



UPPSALA
UNIVERSITET

UPTEC STS 22034

Examensarbete 30 hp

September 2022

Artificial Intelligence in Recruitment

Opportunities and Challenges of Implementing Artificial
Intelligence in today's Recruitment Processes

Helena Lundvall

Civilingenjörsprogrammet inom System i Teknik och
Samhälle



UPPSALA
UNIVERSITET

Abstract

Artificial Intelligence (AI) is one of the most spoken-of technologies of today. The future of AI, how it will affect every aspect of our lives, and its potential associated to various sectors are intensively debated. The technology has in recent years started to emerge in the recruitment field, leading to an intensified discussion of its advantages and disadvantages in this context.

This master thesis aims to examine and analyze where in recruitment processes it is favorable for organizations to use artificial intelligence, why that might be the case, and how it can be done. To answer the research objective, this thesis contains a literature review focusing on the recruitment process, AI in general, and AI in recruitment, as well as an interview study with key people in different job positions connected to recruitment.

Following the results of this study, the main challenges in recruitment today, how AI can help overcome these challenges, and potential barriers preventing AI from doing so, are identified. The main challenges are identified as candidate shortage, distribution of resources, limitations in organizations' ways of working, and keeping recruitments objective. AI has the potential of helping organizations with all of these challenges, mainly due to its superiority over humans regarding the processing of large volumes of information. The potential barriers identified are mainly connected to recruiters' technological knowledge, their trust in AI, and their view of AI as a threat towards their profession.

The thesis concludes that the candidate shortage limiting the labor market today is driving the development of a more efficient and secure recruitment process where AI plays an increasingly important role. To enable the implementation of AI, organizations need to actively encourage the acquisition of knowledge about the technology among their HRM professionals, because, without their understanding of the technology and how it benefits them, its prominent advantages can not be achieved by the organization.

Teknisk-naturvetenskapliga fakulteten

Uppsala universitet, Utgivningsort Uppsala/Visby

Handledare: Anna Rapp (Layke Analytics) Ämnesgranskare: Lars Ericsson

Examinator: Elísabet Andrésdóttir

Populärvetenskaplig sammanfattning

Utvecklingen av artificiell intelligens (AI) har under det senaste decenniet gjort enorma framsteg med allt fler användningsområden och tillämpningar. Idag är AI en etablerad teknik inom flertalet sektorer i samhället och dess snabba utveckling spås inte sakta ner, tvärtom, tekniken bedöms ha potentialen att bidra till ett paradigmskifte i hur vi lever våra liv.

AI anses vara en nyckelkatalysator för innovation och utveckling, och samtidigt ett kraftfullt verktyg som kan medföra nya möjligheter för organisationer och deras arbetssätt. AI kan automatisera aktiviteter som idag begränsas av att människor genomför dem och tekniken kan även bidra med objektivt beslutsunderlag baserat på automatiserad bearbetning av stora mängder information. Utifrån dessa aspekter är det förståeligt att AI implementeras i allt fler sektorer och för allt fler ändamål och syften.

Inom rekryteringsbranschen är trenden tydlig. En ökad användning av AI-lösningar kan observeras. Många organisationer visar intresse för tekniken och är i initiala testfaser för att implementera den i sina processer, men trots dess potentiella fördelar har utvecklingen ännu inte kommit så pass långt att det kan ses som en standard att använda AI inom rekrytering.

Syftet med denna studie är att undersöka och analysera var i rekryteringsprocesser det är fördelaktigt för organisationer att använda sig av artificiell intelligens, varför det är fördelaktigt inom just dessa delar och hur tekniken kan verkställas. Dessa frågor besvaras genom att utreda vilka möjligheter och utmaningar det finns för att implementera AI i rekrytering idag.

Resultaten i studien visar att det finns en mängd faktorer som påverkar AI och dess roll kopplat till rekryteringsbranschen. Studien belyser de största utmaningarna inom rekrytering idag, hur AI kan användas för att tackla dessa utmaningar, och potentiella barriärer som hindrar AI från att göra detta. De mest betydande utmaningarna som identifierats i studien är brist på kandidater, suboptimal fördelning av resurser i rekryteringsarbetet och svårigheten att säkerställa objektivitet i rekryteringsprocesser. AI kan på olika sätt besvara och hantera dessa utmaningar, främst genom dess överlägsenhet, jämfört med människan, att bearbeta stora mängder information och att snabbt ta beslut baserat på detta. Studien visar dessutom att de främsta barriärerna vad gäller AI:s potential att förbättra organisationers rekryteringsprocesser är kopplade till rekryterares tekniska kunskaper, deras förtroende för AI, samt deras syn på AI som ett hot mot deras profession.

Metodiken som använts i studien inkluderar två huvudkomponenter för insamling av information och data. Den första delen är en litteraturstudie som fokuserar på human resource management, rekryteringsprocesser, artificiell intelligens generellt och artificiell intelligens kopplat till rekrytering. Den andra delen är en kvalitativ datainsamling i form av djupintervjuer med nyckelpersoner som innehar yrken med olika koppling till rekryteringsbranschen.

En slutsats från studien är att den kandidat- och kompetensbrist som idag bakbinder stora delar av arbetsmarknaden i sig driver på utvecklingen mot en effektivare och säkrare rekryteringsprocess där AI är ett allt viktigare verktyg. Möjligheten att identifiera och rekrytera kandidater med rätt kvalifikationer är en mycket stark konkurrensfaktor som kan vara direkt avgörande för en organisations förmåga att inte bara växa utan också för att överhuvudtaget överleva. Det kommer därför att bli nödvändigt för organisationer att implementera AI-teknik i deras rekryteringsprocesser om de vill vara kvar på marknaden och utvecklingen i den riktningen går mycket snabbt.

En viktig aspekt är att om organisationer ska kunna tillgodogöra sig de potentiella fördelar som användandet av AI för med sig, så måste de aktivt uppmuntra och möjliggöra fort- och vidareutbildning om AI hos de personer som arbetar med deras rekryteringsprocesser. Ifall dessa personer inte förstår den underliggande tekniken, hur den fungerar och hur den kan underlätta deras arbete, så kommer organisationen inte fullt ut kunna tillgodogöra sig dess fördelar.

Dessa slutsatser öppnar upp för nya intressanta områden att undersöka vidare. Då denna studie fokuserar på en avgränsad del av rekryteringsprocessen vore det av intresse att undersöka möjligheter och utmaningar för att implementera artificiell intelligens även i rekryteringsprocessens övriga delar. Utöver det vore ett annat givande område att undersöka, utifrån att de främsta barriärerna för organisationer att tillgodogöra sig AI:s fulla potential identifieras till rekryterares tekniska kunskaper, deras förtroende för AI, samt deras syn på AI som ett hot mot deras profession, hur dessa faktorer kan förbättras. Slutligen, i ett senare skede med villkoret att användandet av AI kan ses som standard i rekrytering, vore det intressant att analysera vilka typer av AI-lösningar som skapar mest värde för organisationer, samt hur bra rekryteringar genomförda med hjälp av AI är i jämförelse med rekryteringar gjorda av enbart människor.

Acknowledgments

This thesis has been written as the final step of the Master's Programme in Sociotechnical Systems Engineering (STS) at Uppsala University. The project has been carried out in collaboration with Layke Analytics, a Stockholm-based company specializing in artificial intelligence and machine learning applications connected to recruitment. I want to direct a warm thank you to all people at Layke Analytics for their engagement and helpfulness. Additionally, I want to express some extra appreciation to my supervisor Anna Rapp for her persistent support and encouragement.

Furthermore, I want to deeply thank my subject reviewer Lars Ericsson at Uppsala University for our interesting discussions, and his endless guidance, support, and contribution of expertise.

Lastly, I want to thank all of the respondents for their time and invaluable input. Without their insights and experience, this thesis would not have been feasible.

Helena Lundvall

Stockholm, September 2022

Table of Content

| | |
|---|-----------|
| 1. Introduction | 3 |
| 1.1 Research Objective | 4 |
| 1.2 Research Question | 4 |
| 1.3 Delimitations | 4 |
| 2. Literature Review | 5 |
| 2.1 Human Resource Management and The Recruitment Process | 5 |
| 2.1.1 Human Resource Management | 5 |
| 2.1.2 The Recruitment Process: An Overview | 6 |
| 2.1.3 The Recruitment Process: Challenges | 8 |
| 2.2 Artificial Intelligence (AI) | 10 |
| 2.3 Artificial Intelligence in Recruitment | 14 |
| 2.3.1 The Trend of AI in Recruitment Today | 14 |
| 2.3.2 Different Types of AI and Automation Tools | 15 |
| 2.3.3 The Viability of Using AI in Recruitment | 16 |
| 2.3.3.1 Actor Role | 16 |
| 2.3.3.2 AI Role | 17 |
| 2.3.3.3 AI Adoption | 19 |
| 2.3.3.4 Potential Risks | 21 |
| 3. Methodology | 23 |
| 3.1 Interview Study | 23 |
| 3.2.1 Selection of Respondents | 24 |
| 3.3 Analysis | 24 |
| 4. Results | 25 |
| 4.1 Respondent Profiles | 26 |
| 4.2 Challenges in Recruitment | 26 |
| 4.3 Attitudes Toward AI and Automation | 31 |
| 4.4 Alteration of the HRM Profession | 38 |
| 5. Discussion | 40 |
| 5.1 Challenges in Recruitment Today | 40 |
| 5.2 AI in Recruitment | 43 |
| 5.2.1 Actor Role | 44 |
| 5.2.2 AI Role | 46 |
| 5.2.3 AI Adoption | 49 |
| 5.2.4 Potential Risks | 52 |
| 5.3 Conclusions | 53 |
| 5.4 Limitations | 56 |
| 5.5 Suggestions for Future Research | 57 |
| References | 59 |

1. Introduction

In the last couple of decades, the economy has moved away from the traditional capital- and labor-based way of working, and toward a knowledge-based way (Burton-Jones, 2001; Lindmark and Örnevik, 2011). “Knowledge, rather than labor, materials, or money is becoming the most important resource in the firm.” (Burton-Jones, 2001, pp. 64). Coherent to this shift, an increased understanding of which dominant role employees actually play for firms to secure their competitive advantage has arisen (Lindmark and Örnevik, 2011).

In a knowledge-based economy, the single most important thing for a firm to achieve its goals and objectives is to have the right people working there. Which directly implies an immense responsibility connected to today’s Human Resource Management (HRM) departments (Lindmark and Örnevik, 2011). As Chrawshaw et al. (2014, pp. 4) stated: “An organization is only as strong as its people.”.

The Confederation of Swedish Enterprise (translated from the Swedish “Svenskt Näringsliv”) writes a yearly report on recruitment trends in the Swedish labor market based on survey answers from their members. The main subject discussed in the 2021/2022 version is the increased difficulty organizations have recruiting people with the right competences. The difficulties are not connected to a certain kind of industry or a specific type of organization but can be seen in all industries. The trend is also the same regardless of where in Sweden geographically enterprises try to recruit. Seven out of ten enterprises experience recruitment difficulties, and as many as three out of ten recruitment attempts fail completely according to the survey (Svenskt Näringsliv, 2022).

The combination of an increased need for people with the right kind of competences, and the fact that there seems to be a lack of said people, or at least that they are hard to find, creates a considerable problem for the Swedish labor market. Recruitment difficulties will lead to a severe lack of growth potential and reduced competitiveness for enterprises, which in the long run affects the whole Swedish society. Job opportunities are left empty, and potential tax income for the country is lost. Shortcomings in the ability to supply competence are directly adverse to Swedish competitiveness globally and Swedish welfare (Svenskt Näringsliv, 2022).

There are a lot of measures that need to be addressed to solve this problem in the long run. However, in real-time, an immense responsibility is put on today’s Human Resource Management departments to find ways to recruit the right people despite the current situation. HRM in general, and recruitment in particular, is a profession that has been carried out much in the same way for a long time (Chrawshaw et al., 2014). Many of the techniques used in today’s recruitment processes are the same as years ago (Andersson et al., 2016). Given the existing recruitment situation, the so-called “war for talent” has become more pervasive among organizations. This in turn implies that HRM and recruitment professionals need to discover new ways of finding and attracting potential candidates (Anderson and Tushman, 1990).

One transformation that the HRM has undergone in the last decade is the adoption of e-recruitment methods, e.g. job advertisements online, online assessments, and video interviews (Upadhyay and Khandelwal, 2018), and more advanced kinds of technologies seem to be on the horizon. Reilly (2018) points out that recruitment is one of the organizational functions that are most likely to embrace and undergo technology innovation and transformation, and as of 2018, a trend among recruiters in adopting Artificial Intelligence (AI) software and solutions was observed (Upadhyay and Khandelwal, 2018). Artificial intelligence is believed to be a key catalyst for innovation and development. It is a powerful tool that can bring new opportunities for both businesses and services and, at the same time, contribute to the development of new skills and working methods (Regeringskansliet, 2019). With this in mind, new technologies in general, and AI in particular, are expected to be more integrated into the recruitment profession, and its ways of working moving forward.

Earlier research on AI in recruitment is mainly focusing on recruitment seen in a global context, but an absence of research on the subject in a Swedish context has been noticed. This thesis will investigate the use of AI in recruitment from a Swedish standing point.

1.1 Research Objective

This thesis aims to examine and analyze where in recruitment processes it is favorable for organizations to use artificial intelligence, why that might be the case, and how it can be done.

1.2 Research Question

To fulfill the aim of this thesis, the following research questions have been examined:

- Which are the main opportunities and difficulties for applying AI to recruitment processes in Sweden today?

Three sub questions are used to concretise the main question, namely:

- What are the main challenges in Swedish recruitment processes?
- What is the potential for the usage of artificial intelligence in recruitment processes?
- What are the barriers preventing the use of AI in recruitment in Sweden today, and how can these be overcome?

1.3 Delimitations

To limit the scope of this study, two main delimitations are done. First, a geographical delimitation to only consider organizations based in Sweden. Second, due to the many different stages that can be considered parts of the recruitment process, a second delimitation is done to only take the stages connected to recruitment and selection (see Figure 2) into consideration.

2. Literature Review

In the following section the literature review is presented. The literature review was conducted with two purposes. Partly, it functions as an understanding of central background knowledge, and partly as a foundation for the empirical data collection through the interview study. The objective is to get an understanding of the research subject and gain insights into what earlier research has shown on the matter. The literature was identified through keywords search on Uppsala University's library search, and Google Scholar. The keywords used were “human resource”, “human resource management”, “recruitment”, “recruitment process”, “artificial intelligence”, and “artificial intelligence in recruitment”. The literature identified are peer-reviewed articles, studies from researchers and experts in the field, and some popular science articles.

The presentation of the literature is separated into three parts: Human Resource Management and The Recruitment Process, Artificial Intelligence, and Artificial Intelligence in Recruitment. The first one consists of an introduction to the human resource management field and an explanation of the recruitment process to give a general overview of the field. The second one gives background knowledge of AI, what it is and how it works. The last one presents previous research on AI in recruitment in a global context. This division is done foremost for pedagogical reasons, with each part giving necessary knowledge to understand the upcoming part(s).

2.1 Human Resource Management and The Recruitment Process

2.1.1 Human Resource Management

Human Resource Management (HRM) is a management function focusing on hiring, motivating, and maintaining an organization's workforce. It can be defined as “a distinctive approach to employment management which seeks to achieve competitive advantage through the strategic deployment of a highly committed and capable workforce using an array of cultural, structural, and personnel techniques” (Crawshaw et al, 2014, pp. 7).

One of the most common models used in HRM research is The Fombrun Model, see figure 1, which defines the main operations of HRM and their interconnections (Fombrun, 1984). The main operations are Selection, Performance, Appraisal, Development, and Rewards (Lindmark and Örnevik, 2011; Fombrun, 1984). Each of these operations has different functions and processes associated with them, all developed to ensure a return of investment connected to the labor force working in organizations (Crawshaw et al., 2014).

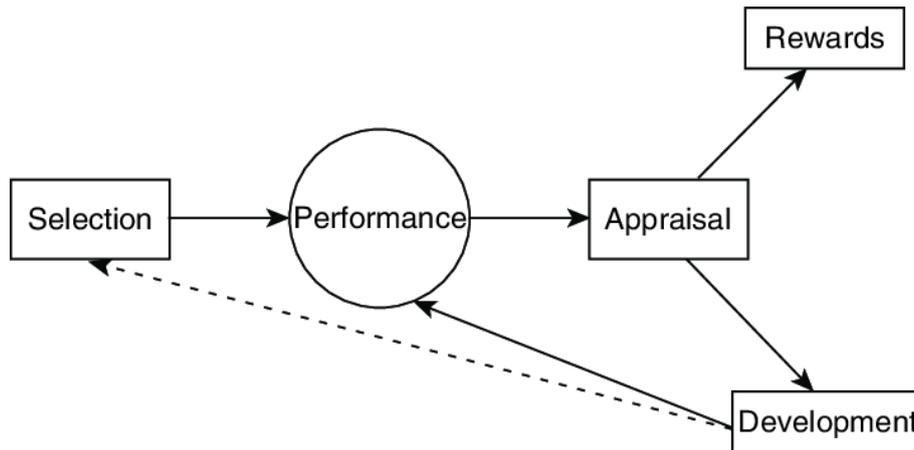


Figure 1. The Fombrun Model of HRM (Fombrun et al., 1984).

The first component of the Fombrun Model, defined as Selection in figure 1, is about how organizations work with the recruitment and selection of people for different positions and job openings. Following the purpose and delimitations of this thesis, the Selection component is the one that this study focuses on. The other components are about HRM processes connected to stages where the people affected are already part of the organizations, and therefore lie outside the scope of this work. In more recent research, the Selection component is re-defined as “The Recruitment Process”, which therefore is the definition used in the remaining parts of this thesis.

2.1.2 The Recruitment Process: An Overview

The recruitment process focuses on how an organization is working to recruit and select people for different positions (Lindmark and Önnévik, 2011). It can be defined as “a process of creating a group of qualified candidates for the vacancies within the organization” (Stoilkovska et al., 2015, pp. 284). To understand the scale of the recruitment process, and its different stages, an overview of the overall process flow can be seen in figure 2.

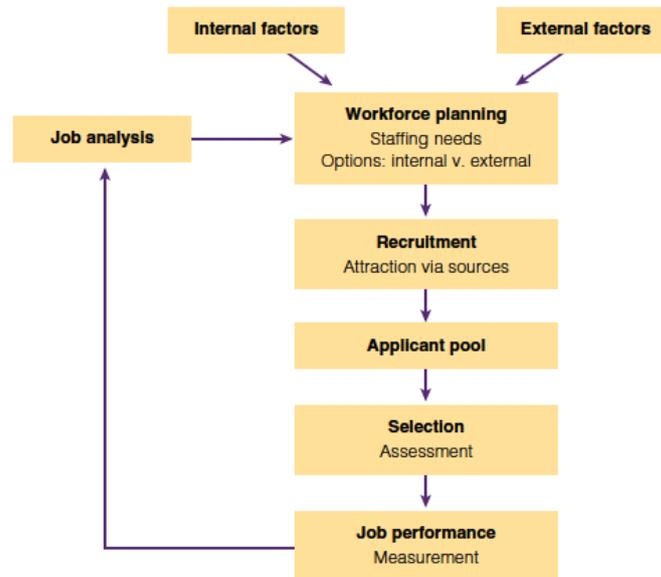


Figure 2. The stages of recruitment and selection (Bratton and Gold, 2012).

Job Analysis and Internal/External Factors

The process can be said to begin with the job analysis, which together with internal and external factors, impact the workforce planning (Bratton and Gold, 2012). Internal factors can for instance be a high rate of absence, product development, and development of new services. External factors, on the other hand, can be aspects such as increased demand for products and services, new laws or regulations, and new kinds of technology (Lindmark and Örnevik, 2011). After an organization has analyzed its current position based on aspects such as these, together with its current employment situation, it is time to map out the needs that the organization has for meeting challenges and possibilities lying ahead (Lindmark and Örnevik, 2011; Bratton and Gold, 2012).

Workforce Planning

By applying various research techniques, the organization determines what kind of knowledge, skills, abilities, and other characteristics and competences are required to meet said needs (Crawshaw et al., 2014; Bratton and Gold, 2012). After analyzing this, the decision if to start new recruitment(s) is taken, and if so, whether it should be done internally or externally (Crawshaw et al., 2014; Andersson et al., 2016).

Recruitment

If the organization decides recruitment is needed, the first step is to decide on selection criteria which can come from defining what a job role involves, and what would make an effective worker in this role (Crawshaw et al., 2014; Bratton and Gold, 2012). The organization must be clear on which competence(s) are of the highest value for the job and which ones come second (Andersson et al., 2016). Following the definition of selection criteria, choices on which selection assessment technique(s) to use need to be made

(Crawshaw et al., 2014; Andersson et al., 2016). Measures of reliability and validity of different selection assessments should help guide choices about which technique(s) to use (Crawshaw et al., 2014, pp. 144).

Establishing a time frame for the process in this stage and appointing responsibilities connected to the process in the organization is favorable (Bratton and Gold, 2012; Breugh, 2008). A strategic goal is to minimize recruitment costs and parallel to this, shorten the time of recruitment to reduce the loss from empty position(s) (Stoilkovska et al., 2015).

Subsequent to this, the organization needs to work out a strategy for recruitment activities to carry out in order to advertise and communicate the job vacancy, and attract job applicants by describing tasks, personal requirements, benefits, and other information (Breugh, 2008; Crawshaw et al., 2014). Decisions on suitable methods need to be taken, and if parts of the process will be outsourced. In the case of outsourcing, quality assurance of external actors needs to be done (Bratton and Gold, 2012; Breugh, 2008).

Applicant pool

Data about the people applying for the vacancy are collected through the selected tools and create a so-called applicant pool consisting of potential candidates (Lindmark and Örnevik, 2011).

Selection

When having the application pool, the selection part of the process begins, usually starting with a screening of the applications based on the selected criteria and with the help of assessment techniques chosen in earlier steps of the recruitment process (Bratton and Gold, 2012; Thebe and Van der Waldth, 2014). This narrows down the application pool before potentially suitable candidates are assessed more carefully to determine who should be selected (Crawshaw et al., 2014).

Job Performance

The selection of a candidate to hire does not necessarily mean the end of the recruitment process. As seen in figure 2, the final step is “Job Performance”, which entails performance tracking and career development. Without a future follow-up of the candidate, it is impossible to evaluate the success of the recruitment (Kerrin and Kettley, 2003, Alan et al., 2016). This part of the recruitment process lies outside the scope of this thesis.

2.1.3 The Recruitment Process: Challenges

Candidate Shortage

One major challenge for organizations connected to the recruitment process is attracting and retaining skilled employees, commonly specified as talent management. Increased competition in finding and recruiting skilled workers intensifies this challenge even more (Alan et al., 2016). As mentioned in the introduction section of this thesis, a study conducted by the Confederation of Swedish Enterprise shows that the main problem connected to

recruitment in Sweden 2021/2022 is the increased difficulty organizations have to recruit people with the right competences. As many as seven out of ten organizations experience difficulties recruiting the right people, and three out of ten recruitment attempts fail entirely due to a lack of candidates (Svenskt Näringsliv, 2022).

Another challenging aspect connected to the competition for skilled employees is the time-consuming parts of the recruitment process. Due to the candidate shortage, and the courtship candidates with commonly requested competences get, many of them are involved in several application processes parallel. Subsequently, this puts pressure on organizations to have fast recruitment processes. If they are slow, the risk of the candidate choosing to move forward with another organization is immense (Crawshaw et al., 2014).

Potential candidates' views on organizations, i.e. employer branding, is also playing a vital part when the so-called "war for talent" intensifies following the candidate shortage. If the selection, screening, and feedback process connected to recruitment have been a negative experience for candidates, the chances of them applying to the organization again are limited. Therefore, it is relevant to ensure that all parts of the recruitment process are efficient and effortless to increase the chances of candidates applying again. Connected to this, the technologies used in the recruitment process should be user-friendly, and at the same time, preferably also cut costs connected to recruitment for the organization (Van Esch et al., 2019).

Objectivity

Another commonly mentioned challenge in recruitment is to ensure objectivity when selecting between potential candidate(s) and reduce the impact of biases associated with subjective assessment of candidates (Crawshaw et al., 2014). According to Crawshaw et al. (2014), there are three main effects following biases in perception that all people are subjective to as human beings. These are: The Halo effect, The Similarity effect, and the Beautyism effect. The Halo effect implies the tendency assessors have to generalize a good or a poor rating of one of a candidate's attributes to all attributes of said candidate. The Similarity effect points to the fact that assessors tend to rate candidates whom they perceive as similar to themselves higher than the ones they do not. The Beautyism effect implies the tendency assessors have rating candidates they perceive to be beautiful more highly than those they do not (Crawshaw et al., 2014). The three effects together account for close to 62 percent of the variations in assessors' subjective ratings of candidates (Crawshaw et al., 2014).

Technological Development

One challenge, which in many ways also can be an opportunity connected to the recruitment process, is technological developments. Technology is a primary factor in shaping the way people work, and adopting the appropriate technology to promote effective and efficient processes is crucial for organizations' survival (Crawshaw et al., 2014).

Okolie and Irabor (2017) have concluded a literature study on the potential challenges of e-recruitment, which can be said to be the latest big technological breakthrough in recruitment pre artificial intelligence. From this can be seen that some crucial potential challenges of technological developments are privacy and data security connected to the information gathered about applicants following its implementation. Therefore, before adopting any kind of online recruitment method, impacts, strengths, and weaknesses of said methods should have been carefully studied (Okolie and Irabor, 2017; Omolawal, 2015).

Another challenge connected to technological developments is the quality and quantity of candidates applying. In getting broader exposure with the help of technology, many organizations have reported getting a large number of applications from unqualified people (Bhupendra and Swati, 2015; Omolawal, 2015). This creates additional work for recruitment staff members who then must review more resumes and more emails, and need to install expensive software to track numerous applications (Armstrong, 2009). Screening large amounts of resumes, checking skill mapping, and the authenticity of applications are all time-consuming tasks for organizations (Anderson, 2003; Mathis and Jackson, 2006).

Lack of knowledge about technological developments within the HRM community, as well as limited commitment to them by senior managers are also potential challenges (Armstrong, 2009; Omolawal, 2015). From a survey on the use of e-recruitment conducted by Kerrin and Kettley (2003), cultural and behavioral change is reported as the most significant challenge in ensuring that new technology delivers.

In addition to this, how potential candidates think about technology developments could also be a challenge. The more technological solutions used in the recruitment process, the more computer savvy is needed from applicants (Bhupendra and Swati, 2015). Also, the limited personal interactions during the recruitment process that follows the implementation of e-recruitment are leading to frustration on the applicants' part due to missed opportunities to share information about themselves, and gather additional information about their potential employer (Robertson and Smith, 2001).

2.2 Artificial Intelligence (AI)

The term Artificial Intelligence (AI) can be seen as an umbrella term that defines and indicates the implicit intelligence of machines (Kaplan and Haeinlein, 2019a). In broad terms, an AI can be defined as an intelligent system with the ability to think and learn (Jarrahi, 2018). The system can be thought of as one that mimics general human abilities such as processing information, learning, problem-solving, and speech, which makes it behave like an intelligent human (Jarrahi, 2018; Russell and Norvig, 2010). Elaborating further, AI can be explained as a system that can interpret and learn from large quantities of data to accomplish stated goals by adapting to situations it exists in (Kaplan and Haenlein, 2019a). Artificial intelligence is relevant anywhere an intellectual task is supposed to be performed, making it a truly universal field (Russel and Norvig, 2010).

Even though artificial intelligence, and research about it, have been around since WWII, and the term first was stated by John McCarthy already in 1955 (McCarthy, 2007; Russel and Norvig, 2010), the concept is still blurry to most people, and many still wonder what AI *actually* is and what it does (Kaplan and Haenlein, 2019a).

According to Kaplan and Haenlein (2019b), there are three main reasons why it is challenging to define AI. The first reason is the difficulty in defining human intelligence to start with, which in turn complicates the connection of intelligence to a machine (Kaplan and Haenlein, 2019b). The concept of intelligence is discussed, and the difficulty of finding a universal definition implicates effects on the understanding of artificial intelligence (McCarthy, 2007). The second reason why the concept of artificial intelligence is still blurry to people, according to Kaplan and Haenlein (2019b), is what is referred to as the “AI effect”. The AI effect implicates the concept that once people have gotten used to a machine completing a certain complex task, the ability to do this task is not seen as a sign of intelligence anymore. This causes the definition of AI to become a moving target, and by this always seeming to be out of reach (Kaplan and Haenlein, 2019b). The third reason is the many different evolutionary stages AI has, going from narrow to general to superintelligence. On top of this, based on its cognitive, emotional, and social competences, AI can be classified into analytical, human-inspired, and humanized (see Table 1). The different kinds of stages and types are easily mixed up, which confuses the term itself (Kaplan and Haenlein, 2019a).

Types of AI Systems

As mentioned in the paragraph above, AI can be classified into three groups based on its cognitive, emotional, and social competences; analytical, human-inspired, and humanized (Kaplan and Haenlein, 2019a). As can be seen in Table 1, analytical AI only has cognitive intelligence meaning that it generates a cognitive representation of the world and makes future decisions based on past experience. Analytical AI can for instance be used in image recognition. Human-inspired AI on the other hand, has both cognitive and emotional intelligence, giving it the ability to recognize and analyze human emotions. As an example, this kind of AI system can be used to identify peoples’ emotions over video calls. Lastly, Humanized AI has all three competences; cognitive, emotional, and social. An AI system of this kind could for instance be a virtual agent with real-time customer engagement (Kaplan and Haenlein, 2019a).

This classification is mainly for understanding how different kinds of intelligence can be seen in AI systems, but can also be linked to conscious and unconscious human behavior which in turn lays the foundation for the data being used in the learning processes of the AI systems. Cognitive intelligence can be argued to be a more straightforward kind of intelligence that humans are conscious of. Emotional and social intelligence on the other hand is something that is more unconsciously built up through the different contexts humans are parts of (Kaplan and Haenlein, 2019a). However, from a technological viewpoint, the defining aspect of all three types of AI systems is their ability to learn from past data which in broad terms can be done through three types of learning processes; supervised learning, unsupervised

learning, and reinforcement learning (Kaplan and Haenlein, 2019a). More about these learning processes in the following section.

Table 1. Types of AI Systems (Kaplan and Haenlein, 2019a).

| | Analytical AI | Human-Inspired AI | Humanized AI | Human Beings |
|-------------------------------|--|-------------------|--------------|--------------|
| Cognitive Intelligence | ✓ | ✓ | ✓ | ✓ |
| Emotional Intelligence | X | ✓ | ✓ | ✓ |
| Social Intelligence | X | X | ✓ | ✓ |
| Artistic Creativity | X | X | X | ✓ |
| | Supervised Learning, Unsupervised Learning, Reinforcement Learning | | | |

How does AI work?

Artificial intelligence can be explained as a sort of classification technology. Fundamentally, it can be said that the primary function of the technology is to differentiate and classify data. Simplified, AI agents are trained on (large) datasets with the aim to learn how new data input should be classified (Russel and Norvig, 2010). The fundamental necessities to have a simple, working AI are, therefore: large quantities of data relevant for the task it is meant to solve, software with programmed algorithms advanced enough to draw conclusions from said data, and lastly, it must be run on hardware with the ability to process and store the data efficiently (Grosan and Abraham, 2011; Savola and Troque, 2019).

Machine Learning

Machine Learning (ML) is a subcategory to artificial intelligence with the approach that the algorithm is learning to improve itself through past experience and data (Russell and Norvig, 2010; Kumar, 2018). One example of a machine learning application is Natural Language Processing (NLP), which entails the process where AI systems understand and analyze language used by humans (Jarrahi, 2018).

Machine learning is divided into three main types depending on which kind of feedback being carried out; supervised learning, unsupervised learning, and reinforcement learning (Russell and Norvig, 2010; Kumar, 2018). Supervised learning entails that input-output pairs are provided to the agent, and it learns to map an input to the correct output. To exemplify, an input can be an image of a cat, and the corresponding output would then be “that’s a cat”. In unsupervised learning, the agent learns patterns in the data without being provided with explicit feedback on what is “right”. The most common unsupervised task is clustering, where the AI agent clusters similar data points gradually developing concepts. For instance, a taxi agent could develop a concept of “good traffic days” and “bad traffic days”, without ever being given labeled examples of each. Reinforcement learning encompasses learning where

the agent learns by rewards and punishments, often by applying points to actions based on how favorable the action is. For example, ten points for a win at the end of a chess game tells the agent it did something right (Russell and Norvig, 2010). Often, a combination of the different kinds of feedback is used.

Deep Learning

Deep Learning (DL) simply explained, is a branch of AI that as closely as possible tries to mimic how the human brain works, in the sense that it learns from experience. If machine learning is a subset of artificial intelligence, deep learning can be explained as a subset of machine learning (Russell and Norvig, 2010), see Figure 3. Deep learning focuses on the use of neural networks and algorithms used to train neural networks to learn from large volumes of data. Neural networks can be explained as a group of mathematical models aiming to mimic how the human brain works. The deep part of the term comes from the fact that neural networks are built up by several hidden layers, and to be classified as deep learning, at least two layers are required, giving so-called multilayered neural networks (Campeato, 2020).

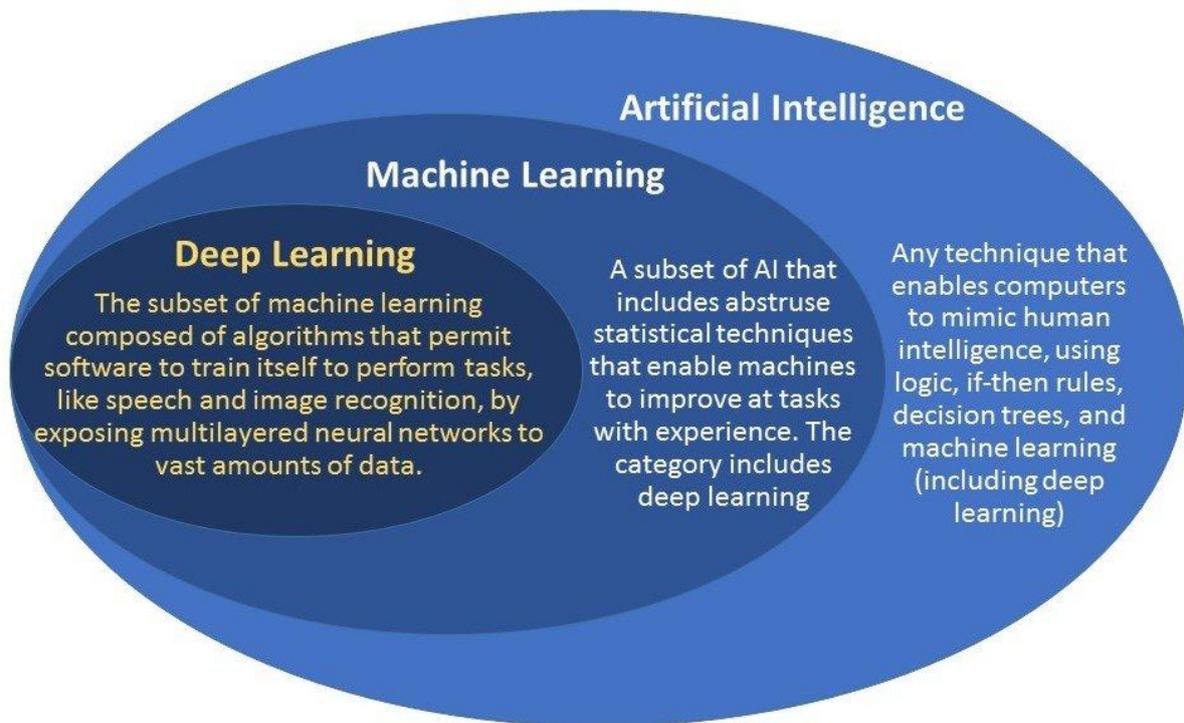


Figure 3. Artificial Intelligence, Machine Learning, and Deep Learning (Dhande, 2017).

As can be seen in Table 1, every type of learning (Supervised, Unsupervised, and Reinforcement) can be connected to each different type of AI System (Analytical, Human-Inspired, and Humanized). In other words, AI solutions (including its sub-categories ML, and DL) can have different types of cognitive, emotional and social intelligence following how they are developed.

2.3 Artificial Intelligence in Recruitment

2.3.1 The Trend of AI in Recruitment Today

Artificial intelligence is believed to be a powerful tool with the ability to bring new opportunities for both organizations, businesses, and services and, correspondingly, contribute to the evolution of new skills and working methods. It is believed to be a key catalyst for innovation and development (Regeringskansliet, 2019).

According to Reilly (2018), recruitment is one of the organizational functions that is most likely to embrace and undergo considerable innovation and transformation in the near future, and as of 2018, a trend among recruiters in adopting AI software and solutions was observed (Upadhyay and Khandelwal, 2018). Since then, AI has become one of the most spoken of trends in the recruitment industry (Upadhyay and Khandelwal, 2018).

One essential reason why AI is making its way into the recruitment industry is the fact that the competition for skilled employees is getting more intensified. For an organization to shorten its time-to-hire does not just represent an efficiency gain, but also a strategic advantage in the battle for human capital (Van Esch et al., 2019; Faerber et al., 2003). These advantages are followed by the fact that AI can process information and make decisions at volumes and speed far exceeding human capacity (Van Esch et al., 2019). Implementing AI into a recruitment process will also facilitate potential candidates' access, which further will increase competitiveness for the organizations doing so (Hmoud and Laszlo, 2019).

Despite AI solutions' promising features and potential gains, and the increasing demand for them, AI tools are not yet used to a great extent in the recruitment field (Upadhyay and Khandelwal, 2018). A lot of organizations are showing interest, but due to the fact that most organizations are new to AI solutions, a lack of knowledge slows down AI's entry into the market (Van Esch et al., 2019).

Even though organizations using AI are not the benchmark in the recruitment field yet, the use of AI tools is becoming progressively more frequent. The more organizations using AI, the more pressure will fall upon other organizations and HRM managers to adapt and incorporate AI into their recruitment strategies to not become outdated (Hmoud and Laszlo, 2019). According to a study made by Okolie and Irabor (2017), HRM professionals in organizations using AI solutions in their recruitment state benefits including reduced costs, increased number of applicants, better candidate matching, easier application processes for candidates with a wider variety of job opportunities, and also a greater response rate on receiving feedback from applicants. In the longer run, the use of AI has the ability to not only change organizations internally but make an impact on the whole recruitment industry by affecting revenue, profitability, and talent acquisition (Savola and Troque, 2019).

2.3.2 Different Types of AI and Automation Tools

Today, AI tools for almost every step of the recruitment process can be found on the market, starting to transform the recruitment field more innovatively (Sekhri and Cheema, 2019). Pre-screening applicants' CVs to detect and evaluate keywords to match candidates to appropriate job openings through Applicant Tracking Systems (ATS) is one of the more common ones (Upadhyay and Khandelwal, 2018). AI-powered chatbots are also getting popular in recruitment processes. By using natural language processing (NLP), chatbots can process information and interact with candidates and enable real-time engagement through text messages, email, and social media, to mention a few communication ways (Upadhyay and Khandelwal, 2018; Nawaz and Gomes, 2019). Another AI-powered tool making its way to the recruitment industry is video chat analysis. These can be programmed to analyze candidates' features such as age, tone of voice, cadence, word choices, mood, behavior, eye contact, emotions, etc (Fernández and Fernández, 2019). Following the large volumes of data existing connected to people on social media nowadays, another AI feature in the recruitment field is to scan social media spaces. Both to find the right candidates, and to assess candidates' social values, beliefs, and attitudes to get an understanding of their personal and professional traits (Upadhyay and Khandelwal, 2018).

In a study made by Savola and Troque (2019), a table of the evolution of recruitment stages is presented to indicate how the recruitment industry works today, and how it can come to work moving forward, see Table 2.

Table 2. Recruitment evolution (Savola and Troque, 2019).

| Recruitment Stages | Current Tools | Next-Generation Tools |
|---|---|---|
| Sourcing & Screening | Broad-based tools: <ul style="list-style-type: none"> - Applicant tracking systems (ATS) - Job boards | Social networks and data driven platforms: <ul style="list-style-type: none"> - Facebook - LinkedIn - Chatbots |
| Applicant tracking & Interview scheduling | <ul style="list-style-type: none"> - ATS - Customer Relationship Management (CRM) tools - Traditional interviews - Scheduling tools | <ul style="list-style-type: none"> - AI candidate correspondence tracking - Self-scheduling tools |
| Assessment | <ul style="list-style-type: none"> - Skill-assessment tools are available - Manual evaluation | <ul style="list-style-type: none"> - AI-based psychometrics and behavioral assessment tools - Video interviewing - Solutions and analytics based cultural fit assessment tools |
| Background checks, Offer management & Onboarding | <ul style="list-style-type: none"> - ATS - CRM and onboarding tools that can be integrated to ATS | <ul style="list-style-type: none"> - Automated background checks - Automated offers - Chatbots that answer basic HR questions |

2.3.3 The Viability of Using AI in Recruitment

In a systematic literature review done by Javed and Brishti (2020) on “The viability of AI-based recruitment process”, four themes in literature about AI in recruitment are identified, namely: Actor Role, AI Role, AI Adoption, and Potential Risks. This section will follow the same structure and is therefore split into four subsection, one for each theme.

2.3.3.1 Actor Role

The actor role emphasizes on the actors, both recruiters and applicants, and on the advantages and opportunities they will be able to achieve from the implementation of AI in recruitment (Javed and Brishti, 2020).

According to Savola and Troque (2019), and Hmoud and Laszlo (2019) administrative and repetitive tasks will be replaced by AI technologies and following this, the recruiters' job tasks will shift more toward strategic functions and leadership roles. Upadhyay and

Khandelwal (2018) mean that even if AI will take over a lot of activities in the recruitment process, humans are still needed when it comes to building relationships with candidates and to put focus on talent identification and development. Following AI's way into recruitment, Kaplan and Haenlein (2019b) write that it will be important for HRM managers to incrementally adopt leadership styles suitable for organizations in transformation.

Bhalgat (2019), Upadhyay and Khandelwal (2018), and Savola and Troque (2019) all state that, even with AI opening up new ways of working with recruitment, humans will still be needed in the recruitment process. Upadhyay and Khandelwal (2018) mean that human recruiters are needed to interpret and quiz candidates when it comes to understanding their emphatical and emotional qualities. Savola and Troque (2019) argue that AI will be used to bring forward the best potential candidates, but humans will be needed to make the final hiring decision.

Srirang et al. (2020) and Nawas and Gomez (2020) argue that the candidates' view on the use of AI tools in recruitment plays a vital role for how successful the use of AI will be. Srirang et al. (2020) bring forward that it is important to consider any concerns candidates might have regarding exclusion, discrimination and privacy, and find ways to assure them about the neutrality of the recruitment process and all tools being parts of it. Nawas and Gomez (2020) mean that one way to do this is to show openness and transparency connected to the algorithms used in the AI solutions, and by doing so, the organizations will show that they play fair.

More and more candidates are open to engaging with AI-based systems according to Van Esch et al. (2019). They argue that this comes from the systems being perceived as novel, convenient and empowering by the candidates. Another reason stated by Nawaz and Gomez (2020) could be that for instance, an AI-powered chatbot could help candidates in their progress by enabling real-time responding to questions, general communication, and feedback. Another thing mentioned by Van Esch et al. (2019) that makes AI systems in recruitment positive for candidates, and at the same time employers, is that by giving candidates a smoother recruitment process with ongoing interaction throughout it, the likelihood of rejected candidates applying to other opportunities in the same organization is way higher than if candidates did not had this kind of experience.

However, Javed and Brishti (2020) stress that these prominent advantages for actors in the recruitment process following the use of AI cannot be achieved until the actors understand what AI is and how its work could benefit them.

2.3.3.2 AI Role

The AI role emphasizes on the impact of AI in recruitment as a powerful technological tool. Mainly focusing on the dominant advantages of it (Javed and Brishti, 2020).

Bhalgat (2019) and Van Esch et al. (2019) mean that the most noted advantage of using AI in recruitment is its ability to minimize human biases, and being more objective than humans. Michailidis (2018) states that the selection of candidates will be more diversified using AI than being done by humans, due to AI's possibility to reduce biases and maximize objectivity. According to Van Esch et al. (2019), this advantage comes from that AI can process information, and make decisions based on said information, at volumes and speed far exceeding human capacity.

By adding AI, and thus minimizing human biases, Bhalgat (2019) means another level of transparency is added to the process, which will lead to an improved attitude toward organizations using AI among potential candidates, and that their employer branding will be improved following that.

From a study done at Unilever, which Van Esch et al. (2019) highlight, it was reported that by using AI, both the speed and quality of their recruitment process increased dramatically. AI's ability to speed up the recruitment process significantly, while not compromising on its quality, is what Upadhyay and Khandelwal (2018) mean justifies the way AI will change the recruiter role. Savola and Troque (2019) proclaim that AI will replace humans in the initial stages of the recruitment process, such as candidate sourcing and attraction, selection, screening, and testing, and allow for human recruiters to only focus on the later stages. According to Geetha and Reddy (2018) AI helps to identify potential candidates' skills, competence, and experience, and match these factors to the job they are applying for, resulting in the hiring of talented candidates.

Another advantage of using AI in recruitment is its value-creation possibilities. To support that AI is cost-effective, Van Esch et al. (2019) stress that the volumes of information that AI can process would take humans an unreasonable amount of time to do manually, which would entail hiring a lot of people for doing the same job as one AI solution can. Javed and Brishti (2020) state that an AI-based software tool only needs a fraction of seconds to analyze large data volumes. Bhalgat (2019) writes that time is valuable in every organization, and by cutting time spent on any task, money is saved. Bhalgat (2019) argues that the time reduction also comes from that AI tools mostly will take over, what today are, time-consuming and repetitive tasks, which will contribute to reduced hiring costs. In job openings getting a large number of applicants, Nawaz and Gomes (2020) write that it could even be necessary to use AI to handle the large amounts of information coming with it. Thereupon, Van Esch et al. (2019) emphasize that, reducing time-to-hire entails not just an efficiency gain, but will also lead to a "strategic advantage in the battle for human capital".

When arguing for AI's possibility to create value, Nawas and Gomes (2020) state that by using AI, organizations can get more up-to-date information about their potential candidates to put in their database (ATS), and by doing so keeping it up to date and adding value to it. AI can also create value for organizations by engaging candidates in their recruitment processes, for instance sending them reminders to complete their information, and answering any questions they might have. It could also enable organizations to see which kind of questions

are most frequently asked by candidates, giving them an understanding of what their candidates are looking for (Nawaz and Gomes, 2020).

Another advantage with AI in recruitment is improved candidate matching. According to Srirang et al. (2019) AI is better at making predictions about which candidate would be most suitable for a job, or vice versa, which job would be most suitable for a specific candidate. Okolie and Ibrabor (2017) claim that employers using AI solutions in their recruitment process have benefits including better candidate matching, but also lower costs, finding of more potential candidates, and greater response rate regarding feedback from candidates. Savola and Troque (2019) mean that when it comes to job performance, productivity and employee turnover, AI makes better predictions about potential candidates than humans do. Wright and Atkinson (2019), and Han (2020) write that AI solutions using ML and NLP, have the possibility to identify if a person would be a good fit for organizations also culture wise. On top of this, Wright and Atkinson (2019) say that AI can identify gaps in business areas in organizations and based on this give examples of what kind of person potentially could fill in those gaps. Van Esch et al. (2019) emphasize that AI can target both more appropriate candidates, and at the same time, help organizations increase the total number of applicants. Another thing AI systems help improve is the handling of candidates who were rejected (Van Esch et al., 2019). In those situations, AI can give feedback about their qualifications, skills and competences to give them an understanding of what they could develop further in the future.

Savola and Troque (2019) argue that AI will not only change organizations internally, but has the potential of changing the whole recruitment industry, and its competition rules. They mean that the recruiters understanding the role of AI and its transformational power, will be the ones to master its prominent advantages, and by that gain competitive dominance. Wright and Atkinson (2019) state that the first movers of implementing AI in the recruitment field will have a significant competitive advantage. The more organizations implementing AI in their recruitment processes, the higher pressure on the ones that have not yet taken that step to do so (Hmoud and Laszlo, 2019).

2.3.3.3 AI Adoption

AI adoption emphasizes on the challenges of adopting new technological knowledge of AI-enabled tools by the actors. Mainly focusing on the willingness the actors have in adopting it, and how eager they are to collaborate in order to achieve benefits and opportunities that can come with it (Javed and Brishti, 2020).

Javed and Brishti (2020) argue that how successful an integration of AI technology will be depends largely on collaboration between actors, defining actors as employers, candidates, the organization itself, or outside organizations. In other words, those who directly or indirectly are a part of the process. They state that for a successful implementation, both internal and external expertise is necessary.

One main factor connected to actors' adoption of AI, is the need for acquiring knowledge (Van Esch et al., 2019). There is an increasing interest among organizations to use AI in recruitment, but most organizations are still in their initial phases of implementing it (Van Esch et al., 2019). Following this, many people working in recruitment are new to the AI field, having minimal, if any, knowledge about it (Javed and Brishti, 2020; Van Esch et al., 2019). A challenge associated with this is, that to ensure that no unconscious bias is built into AI solutions, a deeper knowledge about its workings is essential (Upadhyay and Khandelwal, 2018). Kerrin and Kettley (2003) state that for these kinds of technologies to deliver, the people working with them must have the capability to understand and facilitate the systems. Kerrin and Kettley (2003) point out that the main limiting factors for implementing new kinds of technology in recruitment systems are: the cultural approach of the organization, the lack of technological knowledge within the HRM community, internet usage by target candidates, and the commitment of senior management.

Srirang et al. (2020) state that by improving the knowledge about AI and its algorithms among HRM professionals, their trust in these tools would increase. Without knowledge about the underlying technology, recruiters might doubt results coming from AI solutions, which in turn can lead to rejection of using AI at all. Javed and Brishti (2020) argue that studies show that there exist trust issues among recruiters toward AI solutions, and that following these trust issues, an unwillingness to adopt new technologies is observed. If the recruiters using the tools do not understand the technology, and by this lack the ability to explain its workings to candidates, the candidates trust in their recruitment process might also be lost (Srirang et al., 2020). According to Srirang et al. (2020), it is as important that the AI tools developed are being transparent to inspection as that they are delivering results.

Another aspect strongly affecting the AI adoption among recruiters is that many of them see it as a threat toward their profession (Javed and Brishti, 2020; Van Esch et al., 2019). "The possibility that HRM employees will see AI-enabled recruiting tools as a threat to their jobs is another challenge and, as a consequence, will stymie or even sabotage the implementation of such tools" (Van Esch et al., 2019, pp. 9). Furthermore, since implementing AI will change the way of working with recruitment, recruiters would have to learn new skills, and acquire new kinds of knowledge (Michailidies, 2018), which according to Javed and Brishti (2020) could be another factor motivating them to be resistant toward adopting such technology. Michailidies (2018) also mentions that there might be difficulties when implementing new systems, both regarding the understanding of the new system, but also merging it to the existing ones.

Javed and Brishti (2020) mean that AI making its way into recruitment can spark a debate about humans versus machines and decision making. Savola and Troque (2019) argue that this debate is outdated. Several sources (Boudreau, 2014; Jarrahi, 2018; Kaplan and Haenlein, 2019b) suggest that the answer to this debate is that none of the actors, human nor machine, is better at decision-making, but that the best decisions come from collaborations between them.

From a survey Wright and Atkinson (2019) write about, conducted by the HRPA in 2016, 84% of HRM firms thought AI was a useful tool within recruitment. However, the same report also concluded that HRM firms are either ‘not very prepared’ (33%), or ‘not prepared at all’ (35%) for AI within their operations. Han (2020) argues that HRM professionals and recruiters must accept and learn to use AI tools to maintain their places in the recruitment field, otherwise, somebody else will, and consequently replace them.

2.3.3.4 Potential Risks

This theme, as can be deduced from its name, emphasizes on potential risks and challenges of using AI in the recruitment process. Mainly focusing on data privacy, ethical issues and built-in bias (Javed and Brishti, 2020).

As mentioned in section 2.3.3.2 AI Role, an immense advantage of using AI is minimizing human biases. But one critical thing to keep in mind, is that AI systems are also built by humans, and that they learn from inputs provided by humans, entailing that these are not assured to be error-free either (Javed and Brishti, 2020). According to Srirang et al. (2019) the people developing the algorithms might build in conscious or unconscious biases into them, leading to the system also giving biased results. Van Esch et al. (2019, pp. 215) state that “If there has been gender, age, race, education or other biases in the past and if those emerge in the current high performers in the company who serve as benchmarks, the algorithms will simply learn those patterns and perpetuate the biases”. In other words, biased data in, entails biased data out, having nothing to do with the actual performance of the system which only generates results based on the information it has been given. Wright and Atkinson (2019) however stress that, even if AI may have built-in bias, this can be fixed with proper knowledge while a human's own conscious or unconscious biases are very hard to adjust.

Srirang et al. (2019) agree that an algorithm fed with the wrong kind of data will not learn what is expected, which emphasizes the importance of high quality data being used when developing AI solutions. Finding quality datasets could be a challenge, leading to increased risk of organizations considering to use the many open and cheap datasets available (Wright and Atkinson, 2019). The use of low quality datasets will not help organizations add value to their processes, and it increases the risk of getting unwanted results in their recruitments (Wright and Atkinson, 2019). One way organizations can improve data quality used in AI systems is by standardizing both the outlook and interpretation of it (Savola and Troque, 2019). Javed and Brishti (2020) write that, as a consequence of the increased amount of legal privacy laws, GDPR for instance, people, in general, are being more concerned about how data about them is handled, which in turn could limit the access to data which is needed to train AI.

Van Esch et al. (2019) state that maintaining data privacy and handling ethical issues is one of the most cited and critical challenges of implementing AI in recruitment. Recruiters have the possibility to collect personal information about potential candidates with the help of AI tools

that are not necessarily directly linked to the recruitment per se, which could be used to sort or even discriminate candidates (Van Esch et al., 2019). Reilly (2018) means that the risks connected to data privacy and information rights discussed in AI have raised, not only concern among candidates in the labor market, but also on an governmental and global level.

One additional risk about implementing AI in recruitment, mainly from an organizational point of view, is the cost of doing it (Savola and Troque, 2019; Van Esch et al., 2019). Initially, to even create an AI tool or system is costly. Following this, expensive activities such as implementation, integration and education about it have to be carried out. These activities are all both time-consuming and costly (Savola and Troque, 2019; Van Esch et al., 2019). On top of this, the uncertainty in investing money in new recruitment tools does not only come from how well the tools work in the organization, but also depends on the candidates and if they are accepting or rejecting job offers (Javed and Brishti, 2020). Savola and Troque (2019) stress that several aspects can cause investment insecurities, and that these need to be taken into careful consideration before implementing AI tools.

3. Methodology

To answer the research objective of this thesis certain methodological steps were followed. First, the literature review explores the human resource management field with a focus on the recruitment process and its stages, artificial intelligence in general, and artificial intelligence connected to recruitment. Thereupon, qualitative data were collected through a semi-structured interview study which the literature review laid the foundation for. Following this, the interviews were analyzed, and lastly, the results from the interviews were discussed in relation to the literature review. A more thorough explanation of the methodological steps is presented below.

3.1 Interview Study

An interview study was used to collect qualitative data for the research objective of this thesis. Qualitative research is favorable when the subject to be studied is about understanding a phenomenon from the point of view of people who are experiencing it (David and Sutton, 2016). Following the objective of this research, and that it focuses on understanding where and how AI can be used in recruitment processes, using qualitative research is suitable. Some benefits with qualitative research are getting in-depth information about people's experiences, understanding the context of the phenomenon studied, and getting a deeper understanding of the subject researched (David and Sutton, 2016).

Interviews are the most commonly used methodology in qualitative research. Essentially, there can be said to be three types of interview methods derived from the level of structure and script being used when conducting them (David and Sutton, 2016). In this study, a semi-structured interview method was chosen. The benefit of using a semi-structured method is that the questions can be adapted to the competence and interest of the respondent while still maintaining the same themes (David and Sutton, 2016). Based on the insights from the literature review a number of questions were prepared before the interviews, see Appendix A. However, one important part of semi-structured interviews is follow-up questions, where the interviewer finds something of interest to look deeper into in the respondent's answers and asks further questions connected to that (David and Sutton, 2016). This was done in the interviews conducted for this study which demanded a certain level of flexibility from the interviewer, but was preferable since it can lead to the gathering of information that otherwise could have been left unmentioned.

In total, 10 interviews were conducted. They all took between 40-60 minutes depending on how long and detailed the respondents' answers were. The interviews were held using the video conference tool Zoom, and were, after approval from the respondents, recorded. All of the interviews were transcribed in close attendance to when they were carried out. Due to the fact that the native language of all of the participants was Swedish, the interviews were carried out using this language and were afterward translated into English to enable the use of them in this study.

3.2.1 Selection of Respondents

The selection of respondents was done based on the research objective and chosen delimitations of this study. Since the research focuses on recruitment processes, and the study is delimited to recruitments being carried out in Sweden, the desired profile of the respondents was stated to be people working with recruitment processes in Sweden. Initially, potential respondents were identified, and contacted with the help of Layke Analytics (the company this thesis is done in collaboration with), and from this, seven respondents were found. Due to seven interviews being slightly below the desired number of respondents, three additional respondents were identified through the personal network of the author of this thesis. To get the results from the interviews to be as comprehensive as possible, the respondents chosen have different kinds of roles connected to recruitment, and the organizations they work for are of different types and sizes. For a more thorough presentation of the respondents, see Table 3 in section 4.1 Respondent Profiles.

3.3 Analysis

Following the insights from the literature review, themes connected to recruitment processes and artificial intelligence were mapped out. In turn, these laid the foundation for the interview study. As mentioned, the interviews were recorded and transcribed close to being carried out, and following this, translated into English to enable the use of them in this study. The analysis of the interviews was an iterative process, where the answers were aggregated where they correlated, and patterns in which they agreed and differed were identified. Subsequently, several themes were identified from the interviews that partly, but not completely, corresponded to the ones found in the literature review. What differed was that the themes identified from the interviews were mainly focused on challenges in the recruitment process, whereas the literature review focused more on the potential use of AI in recruitment.

Finally, the themes and patterns identified from the interviews were compared to the insights from the literature review, which enabled an understanding and perception of similarities and differences between them.

4. Results

In the following section the empirical results from the interview study are presented. Initially, a table over the respondents' profiles, including their roles, organizations, and the date of the interviews, is given, see Table 3. Then, the results from the interviews follow, presented in three parts based on the themes identified through the analysis of the interview answers. The themes are Challenges in Recruitment, Attitudes toward AI and Automation, and Alteration of the HRM Profession.

The respondents' answers are anonymized by assigning each respondent an ID (R1, R2, R3, R4, R5, R6, R7, R8, R9, and R10). The information from the interviews is presented as close to the original statements as possible. However, all of the interviews were held in Swedish due to the fact that it is the native language of all of the participants. Following this, the interviews have been translated into English to enable the use of them in this study. Quotes of particular value are presented in their original form (i.e. in Swedish) in footnotes throughout the section.

4.1 Respondent Profiles

Table 3. List of each respondent's ID, their role description, which kind of organization they work in, and the date of the interview.

| Respondent ID | Role Description | Kind of Organization | Date of interview |
|----------------------|------------------------------|---|--------------------------|
| R1 | HR Generalist/Tech Recruiter | Software development (SME) | 22.03.15 |
| R2 | Talent Acquisition | Recruitment and consultancy: White-collar/blue-collar /executive search | 22.03.14 |
| R3 | Developing HR processes | Swedish Government Organization | 22.03.17 |
| R4 | Talent Acquisition | Recruitment and consultancy: White-collar | 22.03.21 |
| R5 | People & Culture Manager | Consultancy: IT, design, communication, and management | 22.03.22 |
| R6 | HR Manager | Swedish Municipality | 22.03.23 |
| R7 | Talent Acquisition | Energy Solutions | 22.03.25 |
| R8 | Recruitment Manager | Bank and Finance | 22.04.05 |
| R9 | Talent Acquisition | Recruitment: Executive search | 22.04.05 |
| R10 | Researcher | Recruitment and consultancy: Supply Chain Management | 22.03.30 |

4.2 Challenges in Recruitment

In this section, the first identified theme, challenges connected to the recruitment process, as discussed with the respondents during the interviews, is presented. The section includes subsections, each focusing on one type of identified challenge.

Candidate Shortage

All respondents (R1, R2, R3, R4, R5, R6, R7, R8, R9, and R10) are identifying candidate shortage as one of their main challenges in recruiting. Respondents R2, R3, R4, R8, and R10 are bringing up the, according to them, established saying, “the candidates’ market” (translated from Swedish: “kandidaternas marknad”), implying the fact that based on how the Swedish labor market looks today, candidates have plenty of job options available, which puts them in a position of power, with the ability to choose between several offers.

Respondent R2 is adding to this, that a result of the competition for candidates is that the potential candidates actually available disappear remarkably fast, putting immense pressure on the people working in recruitment. Respondent R10 stresses that there are not many people without jobs these days. R10 means that when they are doing a recruitment, they are most often just moving people from one organization to another.

Respondents R1, R2, R4, R5, R7, and R10 bring up that for a lot of roles, it can be hard to find candidates with the right competences at all. Respondent R2 means that it is directly connected to the actual workforce availability on the market. The shortage of people within the IT field has been a fact for a long time according to respondents R4, R5, and R6. Respondents R4 and R10 also mean that the shortage has spread to most industries and roles over the last couple of years.

Following this shortage, respondents R3, R4, R5 and R7, argue that a major advantage for attracting the existing candidates is the brand awareness of your organization. Respondent R7 partly blames their lack of candidates on it¹, and believes that by improving their employer branding process, they will have an easier time getting people to apply to their job openings. Respondent R5 points out that it is hard to stand out among all organizations trying to hire, but for those who succeed in doing so, the advantage is extensive. Respondent R3 believes that it is important to involve employer branding throughout the whole recruitment and not just have it as a separate process. R3 argues that it is crucial connected to interactions with the candidates involved in processes that end up not getting the job, meaning that if it is not handled in a good and professional way, the chances of these candidates applying to the organization again is limited, and with today's "war on talent", that can not be risked. R3 stresses that in their organization, this is not followed due to a lack of time².

All of the respondents (R1, R2, R3, R4, R5, R6, R7, R8, R9, and R10) agree that the incoming applications from potential candidates are limited and, for some roles, often even non-existing, putting pressure on recruiters to succeed with search and sourcing of candidates. Respondent R8 says that the majority of their candidates come from their search activities, and respondents R1, R2, R4, R5, R6, and R9, argue that searching for candidates takes up most of their time. Respondent R8 emphasizes that most of the people they employ are not people that actively applied to them but who they found through search. R8 stresses that if they had not put the amount of work into the search as they do, it would have been very hard to find candidates.

A majority of the respondents (R1, R2, R3, R4, R5, R6, R8, and R10) use LinkedIn as their primary search method. Respondent R9 says that they use a mix of LinkedIn, their own candidate database, and Google search. Respondent R7 has also identified search for candidates as one of the major challenges connected to recruitment, but due to a lack of time, their organization has outsourced most parts of that function.

¹ "Vi har svårt att nå rätt kandidater med bara annonsering för vi är inte tillräckligt välkända." (R7)

² "Man är fan lycklig över att man ens har fått ut rätt person." (R3)

Respondents R5 and R9 both believe that recruiters are missing potential candidates in their search, firstly due to that candidates are not that good at branding themselves and their competences, and secondly, that their searching tools are not optimal. Respondent R9 underlines that they believe that if their tools for finding candidates were better developed, the candidate shortage would not be as much of a problem.

Respondents R7, R8, and R9 are bringing up that a sub-challenge connected to the candidate shortage is to define what kind of competences they are looking for in the person they want to attract. R10 means that many times, a role definition defines *necessary* competence requirements that are not actually necessary, which narrows down the pool of potential candidates. R7 and R10 stress that it is important to be realistic when defining what kind of qualifications potential candidates need to have³.

Respondents R1, R5, R8, and R9 are lifting that once they manage to get potential candidates into their recruitment processes, a sub-challenge connected to “the candidates’ market” is how to manage the treatment of these candidates. Respondents R5 and R8 stress that it depends on which kind of role the recruitment is about, for roles on a more senior level, it is very much about building relationships with the candidates, and marketing the organization to get them to choose them (over others). Respondent R5 states that there is a fine line between just the right amount of marketing, and overselling to the candidates, especially the later in the process it is. Respondent R1 mentions that many of the coveted candidates are already employed by other organizations, so to get them to switch, you have to offer them something better, which entails first figuring out what that something better is for just that candidate.

Respondents R4, R5, and R7 add that the timing of the process is essential when attracting candidates. R4 and R5 mean that if the process gets too protracted, the risk of losing candidates is immense. R7 points out that the timing is of specific importance in the final stages of the recruitment, the closer to the final decision, the more crucial. Respondent R1, R5, and R8 mention that the most common negative feedback from candidates is that they dislike it when the recruitment process gets too protracted.

Distribution of Resources

Another challenge connected to recruitment that all of the respondents (R1, R2, R3, R4, R5, R6, R7, R8, R9, and R10) are bringing up is how to manage and distribute the resources connected to the process, and the time needed in each part of it. Respondents R3 and R6 mention that a first challenge is to even find a recruiter to operate the process, pointing out that the employee shortage is true also in the recruitment field.

³ “Alla vill ha den perfekta personen. Realistiskt så finns inte det, det säger sig själv. Ofta måste man kompromissa på något.” (R10)

From all of the interviews, it can be seen that the things the respondents reckon take up the most time, except searching for candidates, are coordination, candidate contact, pre-screening of applicants, administrative tasks, interviews, analysis of results of different candidate testing stages, and background checks. Several of them (R1, R3, R6, and R8) particularly point out interviews, and functions connected to them. Respondents R2, R7, and R8 also mention taking references as one segment being time-consuming. Respondents R2 and R9 mean that there are a lot of repetitive tasks, specifically connected to administration that they have to spend time on, which according to them are not optimal. Respondent R3, who works in an organization where all candidates have to go through an outsourced security clearance, says that waiting for those to go through is their main bottleneck.

The things the respondents point out as being time-consuming, respondents R1, R2, R5, R6, and R8 add are even more complicated for recruitment of roles that, contrary to the general recruitment trend, get a lot of applications, or in roles where the volume of people needed to hire is large. Respondent R5 gives management consultant roles as an example of roles getting large volumes of applications. Respondent R6 instead identifies roles that require lower expertise, for instance roles only requiring a high school degree, to have these kinds of problems.

Respondent R3 stresses that the fact that humans are doing these things contributes to huge limitations. R3 adds that this leads to organizations' HRM departments getting larger when they would wish the resources instead could be spent on the roles they are trying to employ. Respondent R4 means that if some, or all of these stages, could be more effective, they could shorten their recruitment process significantly, leading to people getting jobs faster, and therefore their organizations' turnovers and profits to increase.

Respondents R5 and R7 argue that, even if these things take time and require costly resources, the most expensive thing an organization can do is employ the wrong person. Respondent R7 adds that, therefore, everything that can be done in the recruitment process to minimize the risk of doing so is worth it.

Ways of Working and System Limitations

The third challenge coming up in the interviews is the organizations' ways of working, and connected to that, the different kinds of IT and business systems they use. To start with, respondent R5 thinks that their organization is not working as data-informed as R5 wishes⁴. Respondent R10 works with both internal and external recruitment, and sees a challenge in streamlining those different types, stressing that it is important to ensure that all potential candidates are getting the same treatment.

One sub-challenge mentioned by respondents R1 and R3 to their organizations' ways of working, also partly mentioned under candidate shortage, is handling of, and feedback to

⁴ “/---/ vi vill jobba mer datainformerat, så att vi kan ta mera utav beslut inom mitt område också mer baserat på data.” (R5)

candidates that did not get the job they were in a process for. Respondent R3 stresses this to be the main challenge in the recruitment process of their organization. R3 means that they lack a way to give feedback to candidates not ending up getting the job and that this damages their employer branding significantly. R3 says that finding an effective way of getting these candidates into their CRM (Candidate Resource Management) database, and by this, maybe offering them an opening in another part of the organization would be extremely valuable. R3 adds that this is not done today, that it now is more of a “damage control situation”. Respondent R1 mentions that it is hard to know how to continue candidate contact without offering candidates jobs, stressing that they do not want to lose contact with them in case opportunities open up forward.

Challenges connected to IT and business systems used in their organizations are mentioned by respondent R2, R3, R4, and R5. Respondent R2 mentions that there are a lot of technological functions they would want to use in their processes, which they can not do today due to limitations of the systems they are already using. R2 specifically points out limitations connected to merging different kinds of IT systems together. Respondent R4, on the other hand, thinks that the main problem with their systems are the amount of “clicks” they need to do using them⁵.

Respondent R3 mentions that, for their organization, the main challenges connected to their systems are that they are limited in which ones to use for data and information security reasons. R3 adds that even if all of their systems do not need to have the same level of security, they still do to keep an entirety, leading to a lot of ad-hoc solutions in their processes. Respondent R5 mentions that different parts of their organization have different needs, which is why they have chosen not to enforce certain systems on the whole organization. But at the same time, R5 stresses that there is a challenge in using different system solutions because this makes it harder to keep the entirety in the organization. R5 means that, in one way, they want to keep the organization as one entity, but on the other hand, they want all parts of it to be able to work as effectively as possible based on their needs.

Objectivity

The final challenge brought up, and according to respondents R1, R2, R3, R5, and R6, one of the major ones connected to the recruitment process, is objectivity. Respondents R1, R2, R3, R7, R8, and R10 mention that many of the decisions made in recruitment are built on the recruiters’ gut feeling. Respondents R1, R2, R6, R8, and R10 argue that this is not desirable. Respondents R1, R2, and R6 point out that research shows that humans have conscious and unconscious biases and presumptions when evaluating other people. R2 stresses that this is not what they want to base their decisions on. However, respondent R3 believes that, even if it is not preferable to base decisions on gut feeling from an objective point of view, recruiters doing so are probably doing quite well in their recruitments regardless.

⁵ “Det är så mycket klick och det tar tid, klicka här för att skriva in det, sen måste jag klicka där för att skriva in det.” (R4)

Respondent R7 mentions that before they started a talent acquisition role in their organization, there were a lot of employment decisions based on “a guy that knows a guy that knows a guy” stressing that this is not at all quality assured nor objective. R7 also thinks that one sub-challenge connected to objectivity is how job ads and role requirements are defined. On top of this, R7 adds that they know that men are applying to roles they are not qualified for to a much greater extent than women.

Respondent R6 has done experiments with recruiters in their organization, giving them the same job opening and candidate profiles, asking them to find the best match. The result was different recommendations from every recruiter.

Respondent R6 stresses that another level of objectivity challenge in recruitment, is that not all potential candidates are equally good at declaring their competences and experience, which in turn makes it hard to do fair assessments by just looking at their resumes and cover letters.

4.3 Attitudes Toward AI and Automation

In this section, attitudes toward the use of AI and other forms of automation tools in the recruitment process, as discussed with the respondents during the interviews, are presented. The section includes several subsections, each focusing on different aspects connected to identified attitudes.

General Attitude

Respondents R1, R2, R4, R5, R6, R8, and R9, all argue that they are positive toward the use of AI in recruitment. Respondent R4 believes AI is the future, and that its advantages clearly outweigh its disadvantages. Respondents R1, R2, and R4 think everything that can be used to cut time in their processes are welcome, pointing out that this will enable them to focus more on their core tasks as recruiters. Respondents R4, R5, and R6 believe that using AI will increase the quality of recruiting, and respondent R5 adds that using AI could be a catalyst for their employer branding. Respondent R5 states that implementing AI into the recruitment process feels exciting but at the same time, a bit scary. Furthermore, R5 does not think their organization is ready to implement it yet. Respondent R9 thinks that the attitude, and also readiness, to implement AI in recruitment processes differs significantly between different types of organizations.

Respondent R2 argues that their organization is a forerunner when it comes to new solutions and technologies in recruitment. For them it is important to be one step ahead of their rivals. Respondent R5 is optimistic about AI, stressing that the more dimensions used to evaluate potential candidates, the better, minimizing the risk of making the wrong decisions.

Respondent R9 thinks that their type of business (executive search recruitment), and similar ones, want to believe that they are more forward-thinking than they actually are. R9 argues

these businesses to be quite traditional and conservative in their way of working. Respondent R9 partly blames this on the fact that no one has challenged the recruitment field's way of working, which has led to no incentives to change how things are done. R6 adds that changing something you have done for a long time, which works quite well, will not come by itself. Respondents R6 and R9 bring up that the recruitment process has looked more or less the same for the last couple of years. However, according to respondent R9, many people in the recruitment field are happy that AI is making its way into the industry, that “something is finally happening”.

Respondent R1 has a more considerate view on AI connected to recruitment, mentioning that it will be interesting to see where it ends up, and to see if AI really is a good idea for making the recruitment process better, or if the positive impacts companies developing AI solutions bring forward, are just empty words to sell their products.

Different Needs for Different Roles

That different types of roles require different types of solutions connected to the recruitment process is an aspect respondents R1, R2, R5, R7, R8, and R9 bring up. Respondent R9 thinks that AI and other automation tools are better for low-entry jobs, roles that do not require any specific expertise. In addition to this, R9 says that it would be hard for their kind of business (executive search) to implement AI. At least early in the process, because for them, the early stages are very much about attracting the candidates which R9 thinks needs to be done by humans. Respondent R5 brings up the same situation in their organization. However, respondent R5 thinks it could be favorable for an organization to have its recruitment process, tech-wise, match the role it aims to recruit for. If it, for instance, is a more tech heavy role, it would be good to use more technological tools in the recruitment process.

Respondents R1, R2, R7, and R8 argue that the AI are of more use in recruitment processes where there are a lot of applicants. R8 believes that all processes handling large volumes of information would benefit from it. For instance, R8 mentions their marketing roles to be getting many applications, and means that the recruitment process connected to this definitely would benefit from AI solutions. Respondent R1 gives an example from their earlier employer where they had a lot of incoming applications for their job openings (mainly positions as cleaners and janitors), which they used an AI to hold interviews for. According to R1 it was necessary for them to have that kind of solution, otherwise, the recruitment process would have been unsustainably protracted.

Neither R1 or R7 feel the need for AI solutions to process large numbers of applicants in their organizations today, simply because they state that they do not have that many incoming applications. However, R7 points out that this view might come from a lack of knowledge on their side of how AI technologies can be used.

Improved Efficiency and Value Creation

One thing respondents R4, R9, and R10 see as a positive ability with AI, is its potential to make their recruitment processes more efficient and effective. R9 and R10 mention great

development potential linked to the many repetitive tasks, documentation, and “copy-paste-moments” in their processes. A positive effect of making the recruitment process more effective, according to respondent R4, is that people will get jobs faster. Respondent R9 mentions the possibility for recruiters to focus on their main cores instead of doing repetitive tasks to be one key impact. R9 also adds that AI probably could help them expand their views when finding potential candidates, and by this find more, which also would be great for their organization.

Another aspect brought up by respondents R2, R4, R6, R9, and R10, talking about attitudes toward the use of AI tools is the importance of seeing the actual value of using them⁶. Respondent R2 mentions that, at the end of the day, the decision on how to structure their organization’s different processes, is based on what fastens the organizations’ turnover and increases its profit the most.

Respondents R4, R6, R9, and R10 all see value in AI’s potential to shorten the recruitment process. Respondents R6 and R9 stress that today, they are limited on how many recruitment processes they can have going on parallel, and how many candidates they can bring into them, simply because they are bound to the number of people working with recruitment. Respondents R4 and R9 think that reducing the need for humans in the process by implementing more automation will create increased value for their organizations.

Objectivity

A majority of the respondents, R1, R2, R3, R4, R6, R9, and R10, mention the possibility of more objective recruitments by using AI to be one of the most promising aspects. Respondents R1, R2, R4, R6, R9, and R10 point out that humans are affected by their feelings, presumptions, conscious and unconscious biases, and gut feelings, in a way that AI is not. Respondent R2 believes that AI has the ability to focus more on competences and things recruitment decisions “should be based on”. Respondent R4 thinks that AI has a better ability to see people’s potential and by this help humans be less biased. The experiments mentioned previously, that respondent R10 did with the recruiters in their organization, helped them realize how non-objective their own evaluations actually are, which according to R10, made them see how important the objectivity coming from using AI is.

Even though most of the respondents see the potential for objective evaluations, respondents R1 and R10 mention that they are not completely convinced AI actually is as objective as people want it to sound. Respondent R9 thinks not only humans have bias but that this could also be true for AI. R9 exemplifies it by saying that if an AI learns exactly what the best candidate is, it could lead to an even more homogenous labor market than there is today, not even giving a chance to people not fitting into the exact template of a suitable candidate.

⁶ “/--/ det måste ju skapa ett värde för oss, det måsten finnas en tanke kring det, annars kan vi göra det själva.” (R2)

Trust

One factor playing a vital role when it comes to attitudes toward AI and automated solutions based on the interviews is trust. Respondents R2, R4, R5, R6, R7, R8, R9, and R10 use different forms of personality and logical reasoning tests as automated elements in their recruitments. They all mention that they trust those tests because the results are “correct”. Respondent R8 says that it is easy to trust them because they can see why the results turn out the way they do following that the tool is not especially complicated. Respondent R4 says that as long as tools work, they have no reason not to trust them. Respondent R2 is trying out a new AI solution in their recruitment processes and argues that they trust it because they understand how it works following that they have been a part of the implementation process and seen how it is built.

Respondents R1, R5, R7, R8, and R10 are partly hesitant when discussing trust in AI solutions. R10 emphasizes that they trust that AI is doing what it is supposed to do based on the parameters it is provided with, but that this does not necessarily entail that it is doing the right thing. Respondent R1 mentions that they are somewhat skeptical that AI solutions are doing fair evaluations but also says that this might come from R1’s own knowledge about the technology. R1 adds that regardless of their somewhat skeptical view today, they are hopeful for what the future of AI brings.

Respondents R5, R7, and R8 mention that they would not trust AI to find all potential candidates and that there is a risk good candidates would be sorted out in the process if AI is used. However, R8 adds that if the number of “bad” candidates making it through the process could be minimized by AI, it would be okay if they lost some good ones on the way too.

Respondents R4 and R7 think that one problem connected to trust and AI is the need many recruiters feel to have complete control over the recruitment process. R7 points out that this is probably mostly based on habits, and that it could be changed if the process would change.

HRM Professionals' Technological Knowledge

Respondents R1, R5, R6, R7, and R9 say that their limited technological knowledge affects their attitude toward AI solutions. Respondent R6 says that it is common to have a reserved attitude toward new kinds of technologies if one does not know what they are and how to use them. Respondents R1, R5, R7, and R9 mention that they have felt constrained due to their lack of technological knowledge when discussing AI solutions ^{7 8}.

With this in mind, respondents R2, R3, and R6 argue for the importance of information and education when implementing new technological solutions. Respondents R2 and R3 have noticed that *how* new ways of working are presented is the first key to if it succeeds or not. R6 says that it is crucial to get everyone on board, to meet everyone's presumptions, and

⁷ “Jag förstår ju tekniska begrepp, på ett väldigt ytligt plan, men jag vet inte något mer än så. Svårt då om jag ska bedöma som inte har den tekniska kompetensen, jag vet inte liksom vad som är bra och vad som är dåligt.” (R1)

⁸ “Annars är jag för opåläst på AI för att kunna förstå.” (R9)

educate them on how things *actually* work. Respondents R2 and R6 have noticed that once the recruiters understand how technological solutions work, they are more in favor of both believing in them and using them. Respondent R6 gives an automated reference solution they implemented a couple of years ago as an example, saying that many recruiters were against it from the beginning, but that they now can not imagine working without it.

Respondent R7 mentions that one problem with AI solutions could be that the demand for increased technological competence requires that recruiters put time into learning, which takes time from other parts of their work, making it very much a question of prioritizing.

Respondents R6 and R9 think the technological knowledge, and thereupon, the attitude toward AI solutions, to be a generational issue. They mean that the recruiters that have been in the field for a longer time view the recruitment process as a craft and are more negative to new technological solutions. While recruiters newer to the field are more optimistic, viewing their role as one mainly working with data and information management.

Recruiters' Fear of Losing their Job

Respondents R1, R2, R4, R6, and R9 mean that, according to them, and from what they have understood from other people working in recruitment, the fear of losing their jobs if AI makes its way into the recruitment field is negatively affecting their attitude toward it ^{9 10 11 12 13}.

Respondents R2 and R6 think that it is not only losing their jobs that feels intimidating for recruiters, but even having to change their ways of working. R6 mentions that, for instance, when discussing AI solutions for interviews with their recruiters, many of them had negative attitudes toward it and argued that they like holding interviews. Respondent R2 believes that being questioned to change any kinds of practices in the recruitment process can be scary for those who are used to a certain way of working.

Respondents R2 and R9 are taking the fear of individual recruiters losing their jobs to another level by addressing the fear that the whole recruitment field might alternate as a consequence of implementing AI solutions¹⁴. Respondent R2 sees a risk in that there might not be a market for their line of business (recruitment firms) if AI is developed to a level where humans are no longer necessary in recruitment, stressing that the value of their expertise then would not be recognized.

Humans still Needed

It is clear from the interviews that most respondents (all except R9) believe that there are parts of the recruitment process where humans cannot be replaced. Respondents R3, R5, R7,

⁹ “/---/ så på ett personligt plan blev det som en rädsla att robotar skulle ta över ens jobb.” (R1)

¹⁰ “Klart det är jobbigt om någon säger att nu ska en robot göra det här istället för dig.” (R2)

¹¹ “Då tänkte jag, shit jag kommer förlora mitt jobb nu.” (R4)

¹² “För man var ju rädd om sitt eget jobb helt klart.” (R6)

¹³ “Nackdelar? Att jag blir arbetslös...” (R9)

¹⁴ “Skulle AI bli så effektivt att hela vår affärsmodell rämman. Då skulle ju behöva sänka våra priser kraftigt och slå ut av aktörer som kan data bättre än vad vi kan. Det skulle ändra spelreglerna totalt helt enkelt.” (R9)

R8, and R10 argue that humans have an ability to “read between the lines” in a way they do not think AI could do. Respondents R3 and R8 mention that for them, a valuable ability recruiters have is to see beyond the “100 percent match”. R8 means that a candidate applying for one job opening could actually be a better fit in another part of the organization that might not even have a job opening announced, arguing that this is knowledge only human recruiters already being part of the organization can have.

Evaluating personal chemistry through interactions and discussions is one part of the recruitment process that several respondents (R2, R4, R5, R7, R8, R9, and R10) think humans are irreplaceable. Respondent R7 mentions a stage in their recruitment process where they let their candidates solve a case as an example. R7 describes that this stage includes discussions between candidates and employees, giving them valuable input on how the candidates are taking on assignments. Respondent R9 mentions interviews to have the same function, and respondent R5 says that human recruiters holding interviews are necessary to evaluate how candidates handle social situations.

Respondents R5, R8, and R9 believe that it would be hard to give a fair picture of the corporate culture to candidates without human interaction, and also for the organization to get a feeling of if the candidates would fit into it.

Respondent R4 stresses that once they have initiated a person-to-person contact, they want the rest of the process to be handled by humans. The later in the recruitment process, the more need for human interactions according to respondents R1, R2, R5, and R6. R1 also believes that human involvement is necessary when it comes to salary negotiations.

As mentioned in the section about the distribution of resources, many of the respondents see AI being valuable in the parts of the process where large amounts of data are processed. Furthermore, respondent R8 mentions that analyzing candidates’ technological skills could be a function where an AI would be superior to a human.

Respondent R9 stands out with their beliefs that, in the long run, AI and automation have the potential of taking over the whole recruitment process, making human recruiters unnecessary¹⁵. However, R9 stresses that this is probably far into the future.

Respondents R5, R8, and R10 bring up that they do not believe recruitment would be solid if all human contact was removed, even if the technology to do so existed. Respondent R5 argues that the best solutions are the ones where humans and technology interact, each focusing on the parts they are best at performing.

¹⁵ “Nånstans bygger AI på data- och datapunkter. och det är såklart att om du har all data du behöver varför, vad ska vi (människor) behövas för?” (R9)

The Candidate Experience

Respondents R1, R2, R4, R5, R6, R7, and R8, say that one important thing to mention when discussing attitudes toward the use of AI in recruitment processes is how candidates experience it. Respondents R2, R4, and R5 believe that most candidates have positive attitudes toward AI and other automation tools in recruitment. Respondent R2 thinks that one key reason for this is that candidates like the idea of fair evaluations, and that they want to be evaluated based on the same factors as other candidates.

However, respondent R6 argues that many candidates want human interaction in the recruitment process. According to respondents R2, R3, R4, and R8, one feedback they usually get from candidates connected to their recruitment processes is how positive it is that they had the opportunity to meet relevant people from different parts of the organization and hear their stories. Respondent R1's organization does not have any type of automation connected to their recruitment process today, and according to R1, their candidates seem to really appreciate that.

Respondents R2 and R7 think that the candidates' attitudes are mostly based on their habits, that they are used to how recruitment processes usually progress and build their opinions based on that. R7 believes that if AI tools became more of standard practice in recruitment, candidates would get used to that instead and change their views.

Respondents R4 and R5 think that candidates' views on the use of AI and automation follows from how well they perform in the recruitment process. They believe that candidates ending up getting the job they are in the process for will have positive views, while the opposite will be true for the ones not getting the job. Respondents R5 and R8 think candidates' attitudes toward AI tools being used in the process will differ based on which kind of jobs they are applying for. R8 believes that for job openings with newly graduated people as their target group, the candidates mostly want the process to be fast, and that their opinions are based a lot on that. Respondent R5 thinks that for certain roles, giving management consultants as an example, using AI and other automation tools can add seriousness and prestige to it.

Recruitment R6 argues that, just as for recruiters' attitude toward AI solutions, candidates' attitudes is a generational question. R6 means that they have gotten 100 percent positive feedback from candidates younger than the age of 40 in processes using AI, and 50/50 percent positive/negative feedback from candidates older than that.

Potential Risks

When asked about their thoughts on potential risks following the implementation of AI in recruitment, respondents R1, R5, and R9 think that there is a risk of AI having built-in bias. Respondent R1 lifts the alarming example of Amazon's AI recruiter that showed to have bias built into it. Respondent R5 thinks bias in AI could lead to them missing suitable candidates.

Respondent R9 exemplifies the risk of AI having bias by saying that if an AI learns exactly what the best candidate is, it could lead to an even more homogenous labor market than there

is today, not even giving a chance to people not fitting into that exact template of a suitable candidate. Respondent R10 stresses the risk of AI being merciless for candidates lacking a lot of experience meaning that by using AI, there is no “middle-ground” for candidates not exactly matching what is asked for in job descriptions.

Respondent R5 thinks another risk is that it would be easier for candidates to not be completely honest in the recruitment process if AI and automation was being used to a greater extent. R5 adds that people can be dishonest in interaction with humans too, but that in the personal meeting recruiters at least have the possibility to see a couple of more dimensions.

Respondent R3 thinks the greatest risk with implementing AI are the data and security risks it could entail. Working in a security classed organization, R3 stresses that keeping processes entirely safe from external intrusion is their top one priority.

4.4 Alteration of the HRM Profession

This section presents the results connected to the third theme identified from the interviews: Alteration of the HRM Profession. The section is divided into two parts, first the respondents’ general thoughts on alteration of the HRM Profession, and second, their views on how the new ways of working with recruitment will look like.

Generally

Respondent R5 mentions how the view on the HRM profession has changed from when they studied it several years ago. Back then, the jargon among HRM students was that they had chosen the field because they were people not liking the subjects of statistics and economics, that they preferred the "soft questions" and therefore had chosen the HRM profession. R5 adds that the profession does not look like that anymore, that their processes would not work with that kind of view.

Respondent R7 says that they mostly see signs that the profession has started to change based on all the different AI tools software development companies want to sell to them. R7 mentions there are solutions available that they could not have even imagined a couple of years ago.

New Ways of Working

Respondents R5, R6, and R9 believe that the greatest change of their profession will be connected to data management. Respondent R5 thinks that they will take more of their decisions data-based moving forward. Respondents R4 and R6 expect recruiters’ tasks to be more about analyzing data than it is today, and that their focus will shift to compiling, understanding, and examining information from different kinds of AI and automation tools.

Respondents R1, R2, R6, R7, and R9 think AI’s progression into the recruitment field will alter the HRM profession to focus more on “value-creating tasks”. According to R1, R2, R6,

and R7, this would entail more time for strategic questions, and more time to *actually* get to know the candidates by spending more time on each one. R6 adds that it would give them more time for employer branding activities and managing contacts with candidates that did not get the job. On the other hand, respondent R2 (working at a recruitment firm) has another view, and believes that the time saved by implementing AI will not be spent on more candidate interaction but instead on attracting more recruitment projects from clients ¹⁶.

Respondents R2 and R9 (both working at recruitment firms) think that their roles will move more toward consulting their clients in the recruitment processes, enabling them to have more of an advisor kind of role, which according to them, is favorable because they argue that it is in those exchanges they are actually creating value. Respondent R2 adds that they believe it will also enable them to have more recruitment processes going on parallel, which also increases their potential value-creation.

Respondent R4 believes that there will be two alternatives for recruitment processes in the future. R4 thinks there will be some roles, more “entry-level-kind-of-jobs” where a completely automated process will be advantageous, and another alternative where human interaction will still be necessary. When asked why these two alternatives, R4 says they do not know why but that it is their feeling.

All respondents think there will be a big shift in both the recruitment role per se, but also when it comes to the whole recruitment industry. Respondents R2 and R5 are both bringing forward how important it is for them to be on top of new technologies in recruitment processes. R2 argues that if they are not, somebody else will, and then they are out of the game. R5 states that being a forerunner in digitalization and technological solutions is not just something being favorable for organizations, it is about survival.

¹⁶ “Den tiden man sparar går inte till det humana utan det går bara till att få in fler och fler och fler affärer.” (R2)

5. Discussion

In this section, the insights from the literature review and the results from the interview study are discussed and analyzed. The interview study is compared to insights from the literature review, and similarities and differences between the findings of this thesis and previous research are identified. The discussion is divided into five parts. First, challenges identified in today's recruitment processes are presented. Thereupon, a discussion about AI in recruitment follows, which in turn is split up into the four themes identified in section 2.3.3 The Viability of Using AI in Recruitment: Actor Role, AI Role, AI Adoption, and Potential Risks. Following this, a conclusion connecting the earlier parts of the discussion to this thesis research objective is presented. Lastly, a discussion about limitations of this study is given before recommendations for future studies are suggested.

5.1 Challenges in Recruitment Today

Candidate Shortage

As can be seen both from previous literature, and the interview results, a crucial challenge in today's recruitments is candidate shortage. According to the Confederation of Swedish Enterprise, the difficulty organizations have recruiting people with the right competence is immense. Seven out of ten recruitment attempts fail completely according to their yearly survey (Svenskt Näringsliv, 2022), and the respondents in this study give the same picture. Many of them are having a hard time finding any candidates at all for a lot of their roles. The saying "the candidates' market" brought up in the interviews seems to be a fact, putting large pressure on recruiters and organizations to adjust and improve their recruitment processes to the competitive landscape.

Crawshaw et al. (2014) state that having a fast recruitment process has always been a competitive advantage for organizations in the "war for talent". If organizations are slow, there is an increased risk that candidates move forward with other options. The time-consuming parts of recruitment processes are something the respondents also mention as challenging in connection to recruiting the right people, and this is even more pressing when there is a lack of candidates. Hence, a consensus from this study is that, by making their recruitment processes faster, organizations gain a competitive advantage, which is even more crucial when there is a candidate shortage in the labor market.

The respondents emphasize that one thing giving organizations an advantage in the competition for candidates is having a well-known, and popular employer brand. Some of them even entirely blame their lack of applicants on the fact that they are not well-known enough. Van Esch et al. (2019) say that organizations' employer branding mostly is affected by how they manage their recruitment processes, one thing the respondents agree on, but they are also stressing that the brand awareness comes from how they manage to stand out among other organizations also trying to recruit.

Another thing the respondents bring up as a challenge connected to employer branding is the importance of how rejected candidates have been treated throughout the recruitment process. They argue that if this is not done in a, for the rejected candidates, eligible way, their employer branding is hurt, and the chances of these candidates applying to the organization again are very limited. This corresponds to what Van Esch et al. (2019) say about employer branding in the literature review. One interview respondent stated that they do not have the time to consider this today. From this it can be seen that time shortage directly affects how well the organizations can work with their employer branding, toward potential candidates in general, and rejected candidates in particular, which negatively impacts candidates' attitude toward them leading to a disadvantage in the "war on talent".

Following the candidate shortage, a sub-challenge identified by the respondents that is not explicitly discussed in earlier research is the large amount of work they have to put into search and sourcing of candidates, often to find any potential candidates at all. Most of the respondents' time seems to be spent on these activities, and they state that most of the people they employ do not come from candidates applying to them, but from their own search activities. During these search and sourcing activities, different types of search tools are used by the respondents but none of them seem to think these are optimal. They bring up problems such as: tools being ineffective and non-user-friendly which requires them to spend a lot of time on them, missing candidates due to candidates' diverse abilities to present their competences, and their own ability to define what they are actually looking for in their candidates. Crawshaw et al. (2014) and Bratton and Gold (2012) state that the first step in the recruitment stage of the recruitment process (Figure 2) is for the recruiters to decide on selection criteria, which comes from defining what a job role involves and what would make an effective worker in this role. Andersson et al. (2016) stress the importance of being clear on which competence(s) are of the highest value and which ones come second. It is given that the more explicit recruiters are in their definition of what they are searching for, the more narrow the pool of potential candidates will be. It could be argued that with today's candidate shortage, it is important that recruiters broaden their views on what competences and experiences are needed for the job openings they want to find candidates for.

Another sub-challenge directly connected to the candidate shortage, highlighted in the interviews but not in the literature review, is the question of how to best treat potential candidates. The courtship that candidates with commonly requested competences get, leads to many of them being in several processes parallel, putting recruiters in positions where they want to attract the candidates and sell in their organization as a good workplace, but at the same time quiz and test them to see if they are a good fit for the organization.

Distribution of Resources

The scale of the recruitment process, and its different stages, require a lot of work to be put into it to succeed. Bratton and Gold (2012) identify the stages as Job Analysis, Workforce planning, Recruitment, Applicant pool, Selection, and Job Performance (see Figure 2). As mentioned above, the respondents argue they spend most of their time on search and sourcing activities, which is a part of the Recruitment stage. Except for this, the things requiring the

most resources according to the respondents are process coordination, candidate contact, pre-screening of applicants, administrative tasks, interviews, analysis of testing stages, and background checks. These activities are mostly included in the Recruitment stage, the Applicant pool stage, and the Selection stage, and according to the respondents take up most of the time due to the fact that they include many repetitive tasks. According to the insights from the literature, activities including repetitive tasks are parts of the process where AI solutions will replace humans. Following this, it can be argued that AI has the ability to help organizations better distribute their resources in the stages of the recruitment process where repetitive tasks are present.

Some respondents give examples of roles that go against the general candidate shortage trend and instead get large volumes of applicants mentioning marketing, management consultants, and low-entry jobs as examples. In recruitment processes for these, a conclusion can be drawn that the repetitive tasks mentioned above are even more time-consuming.

Ways of Working, System Limitations, and Technological Development

Challenges connected to how organizations form and coordinate their ways of working with recruitment are mentioned in the literature review and emphasized by the interview respondents of this study.

One primary factor in shaping the way people work is technology, and adopting appropriate technology to promote effective and efficient processes is crucial for organizations' survival (Crawshaw et al., 2014). From the interviews, it can be seen that far from all organizations are following this. Many respondents bring up limitations connected to the different kinds of IT systems in their organizations to be a challenge. Some of the respondents point out that the systems are not user-friendly and demand a lot of repetitive work. Others are focusing on the fact that there are a lot of smart solutions they want to implement but which are not possible to merge into the systems they already have. Some mention ongoing discussions about whether to demand all parts of the organization into the same systems to keep an entirety, or to let all parts choose systems best suitable for their individual work processes, one respondent adding that different parts have different security needs which even more complicates this discussion. Okolie and Irabor (2017) and Omolawal (2015) point out that assessment of any kind of technological tools implemented in recruitment needs to be done carefully. From what can be understood from the respondents' thoughts on the limitations of their systems, this kind of assessment might not have been done to a great extent. One reason for this could be a lack of technological knowledge. Lack of knowledge about technological developments within the HRM community, as well as a limited commitment to them by senior managers, are challenges mentioned by both Armstrong (2009) and Omolawal (2015), and also something the respondents seem to be aware of.

Objectivity

Both in the literature review and in the results from the interviews, it is clear that one challenge in recruitment today is to ensure objectivity. According to Crawshaw et al. (2014), humans have a tendency to assign a good or poor rating of one attribute of a candidate, to all

their attributes. Humans also have a tendency to rate candidates whom they perceive similar to themselves, or whom they find beautiful, higher than the ones they do not. These factors account for 62 percent of the variations in subjective candidate ratings made by humans (Crawshaw et al., 2014). Following this, it can be argued that the more subjective a rating of a candidate is, the less it focuses on the actual competences and experience of the candidates. The results from the interviews show that many recruiters base a lot of their decisions on their “gut feeling”. What this gut feeling comes from, the respondents are having a hard time explaining. Connecting it to the tendencies humans have according to Crawshaw et al. (2014), it can be argued that these gut feelings are not objective. The respondents seem to know that they have both conscious and unconscious biases, and presumptions when assessing candidates, and are also problematizing it, but without seeing a solution to how it could be solved. Furthermore, when they are mentioning that they know they are having biases, they all stress that so do all recruiters, which could be entailed as it is more or less accepted among recruiters that so is the fact.

Another challenge connected to objectivity that gets clear from the interviews but are not brought up in the literature review, is that not all potential candidates are equally good at declaring their competences and experience, which in turn makes it hard to do fair assessments by just looking at their resumes and cover letters.

5.2 AI in Recruitment

According to Upadhyay and Khandelwal (2018), artificial intelligence has been one of the most spoken of trends in recruitment for the last couple of years. That AI is a topic discussed among recruiters can also be seen from the results of the interview study, with all of the respondents having some view on it, and something to say about it, regardless of their role, which kind of organization they work in, or their seniority level.

Reilly (2018) means that recruitment is one of the organizational functions that are most likely to embrace and undergo considerable innovation and transformation in the near future. In addition to this, Van Esch et al. (2019) point out that many organizations are showing interest in AI, but due to the fact that most organizations are new to AI solutions, a lack of knowledge slows down its entry into the market. Drawing conclusions from the interviews, this seems to be true for organizations recruiting in Sweden. They are following the general trend among organizations of being interested in AI tools, but not quite using them yet. Among the respondents, there is only one stating that they are actively using an AI solution in their recruitment process today. However, a majority of them are in the initial testing phases of implementing some kind of AI. Following this, it can be argued that AI has started making its way into recruitment processes in Sweden but is not yet the benchmark in the field.

Given the insights from the literature review and the interviews, it can be understood that one essential reason why AI is starting to make its way into recruitment is the increased competition for candidates in the labor market. As a result of the intensified competition,

organizations need to improve their recruitment process, which gives them incentives to look for new ways of working.

In a study conducted by Okolie and Irabor (2017), using AI solutions in recruitment processes has shown benefits including reduced costs, increased number of applicants, better candidate matching, an easier application process for candidates with a wider variety of job opportunities, and also a greater response rate on receiving feedback from applicants. With insights like this, it is even more understandable that there is an increasing number of organizations looking into implementing AI, which is also confirmed by the insights from the interview study. A conclusion can be drawn that the candidate shortage of today increases organizations' needs to improve their recruitment processes, and with AI's ability to do so, its way into the recruitment field accelerates.

5.2.1 Actor Role

The theme Actor role underlines the actors, both recruiters and applicants, and the potential advantages and opportunities they can obtain following the implementation of AI into recruitment processes.

Alteration of the HRM Profession

From this study, it can be seen that recruiters see the fact that humans are spending time on repetitive tasks, documentation, and "copy-paste-moments" in the recruitment process as a huge limitation when it comes to how efficient their processes could be. Upadhyay and Khandelwal (2018) argue that what justifies the way AI will change the recruiter role is its ability to speed up the recruitment process significantly, while not compromising on its quality.

The respondents believe that following AI's progression into recruitment, their role will shift to focus more on "value-creating-tasks", and insights from the literature acknowledge the same. According to Savola and Troque (2019) and Hmoud and Laszlo (2019), AI will replace humans when it comes to administrative and repetitive tasks, and following this, recruiters' job tasks will alter more toward strategic functions and leadership roles. These changes are welcomed among the respondents. Many of them are emphasizing that everything that can be done to cut time in their processes is welcomed, pointing out that this will enable them to focus more on their core tasks as recruiters. Some of them define these core tasks to be connected to candidate contact, meaning that AI will enable them to spend more time on each potential candidate, and also on managing rejected contacts. One of the respondents does not agree but believes that the time spent by implementing AI will instead enable them to have more processes going on parallel to increase their total profits and turnarounds, and that the time saved therefore will not be spent on more interaction with each candidate. Two of the respondents, both working in recruitment firms, believe that their roles will move toward consulting their clients and that they will adopt more of an advisor kind of role. Some other respondents think that the biggest switch in the recruitment profession will be that, by implementing AI, their tasks will focus more on compiling, understanding, and examining

data from different kinds of AI tools, and making decisions based on this. The respondents are unified in their beliefs that the recruitment process will be more based on data moving forward.

Humans still Needed

From the interview results, a clear standing point from the respondents is that they do not believe that humans can be replaced in all parts of the recruitment process, which the insights from the literature review agree on. Bhalgat (2019), Upadhyay and Khandelwal (2018), and Savola and Troque (2019) think that, even with AI shifting the ways of working with recruitment, humans will still be needed.

The respondents are a bit vague when they are identifying the parts in which they believe humans are irreplaceable, while earlier research states more clear functions. The respondents point out that humans have the ability to “read between the lines” in recruitment in a way they do not think AI can do. Another thing pointed out by the respondents where humans are irreplaceable is when it comes to seeing beyond the “100 percent match”, arguing that humans can have a broader view than AI about where in organizations candidates could be a fit, coming from their experience within their organization. According to Upadhyay and Khandelwal (2018), human recruiters will still be needed when it comes to building relationships with candidates, focusing on talent identification, and the interpretation and understanding of candidates’ emphatical and emotional qualities. These are aspects that the respondents are also bringing up when discussing where humans are irreplaceable in the recruitment process, mainly emphasizing personal chemistry and evaluation of how candidates handle social situations. Other parts where respondents are mentioning humans to be needed, that are not highlighted in the literature, are attracting candidates in the initial stages of recruitment (due to candidate shortage), giving candidates a fair picture of the corporate culture, and seeing if a candidate would fit into the corporate culture.

One of the respondents stands out with their belief that in the future, AI has the potential of replacing humans in all stages of the recruitment process. Savola and Troque (2019) argue that a human will always be needed to make the final hiring decision, but that AI solutions will be used to provide the top potential candidates.

Many of the respondents argue that, even if the technology to replace humans in the whole recruitment process existed, they do not believe recruitments done completely without humans would be solid but that the best solutions are the ones where humans and technology interact, each focusing on the parts they are best at.

Handling Candidates’ Concerns

That the candidates’ attitudes to the use of AI tools in recruitment play a vital role is something both the literature and the interview respondents stress. Srirang et al. (2020), and Nawas and Gomez (2020) argue that how successful the implementation of AI will be, depends largely on how the candidates perceive it. Srirang et al. (2020) state that it is important to take any concerns candidates might have into consideration. The respondents

believe that most candidates are positive toward the use of AI in recruitment, stating that one key reason for this is that the candidates believe AI has the ability to make a fair recruitment and evaluate all candidates based on the same factors. Van Esch et al. (2019) confirm the respondents' beliefs that more and more candidates are open to engaging with AI-based recruitment systems. As long as organizations show openness and transparency about the AI solutions they use, Nawas and Gomez (2020) mean that the use of the technology increases the candidates' beliefs that the organization is doing fair evaluations.

Robertson and Smith (2001) mean that the limited personal interaction following technological development of the recruitment process can lead to frustration among candidates due to missed opportunities to share information about themselves. The respondents also point out limited personal interaction as one thing candidates will be concerned about, however, not focusing on the candidates' potential to share information about themselves, but due to the fact that the candidates appreciate personal interaction because this gives them a picture of what kind of people are working in the organization. The respondents state that the candidates want to hear different employers' stories and experiences from the organization. However, some respondents think that the opinion of personal interaction being needed comes a lot from habit. Candidates are used to having personal interaction and therefore form their opinions based on that. If less personal interaction was the benchmark, and the candidates were used to this, respondents think that the view could be different.

New technological solutions in recruitment processes could also entail that candidates need to change their way of applying to job openings and that the stages of the process they have to go through will be altered. Bhupendra and Swati (2015) state that the more technological solutions used in the recruitment process, the more computer savvy is needed from the applicants. This could be linked to the results from the interviews saying that candidates' concerns about AI solutions can be seen to be a generational question, that younger candidates with higher technological knowledge are more positive while older candidates with less technological knowledge are more reserved.

5.2.2 AI Role

The AI role theme focuses on the potential impact AI technologies can have on the recruitment process, mainly focusing on its dominant advantages.

Objectivity and Minimizing Human Biases

AI's ability to minimize human biases is the most noted advantage of using it in recruitment processes according to Bhalgat (2019), and Van Esch et al. (2019), and the results from the interviews express the same idea. A majority of the respondents clearly state that the possibility of more objective recruitments by using AI is its most promising factor. The respondents believe that AI has the ability to put more focus on candidates' potential, their competences, and things recruitment "should be based on" than humans have, in other words, to increase the objectivity in recruitment. Van Esch et al. (2019) mean that the increased

objectivity comes from AI's ability to process information, and make decisions on this information at volumes and speed far exceeding human capacity. It is hard to interpret if the respondents understand the underlying reason for *why* or *how* AI has the ability to minimize human biases, but it is clear that they understand that it can.

Improved Employer Branding

Another advantage following the implementation of AI, both according to the interview results and the literature study, is to help organizations improve their employer branding. The respondents initially connect the potential improvement to AI's capability to help them get more candidates to apply to their job openings, and secondly, that it could be favorable for their branding to use technological tools that match the technological level of the roles they aim to recruit. The literature study gives two main reasons why AI could improve organizations' employer branding. First, Bhalgat (2019) argues that by implementing AI another level of transparency is added to the process which positively impacts candidates' attitudes toward the organization, and therefore its employer branding. Second, by using AI solutions, organizations give potential candidates a smoother recruitment process with the ability to also give feedback to rejected candidates on qualifications, skills, and competences they could develop in the future, improving the chance of rejected candidates applying to the organization again (Van Esch et al., 2019).

Improved Efficiency and Quality

The literature study emphasizes AI's advantage when it comes to improving the recruitment process by making the process more effective and efficient while not compromising the quality of it. Upadhyay and Khandelwal (2018) argue that this is what justifies the way AI will change the recruiter role. Van Esch et al. (2019) even state that seen in a study made at Unilever, the quality of the recruitment process was improved significantly following the implementation of AI. Since a majority of the respondents are not using AI solutions actively in their recruitment processes yet, they state that they are not fully capable of understanding if using AI would actually improve their recruitments or not. However, they see a positive ability for AI to make their processes both more efficient, effective, and of higher quality. Additionally, they believe that AI could help them expand their views when finding potential candidates, and by this find an increased amount. This can partly be confirmed by the literature. Geetha and Ready (2018) state that AI helps organizations identify skills, competence, and experience in potential candidates, and match these to job openings, resulting in hiring of talented employees.

Improved Value Creation and Candidate Matching

Furthermore, it can be argued that AI has a great potential to increase organizations' value-creation. From the insight of the literature review and the interviews, time-consuming tasks are what are most costly for organizations connected to their recruitment processes. To justify that AI is cost-effective Bhalgat (2019) argues that AI will take over time-consuming and repetitive tasks from recruiters leading to reduced hiring costs. Supporting this, Van Esch et al. (2019) state that AI can process volumes of information that would take humans an unreasonable amount of time to do manually. It is clear from the interview results that, if the

organizations managed to shorten their recruitment processes by making them more effective, it would lead to people getting jobs faster, and therefore the organizations' turnovers and profits to increase. Similar to this, Bhalgat (2019) writes that time is valuable in every organization, and by cutting time spent on any task, money is saved. The respondents point out AI's potential to shorten the recruitment process as one of the most valuable advantages. Van Esch et al. (2019) emphasize that reducing time-to-hire entails not just an efficiency gain, but will also lead to a strategic advantage in the battle for human capital.

Additionally, organizations' increased value-creation could be explained by AI's potential to improve their candidate matching. Connected to recruitment processes, the single most expensive thing an organization can do according to some of the respondents is hire the wrong person. In the insights from the literature, an opinion that AI improves candidate matching can be seen. Srirang et al. (2019) state that AI is better at making predictions about which candidate would be most suitable for a job or vice versa. Okolie and Ibrabor (2017) claim that employers using AI solutions in their recruitment had benefits including better candidate matching, lower costs, finding more potential candidates, and a greater response rate regarding feedback from candidates. Furthermore, Van Esch et al. (2019) argue that AI has the ability to both target more appropriate candidates and increase the total number of applicants. Following this, a conclusion can be drawn that AI can minimize the risk of hiring the wrong person and that this is a strong incentive for organizations to implement it into their recruitment processes.

However, there is a distinction between what the literature says and what the respondents believe when it comes to AI's ability to analyze candidates' suitability for organizations culture-wise, and AI's ability to identify competency gaps in the organizations and corresponding roles to fill those gaps. Wright and Atkinson (2019) state that AI solutions have the capability of doing all these things by using machine learning and natural language processing. The respondents, on the other hand, as mentioned in the Actor Role subsection, believe these to be parts of the recruitment process where humans are irreplaceable. It could be argued that this distinction might follow from a lack of technological competence among the respondents and therefore a lack of deeper understanding of what problems AI solutions are capable of solving.

For the respondents, it is important to see the actual value of the tools they are using in their recruitment processes. According to them, at the end of the day, the decision on how to structure their organizations' different processes, is based on what fastens the organization's turnover and increases its profit the most. A conclusion drawn from this is that for AI solutions to be adopted by organizations and their recruiters, it has to be clear how it improves their value-creation.

Alteration of the HRM Profession, the Organization, and the Recruitment Industry

From the interview results, it is clear that the recruitment process has looked more or less the same for quite a while. The respondents blame this on the fact that there has not really been anything, or anyone, challenging their ways of working, which has led to no incentives to

reform how things are done. With AI making its way into the recruitment field, this can be recognized to change. Following AI's potential advantages connected to the recruitment process, the insights from the literature study give a united prognosis for the future. To start with, AI will change the recruiter role and organizations internally, and moving forward, the chances of it transforming the whole recruitment industry is extensive (Savola and Troque, 2019; Kaplan and Haenlein, 2019b; Hmoud and Laszlo, 2019; Van Esch et al., 2019; Han, 2020). Savole and Troque (2019) mean that this will come from AI affecting organizations' revenue, profitability, and talent acquisition. This understanding can also be observed in the interview results, with all of the respondents, regardless of their attitude toward AI making its way into the recruitment process, having the same belief that there will be a big shift in both the recruitment role per se, but also in the whole recruitment industry.

Kaplan and Haenlein (2019b), and Savola and Troque (2019) argue that the organizations understanding AI's role, its transformational power, and managing to adopt leadership suitable for organizations in transformation, will be the ones to master AI's prominent advantages. Furthermore, these organizations will gain a competitive advantage (Savola and Troque, 2019). Wright and Atkinson (2019) state that for the first movers of implementing AI, these advantages will be even more significant. Some of the respondents seem to have also realized this fact, stressing how important it is for them to be on top of new technologies, arguing that if they are not, somebody else will, and then they are out of the game. One respondent states that being a forerunner when it comes to technological solutions is not just something being favorable for them, it is about survival.

5.2.3 AI Adoption

The AI Adoption theme emphasizes on challenges of implementing AI-enabled tools in recruitment processes, mainly focusing on actors' willingness to do so and factors impacting this.

In the study conducted by Kerrin and Kettley (2003) being brought up in the literature review, it is shown that some limiting factors for implementing new kinds of technology in recruitment are: the cultural approach of the organization, the lack of technological knowledge within the HRM community, and the commitment of senior management. Javed and Brishti (2020) support this, but focus on AI, in particular, stating that how successful integration of AI solutions will be, depends largely on collaboration between employers, the organization itself, outside organizations, and candidates. To put this in relation to the attitudes of the respondents regarding the implementation of AI in their recruitment processes shows a lot of opportunities, but also challenges, for AI's way into the Swedish recruitment field.

HRM Professionals' Technological Knowledge

Actors' level of technological knowledge is crucial for how willing they are to adapt to AI being used in processes they are a part of. Armstrong (2009) and Omolawal (2015) state that the lack of technological knowledge among HRM professionals is slowing down

technological solutions' progress in the field. Javed and Brishti (2020), and Van Esch et al. (2019) mean that the fact that organizations are still in their initial phases of implementing AI is not due to that there are no AI solutions available, but because of the lack of knowledge about AI among recruiters slows down its entry into the market. It can be argued that this situation is true among recruiters and their organizations in Sweden based on the results from interviews. A majority of the respondents point out their own limited technological knowledge to be a significant thing affecting their attitude toward AI solutions, and that they feel constrained by the fact even when only discussing potential AI solutions. For instance, one respondent mentions that they are skeptical about implementing AI, but that this probably follows from that they do not understand the technology. Another respondent says that it is common to have a reserved attitude toward new kinds of technologies if one does not know what it is and how to use them. With technology being a primary factor in shaping the way people work (Crawshaw et al., 2014), limitations in recruiters' technological knowledge put them in a difficult position. Kerrin and Kettle (2003) point out that for technologies to deliver, the people working with them must have the capability to understand them and facilitate them.

Putting the results from the literature review in contrast to the interviews, it seems that the implementation of AI in recruitment processes in Sweden is somewhat in stagnation as of now. Many of the respondents seem interested, but at the same time, they are limited by their technological knowledge when it comes to actually take action. The solution, according to both the respondents themselves, and the literature (Kerrin and Kettle, 2003) is information and education. The respondents stress that it is critical to get everyone on board to succeed with the implementation of new ways of working and that once people understand how technological solutions work, they are more in favor of both believing in them and using them. However, one respondent mentions that gaining new technological skills also takes time, which is what they want to save by implementing AI, putting them in a bit of a moment 22 about what to prioritize.

Trust

Recruiters' trust in AI affects both their willingness to acquire technological knowledge about it and how eager they are to implement AI solutions into their ways of working. From the literature review, it can be understood that there is a contradiction that can be hard to overcome. By improving their knowledge about the technology, trust in AI tools would increase (Srirang et al., 2020), but if recruiters already have trust issues regarding AI, it is known that this increases the unwillingness to learn about the technology (Javed and Brishti, 2020). Trust issues toward AI solutions are observed among a majority of the respondents, and some of them also state that this comes from that they do not understand the underlying technology, which can be directly connected to the contradiction mentioned above. One further issue connected to this is brought up by Srirang et al. (2020), saying that without knowing about the underlying technology, recruiters might doubt results coming from AI solutions, which in turn can lead to rejection of using AI at all.

When the respondents talk about other kinds of automation tools they have implemented in their recruitment processes, personality and logistical tests, for instance, they say that they trust them because the tools are not that complicated to understand and that they can see the results given are correct. One respondent argues that, as long as they feel that the tool is working, they have no reason not to trust them. Srirang et al. (2020) stress the importance of AI tools to be transparent to inspection to increase people's trust in them. One respondent, trying out an AI solution in their recruitment process, confirms this by saying that they have trust in it following that they have been a part of the implementation process from the beginning, and have seen how it is built into their existing process. Another respondent states that they have trust in AI doing what it is told to do based on the parameters it is provided with, but that they do not believe that this is necessarily the “right thing”.

Some respondents bring up that trust issues toward AI among recruiters might come from their feeling of need for control over the whole recruitment process, an aspect not directly mentioned in earlier research on the subject. However, one of the respondents believes that this is due to the habits of the recruiters and that their need for control could alter if the process would go through a transformation to being more AI-based. Following the insights from the literature review that the best decisions come from a collaboration between humans and technological solutions (Boudreau, 2014; Jarrahi, 2018; Kaplan and Haenlein, 2019b), it can be argued that it would be favorable for recruiters to question their own need for control a bit, and be more open to integrating new kinds of technologies into their processes.

Recruiters' Fear of Losing their Job

That many recruiters see AI as a threat to their profession is another aspect strongly affecting AI adoption. The literature review states this view to be common among recruiters (Javed and Brishti, 2020; Van Esch et al., 2019), and the results from the interviews show the same. A majority of the respondents highlight both their own feelings about this and argue that they get the same feeling from many of their colleagues. According to Van Esch et al. (2019), this could lead to recruiters stymie or even sabotage the implementation of AI tools. One respondent states that they see a threat in recruiters' expertise not being valued following the implementation of AI into recruitment.

The fear of AI completely replacing them in recruitment processes is not the only intimidating thing the respondents bring up on this topic, but also the fear of having to change their ways of working. The respondents mention that many recruiters like their processes the way they are, and that changing any form of habit can be scary. This is also brought up in the literature study, Michailidies (2018) states that by AI changing the way of working with recruitment, recruiters will have to learn new skills, which according to Javed and Brishti (2020) could be a factor motivating them to be resistant.

Readiness and Willingness of the Organizations

Despite the challenges connected to AI adoption, there is a trend showing that the demand for implementing AI in recruitment processes among organizations is increasing but simultaneously to this few organizations seem to actually be ready to do so. Wright and

Atkinson (2019) write about a study where 84% of the organizations participating believe AI to be a useful tool in recruitment, but at the same time 33% of them state that they are ‘not very prepared’ and 35% ‘not prepared at all to implement it. The same trend can be seen among the respondents in this study with many of them showing interest in implementing the technology, bringing up that their organizations have started discussing it and partly testing it, but at the same time, the respondents stress that their organizations are not completely ready for it yet. One respondent brings up that they believe the readiness, and also willingness, to implement AI differs significantly between different types of organizations.

5.2.4 Potential Risks

The theme Potential Risks focuses on the potential risks and challenges of using AI in the recruitment process, which is of high relevance to discuss due to the fact that the decisions made by AI, or with its help, directly impact and influence people's lives.

One identified risk, both from the respondents and in the literature study, is AI having built-in bias. AI solutions and their algorithms are developed by humans, and learn from inputs provided by humans. Following that humans have both conscious and unconscious biases, there is a risk that these biases are also implemented into AI solutions, having nothing to do with the actual performance of the system which only generates results based on the information it is given (Srirang et al., 2019; Javed and Brishti, 2020). The respondents seem to understand this risk to a certain level with some of them concretely mentioning built-in bias as a problem following that humans develop AI solutions, while some more vaguely express that they are not convinced AI is as objective as people want to make it sound. Some of the respondents emphasize that they are afraid they would miss suitable candidates due to built-in bias in AI and that there is a risk of good candidates being sorted out in the process.

However, one important thing to keep in mind when discussing built-in bias in AI according to the literature review (Wright and Atkinson, 2019), is that with proper knowledge, this bias can be fixed, while a human's own conscious or unconscious biases are very hard to adjust.

Another concern from the respondents’ point of view is how using AI could make the labor market even more homogenous than it is today, stressing that if an AI learns exactly what a “perfect” candidate is, people not fitting into that exact template would stand no chance. One respondent further argues that there is a risk of AI being merciless for candidates lacking a lot of experience due to AI eliminating the “middle-ground” for candidates not entirely matching what is asked for in job descriptions. These risks are not acknowledged in the literature review.

Data Quality

Following that AI uses large amounts of data to achieve results, another risk of implementing it into recruitment processes is the quality of data being used. If the wrong kind of data is used, the AI algorithms will not learn what is expected, and will therefore not help organizations increase the value-creation in their recruitment processes, and in the worst case,

even give unwanted results (Srirang et al., 2019). If, for instance, the data used contains bias, the system will learn this kind of pattern and give biased results as a consequence (Srirang et al., 2019). This data quality risk does not seem to be understood by the respondents to a great extent. When they talk about using large volumes of data and making their decisions more data-based, it is solemnly from an optimistic point of view. If this ignorance comes from a lack of knowledge about data usage in AI, or from the respondents' belief of them having high-quality data to use cannot be assured.

Data Privacy and Ethical Issues

Another risk that the respondents do not seem to be particularly well aware of, but that earlier research highlights connected to the use of AI, is maintaining data privacy and handling ethical issues following the increased possibility to collect personal data and information about people. Both Okolie and Ibrabor (2017), and Van Esch et al. (2019) state this to be one of the most critical challenges of implementing AI in recruitment. The only respondent pointing out this to be an issue needed to take into consideration is one working in a security classed organization, which probably can be explained by the fact that they are forced to keep security aspects in mind in all parts of their job processes. One reason for the remaining parts of the respondents not mentioning data privacy and ethical issues to be a risk could be the fact that they have not implemented AI solutions yet, which could imply that questions on the subject have not yet come to their knowledge.

To minimize risks connected to data privacy and ethical issues, Okolie and Ibrabor (2017) and Omolawal (2015) point out how important it is for organizations to carefully study the impacts, strengths, and weaknesses of systems before they are implemented into their recruitment processes.

Costs for Organizations

Developing and implementing new technologies is never free of charge. Therefore, one last potential risk of implementing AI tools into recruitment processes from an organizational point of view, is the cost of doing so. The literature review initially points out the development of AI tools being costly, but also activities following that such as implementation, integration, and education (Savola and Troque, 2019; Van Esch et al., 2019). This concern can also be seen among the respondents of the interviews. As stated earlier, at the end of the day, the decisions on how to structure their organizations' different processes are based on what fastens their turnovers and increases their profits the most.

5.3 Conclusions

In this section, the answers to the research questions of this thesis are presented.

Identified Challenges

This study shows that the main challenges in recruitment processes today are candidate shortage, distribution of resources, limitations in organizations' ways of working, and

keeping recruitments objective. The results show that the candidate shortage challenge is the most prominent one, and is also affecting the rest to a great extent.

There are several sub-challenges following the candidate shortage according to the results of this study, focusing on time-consuming processes, sourcing of potential candidates, managing employer branding, handling of rejected candidates, and treatment of potential candidates once they are in the recruitment process.

Potential Usage of AI in Recruitment

The results from this study show that artificial intelligence has great potential in helping organizations meet these challenges. First of all, AI has the ability to take over time-consuming and repetitive tasks from recruiters by its capacity to process volumes of information way faster than humans without compromising on the quality of the assessments, enabling recruiters to shift their roles to involve tasks where AI can not yet replace humans. AI also has the ability to broaden the pool of potential candidates helping organizations with their search and sourcing activities. Firstly, this follows from AI's capability to gain a deeper understanding of competences and experiences suitable for job openings through machine learning and deep learning that might have gone unnoticed by only being evaluated by humans. Secondly, it comes from AI's potential to go through large numbers of profiles, for instance on LinkedIn, and find profiles matching the competences and experiences wished for. By using AI to overcome these challenges, recruiters could focus more on the other challenges defined. For instance by putting more of their time into employer branding activities, handling of rejected candidates, and interactions with candidates already in their recruitment processes. However, the use of AI is also beneficial for organizations connected to these challenges. For instance, the results of this study show that using AI can improve potential candidates' views on the organization which in turn increases their employer branding. Regarding the improvement of the handling of rejected candidates, AI has the ability to provide them with continuous interaction throughout the recruitment process, and feedback on what to improve for the future once rejected which increases the chances of them applying to the organization again. With the candidate shortage in the labor market today, this potential is of immense value.

Regarding the challenge of keeping recruitment processes objective and minimizing human biases, the results of this study show that AI has the ability to, even if not completely at least to a great extent, contribute to a solution to this problem. The results show that AI has the possibility to maximize objectivity in recruitment processes but that it is important to keep in mind that there is a risk of human bias being built into the technology. However, AI is not capable of having bias on its own, if any results from AI solutions include biases, these come from the humans behind the technology, and with proper knowledge, this built-in bias can be fixed in contrast to human's own conscious and unconscious biases.

Potential Barriers and How to Overcome Them

From the results of this study, the main barriers and limitations to implementing AI in recruitment processes are technological knowledge among HRM professionals, recruiters'

trust in AI technologies, recruiters seeing AI as a threat toward their profession, organizations not being ready to implement it, and potential risks connected to data quality, data privacy, and ethical issues.

Technological knowledge among HRM professionals and their trust in AI technologies can according to this study seem to be correlated. The lack of technological knowledge about AI among recruiters can be understood to cause trust issues toward the results from AI solutions, which could generate an unwillingness to adopt AI at all. On top of this, if recruiters see AI as a threat toward their profession and as something minimizing the value of their expertise, which is something the results from this study imply, it can increase their unwillingness to implement AI solutions even more. This in turn could lead to a resistance to acquiring underlying knowledge about the technology, which further minimizes their trust in it. As can be understood from this, a risk of a downward spiral appears among recruiters and their attitude toward AI solutions, their trust in the technology, and their (un)willingness to adopt it in today's recruitment field. To enable the implementation of AI in recruitment it is crucial to understand this barrier and figure out ways to break the spiral.

If recruiters had more profound knowledge about ways AI can help them in their recruitment processes, this barrier would not be as prominent. The results of this study show that recruiters do not understand the many areas and ways AI could actually benefit them or in which ways different types of AI could improve their recruitment processes. For instance, analytical AI systems could help them by taking more reliable decisions based on past data, human-inspired AI systems could be of use in helping them analyze interactions and interviews with potential candidates, and humanized AI could be of extensive value for improving their candidate contact throughout the whole recruitment processes. Putting these examples in addition to what is expressed under the potential usage of AI, it is clear that the advantages of implementing AI in recruitment are many, and could help recruiters with the challenges they themselves are pointing out as their main problems today. In other words, recruiters' ability to gain advantages by using AI is limited by their own current knowledge about it and their willingness to acquire knowledge moving forward. However, the recruitment field is changing, and a clear shift toward implementing AI into its processes can be seen from the results in this study, which implies that recruiters will not have a choice to get on board or not if they want to stay relevant.

The barrier stated as organizations' readiness to implement AI could be argued to most likely be overcome more or less by itself following that the necessity of implementing AI will increase as more organizations are doing so as a consequence of the escalated competition for skilled employees. The results from this study show that the transformation of the recruitment field to become more AI-based has already started, which in turn implies that organizations will have no other choice than to enable and encourage the adoption and implementation of AI technology into their processes.

The potential risks connected to data quality, data privacy, and ethical issues can be seen as barriers not directly affecting the implementation of AI in recruitment per se but rather

aspects important for organizations and other actors to consider once the implementation starts. The actors developing and using AI technologies have a great responsibility to assure these risks are under control.

Final Conclusion

The research objective of this thesis is *to examine and analyze where in recruitment processes it is favorable for organizations to use artificial intelligence, why that might be the case, and how it can be done.*

To answer this research objective: In recruitment processes, it is most favorable to use artificial intelligence for tasks where its abilities exceed humans. Following the results from this study, these are time-consuming and repetitive tasks in the recruitment stage, the applicant pool stage, and the selection stage of the recruitment process. Implementing AI into these stages will increase organizations' competitive advantage in the competition for the best candidates in the labor market. With today's candidate shortage, this advantage could be a key aspect of if an organization manages to stay on the market, or if it becomes outcompeted. To enable the implementation of AI into their recruitment processes, organizations need to actively encourage the acquisition of knowledge about the technology among their HRM professionals, because without their understanding of the underlying technology, how to work with it, and how it benefits them, the prominent advantages of it can not be achieved by the organization.

For a long time, it has been stated that artificial intelligence is the future, but it seems that the future has already started, and to not stay in the past, organizations need to get on board. In the introduction, the quote "An organization is only as strong as its people" was presented. Following the results from this study, this can be argued to still be partly true, but not completely. An updated phrasing should be: An organization is only as strong as its people, its technological tools, and their ability to create value together.

5.4 Limitations

The original plan of this study was to first answer the research objective that has been done in this thesis, and following that, additionally verify it by using quantitative data collected with the help of the company this study is done in collaboration with. Unfortunately, this quantitative data does not exist yet which was not understood at the beginning of this study. Few of the organizations contacted throughout this study save information linked to their recruitment processes, according to them, once a recruitment is done they simply move on to the next one. Meanwhile, the implementation of AI solutions into recruitment processes would lead to more information being available connected to recruitments, but as mentioned earlier in this thesis, organizations in Sweden are not using AI to a great extent yet. Once AI is more of a standard in recruitment, there will be more data available to help analyze both challenges and opportunities.

For instance, if large data sets existed connected to recruitment processes and final hiring decisions, it could, by using this, be verified if the challenge of keeping recruitment processes objective is true or not. Subsequently to this, AI solutions for the verified challenges could then be presented, and it could be more in-depth explained how they help solve said challenges.

However, the results from this study, to a great extent, agree with what earlier research has shown on the matter, which in turn verifies the results of this study. For instance, the challenge of time-consuming and repetitive tasks identified from the results of this study is also identified by Hmoud and Laszlo (2019), Savola and Troque (2019), and Upadhyay and Khandelwal (2018), and with the knowledge of AI's ability to process large volumes of data, and make decisions based on it (Jarrahi, 2018; Kaplan and Haenlein, 2019a; Russel and Norvig, 2010), it can be verified that AI can actually be used to help solve this type of challenge. Another example is the challenge of keeping recruitment processes objective. From the results of this study, it is clear that this challenge exists in the Swedish recruitment field, and it is also brought up in a global context by earlier research (Crawshaw et al., 2014). From earlier research, it is known that by using AI in recruitment, human biases are minimized (Bhalgat, 2019; Michailidis, 2018; Van Esch et al., 2019) which verifies that it helps solve this identified challenge.

Given this, due to the limitations of quantitative data available for this study, the verification of the results drawn from the qualitative data can not be shown through a quantitative analysis. However, by drawing results and conclusions from earlier research on the same subject, the conclusions of this study can still be substantiated.

5.5 Suggestions for Future Research

This study lays a foundation for understanding the main challenges in recruitment processes today, how AI can help overcome these challenges, and potential barriers preventing AI from doing so. The results of this study imply that due to the increased competition for skilled employees following the candidate shortage in the labor market, AI will make its way into the recruitment field. Once AI is more of a benchmark in the recruitment field, an interesting topic for future research would be to examine which type of AI solutions are creating the most value for organizations. In addition to this, it would be of significance to gain insights into how satisfactory the hires done with the help of AI solutions are compared to the ones solemnly done by humans, both from a value-creating point of view, but also from a human perspective.

One of the delimitations of this study is to only take the stages of the recruitment process connected to recruitment and selection into consideration. Therefore, a suggestion for future research that could be of interest is to examine and analyze the opportunities and difficulties of applying artificial intelligence in other stages of the recruitment process.

Furthermore, seeing how important HRM professionals' technological knowledge, their attitudes and trust toward AI are for AI implementations to be successful, how these factors could be improved is undoubtedly a subject for future research.

Lastly, looking further into the future, AI might have the ability to replace all human involvement in recruitment, leading to even more augmented questions to be considered, both from technological and non-technological standing points. What happens if all human interactions in recruitment are replaced by technological solutions? How does this affect us as humans and as a society? How does it affect organizations? What happens with the HRM professionals if their expertise is no longer needed? Is there a potential for AI to solve the candidate and competence shortage of the market by automatically matching people to jobs they are best suited for and are what they are best suited for what they want to work with?

References

- Alan, N., Marian, B., Jane, C., Shields, J. (2016), *Human Resource Management*. 9th ed. Cengage Learning Australia: Melbourne.
- Anderson, N. (2003), "Applicants and recruitments' reactions to new technology in selection", *International Journal of Selection and Assessment*, Vol. 2, No. 5, pp. 121-136.
- Anderson, P., Tushman, M.L. (1990), "Technological Discontinuities and Dominant Designs: A Cyclical Model of Technological Change", *Administrative Science Quarterly*, Vol. 35, No. 4, pp. 604-633.
- Andersson, G., Hallén, N., Smith, P.J. (2016), *Rekrytering och urval: Teori och praktik*. Studentlitteratur AB: Lund.
- Armstrong, M. (2009), *Armstrong's handbook of human resource management practice*. 11th ed. Kogan page: London.
- Bhalgat, K.H. (2019), "An Exploration of How Artificial Intelligence Is Impacting Recruitment and Selection Process", *Dublin Business School*: Dublin.
- Bhupendra, S.H., Swati, G. (2015), "Opportunities and challenges of e-recruitment", *Journal of Management Engineering and Information Technology*, Vol. 2, No. 2, pp. 1-4.
- Bratton, J., Gold, J. (2012), *Human Resource Management: Theory & Practice*. 5th ed. Palgrave Macmillan: London.
- Breaugh, J.A. (2008), "Employee Recruitment: Current Knowledge and Important Areas for Future Research", *Human Resource Management Review*, Vol. 18, No. 3, pp. 103-118.
- Burton-Jones, A. (2001), *Knowledge Capitalism: Business, Work, and Learning in the New Economy*. E-book doi: 10.1093/acprof:oso/9780198296225.001.0001. Oxford University Press: Oxford.
- Boudreau, J. (2014), "Smart Machines: The New 'Human' Capital?" . [online]. Available at: <https://www.cfo.com/accounting-tax/2014/12/smart-machines-new-human-capital/> [Accessed 23 May. 2022].
- Campeato, O. (2020), *Artificial Intelligence, Machine Learning, and Deep Learning*. Dullas, VA: Mercury Learning & Information LLC.
- Crawshaw, J.R., Budhwar, P., Davis, A. (2014), *Human Resource Management: Strategic & International Perspectives*. 1st ed. Thousand Oaks, CA: SAGE Publications Inc.

David, M., Sutton, C.D. (2016), Samhällsvetenskaplig metod. Studentlitteratur AB: Lund.

Dhande, M. (2017), What is the difference between AI, machine learning and deep learning. [online]. Available at: <https://www.geospatialworld.net/blogs/difference-between-ai%EF%BB%BF-machine-learning-and-deep-learning/> [Accessed: 23 May. 2022]

Faerber, F., Weitzel, T., Keim, T. (2003), “An Automated Recommendation Approach to Selection in Personnel Recruitment”. AMCIS 2003 Proceedings, 302.

Fernández, C., Fernández, A. (2019). “AI in Recruiting Multi-Agent Systems Architecture for Ethical and Legal Auditing”, Proceedings of the Twenty-Eighth International Joint Conference on Artificial Intelligence (IJCAI-19), pp. 6428-6429.

Fombrun, C.J. (1984), Strategic Human Resource Management. John Wiley Publishing: New York.

Geetha, R., Reddy, D.B.S. (2018), “Recruitment through artificial intelligence: A conceptual study”, International Journal of Mechanical Engineering and Technology (IJMET), Vol. 9, No. 7, pp. 63–70.

Grosan, C., Abraham, A. (2011), Intelligent Systems: A Modern Approach. 17:th ed. Springer-Verlag: Berlin.

Han, D. (2020), “The Rose: Artificial Intelligence in the Current Hiring Process”, Marriot Student Review, Vol. 3, No. 3, pp. 20-23.

Hmoud, B., Laszlo, V. (2019), “Will Artificial Intelligence take over Human Resources Recruitment and Selection?”, Network Intelligence Studies, Vol. VII, No. 13, pp. 21-30.

Jarrahi, M.H. (2018), “Artificial intelligence and the future of work: Human-AI symbiosis in organizational decision making”, Business Horizons, Vol. 61, No. 4, pp. 577-586.

Javed, A., Brishti, J.K. (2020), “The Viability of AI-based Recruitment Process - A Systematic Literature Review”, Department of Informatics, Umeå Universitet: Umeå.

Kaplan, A., Haenlein, M. (2019a), “Siri, Siri, in My Hand: Who’s the Fairest in the Land? On the Interpretations, Illustrations, and Implications of Artificial Intelligence”, Business Horizons, Vol. 62, No. 1, pp. 15–25.

Kaplan, A., Haenlein, M. (2019b). “Rulers of the World, Unite! The Challenges and Opportunities of Artificial Intelligence”, Business Horizons, Vol. 63, No. 1, pp. 37-50.

Kerrin, M., Kettley, P. (2003), e-Recruitment: Is it Delivering?, Report 402, The Institute for Employment Studies: Brighton.

Kumar, C.GN. (2018), Artificial Intelligence: Definition, Types, Examples, Technologies. A Medium Corporation. [online] Available at:
<https://chethankumargn.medium.com/artificial-intelligence-definition-types-examples-technologies-962ea75c7b9b> [Accessed: 15 Mar. 2022]

Lindmark, A., Önnévik, T. (2011), Human Resource Management: Organisationens hjärta. 2nd ed. Studentlitteratur AB: Lund.

Mathis, L.R., Jackson, H.J. (2006), Human resource management. 11th ed. South Western Corporation: USA.

McCarthy, J. (2007), "What is Artificial Intelligence?", Computer Science Department, Stanford University: Stanford.

Michailidis, M.P. (2018), "The Challenges of AI and Blockchain on HR Recruiting Practices." The Cyprus Review, Vol. 30, No. 2, pp. 169-180.

Nawaz, N., Gomes, A.M. (2019), "Artificial Intelligence Chatbots Are New Recruiters", International Journal of Advanced Computer Science and Applications, Vol. 10, No. 9, pp. 1-5.

Okolie, U.C., Irabor, I.E. (2017), "E-Recruitment: Practices, Opportunities and Challenges", European Journal of Business and Management, Vol. 9, No. 11, pp. 116-122.

Omolawal, S.A. (2015), "E- recruitment: practices, benefits and challenges", Journal of the Institute of Personnel Management of Nigeria, Vol. 7, No. 2, pp. 76-86.

Regeringskansliet (2019), Artificial intelligence will strengthen Sweden's welfare and competitiveness. [online]. Available at:
<https://www.government.se/articles/2018/03/artificial-intelligence-will-strengthen-swedens-welfare-and-competitiveness/> [Accessed 8 Feb. 2022].

Reilly, P. (2018), "The impact of Artificial Intelligence on the HR function" in: Institute for employment studies (Red.), Which way now for HE and organisational changes?. Institute for employment studies: Brighton.

Robertson, I.T., Smith, M. (2001), "Personnel selection", Journal of Occupational and Organizational Psychology, Vol. 74, No. 4, pp. 441-471.

Russell, S., Norvig, P. (2010), Artificial Intelligence: A modern Approach. 3rd ed. Pearson Education Limited: Boston.

Savola, H., Troque, B. (2019), *Recruiters Just Wanna Have...AI? Implications of Implementing AI in HR Recruitment*. Linköpings Universitet: Linköping.

Sekhri, A., Cheema, J. (2019), "The new era of HRM: AI reinventing HRM functions", *International Journal of Scientific Research and Review*, Vol. 07, No. 3, pp. 3073-3077.

Srirang, K.J., Shweta, J., Manoj, K.G. (2020), "Leveraging Artificial Intelligence for Effective Recruitment and Selection Processes", *International Conference on Communication, Computing and Electronics Systems*, pp. 287-293.

Stoilkovska, A., Ilieva, J., Gjakovski, S. (2015), "Equal employment opportunities in the recruitment and selection process of human resource", *UTMS Journal of Economics*, Vol. 6, No. 2, pp. 281-292.

Svenskt Näringsliv (2022), *Rekryteringsenkäten 2021/2022: Växande rekryteringshinder ett allt större problem*, Svenskt Näringsliv: Stockholm.

Thebe, TP., Van der Waldt, G. (2014), "A Recruitment and Selection Process Model: The case of the Department of Justice and Constitutional Development" *Administration Publica*, Vol. 22, No. 3, pp. 6-29.

Upadhyay, A.K., Khandelwal, K. (2018), "Applying Artificial Intelligence: Implications for Recruitment", *Strategic HR Review*, Vol. 17, No. 5, pp. 255–258.

Van Esch, P., Black, J.S., Ferolie, J. (2019), "Marketing AI recruitment: The next phase in job application and selection", *Computers in Human Behavior*, Vol. 90, pp. 215-222.

Wright, J., Atkinson, D. (2019), "The Impact of Artificial Intelligence within the Recruitment Industry: Defining a New Way of Recruiting", *Pearson Business School*, London: London.

Appendix A

Interview Questions

1. Ger du ditt medkännande till att denna intervju spelas in och senare transkriberas?
 - Om nej: Ger du ditt medkännande till att denna intervju dokumenteras genom skrivna anteckningar?
2. Berätta om din yrkesroll
 - Vad är dina arbetsuppgifter och/eller ansvarsområden?
 - Har du studerat för att hamna i den här rollen eller “learning-by-doing”?
 - Om studerat: Vad har du studerat?
 - Hur länge har du arbetat inom HRM/med rekrytering?
 - På företaget du är på nu?
3. Vilka aktiviteter/delar består er rekryteringsprocess av?
4. Hur ser arbetsfördelningen ut gällande rekrytering där du arbetar nu?
 - Hur många personer är ni som arbetar med rekrytering?
 - Vilka roller och/eller ansvarsområden har ni?
 - Hur många personer på de olika rollerna?
5. Vilka utmaningar ser ni kopplat till er rekrytering?
 - Kopplat till vilka delar av rekryteringsprocessen?
 - Vilka är era största flaskhalsar?
 - Vart lägger ni mest arbetskraft/timmar/resurser?
6. I vilka delar av rekryteringsprocessen använder ni er av artificiell intelligens och/eller automatiseringslösningar?
7. Kan du beskriva dessa lösningar?
8. Hur mycket hjälp tycker du att du som rekryterare får av dessa lösningar?
 - Använder du dem?
 - Varför/varför inte?
 - Litar du på resultaten?
 - Varför/varför inte?
 - Dubbelkollar du resultaten?
 - Hur påverkas din yrkesroll av dessa lösningar?
 - I nutid? I framtiden?
 - Hur förändrar de kraven på dig som rekryterare?

- Hur fördelar du din tid innan vs. efter implementering av dessa lösningar?
9. Hur skulle du säga att inställning till artificiell intelligens och andra automatiseringslösningar kopplat till rekrytering är bland rekryterare (och övriga) på företaget?
 10. Vad är din inställning till användande av artificiell intelligens inom rekrytering generellt?
 - Fördelar?
 - Utmaningar?
 11. Finns det delar inom rekrytering där du tror att människor inte kommer kunna ersättas?
 - Om ja: Vilka och varför?
 - Om nej: Varför?
 12. Om du fick drömma totalt fritt kring en rekryteringslösning artificiell intelligens skulle kunna bidra med, vad hade du önskat dig då?
 - Varför den typen av lösning?
 - Varför kopplat till den delen av rekryteringsprocessen?
 13. Det var alla frågor från mitt håll, har du några frågor eller funderingar till mig?
 - Någonting du känner att du vill addera till dina tidigare svar?
 14. Ifall det skulle vara så att jag har en följdfråga efter transkribering av intervjuerna, får jag kontakta dig då?

Tack för din tid och dina värdefulla insikter!