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Companies' Approach to Digitalization in the Recruitment Process

A multiple case study on Swedish firms

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ABSTRACT

Currently companies' HR departments find themselves in a rapidly changing technological environment due to the changes driven by digitalization. Digital tools that support the recruitment process are constantly increasing and the technologies on which they are based are becoming increasingly reliable.

This master thesis aims to understand how HR managers in Swedish companies approach themselves to this digital change and the reasons for this approach, investigating the advantages/disadvantages and opportunities/challenges involved.

The research data were collected in 2020 by interviewing four HR managers from four Swedish companies. They manage the processes related to the approach that the thesis seeks to find. The data were processed using a comparative case study methodology so that the results could be generalized.

In spite of the diversity among the companies interviewed, interesting generalizable results have been found. In Sweden companies, although they are in a highly digitalized country, still do not use new technologies such as AI or Big Data in their recruitment process. They rely heavily on web-based platforms such as ATS (Applicant Tracking System) and social media. Only larger and developing companies are testing other technologies.

Moreover, to justify this choice, a number of advantages and disadvantages of using such digital tools in the recruitment process have been identified. Common advantages such as the increased speed of the process and the lower cost of operations emerged, and other interesting ones include the unexpected advantage of creating an inclusive and cyber-protected environment. The disadvantages, however, were not much emphasized; only the risk of dehumanization that digitalization brings has mainly been underlined. In addition to this, companies in Sweden do not believe much in a total automation of recruitment activities, still giving much weight to human rationality.

Key Words: recruitment process, recruitment methods, digitalization, drivers of digitalization, IT development, artificial intelligence, social media.

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How can I not thank my fellow Swedish adventurers as well. Without you I couldn't have done it, you made the black days brighter. I'm sure we'll meet again someday!

A thanks also goes to all my lifelong friends who have always followed my adventures from afar. I hope you will continue to cheer for me on my next experience.

To Anita, inspiring muse. You have always been with me, despite the miles, despite the borders, despite the difficulties. You are in my heart.

And so the curtain falls on this path. *"It's the end of an era"* I heard someone say. I can't know that. I've always lived life as it came. I've never made plans, but I've always dreamed. I've listened to everyone's advice, but I've always made my own plans. I didn't get along with so many people, but I always respected everyone. And that makes me prouder than anything else.

I never liked greetings. They make me melancholy. That's why I want this to be a wish more than a goodbye. I hope I can live as I have always done until now, waiting for the first move of fate but always with the freedom to go against it...

Göteborg, 7th June 2020

Roberto

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LIST OF ABBREVIATIONS

- AGV Automated Guided Vehicles
- AI Artificial Intelligence
- ATS Applicant Tracking System
- CRM Customer Relationship Management
- CV Curriculum Vitae
- FTK First To Know
- GDPR General Data Protection Regulation
- HR Human Resources
- HRM Human Resources Management
- HR Human Resources
- ICT Information and Communications Technology
- IT Information Technology
- SMACIT Social Mobile Analytics Cloud Internet of Things
- SWOT Strengths Weaknesses Opportunities Threats
- KPI Key Performance Indicator

1. INTRODUCTION

The following introduction aims to make the reader aware of the theoretical context underlying the topic of this thesis. First an overview of the research area with a brief explanation of the main concepts is given and then the discussion of the problem is presented. This will explain the objective of the research and outline the research questions. Finally, the limits of the study are also presented.

1.1 Background

It is clear that in recent years markets and companies are digitalizing, bringing radical changes in their processes and their relationship with people. Underlying these changes are often the development of computer platforms and software, rather than physical innovations.

Digitalization is a very broad concept defined by different definitions and is often interpreted subjectively by people. Summarizing the different perspectives, digitalization can be defined as the use of digital technologies within the business in order to create value for the company *(Gartner, 2016; Ismail et al., 2017)*. Moreover, the concept of digitalization should not be confused with that of digitization. Indeed, the latter could simply be defined as the encoding of analogical information into digital format *(Yoo et al., 2010)*.

Among the main concepts related to digitalization are its technological drivers. In particular technologies such as IT development, social media, big data analytics and artificial intelligence drive the rapid development of this phenomenon *(Ross et al., 2016; Sebastian, et al. 2017)*. The use of these technologies, individually or in a combined way, is literally revolutionizing the way of doing business and in particular some sectors and departments *(Degryse, 2016)*. There are numerous advantages deriving from their use and their continuous improvement could have enormous potential, especially from the point of view of streamlining operations *(Fitzgerald et al., 2014; Degryse, 2016; Bughin et al., 2017)*. On the contrary, however, there are some drawbacks, mainly from an ethical point of view (*Degryse, 2016; Bughin et al., 2017*). In fact, in the common mind there is a growing fear that digitalization could lead to a growing and complete replacement of human interactions with virtual ones *(Degryse 2016)*.

Strongly related to human interactions is the HR department of a firm. In an increasingly competitive and globalized environment, it is essential for a company to obtain the best possible human resources *(Newell, 2005)* but also to adopt new technologies in order to outperform competitors. Therefore, as in all departments, also the HR one is forced to an incremental digitalization. In particular, the

recruitment process is being affected by the phenomenon, where the relationship between a potential employee and an employer has changed, almost totally eliminating (at least in the first phase of the process) physical interaction between people. This means an ongoing change in the HR department, especially in the recruitment practices.

The recruitment process has already undergone a radical change in the early 1990s and early 2000s thanks to the use of the Internet. It has significantly reduced the time and cost of some of the recruitment phases and has driven growth in the use of job portals and corporate websites *(DeCenzo & Robbins 2009)*. Moreover, in recent years the development of the specific technologies mentioned above has allowed a further change in the HR sector. The use of new digital tools has changed all the phases of recruitment, from attraction to research to selection *(Searle, 2006)*.

The advantages that HR departments benefit from the adoption of such tools are countless, but also leave room for intriguing threats. Indeed, while technologies such as social media, big data and artificial intelligence are able to find the best candidates at low cost, in a short time and in a perfectly rational way, they have serious limitations, being developed by the fallible human being *(Nabi et al., 2017; Wołodźko and Woźniak, 2017, Álvarez, 2012)*. But not only the possible mistakes that computers could make in recruitment, the problem is also from an ethical point of view since it tends to robotize the most human among the activities of an organization *(Kaplan & Haenlein, 2019)*.

1.2 Problem Discussion

Considering the growing importance for a company to recruit the best talent in circulation and the very rapid evolution of digital technologies that support this purpose, it still seems unclear how most companies use these tools, at what stages and with what frequency. There is therefore a lack of a real picture of what the benefits and challenges companies are experiencing from approaching these digital software.

In this way, it seems interesting to get to the bottom of this lack and understand what the companies' approach to digitalization is to implement their recruitment process. A preliminary analysis was conducted regarding how HR departments have reorganized/are reorganizing their operations in order to exploit digital technologies. But this is not credible enough if not actually tested with company testimonials. The question is whether those managing these departments are aware of the positive opportunities and in what extent and how firms are adopting digital technologies to improve their processes. In fact, the topic has been mainly addressed by international digital giants, but not much is known about "normal" companies.

In order to fill this gap, the author with the help of First to Know Scandinavia AB, a consultancy company located in Gothenburg, decided to compare 4 Swedish-based companies: Volvo Cars, Company X, Göteborg Energi and Company Y (two companies preferred to not be mentioned in the study). The companies were chosen thanks to the advice of FTK who believed that they could fully respond to this research. Despite the problems encountered in the selection of the sample of companies (discussed in more detail in paragraph 1.4 and 3.2.2) these companies operate in different sectors and with different business models so the study aims to understand how digitalization in the recruitment process is perceived and developed depending on the different business scenarios. In particular, companies of different sizes (although considered large) and also companies with a public character alongside private ones have been intentionally included in the search.

1.3 Purpose and Research Question

The ultimate goal of this research is to provide an academic contribution to the real weight that organizations give to digitalization during their recruitment processes. This study aims to find out how the companies surveyed are approaching digital development in the tools used for the recruitment process and what advantages and disadvantages they perceive from their use. In addition, the author aims to gather the views of HR representatives on the opportunities, challenges and future expectations of their department affected by digitalization.

In other words, the contribution of this study lies in the attempt to gather practical companies' perceptions about the extent to which their recruitment process has been impacted by digital transformation and how this is happening. As said before, differences between companies are included in the research in order to understand how the possibility of using digital tools for the recruitment process varies depending on the type of firm.

Consequently, the main research question and sub-questions are defined as follows:

1. ***How are companies approaching digitalization in the recruitment process?***
2. *What are the main perceived advantages/disadvantages of adopting digital solutions in the recruitment process?*
3. *What are the future perspectives/challenges for the use of digitalization in the recruitment process?*

Obviously the 3 questions are interrelated. The author starts from the main question which is about the current approach of companies to the phenomenon. After a description of this, in order to fully understand the reasons for their ways of doing the author investigates their perceptions of current benefits/risks compared to future ones, in order to fulfill their view of the topic.

1.4 Limitations

The limitations of this thesis are mainly related to the geographical location where the author was located, the limited time to carry out the work and the health emergency that involved the world in 2020 and affected some technical aspects of the research.

As far as the geographical limitation is concerned, the fact that the research was carried out in Sweden affected the research from several points of view. First of all, the author could not benefit of an extensive network of contacts, because Sweden is not his country of residence. This means that the research was limited by the few contacts gathered and did not meet the ideal target of the initial idea. Moreover, the current geographical location together with the health emergency and the limited time, restricted the movements of the author. This is why the research is limited to the study of companies based in Sweden.

The health emergency instead refers to the COVID-19 pandemic that has hit the world. This global emergency has forced the closure of many countries and from the point of view of firms a strong corporate reorganization. That is why it was very difficult to reach the HR departments of the companies during the second part of the research, which, being very busy to deal with the emergency, were not very willing to attend the scheduled interviews. Also for this reason, the research was conditioned by a poor choice of the type and number of companies.

There are also limits in the research method used. Indeed, the case study, in order to strengthen the validity of the study, requires the collection of other evidence in addition to interviews, such as internal documents and specific company reports. None of the representatives interviewed granted the availability of this material, so the only company information refers to public information on the websites and public reports. Therefore, the research is limited to a comparison of configurations that compares empirical findings with existing literature and public information.

Notwithstanding this, taking into account the purpose of this research and the limitations explained above, the results obtained from the data collection were analyzed with the greatest commitment in order to provide a comprehensive conclusion and a valid answer to the research question.

1.5 Thesis Disposition

Introduction
• Presentation of the background; problem discussion; aim of the study and research questions; limitations
Literature Review
• Presentation of theory related to recruitment, digitalization and the expoitation of digital technologies for recruitment process
Methodology
• Outline of the research strategy; research design; research method; presentation of data collecition; analysis' methods; research quality
Empirical Findings
• Presentation of data collected with the interviews and in companies' websites
Analysis of Findings
• Analysis of the findings collected with literature review
Conclusions
• Presentation of final conclusions of the study and answer to the research question and sub-research questions; theoretical and managerial implications; suggestions for future research

Table 1. Thesis Disposition

2. LITERATURE REVIEW

In this chapter are presented the theoretical concepts connected to the context of this study. Firstly, an explanation about recruitment process, its relationship with Human Resources Management (HRM), its phases and methods are provided. Afterwards, the concept of digitalization is presented as an external phenomenon that is affecting and changing enterprises. Finally, it is delineated how digitalization is affecting recruitment process according to previous studies.

2.1 Recruitment

2.1.1 Recruitment in an HRM context

Human resource management (HRM) is the practice of recruiting, hiring, deploying and managing an organization's employees. HRM is simply and commonly known as human resources (HR): this department is responsible for creating, implementing and supervising the policies that govern workers and the organization's relationship with its employees.

Recruitment is the first and a fundamental phase of the HRM and, according to the resource-based view of HRM (*Boxall, 1996*), a good and right recruitment gives the company the opportunity to gain competitive advantage through the acquisition and retaining of best talents. Recruitment process is often understood only as the ability to match the right individual with the right job (*Newell, 2005*). Instead, the value of employees lies not only in their talent and knowledge, but in all the resources they can provide to the company (*O'Meara & Petzall, 2013*): contacts, networks, experiences. And nowadays, with an increasingly competitive and globalized environment, it is essential for a company to obtain the best possible resources *(Newell, 2005)* in order to outperform its competitors. This is why recruitment is considered a crucial phase of HRM.

In the HR management it is essential to assess the role that recruitment plays in the brand image of the company and vice versa: indeed, the relationship between the two things is bilateral (*Ambler & Barrow, 1996*).

A strong employer's brand image certainly attracts more candidates, which implies having to reorganize the recruitment process in order to deal with a large number of candidates (*Valvisto, 2005*). At the same time during the recruitment process, recruiters must behave in a way that reflects the corporate culture and image of the organization. This is exactly what *Järvinen & Korosuo (1990)* say stating that "*recruitment and implementation of the recruitment process strongly transmit the corporate image of the organization*".

2.1.2 Recruitment Process

After explaining which macro-area the recruitment is in, it is important to define exactly what this process is and what steps it consists of.

First of all, you should ask yourself when and why you need recruitment: it is necessary to fill the lack of people in certain company roles *(Carey, 2011)*. Or as *Sarma (2008)* says, recruitment does not occur only when there is a lack of staff, but also when the company wants to adopt different strategies and achieve long-term sustainable development.

To find a definition of recruitment one would have to look back many centuries as this word was first used in military organisations (*Markkanen, 1999*). If we contextualize the definition within the corporate organization, however, the discussion changes: studies conducted by *Snow and Snell (1993)* show that organizations started to give importance to the recruitment process only when organizations started to become bigger and bigger and to present more and more specific tasks. This moment coincides with the Industrial Revolution: this is the origin of the first recruitment theories, before which the process was carried out simply based on feelings and knowledge, not following any rules *(Markkanen, 2002)*. In *1985 Lewis* gave a precise definition that still encompasses the essence and function of the recruitment process: *"recruitment can be defined as the activity that generates a pool of applicants, who have the desire to be employed by the organisation, from which those suitable can be selected"*. This definition is not a foregone conclusion as it emphasises the function of recruitment to create engagement and enthusiasm in potential employees, in addition to research people activities. In fact, this is the feature that allows HRM to achieve its ultimate goal which is to find the right person for the right job position (*Hartley, 2005*).

Hartley (2005) itself defines the concept of recruitment within a 4-step process:

1. Estimate and evaluate the number of possible new employees who will make the application.
2. Seek and find suitable solutions to develop jobs that encourage diversity and multiculturalism in the organization.
3. Recruitment proper, the process of attracting individuals whose skills match the job description offered.
4. The selection, in which the firm hires or discards candidates suitable for the organization.

Focusing on point number 3, it can in turn stand out in a further 4 stages: recruitment objectives, strategy recruitment, recruitment activities, recruitment results *(Breaugh et al., 2008).* The outline below sorts and explains these steps clearly and succinctly.

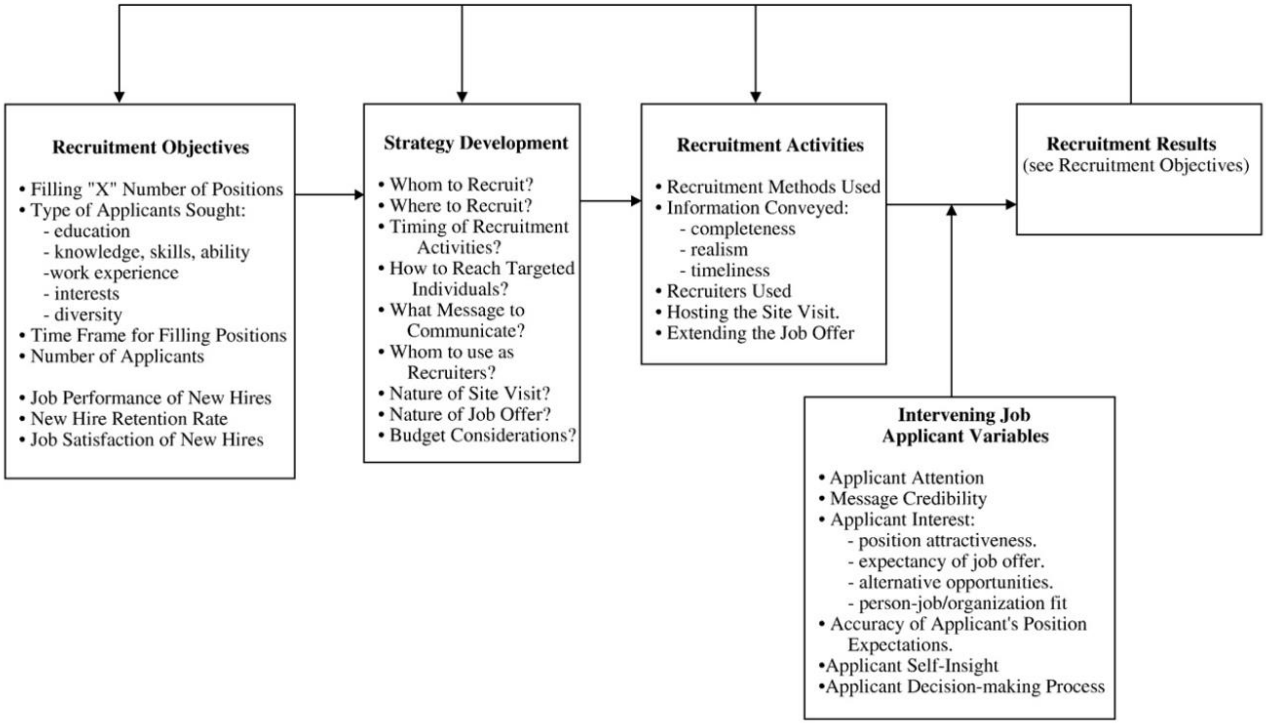

Figure 1. A model of the recruitment process *(Breaugh et al., 2008, 104)*.

As shown in *Figure 1*, the process begins with the definition of some recruitment objectives. Of course, it is necessary to first define the number of positions that need to be filled. Then we move on to establish the main characteristics that the candidate must have in order to fill certain roles. These are just two examples of recruitment objectives that are pre-hire in nature. In the graph it can be seen other examples of post-hire targets (e.g. new hire retention rate).

After setting the main objectives to be pursued, it is important to develop a strategy consistent with them. In *Figure 1* we can see some of the questions around which to develop a strategy, among which the choice of the message to communicate is crucial: this concept introduced by *Lewis* in *1985* is more relevant than ever, since nowadays potential candidates are very often attracted by the brand image of the firm and by its values and messages that it communicate to the public.

Having decided on all the characteristics of which the strategy is composed, the recruitment process moves on to the choice of recruitment activities. This is a fundamental step in the recruitment process because it has a major impact on the selection of talent and is the one that has been most transformed in recent years by technology. Infinite methods of recruitment exist, whether exclusively human or mixed with technology. And in turn the systems, software, technologies used and assessments proposed are always varied. At the same time recruitment activities can be carried out by specialists

inside or outside the company. So, it can be said that there are guidelines for coordinating recruitment activities, but not standardised procedures for these operations *(Breaugh & Starke, 2000)*.

The last stage of the recruitment process concerns the evaluation of the results of the activities carried out so far. In particular, it is useful to compare the outcomes obtained with the objectives set at the beginning of the process, to verify that they have been pursued correctly. If the results are not in line with the required objectives, the strategy should be reviewed so that the employer can learn from his mistakes and develop a better recruitment process *(Breaugh et al., 2008)*.

Finally, the importance of the *"Intervening Job Applicant Variables"* box *(Figure 1)* should not be underestimated. *Breaugh et al. (2008)* think that some variables are often left out of the process analysis. Instead they are very important precisely due to the variability of the recruitment process, which needs to be evaluated differently depending on the perspective from which it is seen. The author gives the example of companies that want to attract the attention of people who are not actively looking for work: in that case the variables suggest to the HR department that common recruitment methods will probably not be effective. Another factor of variability could be related to whether recruitment is internal or external, which is discussed in the next paragraph.

2.1.3 Recruitment Methods

Different recruitment methods and practices can be identified *(Marsden & Campbell, 1990)*, which may vary depending on their formality, structure and use of resources.

The first relevant distinction is between formal and informal recruitment.

In the first type a fundamental role is played by the channels (physical or virtual) between the company (employer) and the potential candidate *(Marsden, 1994)*. These intermediation channels make it possible to connect and link the two parties in a formal way and in accordance with certain protocols: exhaustive examples are advertisements written in newspapers (less and less frequent) or on the Internet (using various types of platforms).

In the latter case, instead, they are individuals themselves, such as current employees or people close to the company, who play a decisive role. Job opportunities are disseminated through interpersonal channels (very common in Sweden) in the form of recommendations or headhunting *(Behtoui, 2008)*.

The second important distinction is the use by organizations of internal or external recruitment methods *(Sarma, 2008; Rao, 2009; Rashmi, 2010)*.

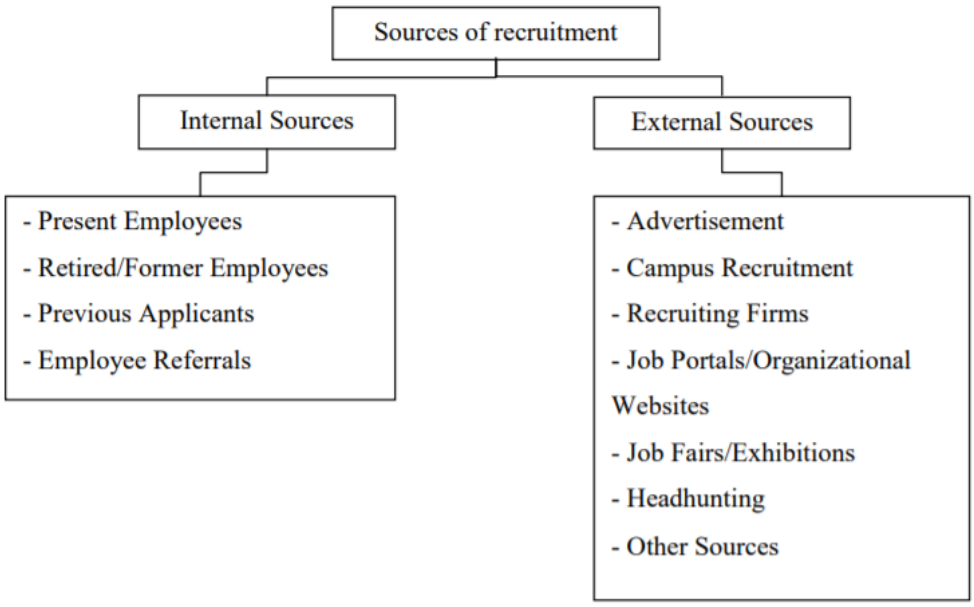

Figure 2. Recruitment sources *(Rao, 2009, 100).*

As shown in *Figure 2* the former type of sources includes, for example, internal promotions of present employees, the latter the search for new talent through different channels. Almost always a company uses both ways *(Rao, 2009).*

Formal and Informal Recruitment

It was already mentioned the distinction between formal recruitment methods, in which the candidate uses material or virtual channels to reach the employer, and informal methods, in which the bearer of the candidate's interests is a person connected in some way to the company (*Marsden, 1994; Behtoui, 2008)*. However, their characteristics are described in detail below.

Formal recruitment methods have the peculiarity of being public. An advertisement, whether it is published in newspapers or on digital platforms connected to the company, can theoretically reach all those who might be interested and suitable and it results in a high response from candidates. This leads to advantages and disadvantages. The high number of candidates allows a very heterogeneous pool of applicants to be created, in which the team of recruiters will then have a wide choice to decide which candidate is best suited to the position offered (*Marsden, 1994)*. On the contrary, there will be a huge amount of data and information to analyze, screen and manage, which will result in a loss of money and time for the firm. Furthermore, as considered by *Breaugh (2008)* in the analysis of the variables related to the recruitment process, informal recruitment methods lead to the disadvantage of creating a lack of attractiveness for those who are not actively looking for a job.

On the other hand, the main characteristics of informal methods are their privacy and immediate effectiveness. In this way a candidate who is introduced to an employer in a direct way "jumps the queue" and avoids HR managers to screen a long series of candidates, wasting time and money. This represents a bilateral advantage, both for the candidate and employer. At the same time, the immediacy of this method has one disadvantage: it prevents the company from being able to choose from a more varied pool of candidates, where it can find the perfect candidate for the vacancy (*Marsden, 1994)*. Not always the candidate who is recommended with these informal methods represents at most what the firm is looking for, he often meets the employer for reasons of kinship or friendship. Moreover, today the recommendation is seen as a negative phenomenon by society, which goes to discredit both those who get a job thanks to this method and the company that adopts it *(Behtoui, 2008)*.

However, for the sake of clarity it's important to add that the relevant literature on recruitment theories dates back to years before the technological and digital revolution of the 2000s. For example, among the formal methods, a lot of emphasis is given to newspaper advertisements, a practice that has now fallen into disuse due to the development and spread of the internet that has transformed and is still transforming the recruitment scenario (as will be seen in the following paragraphs) *(Parry & Wilson, 2009)*.

Internal Recruitment Methods

Internal recruitment methods refer to the search and selection of personnel from a pool of candidates whose information and skills are already known for various reasons. As shown in *Figure 2*, *Rao (2009)* identifies from internal sources the existing workforce of a company, former employees, candidates who had previously applied for other positions and employee references.

In an organization, if a job vacancy arises, a promotion/reassignment of the already regularly recruited workforce is first carried out and only then, if necessary, external research is evaluated *(Sarma, 2008)*. The internal search for employees can be carried out through formal channels (internal announcements, e-mail, website), but much more frequently it is carried out through informal channels as it is faster and more effective. In particular, the reporting of employees is one of the most used and efficient sources of recruitment: employees within the company are the most aware of the knowledge and skills of their colleagues, because through daily contact with them they can better assess their behaviour and quality *(Rashmi, 2010)*. Furthermore, they are well aware of the requirements and values that the company requires for the proposed job, so they can find the best match for that vacancy, all this with much lower costs and lower time compared to a real search.

Patel and Rana (2007) summarised the main advantages of internal promotion in this way:

- The process is immediate and cheaper than the external process.
- It enables a more accurate and reliable knowledge of the candidate.
- It allows for a more efficient redeployment and use of employees.
- Increases employee awareness, motivation and loyalty through a 360-degree involvement.

Despite the many benefits of using internal recruitment methods, there are undoubtedly limits.

First of all, the problem highlighted so far in the fastest methods: involvement of a limited number of people with limited freedom of choice, especially for companies with a small number of employees *(Rashmi, 2010)*. *Sarma (2008)* also thinks that the prolonged relationship between colleagues can create perceptual bias, which could lead to overestimating the skills and qualities of an employee for reasons of friendship or affection. Finally, according to *Rao (2009)*, another disadvantage of internal promotion is that it limits the influence of new knowledge, ideas and perspectives in the company.

External Recruitment Methods

External recruitment is the broadest type in terms of related concepts and methods. It is what recruitment means in the common mindset of people and it is also the type on which this thesis works the most. *Patel & Rana* stated in *2007* that with good organisation and planning, the time and cost disadvantages of external recruitment could be reduced. Nowadays in 2020 it can be said that the development of technology and digitalization in the process has greatly reduced these limitations, but this will be analyzed in detail in the following paragraphs. The sources of external recruitment are numerous and varied, from the *Figure 2 (Rao, 2009)* are reported the most important with their characteristics:

- Advertisement: is definitely one of the most popular recruitment sources. Advertisement can be physical (newspapers, magazines, posters) or virtual (television, telephone, online advertising, social media). The media should be chosen carefully in accordance with the desired target *(Rashmi, 2010)*. It has to be said that nowadays most of the above-mentioned recruitment sources are no longer used, since technological progress has made the web the best and most accessible way for practically everyone. When creating an advertisement, it is not only necessary to clearly specify what skills are required for the job, but also to ensure that the advertisement is creative and attractive for the potential candidate. *Arthur (2012)* identified the main objectives that a good advertisement should achieve to facilitate the recruitment process: to capture the attention of the target audience, to keep their attention high and to make sure that this is the last advertisement that candidates want to read. This method

is quite expensive, but if developed in the right way it allows to shorten the recruitment process a lot.

- Campus recruitment: this is the result of collaboration between educational institutions (high schools, universities) and companies, so that the latter can look for suitable candidates among students who are about to complete their study program or who have just completed it *(Rao, 2009)*. This method can be very efficient in terms of time, as company representatives visit universities and during one day they can test the skills and knowledge of many candidates. It can also be useful if the firm is looking for employees with little work experience to help them grow in the company *(Rashmi, 2010)*. The main disadvantage of this recruitment source is that the candidate students have too similar education and backgrounds.
- Recruiting firms: they are special agencies that deal with matching employers with employees. Employment agencies can be of various types: they can be public or private, or they can depend on the nature of the job offered *(Patel & Rana, 2007)*, so it is essential for companies to choose the agency that best suits their needs *(Arthur, 2012)*. The advantages of these external agencies lie in the fact that they are true specialists in the service they offer. They are able to select valid candidates in a short time and from a wide range of candidates. On the contrary, however, this source of recruitment is very expensive and is often necessary when recruiting employees in management positions *(Arthur, 2012)*.
- Job Portals/Organizational Websites: currently the most widely used recruitment methods, they take advantage of online platforms that allow candidates to apply for the job offer in a few steps. The spread of this method derives from the enormous diffusion of the use of the Internet and the development of increasingly fast and intelligent digital technologies *(DeCenzo & Robbins 2009)*. In general, this method is preparing to attract a large number of candidates, so it is more effective for large companies that carry out mass recruitment. Each company, however, offers portals with different features, depending on their size and needs. This type of recruitment source attracts more candidates and is very effective for mass recruitment. In particular there are some points to consider when choosing the right portal: number of people to recruit through the portal, size of the database, usability of the platform and cost-benefit ratio *(DeCenzo & Robbins 2016)*. These portals should be mentioned together with the company's websites because that is where they are accessed from. Particularly on the websites there are often career areas, where all job opportunities in that company are presented. Accessing the website provides a clear overview of the company, understanding its values and cultures; according to *Rashmi (2010)* it is also very useful for strengthening the brand image.

- Job fairs/Exhibition: these are events where company recruiters can interview multiple candidates in a short time. The main feature of these events is in their candidates, who usually all belong to the same group of people or sector, usually struggling with their inclusion in the world of work (e.g. students, graduates, women). Trade fairs are useful for networking and information exchange between companies that meet at these events *(Arthur, 2012)*.
- Headhunting: it is an activity carried out by recruitment professionals. This method is almost always used for senior management positions. Indeed, a head-hunter searches among those who are successful in their current job and have no intention of changing it. The search takes place between competing companies or through networks reserved for these professionals. Among the main advantages is the absence of advertising costs and the reduction of costs to manage spontaneous applications. Moreover, the headhunting allows to find highly qualified and competent candidates. Among the disadvantages are the high salaries to be paid to head-hunters and problems related to the management of private data and information *(Patel & Rana, 2007)*.

Having considered the main recruitment methods available for a company and described all their characteristics, it is good to make a reflection. This thesis aims to analyze and deepen the major effects of digitalization on the recruitment process. For the sake of clarity, it seemed right to introduce all the relevant theory of the subject, but in the next chapters the attention will focus exclusively on the parties most affected by the phenomenon. This is because nowadays topics like external recruitment, advertisement, job portals and websites are more actual than others. In the next paragraphs, after introducing general concepts on innovation and digitalization, the literature on the application of the latter on recruitment will be analyzed as well.

2.2 Digitalization

Having presented the whole recruitment theory as a fundamental process in an organization, it's necessary now to shed light on digitalization as a phenomenon that is impacting companies in different ways. In particular, as explained previously, the purpose of this study exploring how it is shaping recruitment process.

For the sake of providing a comprehensive view about how digitalization is affecting business organizations this paragraph is structured in such a way that an introduction to the digital phenomenon is provided, including the main technologies involved in it. Then, at the end of the chapter, the theoretical implications of digitalization on the recruitment process will be analyzed.

2.2.1 Definition of Digitalization

An accurate definition of digitalization is the one given by *Gartner (2016)*, according to which the term refers to *"the use of digital technologies to change a business model and provide new revenue and value-producing opportunities; it is the process of moving to a digital business"*. *Ismail et al. (2017)* instead talk about digital transformation considering the effects it has on a business: an improvement in the customer experience, the benefits in the overall organization and management of the company and the ability to bring benefits to all segments of the business in a holistic way. Precisely with regard to the first point, *Simons (2005)* noticed a change in the treatment of customers: in fact, the world was becoming more and more customer-oriented, to such an extent that managers were forced to delegate decisions to those who were more in contact with consumers and could take more appropriate measures. This was making the market more competitive (Simons, 2005).

As precise as these definitions may be, they refer to a process that involves the entire business model of a company. For this research, the definition given by *Brennen and Kreiss (2014)* is more suitable, for which the digitalization is "*the way in which many domains of social life are restructured around digital communication and media infrastructures"*. This definition has been taken as a reference because it looks to be more suitable if associated with the recruitment process: indeed, the HR department is based on relationships and interpersonal contacts, so it fits better with the concepts of social life and communication in the above definition, but in the next few paragraphs this concept will be deepened.

The concept of digitalization must be distinguished from that of digitization. The latter is "*the encoding of analogical information into digital format*" *(Yoo et al., 2010)*. This means that digitalization represents the way people use these technologies, while digitization refers to the manner in which digital technologies replace analogical technologies.

Going back in time it can be seen that already about two decades ago the phenomenon of digitalization began to emerge and show its first effects. Indeed, in *1998 Sassen* considered that *"the digitalization and globalization has subsequently eroded national sovereignty, reshaped conceptions of materiality and place, and facilitated new circulations of culture, capital, commodities and people"*. This shows how this phenomenon may seem very recent, but in fact it has its roots at the turn of the 80s and 90s *(Beniger, 2009)*.

Today, however, it seems almost necessary for companies to adapt to the digital revolution in order to survive the fierce competition generated by the phenomenon. And even when they try to adapt, many existing organizations fall victim to companies that are born already digitalized and do not need

to change their business model. This context generated by the digital revolution in which only "the strongest" (those who manage to adapt to new technologies) survive or manage to remain competitive, has been called *"Digital Darwinism" (Schwartz, 2002)*. This is why firms should always be updated on existing new technologies and consider whether or not to adapt them before they become necessary *(Newman, 2017)*.

2.2.2 Stages of Digitalization

Although the concept of digitalization is current and widespread, it is important to say how some countries are more advanced in this area compared to others. In fact, *Sabbagh et al. (2012)* have identified different parts of the world where digital development varies greatly and so they have classified it in 4 categories: *Constrained, Emerging, Transitional* and *Advanced*. These categories are identified according to a score that marks the level of digitalization of a country *Sabbagh et al. (2012)*. In turn, this score is determined by the following characteristics:

- Ubiquity: measures the physical ease of access to digital services for people and organizations.
- Affordability: it is linked to the costs of digital services and measures the economic ease with which these services can be accessed (e.g. in a country the more people can afford to access these services, the more it is digitalized).
- Reliability: measures the quality of digital services available.
- Speed: measures the virtual speed of digital services available.
- Usability: measures the ability of local ecosystems to adopt and develop the use of digital technologies for people to use them.
- Skill: measures the ease and proficiency with which people introduce digital services into their daily and working life.

According to these parameters Sweden was already an *advanced* country in *2012*, when *Sabbagh et al. (2012)* developed this theory. This means that it has always been among the pioneers of new digital technologies and ICT, developing a society capable of exploiting the technologies, products and services available, while also encouraging the development of speed and quality of digital services.

2.2.3 Drivers of Digitalization

After having narrowed down the broad definition of digitalization, it is useful to define which were and which are the main technologies that have sanctioned the birth and rapid development of the

digital transformation business. Among all of them, it is clear how IT development has played a crucial role in digitalization and has in a sense laid the foundations for creating all the technologies that support the phenomenon. In 2016 the term *"SMACIT"* was coined to indicate the most relevant technologies for business digitalization *(Ross et al., 2016)*. In reality it is just an "update" of the already existing acronym *"SMAC"*: in fact this word is formed by the initials of social media, mobile, analytics of data (concerning big data) and cloud with the most recent addition of the Internet of Things (IoT, but abbreviated with IT in the acronym). According to *Sebastian et al. (2017)* the revision of this acronym was also essential because the technologies mentioned by it are constantly evolving and take on different aspects over time. It also leaves out very relevant technologies such as blockchain, artificial intelligence and virtual reality *(Sebastian, et al. 2017)*.

Considering the objective of the research, only the digital technologies that the literature generally puts near to the recruitment process will be analyzed closely.

IT Development

Information technology (IT) is the use of computers to store, retrieve, transmit, and manipulate data or information *(Isaacs et al., 2009)*. As said before, IT development is the phenomenon on which digitalization is based. Today there is no business without IT. The development of IT has changed the very nature of jobs, changing the way people connect and information is exchanged *(Lee & Choi, 2014)*.

Frye (2017) stressed the importance of adopting this technology for a company for 5 main reasons:

- It facilitates communication in two ways: within the organization and with customers.
- It makes it possible to transmit and store huge amounts of documents in digital format, making them easier and faster to access.
- It increases the efficiency of inventory management, allowing instant updating of every incoming and outgoing movement.
- It helps the brand to be more attractive to customers, thus strengthening Customer Relationship Management (CRM).
- The enormous amount of data available through the use of IT is useful from a strategic point of view; it is easier to outline a coherent and winning strategy by knowing exactly what the market requirements are.

Precisely on this last point it is good to go into more detail. How do a business strategy and an IT strategy coexist? *Figure 3* outlines the three approaches for the two strategies to work together *(Voloudakis, 2005).*

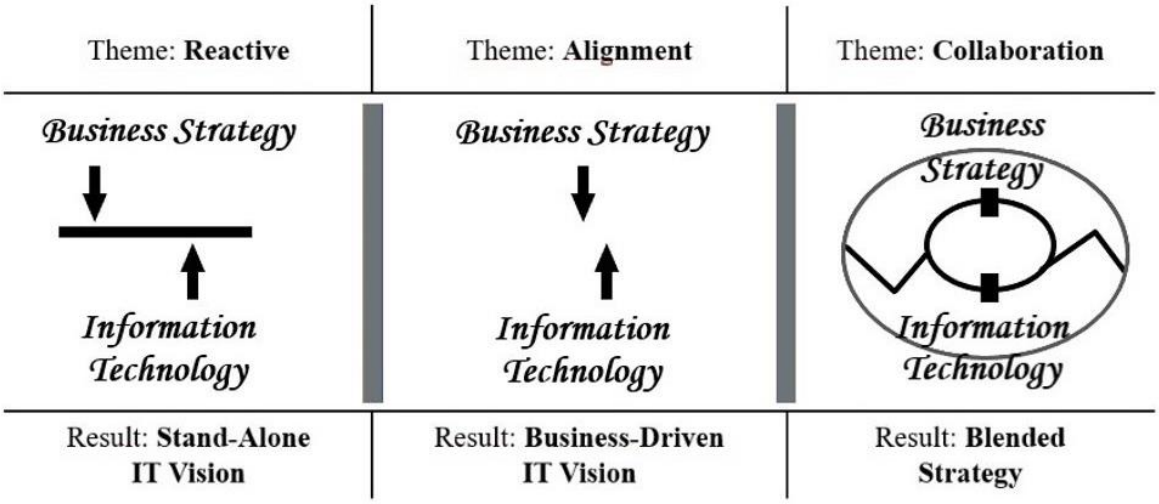

Figure 3. Intersection of Business and IT Strategy *(Voloudakis, 2005).*

The *reactive* approach leaves the IT leaders free to develop a strategy for their department and then incorporate it into the business strategy. This produces a stand-alone IT vision, with major misalignments in strategy.

In the *alignment* model, IT leaders work with leaders in other departments to align the two strategies. However, this collaboration is limited to developing a strategy only within individual departments, producing a business-driven IT vision.

The *collaboration* approach sees business and IT leaders working together to develop a holistic strategy for the entire organization. The result is a blended strategy, able to quickly exploit the technological capabilities and adapt quickly to an environment like the current one.

Social Media

One of the main technologies that the IT development has created and that is fundamental in every company's strategy are social media.

Social media are interactive technological platforms that connect people through the creation and sharing of information, ideas or content of various kinds, resulting in virtual communities *(Kietzmann et al., 2011)*. The most important feature is precisely this last one, the creation of virtual (social) network. The ease with which you create connections with people and the possibility to freely discuss your opinions and points of view has made the spread of this technology very rapid. Some popular social networks are *Facebook, YouTube, Twitter, Instagram, LinkedIn, Pinterest, Tik Tok*.

Sajid (2016) reflects on the meaning of the term "Social Media" and notes how it is made up of two words. "Media" generally refers to channels that broadcast news, multimedia content, ideas. This term

can often be found associated with the press or in marketing. "Social" refers to the social community between which exchanges and interactions will take place. It is precisely from the union of these two meanings that we arrive at the definition above. Indeed, *Kaplan and Haenlein (2010)* determine social media as *"a team of Internet-based applications that develop the ideological and technological foundations of Web 2.0, which allows the development and return of user-generated material"*.

Kietzmann et al. (2011) outline 7 functional blocks related to social media. They are independent of each other and do not all have to be present in a social networking activity. They only help to clearly understand the main features of these platforms. They are listed below:

- Identity: the extent to which users reveal themselves.
- Conversations: the extent to which users communicate with each other
- Sharing: the extent to which users exchange, distribute and receive content
- Presence: the extent to which users know if others are available
- Relationships: the extent to which users relate to each other
- Reputation: the extent to which users know the social standing of others and content
- Groups: the extent to which users are ordered or form communities

Social media brings crowds together, but not randomly. In fact, almost always these networks have a clear purpose, a specific theme or target a specific target of users *(Sajid,2016)*. Unlike the platform that is used, different multimedia content on different topics can be found. For instance, YouTube mainly prepares to collect videos created by users and share them publicly on its platform. But there are also more specific ones, such as LinkedIn, which mainly connects employers to potential workers through its platform, as well as connecting virtually all components of any work network to each other.

Social media uses web-based technology to quickly spread information and details to a wide range of customers. Companies can benefit tremendously from using them: lower costs and increased revenues, both of which result from increased visibility into social media *(Sajid,2016)*. This happens because social media allows companies to:

- exchange skills and information with other companies
- take direct advantage of customer advice and reports
- ensure that feedback from previous customers directly helps to solve the problems of current customers
- increase customer/public opinion/potential workers engagement and retention.

This is why social networks become essential information, involvement and entertainment tools for companies.

Big Data Analytics

Another important help that the IT development gave to companies regards the analytics of big data.

Big data analytics is the process of collecting and analyzing large volumes of data (big data) to extract hidden information. Big Data has been talked about for many years, but only recently its importance has become crucial for many organizations, also thanks to new technologies able to extract the maximum value. Being able to acquire and analyze a massive amount of data, which is shared every day in the network of a business, allows it to gain significant and sometimes vital information for its decisions *(Vitari & Raguseo, 2019)*.

But what does "Big Data" stand for? Big Data can be defined simply as a concrete combination of personal, commercial, geographical, behavioural data available on the web, especially on digital networks *(Degryse, 2016)*. The giants of the web, such as Google or Facebook, in recent years have made Big Data one of their main businesses. In fact, they produce and accumulate the data of all their users, use algorithms to convert it into useful information for companies and sell it to them. And companies buy them because from this information they can understand market conditions and customer behaviour and can make decision-making more effective and faster than the competition *(Raguseo & Vitari, 2018)*. This process of analysis makes it possible to make a predictive analysis, i.e. to know in advance what will happen: this becomes possible because if we have a model and we have enough historical data we can determine what will happen in the near future (a trend) with statistical bases or foundations. On the basis of these forecasts it is then possible to act on the future through a prescriptive analysis, like to look for the conditions for a certain event to happen *(Raguseo & Vitari, 2018)*.

Today are more and more efficient technologies and analysis techniques to discover hidden patterns and connections between data *(Cadambi et al., 2013)*. The learning machines, thanks to their processing, are able to do amazing things driving vehicles, diagnosing diseases, hiring people and so on. But the real tangible advantages for a company from the improvement of data processing technologies are *(Bahga & Madisetti, 2016)*:

- Reduced costs: the variety, effectiveness and simplicity of the new tools reduce the cost of managing and analyzing large volumes of data.
- Increased speed: the analyzes conducted are capable of producing a result almost real time.
- Increased Accuracy: large amounts of data can be used to perform more accurate analysis.

However, the success of the big data phenomenon leaves some questions open. The first concerns the competitive battles that are already being created for the collection, analysis and use of data *(Manville, 2016)*. Although it seems to be a matter for a few big companies, it is not known if smaller companies will be able to emerge in this context and create more competition in the market. The second point concerns privacy and data protection. Currently, there is increasing attention from government organizations to regulate the use of private data and the privacy of users. What is known so far, however, is that it is difficult for regulators to monitor the proper use of data, so the issue remains far from closed.

Artficial Intelligence

Among the other technologies that derive from IT development and that are useful for the purposes of this research, there is artificial intelligence.

Artificial intelligence (AI) is described as technological systems capable of providing computers with performance that, to a common observer, would seem to be exclusively attributable to human intelligence *(Kaplan, 2016)*. In short, we are talking about computers that are capable of performing intelligent tasks. It is difficult to give a more precise definition, since there are a lot of subfields, it depends on the specific function you want to give to the intelligent computer *(Tecuci, 2012)*. More accurate definitions can be given by focusing either on the internal processes of reasoning or on the external behaviour of the intelligent system and using as a measure of effectiveness or similarity with human behaviour or rational behaviour.

Thinking Humanly	**Thinking Rationally**
"The exciting new effort to make computers think … *machines with minds*, in the full and literal sense." (Haugeland, 1985) "[The automation of] activities that we associate with human thinking, activities such as decision-making, problem solving, learning …" (Bellman, 1978)	"The study of mental faculties through the use of computational models." (Charmiak & McDermott, 1985). "The study of the computations that make it impossible to perceive, reason, and act." (Winstron, 1992)
Acting Humanly	**Acting Rationally**
"The art of creating machines that perform functions that require intelligence when performed by people." (Kurzweil, 1990) "The study of how to make computers do things at which, at the moment, people are better." (Rich & Knight, 1991)	"Computational Intelligence is the study of the design of intelligent agents." (Poole et al., 1998) "AI… is concerned with intelligent behavior in artifacts." (Nilsson, 1998)

Figure 4. Some definitions of artificial intelligence organized into four categories *(Stuart & Peter, 2016)*.

In this regard *Stuart & Peter (2016*) draw up 4 main skills (in *Figure 4* above) that the machine must have:

- Acting humanly: the result of the physical operation performed by the intelligent computer is no different from that performed by a human.
- Thinking humanly: the process that leads the intelligent system to solve a problem is similar to that of a human.
- Thinking rationally: the mental process that leads the system to solve a problem is a logical process.
- Acting rationally: the process by which the machine solves the problem is the one that allows it to obtain the best expected result with the information available.

However, it is useful to remember that the concept of AI has existed for a long time, only in recent years its growth and development has been driven by the ongoing technological and digital revolution. In fact, the improvement of existing machines has made it easier and faster to read the data to be converted into actions for the intelligent computer *(Tecuci, 2012)*.

Artificial intelligence can be used in a lot of different industries, from the most analytical to the most intellectual one *(Bostrom, 2017)*. Sometimes AI systems exceed the performance of human being because they are perfectly rational: in fact, human behaviour is never 100% rational because human consciousness has limits that make it almost impossible to perceive and process all the information to find the optimal solution to a problem *(Omohundro, 2014)*. Others argue that rationality is not always enough: in some situations, such as recruitment, feelings such as intuition are needed *(Miles & Sadler-Smith, 2014)*, but this will be explored later.

Artificial intelligence is a subject halfway between science and philosophy because it manifests ethical as well as theoretical and practical aspects. In fact, the use of artificial intelligence is often criticized for converging towards a total replacement of human beings with robots *(Kaplan & Haenlein, 2019)*. Even internationally renowned scientists such as *Stephen Hawking* have warned about the dangers of artificial intelligence, considering it a threat to the survival of humanity *(Cellan-Jones, 2014)*. So, the real risk will be when AI starts building machines that are smarter than humans. Despite its drawbacks, some of them very significant, AI also presents enormous opportunities *(Nadimpalli, 2017)*. Given the skills and abilities that this technology already has today, it is expected that in the future AI will improve human capabilities in many ways and will play a progressively more important role in the field of digitalization.

2.2.4 A SWOT Analysis of Digitalization

After having described in detail the drivers of digitalization, it seems important to examine in detail also the benefits, drawbacks opportunities and threats that have come out of it. There is a SWOT analysis developed by *Degryse (2016)* that clearly outlines all these aspects about digital companies against companies who does not embrace the phenomenon (*Figure 5*). These aspects are very varied, but as did before, only those that may be linked to the recruitment process will be considered, in order to consistently achieve the purpose of the thesis.

Strengths	Opportunities
1. Connected world, open systems, knowledge economy	1. New jobs (computer engineers and scientists, network experts, etc.)
2. Networks, exchange, sharing and collaboration, with access based on functionality rather than ownership	2. More 'agile' work organisation; new forms of more flexible and more autonomous work
3. Integration of industries and services: intelligent factories, energy systems, mobility, transport and cities and 'optimised' governance	3. Abolition of repetititve and routine tasks
4. Automation, robotisation, learning machines	4. Better ergonomics, help in performance of heavy or complex tasks
5. Productivity, efficiency and profitability gains	5. New forms of collaboration and cooperation among workers
6. Zero marginal cost economy	6. Reshoring or onshoring (return of industries and new 'smart' factories – and jobs – to their country of origin)
7. Innovative products and services, proliferation of mobile apps to 'make life easier'	7. Possibility of new ways of distributing productivity gains (working time reduction)
8. New autoproduction capacities, micro factories	8. Possibilities of social emancipation, change of economic model geared to peer-to-peer and common goods ('post-capitalist' society)
Weaknesses	**Threats**
1. Jobless growth, jobless future	1. Massive destruction of medium-skilled jobs (computerisation)
2. Emergence of super powerful oligopolies, new world data masters	2. Intensification of 'anytime, anywhere' work; blurring of the boundary between private life and working life leading to stress and burnout
3. Concentration of power and wealth in value chains (equivalent losses for other companies, sectors and countries)	3. Loss of control by workers of their own expertise and know-how and free will (becoming the tool of a machine)
4. Frequent problems of (non)-compliance with regulatory, administrative, labour and taxation standards	4. Digital management, policing of workers, risk of mutual loss of trust between employees and management
5. Protection of personal data exposed to intrinsic risks	5. Precarisation of jobs and statuses, total dependence on 'data masters'; 'servification'
6. 'Algorithmisation' of individual behaviour, work and consumer habits, social and cultural preferences; normalisation and standardisation of the individual	6. Weakening of collective action and industrial relations
7. Hollowing out of the middle classes and polarisation of society between a reduced number of 'top-of-the-scale' workers and a mass of 'bottom-of-the-scale' workers	7. Skills and training/labour demand mismatch
8. Under-investment and under-utilisation of digital tools for the social emancipation of low-income sections of society	8. Exacerbation of inequality, wage stagnation
	9. 'Digital Taylorism' and emergence of a class of digital galley workers (crowd sourcing); world competition among workers for all jobs not requiring face-to-face contact
	10. Erosion of tax base and social insurance financing

Figure 5. Swot Analysis of Digitalization *(Degryse, 2016).*

Advantages and Opportunities

Fitzgerald et al. (2014) have identified several advantages resulting from the introduction of digitalization in a business: it has reduced the time of some operations, improving internal communication; it has allowed to reach customers more easily and in a more targeted way, improving the customer experience and engagement; thanks to the introduction of new technologies it has

allowed the birth of new businesses or has revolutionized existing business models, creating innovative products and services *(Degryse, 2016).*

Other benefits of digitalization include the impact on revenues and profit growth (Degryse, 2016), but this depends on the aggressiveness and timing with which companies adopt the new technologies *(Bughin et al., 2017)*. This positive impact also depends on the ease of collaboration between companies, which thanks to digitalization are creating increasingly large and interconnected networks *(Degryse, 2016)*.

There are also different perspectives in terms of digitalization opportunities. Adaptation to new technologies requires the development and updating of the workforce, with the possible introduction of new professional figures. At the same time, computers and intelligent systems will be able to prevent workers from working and routine mechanisms, a major problem in the doctrine of business organization *(Degryse, 2016)*. In this way it will be possible to move towards increasingly flexible and agile organizations, as the current innovation doctrine teaches *(Jacobs et al., 2014).* This could lead to increasingly flat organizations with high degree of interdepartmental interconnection and cooperation among workers *(Degryse, 2016)*.

Disadvantages and Threats

As already mentioned above, digitalization presents ethical and organizational drawbacks, with issues that could turn out to be real problems in the near future.

Among the current problems are those faced by companies in adapting to change. Companies do not always understand how and to what extent to introduce these digital technologies into their business and sometimes do not consider them useful by not investing in them *(Bughin et al., 2017)*. It can therefore said that many companies are currently not ready to face radical changes, which would lead to fragmentation of their value chain and converge into new emerging ecosystems *(Berman et al., 2013)*.

Even the labour market in general is sometimes severely affected *(Degryse, 2016)*: the increasing adoption by companies of intelligent mechanised systems leads an increase in unemployment and undermines medium-skilled jobs that tend to disappear. The internal working environment is also changing, and changes that could be dangerous are in prospect. In fact, digitalization in organizations is leading to an increasing *"Algorithmisation"* of human behaviour, leading the individual to standardization *(Degryse, 2016)*. This situation risks bringing to a digital management of people, with which it is difficult to transmit a true corporate culture and establish mutual trust relationships between employees and management.

A separate discussion is needed for the processing and management of sensitive data. The cyber-security issue is certainly one of the most current global problems, not only in the field of digitalization.

With the spread of digitalization, as mentioned above, a huge amount of data is exchanged on the web. Although this leads to concentrating power in the hands of those huge companies that collect data from their thousands of users *(Degryse, 2016)*, this makes them even more vulnerable. Hacker attacks on the IT systems of companies and government agencies are increasingly common, almost on the agenda. These attacks have negative consequences on several fronts. First and foremost, for users, such as people, whose data has been stolen. Second for users, as customers, who lose confidence in the company, and of course this results in a loss of reputation, engagement, and profits for the organization *(Brockett et al., 2012)*. Precisely on this last point *Kelly (2012)* in his research estimated millions of dollars lost by U.S. companies affected by cyber-attacks, with data destined to grow.

Nowadays almost everyone is aware and scared by this huge problem of the web, that's why lot of people are considering a moderate use of digitalization.

2.3 The Impact of Digitalization in the Recruitment Process

After introducing the general contexts of the two macro-arguments dealt with, the theoretical field by focusing on the doctrine concerning digitalization in HR, in particular in recruitment, will be narrowed down.

As described in the previous paragraphs, recruitment over the years is becoming increasingly important in the HR department as people are increasingly seen as resources that generate competitive advantage *(Kapur & McHale, 2005)*. The introduction of digitalization in the HR department is exploding. As a result, the recruitment process function is extending beyond core activities, such as recruitment itself or talent management systems, to the interaction and media attraction of people *(Schutte, 2019)*. This is transforming the experience of recruiters and increasing the strategic value they can bring. Through the use of IT, recruitment has changed, and is still changing, its face. From the simplest to the most sophisticated technologies, companies are able to identify the most suitable candidates for their job requirements *(Bondarouk & Brewster, 2016, 2660)*. With the digital revolution, the internet has become the main place where companies and potential candidates can meet and exchange information. In fact, recruiters, on behalf of the company they represent, collect,

thanks to platforms such as social media and corporate websites, daily resumes and interests to work in their organization, even when there is no real need for staff *(Zang & Ye, 2015)*.

Comparing a traditional recruitment process to a digital one, it is easy to identify the problems of the former that the latter solves. In fact, in a recruitment process without the use of technology it is difficult to collect a lot of information from different candidates and maintain a certain objectivity throughout the process. Thanks to the use of digital systems, on the other hand, many information on candidates are processed in a short time in such a way as to make decisions as objective as possible, unlike a recruitment process carried out in all its phases exclusively by humans, who, even in a small part, are unable to transcend their subjectivity *(Bondarouk and Brewster, 2016)*.

The combined use of the internet, digital platforms and intelligent software has led to the automation of the routine tasks of the recruitment process in all companies. Repetitive jobs and activities such as CVs screening are now almost totally automated, at least in medium-large enterprises, because digital software compared to humans takes less time, is less expensive and avoids the repetition of boring and tedious tasks for the human being *(Nilsson, 2005)*. The particular thing about digitalization is that unlike mechanization, which refers to tasks that did not require the human brain, machines are now able to perform intellectual tasks autonomously. Here the recruitment process is a perfect example for this concept, a work that has undergone a transformation following the phenomenon of digitalization, and that risks being transformed again *(Ford, 2013)*.

In the following paragraphs the theory of digital recruitment and its relationship with the major reference technologies is reported.

2.3.1 Online Recruitment

The rapid technological and internet development at the turn of the 1990s and early 2000s made websites the most frequently used tool for recruitment activities *(Cronin et al., 2006)*. Thanks to the use of these digital platforms, recruiters can do all or most of the recruitment process. Indeed, online recruitment is not only about receiving job applications digitally, but it's believed to include several areas of recruitment: collect and screen applicants at work, store applicants' data and subject them to selective testing *(Panayotopoulou et al., 2007)*.

In this regard *Searle (2006)* identifies three essential phases of recruitment: attraction, search and application & assessment *(Figure 6)*:

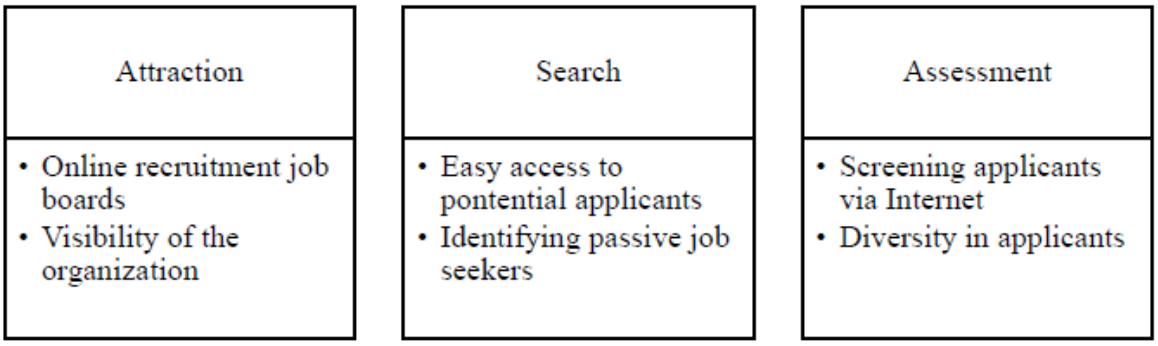

Figure 6. Essential processes of recruitment and selection *(Searle, 2006)*.

- *Attraction*: in this phase the company, as mentioned in the previous paragraphs, can decide between internal and external recruitment methods *(Sarma, 2008; Rao, 2009; Rashmi, 2010)*. With regard to the latter, we can say that the use of the web sites for digital advertisement has almost completely replaced the paper one in newspapers and brochures. The advantage is bilateral: companies recoup time and costs and manage to have more visibility and candidates and, in turn, candidates can range from a wider range of job offers to choose from and can easily gather information about organizations *(Searle, 2006)*.
- *Search*: during this phase the organizations look for suitable candidates. In offline recruitment it was usual to call up candidates who had been rejected in the past or headhunters were also used for minor positions. Thanks to the internet, however, the approach to the search changes, facilitating communication and interaction between the firm and the candidates. By monitoring the navigation on their sites, companies can also search among potential candidates who are not actively looking for new jobs. However, sometimes these practices lead to the unintentional (sometimes even intentional) and disproportionate use of personal information, which can result in privacy violations *(Searle, 2006).*
- *Assessment*: this is the phase most transformed and influenced by the digital tools. Online applications have drastically changed the candidate identification process. Their skills and abilities are quickly assessed through online tests and assessments using intelligent software that elaborate feedback *(Searle, 2006)*. Thanks to the internet, jobseekers participate more frequently and more easily in the recruitment process and increase opportunities for those who cannot take advantage of informal recruitment methods *(Baron & Austin, 2000)*.

After describing the main steps involved in online recruitment, the main advantages are summarized below *(Nabi et al., 2017; Wołodźko and Woźniak, 2017, Álvarez, 2012)*:

- Time & Cost saving
- Increase in Corporation's Image & Employer Branding
- Larger pool of skilled talents
- Standardization of the process
- Flexibility & Creativity of the tools
- Prompt feedbacks of the results

However, the actual improvement of the recruitment process through the use of the Internet depends very much on the objectives and strategic vision of an organization. Indeed, e-recruitment does not always respect the values and purpose of a company *(Drasgow et al., 2015)*. In addition, in the practical adoption of these technologies it is also necessary to consider the issues related to technical aspects: whether to develop the website internally or to have it developed externally, to choose the tools that elaborate feedback suitable for the vacancy, up to what stage of recruitment to adopt these supports and so on *(Nabi et al., 2017)*.

The use of technologies in recruitment processes is more frequent among medium-large organizations *(Anderson, 2003, 130)*. This gives rise to a very big potential problem: multinational giants gain more advantages by being known all over the world *(Maurer & Liu, 2007)*; in this way they reach a large number of potential candidates online and collect a huge amount of data whose use is not yet very clear *(Manville, 2016)*. Some of the information submitted by candidates may contain sensitive personal information, including information relating for example to their sexual orientation. The employer must not discriminate against individuals and ensure that there is equal treatment between candidates during the process. That is why nowadays it is always important for candidates to know their rights and all the uses the company makes of their data when they make a job application *(McLean et al., 2016)*.

2.3.2 Social Media in the Recruitment Process

In recent years human resources management has changed considerably due to the effects of globalization: the brand and visibility of a company has become increasingly important to be attractive in the eyes of potential candidates and recruitment costs have increased significantly. To solve these two problems together, social media seems to be the most effective and powerful solution.

Taking about social media and recruitment, it is important mention the largest social network that focuses on the world of work, *LinkedIn*. In fact, this platform connects thousands of professional profiles with employers every day. Some companies use *LinkedIn* for most of the hiring they do. In

particular, figures updated at the beginning of 2020 say that *LinkedIn* has over 575 million members, 3 million in Sweden alone, and around 260 million active users every month *(Osman, 2020).*

Facebook is also useful to companies for marketing initiatives, employer brand leverage and recruitment (*Leader-Chivée et al., 2008).* Indeed, the use of social media is very important to attract Generation Y and Z, people born between the early 1980s and early 2000s, because they give companies the opportunity to interact with people more informally. In *2008, Leader-Chivée et al.* defined social networks as a *"boomerang talent"* that companies can use in order to passively recruit only by managing the social platform optimally and being socially connected. In the same year, it was found that 25% of employees left work due to a lack of social connectivity within the organization and 77% of employees aged 20-29 saw sociality and job interconnectivity as essential elements for workplace satisfaction (*Leader-Chivée et al., 2008).* These estimates will certainly be even higher today, taking into account the progress and evolution of these digital platforms in recent years. As can seen, social media helps the company to connect with its employees and not only improve the hiring process.

It is important that organizations understand the potential benefits and risks of using social media in the recruitment process.

Among the resulting benefits, certainly the first is the already mentioned ease of connection between the two parties, candidate and employer. From the point of view of employers' candidates, they can take advantage of detailed social profiles of candidates by acquiring more knowledge of their skills and personality than a normal CV *(Feichtinger & Hörold, 2015).* In addition, social networks have also changed the way in which the potential candidates are looking for a job. In fact, even those who are not actively looking for a job can easily be attracted and apply, even while working for other companies *(Feichtinger & Hörold, 2015).*

However, there are several drawbacks in the use of social networks in this field. For example, not everyone uses social platforms or does not actively use them, so although it is an efficient means of recruitment it cannot be the only one *(Feichtinger & Hörold, 2015).* Another problem is that companies do not always manage to attract the right types of candidates, as some candidates often disguise their personality by describing themselves on their profiles as people they are not. This can waste companies' time and even lose the opportunity to hire someone really talented *(Doherty 2010).* Companies also acquire an enormous amount of sensitive data through the use of these platforms. Here, too, of course, companies must ensure that data collected online does not discriminate against candidates *(Gueutal et al., 2009).* As has been noted so far, the topic of data management is a recurring one, so let us go into this topic related to the recruitment process in the following paragraph.

2.3.3 Big Data Analytics in the Recruitment Process

As mentioned in the previous paragraphs, technologies capable of processing large amounts of data are increasingly growing *(Bara et al., 2015)*, and the consequent phenomenon of big data is radically affecting the HR department *(McCormick et al., 2016).* Thanks to the use of intelligent systems that process big data, organisations can count on more efficient recruitment, creating a competitive advantage over other businesses *(Bara et al., 2015)*.

Big data are used by organizations in recruitment to make the activity more objective: they think that sometimes the subjectivity of recruiters hinders the correct identification of talent. Despite this, however, the help of the human being is still important in the analysis of big data because they are not infallible, often contain errors and lead to dead ends *(Scholz, 2017).* Indeed, to make the most of the potential of big data, HR departments need to improve big data literacy, i.e. their ability to learn from past data, because if you do not understand how to use them and include them in the recruitment process, their use is likely to fail (*Christozov & Toleva-Stoimenova, 2015)*. Therefore, it can be said that over time only part of the available information will be useful and relevant for recruitment purposes.

Big data analytics can be used in human resources management in many ways. In the recruitment process, big data are used for example in the search for candidates, in communication with them and in employer branding. In particular, big data make it easy to discover the backgrounds of candidates, information that can be useful in their classification *(Scholz, 2017).*

Among the opportunities related to the analysis of big data there is the possibility to create targeted job advertisements and direct them towards the target objectives for the work itself. Through the combination of complex data and algorithms, it is possible to create job advertisements tailored to the individual, maximizing the effectiveness of advertising *(Aguirre et al., 2015).*

Another capability of big data in the recruitment process is talent assessment. The analysis of big data makes it possible to create competence models and thus calculate employees' performance. These competence models can be exploited by applying them to cognitive tests or actual job performance, in order to hire candidates *(Sivaram & Ramar, 2010)*. In addition, big data can also be used for internal recruitment: they analyze the interests and work ambitions of current employees in order to steer them towards personalised career paths *(Zang & Ye, 2015).*

At this point, however, it is important to make it clear that big data are a practice still under development, so their analysis cannot yet be defined as mature *(Zang & Ye, 2015)*. Indeed, big data are still unstructured data, i.e. data stored without any pattern *"that are usually not as easily*

searchable, including formats like audio, video, and social media postings" (Taylor, 2018). Therefore, despite all the advantages they potentially offers, they are not able to replace traditional structured data, i.e. data stored in databases, organized according to rigid schemes and tables *"whose pattern makes them easily searchable" (Taylor, 2018)*. When considering human resources management, the use of big data is not yet seen from a strategic perspective, the use of structured data still prevails over big data technology *(Scholz, 2017).*

The use of big data analysis in human resources management has an ethical problem. As already said several times in this research, data related to personal privacy risks being violated when using this technology. Organizations must also consider the extent to which they can use information from big data. This is because in the recruitment process the use of this data could constitute a risk of discrimination. That is why today it is impossible to use the recruitment process entirely to big data analysis, rather recruiters should use this technology in conjunction with their traditional operations and not disproportionately *(Scholz, 2017).*

2.3.4 Artificial Intelligence in the Recruitment Process

After talking about big data, it is useful to deepen the knowledge of the use of artificial intelligence technologies that process this data in the recruitment process. AI technologies can be applied in the digital recruitment of employees in different ways.

The most "trivial" thing that AI can do is the analysis of the curriculum, from which it is able to extract relevant information by skimming a text *(Stuart & Peter, 2016).* This software therefore frees recruiters from the long and tiring reading of resumes received by potential candidates. In medium and large companies, which receive dozens of applications per day, the use of these technologies has completely revolutionized this phase of the recruitment process *(Kaczmarek et al., 2005).* Artificial intelligence enables an automated candidate classification system, using algorithms based on past data provided by human recruiters *(Faliagka et al., 2012).*

However, AI has much more potential. From the analysis of curriculum vitae or cover letter texts or direct interaction with a candidate, he might be able to accurately describe his personality through the theoretical model of the *Big Five* by *Robert R. McCrae and Paul T. Costa*. Through the skills and academic motivation described and through the evaluation of logical and general work performance the software is able to define the behavioural and personal traits that describe a candidate *(Komarraju & Karau, 2005)*. From here the intelligent digital system is able to interpret the data collected, managing to elaborate a compatibility with the proposed job. It is generally thought that

understanding and analyzing a personality is a practice more effectively carried out by human intuition and perceptions, but many experts believe that AI will overcome humans in the accuracy with which they describe a personality *(Mairesse et al. 2007)*.

Although scientists believe that the role of factual analysis outweighs intuition in recruitment *(Miles & Sadler-Smith, 2014)*, the latter is a key factor in recruitment decision-making even if it is not always noticed *(Vaahtio, 2007, 110)*. This is why a dualism between rational analysis and irrational intuition is born: the role of AI is precisely that of acting with intelligence and total rationality, trying to eliminate any form of subjectivity *(Omohundro, 2014)*, while the human being will never be able to act in a completely objective way.

In recruitment, AI is also functional for external communication. As mentioned above, the use of big data allows to attract talent suitable for the open position by personalizing the advertisement *(Aguirre et al., 2015)*. But of course these data must be collected and processed: in these two phases the AI intervenes acquiring information from written language and processing it consistently *(Stuart & Peter, 2016)*. This kind of communication needs algorithms based on human communication, so human values must also be introduced in it *(Heiss, 2017)*. The quality of algorithms improves with increasing data quantity and quality (*Christozov & Toleva-Stoimenova, 2015*): therefore, a significant amount of data is needed to obtain reliable results, otherwise artificial intelligence can lead to wrong results even if the algorithms are correct.

That is why nowadays it is no longer sufficient for recruiters to develop only the skills of their department and those of the IT engineers, who develop these technologies, to know only their subject matter. The role of the human being is fundamental in the development and training of algorithms because only they are able to fix the errors that algorithms make. Thanks to this today artificial intelligence seems to be able to create reality and also to develop ideologies *(Mager, 2012)*. For this reason, according to the relative theory, artificial intelligence still seems to be unable to work autonomously without the coordination of people. As a result, the human resources department and the IT department are getting closer and closer to each other and will increasingly collaborate for a digital recruitment process *(Scholz, 2017)*.

2.3.5 Challenges of Digitalization in the Recruitment Process

Although the digital technologies studied so far seem to make human resources management more effective and efficient, their benefit is not yet scientifically confirmed *(Zang & Ye, 2015)*. *Bondarouk and Brewster (2016)* for example argue that the introduction of excessive digitalization in the HR

department has created tension between experts in the department and others in the organization. The experts argue that these tensions will not end until HR and IT merge into management decision-making *(Rasmussen & Ulrich, 2015)*. For this to happen, HR professionals should first and foremost develop new knowledge in the digital environment in order to adapt to the rapid changes in the labour market *(Bara et al., 2015)* and should also take on additional responsibilities for the management of IT data and decisions taken by these information systems *(Bondarouk & Brewster, 2016)*. In addition, *Art. 22* of the *General Data Protection Regulation* (GDPR - the European Union regulation on the processing of personal data and privacy) prohibits decisions based exclusively on automated processing of data that may have legal effects concerning, except in exceptional cases indicated in the article *(Sarra, 2019)*.

Here dealing once again with data protection issues. As already repeated several times, some of the information collected on candidates may contain sensitive personal information on the basis of which discrimination may occur *(McLean et al., 2016)*. Potential candidates and current employees are the most affected by this phenomenon, as they have no control over the management of this data. This is one of the main challenges of digitalization in the recruitment process *(Zang & Ye, 2015)*.

Based on the drawbacks identified by *Degryse (2016)* (*Figure 5*), the main concern linked to the recruitment is the replacement of human beings by automatic machines. In fact, automation could cause many recruiters to lose their jobs, as it has done so far. Some scholars believe that there is a real risk that AI and digital machines will take over, as their development becomes increasingly rapid *(Müller, 2016)*. However, it is important to underline that the deep knowledge of all these technologies and their real potential application remains of few companies, so this risk seems to be currently limited only to large digital companies (*LaFrance, 2015)*.

2.4 Summary of Literature Review

After concluding the literature review, in order to summarize the reading and provide guidance to the reader, a summary of the theory analyzed so far is made. It is reviewed the literature regarding recruitment and digitalization and finally the theory regarding both.

Specifically, in the *section 2.1* the topic is *Recruitment*. Starting from its insertion in the wider context to which it belongs, HR management, a comparison between the various definitions is then faced. Then, an analysis on the various recruitment methods used in the process is provided. For the purposes of the research question this part is important because, in order to understand the digital approach in this business process, it is important to first understand what it is and how it develops.

In *paragraph 2.2* the topic of *Digitalization* has been introduced. Even in this case, the paragraph starts from an analysis of the various definitions proposed by scholars, in order to find the one that best fits the purpose of the research. Then the stages of it are briefly reviewed, to get to the drivers of digitalization, in which the theory for the major technologies involved in the study are deepened, Finally, a SWOT analysis concerning the phenomenon is proposed. In order to answer the research question, the general part on digitalization is also important. This is done in order to fully understand the phenomenon and how it is revolutionizing the business in general, before the recruitment process in particular.

In the last *paragraph 2.3* the theory of the *Impact of Digitalization in the Recruitment Process* is analyzed. In this paragraph, after a short introduction, the theory related to the use of the digital technologies mentioned before in the recruitment process is reported. In doing so, the advantages and disadvantages of the use of technology in this field are stressed, concluding with future challenges that are all unresolved. This part of the literature review is essential to understand where digitalization in the recruitment field is currently and to compare it with the Swedish context that will emerge from the interviews.

Recruitment	• Recruitment in an HRM context • Recruitment Process • Recruitment Methods
Digitalization	• Definition of Digitalization • Stages of Digitalization • Drivers of Digitalization • A SWOT Analysis of Digitalization
The Impact of Digitalization in the Recruitment Process	• Online Recruitment • Social Media in the Recruitment Process • Big Data Analytics in the Recruitment Process • Artigificial Intelligence in the Recruitment Process • Challenges of Digitalization in the Recruitment Process

Table 2. Summary Table of Literature Review

3. METHODOLOGY

The aim of this chapter is to exemplify the methodological approach adopted by the author in conducting this research. In particular, the research strategy, methods and design are presented, justifying their usefulness for the purpose of my study. It also clarifies how the data are collected and analyzed and why this research should be valid.

3.1 Research Strategy

This research prepares to start from the theoretical study of sensitive experiences to arrive at a general definition. This is the definition of the inductive method that is considered the most appropriate for the purpose of this thesis. The goal is not to test generally accepted theories in this field, but to explore the area of research, to observe how the players involved act taking into account an existing theory. It follows that the *case study* method seems the most suitable to understand *how* and *why* the various Swedish HR managements approach and perceive the possibility to actively exploit digital solutions to transform and eventually implement their recruitment process.

Often the case study has been rated as inferior to other research methods such as qualitative, quantitative research and experiments. Actually, *Yin & Pinnelli (2005)* break this stereotype and re-evaluates the case study research method as the most versatile and concrete one. The case study allows an investigation that preserves the holistic and significant characteristics of real-life events, such as individual life cycles, managerial and organizational processes and the development of industries and sectors (as is the case with this research).

Yin & Pinnelli (2005) think that each method can be used for exploratory, descriptive, or explanatory purposes Rather to choose the best strategy for one's own research there are mainly three conditions of reference:

a) the type of demand of the research;
b) the margin of control that the researcher has over real behaviour;
c) the degree of attention on contemporary events rather than historical ones.

Table 3 (Yin & Pinnelli, 2005) shows these three conditions and indicates how each one is connected to five major research strategies in social sciences: experiments, investigations, archive analysis, stories and case studies.

Strategy	Form of the research question	Does it require behaviour control?	Attention to contemporary events?
Experiment	How, why	Yes	Yes
Survey	Who, what, where, how many, how much	No	Yes
Archive analysis	Who, what, where, how many, how much	No	Yes/no
History	How, why	No	No
Case study	How, why	No	Yes

Table 3. Relevant situations for different research strategies *(Yin & Pinnelli, 2005)*

The case study is most suitable when the research question is in the form of *"how"* and *"why"* *(Table 3)*. This is because these questions deal with operational links that need to be traced over time, rather than just frequencies and incidences. Then this research method is suitable when there is in fact no access or control over the behaviour of the people driving the phenomenon *(Table 3)*. The case study is also suitable for the examination of contemporary events and when the related behaviours cannot be manipulated and differently from historical studies adds two sources of evidence that are usually excluded from the historical repertoire: direct observation and systematic interview. Indeed, the case study is capable of dealing with a wide variety of evidence such as documents, objects, interviews and observations *(Yin & Pinnelli, 2005)*. If we focus our attention on the research question proposed, it is immediately clear that it fully reflects the characteristics suitable for a case study, which is why this research strategy was chosen.

In addition, the case study as a research strategy tries to clarify why a decision or a series of decisions is taken and with what result *(Schramm, 1971)*. This definition therefore refers to the concept of "decisions" as the main reference of case studies. The case study method is used when you want to deliberately study contextual conditions considered relevant to the phenomenon being studied created by decisions *(Yin & Pinnelli, 2005)*. In fact, this research is based on the decisions and approach to digitalization of Swedish HR departments.

3.2 Research Design

3.2.1 Multiple-Case Study

A comparative design was chosen to achieve the goal of the thesis, which is to understand how the digital age is impacting companies' HR departments in order to highlight similarities and differences *(Bell et al., 2018)*.

In particular, having previously justified the use of the case study, a multiple case study is the best way to create a comparative sphere between the cases analyzed, so that different findings can be investigated for each case rather than focusing attention on an isolated. Evidence from multiple cases is considered more reliable, so a more rigorous study is derived (*Herriott & Firestone, 1983*). The multiple case study has two main characteristics *(Yin & Pinnelli, 2005)*:

- Repetition with logical sampling: when the samples selected for research produce similar results, the repetition can be said to have taken place. Each case must be carefully selected so that it either produces similar results (literal repetition) or produces conflicting results but for a foreseeable reason (theoretical repetition). The next paragraph explains how the sample enterprises were selected.
- Generalization: this research design also makes it possible to generalize the theory that emerged from the research. If two or more cases show to support the same theory, replicability can be supported. This generalization is called "*analytical generalization*" which is different from *"statistical generalization*" where samples are not carefully selected.

Based on these characteristics we can say that thanks to the multiple case study, insights from companies belonging to different sectors and with different business models can be produced during this research. Hence, the objective is to understand the specific perspective of recruiters, putting in the background (but not leaving out) the context in which they operate.

In this regard, care must be taken when the case study focuses on a subunit (HR department) and is not able to refer to the larger analysis unit (enterprises) *(Yin & Pinnelli, 2005)*. For this reason, as we will see in the following paragraphs, the perspective of the HR specialists has been integrated with a careful analysis of the corporate strategy for which they work.

3.2.2 Selection of Analysis Units

The choice of the appropriate analysis units derives from the requirements of the research question *(Yin & Pinnelli, 2005)*. In this research for "analysis units" we refer to Swedish companies,

represented by specialists in the HR department. As already mentioned in paragraph 1.4, Sweden's focus is a personal geographical limitation. In particular, the companies were chosen so that they were really involved in the phenomenon analyzed and that they could give a real contribution to the research *(Eisenhardt, 1989)*: being digitalization a tool that in HR is useful to manage a large number of people, the selected sample refers to medium/large enterprises, with at least 1000 employees. However, being Sweden among the most digitalized countries in the world, it is very consistent to analyze these results and therefore they are not much affected by the geographical limitation.

The initial idea was to select samples in order to produce similar results (*literal repetition*), but various limitations (described in paragraph 1.4) did not allow the author to achieve the objectives set. For this reason, there are some conflicting results, but being understandable and analyzable reasons (*theoretical repetition*) the final result of this thesis remains consistent and reasonable. The initial idea was to select companies with a strong technological and digital approach, but above all with a similar size: in fact, the budget they have available to implement certain technologies and the use they would make of them depends very much on this. For this purpose, large multinational companies would have been selected but was difficult to reach them. Thanks to the collaboration with FTK, therefore 4 different companies have been reached:

- Volvo Cars: is a global car manufacturing company with more than 40000 employees and a strong technological approach.
- Company X: is a multinational technology company specializing in product development. It collaborates with very diverse companies and has more than 2000 employees.
- Göteborg Energi: is the municipal energy supplier of the city of Gothenburg. Very active in the creation of sustainable solutions in the sector it has about 1000 employees.
- Company Y: is a leading distributor of automation systems and components for many sectors. It has about 1800 employees.

For reasons of confidentiality and privacy, two of the four companies interviewed asked not to mention their name publicly. Therefore, they will not be named throughout the research and any clear reference will be avoided.

3.3 Research Method

For the completeness of the study, both primary and secondary data were analyzed. The primary data refer to those collected in the research field, through interviews with the specific aim of finding answers to the research questions. Secondary data, on the other hand, relies on pre-existing sources

or documents processed in researches with different purposes and not directly related to the specific research *(Hox & Boeije, 2005)*. Since this is experimental research, its results are mainly based on primary data, while secondary data only serve to confirm or possibly counteract the results obtained.

3.3.1 Secondary Data

First of all, it is necessary to clarify that there are two different approaches to review the literature: systematic and narrative review *(Bell et al., 2018)*. For this thesis the narrative method has been adopted, which uses the literature review as a tool to acknowledge the reader about the topics that are covered in the research *(Bell et al., 2018)*. In addition, a systematic method of analysis would not have been suitable for an investigative research like this, where the researcher needs flexibility as the purpose of the thesis is refined as it progresses *(Bell et al., 2018)*. In light of the above, in order to provide a comprehensive and clear theoretical background on the concepts mentioned in this thesis, the author conducted a literature review using sources that he considered concrete and trustworthy. Then, the objective of this literature review is to understand what the major threats in the topic are, so that unresolved questions can be answered.

In particular, the relevant literature from which the information has been drawn consists of scientific and journal articles, reports, books and has been found through *LUISS Library*, *University of Gothenburg Library*, *Google Scholar*, *Scopus*, *Web of Science* or the web in general. In order to narrow the field of research, the literature was chosen so that it did not exceed the limits required by the study, so the concepts of recruitment and digitalization were first introduced (always within the appropriate limits) and then focused on the existing literature on the application of the second topic on the first. For the sake of providing an example of how the documents were found, some keywords are presented: *recruitment process, recruitment methods, e-recruitment, definition of digitalization, drivers of digitalization, advantages and disadvantages of digitalization, artificial intelligence, social media, digitalization in the recruitment process*.

As mentioned in the introduction, the author included alongside the literature review the approach of the companies examined to the topic under review. Usually in a case study this type of evidence source should be included in the primary data. However, this information was not collected by the author himself for the purpose of the thesis, as the company representatives denied any private internal documents. In fact, the only information available were found from public sources like company reports and websites. Therefore, the author considered using this data as further evidence to reinforce/contract what emerged from the interviews, the primary data.

3.3.2 Primary Data

After introducing secondary data, it is important to stress the main role that primary data play in this research. Primary data include information collected through interviews with representatives of HR departments of companies (presented in chapter 4).

Sampling and Respondent Selection

This study uses intentional sampling as the author selected the interview participants based on the available contacts but considering their potential ability to meet the required needs (*Samure & Given, 2008)*. They had to be able to answer the questionnaire and provide important insights to reach an answer for the research question. This means that for the research it was not enough to interview simple recruiters or IT professionals, but someone who was in charge of HR team management and was therefore aware of any digital approaches and techniques used in the recruitment process. *First to Know*'s support was essential to reach and assess the quality of the experts interviewed, as it often acted as a link between the author and the companies.

Respondents were initially contacted via *LinkedIn* and by email, thanks to contacts provided not only by *First to Know*, but also by experts who were invited weekly to the latter's office. The interview request contained a brief explanation of the thesis project, with the semi-structured interview questionnaire attached in the message.

Interviewee	Company	Role	Date	Method	Lenght
Stefan Begall	Volvo Cars	Global Head of Recruitment	04/03	Phone Interview	51 min
Anonymous X	Company X	Manager of the Employee Experience	11/03	Face-to-Face Interview	42 min
Ulrika Mattsson	Göteborg Energi	HR strategist	14/04	Phone Interview	33 min
Anonymous Y	Company Y	Global HR Manager	04/05	Skype Interview	32 min

Table 4. Case Companies' Respondents ([1])

([1]) For more information about the companies analyzed (for those who have allowed their name to spread) and their approach to digitalization in the recruitment process, the following links are related to specific areas of their websites where some information about them can be found: https://www.media.volvocars.com/global/en-gb/media/documentfile/252052/volvo-car-group-annual-report-2018; https://group.volvocars.com/careers/our-application-process; https://www.goteborgenergi.se/ars-och-hallbarhetsredovisning/ars-och-hallbarhetsredovisning.

The empirical findings were collected from interviews with corporate representatives from the HR area. As already mentioned, the author made sure to select relevant figures in the field so that they could give more complete and acknowledged insights on the topic. They were chosen because they were considered suitable in terms of availability and willingness to participate and to communicate knowledge and opinions about the impact of the digital phenomenon on the recruitment process. The list of selected respondents linked to the companies they belong to is provided above *(Table 4).*

Interview Method and Questions

Among the different possibilities to obtain data in a case study, interviews are one of the most important. The interviews are finalized and meaningful, in the sense that they focus directly on the object of the case study and provide the random relationships detected *(Yin & Pinnelli, 2005).* Moreover, they not only offer the possibility of obtaining information-rich insights, but also allow for questions that can be modified during the course of the interview adapting to the interviewer's needs *(Yin & Pinnelli, 2005).*

This master thesis uses semi-structured interviews, meaning that the author has key questions around which his or her data collection revolves. These key questions represent the interview guide (attached in the Appendix), which is a real set of instructions that the interviewer follows and that includes the main topic and useful questions in order to find answers to the research question *(Bell et al., 2018).* The semi-structured structure allows the interview to retain the characteristics and advantages of both an open interview and a fully structured interview. It allows the interviewee to express himself freely, leaving room for his ideas and opinions, but at the same time it is also able to limit its range within the topic under examination, leading the interviewee to confirm or challenge the existing theory *(Yin & Pinnelli, 2005).* In particular, the semi-structured applications were chosen by the author with the aim of ensuring comparability between the various case companies. As the units of analysis differ in size and sector, flexibility is needed, since some questions may be suitable for some companies rather than others.

In detail, all interviewees were asked preliminary questions about their company, their job function within it, their background and their recruitment concept. This helped to understand whether they had the knowledge and experience to address the subsequent questions in order to be a suitable respondent. For the following questions the author grouped the questions into three main areas: the current recruitment process and its associated digital tools; the advantages and disadvantages of digitalization in the process; the future perspectives and challenges related to the topic.

Conducting the interviews

As can be seen from *Table 4*, four interviews were carried out for research purposes ([2]). Only one out of four, however, took place face-to-face, while the others, due to lack of availability or health restrictions described in paragraph 1.4, were forcedly carried out by telephone or Skype.

As far as the face-to-face interview is concerned, the location was chosen by the respondent according to his availability: the interview took place at the company's headquarters where the author had the opportunity to interact also with the company environment. For telephone and Skype interviews, on the other hand, the question is different. The telephone interviews were all initially scheduled via Skype, but in two of the three, connection problems arose that forced the participants to switch the call over to the telephone. In the telephone interviews there were many difficulties in establishing a fluid and friendly conversation, as he could not exploit the vision of his facial expressions and found it more difficult to touch the right points of the topic.

All interviews were recorded after asking permission from the interviewees. Although this allowed for a literal transcription of the interviews, all interviews were summarized to avoid a time-consuming activity (lasting between 30 and 50 min) and to facilitate the reading of the thesis.

3.4 Data Analysis

The findings collected through the interviews are analyzed together with the secondary data in Chapter 5. A general analytical strategy was developed that follows the theoretical hypotheses that conducted the case study *(Yin & Pinnelli, 2005)*.

In detail, the main strategy adopted is the logic of comparison of configurations that compares an empirical configuration with a theoretical one *(Trochim, 1989)*. This logic can be applied even though the research does not have a high number of dependent or independent variables. Therefore, the findings collected are compared with the main theory and with data found on company websites, following the same structure used in the data collection chapter.

In this regard it is possible to speak of integrated analysis units referring to the first paragraph of interviews, which mainly answers the research question. For the sake of clarity, an integrated unit of analysis means a smaller unit of the case itself for which many elements of the data have been

([2]) Before these interviews were carried out, a preliminary test was carried out to refine the knowledge on the subject and develop a more complete questionnaire.

collected *(Yin & Pinnelli, 2005)*. This type of analysis is only useful to reinforce the main analysis strategy, which is that of comparing configurations.

All in all, throughout the whole procedure the critical thinking of the author has been expressed so as to provide a valuable answer to the research question and to the sub-research question by reflecting upon his own interpretation of the results.

3.5 Reliability and Validity of the Research

Since a research project is supposed to represent a logical set of information, it is possible to make a judgement on the quality of any research project in relation to certain logical tests *(Yin & Pinnelli, 2005)*. The parameters to refer to for such tests include the concepts of reliability and validity of the data *(U.S. General Accounting Office, 1990)*.

Reliability

The objective of reliable research is to demonstrate that the operations of a study, such as data collection procedures, can be repeated with the same results *(Yin & Pinnelli, 2005)*. Therefore, this means that if a researcher repeats a case study with the same procedures, he will come to the same results and conclusions as described in this case.

Specifically, in this research, the author has tried to set aside as much as possible his values, understandings and assumptions so as not to influence the reliability of the study and data analysis *(Bell et al., 2018)*. The assumptions made derive almost exclusively from data collection and analysis. The only factor that could undermine the reliability of the research is the low amount of data collected.

External Validity

Since this is an exploratory case study, it is important to clarify that the only validity test that can be performed is the external one. In fact, the internal validity is only for a causal or explanatory case study, so the researcher tries to determine whether event X leads to event Y.

External validity is concerned with establishing the domain within which the results of a case study can be generalized, i.e. the extent to which the study results can be applied to other contexts or settings *(Yin & Pinnelli, 2005)*. As we said in the previous paragraphs, the generalization to which this research aims is analytical, i.e. with a carefully selected sample. Therefore, it can be stated that the replicability of the results of this thesis will be possible but within certain limits, in this research of geographical type and enterprise size.

Moreover, the findings resulting from this research can also be seen as implications deriving from the contingent environment analyzed. Therefore, the results under these specific settings may be able to provide further basis for the existing academic literature in the field and references for HR departments that need to approach digitalization.

4. EMPIRICAL FINDINGS

This chapter presents the collection of empirical data (primary and secondary). In particular, the interviews (primary) are organized by company case in order to have a complete view of each of them. At the beginning of each case a brief presentation of the respondent and the company is provided. Then, for each business case the paragraphs containing the main topics are clearly separated, in order to facilitate reading and understanding. In the end each company's approach to the topic (secondary) is presented, extrapolated from websites or other company documents. A summary table is presented at the end of the chapter to organize the main findings of the interviews.

4.1 Guide to Empirical Findings

The findings obtained from the interviews are grouped by case company in order to give the reader a complete understanding of the company in relation to the topic in question. Initially, the interviewees, the company they work for, their background and their current function in the company are presented.

Then the collected data are divided into categories that correspond to the main points of the interview guide and that were highlighted during the interview. In addition, the paragraphs are divided so that they are easily linked to the literature review and they are able to clearly address the research question and the sub-research questions. This point is explained below.

The first paragraph concerns the current recruitment process of the company, its phases and the technological tools used in it. Trying to find a link with the literature review, it can be linked both to *paragraph 2.1 (*specifically *2.1.2* and *2.1.3*) that concerns recruitment phases and methods used, and to the whole *paragraph 2.3* that concerns digital tools and technologies associated with the world of recruitment. Since this paragraph is full of important concepts for the answer to the main research question, for clarity it is divided into further sub-paragraphs.

The second paragraph focuses on the main advantages and disadvantages identified by the HR specialists interviewed in the use of digital technology in the recruitment process. This part can be linked to *paragraphs 2.2.4* in which a SWOT analysis of digitalization in general is made, but also to *paragraph 2.3* that talks about the benefits and drawbacks of digital tools in HR.

The third paragraph focuses on future prospects and challenges regarding the topic, both from a business point of view and from the personal point of view of the respondents. It refers to the literature review in *section 2.2.4*, in the part of SWOT where opportunities and threats are highlighted, and in *section 2.3.5* where the main challenges of digitalization in the recruitment process are described.

Finally, for the completeness of the search, for each case company useful information about the topic found on their website are presented.

4.2 Global Head of Recruitment at Volvo Cars

Volvo Cars is a Swedish car manufacturing company with more than 40000 employees and a strong technological approach. Its market radius is international and represents one of the best known and oldest car manufacturers in the world.

Stefan Begall is the Global Head of Recruitment at Volvo Cars. He is the head of the global recruitment program, but he is not a direct recruiter. He leads and manages the subordinate teams with a strong international perspective. With a background in the sales department and having started at entry level in recruitment, Stefan is now exclusively involved in the strategic part of the recruitment process and is well versed in the process.

For him, recruitment is one of the main assets on which a business is based and develops. This is because he believes that everything revolves around people, from the initial idea of the business, to the way and the commitment with which it is carried out.

> *"Recruitment represents one of the most important aspect when building and developing a business. Everything is about people. It doesn't matter what type of products you sell or what type of services you offer, people do the work."*

That is why he believes that hiring the most talented people is very important.

4.2.1 Recruitment Process

As mentioned, Volvo Cars has more than 40000 employees and that makes it more than a big company. As such, the need to hire people arises almost every day, so much so that on average between 1000 and 500 people are employed. In reality, however, due to different reasons, last year (2019) the firm hired only 450 people externally, greatly increasing internal recruitment.

Recruitment phases

There are a number of more or less pre-determined recruitment stages at Volvo Cars:

1) Initially a manager, following the need for an employee, submit a request in the internal software used to manage the process.
2) A recruiter takes care of the request and starts a conversation with the manager in order to learn more about the position and have a clear job description.
3) The job offer is posted on dedicated digital platforms.
4) Applications are evaluated.
5) A preliminary cognitive interview is carried out.
6) Candidates are tested online through the use of digital assessment tools; the tests are always different depending on the job position you are talking about.
7) There is a competence-based interview in which candidates show whether they match the required skills.
8) Candidates are presented to the manager who carries out a different number of interviews depending on the complexity of the role.
9) The contract and a mandatory agreement to be signed electronically are sent to the applicant.

Digital Tools and Main Technologies

In the Volvo Cars recruitment process there are many stages in which digital systems are involved or which are done completely digitally.

The company uses an ATS called *SuccessFactors*. This software creates a dynamic virtual platform through which various functions can be managed. Through this platform all candidates apply for the job (on the website or via social networks) and insert their data. The system collects and stores the data and creates a profile for each candidate. These profiles make recruitment management simple and versatile, so that all those working on the cause can easily track the candidate's path.

Another software used by Volvo Cars is *RecRight*. Thanks to this tool the company carries out pre-recorded interviews to manage job positions with many applicants. Also, as far as interviews are concerned, if it is not possible to carry out interviews in a physical way due to problems of various kinds, programs such as *Skype* or *MicrosoftTeams* are used to connect in live video calls with the candidates.

The company is also very active on social networks, which it uses in two different ways:

- It uses job social media such as *LinkedIn* or *Indeed* to post job offers and directly collect candidates' applications.

- It uses popular social networks like *Facebook* and *Instagram* to attract candidates. Through these platforms, Volvo Cars tells daily work stories to convince people why it is interesting to work for them. In this way they build on how they are perceived externally.

Finally, e-signature is almost always used to sign contracts.

As we note, the basis of Volvo Cars' recruitment process is the use of the internet. IT development in recent years allows the process to start, manage and finish online quickly and easily. It also underpins other technologies such as social media and software.

In addition Volvo Cars is developing some tools that work with AI, such as automatic chat bots to interact with candidates or a machine that reads CVs and checks whether or not they match the required skills.

> *"We are discussing about introducing a CV matching tool. We haven't implemented it yet but we are working at it. It could be useful to bring down the funnel of applicants to a more manageable level. We have quite a lot of applicants for most of our positions and unfortunately not all applicants match our requirements."*

The company has started testing with these tools, but they still have many bugs, so they will probably be ready by 2021. HR department now in Volvo Cars is prioritizing other things, they only adopt technologies when they really work and can make differences.

In terms of regulation, Stefan described the Volvo Cars team as a GDPR expert. In fact, they do not adopt any digital tools that do not comply with European data protection regulations, their tools are 100 percent GDPR proof. That's because a global company like Volvo is always in the spotlight and acts in different countries with different rules, so it can't afford to go over the limits.

4.2.2 Perceived Advantages and Disadvantages

Stefan Begall thinks there are many advantages to using digital technologies in Volvo Cars' recruitment process:

> *"Having everything digitalized and not on the papers gives us full insight into where a candidate is in the process and gives us a lot of benefits."*

- The software used makes it really simple and intuitive to manage candidate information. In this way recruiters can have a clear view of all applicants and can have the advantage of being able to carry on the same application.
- It helps to develop KPIs. Digitalization easily develops statistics, making it possible to understand the most attractive and requested positions or those who perform in certain areas rather than others.
- Facilitates the creation of an inclusive working environment. By making it easier to track the gender and backgrounds of candidates, it is easier to pursue the goal of an international and equal environment.

> *"From a diversity perspective, which is very important to us, we have a recommendation from our board that we have to be 50-50 in the balance gender. Then we have to take into account that we are a very international business so we don't only want Swedish candidates, but we want teams with a very high diversity degree"*

- Overall helps a lot to find the best candidate in terms of matching the skills required. Competencies always come first.
- Develop a paper-free model. Reducing paper waste not only helps business logistics but is also an environmental benefit.

On the contrary, the disadvantages that the head of the global recruitment programme identifies are:

- In the analysis of statistics and KPIs. You need to have a good knowledge of how they work applied to recruitment. They can throw you off track if you do not learn how to select sources from the web and teach recruiters how to interpret data.
- Volvo Cars also has applications from countries around the world that are underdeveloped, and therefore not very technological and digital. In this case the digital mechanisms leave some people out of the recruitment process if you don't leave even an "analog glimmer".

4.2.3 Future Perspectives and Challenges

If he looks to the future of the recruitment process, Stefan sees it as more digital, automatic and interconnected. According to him, digital tools are increasingly able to understand the needs of HR managers. Obviously in order for them to improve work efficiency, they need to be refined so that they correctly interpret the stimuli coming from the human world.

He thinks that AI, by processing the amount of data that can be found through the web, will be increasingly present in recruitment. Repetitive tasks will be carried out by robots (for example in Volvo Cars the drafting of contracts is already done by robots) and will save time for recruiters with irrelevant candidates. The robots will also allow you to be active for 24/7 conversation, so you can easily communicate with people from all over the world and in different time zones. Furthermore, in the future, intelligent machines could correct and eliminate the bias that humans have in the perception and evaluation of candidates.

But Mr. Begall thinks that automation will not be able to completely replace the interaction between people in this department.

> *"Maybe I'm old fashioned but I do believe that AI will only assist HR professionals' work. It can help us in part of the recruitment process. I don't want to lose the interactions between people!"*

Human interactions are still fundamental, so AI will only support HR professionals' work. However their approach at Volvo is daily based to new technologies: they are always open to testing new technologies (as they are already doing for AI), but they introduce them into their operations only when they are really ready to bring a benefit.

There are important challenges that companies face by increasing the digitalization of recruitment processes.

First and foremost, they must be able to choose the right tools to suit their needs and use them in a proper way. Also, the HR department must never forget that people need to interact with other people, so in this area it is important not to submit to the use of digital, although it brings enormous benefits. In addition, you must always consider the international aspect: not all countries have the same level of digitalization, and being Sweden one of the most digital countries in the world, it must be careful not to propose mechanisms that are difficult to understand or accessible to most people.

4.2.4 More about Volvo Cars

When you open the Volvo Cars website, the words innovation and digitalization immediately jump out at you. These two aspects are strongly associated with the image of Volvo Cars. If you look carefully in the 'careers' section on the website or in the 'people' section on the company report, the focus is no more this, but mainly on corporate sustainability, internationalization and gender balance.

Volvo Cars has an approach that is very care to workers' needs, from transparency to career opportunities. Volvo has earned a lot of awards over the years for being among the best employers in Sweden and around the world. The company is always actively looking for highly skilled employees, attracting them with their cutting-edge environment and current employee stories.

4.3 Manager Employee Experience at Company X

Company X is a Swedish multinational technology company specializing in product development. It operates as a technical consultant partner in many sectors, mainly with companies in the automotive, energy and life science sectors, and has more than 2200 employees. Their focus is strictly on the end user, and their mantra expresses their priority on people rather than technology.

Anonymous X is an HR manager who works primarily with the company's Swedish department. She is leading the employee experience at Company X and is the head of a team in an HR manager working with Swedish department of the company. Her HR team is responsible for creating concepts, ways of working and proposing new ideas to implement these points in order to improve the recruitment experience. Her background includes HR studies and she has always worked in this field, in different business sectors but always in touch with the technology.

For her, recruitment means finding the person who best matches the company's values, beliefs and ambitions.

> *"Recruitment means finding the best possible match between someone's core values, beliefs and ambitions and pairing them with those of the company. In this way the employee will be more comfortable in the work environment and it will be easier for him/her to succeed. Only when you find a perfect match you have a good recruitment!"*

So, only by being in line with the company's vision an employee can succeed in an organization.

4.3.1 Recruitment Process

Company X has more than 2200 employees and that makes it a big company for the Sweden market. It is a fast expanding business, hiring 400 people every year. This means that they are always recruiting every day, looking for innovative and creative solutions to manage the large amount of candidates and find the talent to match their vision.

Recruitment phases

The interviewee said that there is not a fixed recruitment process, it is very varied especially in the number of interviews and the duration of them.

> *"We don't have a fix process and all our managers are doing the recruitment themselves. We are just coaching them in the start, in making sure the things grow as they should. So, everyone could act differently in the methods like number of interviews and duration of them. They have just to follow some guidelines."*

However, she tried to structure her company's recruitment process in the following steps:

1) Plan: a recruitment plan is defined to understand the recruitment needs.
2) Advertise: a job ad is created and published on various platforms
3) Promote & Search: tools are used to increase reach for job ads and candidates are searched on LinkedIn.
4) Review: incoming applications are screened and candidate feedback is generated.
5) Interview & Assess: interviews and assessments of various types are made, then references are checked.
6) Offer & Feedback: an offer is submitted to the candidate.

Digital Tools and Main Technologies

A lot of use is made of digital tools during the recruitment process of Company X.

The company uses software served by *TeamTailor*.

> *"We adopted TeamTailor last year and we changed the entire recruitment system. Currently we are using it for everything, from the advertising to the administration of applications. It's basically everything we need, it's fantastic!"*

This product helps the company in 3 different ways:

- Employer Branding: it manages the career section of the company so that its employees are user friendly and attract candidates.
- Candidate experience: manages applications and relationships with candidates to improve their experience.

- Recruit & Analyze: helps the company manage multiple hiring processes across the organization to make team work more collaborative.

Then Company X uses an application called *Refapp* to check references. This web-based tool manages references in a simple, clear and effective way. It simplifies the structure and increases the customization of references in the recruitment process.

The company uses its own website, national employment sites and many social media to post its job ads. In facr, its ads can be found on *Arbetsförmedlingen, Jooble, Facebook Jobs, Indeed, LinkedIn, Google Jobs, Glassdoor*. It is also very active on social media to create engagement and especially in the *Promote & Search* phase they are used to increase reach for job ads and *LinkedIn* is used to actively search for candidates.

Skype is used a lot for interviews because the applications come from all over the world. It is quite reliable and useful especially in this period due to the pandemic, despite not capturing all the body language.

Currently Company X works with data analytics but not with big data. This data is used to feed learning machines. In fact, the Anonymous X is teaching some intelligent machines (AI) to reproduce operations in the same way as she does. So, it could be said that Company X's HR department is testing products based on artificial intelligence.

4.3.2 Perceived Advantages and Disadvantages

Company X's HR manager thinks there are many advantages to using digital technologies in the recruitment process:

> *"Why is it good to use digital tools? There are no options really {laugh}, the number of applications every day is massive!"*

- The ability to manage many applicants. Company X receives 3000 applicants per day and it would be impossible to manage them all manually. It is true that before the internet you received even fewer applications, but the advantage now is that you can choose from a wider range of candidates.
- The speed and agility of digital services. They increase the speed of operations and are easy to use.

- They are not expensive. Implementing your own digital systems can be expensive but rely on external providers is not expensive at all compared to the alternative cost if the same functions are performed without them.
- They allow you to reach people from all over the world.
- The help to comply with the GDPR. The software is specially created to comply with the regulations by deleting data that is not needed.

On the contrary, the Anonymous X struggles to recognize current drawbacks in the use of these technologies. Sometimes it finds it a bit dehumanizing, because in the process it sees only names and documents and not people.

4.3.3 Future Perspectives and Challenges

If she thinks about the future of her company's HR department, she does not see it any different than now. In the short term, there are no plans to adopt new digital solutions, apart from those technologies they are testing. But she is taking into account that the company is growing rapidly and continuously, so she might consider introducing new tools. In general, she thinks that in the future machines will not replace people in this field. Biological creatures need human interactions, and it is difficult that machines will have emotions like humans.

However, the figure of the HR professional will change, leaving the simpler and more mechanical tasks to computers, while the more creative activities will be performed by humans. For example, think that computers will learn to post ads by themselves when they need to and increase the response rate of ads. They will also be able to schedule interviews (smart schedule) depending on the previous commitments of the recruiter and they will be able to analyze the vocal records of the interviews. The only benefit of completely replacing human beings with machines would be the elimination of the bias that recruiters have. Technology could help to select people based solely and truly on their skills.

Although revolutionary automation technologies like AI are growing, she thinks they are not good enough now.

> *"Artificial Intelligence is starting to grow, but it is not good enough yet. Usually we see in TV or on the web robots that are able to act like humans, also doing recruitment. Well, that's just for show!"*

The problem behind the development of these technologies is an ethical one, because the machines could be fake trained and discriminate or lead to false results.

4.3.4 More about Company X

The information on the website and the annual report of Company X is very interesting. As mentioned initially, the two main focuses are technology, related to the products they develop, and people, their customers, on whom they focus more than the rest. The company develops together with companies highly digital products using technologies such as artificial intelligence for purposes such as automation and autonomous driving.

This propensity for digitalization is also highlighted in the company's annual report and in particular in the 'employees' section. Here reference is made to a renewed employee experience: in fact, new digital systems support the recruitment process to provide candidates with an excellent first impression and make them understand the focus of the company right from the start. In the dedicated section, however, the role of technology in the company is clear, i.e. to support human work.

4.4 HR Strategist at Göteborg Energi

Göteborg Energi is the municipal energy supplier of the city of Gothenburg. The company provides energy solutions, broadband, district heating, cooling, natural gas, and electricity supply network. It serves customers throughout Sweden and is very active in the creation of sustainable solutions in the sector with about 1000 employees.

Ulrika Mattson is an HR strategist at Göteborg Energi. She works in collaboration with the company's recruiters but does not exercise that function at all. Starting from social science studies she has always worked in the public sector in the HR area, moving from the company in the municipality of Gothenburg to its energy company.

For her, recruitment is the business function that allows the company to find on the market the skills they need to carry on their business, but above all to help them develop it.

> *"Recruitment is a very important process in a business organization. It allows a company to find new competences on the market in order to move through another step in the business development."*

In an industry so open to sustainability, a company continuously needs innovative and sustainable ideas to achieve its goals.

4.4.1 Recruitment Process

Göteborg Energi has about 1000 employees and it represents one of the biggest companies in the city. It operates only in the Swedish market and in the last year 117 new people have been hired. The company in question only posts vacancies when there is a need to replace vacancies or the need for new skills to develop innovations.

Recruitment phases

Ulrika said that the recruitment process is very varied and can be done through internal and informal ways as per Swedish culture.

> *"I've been working in the field for many years and I can tell you that the recruitment methods are infinite, it's difficult for a company to have fixed steps. Also, it is very common in Sweden to use informal recruitment methods through references."*

However, the main recruitment channel is external and takes place in different stages:

1) The skills that the company needs are set by a manager in collaboration with recruiters.
2) The team involved meets to decide how to recruit, which methods to use and through which channels to pass.
3) The job advertisement is posted publicly or privately, depending on the nature of the job.
4) All applicants are analyzed and evaluated through interviews; there is not a fixed number of interviews.
5) The right candidate is chosen and the job offer is presented.

Digital Tools and Main Technologies

Some digital tools are used by the energy company in its recruitment process.

The system mainly used is called *EasyCruit* a *Visma* software (ATS). This software is used in the same way for all the types of position and it is not differentiated. It has three main functions:

- Provides the platform to submit applications online. This platform is then integrated in the career section of the company's website.

- Manages applications by simplifying work models, generates self-amending responses to emails and mass-processes candidates.
- Track candidates, rank them according to their application needs and their scores in order to facilitate the selection process.

The company also uses *Skype* for interviews that are impossible to do directly or for the first interviews of the process because it does not allow to catch everything of a person. In fact, she prefers to arrange personal meetings whenever is possible. In addition, it uses a digital system to automatically transmit agreements to selected candidates.

Obviously, the development of the internet has radically changed the recruitment process at Göteborg Energi, making the website the main recruitment channel. But it also allows the use of social media to attract and search for candidates. The company mainly uses *LinkedIn* for these purposes and also has *Facebook* and *Instagram* pages which, however, it does not use too often especially for recruitment purposes.

Other technologies are now not present in the tools used by Göteborg Energi for their recruitment. Some tools that rely on artificial intelligence for the recruitment process are interesting for the company and would also be useful. But they are not going to adopt them because, being not necessary because of the amount of work they have to do and the excessive cost it would entail.

4.4.2 Perceived Advantages and Disadvantages

Göteborg Energi's HR strategist noted the following advantages of digitalization in their recruitment process:

- The integrated software used in the process is easy to use, versatile and comprehensive of many different features.
- Having all the data necessary for the recruitment on the same platform is convenient for managing the process in a faster way.
- Digitalization, in the specific IT development, allows the HR department to reach easier people that match the specific skills required.
- Comparing the cost of introducing digital tools with the labour cost required for the same tasks, these tools can be defined cheap.

According to her is difficult to find any disadvantages in digital tools used in her company.

"The advantages are too many that even if there are relevant drawbacks in it, it would be impossible not adopting them."

This means that the use of some digital tools is necessary nowadays in the recruitment process of a big firm, despite some drawbacks. However, Göteborg Energi's strategist recognize a limitation in the technology adopted. Indeed, they are reliable only in the search phase, but not in the selection one.

4.4.3 Future Perspectives and Challenges

She thinks the future prospects are hard to predict. There are many companies that produce software that are very similar to each other, only with different small details; it is difficult to monitor its evolution. The company currently has no short-term plans to introduce digital tools that rely on AI or Big Data.

It also does not believe that robots will be able to replace people in this work despite their improvement.

"AI is making rapid and significant progress in HR. But I do not believe that robots will be able to replace human recruiters, at least in the next 20 years."

She thinks it will take a long time for technology to perfect itself to the point where it can create artificial machines that are completely equal to humans. Only then robots could replace people.

A challenge arising from the increasing digitalization of the recruitment process is related to data management. Complying with the numerous regulations, collecting an amount of data that you don't even know you have, becomes increasingly difficult to manage, despite the fact that the software used now are able to manage the data in a way that comply with the European regulation. Moreover, for the public sector, this matter becomes even more challenging, as the rules are more and more strict.

4.4.4 More about Göteborg Energi

On the Göteborg Energi website values like sustainability and technology are exalted, but nothing in particular to some digital strategy. On the other hand, the company's activity does not make it very close to digitalization.

Analyzing the company report there is instead a section where it talks about the recruitment process. The focus this year was on gender equality and diversity in the energy sector, where they shared experiences and ideas and stimulated to take new initiatives. But in a small part of the paragraph it is said that every year the HR team is committed to making the recruitment process more direct and user friendly, but nothing in particular about digital strategies.

4.5 Global HR Manager at Company Y

Company Y is a product development company in the Automated Guided Vehicles (AGV) sector. The company is a leading distributor of automation systems and components for the machine builder sector and provides unparalleled innovative solutions in terms of performance, reliability and ease of use. It is part of a U.S. group, but its Swedish location is independent in its operations related to the recruitment process. It has 1800 employees.

Anonymous Y is the company's Global HR Manager. She manages several recruitment teams and makes recruitment decisions in collaboration with other managers. She has always worked in HR, but in very different areas making her very versatile.

For her, recruitment is not only about sourcing the best skills and talents on the market, but also about building long-term relationships with people.

> *"Recruitment means sourcing the best skills and talents on the market. But it's also long-time relation building; the networks available nowadays are huge thanks to digital platforms."*

4.5.1 Recruitment Process

Company Y has about 1800 employees. It has a very low turnover rate with about 15/17 new hires each year in addition to the hiring related to the replacement of employees leaving the company. Essentially, they recruit only when needed, although each year they have internal targets to achieve related to how the business grows.

Recruitment phases

Company Y does not hire many people, so it does not manage large teams of recruiters who therefore need structured rules. However, the HR manager has identified three macro-phases:

1) Employer Branding: At the heart of the recruitment process, the team works to make the company more attractive to candidates through offline and online channels.

> *"Before our recruitment process begins, what we do all the time is working with the employer branding so that people know of us and think we are an attractive employer to work for."*

2) Needs of the Position: the requirements that a candidate must have in order to fill the vacant position are set
3) Search Process: the search process takes place in two ways:
    - for junior positions they post ads online (Website/LinkedIn), but it is less frequent
    - for senior positions or for jobs that require skills that are really hard to find, they use external recruitment agencies (Recruitment Companies). Most used by the company.

> *"We always try to advertise on the web in our recruitment process. But today software's skills are really hard to find, so normally we use someone who can search for us."*

4) Selection Process: the phase in which their team or recruitment company chooses the right candidate.

Digital Tools and Main Technologies

The software used by the HR team of the Company Y for the recruitment is *TeamTailor*.

> *"We are using TeamTailor. We just implemented it three months ago, so we are pretty new on that. But it seems to work very well. It carries out all the functions we need to interact with people who want to work for us, for all those who show interest for us."*

The company uses it with 3 main purposes:

- Management of ads on the web.
- Management of the relationship with candidates.
- Internal management of candidates.

Then to post its ads the company, thanks to the use of the internet, uses a career page on its own website and the social network *LinkedIn*. Their recruiters actively use *LinkedIn* not only with this

purpose, but also in the continuous activity of employer branding. It is not the only social media it uses, as it also uses *Facebook*, but only to tell stories about employees and increase its visibility.

Of course, Company Y uses *Skype* to conduct cognitive interviews mostly, so in the first phase of the process. It is a key tool in the recruitment process, although before hire an employee they always do at least one interview in person. Even in this period of epidemic where it is not possible to meet in person, they will wait, except in urgent cases, until the end of this limitation to complete the outstanding hires.

The company does not use other digital tools internally in the recruitment process. However, the recruitment companies they collaborate with, work with other technologies. The Anonymous Y does not know exactly what these technologies are, but she knows for sure that some of them operate through the famous *CareerBuilder* platform, that helps find the right candidates through the AI technology.

4.5.2 Perceived Advantages and Disadvantages

The Anonymous Y perceives the following benefits from the adoption of digital tools in the recruitment process:

- The good-looking platform that results very attractive.

> *"First of it is a real good-looking platform! Our company is owned by an American holding and they influence us in this. They rightly think that the first thing that jumps out at a potential candidate is the beauty of the page."*

- The platform provided by the software ATS is well-structured with the possibility to administer candidates in a versatile way.
- The possibility of multiple recruiters handling the same person's application, exchanging notes and comments or even sharing candidates with each other.
- The platform allows to have all the necessary documentation on a single spot in a way that makes the work more agile
- The software ensures GDPR compliance.

She thinks there are no real disadvantages to the use her company makes of it. However, the only downside she recognizes in a digital recruitment process is that you only really know a candidate when you physically meet him/her.

4.5.3 Future Perspectives and Challenges

Company Y's global HR manager sees much digitalization in the future of the recruitment process. But she thinks that probably this will not happen in her company, being very stable in terms of turnover rate. So she finds it hard to see in the short term in her company, digital tools very different from those used now.

But in general, according to Anonymous Y, there will certainly be much less administrative tasks to do manually, as some entire steps will be carried out by robots. In addition, the robots will be able to do the interviews in the same way as they now provide support via chat bots.

She thinks that machines will be perfectly rational, not like people. Therefore, in the process they could eliminate the biases that are currently present in the recruitment. That is why it is credible for her that computers will be able to carry out the entire recruitment process.

> *"I hope robots will not replace us {laugh}. But I believe that in 10 years it would be possible that this happens. New technologies are becoming increasingly ready for this change and the benefits are too convenient. I think that if artificial intelligence takes further steps forward, the transaction between human and computerized recruiters will be possible."*

Finally, she made it clear that this is a personal point of view and does not particularly concern the future of the Company Y.

4.5.4 More about Company Y

From the site of the Company Y it is immediately clear the importance that the company gives to innovation, technology and automation. It makes its own products of this kind, so it is normal. In the 'Values and Culture' section, however, in first place is the focus on teams. The company wants them to be coordinated, competent and efficient and is committed to using and implementing the best methods to ensure this competence.

In addition, it was not possible to access the company's report, as Company Y belongs to a larger US group, in which reports there are no useful insights for research.

Respondent	Recruitment Process				Perceived Advantages and Disadvantages		Future Perspectives and Challenges	
	Personal Definition	**Need for Recruitment**	**Recruitment Phases**	**Digital Tools and Technologies**	**Advantages**	**Disadvantages**	**Future Perspectives**	**Challenges**
Global Head of Recruitment at *Volvo Cars*	People are assets, hiring most talented people	Everyday, 1000-500 people every year	Need of employee, job description, job ad, evaluation of applications, cognitive interview, assessment tests, competence interview, final interview, agreement	SuccessFactors, RecRight, website, social networks, Skype, Microsoft Teams	Simple, intuitive, develop KPIs, inclusiveness, internationalization, best candidate, paper-free	Interpret data, exclude undigitalized countries	AI, more digitalization and automation, computers will do repetitive tasks, chat bots, eliminate biases, only support human activity	Ability to replace humans, choosing right tool, not introducing too much digitalized tools
Manager Employee Experience at *Company X*	People who match companies' values, beliefs and ambitions	Everyday, 400 people each year	Plan, Advertise, Promote & Search, Review, Interview & Assess, Offer & Feedback	Team Tailor, Refapp, website, social networks, job platforms, Skype	Manage many applicants, wide range, speed, agility, easy, cheap, people from all the world, comply with GDPR	Dehumanizing	AI, machines will not replace people, computers will do simpler tasks, will schedule interviews, eliminate biases	Ability for machines to have emotions, ethical problems
HR Strategist at *Göteborg Energi*	People who has the skills to carry on the business and help to develop it	Only when need to replace, 117 people each year	Set skills, how to recruit, job advertisement, analysis of applicants, selection & offer	EasyCruit, website, social networks, Skype	Easy, versatile, comprehensive, all on the same platform, reach people with best skills, low cost	Only reliable in the search phase	Robots will not replace humans	Choosing the right tool, complying with data
Global HR Manager at *Company Y*	Building long-term relationships	Only when needed, 15/17 people each year	Employer branding, needs of the position, search process, selection process	TeamTailor, website, social networks, Skype, CareerBuilder	Good-looking, versatile, multiple recruiters can handle the same application, all on a single spot, GDPR compliance	You don't know a candidate until you don't meet him/her	Much digitalization, less administrative tasks, interviews via chat bots, eliminate biases, machine rationality	-

Table 5. Summary of Empirical Finding

5 ANALYSIS OF FINDINGS

In this chapter a comparative analysis between the analytical findings of the various HR representatives of the companies under examination and the theory is outlined. For sake of clarity and consistency, the analysis is presented following the structure of chapter 4, i.e. with the same categories and subcategories. The categories are as follows: Recruitment Process, Perceived Advantages and Disadvantages, Future Perspectives and Challenges. Opinions on the meaning of recruitment and information gathered from corporate websites contribute to enrich the analysis in the above paragraphs.

5.1 Recruitment Process

To understand the general approach to digitalization in the recruitment process of Swedish companies, it is necessary to investigate from the concept of recruitment that they have. The general approach to recruitment that HR representatives' companies may have can arise from their personal recruitment concept. Surely their vision must also marry the company's values and vision in order to recruit the right talents to meet the ultimate mission. The findings analysis immediately shows that the 4 respondents have a different idea of the subject.

For the HR Strategist of Göteborg Energi, recruitment is a matter of skills: it represents the corporate function that allows the company to find the skills it needs. This somewhat simplistic view of the subject was given by *Newell (2005)* who saw recruitment simply as *"matching the right individual with the right job"*.

O'Meara & Petzall (2013) instead argued in this regard that *"the value of employees is not only in their talent and knowledge, but in all the resources they can provide to the company"*. This thought is shared by the Global HR Manager of Company Y, which sees recruitment not only as the search for the best skills and talent on the market but aims to build long-term relationships with people.

In addition to these visions based on skills and networks, the Manager Employee Experience of Company X relies most on the values, beliefs and ambitions of the candidates. She is convinced that only by being in line with the company's vision can an employee succeed in an organization *(Järvinen & Korosuo, 1990)*.

Volvo Cars' Global Recruitment Leader gives recruitment a key importance within a business. According to him, recruitment and selection is one of the most important assets on which a business is based and develops. This thought can be compared to *Boxall (1996)* who thinks that the company

can *"gain competitive advantage through the acquisition and retention of best talents"* especially in a competitive and globalized environment like the current one that forces companies to *"obtain the best possible resources in order to outperform its competitors" (Newell, 2005).*

In order to understand the approach to digitalization in the recruitment process of Swedish companies it is also good to analyze their size in terms of employees, how often they recruit new staff and to what end. The size of the company is crucial in this analysis because *"companies attach more importance to the recruitment process as they start to get bigger and bigger and have more specific tasks" (Snow and Snell, 1993)*.

Among the companies analyzed Volvo Cars is the largest and has many more employees than the others. In fact, it is the one that employs the most on average (between 500 and 1000), activating the recruitment process every day. The same is true for Company X which, despite having about one twentieth as many employees, is a strongly expanding business and recruits 400 new people every day. This means that these companies recruit every day and not only to *"fill the lack of people in certain company roles" (Carey, 2011),* but "*also when the company wants to adopt different strategies and achieve long-term sustainable development" (Sarma, 2008)*. The frequent use of these two companies' recruitment activities means that they are always looking for innovative solutions to manage the large number of job applications they receive.

In contrast, Göteborg Energi and Company Y do not recruit very frequently. Mostly they only recruit when there is a need to replace vacancies. The former, however, despite being the smallest of the companies analyzed, employs around 100 people annually; Company Y, on the other hand, despite being larger, has a very small number of new hires each year (15/17), in fact it uses a lot of external recruitment agencies.

5.1.1 Recruitment phases

The analytical results from the interviews showed that companies proceed differently in the recruitment process. In reality, however, if we start from the recruitment model in *Figure 1* it can be seen how the phases of the companies analyzed (reported in *Table 5*) can be traced back to those identified by *Breaugh et al. (2008)*. This is explained in detail below.

1. The first step in the recruitment process is the definition of *Recruitment Objectives*. In this phase, it should be considered which positions need to be filled and what are the main

characteristics that a candidate needs to have to fill certain roles. If we look at the Volvo Cars process, it can be seen that the first two stages can be traced back to the setting of the recruitment objectives. In fact, the manager of a given department forwards the request for an employee to the recruiter, who then discusses the job description with him/her in order to set the ideal characteristics sought. The same is true for Company X. Its first phase *"Plan"* deals with defining a recruitment plan in order to understand the recruitment needs, which is the same objective as the first phase identified by *Breaugh et al. (2008)*. Also for Göteborg Energi the first phase has the same objective as the others: it aims to set the skills the company needs. Finally, Company Y also has the same phase. Through *"Needs of the Position"* phase the requirements that a candidate must have in order to fill the vacant position are set. The difference with other companies, however, is that in Company Y this is not the first phase, but the second one. Indeed, it recognizes as the first phase the continuous activity of *"Employer Branding"* that exercises in order to make itself more attractive in the eyes of the candidates.

2. The second step is the *Strategy Development* of the recruitment process. In this phase the most important thing is to decide how to recruit and the selection of the message to communicate to potential candidates. This step is very important because *"recruitment and implementation of the recruitment process strongly transmit the corporate image of the organization" (Järvinen & Korosuo, 1990)*. Volvo Cars does not actually identify a specific step in its process, but the subsequent responses show that Volvo Cars is very active, especially on social media, to promote its brand image and encourage people to work for them. Company X, on the other hand, in its third phase *"Promote & Search"* devotes part of its efforts to increasing reach for job ads through certain channels and tools. The second phase of Göteborg Energi is instead the one that most resembles the definition of *Breaugh et al. (2008)*: the involved team meets and decides the strategy so as to make the subsequent job advertisement as effective as possible. Finally, as said before, Company Y puts at the base of the recruitment process the message it communicates externally. Through the first phase of *"Employer Branding"*, the team works to make the company more attractive to candidates through offline and online channels.

3. The third step concerns *Recruitment Activities*. This is a fundamental step in the recruitment process because it has the greatest impact on talent selection and is the one that has been most transformed in recent years by technology, which is the main focus of this thesis. For Volvo Cars recruitment activities are numerous (3-8). They start with posting job offers on dedicated

platforms and continue with a series of assessments of candidates through cognitive interviews and skills assessment. Assessment tests are also carried out. Also the recruitment activities of Company X include different phases: the *"Advertise"* activity with the use of different platforms to post ads, the *"Search"* activity in which candidates are actively searched and the *"Interview & Assess"* activity in which candidates are subjected to interviews and assessments of various types. In Göteborg Energi instead the third and fourth phases are about job advertisement and the analysis and assessment of candidates with interviews. Particular is the case of Company Y which in the *"Search"* phase of its recruitment process clearly distinguishes two recruitment methods: the one made with the internal recruitment team and the one made by external recruitment agencies. The second is more frequent, limiting the actual recruitment activities carried out by the company.

4. The fourth step of the recruitment process identified by *Breaugh et al. (2008)* are the *Recruitment Results*. In this phase the results of the activities carried out up to that point are evaluated and the selection is made if they are positive. In all four companies analyzed, this phase coincides with their final stages, in which the ideal candidate is selected and the proposal for a job contract is submitted to them.

It is important to underline that respondents tacitly turned their attention to the formal recruitment process. This is because more or less structured processes can be identified in this type of recruitment and especially the use of digital channels to connect with the candidates can be found *(Marsden, 1994)*. In informal recruitment, on the other hand, there are no structured rules, as recruitment takes place through the intermediation of people close to the company who recommend a candidate by bypassing company protocols *(Behtoui, 2008)*. As a result, the analysis has shifted even more towards external recruitment. This is because the internal recruitment of employees is almost always carried out through informal channels in a faster and more effective way *(Rashmi, 2010)*.

5.1.2 Digital Tools and Main Technologies

After noting how the recruitment process follows more or less the same logical pattern in all the companies analyzed, despite their structural differences, we can highlight which are the digital tools used by recruiters and in which of the phases they occur. Based on the most relevant technologies for

the subject of recruitment highlighted in the literature, a single analysis is provided for each of them, placing the digital tools associated with them.

Online Recruitment

Among the technologies explored in depth in the literature, the one used by all trivially is the internet. IT development is the phenomenon on which digitalization is based, *"today there is no business without IT" (Lee & Choi, 2014)*. This is very true from the analysis of the respondents' answers, because to apply to a job for their companies you have to necessarily use internet to access their website or digital job portal. And the spread of these two methods, as *DeCenzo & Robbins (2009)* says, comes from the enormous diffusion of the use of the Internet and the development of increasingly fast and intelligent digital technologies. That is why as much as it seems obvious it is consistent to talk about IT development in this research: online recruitment is not only about receiving job applications digitally, but it's believed to include several areas of recruitment: collect and screen applicants at work, store applicants' data and subject them to selective testing *(Panayotopoulou et al., 2007)*. For all the companies analyzed, the website has a careers area linked to a job portal. So also in this case, as often happens, in the recruitment process the company's websites are only where job portals are accessed from *(Rashmi, 2010)*. The job portals of the companies analyzed work thanks to software found externally. They are explained and analyzed below.

Companies X and Y use the same software called *TeamTailor*. This ATS (Applicant Tracking System) is not very diversified and provides the same functions to both companies, which use them with the same 3 main purposes:

- The first useful function that the software provide is to manage the entire employer branding. It manages ads on the web and attracts candidates providing a user-friendly career platform in which to make applications. In this way it gives the company the opportunity to strengthen its brand image and this helps to attract more candidates *(Valvisto, 2005)*. This function of the system is therefore used in the second phase of the recruitment process identified by *Breaugh et al. (2008)*, that of *Strategy Development* in which the communication of one's corporate image represents a fundamental function.
- The second function of ATS is activated after potential employees have applied for a job. It manages the candidate experience by helping the companies under consideration to manage numerous applications deriving from a strong brand image *(Valvisto, 2005)* and all relations with candidates. This function is therefore useful in the *Recruitment Activities* step where the company uses different tools to test the validity of the candidate *(Breaugh & Starke, 2000)*.

- The third function of the software is useful for evaluating and recruiting candidates. It helps the company to manage multiple recruitment processes across the organization to facilitate the development of the results of recruitment activities. This function can be placed in the last stage of the process, *Recruitment Results*, where the company evaluates all applications comparing the outcomes obtained and makes its choice (*Breaugh et al., 2008).*

Göteborg Energi uses a software very similar to this one just described, that is *EasyCruit* a software by *Visma*. It's very similar to *TeamTailor* because it's not a very differentiated system that performs more or less the same functions as the previous one:

- It provides the platform to submit online applications. In the same way this helps the company in the *Strategy Development* phase *(Breaugh et al., 2008)* to promote its brand with an easy to use platform.
- It manages applications through various tools suitable for mass-processes of the candidates. In this way it implements the *Recruitment Activities* phase *(Breaugh et al., 2008)*.
- It tracks the candidates and ranked them with scores linked to the needs of the job position initially established. This is perfectly linked to *Breaugh et al. (2008)* description of the *Recruitment Results* step.

Volvo Cars instead uses the software of *SuccessFactors*, a company belonging to the famous European multinational *SAP* for the production of management software. This software is among the pioneers of job portals and has many features. For Volvo Cars this system is essential to centralize and standardize workflows. In fact, the system collects applicator data and stores it on a cloud, creating a profile for each of them. In this way, *Recruitment Activities* and *Recruitment Results* (*Breaugh et al., 2008)* evaluation can be managed in a versatile and simple way through this dynamic virtual platform.

Leaving aside Applicant Tracking Software, some companies also use other web-based software to support major ATS. Volvo Cars uses *RecRight*, a digital tool that allows the company to pre-recorded interviews to manage job positions with many applicants, enriching the *Recruitment Activities* phase. Company X, on the other hand, uses software called *Refapp* which is useful in the *Recruitment Results* phase. It is used to check references to streamline the final evaluation process of candidates.

In addition, among the last two steps of the process identified by *Breaugh et al. (2008)* all the companies analyzed use the web-based software for video calls, *Skype*, to carry out interviews that are impossible to physically organize during the recruitment process.

Having so far in the analysis linked the use of digital tools with the phases of the recruitment process of *Breaugh et al. (2008)*, it is important to note that they never act in the first phase, that of the definition of *Recruitment Objectives*. So, it is noticeable that online recruitment takes this phase out, leaving it in the hands of human activity alone. In light of this, it is appropriate to reclassify the phases involved in online recruitment according to the model described by *Searle (2006)* in *Figure 6*. In fact, looking at the functions performed by the ATS used by the Company X, Göteborg Energi and Company Y, it can be seen how they are perfectly traceable to the three phases of the model: *Attraction, Search, Assessment*. Volvo Cars' software also performs *Search* and *Assessment* functions, while for *Attraction* uses other digital tools analyzed successively. For this reason, in the following paragraphs, the analysis of the other digital tools will be linked to this model.

Social Media

The interviews carried out confirm that social media is currently one of the digital technologies fully involved in the recruitment process. All the HR professionals interviewed admitted the use of social media in the process they manage and they all distinguished the dual purpose they pursue. Specifically, there are some social networks in particular more suitable for one purpose and others more suitable for another.

- The first aim identified by the interviewees concerns work social networks: on these platforms recruitment managers can directly post their job ads and collect applications. This use of social media intervenes in the *Search* phase of online recruitment, in which the organizations look for suitable candidates *(Searle, 2006)*. This is made possible thanks to the extensive networks that these platforms create by connecting thousands of users (employees and employers) to each other *(Osman, 2020)*. In this way HR department's representatives can easily access the social profiles of candidates who often tell more than one resume *(Feichtinger & Hörold, 2015)*.

  The respondents' answers confirm *LinkedIn* as the most used social network in the workplace. The two largest and most hiring companies surveyed, however, also use other job platforms that however carry out the same tasks of social networks. Volvo Cars uses *Indeed*, while Company X uses *Jooble, Facebook Jobs, Google Jobs, Glassdoor* as well as *Indeed*. Göteborg Energi and Company Y probably do not need a lot of hiring and are satisfied with the catchment area that *LinkedIn* offers.

- The second goal that respondents emphasized even more emphatically than the first, concerns all the other social media that companies can use as "boomerang talent" to recruit passively only by being socially connected *(Leader-Chivée et al., 2008)*. In fact, all companies interviewed confirmed the use of popular social networks to attract candidates. This use of social media intervenes in the *Attraction* phase of online recruitment, where the company works to increase its visibility *(Searle, 2006)*. This aim of social media is widely confirmed by the literature, which sees it as a tool to increase engagement and retention of potential workers, especially those born between the early 1980s and early 2000s *(Sajid,2016; Leader-Chivée et al., 2008)*.

  Specifically, among the companies interviewed, the most active one on social networks with marketing purposes is Volvo Cars. Through the most popular social networks, *Facebook* and *Instagram*, the company tells daily stories to show people how interesting it is to work for them. These activities play a key role for the company, as they can take advantage of the wide visibility they enjoy, as Volvo Cars is a strong brand recognized worldwide. That's why during this phase, the *Attraction* phase, the company doesn't rely on the integrated ATSs that also manage the visibility of the company and its ads; the management of such an important brand is individually entrusted to a team that manages it with the utmost care and effectiveness. Other companies also mainly use their *Facebook* pages to tell stories, create engagement and increase visibility. For this purpose, Company X is much more active than Göteborg Energi and Company Y, who do not use their pages too often.

Big Data Analytics

From the interviews carried out on championship HR professionals it seems that Swedish companies are still far from adopting a revolutionary technology such as Big Data in their recruitment processes.

In the interviews done, 3 out of 4 respondents (Volvo Cars, Göteborg Energi, Company Y) did not give relevant information on the topic, simply replying that they do not use technology in their recruitment process. Company X's HR manager gave the same answer, confirming that they do not use Big Data Analytics, but only admitted the use of structured data analysis that are used for feed learning machines.

This shows what emerges from the literature, that big data are still under development and "*despite all the advantages they potentially offers, they are not able to replace traditional structured data"*

(Taylor, 2018) and that *"when it comes to HRM, the use of big data is not yet seen from a strategic perspective" (Scholz, 2017)*.

Perhaps it could be true that Big Data is still the exclusive matter of giant companies, which are the only ones that are able to collect immense amounts of data and have the need to process them, to manage the large pool of potential candidates online *(Manville, 2016)*. At the same time, the companies analyzed in this research do not include very large companies, apart from Volvo Cars which, despite being a huge company, is not even among the largest in its sector.

Artificial Intelligence

As far as Artificial Intelligence technology is concerned, the discourse slightly changes. None of the companies analyzed currently actively use AI in their recruitment process, but some of their answers give space to this technology in the short term.

Volvo Cars for example is developing and testing some tools that work with AI technology in the recruitment process, such as automatic chat bots or machines that read CVs and check if the skills they contain match those required. This has been called *"the most trivial thing that AI can do"* related to the recruitment process *(Stuart & Peter, 2016)*, but it is obviously the most concrete one at the moment.

Company X is also experimenting with AI in the HR department. Anonymous X said she is teaching some intelligent machines to reproduce operations in the same way as she does. This is proof that intelligent computers need humans to transmit ways of behaving and values to them *(Heiss, 2017)*.

Finally, Company Y's Global HR Manager has also given insights on the subject. Indeed, although no AI technology is used internally in their HR department, the external recruitment companies with which they collaborate operate with AI-based tools. This means that the company embraces this technology, even if they do not have the opportunity/wish to develop it internally.

It is important to underline that these three companies are in close contact with this technology. In fact, although there is no indication in the company reports regarding the use of AI in recruitment, these companies produce and develop products that work autonomously thanks to Artificial Intelligence. This is important because the adoption of this technology in the recruitment process in a cautious way seems to be coherent with their general strategy and emphasizes two things:

- On the one hand, the technological and digital approach of the company that can be seen from their description.

- On the other hand, the attention they pay to people, to whom they try to deserve the most familiar and humane recruitment process possible.

With regard to Göteborg Energi, the company currently has no short-term plans in order to introduce digital tools that rely on AI, but at the same time it may not be necessary for its infrequent recruiting process.

5.2 Perceived Advantages and Disadvantages

Among the advantages and disadvantages perceived by the HR representatives of the Swedish companies interviewed, there are some points of view in common but some diverging, as actual improvement of the recruitment process through the use of the Internet depends very much on the objectives and strategic vision of an organization *(Drasgow et al., 2015)*. In addition, some related specifically to certain instruments, others in general.

5.2.1. Advantages

From the analysis of the interviews, it seems that all respondents are generally satisfied with the functioning of digital tools they use in their recruitment process, so there are many advantages identified by them (reported in *Table 5*).

Banally, the adoption of digital tools brings time and cost saving not only in the recruitment process *(Álvarez, 2012)*, but in general in the enterprise *(Fitzgerald et al., 2014)*. In the interview, Anonymous X underlined these two aspects in its answers. In fact, Company X receives 3000 applicators per day, so not only the digital tools used increase the speed of its operations, but it would also be impossible to manage them all manually. In addition, she pointed out that these systems, if you rely on external providers, are not at all expensive if compared to the alternative cost of performing the same operations without these tools. Göteborg Energi's HR strategist used almost the same words to highlight the cost advantage that digitalization brings to the recruitment process, stressing the comparison with the labor cost it replaces.

The second important advantage relates to the ultimate goal of the recruitment process, which is to find the best talent that meets the company's requirements *(Hartley, 2005)*. Strangely enough, only two of the four companies interviewed recognize the advantage that digitalization brings in this matter: to create a larger pool of skilled talents (*Nabi et al., 2017)*. Volvo Cars admitted that the tools they use help them to find the best candidates in terms of the skills required. This is very important

to them because, before any other objective, they always prefer skills ahead of all other characteristics during recruitment. Göteborg Energi also benefits from digitalization. However, unlike the theory *(Nabi et al., 2017)*, for the respondent it is not the large pool of candidates that allows to find the best skills, but the possibility that digital tools provide to more easily understand the skills of the applicants by looking at their profiles.

An interesting advantage that emerged from the responses was the inclusion and diversity of employees. This goes against the existing literature on the subject. Indeed, the papers analyzed only stress the risk that the automation of some digital mechanisms leads to the possibility of discrimination of any kind against candidates *(McLean et al., 2016; Gueutal et al., 2009; Scholz, 2017)*. Volvo Cars' Global HR Manager pointed out that the digital tools they use in the recruitment process make it easier to track the gender and backgrounds of candidates, facilitating the creation of a more international, inclusive and fairer working environment. Among other things, this is one of the main objectives identified by Volvo Cars with regard to recruitment. The same objective is highlighted in the Göteborg Energi corporate report, but the HR representative did not mention any benefits from the adoption of digital systems. On the contrary, Company X did not identify this as one of its main objectives but recognized that digitalization has the advantage of reaching people from all over the world during the recruitment process. However, it is not clear why digitalization in the recruitment process is never included in the benefits by the literature. Today, inclusion is one of the most current and most heartfelt issues in society, so scholars and researchers should focus more attention on this in order to guide companies towards a more conscious and appropriate use of digital tools in the recruitment process.

With reference to ATSs, the software used to collect and manage applications, all enhance the benefits that their platforms provide. Volvo Cars and Göteborg Energi enhance the simplicity, intuitiveness and versatility of the platform. Their platforms have the advantage of being able to manage candidate information with a clear and comprehensive view of all of them. This is very consistent with Göteborg Energi 's strategy to make its recruitment process more direct and versatile. Company Y perceives the same advantages mentioned so far and adds others. In fact, its Global HR manager not only calls it a "good-looking" platform, but underlines the advantage of having all the useful information in the recruitment process on a single spot, allowing multiple recruiters to handle the same application by exchanging comments and notes (this advantage is also highlighted by Volvo Cars). These enhanced features mainly relate to the versatility, agility and flexibility that digital software provides to the recruitment process, a concept that clearly emerges from the literature *(Wołodźko and Woźniak, 2017)*.

Another advantage that runs counter to the literature is about the regulation of data protection and privacy. Generally, digitalization in the recruitment process is associated with the risk that data collected during the process may be used for discriminatory purposes, or disclosed without the consent of people involved *(Degryse, 2016; Manville, 2016; McLean et al., 2016; Gueutal et al., 2009; Scholz, 2017; Zang & Ye, 2015).* The analysis of the interviews shows how some software today ensures the compliance of the recruitment process with the GDPR, the European data regulation. For example, Company X and Company Y, which use the same software *(TeamTailor),* highlighted the advantage that their system provides: it complies strictly with the relevant regulations, deleting data from the system when they are no longer needed.

Among other advantages that the literature fails to identify, the Volvo Cars manager thinks that the use of digital tools in their recruitment process helps to develop KPIs. Indeed, digitalization develops statistics easily, making it possible to understand the most attractive and requested positions or those who perform in certain areas rather than others. Another advantage identified by Volvo Cars not mentioned in the literature concerns the environmental side. Stefan Begall in fact thinks that digitalization in the recruitment process develops a paper-free model, helping the company on the one hand to make its logistics operations leaner and on the other hand to give an environmental benefit.

5.2.2. Disadvantages

On the contrary, since HR professionals are satisfied with the digital systems used in their recruitment process, they struggle to find significant disadvantages of adopting them. Rather they have defined some small problems and limitations that these tools bring (reported in *Table 5*), perhaps because their use is limited as a tool to support human activity, not invading its space.

Among the most common problems related to the digitalization of recruitment in general there is the concept of "*Algorithmisation of Human Behaviour"* introduced by *Degryse (2016),* which refers to the standardization of individuals as data and not people. The problem identified by Anonymous X refers to this matter. She sometimes considers the digital systems she uses in the recruitment process a bit dehumanizing. This is because in a large part of the process she is forced to manage names linked to documents and does not interact with people.

This downside could be linked to the one identified by the respondent of Company Y. She thinks that although the process of applying and managing a candidate is facilitated by digitalization, it means that you don't really get to know the person you are dealing with until you physically meet him/her.

The same thinks Ulrika Mattson of Göteborg Energi, who recognizes the usefulness of digital tools only in the search phase of the recruitment process, but considers them limited as far as the selection phase is concerned. This confirms what has been said by *Drasgow et al. (2015)*, who strongly believe that the actual improvement of the recruitment process through the use of the Internet depends very much on the objectives and strategic vision of an organization and, as has emerged in the previous paragraphs, these activities are still carried out by humans in the companies interviewed.

Volvo Cars' HR manager recognized two interesting drawbacks related to the use of digitalization in the recruitment process. The first is related to the personal benefit that the company itself derives from digitalization in the development of KPIs. He thinks that however favorable it may be on the one hand, on the other hand it can lead to a wrong assessment of some dynamics. In fact, if recruiters are not familiar with how to select and interpret the correct data, this can send the entire recruitment process off track. This could be related to the concept introduced by *Bughin et al. (2017)*, according to which companies do not always understand how to use digital technologies and usually they don't invest in training employees on how to use such these tools.

In addition, the Volvo Cars representative recognized another disadvantage that is underestimated in the literature. This latter, in relation to digitalization in the recruitment process, often speaks of discrimination as a preference of one category of people over another. Stefan Begall, on the other hand, recognizes that the digitalization of the recruitment process represents a discriminating factor for all those living in undeveloped and undigitalized countries *(Sabbagh et al., 2012)*, but also because this causes many candidates to fail or find it very difficult to apply for Volvo Cars.

5.3 Future Perspectives and Challenges

The interviews carried out show that there are different future perspectives for digitalization in the recruitment process and at the same time some challenges to be faced (reported in *Table 5*). It is clear and recognized by respondents that digitalization will be increasingly present in recruitment. Some companies mentioned the future perspectives and challenges in their specific case, others analyzed the situation in general.

Among the future perspectives of the interviewees on the topic, the most shared one is the opportunity to abolish repetitive and routine work. Confirming this view is the Volvo Cars representative, who considers the replacement of humans with robots in repetitive tasks an important opportunity not to waste time with irrelevant candidates (*Nilsson, 2005)*. As formerly said, the company is already working to introduce an AI based tool that scans CVs and check if the skills they contain match those

required. Company X interviewee also thinks that the simplest and most mechanical tasks will be performed by computers, leaving the creative tasks to humans. Moreover, Anonymous Y trusts that AI technology will reduce administrative tasks, leaving entire steps in the hands of robots. These visions are widely shared by the existing literature, which recognizes it as a future benefit not only for the recruitment process, but in a business in general *(Nilsson, 2005; Degryse, 2016)*.

Another credible opportunity identified by respondents is the ability of robots to interact with people and answer their questions. Volvo Cars is in fact implementing specific bots for the recruitment process, which will be active 24/7 and will allow people from all over the world to communicate at all times, without time constraints. Company Y's Global Manager also thinks that computers with AI technology, through chat bots, will be able to communicate rationally with people. Only she even thinks that they will be able to carry out interviews with candidates like human recruiters.

In reality, these visions are more current than ever because they are linked to an imminent future. Fundamental for the long-term perspective instead is what emerges from the last question. The last point of the questionnaire (shown in *Appendix)* opens a scenario *"Do you believe that in the future, even with an improvement in technologies, HR's responsibilities will be as important as now? Human contact remains important? Digital tools will only support the work of HR professionals?"*. Only Anonymous Y responded positively to this answer, stressing how credible it is that in the coming years computers will be able to carry out the entire recruitment process.

The other 3 interviewees answered negatively. The manager of Volvo Cars thinks that human interactions are still fundamental in the recruitment process, so digitalization will only support HR's work professionals. The representative of Göteborg Energi shares this idea, confirming that robots will not be able to support people in this work. The Anonymous X instead thinks that despite revolutionary automation technologies like AI are growing, they are not good enough now. According to her, however, the real problem behind the development of these technologies is ethical rather than technological, because the machines could be fake trained and discriminate or lead to false results. This vision confirms *Degryse's (2016)* vision that among the greatest uncertainties and fears related to digitalization identifies the one linked to the replacement of human beings by automatic machines.

However, Volvo Cars and Company X, who in the short term believes only in a decrease in routine and administrative work with the introduction of other digital tools in their recruitment process, recognize a key opportunity that would result from fully automated recruitment. In fact, they think that probably in the future, intelligent machines will be able to recruit better than humans, eliminating their bias and false perceptions that are created when evaluating candidates. According to Anonymous X technology could help to select people based solely and truly on their skills. This is a potential

advantage widely exalted by the literature (*Mairesse et al. 2007, Miles & Sadler-Smith, 2014; Omohundro, 2014)*, but at the same time it produces a dualism between rational analysis and intuition. In fact, technology tends to eliminate all forms of subjectivity, but intuition in this matter still remains very important *(Vaahtio, 2007)*. This is why the representatives of these two companies have this contradictory vision. This is a question that remains open and leaves room for further studies.

Among the other challenges that companies face in their approach to digitalization in their recruitment process, there is the difficulty in choosing the right software. Volvo Cars and Göteborg Energi think that there are many companies on the market that produce very similar software, offering many detailed functions, whose evolution is often difficult to monitor. So, the challenge for them is to be able to understand the real functionality of these tools so that they can integrate them with their strategies and needs in a proper way.

Finally, the interviews revealed an interesting response regarding the GDPR. In the previous paragraph it was analyzed how digitalization in the recruitment process favours compliance with data protection regulations, to the detriment of existing literature that recognizes this aspect of digitalization as risky. Now we see that Göteborg Energi is the only company to find this challenging. According to Ulrika Mattson, compliance with the many regulations is difficult when you have data that you do not even know you own. Indeed, although the software used complies with the European regulations, the public sector is always full of new and strict rules.

6 CONCLUSIONS AND FUTURE RESEARCH

The final chapter is devoted to conclusions and recommendations about this research project. After the analysis of empirical findings together with the relevant literature, answers to the research question and sub-research questions are provided. Once the main implications are presented, suggestions are then provided to develop future research.

6.1 Research Summary

In order to provide a clear understanding of the final results of this research thesis it is good to quickly summarize the highlights of the project.

As pointed out in the research objectives (paragraph 1.3), the main objective of this work is to understand how digitalization supports the recruitment process of Swedish firms. To do this, the author started from an analysis of the existing literature to deepen the concepts of recruitment and digitalization (Chapter 3). Then 4 representatives from HR departments of different Swedish companies were interviewed, who gave the author an understanding of what recruitment means for them and their company and how they approach digitalization to implement it. In addition, the main advantages/disadvantages and future perspectives/challenges that respondents perceive on the topic were collected. After a careful analysis of the findings found, the conclusions are in the following paragraphs.

6.2 Main Research Question

The main research question describes the objective of this study and is the backbone of the results found. This is why it is analyzed first, and then dressed with the results from the sub-research questions. The main research question is:

- ***How are companies approaching digitalization in the recruitment process?***

Taking into account the limitations mentioned in paragraph 1.4, which moved the initial idea of selecting very similar analysis units, towards that of widening the sample range, similar results were produced in some parts of the research. Therefore, despite some substantial differences in the size

and nature of the company, a series of results have been produced that can be theoretically generalized (*analytical generalization*). For this reason, we can describe the approach to digitalization in the recruitment process of Swedish medium-large companies, by answering the research question, according to the following points:

1) When talking about digitalization in the recruitment process, companies refer only to formal external recruitment.

2) Their recruitment phases, despite small differences, are all traceable to the same categories traditionally identified by the literature. The stages of the recruitment process affected by digitalization are *attraction*, *search* and *assessment*. In the first phase in which the objectives of the recruitment process are set, no substantial digital tool is involved.

3) Online recruitment is the main digital technology for the recruitment process. In particular, thanks to IT development, there are two digital tools on which companies' online recruitment processes are based:

- ATS (Applicant Tracking System), integrated digital software that take over and manage a large part of their recruitment processes, providing different functionalities and features, but that pursue the same results.
- Software for video calls, in particular *Skype*. This technology is considered fundamental in the candidate's assessment process, as it allows for very reliable interviews.

4) The use of social media is fundamental in the recruitment process with a dual purpose**:**

- Work social networks are used to post job ads and collect applications in a direct way.
- The most popular social networks are used to increase the brand awareness of the company and be more attractive to potential candidates.

It could be added that none of the companies analyzed make use of technologies such as big data analytics and artificial intelligence in their recruitment process. But this would be the description of a non-approach, rather than an approach. It could also be added that larger or fast-growing companies, such as Volvo Cars and Company X, which have a more frequent recruitment need and a higher turnover rate, are working to introduce AI technology into their recruitment process. However, this is an initial trial of individual company cases, which does not allow it to be generalized as a common behaviour of medium-large Swedish companies.

6.3 Sub-Research Questions

In order to justify the answer to the main research question it is necessary to answer the two sub-research questions that explain the reasons for the type of approach to digitalization in the recruitment process adopted by medium-big Swedish companies. In this case the answers are not generalizing, since they depend on the structure and objectives of the organization under examination and constitute perceptions or opinions of the respondents, not measured facts.

The first sub-research question is:

- *What are the main perceived advantages/disadvantages of adopting digital solutions in the recruitment process?*

As mentioned before, in this case it concerns personal perceptions related to the advantages/disadvantages of individual companies. Therefore, the results are compared in order to highlight similarities or differences between companies, and to exalt those parts that are in contrast with the existing literature.

No doubt the results of this research show that HR representatives in companies recognize many advantages of using digital tools in the recruitment process, as opposed to the very few disadvantages.

The main advantages highlighted concern the efficiency and effectiveness of such tools.

- The first term refers to the advantages in terms of time and costs involved in operations. This is an advantage that is commonly identified in the literature *(Álvarez, 2012; Fitzgerald et al., 2014)* and that has been confirmed by the respondents of Göteborg Energi and Company X. In particular, the latter pointed out that it is impossible for a medium-large company today to manage the high demands in terms of cost and time without the use of digital tools.
- The second term instead concerns the advantages in terms of quality provided by digitalization. In fact, Volvo Cars and Göteborg Energi have confirmed what has already been said in the literature (Hartley, 2005; Nabi et al., 2017) that thanks to the use of digital technologies it is possible to find more skilled employees, thanks to a larger pool of candidates and thanks to the possibility to understand their characteristics more quickly.

Another advantage that has been confirmed by this research is the ease of use of the digital tools used in recruitment. On the other hand, simplicity, versatility, agility and flexibility are all qualities that the literature recognizes when talking about digitalization in the recruitment process. What this research adds, however, is that this advantage lies mainly in the ATS software used by companies. In fact, representatives of Volvo Cars, Göteborg Energi and Company Y, mention these attributes within the platforms that these software provide.

Finally, two fundamental advantages emerge from this research that not only the literature does not mention, but it includes them among the problems related to digitalization in the recruitment process.

- The first concerns data protection and privacy regulations. Volvo Cars, Company X and Company Y argued that the software they use is made to automatically ensure the compliance of the recruitment process with the GDPR, the European data regulation.
- The second is the inclusion and diversity of employees. Volvo Cars' Global HR Manager mentioned it: according to him, digital tools make it easier to track the gender and ethnicity of candidates, facilitating the creation of a more inclusive and international environment.

Speaking of discrimination the Volvo Cars interviewee pointed out that, on the contrary, it is also a disadvantage that can result from digitalization. However, this is not because of the willingness of recruiters during the recruitment process, but because of the disparity in levels of digitalization between countries. For this reason, many candidates usually can fail or find it very difficult to apply for a job.

In the end, the disadvantage identified by *Degryse (2016)* as "*Algorithmisation of Human Behaviour"* was recognized by this research, in particular by the interviewees from Company X and Company Y. Indeed, digitalization leads to dehumanizing the recruitment process, forcing recruiters to interact with computers rather than people during many stages of the process. This has the disadvantage of not really knowing a person until you meet them live.

The second sub-research question is:

- *What are the future perspectives/challenges for the use of digitalization in the recruitment process?*

In the same way as the previous research question, the answer to this one derives from personal opinions about the future of digitalization in the recruitment process. Therefore, a descriptive answer like the previous one is provided.

The most interesting future perspectives that the representatives of the HR departments of medium-big sized Swedish companies perceive, concern the technologies they do not currently use. This research confirms that there is much hope for the future use of AI mainly on two fronts:

- The opportunity for intelligent computers to replace humans in simple, repetitive and mechanical tasks, such as CV scanning or other basic administrative tasks, recognized by Volvo Cars and Company X.
- The opportunity for AI bots to manage chats to communicate 24/7 with individuals involved in recruitment, recognized by Volvo Cars and Company Y.

Alongside the latter, this research shows that the possibility that AI systems could conduct interviews independently and do so better than humans, acting totally rationally and without bias, is also perceived. Despite this, it is not generally perceived, except for Company Y, that the possibility that the progressive introduction of these digital systems could completely replace humans in the management of the recruitment process.

This last aspect is important because it shows that Swedish companies, despite living in an ultra-digital environment and having always been among the pioneers of technological development, do not currently recognize the possibility that technology can get to such a point where they can manage such a "human" department as HR. Although respondents at Volvo Cars and Göteborg Energi think that this will not happen because of technological limitations, while Company X's representative thinks that the limitations are more ethical than technological. In addition, Anonymous Y is the only one who believes in a fully digitalized recruitment process, perhaps also because of the nature of its business that develops products related to AI technology and aimed at automation.

Other challenges that emerge from this research include the increasing difficulty in choosing the right tools for one's recruitment process, as they are increasingly varied and have different characteristics.

In answering this sub-research question the last interesting clue also concerns the GDPR. The only company that currently fears that the increasing digitalization makes it difficult to manage candidate data is Göteborg Energi. Indeed, as a public company, it is subject to stricter restrictions that are not always easy to assess. One can conclude that digitalization could bring this type of problem to public companies.

6.4 Implications

First of all, this research is intended to be a tool for all companies and those who work in them in order to better understand the concept of digitalization in the recruitment field and what Swedish companies' interpretation of the topic is.

Secondly, this thesis reveals some discrepancies between the theory and the facts of the case. For example, two important findings concern inclusion and data protection; this study has shown that digitalization in the recruitment process favors these two aspects, contrary to what the literature says, which identifies them firmly among threats. Not only does the research aim to bridge this gap, but it is also useful in fulfilling the lack of literature that there exists about the impact of digitalization in the recruitment process.

Then, from a managerial point of view, this thesis can be useful for managers who, based on the approach taken by Swedish companies, can understand what are the real advantages and disadvantages of the digitalization and from which tools in particular they derive, helping them to understand whether the digital transformation is convenient or not. It can also help them to consider future opportunities or challenges that they may have underestimated.

In this regard, another managerial hint that emerges from this work concerns the size and nature of a company. Concerning the first aspect, the research shows how two companies, very different in size and number of employees, may have similar or not too distant approaches. On the second aspect, the thesis shows how the fact that a company is public rather than private can lead to different limitations due to the additional regulations to which public companies are subject.

6.5 Further Research

As far as the future researches are concerned, since this is a phenomenon in continuous evolution, relying mainly on mature technologies but already approaching more innovative technologies, the author believes that it would be interesting to repeat the analysis in the next few years, so that recruitment can count on technologies more ready to play an even more crucial role.

Another proposal is to try to develop the case study only focusing on one company in order to gain a more in-depth study of digitalization and its impact on the firm's recruitment process. By doing this, while losing generalizability, the future researcher may be able to analyze every single aspect of the recruitment process affected by digitalization. On the contrary, it might be interesting to increase the number of companies to strengthen the generalizability of the theory.

Another interesting idea would be to reduce the sample of companies analyzed to only multinational companies (which was the initial idea of the project), because if bigger firms are now the first to work on the development of new digital technologies, in the coming years we can better observe their applications on the recruitment process.

Moreover, the geographical focus could be widened by comparing similar companies but operating in a different national environment. Or it could be proposed again the same kind of work conducted by this research in another country, and then compare the results with those obtained in this thesis.

Then, the phenomenon could also be investigated by interviewing different people within the organizations, and not only managerial figures in the HR department. For example, it might be interesting to hear the opinion of simple recruiters to understand the real usability and their initial approaches to these digital tools. Or alternatively you could listen to IT professionals to understand the advantages or difficulties encountered in the technological implementation of these tools.

REFERENCES

Aguirre, E., Mahr, D., Grewal, D., de Ruyter, K., & Wetzels, M. (2015). Unraveling the personalization paradox: The effect of information collection and trust-building strategies on online advertisement effectiveness. Journal of retailing, 91(1), 34-49.

Álvarez, G. (2012). New technologies in the university context: The use of blogs for developing students' reading and writing skills. International Journal of Educational Technology in Higher Education, 9(2), 185-199.

Ambler, T., & Barrow, S. (1996). The employer brand. Journal of brand management, 4(3), 185-206.

Anderson, N. (2003). Applicant and recruiter reactions to new technology in selection: A critical review and agenda for future research. International Journal of Selection and Assessment, 11(2-3), 121-136.

Arthur, D. (2012). Recruiting, interviewing, selecting & orienting new employees. AMACOM Div American Mgmt Assn.

Bahga, A., & Madisetti, V. (2016). Big data science & analytics: A hands-on approach. VPT.

Bara, A., Botha, I., Belciu, A., & Nedelcu, B. (2015). Exploring data in human resources big data. DB J, 6, 3-10.

Baron, H., & Austin, J. (2000). Measuring ability via the Internet: Opportunities and issues. In Annual Conference of the Society for Industrial and Organizational Psychology, New Orleans, LA.

Behtoui, A. (2008). Informal recruitment methods and disadvantages of immigrants in the Swedish labour market. Journal of ethnic and migration studies, 34(3), 411-430.

Bell, E., Bryman, A., & Harley, B. (2018). Business research methods. Oxford university press.

Beniger, J. (2009). The control revolution: Technological and economic origins of the information society. Harvard university press.

Berman, S., Marshall, A., & Leonelli, N. (2013). Digital reinvention: Preparing for a very different tomorrow. Institute for Business Value. IBM Global Business Services.

Bondarouk, T., & Brewster, C. (2016). Conceptualising the future of HRM and technology research. The International Journal of Human Resource Management, 27(21), 2652-2671.

Bostrom, N. (2017). Superintelligence. Dunod.

Boxall, P. (1996). The strategic HRM debate and the resource-based view of the firm. Human resource management journal, 6(3), 59-75.

Breaugh, J. A., Macan, T. H., & Grambow, D. M. (2008). Employee recruitment: Current knowledge and directions for future research. International Review of Industrial and Organizational Psychology 2008, 45, 82.

Breaugh, J. A., & Starke, M. (2000). Research on employee recruitment: So many studies, so many remaining questions. Journal of management, 26(3), 405-434.

Brennen, S., & Kreiss, D. (2014). Digitalization and digitization. Culture digitally [Online], Available at http://culturedigitally.org/2014/09/digitalization-and-digitization/ [accessed 29/03/2020].

Brockett, P. L., Golden, L. L., & Wolman, W. (2012). Enterprise cyber risk management. Risk management for the future–Theory and cases, 319-340.

Bughin, J., LaBerge, L., & Mellbye, A. (2017). The case for digital reinvention. McKinsey Quarterly, 2, 1-15.

Cadambi, B. V., Mayer-Schonberger, V., & Cukier, K. (2013). Big Data: a Revolution that will Transform how We Live, Work and Think. SAMVAD, 6(2), 94-98.

Carey, W. P. (2011). Employees First: Strategy for Success Knowledge. Arizona: M Libraries Publishing.

Cellan-Jones, R. (2014). Hawking: AI could end human race [Online], BBC News, Available at https://www.bbc.com/news/technology-30290540 [accessed 03/04/2020].

Christozov, D., & Toleva-Stoimenova, S. (2015). Big Data Literacy.

Cronin, B., Morath, R., Curtin, P., & Heil, M. (2006). Public sector use of technology in managing human resources. Human resource management review, 16(3), 416-430.

DeCenzo, D. A., Robbins, S. P., & Verhulst, S. L. (2016). Fundamentals of human resource management. John Wiley & Sons.

Degryse, C. (2016). Digitalisation of the economy and its impact on labour markets. ETUI Research Paper-Working Paper.

Doherty, R. (2010). Getting social with recruitment. Strategic HR review, 9(6), 11-15.

Drasgow, F. (2015). Technology and testing: Improving educational and psychological measurement. Routledge.

Eisenhardt, K. M. (1989). Building theories from case study research. Academy of management review, 14(4), 532-550.

Faliagka, E., Ramantas, K., Tsakalidis, A., & Tzimas, G. (2012, May). Application of machine learning algorithms to an online recruitment system. In Proc. International Conference on Internet and Web Applications and Services.

Feichtinger, B., & Hörold, C. (2015). Recruitment and Selection: The way of finding future talented leaders.

Fitzgerald, M., Kruschwitz, N., Bonnet, D., & Welch, M. (2014). Embracing digital technology: A new strategic imperative. MIT sloan management review, 55(2), 1.

Ford, M. (2013). Could artificial intelligence create an unemployment crisis?. Communications of the ACM, 56(7), 37-39.

Frye, D. W. (2007). Information Technology and Its Role in the Modern Organization. Network Security Policies and Procedures, 1-9.

Gartner (2017) Digitalization [online], Garner, IT Glossary, Available at: https://www.gartner.com/en/information-technology/glossary/digitalization [accessed 29/03/2020].

Gueutal, H. G., Kluemper, D. H., & Rosen, P. A. (2009). Future employment selection methods: evaluating social networking web sites. Journal of managerial Psychology.

Hartley, N. T. (2005). The 7 hidden reasons why employees leave. Journal of Applied Management and Entrepreneurship, 10(4), 80.

Heiss, J. L. (2017). Cooperating AI Making artificial intelligence more human.

Herriott, R. E., & Firestone, W. A. (1983). Multisite qualitative policy research: Optimizing description and generalizability. Educational researcher, 12(2), 14-19.

Hox, J. J., & Boeije, H. R. (2005). Data collection, primary versus secondary.

Isaacs, A., Daintith, J., & Martin, E. (Eds.). (2009). New Oxford dictionary for scientific writers and editors. Oxford University Press.

Ismail, M. H., Khater, M., & Zaki, M. (2017). Digital business transformation and strategy: What do we know so far. Cambridge Service Alliance, November.

Jacobs, F. R., Chase, R. B., & Lummus, R. R. (2014). Operations and supply chain management (pp. 533-535). New York, NY: McGraw-Hill/Irwin.

Järvinen, A., & Korosuo, H. (1990). Henkilöstöhankinta yrityksen menestystekijänä. Tietosanoma.

Kaczmarek, T., Zyskowski, D., Walczak, A., & Abramowicz, W. (2010). Information extraction from web pages for the needs of expert finding. Studies in Logic, Grammar and Rethoric, Logic Philosophy and Computer Science, 22(35), 141-157.

Kaplan, J. (2016). Artificial intelligence: Think again. Communications of the ACM, 60(1), 36-38.

Kaplan, A., & Haenlein, M. (2019). Siri, Siri, in my hand: Who's the fairest in the land? On the interpretations, illustrations, and implications of artificial intelligence. Business Horizons, 62(1), 15-25.

Kaplan, A. M., & Haenlein, M. (2010). Users of the world, unite! The challenges and opportunities of Social Media. Business horizons, 53(1), 59-68.

Kapur, D., & McHale, J. (2005). Give us your best and brightest: The global hunt for talent and its impact on the developing world. Washington, DC: Center for Global Development.

Kelly, B. B. (2012). Investing in a centralized cybersecurity infrastructure: Why hacktivism can and should influence cybersecurity reform. BUL Rev., 92, 1663.

Kietzmann, J. H., Hermkens, K., McCarthy, I. P., & Silvestre, B. S. (2011). Social media? Get serious! Understanding the functional building blocks of social media. Business horizons, 54(3), 241-251.

Komarraju, M., & Karau, S. J. (2005). The relationship between the big five personality traits and academic motivation. Personality and individual differences, 39(3), 557-567.

Korosuo, H. & Järvinen, A. (1992). Rekrytoijan käsikirja. Vantaa: Amer yhtymä Oy Weilin+Göösin kirjapaino.

LaFrance, A. (2015). Not Even the People Who Write Algorithms Really Know How They Work [Online], The Atlantic, Available at: https://www.theatlantic.com/technology/archive/2015/09/not-even-the-people-who-write-algorithms-really-know-how-they-work/406099/ [accessed 20/04/2020]

Leader-Chivee, L., Hamilton, B. A., & Cowan, E. (2008). Networking the way to success: online social networks for workplace and competitive advantage. People and Strategy, 31(4), 40.

Lee, J. N., & Choi, B. (2014). Strategic role of IT and its impact on organizations. Information and Management, 51(7), 881-882.

Lewis, C. G. (1985). Employee selection. Hutchinson.

Mager, A. (2012). Algorithmic ideology: How capitalist society shapes search engines. Information, Communication & Society, 15(5), 769-787.

Mairesse, F., Walker, M. A., Mehl, M. R., & Moore, R. K. (2007). Using linguistic cues for the automatic recognition of personality in conversation and text. Journal of artificial intelligence research, 30, 457-500.

Manville, B. (2016). Are Platform Businesses Eating the World? [Online], Available at: https://www.forbes.com/sites/brookmanville/2016/02/14/are-platform-businesses-eating-the-world/#5418a24961a2 [accessed 02/04/2020].

Marsden, P. V. (1994). The hiring process: recruitment methods. American Behavioral Scientist, 37(7), 979-991.

Marsden, P. V., & Campbell, K. E. (1990). Recruitment and selection processes: the organizational side of job searches. Social mobility and social structure, 59-79.

Markkanen, M. (1999). Etsi, arvioi, valitse: onnistunut rekrytointi. WSOY.

Markkanen, M. (2002). Onnistu rekrytoinnissa. Juva: WS Bookwell.

Maurer, S. D., & Liu, Y. (2007). Developing effective e-recruiting websites: Insights for managers from marketers. Business horizons, 50(4), 305-314.

McCormick, N., Advisory, H. R. M., & Andrews, C. (2016). Innovation in Human Resources: the combination of HR Standards, HR Auditing and Big Data. HR Director, 52-54.

McLean, S., Stakim, C., Timner, H., & Lyon, C. (2016). BIG data and human resources: letting the computer decide. Scitech Lawyer, 12(2), 20.

Miles, A., & Sadler-Smith, E. (2014). "With recruitment I always feel I need to listen to my gut": The role of intuition in employee selection. Personnel Review.

Müller, V. C. (Ed.). (2016). Risks of artificial intelligence (p. 291). Boca Raton, FL: CRC Press.

Nabi, G., Ghous, G., & Rahimiaghdam, S. (2017). DO WE HAVE SUFFICIENT LITERATURE ON E-RECRUITMENT AND SELECTION AN ANALYTICAL REVIEW BASED ON E-RECRUITMENT AND SELECTION.

Nadimpalli, M. (2017). Artificial intelligence risks and benefits. International Journal of Innovative Research in Science, Engineering and Technology, 6(6).

Newell, S. (2005). Recruitment and selection. Managing human resources: Personnel management in transition, 115-147.

Newman, D. (2017). Innovation vs. Transformation: The Difference in a Digital World [Online], Available at: https://www.forbes.com/sites/danielnewman/2017/02/16/innovation-vs-transformation-the-difference-in-a-digital-world/#310534b565e8: [accessed 29/03/2020].

Nilsson, N. J. (2005). Human-level artificial intelligence? Be serious!. AI magazine, 26(4), 68-68.

O'Meara, B., & Petzall, S. (2013). Handbook of strategic recruitment and selection: a systems approach. Emerald Group Publishing.

Omohundro, S. (2014). Autonomous technology and the greater human good. Journal of Experimental & Theoretical Artificial Intelligence, 26(3), 303-315.

Osman, M. (2020). Mind-Blowing LinkedIn Statistics and Facts [Online], Kinsta, Available at: https://kinsta.com/blog/linkedin-statistics/ [accessed 11/04/2020].

Panayotopoulou, L., Vakola, M., & Galanaki, E. (2007). E-HR adoption and the role of HRM: evidence from Greece. Personnel Review, 36(2), 277-294.

Parry, E., & Wilson, H. (2009). Factors influencing the adoption of online recruitment. Personnel Review.

Patel, V. N., Rana, G. (2007). Personnel Management. Oxford Book Co.

Raguseo, E., & Vitari, C. (2018). Investments in big data analytics and firm performance: an empirical investigation of direct and mediating effects. International Journal of Production Research, 56(15), 5206-5221.

Rao, P. S. (2009). Personnel and human resource management (pp. 236-345). Himalaya Publishing House.

Rasmussen, T., & Ulrich, D. (2015). Learning from practice: how HR analytics avoids being a management fad. Organizational Dynamics, 44(3), 236-242.

Rashmi, T. K. (2010). Recruitment management. Himalaya Publishing House.

Ross, J. W., Sebastian, I., Beath, C., Mocker, M., Moloney, K., & Fonstad, N. (2016). Designing and executing digital strategies.

Sabbagh, K., Friedrich, R., El-Darwiche, B., Singh, M., Ganediwalla, S., & Katz, R. (2012). Maximizing the impact of digitization. The global information technology report, 2012, 121-133.

Sajid, S. I. (2016). Social media and its role in marketing.

Saumure, K., & Given, L. M. (2008). Nonprobability sampling. The SAGE encyclopedia of qualitative research methods, 2455, 563-564.

Sarma, A. M. (2008) Personnel and Human Resource Management. Himalaya Publishing House.

Sarra, C. (2019). Il diritto di contestazione delle decisioni automatizzate nel GDPR. XII 2019, 33.

Sassen, S. (1998). Globalization and its Discontents.

Scholz, T. M. (2017). Big data in organizations and the role of human resource management: A complex systems theory-based conceptualization. Frankfurt a. M.: Peter Lang International Academic Publishers.

Schramm, W. (1971). Notes on Case Studies of Instructional Media Projects.

Schutte, N. E. (2019). HR 5.0-From Digitization to Digitalization.

Schwartz, E. I. (2002). Digital Darwinism: 7 breakthrough business strategies for surviving in the cutthroat Web economy. Crown Business.

Searle, R. H. (2006). New technology: the potential impact of surveillance techniques in recruitment practices. Personnel Review.

Sebastian, I., Ross, J., Beath, C., Mocker, M., Moloney, K., & Fonstad, N. (2017). How big old companies navigate digital transformation.

Simons, R. (2005). Levers of organization design: How managers use accountability systems for greater performance and commitment. Harvard Business Press.

Sivaram, N., & Ramar, K. (2010). Applicability of clustering and classification algorithms for recruitment data mining. International Journal of Computer Applications, 4(5), 23–28.

Snow, C. C., & Snell, S. A. (1993). Staffing as strategy. Personnel selection in organizations, 448, 478.

Stuart, R., & Peter, N. (2016). Artificial intelligence-a modern approach 3rd ed.

Taylor, C. (2018). Structured vs. Unstructured Data [Online], Datamation, Available at: https://www.datamation.com/big-data/structured-vs-unstructured-data.html [accessed 13/04/2020].

Tecuci, G. (2012). Artificial intelligence. WIREs Comput. Stat. 4 (2), 168–180.

Trochim, W. (1989). Outcome pattern matching and program theory. Evaluation and program planning, 12(4), 355-366.

US General Accounting Office. (1990). Case study evaluations.

Vaahtio, E. L. (2007). Pestaa paras: rekrytoinnin opas esimiehelle. Edita.

Valvisto, E. (2005). Oikeat ihmiset oikeille paikoille. Talentum.

Vitari, C., & Raguseo, E. (2019). Big data analytics business value and firm performance: Linking with environmental context. International Journal of Production Research, 1-21.

Voloudakis, J. (2005). Hitting a moving target: IT strategy in a real-time world. Educause Review, 40(2).

Wołodźko, K., & Woźniak, J. (2017). The use by large polish organizations of information about CSR activities in e-recruitment. Economics & Sociology, 10(2), 47.

Yin, R. K., & Pinnelli, S. (2005). Lo studio di caso nella ricerca scientifica: progetto e metodi. Armando.

Yoo, Y., Henfridsson, O., & Lyytinen, K. (2010). Research commentary—the new organizing logic of digital innovation: an agenda for information systems research. Information systems research, 21(4), 724-735.

Zang, S., & Ye, M. (2015). Human resource management in the era of big data. Journal of Human Resource and Sustainability Studies, 3(01), 41.

APPENDIX

Interview guide

Preliminary Questions

- What's your company about? And what is your role in the company?
- Would you like to tell about your own background?

The Recruitment Process

- In few words, what means recruitment for you?
- How often does the need for recruitment occur in your company?
- What are the phases of your company's recruitment process?

Digitalization in the Recruitment Process

- What digital tools do you use in all these phases and in which of them?
- How do these tools work?
- How diversified are these tools? In the sense in a same phase of recruitment can be used different tools depending on the type of worker you are looking for?
- What are the main technologies associated with the digitalization of recruitment process?

Advantages and Disadvantages

- Which are the advantages that they provide in the process? And what are instead the drawbacks?
- Is it expensive to implement such these tools?
- Have you noticed any kind of discrimination during the recruitment process when using digital tools? And how can be avoided these situations?
- What about GDPR?

Future of Recruitment

- What are the future perspectives and challenges of digitalization in the recruitment process?
- Do you believe that in the future, even with an improvement in technologies, HR's responsibilities will be as important as now? Human contact remains important? Digital tools will only support the work of HR professionals?