXTUAL	MACRO	MESO	MICRO
Subject of research	The development of the e-HRM notion	Exploration of the world of phenomena of e-HRM	The exploration of the role of ICT in the world of labour, and of the attitude of employees/users	The exploration of the Hungarian specialities of e-HRM
Denomination of the research sub-programme	**1. Exploration, founding of the e-HRM notion**	**3, The analysis of functionality of the human resource information system**	**5, Changes generated by ICT means in the time use of employees**	**7, e-HRM activity of enterprises on the virtual labour market**
Methodology	Literature processing	Analysis of secondary information sources, qualitative	Population questionnaire, quantitative	Time-series web observation, with qualitative and quantitative system of means
Research methodology	Exploration of secondary information sources, processing of magazines, textbooks	Processing, standardization of descriptions of the five leading HR software products	Large-sample, by telephone n=2000	Time-series observation of career portals of the TOP 50 Hungarian large businesses
Denomination of the research sub-programme	**2. Analysis of the historical relationship between HR and IT**	**4, Identification of online labour market actors**	**6, Changes generated by ICT means in the attitude of employees**	**8, The role, embeddedness, and functions of e-HRM within the company**
Methodology	Literature processing	Web observation, qualitative	Population, closed questionnaire, qualitative and quantitative	Case study, qualitative
Research methodology	Information filtering, time-series analyses	Identification, periodical observation of career portals	Large-sample, by telephone n=2000	Based on case studies, closed in-depth interviews at three enterprises

Source: own editing

The complex research programme presented in the table constituted a framework for recent researches; but it was far from linear. Certain intermediate results, as well as the personal learning process related to research experiences resulted in more research findings that led to the refinement of research directions (these are also integral parts of certain chapters).

The structure of the PhD thesis

My PhD thesis consists of four large chapters and a summary. First, I study the historical aspect of the electronization of HR work, the development and system of the notion of e-HRM on a contextual level, presented in chapter I. In chapter II, I present, on a macro level, the "flood" of changes, concerning HR work, through the eyes of an HR worker. I also study the main macro-environmental factors, the human resource information system and the development of the virtual labour market and its actors. In chapter III, I present the results of my empiric research on a meso-level. During the elaboration of the topic, user/employee attitudes in the world of labour became central aspects of my research. Chapter IV, on a micro level, deals with the e-HRM practice of Hungarian enterprises. The most important results and theses are also summarized in the final, fifth chapter of my thesis.

III. Theoretical background of the thesis

We find different technical assistance levels for the different development stages of personnel activities, (see the works of Armstrong and Peretti). **The development of information technology applications supporting human resource management and the development of personnel activities can be compared**, the relationship of single stages can be summarized as follows:

- In the "Personnel Administration" era, information technology support covered accounting, the registry of working time and leaves, as well as the management of personal data.
- In the "Personnel Management" era, the so-called Human Information /HI/ systems started. Besides employee and job information, human resource management functions were also "fed to the computer". Recruitment, selection, integration, remuneration, education and training were supported by information technology: computer programmes were developed for the effective administration of these activities.
- In the "Human Resource Management" development stage, Human Resource Information Systems (HRIS) applications appeared. Beyond personal data registry and human resource management functions (from recruitment through performance evaluation to the cafeteria system), these systems already covered organizational communication and decision support in an interactive way.

Besides the information technology (software) support presented above, the appearance of info-communication technologies has also resulted in a change of approach in HR work. In the world of labour, the use of ICT constitutes results in the modification of human connection as well and human presence is less and less required. In other words, we do not have to determine the location anymore only the time and "mediating instrument" (mobile phone, internet, Skype etc.) for executing transactions. Many writers in the field call for a change of approach of "personal presence - mediated presence" from HR experts (see, for example, the article of Kristóf Baltay in *Munkaügyi Szemle* – Labour Review). According to them, one reason for the failure of human fields can be the conservative approach of Hungarian workers towards info-communication technologies. While electronization (digitalization) means development, increase and efficiency improvement for senior managers, HR experts refer too often to the priority of human relations, and this conservative approach can sometimes mark them as anti-progressive within the company.

The first model grounding the change of approach can be attributed to a university research group in the Netherlands (Bondarouk and her associates), who make a difference in approach between HR and e-HRM according to the very fact that while the traditional HR activity ("fact to face HR") builds on personal interaction, e-HRM is based on mediated presence. Exemplified: corporate training traditionally builds on the personal meeting of the trainer/advisor and the student, it assigns resources to it (location, time, presentation means etc.). On the other hand, in modern e-learning systems, the personal meeting is technicized ("the teacher is already in the learning material"), and resources need to be assigned for that.

The main differences between traditional HR work (face-to-face HR) and the HR work based on mediated presence (e-HRM) are the following:

Table 2: basic differences in approach between face-to-face HR and e-HRM

Face to face HR (direct presence)	*e-HRM (mediated presence)*
Everybody is equal, everyone is given all the information	Everyone can access every information concerning him/her – if he/she needs it
The labour force at the company can be ordered into homogeneous groups: services can be confectioned	The labour force consists of individuals: each service is shaped to the person
We listen to the requests, we analyse the situation with HR experts, and make concrete suggestions for the solution	We have documented every previous question and answer; we make them searchable, so that everybody can learn from them. We expect new questions

Source: own editing based on Bondarouk's: "Comparison of implications of face to face and e-HRM"

My PhD thesis was prepared in consideration of this new approach.

IV. Main findings of the thesis

While studying the system of connections between human resource management and info-communication technology and processing the literature, I have come to the conclusion that **HR electronization goes back all the way to the 1960s.** Human resource management and the use of information technologies started spreading in business practice at the end of the 1960s from the USA. Technical development through electronization has directly influenced human resource management functions from the beginning.

Findings of chapter I:

In the first chapter of my thesis I pointed out that it is simplistic to define the notion of electronic human resource management as the online support of HR. My studies underline that on the one hand, we deal with a derivative notion that requires a multidisciplinary historical and logical approach; and on the other hand, according to the concerning literature, electronic human resource management also involves a change of approach. E-HRM is not only the information technology (software) support of HR, but the "actuation" of human resource management in the virtualized world of labour.

On a contextual level, considering the common historical roots of personnel work and electronization, the meaning of embedded key notions, as well as the normative approach grounding the change of approach, I suggest the use of the following notion in relation to electronic human resource management:

THESIS~1: Electronic human resource management (e-HRM) is the implementation of principles and activities related to human resources based on information technologies, in order to realize organizational and individual objectives.

The created definition requires a high abstraction level, since it embeds the complicated objective system of organizations and the demands of employees at the workplace into the notion, and it builds on the whole verticum of functions. *The formalized complex approach underlines that due to the fast and intensive changes in previous years, the notion of e-HRM has been immature, many times simplistic.*

Findings of chapter II:

In chapter II of my thesis, from the environmental factors of e-HRM I presented the functionality of the human resource information system, as well as the fragmentation of the virtual labour market. Based on descriptions of software products, I have explored the operational model of Human Resource Information Systems (HRIS). I have shown that the modern HRIS system is an information technology solution that embraces the whole HR activity, is of modular structure, and is the information technology basis of e-HRM activity.

In relation to the virtual labour market, I have explored its key actors, the main tendencies, and the "flood" of changes concerning employers and employees. I have studied and underlined the fact that the second element of online public services conceived by the EU (job finding, internet services of employment centres) has been realized, and regarding its development, it has been established in Hungary as well by the end of 2006.

In my thesis, I have shown that info-communication technologies have brought new, specific changes for employers and employees through internet recruitment solutions. The primary stage of these interactions is the online labour market, or virtual labour market, where employers and employees can contact each other through online applications. My observations indicate that the online labour market can be divided into three well distinguishable parts:

(1) Online business content providers specialized in job seeking and database activity (so-called career pages or job boards).

(2) Career columns on websites of companies and organizations.

(3) Internet-based services of traditional labour market consultants (e.g. career advisers, "head-hunters", employment organizations)

THESIS~2 *The triple division of the "online labour market" has been developed in the USA, Europe and Hungary too. Significant community efforts are part of the European development of the triple division (e-Europe programme, EURES system), Hungarian government measures have led to results in the period between 2004 and 2006 (e.g. afsz.hu). The intensive government activity typical for Hungary cannot be seen in Anglo-Saxon countries, where the services of business actors dominate.*

In chapter II, I have underlined that info-communication technologies have generated new business models, such as the already presented virtual labour market, online company recruitment, as well as the private and public world of career portals.

Findings of chapter III:

According to the system of man-instrument-content reflecting the information society approach of Castells, in chapter III, I have provided primary data regarding the first pillar in connection with the attitude of employees/users. My hypothesis was that the use of ICT is transforming the world of labour.

Through primary research results, I established that one characteristic effect concerning the employees (humans) in the world of labour is the "time-online" effect that changes the traditional working time/leisure and workplace/home model. My results show that the use of info-communication technologies (especially the mobile phone and internet) takes the work home and vice versa: private life moves into the workplace.

THESIS~3 *My researches indicate that the "time-online" effect is a form of behaviour where the boundaries of working time/workplace and leisure time/home get washed away because of the use of info-communication technologies. Due to the influence of info-communication technologies, a growing group of employees engage in working outside*

the workplace as well, and vice versa: with the same intensity they engage in private (leisure time) activities at the workplace as well. This form of behaviour is characteristic for more than one third of respondents of the sample. I have found a difference between "blue" and "white collar" employees. Among graduates, the "time-online" effect concerned more than a half of the respondents, and it showed a growing tendency.

THESIS~4*: With higher-level statistical methods and a complementary quantitative research, I managed to present that employees experience the uptake of info-communication technologies in the world of labour in different ways. By quantitative means, I have identified the system of the e-Optimism, e-Pragmatism and e-Pessimism factor, and in relation to the IT attitude of employees, I have also found, through a qualitative methodology, main motives (efficiency, complexity, necessity) that can be compared to them. The main motives are as follows*

The main motive of efficiency:

According to the evaluation of employees/users, info-communication technologies have made work easier in previous years. In the majority of cases, employees consider the spread of technologies in reference to their own work as positive. The motive system "work has become easier, faster, simpler with ICT" is typical in employee feedbacks, which, in terms of economics, means the increase of work efficiency.

The main motive of complexity:

Users also draw up motives starting out from technological problems where the efficiency of their work is definitely decreasing; they also report that work has not become simpler, but harder. In these cases, the work process would typically not become simpler, since along the establishment of digital infrastructure, traditional processes are also maintained (e.g. the motive of double work). Other motives also indicate that work has not become easier, since the organization has adapted itself to the efficiency provided by new technologies (the motive of shrinking time horizon), so the expectations of employers have risen.

The main motive of necessity:

In relation to the technological development, employees also mentioned motives where ICT has

become an essential means in the actual workplace, on the one hand, from an infrastructural point of view ("just like electricity"), and on the other hand, from a mental point of view ("working without ICT is unimaginable. The necessity motive permeates business relations, operational processes of the organization and the everyday life of employees. The necessity main motive also means that work without ICT has become impossible for the employee.

I believe that this three-factor model, these three main motives are adequate for the examination of the relation between employees/users and info-communication technologies.
In the knowledge of that fact, I believe that from the side of the human factor, it becomes explicable that the electronization originated in the world of labour, since the related organizational efforts do not necessarily meet the attitudes of employees.

The findings of chapter IV:

In chapter IV, I have studied the contents of online career portals uploaded by employers on a micro level, with the help of primary data series. Through the corporate practice of electronic recruitment, and corporate case studies, I have demonstrated that electronic human resource management in business cannot at all be regarded as "standard practice" in Hungary. My hypothesis, according to which specialities and differences can be experienced in Hungary, proved to be justified.

THESIS~5/A: Companies with the biggest turnover and profit operating in Hungary (TOP 50) are using info-communication technologies in their online presence for the support of recruitment processes, however, the phenomenon of an adaptation delay of 5-6 years can be observed compared to international trends. Three-quarters of the studied leading companies operate a career portal on their websites, but only half of them had actual job offers in the survey period.

THESIS~5/B: The companies in question do not, or only partially fulfil employee demands towards career portals: in personnel communication, they apply impersonality and anonymity, and the interactivity of the internet in Hungary is only partially utilized for recruitment and HR information purposes.

THESIS~5/C: The e-HRM target system of Hungarian companies in my study shows similarity with international examples (e.g. cost reduction, improvement of HR service standards), however, a significant difference in configuration can be observed. The difference is manifested in the system of means used for the achievement of objectives. The subject

of intervention for foreign companies is rather HR relations, while in Hungary it is HR transactions.

Possible fields of utilization of the theses

The results presented in my PhD thesis can give a new impulse mainly for Hungarian human resource management experts in relation to developments, and I hope that with my study I will generate productive debates regarding the significance of e-HRM. On the other hand, my thesis can contribute to a better comprehension of the relationship between human resource management and the information society: my theses can facilitate the better comprehension of the world of phenomena of virtualizing workplaces, and to the effective utilization of ICT.

I believe that the analyses in my thesis can adequately be used in business too, since the international examples and operational models presented can be adapted to the concrete launch of specific Hungarian e-HRM projects. In spite of the fact that my analyses concerning Hungarian corporate career columns show that there are still many deficiencies, I believe that there is just as much to be learnt from mistakes as from the best solution.

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