THE ALTERING ROLE OF LINE MANAGERS DUE TO ARTIFICIAL INTELLIGENCE FOR RECRUITMENT

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ABSTRACT,

Purpose This study aims to decrease the knowledge gap regarding the changing role of line managers due to the introduction of artificial intelligence for recruitment. It elaborates on the opportunities and challenges of artificial intelligence for recruitment and the consequent altering role of line managers. A broad, process-based definition of recruitment is used, which encompasses the entire process from attraction to appointing. ***Design*** The study uses a systematic literature review to gain a basic understanding of the implications of artificial intelligence for the different recruitment activities including sourcing, screening, selecting, and appointing. The semi-structured interviews with experts from different software companies are conducted to gain insight into the related altering role of the line manager. ***Findings*** Artificial intelligence for recruitment will support the line manager by taking over administrative tasks and assisting the decision-making process. The nature of artificial intelligence remains supportive, meaning that the role of line managers within recruitment cannot be replaced as their human intuition remains necessary in building relationships with candidates, final decision-making and in avoiding the challenges that artificial intelligence for recruitment brings. However, the role of line managers is likely to change in the following four ways: earlier involvement within recruitment, shift from an administrative towards a coaching role, need for a new combination of skills and an altering collaboration with the HR manager ***Research limitations/implications*** We acknowledge the interviews with software providers to be less neutral, as they provide a rather positive image of their software. Besides, a sample size of three cases is relatively small, limiting us in building solid theories on such a new topic. Further research with a larger, more diverse sample size is needed to view the topic from multiple angles which can contribute to supplementing and confirming the insights acquired in this research ***Practical Implications*** This study provides practical insights to a wide range of people within a company (line managers, executives, senior managers, HR managers, and employees) considering the implementation of artificial intelligence for recruitment as it informs them on the related opportunities and challenges and the subsequent altering role of the line manager. Software suppliers can take away the results of this study in creating artificial intelligence software for recruitment that needs to be appealing to the HR manager and the line manager. ***Originality Value*** The originality value in this research can be found in the specific focus on the altering role of line managers due to artificial intelligence for recruitment practices, whereas previous literature only focused on the related altering role of HR managers.

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1. INTRODUCTION

Emerging economic, social, and political issues force the business function of Human Resource Management (HRM) to reinvent their organizations and explore new trends (Deloitte, n.d.). For the purpose of this study, the function of Human Resource Management includes all those people who are involved in the management of people in organizations. One development that is undoubtedly highlighted by researchers is the human and digital future of HRM (Meister, 2020). This contributes to many operational HRM practices becoming automated and data-driven (Verlinden, n.d.). Especially, Artificial Intelligence (AI), an important part of digitalization, is having several implications for the discipline of HRM. In this research, AI is defined as: 'the ability of such things as machines to learn, interpret and understand on their own in a similar way to that of humans' (Johansson & Herranen, 2019, p. 14). For a long time, scientists have called for the integration of AI with HRM. They have predicted benefits for overall employee experience, resulting in more time, capacity, budget, and information for managers to assist decisive people management (EY, 2018). In Europe alone, AI technology spending increased with 49% over 2018 (IDC, 2019). It is expected that AI can assist and eventually improve the function of HRM, resulting in an expected revenue of $120 billion (Krumina, 2019). One of the dominant themes of HRM technology is AI for recruitment (Ideal, n.d.). Whereas in existing academic literature and within the HRM function itself, recruitment practices are often separated from selection practices, this research uses a broad, process-based definition of recruitment in which recruitment comprises the entire process from attraction to appointing. Therefore, the definition of Ghosh (2019) is used to define recruitment as '…the end-to-end process of effectively and efficiently sourcing, screening, selecting, and appointing the best-suited candidate to the right role.' Recruitment is an important step when increasing organizational effectiveness, especially now that research has revealed that the most important corporate resources a company can have over the next 20 years is talent (Aspan, 2020; McKinsey & Co., 1997). It is estimated that the demand for talent will go up, while the supply of it will go down, eventually resulting in a talent shortage (Fishman, 1998). After their research, McKinsey & Co (2001) introduced the term 'war for talent' which refers to a constant, and costly battle in which companies compete with each other to recruit and retain the most talented employees. New recruitment techniques need to be integrated to enjoy a clear competitive advantage in the war for talent (Slezák, 2019). AI technologies have the potential to be one of those new recruitment techniques as they speed up the recruitment process while tapping into a wider talent pool. (Fatemi, 2019; Alanen; 2018). Scientific research acknowledges that, besides these opportunities, there also challenges related to the use of AI for recruitment, of which personal privacy is one of those challenges (Bondarouk & Brewster, 2016).

Over recent years, HR managers have increasingly transferred their tasks to line managers (Bos-Nehles & Van Riemsdijk, 2014; Renwick, 2003). Many line managers are nowadays partly responsible for the implementation and execution of HRM practices, including the recruitment of new employees for their teams (Terhalle, 2009). Despite this transfer of responsibilities, much of the literature on HR practices fails to recognize and include the involvement of line managers within the recruitment function. This remains the case now that AI is reshaping recruitment; research on the related altering role of line managers remains on the sideline. For the definition of line managers, we will draw upon the definition of front-line managers given by Nehles (2006); line managers are the people within an organization who manage their subordinates on a day-to-day basis and are responsible for performing HR activities, while also reporting to a person in a higher-ranked position. Several researchers have argued for the realistic future in which AI stands alongside human beings in a collaborative context rather than the industry-wide replacement of humans (Katz, 2017; Kumar, 2017). These findings comfort many line managers with the idea that their jobs will survive. However, this does not imply that their way of working should adapt itself to the arrival of AI. With the help of AI for recruitment, line managers may shift towards different tasks (e.g. from data collection to data interpretation) that will require different skills to recruit employees effectively (Roubler, 2019). Current research mainly focuses on the altering role of HR managers caused by AI for recruitment. Consequently, we believe that academic research has not addressed the altering role of line managers yet and that therefore, there is a lack of understanding of how AI-supported recruitment transforms the role of line managers in the recruitment of employees.

The overarching goal of this research is to decrease the knowledge gap that exists around the implications of AI for recruitment. The objective of this study is to describe how the use of AI for recruitment transforms the role of line managers in the recruitment of employees.
In order to achieve this objective, the following research question needs to be answered:

What are the consequences of AI-supported recruitment for the role of line managers in the recruitment of employees?

To be able to derive at an answer, the research question is divided into two different sub-questions that are eventually integrated with each other:
1. What are the opportunities and challenges of AI-supported recruitment?
2. How do these opportunities and challenges transform the role of line managers during the recruitment of the employees?

By answering the research question, knowledge of how AI-supported recruitment alters the tasks, responsibilities, and skills of line managers in the recruitment of employees can be expanded. This can eventually generate more clarification on the process of implementing AI for recruitment. The results of this study are valuable for especially practitioners (e.g. line managers and executives), as it clarifies the role of line managers when bringing AI into the recruitment process. Research can also build upon this study when further addressing other recruitment research implications, whether or not related to AI. Finally, there is an opportunity for AI-providing software companies to draw upon this research when developing AI software for the use of recruitment within businesses.

2. THEORETICAL BACKGROUND

This chapter provides a theoretical background to the topic of HRM, recruitment, and line managers by reviewing past literature. It elaborates on the HR role that line managers fulfill in HR practices, especially within recruitment. The knowledge acquired from this chapter is used as a preparation for the systematic literature review.

2.1 The Role of Line Managers Within HRM

Literature suggests that the role of line managers has evolved over recent years due to the decentralization of management

activities that have increased the range of responsibilities for line managers (Townsend & Kellner, 2015). Bos-Nehles (2010) states that the role of line managers has shifted from the operational supervision of a team towards team leadership and strategic business management. Brewster & Webster (2003) also found that across the EU, businesses made moves to hand the line manager more responsibility for staff management. The recognition of human resource management as being vital for increasing firm performance and the devolution of HRM are important contributors to this (Bos-Nehles, 2010; Renwick, 2003; Gabcanova, 2012). Buitenhuis (2017, p.13) defines devolution as 'the process of redistributing HRM tasks and responsibilities between line managers and HR specialists, with the aim of integrating HR strategy with business strategy.' This in turn suggests that HR managers and line managers carry a shared responsibility for recruitment and selection, training and development, and workforce expansion and reduction (Brewster & Larsen, 2000; Larsen & Brewster, 2003). Whereas HR professionals often deal with the design and development of such HRM practices, line managers are concerned with the successful implementation of these practices on the operational work floor (Terhalle, 2009). Thus, besides their continuing operational activities, line managers have also been charged with many HRM activities (Bos-Nehles, 2010). Even though undertaking the HRM role requires line managers to perform multiple roles at once (Renwick, 2003), the redistribution of HRM activities to line managers positively affects the employee efficiency and motivation and helps to better integrate HRM with the business strategy (Harris, Doughty, & Kirk, 2002; Budhwar, 2000).

2.2 Recruitment and The Role of Line Managers

It is generally accepted that the success of an organization is inherently connected to the type of individuals it employs (Dineen & Soltis, 2011). According to Dineen and Soltis (2011), employee recruitment has gained considerable attention, since the way an organization recruits can influence the kind of employees it hires, the performance of these employees, and their retention rate. For many organizations, recruitment has become a top priority now. Various studies pointed out that recruitment is one of the HRM-related activities that HR professionals devolve to line managers (Nelesh, 2015; Wilding, 2014). Although recruitment is often devolved to line managers, decisions regarding this process still happen in conjunction with HR professionals in order to facilitate organizational consistency (Terhalle, 2009).

2.2.1 Recruitment activities

Breaugh (2008) argued that establishing clear recruitment objectives and developing a recruiting strategy are the first two elements of the recruitment process after which it is followed by the execution of recruitment activities. The first recruitment activity is the creation of a pool of potential candidates to fill up a position, also known as sourcing (Gummadi, 2015). Lepak & Gowan (2015, p. 203) define sourcing as '... the process of identifying, attracting, and screening potential applicants who are not actively in the market for a new job.' A partnership between the HR department and line managers determines the need for either internal or external sourcing (Foster, 2018). When sourcing, a collaboration between the HR manager and line manager is also needed for the composing of a job description (Hamilton & Davison, 2018). Increasingly more firms expect their recruiters to strategically source and attract passive job candidates via e.g. social networking sites such as LinkedIn (Lepak & Gowan, 2015). The sourcing of new candidates also occurs at employment fairs and seminars (Kapur, 2018). For

some particular roles, the word of mouth is the most powerful tool (Foster, 2018). After prospective applicants have been sourced, the top few candidates are shortlisted by screening the match between the resumes of candidates and the selection criteria (Faliagka, Tzimas & Tsakalidis, 2012). Screening is often done on the basis of factors such as skills, experience, and educational qualifications (Kapur, 2018). Whereas it can be assumed that line managers are getting increasing responsibility for screening, the HR function is often still in charge of recruitment. After this screening, candidates go through a wider range of various selection methods to further narrow down the number of applicants (Kapur, 2018). Interviews continue to the most frequently used selection method around the world (Lunenburg, 2010). A selection interview allows employers to assess candidates' verbal skills, personality, and interaction with other people. A well-balanced interview team is necessary, meaning that the candidate's immediate supervisor-to-be, often the line manager, is involved in conducting interviews (Lunenburg, 2010). Rynes (1991) assumed that the inclusion of both the HR manager and line manager can bring different, but meaningful expertise into the interviews. Whereas HR managers excel in providing general company knowledge, line managers come in handy in terms of job-specific information (Rynes, 1991). Additional selection methods are reference checks and conducting additional interviews (Lepak & Gowan, 2015). After the required information about the candidates have been obtained by prior selection processes, final selection and appointing of the best candidate is the last step before hiring (Kapur, 2018). By comparing the attributes that a specific individual has with the attributes recognized as excellent for a certain position, line managers are in a position to judge whether an individual is suited to perform the responsibilities of the job (Foster, 2018). It is the line manager who is at the end responsible for the decision whether a candidate is the right person to be fitted into a role, a team, and an organization. This contributes to the idea of Gummadi (2015) who brings forward that the line manager is generally considered in the final selection decision as he is eventually responsible for the performance of the new employee.

3. METHODOLOGY

This research can be considered a qualitative research, as it aims to discover and acquire an in-depth understanding of the trend of AI for recruitment (Bryman & Bell, 2011). As there is already a solid basis of literature on the implications of AI relating to recruitment, a systematic literature review has been conducted. The literature this study searched for is primarily practitioner literature. Practitioner literature can be explained as literature that is written for practitioners concerned with issues and problems that arise in professional practice. During the first orientation on existing literature, it was already identified that scientific research regarding this topic is very challenge-oriented. Thus, lacking in the identification of the related opportunities. Therefore, the use of practitioner literature was preferred over scientific literature as practitioner literature has already revealed many more insights, referring to the opportunities and challenges of AI for recruitment. For the systematic literature review, Google was chosen as the search engine for this practitioner literature.

Within Google, we searched for articles, not older than five years, in the English language that used the inclusion criteria 'artificial intelligence' (or AI), 'recruitment', and 'line manager'. As mentioned earlier, often the recruitment term is used separated from the selection term. However, also for the systematic literature review, we solely used the search term 'recruitment' as practitioner literature often comprises selection activities within the recruitment term. Furthermore, we used the

five years' cut-off point to search for the most accurate articles as AI for recruitment is a relatively new phenomenon. Earlier literature would be likely to be less accurate and more speculative and was therefore excluded.

The initial search gave us 20 Google pages with 198 links. In shortlisting these links, we excluded the ones that were blogs, scientific articles, job vacancies, supplier advertisements, and those without a date. This reduced the number of articles to 83. To further narrow down the number of articles, another 35 articles were excluded after reading titles and the introduction. These were, despite the inclusion criteria, not enough focused on the implications of AI for recruitment. Another 4 of the 48 left were rejected, due to irrelevancy, after reading the full article. This left us with an amount of 44 articles that were reviewed and used for the systematic literature review. Figure 1 presents a visualized overview of the article selection process for the systematic literature review.

The first sub-question focuses on the opportunities and challenges of AI for recruitment and was solely researched via the systematic literature review. Literature on the opportunities of AI for recruitment is omnipresent. Even though practitioner literature has less focused on the challenges of AI for recruitment, available literature was still used to be able to create a basic understanding of these challenges for recruitment. However, existing literature often generalizes the implications of AI for all recruitment activities. Therefore, every reviewed article was first analyzed by coding the opportunities and challenges, where each opportunity and

challenge was even further coded by linking them to them related recruiting activity (sourcing, screening, selecting, and appointing). This coding assisted in finalizing the systematic literature review results chapter as they helped in systematically presenting the opportunities and challenges for each recruitment activity. The second sub-question aims to identify the related transforming role of line managers due to the challenges and opportunities of AI for the recruiting of employees. Therefore, an analysis of the 'anticipated' (after the arrival of AI) role of line managers is needed. This was done via semi-structured

Figure 1. PRISMA flow-chart

interviews. Thus, another prerequisite of qualitative research that is fulfilled is that this research primarily relies on non-numeric data to interpret meaning from this data (Jackson, Drummond & Camara, 2007). Due to our recognition that research on the transforming role of line managers remains on the side-line in literature for quite some time, this knowledge was expanded by generating primary data via semi-structured interviews with five experts from three different software companies that provide AI-based solutions for recruitment practices. Two respondents represented the case of Infor, a worldwide technology company, consisting out of 17000+ employees, that helps their clients in optimizing their resources by developing and providing different types of enterprise software. Their human resources applications (e.g. digital assistant, robotic process automation, and machine learning) help with the optimization of the interaction between technology and people. Talent Science is one of Infor's HR products that creates behavioral assessments based on 26 different cognitive, cultural, and behavioral aspects. It facilitates decisions on who to hire, for what position and, it assists in determining whether there is an appropriate cultural fit. Another two respondents were involved on behalf of Workday. Workday is originally an American company, established in 2005, operating on an international level. Their HR, finance, budgeting, planning, and analytics software helps clients to become more efficient and agile by developing so-called 'if-then scenarios'. Another respondent in this research represented the case of Visma Raet. Visma Raet is a company with 1100 employees developing and providing HR-software in the field of salary processing and talent. Besides, it carries out the provision of HR and payroll services for a diverse range of clients. Visma Raet is increasingly developing robotized HR software that helps to reduce administrative overload and they are working towards more sophisticated forms of AI for their HR software. The conducted systematic literature review on the implications of AI-supported recruitment has been used as input for the questions of these interviews (Appendix C). Semi-structured interviews are preferred over structured interviews to allow for more flexibility and responsiveness to rising themes by giving interviewees the freedom to express themselves in their own words (Jackson, Drummond & Camara, 2007). After the new data on the consequences of AI-supported recruitment for the role of line managers were collected and transcribed, we again analyzed the acquired data by coding it. The data of the interviews were analyzed and structured by using a set of 9 codes relating to the opportunities of AI, challenges of AI, and the altering role of line managers. The results chapter was drawn alongside these codes and eventually, we were able to expand the knowledge acquired from the systematic literature review. By supplementing the existing knowledge about the opportunities and challenges from the systematic literature review with the acquired information about the altering role of line managers from the interviews, we were able to establish links and eventually derived at new insights.

Finally, once these new insights were derived, we used them to draw a conclusion on what the consequences of AI-supported recruitment are for the role of line managers in the recruitment of employees.

4. RESULTS

This chapter elaborates respectively the results acquired from the systematic literature review and the semi-structured interviews.

4.1 Systematic Literature Review

The systematic literature review gave a basic understanding of the identified opportunities and challenges of AI within recruitment. The upcoming sections present the results acquired from the systematic literature review.
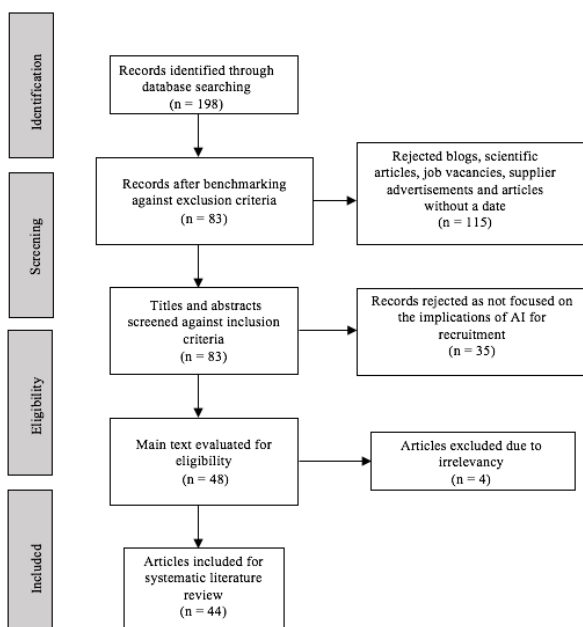
4.1.1 Opportunities of Artificial Intelligence within recruitment

Practitioner literature has revealed a wide variety of opportunities of AI within recruitment. Although most of these opportunities can be linked to different, specific recruitment activities, some opportunities are present throughout the entire recruitment process. This part starts with the opportunities of AI for recruitment that are there throughout the whole recruitment cycle. Afterward, a detailed description is given for the opportunities related to the following recruitment activities; sourcing, screening, selecting, and appointing. Table 1 (Appendix A) presents a more systematic overview of the opportunities of AI per recruitment activity.

4.1.1.1 All activities

The opportunities of AI for recruitment in the following parts can all be addressed to certain recruitment activities. This is, however, not the case for all opportunities identified by the reviewed literature. Reducing bias is an opportunity that AI offers recruitment alongside the whole recruitment process. Almost unavoidable is the fact that hiring professionals come with their own biases when evaluating applicants (Farokhmanesh, 2019). Human bias occurs during sourcing, but especially in the screening and selection stages (Vidal, 2019; Dijkkamp, 2019). Machine learning aims to reduce these unconscious biases by programming software to ignore irrelevant traits such as gender and age, and instead focus on candidate's skills and experiences (O'Donnell, 2018). This eventually results in an increasingly diverse talent pool and a fair, inclusive process by discovering strong candidates that may have gone unnoticed in the manual process (Hipps, 2018; Meister, 2019). Another advantage of AI throughout the whole recruitment process is the improvement of candidate experience by using chatbots. Smith (as in Bayern, 2020) recognized the fact that candidates are becoming more similar to customers than ever before. They expect transparency and timely responsiveness. The introduction of chatbots enables direct communication with candidates at different phases about the progress of the recruitment process (Bayern, 2020; Starner, 2019). This communication can occur with the help of algorithms that provide personalized questions and answers (Dijkkamp, 2019). What is maybe even more appealing is that these chatbots have, in contrast to recruiters, a 24/7 availability and are also in a position to give applicants personal advice regarding their interviews (BNP Paribas, 2019).

4.1.1.2 Sourcing

Today, attracting the best talents is one of the most difficult tasks for businesses. With demand exceeding supply, HR departments have to alter and intensify their sourcing strategies. Literature suggests the many opportunities of AI for the sourcing of candidates. AI has the potential to help recruiters compile appealing job descriptions (Guenole & Feinzig, 2018; Florentine, 2017). Peterson (2019) highlights that one way to do this is by analyzing the content of previous successful job descriptions and use these results to determine the terminology and structure that is likely to improve the quality of a certain job posting. Creating appealing job descriptions can also be taken one step further by tailoring them to different types of candidates (Derbyshire and Babic, 2020). Once job descriptions have been developed, AI can start initiating contact with potential candidates, those being either active or passive (Dijkkamp, 2019; Vidal. 2019; Goyal, 2017). Initiating contact can be made more attractive to applicants by providing them with person-job matching. Bots are now created to match candidates' CV's with job roles they aspire to fulfill, also taking into account their geographic location

(Castellanos, 2019; Davies, 2019). As talent shortage is a prominent issue for industries, the ability of AI to enlarge the talent pool is a relief for many recruiters. Employee referrals, 24/7 sourcing, identification of suitable candidates already on the payroll, and the rediscovery of talents who applied in the past are antecedents of an enlarged talent pool. (Davies, 2019; Kolbjornrud et. al, 2016; SiliconRepublic, 2020).

Companies can use machine learning algorithms to build statistical models by using historical data, e.g. skills and abilities from high-performing employees (Peterson, 2019). These models help to identify the ideal candidate from the large talent pool more easily. Goyal (2017) recognizes the fact that, although unlikely, resumes not always seems to be up-to-date. AI sifts through social media channels like LinkedIn and Facebook scanning profiles and posts to take away the problem of old resumes and instead sketches current candidate profiles (Power, 2019; Goyal; 2017). Finally, the capabilities of AI are more and more developing, and whereas literature seems to be somewhat limited on this, AI can also show talent competition within a specific area and predict the time and resources needed to fill a certain job requisition (Castellanos, 2019; Florentine, 2019).

4.1.1.3 Screening

Once candidates have been sourced, screening is the next step in the recruitment process. AI for sourcing leads to a wider range of applicants and therefore to a wider range of resumes to be screened before the real selection can even begin. One of the opportunities of AI for recruitment that is most named is the screening of resumes, after which the number of candidates are shortlisted. The screening of resumes is a preliminary analysis for checking e.g. skills and experiences of applicants (Jordan, 2020). A set of pre-established criteria will function as a yardstick on which AI can base its initial rounds of selection (Wong, 2020). To accelerate the screening process even further, automated systems are introduced to rank job applicants based on their resumes and their connected predicted suitability for the position (Johansson & Herranen, 2019; Chin, 2019).

4.1.1.4 Selecting

After screening, various other selection methods are used to further narrow down the number of applicants. When a list of interviewees is in place, line managers or recruiters can start interviewing. Creating interview schedules sometimes appears to be a slow process resulting in frustrated candidates. AI-driven software can be a helpful tool in (re)scheduling optimal interview times, benefitting candidates as well as line managers (Peterson, 2019). It has access to the calendars of all stakeholders and based on that it can identify open times and suggest options. AI is also an upcoming trend when it comes to conducting interviews (Starner, 2019; Derbyshire & Babic, 2020; Nicastro, 2019). This video interviewing frequently occurs in conjunction with the opportunity of soft skills assessment. During the interview, AI software analyzes aspects such as facial expressions, inflections in voice, and word choice to determine a candidate's soft skills (O'Donnell, 2018). These in turn can be matched with traits of existing high-performing employees (Reilly, 2018). Increasingly, companies engage in personality tests and gamification (Francis, 2020; Redstone, 2018). Gamification is a process in which candidates are invited to play a series of online neuroscience-based games, also uncovering applicants' attributes and job-related characteristics (Schweyer, 2018). Based on applicants' soft skills, AI can assess whether or not there is a person-organization fit (Savola & Troqe, 2019). AI systems predicting the future performance of candidates within the company is the final opportunity of AI for selecting. For example, Ideal has the software to scrape through all data sources

and use predictive analytics to predict which of the applicants is most likely to succeed on the job (Francis, 2020). This again can be done by comparing an applicant's data to the resumes and performance reviews of highly successful employees already working for the company (Florentine, 2017).

4.1.1.5 Appointing

Whereas the actual appointment of the new employee is likely to be done manually by the line manager or HR manager, the sharing of regret information to rejected candidates is a task in which AI can assist (Nicastro, 2019). This does not remain limited to only sharing rejection information, but it can also provide feedback to the applicants, e.g. on how to improve for the future and recommending other suitable job positions. This is a form of building candidate relationships, that is considered as improving branding image by many companies (Savola & Troqe, 2019).

4.1.2 Challenges of Artificial Intelligence within recruitment

Besides the opportunities identified by the reviewed literature, there are also challenges to be highlighted. However, there seem to be fewer challenges than opportunities. Most of these challenges are not related to a single recruitment activity but companies can encounter these challenges along the entire recruitment process. Only for sourcing, specific-related challenges have been identified. Table 2 (Appendix B) gives a schematic overview of the challenges of AI for recruitment.

4.1.2.1 All activities

When companies decide to implement AI for recruitment, one of the main challenges is the noticeable disappearance of the human aspect throughout the entire recruitment process (Dijkkamp, 2019). According to Savola and Troqe (2019), AI can impossibly imitate the internal logic perception, subconsciousness, and 'common-sense' that can be found in humans. For this reason, AI can be destructive when relying on this technology only (Pickup, 2018).

With AI for the recruitment process still being in a relatively early stage, HR departments and recruiters sometimes grope in the dark when it comes to the right ethical use of AI. Concerning privacy, most systems guarantee to only search for data available in the public domain, but boundaries often turn out to be blurring (Goyal, 2017). Meanwhile, various laws e.g. the General Data Protection Regulation (GDPR) and the anti-discrimination law, are getting grip on recruitment. Wrong use can lead to unexpected lawsuits and reputational damage often resulting in liability and overall responsibility for harm (Leithead, 2018; Farokhmanesh, 2019).

Another significant challenge is the potential bias that AI-based systems can bring into the hiring process. Although it is often mentioned that AI reduces biases, reviewed literature suggests that the opposite can be true as well. Machine learning algorithms are based upon training data from which it learns. Once this initial data is already biased, the AI tool will immediately reflect this by leaving out many potential candidates that do not align with the input data (Nicastro, 2019; Leithead, 2018). To give an example, when an algorithm uses existing data about a company's employees (predominantly male) to benchmark against, the software will leave aside CVs that include the word 'women' (Derbyshire & Babic, 2020). For interviews, this can be the case when tools start showing an adverse preference for certain voice tones and expressions (Faragher, 2019). AI software can also develop an aversion against characteristics that are culture-specific such as failing to smile. All of this can be an (unconscious) breeding ground for discrimination. The 'black box' nature of algorithms can make the use of AI even more challenging, e.g. when judging potential discrimination (Starner, 2019). Especially when using software from a third-party vendor, the training data often remains unknown and non-developers lack the ability to alter third-party systems they use (Chin, 2019). It is necessary to know why an AI algorithm makes a decision, every time that it makes a decision. The system should be transparent and interpretive so that humans can learn from mistakes and keep developing it (Bersin, 2019).

Also based on prior challenges, there is evidence that applicants do not like a recruitment process that is based on AI. The inflexibility of e.g. chatbots to react to a non-standard conversation can alienate candidates (Pickup, 2018). Furthermore, a survey from ManpowerGroup solutions shows that 61% of the candidates prefer face-to-face interviewing over AI-based interviewing (Reilly, 2018).

Reilly (2018) recognizes that the decrease of the human aspect within recruitment can lead to some people fooling the computer by including false data to get through screening and selection. Johansson and Herranen (2019) and Farokhmanesh (2019) highlight that there are things that AI can't figure out for candidates, e.g. whether or not there is a cultural fit.

If companies decide to adopt AI for recruitment, the ability of HR departments to adapt to AI can become a challenge when this is not based on a staged approach or when managers do not possess the technical skills (Pickup, 2018). The consequences can be bad experiences to both candidates and hiring managers, but also a waste of resources (Leithead, 2018).

4.1.2.2 Sourcing

Compiling and supplementing candidate profiles via the search of social channels has been recognized as one of the opportunities of AI for sourcing (Power, 2019; Goyal, 2017). Nevertheless, inherently connected to this upcoming phenomenon is a downside that can be described as the possibility of ignorance of applicants without an internet presence. When there is a lack of sufficient online data of potentially-employable candidates, they may fall under the radar. As a consequence, social profiles cannot be made and these people may miss out on job opportunities (Farokhmanesh, 2019; Goyal, 2017).

4.2 Semi-Structured Interviews

There is a shortage of existing literature researching the combination of recruitment, AI, and line managers. In overcoming this gap, semi-structured interviews with five respondents representing the cases of Infor, Workday, and Visma Raet were conducted to acquire an in-depth understanding of the altering role of line managers after the introduction of AI for recruitment. As a result of the interviews with the companies, we have acquired new insights, which will be further explained below. To start with, a more general description of the consequences of AI for recruitment and the changing role of the line manager is given. Subsequently, more specific insights for the altering role of line managers are elaborated.

4.2.1 The changing role of the line

Although all representing different HR software, the respondents of all the three cases highlighted the undoubted future in which AI is going to change recruitment practices, eventually resulting in a transformed role for the line manager. Visma Raet presented the potential of their robotized HR software as *simplifying [administrative] tasks for the HR back-office, resulting in more streamlined* processes.' Infor mentioned their AI-based

recruitment software *'doing the administrative and transactional functions of a [line manager's] role'* and besides *'augmenting human intelligence ... to help us make better decisions.'* Workday sees the value of AI for recruitment as *'bringing a lot of information together ... that you [line manager] can focus much more on human interaction'.* Frequently given examples of the opportunities of AI by all companies were the automatic screening of CVs, increasing diversity, candidate engagement via chatbots, identification of time and resources necessary to acquire a certain candidate, AI video-interviewing, identification of person-organization fit and automatic ranking of prospective candidates. All these opportunities provide the line manager with meaningful insights on different recruitment decisions, such as *'who to hire and where to put them in the organization.'* The assistance of AI in recruitment by taking over administrative, tasks leads to a line manager involving itself in more strategic matters that require human empathy such as the binding of candidates and identifying the perfect team composition. Infor summarized this as the potential of technology helping to create a more human experience. However, the thread of the interviews, is the continuously, needed human element in discerning candidates. All companies mentioned the likely ever assisting and supportive nature of AI, meaning that it is very unlikely that AI for recruitment practices is ever going to replace the human element. According to Workday, the replacement of line managers within recruitment is out of the question. Instead, AI allows you to put those people in the position to do the right things. Visma Raet also sees IT, including AI, as only serving and supporting humans as the instinct of humans remains vital: *'As a manager, you want to control some things yourself ... [such as] the feeling whether someone fits into a team ... Sometimes it is gut feeling ... that in reality turns out to be true.'* Workday expressed the human EQ as indispensable in determining whether the true match between the candidate and the job is there: *'... it is a combination of EQ and IQ, and AI has no EQ or human interaction. It does not replace, but complements each other.'* This also connects with Infor's view stating that humans are too complex to be fully grasped by AI resulting in a need for human empathy and intuition in the recruiting of employees. Infor even saw this sometimes resulting in line managers *'doing crazy things'* by bypassing data and eventually hiring a completely different candidate than what was initially suggested by the AI-provided data.

Furthermore, Infor and Workday also recognized the involvement of line managers as vital in communicating the value of AI to candidates. In the opinion of Infor and Workday, communication is important in reducing skepticism among candidates towards the introduction of AI. Besides, Infor states that clear communication between the line manager and candidates can also help in avoiding the rise of legal, ethical, and privacy issues.

Even though it was pointed out that AI is not able to replace the function of the line manager within recruitment, they did mentions some new, specific insights which are part of the changing role of the line manager. These will be discussed below.

4.2.1.1. Altering collaboration between HR manager and line manager

Infor claimed that in their experience, because of the arrival of AI for recruitment, the collaboration between HR and the line has been made easier and more intense. *'AI can make the collaboration easier ..., helping the line manager and the HR person collaborate based on data. Not intuition, not my opinion, not from my perspective, but let's talk about the data ...'* AI can facilitate in creating a shared language based on data between the line manager and HR manager. It facilitates the elimination of subjectivity, replacing this with objectivity, resulting in better-agreed decisions. Infor highlighted the unavoidable but challenging implications that this collaboration has for software companies in the provision of software tenders as their AI-based software now needs to be meaningful and easy to use by as well the HR manager and the line manager.

Visma Raet sees a decrease in the actual collaboration in recruitment activities between HR and the line manager, as the line manager will become more responsible for the execution of the recruitment process, whereas the HR manager is likely to shift towards strategic tasks e.g. determining the recruiting strategy, causing a sense of increased separate paths for the two. Nevertheless, this seems to complement the view of Infor who states that nowadays, there is also the possibility of the line manager being fully responsible for the recruiting of new employees, in which the HR manager is left with just a supporting role.

4.2.1.2 Early involvement in the recruitment process

An important consequence of AI for recruitment is the early involvement of line managers in the recruitment process. Infor: *'I think this is an important consideration, especially right now where a lot of traditional roles are being re-evaluated.'* This was followed by mentioning that the early involvement of the line manager is necessary for expressing the needs when searching for a new candidate. Besides, according to Visma Raet, AI gives line managers the power to be in charge of the early phases of recruitment as it can quickly send them an overview of the top candidates. Before the introduction of AI for recruitment, line managers were often dependent on their recruiters in the identification of a selected list of candidates that were suited for further selection. So, instead of waiting for the often lengthy, manual sourcing and screening process of recruiters, line managers are now, with the introduction of AI, able to quickly identify and respond to the top-ranked candidates. Visma Raet sees the early description and identification of top candidates by line managers as especially important now that the war for talent is going on, and fast responses are necessary when willing to acquire the best talent.

However, it was said by all companies that the more interactive participation with candidates from the side of the line manager starts to occur from the selection phase since earlier phases are very front-loaded with AI screening candidates for further selection. Workday: *'Through AI we are already quite sure that the right people are getting through the screening stage.'* Therefore, another additional 'check-conversation' by a recruiter is eliminated, enabling a line manager to immediately conduct the first conversation with the applicant. In the selection phase, Infor states that AI provides the line manager with a *'report about that person and ... recommended interview questions.'* From this phase on, not recruiters, but line managers need to be involved to function as a double-check and to *'validate if the assessment is right.'*

4.2.1.3 Need for altering skills

In evaluating new skills for line managers to effectively work with AI for recruitment, Visma Raet and Infor believe that the possession of a certain level of technical skills is a condition to be able to interact with the data. Infor stated this as *'... we do not all need to be data scientists but we do need to know how to interpret information and how to use it to make better decisions.'* With this statement, they also recognized the need for analytical skills. Analytical skills help in understanding the why behind certain AI-supported decisions, as they often remain unknown.

Furthermore, Infor supplemented this with the more traditional soft skills (e.g. problem solving, critical thinking) as being critical as they allow you to be successful in a wide variety of roles. In the comparison of the aforementioned skills with the skills necessary before the arrival of AI, it was suggested that, before the arrival of AI, the skills were not less important but they '*weren't just utilized this often.*' It is this new combination of skills that will make a line manager successful when working with AI for recruitment:'*You need to have great soft skills, you need to be able to navigate the technology and you need to be able to interpret data. If you have all three of those, you [as a line manager] are going to do really well.*'

Whereas planning and administrative tasks were a line manager's greatest occupation before, Visma Raet and Infor both finalized with the importance of the '*people management skill*' / '*social skill*' now that line managers are truly able to interact with the people. An important note that was made by Infor, is that it is not likely that these characteristics can be taught to line managers: '*you can help, and guide them, but you can never teach those kinds of things inside you.*'

The different view of Workday on this aspect needs to be mentioned as well. They believe that, just as in the consumer world, everything needs to be user-friendly if it is willing to be adopted. This also applies to their AI-software for recruiting, '*as long as the market creates user-friendly software … you [as a line manager] do not need to have extra skills.*' This software will then, even with limited technical skills, enable you to work with it. According to them, the AI-provided data also comes with a set of reasons why that data is provided in a specific way, directly removing the need for analytical skills.

4.2.1.4 Shift from administrative towards coaching role

What can be made up from all the responses in the interview is that AI for recruitment will only be there to support line managers, augmenting their intelligence and taking over administrative tasks, freeing up time for tasks that require more human intuition. Example of Infor: '*If we can eliminate or automate the majority of those administrative tasks of being a manager…Technology can do all that…*' Visma Raet named that, as a result of AI for recruitment, '*line managers can move to being people managers*'. Infor worded this as the possibility for line managers to '*do things that require truly, unique, human interaction*' such as '*developing, meaningful authentic relationships with candidates.*' In this relationship, the line manager takes his position as a coach. The line manager has more time to get familiar with the potential candidates and guide them through the recruitment phase, not only taking into account the company's objectives but also, as mentioned by Workday '*assist candidates … to reach their personal objectives.*' This helps the person to get the most out of itself, helping that person to reach their full potential by thinking along with them '*about whether future ambitions of a candidate can be supported [within the company].*' Thus, assessing whether a person's aspirations truly fit into the job role and organization by not only focusing on the given AI-supported data but also by taking into account a persons' next steps: '*where are you today, what do you want to do next year and the year after that*' even if this sometimes means that the suggestions of AI-software about a certain candidate are sometimes ignored. Besides, another task of a line manager as a coach is that he needs to pull together the right team of people. His task when hiring is to compare different people and put them together in groups until you have the unique DNA of people together. This was summarized by a statement of Infor: '*I like this coach, the [line] manager as a coach because he is always looking for the best team because you need strikers, defenders, and goalkeepers.*'

So, the line manager as a coach is there throughout the recruitment process to support candidates by taking time and effort to see whether, and if so how, an applicant's qualities and personal aspirations can best fit into the team. This can contribute to each individual reaching their full potential, while also contributing to the achievements of the team and the company.

5. DISCUSSION

In this paper, we decreased the knowledge gap regarding the implications of AI for recruitment by answering the research question of how AI-supported recruitment is going to alter the role of line managers within the recruitment of employees. The hybrid-method approach, consisting of a systematic literature review and semi-structured interviews, enabled us to generate new insights on this topic.

The systematic literature review aimed at answering our first sub-question by identifying the different opportunities and challenges that AI for recruitment has in store. The results of the systematic literature review showed the potential of AI to make meaningful changes along the entire recruitment process, including sourcing, screening, selecting, and appointing. It can speed up the sourcing of potential candidates while simultaneously reaching out to a larger pool of candidates. In screening, AI can quickly provide a shortlisted and even ranked list of potential candidates suited for further selection. AI-software for selection practices can assist in video-interviewing and based on it determine a person's soft skills and the person-organization fit. As communicating feedback and final hiring decisions to candidates can be a time-consuming activity, AI has been identified as a useful tool to also automate this process. Finally, AI can increase customer engagement and reduce bias throughout all recruiting phases.

Nonetheless, we have also identified the different types of drawbacks that AI for recruitment can bring. These are mostly related to AI being able to learn its own bias, an aversion of applicants towards AI application systems, undermining of ethical, privacy, and legal regulations, and the reduced presence of the human aspect within the recruitment process.

The semi-structured interviews guided us in addressing our second sub-question on how these opportunities and challenges eventually transform the role of a line manager. Many of the opportunities already identified in the systematic literature review were confirmed. The potential of AI was summarized as the ability of AI to reduce the amount of administrative, repetitive tasks, and augment a line manager's intelligence to assist them in decision-making processes. More important was the uniformity regarding the role of line managers now that AI for recruitment is here: the line manager's role within recruiting cannot ever be replaced by AI. As humans, and thus candidates, are too complex to be completely understood by AI, there will always be a need for a line manager's presence within recruitment as their intuition and empathy are requisites within final decision-making. Sometimes even resulting in line managers still moving into another direction that is not based on the given data but on the combination of their EQ and experience. AI can give you a nudge in the right direction, but the line manager is needed to fully benefit from the opportunities provided by AI. The results of the interviews also brought insights on how the communication between candidates and line managers is paramount in contributing to AI reaching its potential, without causing aversion or give rise to privacy, ethical, or legal scandals. These findings permit us in saying that a line manager's presence can also make a difference in avoiding the identified challenges regarding the fear for the disappearance of the human aspect, the aversion of candidates towards AI-based

recruiting systems, and the rise of legal, ethical and privacy issues.

Despite our identification that the supporting nature of AI causes the role of the line manager to remain present within recruiting, the interviews provided us with four new specific insights on how their lasting role is likely to change.

First of all, we have identified the strategic shift from an administrative role towards a coaching role for the line manager within recruitment. As AI takes over a majority of their tasks, line managers have more time left to create interactive relationships with candidates, in which the line manager takes the role of a coach who supports the candidate in the recruiting process by also taking into account the future perspectives of the candidate. This increased attention, which is not only based on data, can help in determining if and how a person can get the best out of themselves within a certain job position, and whether this is also benefitting the team and organization.

Secondly, the line manager will be earlier involved within the recruiting process as he needs to accommodate the AI-software with input on the required competencies for the specific job role. After sourcing, AI puts line managers in the position to easily undertake action themselves on prospective candidates, since they are no longer dependent on a recruiter screening candidates. Early involvement can contribute to fast and efficient sourcing, which has been identified as a prerequisite for successfully competing in the war for talent.

Thirdly, this research also found that line managers need to possess a new combination of skills including technological, analytical, social, and soft-skills. Not all interviewees recognized the need for new skills as they argued that a user-friendly AI-system should be easily used by everyone, not calling for any new competencies to be acquired. Still, we do believe that these skills are paramount as AI for recruitment is still in its early stages in which the perfect, flawless AI-system seems a little too optimistic. A basic understanding of the system, an analytical view towards the produced data, and skills enabling critical thinking and problem solving can be vital in avoiding the challenges such as AI programming bias into its own algorithms and in preventing the rise of diversity and privacy matters.

Finally, AI-supported recruitment is likely to cause the HR manager and line manager to collaborate in a different way. Now, AI-based recruitment causes HR managers to shift their attention to the strategic side of recruitment while slightly supporting the line managers who are becoming responsible for the execution of the prescribed recruitment strategy. They will no longer cooperate in carrying out the recruitment activities, but in ensuring that the actual implementation is in line with the pre-scribed strategy. What needs to be mentioned though, is that despite these different roles, HR managers and line managers will both still rely on AI-supported data in their roles, implying that when collaboration is required, this is made easier by hard data creating a shared language.

5.1 Practical Implications

This study can be of value to several parties. First of all, the results can be meaningful for everyone who is planning on implementing AI for recruitment within the organization, including executives, senior management, and HR managers. This research can guide their considerations in two ways. First of all, it can assist in making a comparative assessment based on the identified opportunities and challenges when discussing the adoption of AI. Secondly, they can identify how AI is going to alter the role of their line managers within recruitment and whether they have the right type of line managers in-house that can work with AI. As the most prominent skills necessary are

internally found, they are hard to be externally taught. Therefore, the examination of the skills of the line manager is best done before the adoption of AI for recruitment. Second of all, the results can be valuable for many line managers at the start of implementing AI for recruitment practices. It brings them insights and guidance, not only about the possible opportunities and challenges that they can encounter but mainly about their related, expected changing role and the skills they need to possess to effectively work with it.

Finally, as this research also recognized the HR manager and the line manager both relying on AI-supported data for recruitment, AI software suppliers can take this finding into account when creating AI-software for recruitment. This reliance suggests HR managers and line managers both using the software and therefore it should have a UI (user interface) appealing to HR managers as well as line managers.

5.2 Theoretical Implications

As a result of this research, we have found a threefold of important theoretical implications that deserve to be mentioned. The first implication that can be drawn from this study is that it supports the existing HRM devotion literature which already highlights the increasing transfer of tasks from the HR manager towards the line manager. This research confirms and supplements this finding as AI for recruitment can be seen as a driving factor for increased devotion between HR and the line. Previously, most of the recruitment activities were a joint effort in which the line manager was most actively involved within selection. Now, the line manager receives responsibilities within earlier stages and the role of the HR manager within the execution of recruitment activities seems to disappear. This implies the line manager being increasingly involved within the implementation of recruitment activities, giving the HR manager time and space to focus on the strategic path, which is also in accordance with existing HRM devotion literature.

Furthermore, we have identified a difference between the reviewed practitioner literature and the conducted interviews in this research. Practitioner literature on the implications of AI for recruitment guided us in this research, but remained limited to the discussion of opportunities, challenges, and the transforming role of HR managers, even though the interview of this study showed that there is another important implication that cannot be forgotten when talking about AI for recruitment: the subsequent altering role of line managers. A comparison of the two implies that this study deviates from practitioner literature as this study involves the altering role of line managers, whereas practitioner literature on this topic is lacking behind.

Finally, one of the major implications of this research, stating that line managers are still important as AI for recruitment can only be supportive, is in line with the bulk of preceding academic literature that already argued for the collaborative context rather than the entire replacement of humans by AI.

5.3 Limitations of the Study

In reviewing the limitations of this study, we have encountered two aspects that deserve further explanation. The first limitation touches upon the nature of our respondents. Since we conducted our interviews with representatives of various HR software-providing companies, we need to acknowledge that the objectivity in some of their answers are at a stake. These software providers were relatively more focused on the related opportunities rather than talking about the associated challenges of their AI-software for recruiting practices. Therefore, they are in the position of providing a highly positive image of their software, which is likely to be less neutral.

The second limitation of this research can be accounted towards the timing of the study. This study was halfway confronted with the upcoming of COVID-19, which led to transformations for many organizations. Since the semi-structured interviews occurred in the second half of our study, generating contacts for interviews became challenging as voluntarily supporting research was not considered a priority for all businesses anymore. This resulted in a relatively small sample size consisting of three company cases. For a topic that has not received attention before, we admit that a sample size this small does not provide significant evidence to establish solid claims. However, as the interviews approached the topic of AI for recruitment very broadly, the new results regarding the altering role of line managers are likely to be generalizable implying if companies start to use AI, there is the probability that the results will be the same. Still, this all remains a little 'wishful thinking' as many companies have not yet introduced AI for recruiting practices.

5.4 Recommendations

The joined results of the systematic literature review and semi-structured interviews enabled us to make relatively solid claims regarding our first sub-question about the opportunities and challenges of AI for recruitment. However, as this study is one of the first to research the altering role of line managers due to AI-supported recruitment, we were able to derive at new, likely insights on this topic but these cannot yet be positioned as a sound theory. Therefore, we believe that further research on the consequences of AI-supported recruitment for the role of line managers needs to be conducted to generate increased concrete evidence on this altering role of the line manager. Besides, there is a high probability that this research only highlighted the tip of the iceberg and that there is much more waiting to be discovered about the altering role of the line manager as a consequence of AI-supported recruitment. Future researchers involved in researching this topic should especially consider involving a larger sample size containing a wider variety of respondents, e.g. including line managers or company executives already using AI-software, to acquire new and different perspectives that can contribute to confirming and supplementing the results of this research.

6. CONCLUSIONS

With the war for talent creating an increasingly competitive landscape, many businesses are in need of an optimized recruiting process that is able to find the best talent in the least possible time. The upcoming phenomenon of AI-software for recruiting is undoubtedly in the position to transform these recruiting processes. However, such a system comes with many implications. This research has identified the implications for the introduction of AI for recruitment and the consequent altering role of line managers. The systematic literature review showed the many opportunities of AI for recruitment, most of them relating to AI taking over administrative tasks and supporting the decision-making of the line manager by augmenting their human intelligence. However, it was also recognized that AI can bring challenges to the recruitment process, of which these are the most frequently mentioned: the disappearance of the human aspect, AI programming bias into the algorithms, candidates' aversion towards AI-supported recruiting and the possibility of violating ethical, privacy and legal rights.

Despite the recognized opportunities, the interviews pointed out that AI is not capable of replacing the human relationship as a line manager's empathy and intuition remains an ever-needed requisite for the more strategic implementation tasks such as building relationships and final decision-making. In fact, this human instinct can sometimes even cause a line manager to make different decisions in hiring then the initial suggestions made by AI. Instead of replacing line managers, line managers turn out to be vital in reaping the benefits of AI for recruitment. Even though AI is not in the position to make the role of the line manager superfluous, they can expect their role within the recruitment of employees to be transformed in four ways: they will shift from an administrative towards a coaching role, they will be earlier involved within the recruitment process, they will collaborate with the HR manager in a different way, and they need to obtain a new combination of skills (technological, analytical, social and soft-skills). Clear communication, in combination with the mentioned skills, can prevent AI from programming its own bias and the occurrence of legal, ethical and privacy issues can be prevented. Besides, no support was found for AI actually causing the full disappearance of the human aspect.

What can be concluded from this research is that the line manager remains ever-needed in benefitting from the opportunities provided by AI, while also contributing to avoiding the challenges caused by AI. Even though AI for recruitment has not yet gained a foothold in many companies, there seems to be no need to fear the disappearance of the line manager's role within the recruitment of employees.

7. ACKNOWLEDGMENTS

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9. APPENDICES

9.1 Appendix A Table 1

Table 1. Suggested opportunities of Artificial Intelligence within recruitment

Opportunities per recruitment activity	Examples from reviewed literature
Sourcing	
Creating appealing job descriptions	Dijkkamp (2019), Guenole and Feinzig (2018), Peterson (2019), Derbyshire and Babic (2020), Florentine (2017), Goyal (2017), WillisTowers Watson (2020), BNP Paribas (2019)
Initiate contact with potential candidates	Dijkkamp (2019), Vidal (2019), Schweyer (2018), Goyal (2017)
Person-job matching	Guenole and Feinzig (2018), Derbyshire and Babic (2020), Vidal (2019), Castellanos (2019), Faragher (2019), Davies (2019), Stephan et al. (2017), Kolbjornsrud et al. (2016)
Enlarging the potential talent pool	Savola and Troqe (2019), Peterson (2019), Pickup (2018), Redstone (2018), Reilly (2018), EY (2018), Davies (2019), Florentine (2019), Feloni (2017), SiliconRepublic (2020), Bayern (2020), Kolbjornsrud et al. (2016), O'Donnell (2018)
Identify ideal candidate by using historical data	Peterson (2020)
Create/supplment candidate profiles	Power (2019), Goyal (2017)
Show competition in specific area	Castellanos (2019)
Predict time and resources needed to fill job requisition	Florentine (2019), Stephan et al. (2017)
Screening	
Shortlisting by resume screening	Johansson and Herranen (2019), Castro Betancourt (2019), Jordan (2020), Bersin (2018), Starner (2019), Wong (2020), Carew (2020)
Ranking of applicants	Johansson and Herranen (2019), Power (2019), Castellanos (2019), Reilly (2018), Chin (2019)

Table 1. Suggested opportunities of Artificial Intelligence within recruitment

Opportunities per recruitment activity	Examples from reviewed literature
Selecting	
Predict future performance within company	Guenole and Feinzig (2018), Savola and Troqe (2019), Francis (2020), Bersin (2018), Florentine (2017), Chin (2019)
Automatic interview scheduling	Peterson (2019), Castro Betancourt (2019), O'Donnell (2018), Power (2019), Schweyer (2019), BNP Paribas (2019)
Video interviewing	Starner (2019), Derbyshire and Babic (2020), Francis (2020), Nicastro (2019)
Soft skills assessment	Francis (2020), O'Donnell (2018), Power (2019), Feloni (2019), Chin (2019), Farokhmanesh (2019), Vidal (2019), Jordan (2020), Reilly (2018), Schweyer (2018)
Identify person-organization fit	O'Donnell (2018), Savola and Troqe (2019), Power (2019), Schweyer (2018), Nicastro (2019)
Appointing	
Communicate hiring decisions/feedback back to candidates	Johansson and Herranen (2019), Savola and Troqe (2019), O'Donnell (2018), Power (2019), Schweyer (2018), Nicastro (2019)
All activities	
Reduce bias	Dijkkamp (2019), Guenole and Feinzig (2018), Savola and Troqe (2019), O'Donnell (2018), Vidal (2019), Pickup (2018), Starner (2019), Castellanos (2019), Faragher (2019), Hipps (2018), Farokmanesh (2019), Chin (2019), SiliconRepublic (2020)
Improved candidate experience by using chatbots	Dijkkamp (2019), Johansson and Herranen (2019), Meister (2019), Power (2019), Francis (2020), Vidal (2019), Bersin (2018), Redstone (2018), Starner (2019), Faragher (2019), Hipps (2018), Schweyer (2018), Nicastro (2019), Wong (2020), Hire by Google (2019), Bayern (2020)

9.2 Appendix B Table 2

Table 2. Suggested challenges of Artificial Intelligence within recruitment

Challenges per recruitment activity	Examples from reviewed literature
Sourcing	
Possibility of ignorance of applicants without internet presence	Farokhmanesh (2019), Goyal (2017)
All activities	
Disappearance of the human aspect	Dijkkamp (2019), Savola and Troqe (2019), Pickup (2018)
Undermining ethical, legal and privacy regulations	Dijkkamp (2019), Power (2019), Derbyshire and Babic (2020), Bersin (2018), Starner (2019), Reilly (2018), Leithead (2018), Farokhmanesh (2019), Goyal (2017), EY (2018)
Potential for training and perpetuation of bias	Dijkkamp (2019), Johansson and Herranen (2019), Savola and Troqe (2019), O'Donnell (2018), Power (2019), Derbyshire and Babic (2020), Bersin (2018), Pickup (2018), Starner (2019), Reilly (2018), Faragher (2019), Hipps (2018), Leithead (2018), Farokhmanesh (2019), Nicastro (2019), Chin (2019), EY (2018), SiliconRepublic (2020)
Aversion of applicants towards AI application systems	Dijkkamp (2019), Pickup (2018), Reilly (2018)
HR departments' adaptability to AI	Johansson and Herranen (2019), Leithead (2018), Pickup (2018)
Difficulty of AI understanding companies' values	Johansson and Herranen (2019), Farokhmanesh (2019)
Underlying reasoning of AI remains unknown	Starner (2019), Bersin (2019), Reilly (2018), Faragher (2019), Chin (2019)
Ability of humans to outsmart AI	Reilly (2018)

9.3 Appendix C Interview questions

1. What opportunities does the AI software of [company's name] offer for recruitment and how does this alter the role of line managers?
2. What challenges can be encountered when using AI software for recruitment and how does this alter the role of line manager?
3. When looking at … (screening, selecting, sourcing, appointing) what are the opportunities for this recruitment activity that [company's name] AI software offers?
4. When looking at … (screening, selecting, sourcing, appointing) what are the challenges that can be encountered when using [company's name] AI software?
5. Which stages of the recruitment/selection process are most AI-supported and why?
6. Which stages of the recruitment/selection process are least far with the use of AI and why?
7. Which role do LM's have in the recruitment and selection of employees?
8. Literature suggests that AI for recruitment has solely implications for HR managers. What is your opinions on this?
9. What qualities, necessary for the recruitment of employees, does a LM have that cannot be easily executed by AI software?
10. What skills does a line manager need to obtain when working with AI for recruitment?
11. What are new tasks of line managers after AI took over their tasks in recruitment?
12. There has been written a lot about the future of AI for recruitment, either supportive, collaborative or replacive. How do you see the future of AI for recruitment?