

E-HRM IN AN E-BUSINESS ENVIRONMENT

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ABSTRACT

This special issue on Electronic Human Resources Management (E-HRM) in an E-Business environment looks at opportunities and challenges associated with recruiting and developing firm's workforce in a digital world characterized by endemic talent scarcity, changing values and shifting on- and offline behaviours of candidates and employees.

We first draw on a Delphi study with leading HR executives from 25 internationally renowned large firms and on a quantitative survey with 144 HR managers from German top 1,000 firms to delineate the key trends and issues for modern HR executives. Demographic challenges and the war for talent are seen as the most important trends in firms of all sizes and in all industries, even ahead of, for example, social media or the global economic crisis. Resulting from these trends, our survey reveals that HR managers' most pressing challenges are staff retention and internal and external employer branding. Overall, the results emphasize the importance for an E-HRM that needs to be both effective – adequately fill vacancies – and efficient – make best use of scarce resources.

The papers in the special issue address some of the open issues identified. Overall, in a peer-review process two out of nine submitted articles were selected for the special issue (22 per cent acceptance). The first paper by Stefan Strohmeier scrutinizes how e-portfolios can improve e-recruiting and talent management. The second paper by Sharna Wiblen, David Grant and Kristine Dery uses a single case study to learn how a shift from HRM to E-HRM can affect talent management and people in an organization and transform firm's IT and HR function.

Keywords: E-HRM (Electronic Human Resources Management), HRIS (Human Resources Information Systems), talent management, recruiting, e-recruiting, talent management, computer personnel research.

1. FROM HRM to E-HRM

The global demographic development, the imminent retirement of the baby boomers generation [Frank et al. 2004] and, more recently, changing values, norms and behavioural patterns of Generation Y force firms to open up to new approaches for managing their personnel. Other related drivers of a need to change the human resources management (HRM) in organizations include the economic downturn over the past three years, increasing scarcity of a variety of skill profiles on the labour market and new ways how people want to balance their work and private life [Gueutal 2009]. In fact, these trends merely aggravate the challenges in many firms that have long suffered from a scarcity of qualified employees, or talent and the unavailability of certain candidates in many skill areas has long been identified as a major obstacle to firm success and growth even in times of economic downturns [Trevor and Nyberg 2008; Laumer and Eckhardt 2010]. Talent availability has become a hot topic as globalization has increased both, supply of and demand for certain skills [Dolan 2004]. The resulting recruiting challenge for firms has been called war for talent [Chambers et al. 1998]. While almost all HR executives are boldly aware of the problems of finding talent, especially in the IT domain [Luftman and Kempaiah 2008], there is no consistent insight on how to cope with it. At the same time, advances in information and communication technology and the ubiquity of the internet can offer substantially new ways to attract and recruit talent and to organize firm's entire HR function. Hence, Electronic HRM (E-HRM) can give a firm a substantial competitive edge in a tough market for skills by establishing a better talent management capability.

The four major areas of talent management are talent attraction, recruiting, development and retention. First, (*„attract'*) talent has to be attracted and the organization has to establish itself as the employer of choice for external (job seekers) and internal talent (employees). Second (*„recruit'*), new employees can be selected from incoming job applications. Some authors argue that a holistic candidate relationship management (CRM) approach that fully utilizes human resource information systems (HRIS) for all recruiting sub processes is an important element of a superior HR capability as it helps firms internally to manage the entire application

process and externally to better communicate with applicants [Lee 2007; Weitzel et al. 2009]. Third („*develop*”), if firms align their HR strategy with the firm strategy, skills needed in the future can be internally developed by training and education programs, and by staffing people into projects so they can learn the skills they, and the firm, will need. This development perspective might also be part of an incentive scheme to hire and retain good employees [Malinowski et al. 2008; Maier et al. 2009]. Fourth („*retain or poach*”), especially higher qualified candidates might not send their CV or post their résumé on an Internet job board. Instead, a firm might consider enticing someone away from another firm. It is thus important to know what drives a candidate’s willingness to change n employer in order to retain the good ones. To put it the other way around: What are effective employee retention measures? [Schweyer 2004; Eckhardt and Laumer 2008; Lawler III et al. 2008; Weitzel et al. 2009]

The scope of IT support for these talent management activities goes from attracting to selecting candidates, and from identifying talent over developing employees to retaining them [Strohmeier 2007; Keim and Weitzel 2008; Malinowski et al. 2008; Laumer and Eckhardt 2009; Laumer and Eckhardt 2009; Laumer et al. 2009; Laumer et al. 2009; Maier et al. 2009; Strohmeier 2009; Weitzel et al. 2009]. Recent research shows that the internet, in particular, has changed the way HR process are managed [Bussler and Davis 2001; Feldman and Klaas 2002; Parry and Tyson 2008; Laumer et al. 2009]. In the course of the shift between generations and the maturation of the internet to what is often called a Web 2.0, the way the HR function in organizations is managed has significantly changed [Strohmeier 2007]. For instance, Generation Years are frequent users of social media applications like Facebook.com or LinkedIn.com and spend large parts of their days online via mobile internet devices. Hence IT support for talent attraction could include online channels like Internet job boards, social media applications or firm’s own career website. For recruiting, holistic e-recruiting systems could be used as suggested by [Lee 2007] and extended by [Eckhardt and Laumer 2008; Eckhardt et al. 2008; Laumer and Eckhardt 2009]. For developing, [Strohmeier 2007] suggests the use of personnel developing systems, computer-based training system and learning management systems. Regarding retention, Eckhardt and Laumer [2008] suggest an IT-system architecture how recruiting and retention could be aligned. Holistic talent management systems as suggested by Maier et al. [2009] could integrate all the different aspects of managing talent in organizations.

To understand and manage the implications of the change from a pre-internet non-electronic to a modern E-HRM in an E-Business environment, this special issue aims at providing new insight into the ways IT can support talent management and looks at external trends and internal challenges organizations have to deal with. For that purpose, the special issue editors have conducted two studies to empirically reveal the key challenges for HRM and to identify promising and important areas for E-HRM research. Then, two out of nine submitted papers that are the core of this special issue contribute to E-HRM research by addressing some of the identified areas.

2. External trends and internal challenges for E-HRM

To clearly understand key E-HRM trends and the resulting challenges for firms, the editors of the special section asked HR executives about the importance of *external trends*, like demographic developments, and how this impacts the work of the HR department (*internal challenges*). For this purpose, we used two approaches: First, a Delphi study to qualitatively identify trends and challenges, and second a survey to quantitatively evaluate the relative importance of the various trends and challenges.

2.1. Research methodology

In the summer of 2010, the special issue editors conducted an empirical study to evaluate the importance of external trends and internal challenges for the HR management of organizations in Germany. Therefore, a questionnaire was developed based on the results of a Delphi study we conducted with 25 leading HR executives from large German firms. The first Delphi round was part of a strategic workshop about the future of HRM in 2009. The main result of the Delphi study was a quite exhaustive list of potential trends and challenges. These items were used in the quantitative survey where survey participants rated each of these trends and challenges using a 7-point Likert scale ranging from very important to very unimportant indicating the perceived importance for each of the trends and challenges for their organization. We contacted HR executives of the

Fortune 1,000 in Germany, of 1,000 SME's and of 300 IT-organizations from Germany. In total we received usable questionnaires from 144 German Fortune 1,000 organizations, 50 SMEs and 31 IT firms.

2.2. Delphi results: Identifying external trends and Internal challenges

Discussing the future of HRM with 25 leading HR executives in 2009, the following external trends and internal challenges for organizations human resource management have been identified. External trends are those developments which cannot be directly influenced by HR managers, such as demography or globalization. According to the participating HR executives, external trends for HRM are (in alphabetical order):

- **Always online:** "Always online" describes an accompanying phenomenon of the mobile Web 2.0 generation that is, essentially, never offline. Overcoming bandwidth bottlenecks and prohibitive data transmission costs, Wi-Fi, new mobile technologies and flat fee data plans for mobile devices have enabled uninterrupted connectivity over multiple devices like laptops, cell phones, Smartphones, Blackberrys or iPads. As a consequence, several Web 2.0 vendors, especially social network platforms, allow their users to connect to the platform via applications on their mobile devices. For HR management this is interesting when looking at the recruiting and development of employees, as potential candidates could be identified and attracted via differentiated employer branding campaigns in social networking platforms and, as some suggest, even receive and sign their work contracts directly via their cell phone. This is summarized under the buzzword *Mobile Recruiting*. Within the HR development function employees could receive work-related training information via their cell phone and exercise their abilities in mobile lessons or assessments.
- **Bologna Accords:** The Bologna process is a European reform of the university system that introduces a uniform European graduate system containing bachelor and master degrees similar to the Anglo-Saxon system. Particularly in Germany, the shift from a system with diploma degrees and lots of free time for students to use for internships or other work experiences to a strictly structured system with substantially less free time for students to spend as interns in firms has a profound impact for employee recruiting and training. The reason is that intern programs were important "talent pipelines" many hires came from students that had already spent some time as interns. Not only could the firms assess these candidates much better but also retain them at an early stage and before other firms could add them to their talent pool. The challenge now is to open new talent pipelines, i.e. tailor-make attraction channels and training programs for the group of bachelor and master graduates that will join companies without previous work experience in internships or student jobs.
- **Culture and value change:** There has clearly been a change in the perception of a variety of values and goals as we see, for example, a renewed focus on social and ecological responsibility. An empirical online survey by the editors in 2010 with more than 10,000 jobseekers revealed that, for instance, natural science graduates prefer to work for companies that accentuate the importance of environmental politics over those offering higher payment. Similarly, graduates in social science prefer working for a company that meets the highest ethical standards over working for an internationally operating company, selling famous products and offering higher salaries [Laumer et al. 2011 (forthcoming)]. An important consequence is that firms have to adapt their internal and external communication and employer brand.
- **Demographic change:** The demographic change is known as the consequentially shrinking workforce due to an aging society [Frank et al. 2004]. The demographic change implies a decreasing number of graduates entering the job market and an even worse "war for talent" as talent shortage will increase. In addition, with an aging society organizations have to develop ways how older employees could be integrated in the workforce.
- **Employee turnover:** Employee turnover is one of the major challenges for corporate HR management as losing good employees threatens the foundation of any firm. SMEs, in particular, often find it hard to fill key position as they are fighting the same war for talent as the big firms but often lack their employer brand and cannot offer similar salaries and job development opportunities [Chambers et al. 1998].

- **Generation Y:** Individuals born after 1980 are often called Gen Year, digital natives or millennials. As they grew up in the digital age with a continuous supply of information through different media channels, they see the Internet as a given part of everyday life that has always been there. Sociologists have revealed a change in values and norms among Gen Years such as a comparatively shrinking political interest and a rising sense for social and ecological responsibility. For HR management, this leads to the need to adjust almost all HR practices from the attraction and recruiting of candidates to the retention and development of employees.
- **Globalization:** The „flattening“ world also challenges HR management especially concerning recruiting and diversity management. Companies acting on a global rather than just a regional scale can domestically hire more foreigners (in and outside their country) and also in foreign countries. Explicit knowledge of foreign labour markets and the behaviour of its actors as well as the management capability for a more diverse workforce are clearly needed. Additionally, through projects and internal career programs, employees increasingly work in various foreign firm branches. For HR management, coping with international recruiting and placement, managing expats and their cultural integration in and outside the country are demanding new challenges.
- **Legal requirements:** Legal requirements, like the “law of equal treatment” (“Allgemeines Gleichbehandlungsgesetz”, AGG) that was recently introduced by the German government, establish new duties for HR management. The AGG is an anti-discrimination act to prevent discrimination because of gender, age, race or sexual orientation that has several implications especially for the recruitment of new employees. As companies are now forced to prove the juridical appropriateness of every candidate hired they need to consider which information to demand during the application in order to prevent possible discrimination charges. In the course of this progress existing and new applicant management systems need to be updated to comply with the new legal requirements and also to offer affordable compliance.
- **Low candidate mobility:** Especially in times of a talent shortage for specific job profiles, companies are forced to recruit nationwide or even on a global basis. However, not only are many talent groups rare but often candidates have a surprisingly low mobility, and only a fraction of candidates would move to another city for a new job. A recent survey with job seekers on the German labour market showed that only one in two university graduates are professionally mobile in the state they currently live in while even less than one in two managers are professionally mobile nationwide [Laumer et al. 2011 (forthcoming)]. This relatively low mobility forces companies, on the one hand, to develop special candidate attraction initiatives to lure in interesting candidates from distant locations and, on the other hand, to install specific solution to retain valuable talent within the company.
- **New ways of working:** Together with the growth and maturation of the internet, new ways of working have emerged and become quite common. These include flexible work time models s “flextime” or “s bb tic l” [Weitzel 2010] nd flexible work place models s “home office” or “mobile office”. Especially to help women with children return to the labour market, companies need to provide several differing incentives for these new ways of working in the candidate attraction process. As this also affects later stages of the HR management, a more holistic HR approach is needed integrating new and traditional ways in all HR fields and processes.
- **Recession/Economic crisis:** What started as a subprime mortgage crisis has developed into a worldwide economic crisis, with major consequences for banks and financial markets around the globe. Closely following, there has been a rapid rise in the incidence of layoffs [Welbourne 2009]. For example, between December 2008 and April 2009 over 5.7. Million US jobs have been lost. In Europe the general situation is similar. Still, specific work profiles remain scarce and the crisis couldn’t even ease the war for talent. For example, the German Federal Association for Information Technology, Telecommunications and New Media [Bitkom] reports that there were 45,000 open positions for IT workers at the end of 2008 and companies still cannot find appropriate IT staff even in a severe downturn [Bitkom 2009]. Hence, HR management needs to be active in times of economic downturns as well and build up relationships with prospective candidates. In a crisis, HR management needs to solve the same demanding problems as in regular times but often with smaller budgets.

- **Reform of high school system:** The reform of the German high school system includes the reduction of overall school time from 13 to 12 years by shortening high school from nine to eight years. This will lead to more than a quarter of a million additional high school graduates in Germany till 2015 and up to 150,000 additional university graduates till 2020. Beside the advantage of more available candidates, companies' HR management also needs to be prepared to lift a glut of applications for apprentice and trainee positions within this period of time. Additionally, applicant management systems need to be prepared to process a lot more applications at the same time compared to the current situation.
- **Social media/Web 2.0:** The introduction of Web 2.0 has dramatically changed the daily work in HR as, for example, in staff recruitment, searching for candidates via LinkedIn and Facebook or micro-blogging via Twitter have become the HR employee's daily tools. New terms and technologies in a changing information society such as social networking sites, blogs, or rating platforms (e.g. RateMyEmployer) offer new ways both to attract and to recruit new employees [Kluemper and Rosen 2009]. A major challenge in staff recruitment will be on the one hand to adjust to these circumstances and on the other hand to transfer recruiters' knowledge to the capabilities a recruiter 2.0" who is able to handle and to use this bunch of new applications [Weitzel et al. 2009].
- **War for talent:** The war for talent is a meme introduced by Elizabeth Chambers and colleagues in their article in McKinsey Quarterly [Chambers et al. 1998]. It defines the globally increasing competition for scarce talent profiles on the global labour markets. Basic reasons for the underlying talent shortage in distinctive job profiles range from demographical developments over shrinking enrolments (e.g. for IS) to low numbers of female workers especially in technical job profiles. Within this war for talent companies have changed their focus from simply posting job ads in newspapers and interviewing candidates to a more holistic approach including the attraction, binding and poaching of candidates. Considering the aging workforce, the problem is expected to become even worse in the upcoming years.

In contrast to these external macro trends, the Delphi-study has revealed internal challenges for HR executives that organizations will have to face in order to respond to the external trends. The following internal challenges have been identified by the participating German HR executives (in alphabetical order).

- **Alignment:** Like in other parts of the firm, the HR department needs to be better aligned with the respective business units. Operational alignment of daily processes and the development and implementation of an HR strategy closely aligned with the overall corporate strategy are essential for HR to be relevant. In the near future, HR staff will (have to) turn from a simple manpower supplier to a consultant giving advice to the business departments concerning gathering and treating talent [Eckhardt et al. 2011 (forthcoming)].
- **Business value of HR:** Quite typical for secondary processes, the particular business value impact of HR on firm goals is unclear and hard to measure. This is bad because it makes thorough governance difficult, and might even be worse in a crisis when the entire HR department is in need to justify its costs. Thus, understanding the business value contribution of HRM is an essential part of a professionalization many HR executives perceive as imminent.
- **Candidate relationship management:** Especially due to the global talent shortage, companies need to bind candidates at an early stage to ensure the long term labour supply for their workforce. Candidate relationship management, conceptually based on customer relationship management from the marketing field, has been identified as a very effective technique for finding and staying in touch with people particularly with scarce skill profiles, including current and former employees [Weitzel et al. 2009].
- **Controlling:** A potential solution for measuring and quantifying the business value of HR and also part of the professionalization of HRM is the identification and integration of key performance indicators providing transparency of the achievement and contribution of the HR department.

- **Employer branding:** Several prior research approaches have identified the employer's positive or negative public image as main influencing factor for an applicant's decision to apply or not to apply to a distinct company [Gatewood et al. 1993].
- **Internal employer brand:** As the external employer image helps to attract interesting external candidates, the development of an internal employer brand supports the company's efforts to remain employer of choice.
- **Know your talent:** One of the major outcomes of talent management research in large-scale companies is the recommendation that companies need to know their respective talents. Based on a target group analysis this includes, on the one hand, the identification and definition of target groups and, on the other hand, the development of target-group oriented measures.
- **Layoffs:** Especially in times of economic downturns as described above the development of downsizing measures gains importance as companies are forced to reduce their workforce to lower payroll costs.
- **New skills for recruiters:** In the Web 2.0 era several HR functions need to enhance their skills in using new social media. For example, as Facebook, LinkedIn and Twitter are widely used platforms amongst candidates, recruiters need to be skilled in the active use of these platforms. Overall, communication skills in all media and channels become more important.
- **Online communities:** While several social network platforms (e.g. Facebook, LinkedIn, Twitter), blogs or wikis were introduced in the HR field over the past years, many HR departments find it difficult to make sense of social media and their impact on HR/Recruiting and to decide, if and how to use them.
- **Referrals:** As employee networks provide an interesting channel to attract and hire new employees companies need to build up adequate measures to use these employee networks especially in terms of referral programs.
- **Retention:** Prior research has shown that companies cannot attempt to manage employee turnover by simply influencing the termination decisions of each employee [Sheridan 1992]. Abelson and Baysinger [1984] suggest that an effective HR strategy should count the cost of replacing leaving employees against the cost of retaining initiatives for those who stay. As it is more expensive to substitute highly qualified employees than weak performers [Cascio 1982], a cost-effective strategy to minimize turnover among strong performers is substantial for today's HR management. For this purpose Laumer [2009] introduces non-monetary solutions such as challenging work experience or community building for retaining scarce IT talent.
- **Strategy implementation:** HR employees need to change into long-term strategic thinkers and business partners as they develop into informing consultants [Welbourne 2009]. A particular part of their new profile is the development and implementation of strategic measures for HR practices, especially in the field of attracting, hiring, retaining and developing talent.
- **Universities:** External challenges as the Bologna Accords or the reform of the high school system oblige German companies to increase their relationship management activities with universities in terms of participation at university job fairs or offering of lectures by managers. Close cooperation with universities provide companies with an immediate access to a large talent pool of potential trainees or interns.
- **Visibility for top management:** Due to the problem of the unclear and difficult to measure business value of HR, HR executives struggle to make top management aware of their role, contribution and overall importance for the company that exceeds just publishing ads when there are vacancies.

These external trends and internal challenges are now evaluated using an empirical survey with German Fortune 1,000 companies, 1,000 German SME's and 300 German IT organizations.

2.3. Survey results: Top trends and challenges in Germany's Fortune 1,000 organizations Analyzing the results of the 144 participating Fortune 1,000 organizations in our study, Table 1 illustrates the ten most important

external trends and internal challenges as rated by the HR managers of these organizations. Demographic change and war for talent are the two top trends for the Fortune 1,000 organization, but also for all other groups (see below). The third most important trend is the Bologna reform. Social Media/Web 2.0 rank fourth. The economic crisis, legal requirements, new work designs, low employee mobility, cultural and value change as well as Generation Y are also among the top ten most important external trends for HR in the Fortune 1,000 organizations.

Based on these external trends, the participating HR managers ranked retention as the top internal challenge, followed by Employer Branding for external target groups and Employer Branding for existing employees. Alignment, visibility of HR, the business value of HR, and universities are also ranked among the ten most important internal challenges for HR management in Fortune 1,000 organizations in Germany. The results confirm both the long-term demographic threats and related talent scarcity but also the imminent professionalization of the HR function.

Table 1: Top-10 external trends and internal challenges for Fortune 1,000 organization.

Rank	external trends	internal challenge
1	Demographic change	retention
2	War for talent	Employer branding
3	Bologna Accords	Internal employer branding
4	Social Media/Web 2.0	Alignment
5	Recession / Economic crisis	Visibility for top management
6	Legal requirements	Business value of HR
7	New work designs	Universities
8	Low employee mobility	Know your talent
9	Cultural and value Change	Candidate relationship management
10	Generation Y	Strategy implementation

2.4. Survey results: Top trends and challenges in Germany's SMEs

Regarding external trends and internal challenges the participating small- and medium-sized organizations rank the war for talent as the most important external trend affecting their HR management. The second most important one is demographic change, followed by legal requirements. Employee turnover and low employee

mobility are ranked four and five. Among the ten most important trends are also the economic crisis, new work designs and the high school reform in Germany. The participating HR managers of German SMEs rank retention, internal and external employer branding as the top three challenges. Alignment, candidate relationship management and layoffs are also among the ten most important challenges for HR in the participating German SMEs as illustrated by **Table 2**

Table 2: Top-10 external trends and internal challenges for SMEs

Rank	External trends	Internal challenges
1	War for talent	Retention
2	Demographic change	Internal employer branding
3	Legal requirements	Employer branding
4	Employee turnover	Alignment
5	Low employee mobility	Candidate relationship management
6	Recession / Economic crisis	Universities
7	New work designs	Visibility
8	Globalization	Strategy implementation
9	Social Media/Web 2.0	Know your talent
10	High school reform	Layoffs

2.5. Survey results: Top trends and challenges in Germany's IT organizations

Among the participating organizations are 31 part of the IT industry. According to Table 3, demographic change and war for talent are again the two most important external trends for IT organizations. The third most important trend is different compared to the Fortune 1,000 and SMEs, though, as IT organizations name Generation Y. Also among the top ten trends are new work designs, low employee mobility, globalization and employee turnover. In addition, the most important internal challenges are, again, retention, and internal and external employer branding. Also among the ten most important challenges are alignment, referrals, universities or, candidate relationship management and a new skill set for recruiters.

Table 3: Top-10 external trends and internal challenges for IT organizations

Rank	External trends	Internal challenges
1	Demographic change	Retention
2	War for talent	Internal employer branding
3	Generation Y	Employer branding
4	New work designs	Alignment
5	Low employee mobility	Visibility for top management
6	Recession / Economic crisis	Referrals
7	Legal requirements	Universities
8	Social Media/Web 2.0	Know your talent
9	Globalization	Candidate relationship management
10	Employee turnover	New skill set for recruiters

3. Implications for E-HRM research

3.1. Open research questions for E-HRM research

The analyses above reveal that demographic change and war for talent are the most important external trends for Fortune 1,000, SMEs and IT organizations in Germany. In addition, in large firms the Bologna process and Social Media/Web 2.0 re seen s further major developments shaping a firm's HR function. In SMEs, legal requirements and employee turnover and in IT organizations Generation Y and new work design are also considered big trends. Regarding internal challenges, Fortune 1,000, SMEs and IT organizations all agree that retention and employer branding are the most important challenges.

These results have some implications for E-HRM research as E-HRM research should provide answers how IT could address external trends and offer solutions for internal challenges. Regarding external trends talent management solutions addressing demographic change and the war for talent are necessary. Therefore, for all four aspects – attraction, recruiting, developing, retention - solutions are necessary to make organizations more efficient and effective in talent management. E-HRM research hence needs to discuss how IT could support talent attraction, recruiting, developing and retention. In the past, E-HRM research has provided a lot of answers

to these issues; however, more research is necessary as organizations are still lacking a holistic talent management approach addressing external trends and internal challenges.

Our study helps to suggest important research questions that are relevant as they explicitly reflect not only the state of the research but also the needs of HR managers. Drawing on our survey results we see these theoretically promising and managerially relevant areas for future HRM research.

- **Demographic change:** How can E-HRM support the managing of demographic change? (e.g. by providing solutions to illustrate the demographic characteristics of employees; implementing an alerting system indicating demographic issues in organizations)
- **War for talent:** How to combine talent recruiting, developing and retention to address the war for talent? How could E-HRM provide solutions supporting a holistic talent management system? Are e-portfolios a first step towards a holistic talent management system as they provide relevant information for recruiting and developing? How does talent respond to changes necessary for addressing the war for talent?
- **Bologna Accords:** What are new strategies to retain graduates at an early stage? How can firms describe and visualize specific work and job profiles to students? How could IT support these aspects?
- **Social media/Web 2.0:** How do social media affect HRM? How can social media applications be used to support HRM challenges like attraction, recruiting, retention and developing? What are consequences of the use of social media in HR? Are HR managers ready for social media in HRM? How to manage the change associated with social media in HRM?
- **Legal requirements:** How can E-HRM help in developing and evaluating IT solutions to understand and integrate legal requirements?
- **Generation Y:** Are measures for recruiting, developing and retention different for Generation Y?
- **New work designs:** How do new work designs affect HRM? How can IT be used to support these new ways of working? Do E-HRM and IT solutions in general offers new ways for balancing work and private life? What are consequences of new work designs for HRM?
- **Retention:** What are successful retention measures? How can IT support effective retention measures of organizations?
- **Employer branding:** How can IT support effective employer branding measures of organizations? How could E-HRM be supportive for employee retention and reducing employee turnover?
- **Controlling:** How to measure and monitor the effectiveness of E-HRM measures and HR employees?

Overall, E-HRM research should focus on the development and evaluation of holistic talent management solutions that integrates recruiting, attraction, developing and retention of talent, on the questions how does talent response to these changes and how the change and consequences coming with these developments in E-HRM could be managed.

3.2. Implications for CPR Research

Beside the discussed implications for E-HRM research there are also particular implications for computer personnel research (CPR) based on the trends and challenges of German IT organizations. Possible research questions based on the identified and evaluated trends and challenges include:

- **Generation Y:** What are factors influencing retention of Generation Y IT personnel?
- **Retention:** What are non-monetary solutions for retaining the IT-workforce? What are factors influencing organizational commitment of IT personnel? What are measures to support organizational commitment of IT personnel?
- **Recruiting:** What are factors influencing the job seeking process of IT personnel in general and what image factors in particular? Are IT candidates different? When do IT graduates develop attitudes towards employers and when do IT graduates make decision of employer of choice? Are recruiting events in the first semesters beneficial? How does IT talent gather information about job change?
- **Alignment:** Which job profiles include boundary spanners to enable or to extend alignment?

- **Referrals:** How to use private networks (offline and online) of IT personnel for recruiting?
- **Know your talent:** What are extrinsic and intrinsic motivation factors of IT talent?
- **New skill set for recruiters:** How could you transfer the skill set of recruiters 2.0 in order to recruit IT talent? What are skills necessary to recruit IT talent in 2020?
- **Social media/Web 2.0:** How to use social media for recruiting, developing and retaining IT talent? What are effective social media applications? How should social media applications be designed to support IT talent management? What are innovative social media applications for IT talent management? What are influencing factors of IT personnel's social media use within HR issues? What are influencing factors of IT organizations' social media use for managing IT personnel? What are consequences of social media use in an IT organization's HRM?
- **Development:** What are effective measures for developing the IT workforce? What are important social and technical skills of IT personnel? What are effective measures for developing the social and technical skills of IT personnel?
- **War for talent:** Which specific profiles of IT personnel are scarce? What are reasons for the IT war for talent? What are successful measures to address IT talent scarcity?

Beside these specific implications for CPR research two questions summarize these issues: How to combine IT talent recruiting, developing and retention to address the war for talent and how does IT talent response to the changes made to manage IT personnel more effectively?

3.3. Special Issue on Electronic Human Resources Management in an E-Business Environment

In this special issue on Electronic Human Resources Management in an E-Business Environment two research papers are included. These two articles were selected in a peer-review process out of nine original submissions and hence represent 22 per cent of all submissions. Stefan Strohmeier introduces an educational innovation which aims at the systematic self-controlled development of qualifications based on a meaningful collection of electronic items. These e-portfolios are also, according to Strohmeier, suitable tools for recruiting employees and he argues that systematic studies are missing. His paper critically examines this view using a parsimonious model of technology acceptance and uncovers diverse usage conditions. In his point of view recruiting e-portfolios have to be understood as a distinctly ambivalent concept, adoptable only in a restricted and contingent way, while there are several organizational and particularly technical measures that could improve future e-portfolio usage in recruiting.

Sharna Wiblen, David Grant and Kristine Dery present a comprehensive exploration of an organization's decision to transition from their proprietary stand-alone HRIS to an integrated vendor system. The single in-depth case study shows how this transition ultimately led to the reshaping of the organization's understanding of the talent requirements in both the human resources (HR) and information technology (IT) functions and resulted in a new approach to the management of talent. By applying a social construction of technology based approach (SCOT), Wiblen et al. argue that it is important for those involved in the transition of a technology to be mindful of the potential talent and talent management consequences.

With both papers we expect to provide a first step towards the research and solutions needed as described in the section above. Strohmeier describes a concept how the process of recruiting and talent management could be supported as e-portfolios will enable, on the one side, recruiting (faster, more information) and, on the other side, talent management (development, team staffing based on information available). Wiblen et al. analyze how the shift to E-HRM will affect people in organizations and the way talent is managed. However, as several more questions have to remain open, we call for more research addressing the identified issues as the e-business environment is constantly shifting while demographic changes and the war for talent are ever more pressing.

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