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Anna B. Holm*

E-recruitment: Towards an Ubiquitous Recruitment Process and Candidate Relationship Management**

Up to now, there has been little research on the impact of e-recruitment on the recruitment process as a whole. The present study fills part of this gap by investigating the effect of e-recruitment on the design of the recruitment process. Three explorative case studies were carried out in three large organisations in Denmark in 2008-2010. The findings indicate that e-recruitment transforms the traditional recruitment process into a time- and space-independent, collaborative hiring process. The most significant changes are recorded in the sequence and increased divisibility of main recruitment tasks and subtasks. For management, the main task is now that of communicating with candidates. In addition, a new on-going task of maintaining a corporate career website has become an integral part of the new recruitment process. The new design is presented in the following, and its implications briefly discussed.

E-Recruiting: Auf dem Weg zu einem ubiquitären Rekrutierungsprozess und integriertem Bewerber-Beziehungsmanagement

Bis heute wurden die Auswirkungen von E-Recruiting auf den gesamten Rekrutierungsprozess wenig erforscht. Die vorliegende Studie zielt darauf ab, diese Forschungslücke durch die Untersuchung der Auswirkung von E-Recruiting auf die Gestaltung des Rekrutierungsprozesses teilweise zu schließen. Der Beitrag basiert dabei auf drei explorativen Fallstudien in drei großen dänischen Organisationen in den Jahren 2008-2010. Die Ergebnisse lassen darauf schließen, dass E-Recruiting den traditionellen Rekrutierungsprozess in einen zeit- und raumunabhängigen, kollaborativen Prozess transformiert. Dies stellt sich insbesondere in der Modifikation der Aufgabenabfolge und der erhöhten Teilbarkeit der Rekrutierungsaufgaben heraus. Zudem ist hervorzuheben, dass sich die Kommunikation mit den Bewerbern als eine zentrale neue Managementaufgabe herausbildet. Darüber hinaus bildet die permanente Pflege der Karriere-Website einen integralen Teil des neuen Rekrutierungsprozesses. Damit stellt dieser Beitrag generell die technologische Neugestaltung von Rekrutierungsprozessen vor und diskutiert deren Auswirkungen.

Key words: **e-recruitment, recruitment, e-HRM, staffing**
(JEL: M50, M55, M59, O15)

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1. Introduction

The use of electronic recruitment, also called e-recruitment, in the developed countries is rapidly becoming one of the fastest-growing recruitment techniques (Bartram, 2000; Lawrence, Sauser, & Sauser, 2007, p. 119; Lee, 2005; Lermusiaux & Snell, 2003; SHRM, 2008a, 2008b). Despite the apparently widespread use of e-recruitment, however, a gap seems to have emerged between research and practice (Anderson, 2003; García-Izquierdo, Aguinis, & Ramos-Villagrasa, 2010; Sylva & Mol, 2009), possibly because scholars are struggling to keep up with the sheer pace of change (Anderson, 2003). The increasing number of research contributions tend to focus on the design of corporate recruitment websites (Maurer & Liu, 2007; Selden & Orenstein, 2011), applicants' perceptions of career websites (Braddy, Meade, Michael, & Fleenor, 2009; Cober, Brown, Keeping, & Levy, 2004; Goldberg & Allen, 2008; Sylva & Mol, 2009; Thompson, Braddy, & Wuensch, 2008; Williamson, King, Lepak, & Sarma, 2010), and e-recruitment system design (Biazzo, 1998; Furtmueller, Wilderom, & Tate, 2011; Lee, 2007). So far, however, there has been little academic research on the subject from an organisational, i.e. recruiters', perspective (Parry & Tyson, 2008; Parry & Wilson, 2009; Wolfswinkel, Furtmueller, & Wilderom, 2010). Here, the organisational perspective refers to the process of organizing and performing recruitment tasks and activities within organisations, in the context of an organisational environment. Moreover, little attention has been given to the impact of technology on the recruitment process as a whole (Parry & Tyson, 2009), or to how the e-recruitment process is integrated in practice (Lee, 2011). The aim of this research is to fill some of this gap.

I initially carried out an explorative study of e-recruitment practices in Danish organisations (the results of which are not presented here due to space constraints; see Holm, 2012). From the very start of the inquiry, however, it became clear that the introduction of e-recruitment to the recruitment process had affected the way the companies organise their recruitment activities. Among other things, there were a number of changes in the sequence and nature of some recruitment tasks and subtasks, which have not previously been reported in the literature. These observations led to the following research question of the present study: How does the introduction and use of e-recruitment affect the design of the traditional recruitment process, and what are the consequences of this for recruiting organisations?

To answer this, I used the case study method to examine the recruitment processes at three large multinational companies in Denmark during 2008-2010. The case companies had extensive experience in the use of e-recruitment practices. In order to identify how e-recruitment had affected the overall design of the recruitment processes, I first identified the design of the traditional recruitment process as reported in several research contributions (Bartram, 2000; Breaugh & Starke, 2000; Dessler, 2006; Millmore, Lewis, Saunders, Thornhill, & Morrow, 2007; Newell, 2009). I then interviewed recruitment professionals from the case companies, asking how they had performed recruitment tasks before and after the introduction of e-recruitment in their organisations, and how they had perceived the changes. To better understand the overall recruitment process, I also carried out interviews with their collaborative partners, e.g. technology providers. I then compared my findings with the academic litera-

ture in the field, and identified the new recruitment process design, which differs considerably from the linear process reported in earlier research contributions.

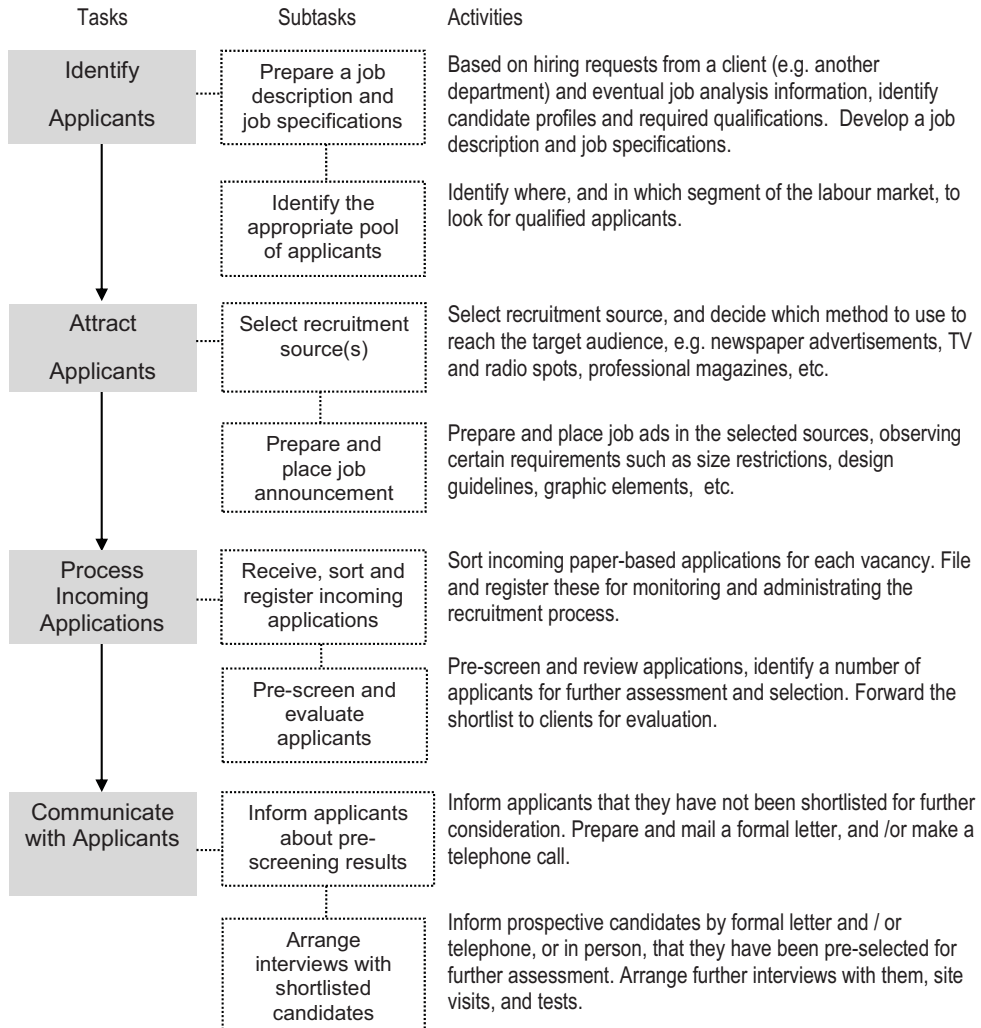
In the next section I present a detailed description of the traditional, i.e. paper-based, recruitment process of external candidates, define the scope of electronic recruitment, and argue that studying recruitment from an organisational perspective requires treating recruitment as a business process. This is followed by an outline of the research design, which is based on the case study methodology, and the recruitment process as the unit of analysis. The next section presents the findings, where I compare recruitment activities at the three case companies, and identify changes in the subtasks and activities of the recruitment process attributed to the introduction of e-recruitment. I then compare the results of the study with the findings of other research contributions, and draw key conclusions. Finally, I briefly suggest implications of the research for theory and practice.

2. Conceptualisation of recruitment, the recruitment process and e-recruitment

Organisational recruitment plays a crucial role in the development of human capital and strategic human resource management (Cober, et al., 2004; Liviens & Chapman, 2010; Millmore, et al., 2007). Given that the primary objective of recruitment is to identify and attract potential employees (Barber, 1998, p. 10), recruitment can be defined as practices and activities carried out by an organisation for the primary purpose of identifying, attracting and influencing the job choices of competent candidates (Barber, 1998, p. 5; McKenna & Beech, 2008, p. 178; Ployhart, 2006). Recruitment activities involve either external candidates from outside organisations or current employees, in which case it is called internal recruitment. The focus of this study is solely on the process of recruiting external candidates, since internal recruitment often involves other issues, such as career planning and development (Barber, 1998, p. 4).

The traditional, i.e. paper-based, recruitment of external candidates from job advertising is a linear process with consecutive tasks. It usually starts with the identification of required applicants, their location and placement in the labour market, and proceeds with activities designed to attract and persuade qualified applicants to apply. Job applications are then received, screened, and sorted, leading to the drawing up of a shortlist. The process ends with communicating the pre-screening results to applicants. (A summary of this type of recruitment by tasks, subtasks and activities is presented in Figure 1.) Therefore, in this study, a typical recruitment process is treated as a business process (Reynolds, 1995, p. 328), which, in line with Davenport and Short (1990), can be defined as a set of logically related tasks performed to achieve a defined business outcome for internal or external recipients. A business process occurs across or between organisational subunits and is independent of a formal organisational structure. In the case of recruitment, this process is normally performed for either internal customers – line managers and executives from various parts of the organisation - or external ones, e.g. clients, resulting in a shortlist of candidates which customers can choose from.

Figure 1: Traditional paper-based recruitment process using job advertising



Source: Adapted from Barber (1998), Breaugh & Starke (2000), Bartram (2000), Dessler (2006), Millmore et al. (2007), and Newell (2009).

The figure summarises the traditional process of recruiting external candidates without the use of electronic methods. The process consists of a number of common tasks and subtasks and related activities, performed *sequentially* to fulfil a recruitment objective.

The recruitment process can vary in complexity and degree of difficulty depending on the recruitment objectives and the recruitment sources chosen (Breaugh & Starke, 2000). The most commonly used sources for external recruitment are newspaper ads, private and public employment agencies, Internet job boards, corporate websites, employee referrals, colleges and universities, search firms, job fairs, etc. (Ployhart, Schneider, & Schmitt, 2006, p. 280). Internet-related sources, e.g. corporate websites,

job boards, job portals, and, most recently, social networks, are increasingly being used as the main recruitment sources for external candidates (SHRM, 2008a, 2008b). This is reflected in the initial definition of the term e-recruitment as being recruitment of candidates on the Internet (Heery & Noon, 2001). With the evolution of enterprise information systems and techniques deployed and used for recruitment purposes (Lee, 2005), e-recruitment has been further elaborated to include candidate management technology (Parry & Tyson, 2009) and the recruitment process in general, e.g. tracking applicants, selecting, offering jobs, or rejecting (Armstrong, 2006, p. 420). These definitions suggest a duality of the term e-recruitment, which may be simultaneously perceived as the use of an Internet-based recruitment source and as technology-enabled recruitment management practices. The main focus of the present research is on the managerial side of recruitment, and not on the recruitment sources. Therefore, in this paper e-recruitment is viewed and defined as the organisation of recruitment process and activities, which, by means of technology and human agents, facilitate time- and space-independent collaboration and interaction in order to identify, attract, and influence competent candidates (Holm, 2012, p. 91).

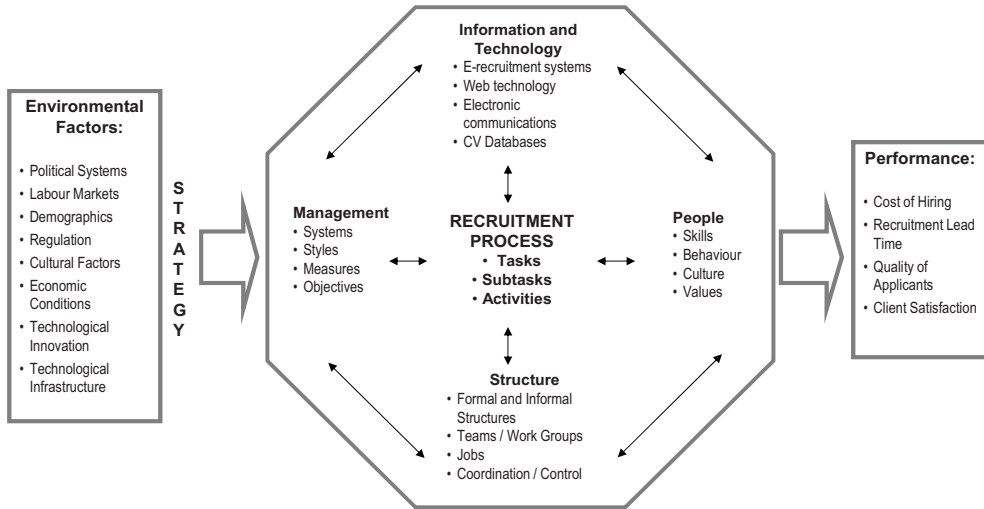
3. Research framework

A recruitment process change can be caused by many factors, which affect organisations in different ways. This is well illustrated by the use of a descriptive model of business process change (BPC) proposed by Kettinger and Grover (1995) and Kettinger, Teng and Guha (1997). The model rests on the assumption that an organisation is a complex social system consisting of mutually interrelated and self-adjusting subsystems of organisational change, namely task, technology, people, and structure (Keen, 1981; Leavitt, 1965). The BPC model is strategy-driven, and adds process, products and services (Kettinger & Grover, 1995). Following the model's logic, introducing technology to the recruitment process, as in the case of e-recruitment, would affect business process tasks, subtasks and activities. Figure 2 presents the BPC model adapted to the recruitment process.

A search for peer-reviewed journal manuscripts on e-recruitment identified only a few research contributions on e-recruitment from an organisational or business process perspective, of which three are the most relevant for this research: Cappelli (2001), Lee (2005), and Singh and Finn (2003).

In his study on Internet recruiting, Cappelli (2001) examines different service providers, new technologies, and companies' recruitment strategies. In his view, the e-recruitment process consists of three major steps: attracting, sorting, and contacting candidates. The first step involves the appropriate design of web pages, using electronic networks for promotion, and tracking potential candidates on the Internet and in on-line databases. The next step – sorting – involves the screening of candidates with the help of sophisticated on-line tests. In the third step, contacting candidates, e-recruitment systems are a big help, since they enable communication tasks to be automated (*ibid.*).

Figure 2: Research framework: Recruitment process change model



Elaborated and adapted from Kettinger & Grover (1995), and Kettinger, Teng, & Guha (1997).

The model illustrates how organisational subsystems, i.e. structure, management, people and technology, are interdependent and bound in the recruitment process. It suggests that changes in one subsystem may affect other subsystems and business process tasks, subtasks and activities.

Lee (2005), who has studied the evolution of e-recruitment systems and analysed the corporate career websites of Fortune 100 companies, emphasises that e-recruitment has fundamentally changed the corporate recruiting process from batch mode to continuous mode, suggesting a major change in the business process. Unlike the traditional paper-based recruiting process, e-recruitment allows around-the-clock collection and processing of job applications. Thus, according to Lee (ibid.), a modern e-recruitment process is a two-way communication process, web-enabled, time- and space-independent, and a ubiquitous system for both job seekers and recruiters.

Based on a review of the literature, Singh and Finn (2003) conclude that the increased use of ICTs in recruitment has had a fundamental impact on all aspects of an organisation's recruitment function, including people, processes, organisational structures, and forms. They suggest that new processes are needed to lower costs, accelerate transactions, improve efficiency, and provide better service. One example of such processes is the automated pre-screening of applicants.

4. Research design

Qualitative research design was considered the most suitable for the purpose of the investigation, since it permits the use of multiple data sources (Creswell, 2009), which could provide the necessary insights into complex social processes (Eisenhardt & Graebner, 2007; Fitzgerald & Dopson, 2009, p. 465), such as the recruitment process. Therefore, the research design used was a multiple-case study (Yin, 2003, p. 39-53) based on purposeful criterion sampling (Patton, 2002, p. 230-246). Prior to the study proper, I carried out an exploratory study on the organising principles of e-

recruitment (Holm, 2012), during which I selected three large organisations with well-established e-recruiting practices which could provide rich information and potentially allow a case-by-case comparison (Eisenhardt, 1989). The organisations chosen also hired over 100 new employees per year, carried out a considerable amount of external recruitment themselves, had well-established recruitment practices with e-recruiting, operated an e-recruitment system, maintained full control and ownership of the recruitment process, and were part of a larger organisation with substantial resources.

The companies selected for the study were all multinational corporations (MNCs) originating from, and with headquarters in, Denmark. To ensure confidentiality of the collaborating organisations and their respondents, the case companies in this paper have been given fictitious names - Scandifin, Danadrinco and Energowing. In all three case studies, the recruitment process was embedded in a specific unit: at Scandifin and Danadrinco it was in the HR department responsible for recruiting in Denmark only, while at Energowing it was in the unit responsible for recruitment for a major division with main operations in Denmark. (Some general information about the case companies is provided in Annex 1.) At the time of the study, the case companies had been using e-recruitment for over 5 years.

I used the recruitment process as the unit of analysis and focused only on the business process. I was thus looking for possible changes in the tasks, subtasks and activities of the business process of recruiting which could be attributed to the use of electronic recruitment, compared with the process presented in Figure 1. If the introduction of e-recruitment had resulted in changes in process tasks and subtasks, then it would have meant significant changes in the overall recruitment process. If the changes had occurred only at the level of activities, the changes would be considered incremental. The data collection process was therefore designed to capture the entire recruitment process in the case organisations in as much detail as possible, which would permit comparative analysis for each step of the recruitment process. Thus, a mix of qualitative methods, techniques, and data sources available at the time of the research was utilised during the study. A brief description of the data, all of which were collected in Denmark in the period 2008-2010, is provided in Annex 1.

Firstly, I conducted in-depth, face-to-face, semi-structured interviews with a number of key informants (Patton, 2002, p. 321), including HR partners and employer brand managers, recruitment partners, and others, who were involved in recruitment process tasks. I asked a broad set of questions related to the overall design of the recruitment process and its individual elements, the overall flow of the process, and how individual tasks were performed for each hire. I also inquired about the organisational structure, recruitment personnel involved in the process, and the technological solutions and external partners used in the process, e.g. job portals, technology providers, etc. Each interviewee was also asked to describe a typical recruitment process in her / his organisation in detail, and explain her / his own role in it. The interviews typically lasted between one and two hours, were conducted onsite, digitally recorded, and subsequently fully transcribed.

Secondly, since the recruitment process in the case organisations strongly depended on various technological solutions in the recruitment process, I reviewed the functional characteristics of their e-recruitment systems and interviewed representa-

tives of the companies' technology providers and the major job portal in Denmark. During the interviews, I asked a set of questions about the work flow design of the e-recruitment systems, the advantages and limitations of the systems in supporting various recruitment tasks, the manpower and level of skills required to operate the systems, and the technological solutions enabling partial or full automation of the recruitment process. The interview with the largest job portal clarified how easy it was for the companies to place a job advertisement online and how well the various e-recruitment solutions were integrated with the portal's platform.

Thirdly, I analysed the content of corporate webpages and the job ads that the case companies placed on their websites. The corporate career websites provided ample data on how case organisations were attracting potential candidates and the extent to which the websites were employed to support each individual hire, together with the general organisational effort required to build a positive image of the organisation as employer. I also tested the résumé submission utility of each recruitment site to acquire additional information about how they were integrated into the overall recruitment process in the organisations. I took notes on observations and screenshots included in the data analysis.

Some additional data were added to the data set after a number of observations made at two job fairs and two HR fairs in Denmark, where I was able to meet and interview representatives of major job portals and job databases used by the case companies for online recruiting, and where I took notes on observations and conversations.

The fully transcribed interviews were exported to QSR nVivo 9 - software for the analysis of qualitative data. Most of the brochures, texts, and other secondary text data were exported to the nVivo project. The data were then sorted in sets for each case and inductively coded and analysed. The coding started with provisional categories, referring to recruitment tasks and subtasks, as defined earlier (see Figure 1), and proceeded with inductive coding, where the new codes emerged in the process. The findings were then summarized and analysed using the method of case-to-case comparison to identify similarities and differences of the recruitment process designs of the case companies.

5. Findings

In this section, I first briefly describe the recruitment process in the case organisations task-by-task, and then present findings related to the overall design of the recruitment process with e-recruitment. A more detailed case-by-case comparison of the recruitment processes in the three organisations is shown in Table 1.

5.1 Recruitment process tasks and the use of e-recruitment

Identification of applicants

The recruitment process in all three companies in the study typically started with the identification of required applicants, and their location and placement in the labour market. This task was performed in the same way as described earlier in the traditional paper-based recruitment process presented in Figure 1. The activities under this task are characterised by a limited use of electronic means, and include email correspondence

Table 1: Summary of the comparative analysis of the recruitment process in the case companies

Task	Subtasks	Similar Activities	Divergent Activities	Recruitment Process Change
	Prepare and place job announcement	Recruitment personnel prepare and place job ads in the selected sources, observing certain requirements, e.g. size restrictions, design guidelines, graphic elements, etc. Job ads are posted on corporate websites.	<p>Scandifin: Job ads from the corporate website are posted by Internet job portals and database systems.</p> <p>Danadrinco: Job ads are posted automatically, through the e-recruitment system, by Internet job portals and databases.</p> <p>Energowing: Job ads are forwarded by email to the selected Internet job portals and databases and posted by them.</p>	<p>Changes in activities. No change in the nature of the task or subtask.</p> <p>Changes in the sequence of tasks – the task of communicating with applicants starts here.</p>
Process incoming applications	Receive, register, and sort incoming applications	All incoming applications are received and sorted automatically through an e-recruitment system. The subtask is fully, or almost fully, automated.	<p>Scandifin and Danadrinco: No paper-based applications accepted.</p> <p>Energowing: Paper-based applications are registered and transferred into the e-recruitment system by an Energowing employee.</p>	Changes in the sequence of subtasks, i.e. pre-screening may commence simultaneously, as well as continuation of the task of communicating with applicants.
	Pre-screen and evaluate applicants	Line managers and recruiters pre-screen and review applications using the data stored in the e-recruitment system. They identify and rank a number of applicants to continue through assessment and selection. The rankings and eventual comments are stored in the e-recruitment system.		Changes in activities. No change in the nature of the task or subtask.
Communicating with applicants	Inform applicants about pre-screening results	Rejected applicants receive an email sent through the e-recruitment system. Sometimes, they are contacted by telephone.	<p>Scandifin and Danadrinco: Line managers are responsible.</p> <p>Energowing: Recruitment partners are responsible.</p>	Changes in activities. No change in the nature of the task or subtask.
	Arrange interviews with shortlisted candidates	Arrange further interviews, site visits, and tests with them.	<p>Scandifin: Line managers arrange interviews by telephone.</p> <p>Danadrinco: Further interviews are planned and arranged through electronic scheduling and e-calendar.</p> <p>Energowing: Recruitment partner arranges interviews by telephone.</p>	Changes in activities. No change in the nature of the task or subtask.

and an e-recruitment system for initial vacancy registration. One respondent from Danadrinco described it in the following way:

“...First we have a Word document, which a [line] manager sends me, where he / she writes that he / she would like to request recruitment of an employee for a certain position... With it in hand I contact him / her, and help him / her to prepare a job announcement... There are job descriptions for all positions at Danadrinco... Based on a [relevant] job description, we make a job announcement... and that job announcement is then put in our [e-recruitment] system. So there are some processes that are manual ...or it is done by mail or whatever... And then a job announcement is created and put into the system and from there the rest of the process is electronic.” (My translation.)

Put another way, in all three companies, there are hardly any e-recruitment-enabled activities at this phase of the recruitment process.

The overall use of various e-recruitment sources, tools and techniques by the three companies at different stages of the recruitment process is summarised in Table 2.

Table 2: The use of e-recruitment sources, techniques and tools in the case companies at different recruitment phases

Recruitment phase	E-recruitment techniques, tools and sources
<i>Identification of candidates</i>	None
<i>Attracting applicants</i>	E-recruitment system, Internet job boards and career portals, corporate career website, social networking sites, various (third-party) websites, industry-specific web resources, electronic mail and electronic mailing lists
<i>Processing and pre-screening applications</i>	E-recruitment system
<i>Communicating with candidates</i>	E-recruitment system, corporate career website, electronic mail and electronic mailing lists

Attracting applicants

The task of attracting applicants was by far the most reliant on e-recruitment sources, tools and techniques in all three companies. For sourcing candidates, the companies used advertising on corporate websites, Internet job portals, and a few online résumé databases. Sometimes, the companies also placed job ads on specialised websites, such as various financial institutions and the state financial regulator in the case of Scandifin. Energowing frequently used professional networks like LinkedIn as an additional recruitment source.

In all three companies, new job ads were posted directly by divisional recruitment teams using their e-recruitment systems. E-recruitment systems were also utilised for the preparation and submission of job advertisements from the system interface, making it possible for the recruitment staff to reuse and reformat older texts, job descriptions, images and other relevant content when new vacancies were to be announced or new e-recruitment sources to be used. Scandifin’s e-recruitment system provider explained it in more detail:

“... You can work with the layout and content template [in the system] where you can select what kind of a content template you want to have, what kind of font, size, how the

layout of the advertisement should be, etc... You can import text from Word or other types of external programs. Then you can create different types of ads, and once you've done that you must of course publish them. Then you... choose where to publish them, and then ...our system automatically sends them out to a website, the intranet or other - it's totally integrated, so when you press the button, the data are sent out to various external media.” (My translation.)

Processing incoming applications

The task of processing incoming applications in all three companies was fully, or almost fully, automated. In the study companies, all incoming applications were received and sorted automatically through an e-recruitment system. Unlike with traditional paper-based recruitment, the system allowed the processing and pre-screening of incoming applications to start and run concurrently with the activities for attracting candidates. At the time of the study, the recruitment team from Energowing still permitted paper-based job applications, and registered and transferred them to the e-recruitment system manually, while paper-based applications were not accepted at Scandifin and Danadrinco.

Despite various claims, that, in the case of e-recruitment, pre-screening incoming applications is performed by sophisticated e-recruitment systems, none of the recruitment teams used automated screening for this purpose; in fact, all the recruiters in the study rejected this as an option. The rationale behind this was well put by one of the informants from Scandifin:

“...We have 300-500 different jobs with a job description. And in my opinion, if we are to think seriously about screening questions, we have to look at each job individually, and also at each job description. We then need to evaluate what is important for us to know [about the candidates]... and the [screening] questions should be very precise and correctly formulated so that we can get correct answers. And even then we may not get the answers we want, as people interpret questions differently, and therefore also answer differently... Therefore I think that it would be extremely resource-intensive to have to formulate [screening] questions for each job.” (My translation.)

The interviewees from the case companies said that the screening of résumés was often initiated by line managers even before the deadline for applications. The timing and sequence of this subtask was strongly dependent on the line managers themselves. After the pre-screening was completed, a number of candidates were contacted to arrange further assessment and selection activities. E-recruitment systems were used for this as well, but all the studied recruitment teams and their clients, i.e. line managers, would normally do this by telephone, and would use the system only for scheduling and tracking purposes.

Communication with candidates

For each hiring cycle, the task of communicating with applicants started at the same time as that of attracting applicants. Due to the automation features of the e-recruitment systems, candidates were often notified immediately that their job application had been received. Rejected candidates were also informed promptly about the result of the pre-screening even before the vacancies were formally filled. All three companies considered this to be an advantage for the applicants, since it meant that

recruiters did not have to keep them waiting unnecessarily just to hear that they had not been selected for further assessment. One of the respondents from Scandifin put it this way:

“...The ones falling out of our target group can immediately receive an answer and our thanks for the application, but also the rejection. And then the applicant has received a reply a few days after he sent his application. It may also in some situations seem a little hard that, say, 5 days after having sent the application, you are already told that you are not getting the job. But then it's just clear. And the rest get to know that they are in the [selection] process with conversations, interviews and other different things.” (My translation.)

All three case companies were largely reliant on their corporate career websites, and used them for communicating with prospective applicants and as the entry point for the online submission of job applications. At Scandifin and Danadrinco, the task of providing and updating content other than job advertisements was the responsibility of the HR departments at headquarters, while at Energowing the career website was maintained under the supervision of the corporate employer brand manager. She explained her daily task of updating the website in the following way:

“If you look at where job seekers would prefer to find information about a company, it's on the company website. I am responsible for the jobs section of the website and I am frequently in and updating the text that we write every time a change occurs in relation to ... for example composition of the staff. Two weeks ago, we had 54 nationalities at Energowing, but now we have 56. So it must be constantly updated so there is always the newest information.” (My translation.)

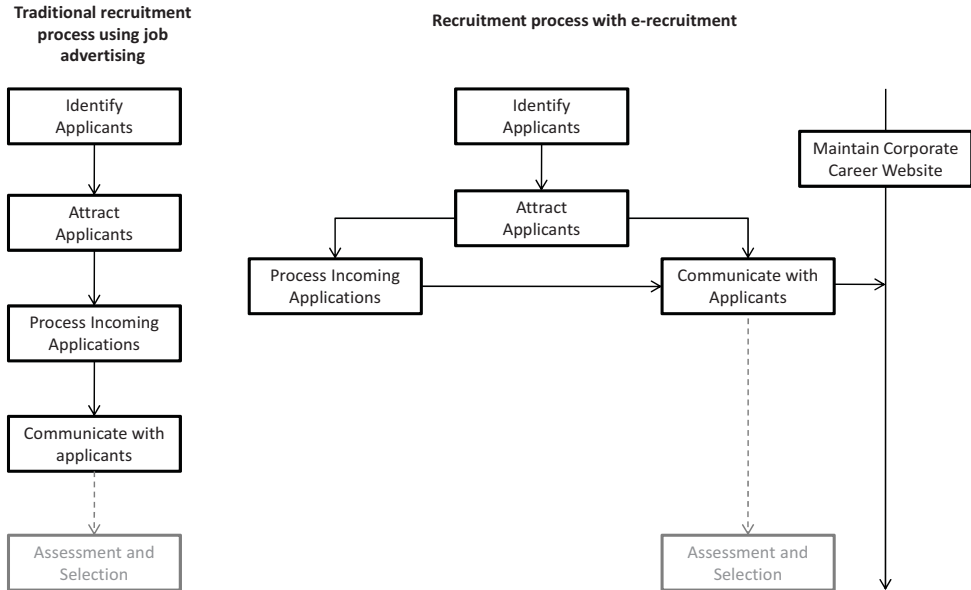
In the case of Energowing, the system even allowed applicants to create individual web pages on the employer's server, where they could submit their files and monitor the progress of their application. Recruiters were uncertain how much this feature was used, however.

5.2 Changes in the recruitment process design

The main changes in the recruitment process design using e-recruiting vis-à-vis the traditional paper-based recruitment process were in the sequence of the process tasks. Unlike in the traditional recruitment process, the task of communicating with applicants and processing incoming applications was performed simultaneously with the task of attracting applicants, suggesting a major change in the recruitment process design. The technology used enabled communication with current applicants to start simultaneously with the posting of job ads, and to be continued throughout the entire recruitment process. Apart from the apparent change in timing, the subtask of informing applicants about the pre-screening results was transformed into that of informing them about the progress of their applications. Furthermore, in all case companies, the subtask of pre-screening incoming applications was often initiated shortly after job advertisements were posted online. In this way, the task of communicating with candidates becomes one of the focal tasks, because it “binds” several tasks and subtasks in the process and is performed practically throughout the entire recruitment process. These changes are illustrated in Figure 3 and described in Table 1. This may explain why, in two of the cases companies, HR departments were hiring communication experts, e.g. an employer brand manager at Energowing and a new graduate in corporate

communications at Scandifin, suggesting changes in required skills and personnel competencies.

Figure 3: The design and sequence of tasks in traditional paper-based recruitment process vs. the (new) recruitment process using e-recruitment



Compared with the traditional recruitment process, the tasks and subtasks of the recruitment process using e-recruitment are less sequential and can be performed concurrently. In the new process, the task of communicating with applicants commences during the early stages of the recruitment process, and binds the more traditional tasks with the new task of maintaining the corporate career website.

One of the highly divisible tasks which emerged with the spread of the Internet and the use of e-recruiting is that of maintaining career websites. This is an on-going task which is independent of individual hiring cycles, but it is also interrelated with the objectives and outcomes of each individual recruitment cycle. Therefore, the task of maintaining corporate career websites is added to the new recruitment process, as shown in Figure 3.

6. Discussion and conclusions

The results suggest that the typical paper-based recruitment process in the studied organisations, as described in Figure 1, is no longer present in its original form and design. The most significant differences identified were attributed to changes in the sequence of tasks and subtasks, their increased divisibility, and the nature of the related activities. E-recruitment techniques and related technology were observed to be used, albeit to different extents, in the tasks of attracting applicants, processing incoming applications and communicating with candidates, supporting Cappelli's (2001) findings that the e-recruitment process consists of three major steps: attracting, sorting, and contacting candidates.

The study further showed that the introduction of e-recruitment affected process tasks and subtasks to a varying extent. For example, the subtask of receiving, sorting and registering incoming applications was significantly affected, since the e-recruitment systems did this automatically, apart from the one case where recruiters had to register and type in paper-based applications manually. Therefore, this subtask is irrelevant where an e-recruitment system has been introduced and applications are accepted solely through the system's submission facility.

The tasks of attracting applicants, processing applications and communicating with candidates are often performed concurrently, supporting the findings in Lee (2005). However, this study found no evidence to support Cappelli's (2001), Singh and Finn's (2003) and Lee's (2005) assumption that the pre-screening of candidates can be handled by sophisticated online systems, and none of the recruiters in the study regarded this option as being feasible.

The findings are also in line with the observations of Davenport and Short (1990), who suggest that adding IT capabilities to a business process can affect the process in eight general ways; these are summarised in Table 3 and illustrated with the examples from the study. These suggest a transformational role of e-recruitment when introduced to the recruitment process, which, on a general e-HRM level, adds new knowledge and insights to the contributions by Ruël, Bondarouk and Looise (2004), and, specifically for recruitment, to those by Parry and Tyson (2009). These studies conclude that the introduction of e-recruitment leads to cost reductions and efficiency gains, improved service to clients, i.e. line managers, enhances global orientation, and allows recruitment professionals to spend more time on more value-added tasks, such as communication and employer branding.

Organisational design theories have some additional explanations for these outcomes. As shown in Figure 1, traditional paper-based recruitment, e.g. using job advertising, is often a discrete, fixed process (Halperin, 2009), initiated by an apparent need and request for new employees. It consists of tasks and subtasks which are fairly well-defined and repeated for each new vacancy, but which are sequential and not easily divisible. Such a process design is viewed by organisational design researchers as being *complicated*, since it requires continuous attention and the coordination of connected processes (Burton, DeSanctis, & Obel, 2006, pp. 111-114).

The recruitment process investigated in the study is based on a process design characterized by a high level of repetitiveness and a medium-to-high level of divisibility, since a number of tasks and subtasks can be carried out concurrently, or even independently. Such task design can be defined as *orderly* (Burton, et al., 2006, pp. 112-113). The orderly design has a major advantage over the complicated design in its task divisibility, inasmuch as problems encountered in performing one task do not necessarily prevent progress in other tasks. It therefore requires less coordination, and is more efficient (*ibid.*). The move from complicated to more orderly task design might explain why recruiters in all three companies reported a reduced administrative burden and less coordination of the recruitment process.

Table 3: Organisational impact of technology on the traditional recruitment process

Transformation	Examples from findings
<i>Transactional</i> Unstructured processes are transformed into routinized transactions.	All communication with candidates in the case companies is registered in the e-recruitment system.
<i>Geographical</i> Information is transferred rapidly and easily across large distances, making process independent of location	Line managers can screen and assess candidates regardless of their geographical location.
<i>Automatisational</i> IT replaces or reduces human labour in the process	Labour-intensive tasks of sorting and processing application and communication with candidates are automated with the help of the e-recruitment system.
<i>Analytical</i> Complex analytical methods are used in the process	E-recruitment systems can be programmed to screen and assess applicants.
<i>Informational</i> Vast amounts of detailed information are involved in the process	Detailed information on each applicant is readily available for the process stakeholders.
<i>Sequential</i> Changes in the sequence of tasks in a process, allowing multiple tasks to be carried out simultaneously	The tasks of applicant attraction, processing of applications and communication with candidates are performed concurrently.
<i>Knowledge management</i> Knowledge and expertise are captured and disseminated to improve the process	Documents, texts, graphic designs and other content for each recruitment cycle are stored in the e-recruitment system and can be shared and reused.
<i>Tracking</i> Detailed tracking of task status, inputs, and outputs	Each recruitment task and subtask is tracked using the use e-recruitment system
<i>Disintermediation</i> IT connects two parties within a process who would otherwise communicate through an intermediary.	Line managers, hiring employees for their units, can process and assess incoming applications and contact qualified applicants without the assistance of recruitment professionals.

Source: Elaborated from Davenport and Short (1990, p. 107)

7. Limitations and Implications

The study has some limitations, however. The main purpose of the study was to determine whether the introduction of e-recruitment had affected the overall recruitment process design, and thus did not address in depth any changes related to management, formal and informal structures of the recruiting teams, etc. Although applicants are the other major player in the recruiting process (Barber, 1998, p. 7), they were not included in this study. Furthermore, the reasons for adopting e-recruitment were not investigated.

Practitioners considering introducing online recruiting and e-recruitment systems might feel apprehensive about the less consecutive nature of the recruitment tasks in

the new process, and by the need to learn a new technology. However, this study does not reveal any specific problems for HR professionals using various e-recruitment technologies, and none of my respondents reported or complained about being forced to learn a lot of new technology. On the contrary, the e-recruitment systems were very easy to use, and when hosted by an external application service provider, were up and running in literally no time. However, as communication with applicants plays a more significant role in the new process, recruiters should be aware of the increased demands associated with this task. In particular, special attention should be given to activities related to Internet communication and automated mailing. This was a concern expressed by many recruiters, and two of the case organisations made extra resources and specially educated staff available to deal with the issues of online communication. With the increasing use of online social networking for recruitment purposes, the task of communicating with candidates becomes even more complex.

The Business Process Change (BPC) model presented in Figure 2 suggests that changes in one of the subsystems, i.e. technology, personnel, management and structures, will also affect the other subsystems. This is a potential starting point for research into organisational design and management of HR departments and recruitment teams, and would address the question of how e-recruitment affects these subsystems. Lee (2005), for instance, argues that management practices evolve together with e-recruitment systems. And Cappelli (2001) suggests that changes related to the introduction of e-recruitment may be manifested in a decentralisation of the hiring function, where line managers can find their candidates on job boards and other vendors. These propositions may constitute some relevant avenues for future research. This study finds that, although line managers began playing a bigger role in the tasks of pre-screening and communicating with candidates, there was no evidence to suggest that they were performing recruitment activities without the involvement of their recruitment partners.

In addition, research at the macro level can contribute to the field by determining how environmental factors attributed to society in general, e.g. culture, regulations, etc., affect organisations' recruitment strategies and practices. For example, Cappelli (2001) argues that e-recruitment is more than just an HR tool, but represents a change in the culture of how to get hired. If this is true, then companies without an e-recruitment-enabled process of hiring will have to review their strategies and practices to conform to the norms of the society in which they operate.

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Annex 1: Case companies and related data

Company background information	Organisation of recruitment process	E-recruiting practices	Data sources	Description of the collected data
<p>Scandifin</p> <p>A corporation consisting of Scandinavian banks, insurance companies and investment funds, merged and incorporated in 2000. Main activities include personal and corporate banking, capital markets, savings and asset management, and running pension funds. Operates 1400 bank branches in Scandinavia and Eastern Europe, with total full-time staff of 33,000 employees.</p>	<p>HR department at Scandifin's headquarters under the supervision of the head of department. The team handled all Scandifin's recruitment in Denmark, including temporary jobs and traineeships. Job ads, including online ones, were the main recruitment source for around 300 to 500 vacancies a year.</p>	<p>Corporate websites and Internet job advertising used as a recruitment source since the late 1990s. Most job ads placed on the corporate career website and a number of job portals. E-recruitment system acquired and deployed as software-as-a-service in early 2000s. Since then no paper-based applications have been accepted.</p>	<p>Semi-structured face-to-face interviews with key informants: the head of the HR department, a senior HR partner, a career website communication professional, the corporate website executive, and two experts from the e-recruitment system provider.</p> <p>Other sources: corporate career website.</p>	<p>Transcribed interviews.</p> <p>Corporate brochures.</p> <p>Career website screen-shots.</p>
<p>Danadrinco</p> <p>Producer of alcoholic and non-alcoholic beverages.</p> <p>Part of an international group of companies, with more than 45,000 full-time employees in 25 countries. 2,000 employees in Denmark, mainly in running corporate headquarters, production, and the distribution of alcoholic and non-alcoholic beverages.</p>	<p>The recruitment partners and their assistants worked out of the HR department, carrying out a number of HR-related tasks. Annually, they handled 130-150 recruitments, of which about 100 were sourced externally through job advertising.</p>	<p>In 1996, Danadrinco introduced an e-recruitment system supplied by a major international HR technology and Internet job portal provider. The system was used for all Danadrinco's internal and external recruitment, including when handled by a third party, e.g. employment agencies and search bureaus. The majority of job ads were placed online on Danadrinco's corporate recruitment webpage and external Internet job portals.</p>	<p>Semi-structured face-to-face interviews with key informants: head of the HR department and an HR partner with overall responsibility for recruitment, and an expert from the e-recruitment system provider.</p> <p>Other sources: professional presentation of the head of the HR department at a national HR Fair.</p>	<p>Transcribed interviews.</p> <p>Copy of the presentation slides and the transcription of the presentation.</p> <p>Notes on interviews.</p> <p>Brochures from the e-recruitment system provider.</p> <p>Career website screen-shots.</p>
<p>Energowing</p> <p>Energowing is a multidivisional MNC with headquarters in Denmark. Its core business comprises R&D, and the manufacture, sale and maintenance of energy systems. It employs roughly 20,000 employees worldwide.</p>	<p>The recruitment team in this study came from one of Energowing's divisions in its core business operations. Recruiters were placed in the divisional HR department and reported to the divisional HR Partner, and to Energowing's corporate vice president and corporate employer brand manager. The team handled around 300 hires per year.</p>	<p>The corporate career website and a number of Internet-based job portals were the main recruiting sources for external candidates. Professional online communities like LinkedIn were used for employer-branding activities and job advertising. The e-recruitment system used was a modular part of a wider enterprise resource planning (ERP) system implemented universally throughout the company.</p>	<p>Semi-structured face-to-face interviews with key informants: head of the HR department responsible for recruitment, a recruitment assistant, corporate employer brand manager, and a senior consultant from the e-recruitment system provider.</p> <p>Other sources: corporate career website, professional presentation of the employer brand manager.</p>	<p>Transcribed interviews.</p> <p>Copy of the presentation slides and the transcription of the presentation.</p> <p>Brochures from the e-recruitment system provider.</p> <p>Career website screen-shots.</p>