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I Processi di recruiting attraverso l'ausilio delle Intelligenze artificiali

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Recruiting Processes through the Artificial Intelligence

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INTRODUCTION

In the digital age in which we live, labour market dynamics are undergoing an unprecedented transformation, driven by technological innovation and the increasing adoption of artificial intelligence (AI). In this context, the recruiting industry faces unique challenges and opportunities, prompting organizations to reconsider and redefine their approaches to talent selection.

This study aims to explore the crucial role artificial intelligences play in recruiting processes, outlining their implications, advantages and challenges. Through an in-depth analysis, it aims to understand how AI can optimize the entire recruiting cycle, from identifying necessary skills to evaluating candidates and making informed decisions.

The increasing complexity of the labor market, coupled with the need to respond promptly to changing business needs, has prompted many organizations to implement AI-based solutions to make their recruiting processes more efficient and effective. However, while AI offers promises of automation and accuracy, ethical and social questions emerge that require critical analysis.

Through this thesis, we aim to take a close look at the impact of artificial intelligence on recruiting processes, analyzing case studies, best practices and emerging challenges. We are asked to reflect on how to balance the efficiency offered by AI with the importance of humanity in decision-making, while maintaining the balance between technological innovation and ethical values.

In conclusion, the research aims to contribute to an in-depth understanding of the dynamics between AI and recruiting, providing a critical foundation for practitioners, academics and organizations wishing to take full advantage of the transformative potential of artificial intelligence in recruitment.

STRATEGIC IMPORTANCE OF HUMAN RESOURCES

A key role in the enterprise value creation process is assigned to the proper management of intangible resources. The latter, in an expanded view, include not only patents, trademarks, licenses, etc., but also softer resources, such as leadership, professional and managerial skills, customer satisfaction, network of alliances, image and reputation, procedures, and, among these, in particular, those related to the wealth of knowledge and skills the company has. It affirms the idea of the enterprise as a distributed entity and intelligence (Tsoukas, Academy of Management Journal) and knowledge-intensive aware that faster learning is the preferred source for sustainable competitive advantage. The perspective of the knowledge-based enterprise, or Knowledge-based Therory, emphasizes how the ability, speed and effectiveness with which organizations generate and share knowledge and information have become key variables in determining the advantage generated by enterprises and in giving them a sustainable competitive advantage in the long run. The development of communication technologies amplifies the opportunity to enhance individual knowledge and transform it into a collective resource that can be used by the entire organization. In a knowledge- and relationship-intensive economy with a strong service component, which is accompanied by new organizational forms and de-structuring of processes, the critical economic resource is not only knowledge itself but especially the individuals who generate and use it.

The survival, development and success of the enterprise depends largely on the people within the organization who design and direct activities and equipment, decide how and where to use resources, are the ones who make processes work, their contribution is decisive in producing good or bad

functioning of the organization: "every aspect of a company's activity is determined by the competence, motivation and general efficiency of its human organization" (Likert, The Human Organization: Its Management and Value). Every outcome depends on behaviors, and these behaviors are a function of people, that is, their culture, in the sense of a set of identities, values, available knowledge and skills possessed at the general level. The statement "all knowledge resides in human heads" (Simon, Journal of Economic Perspective) captures well the idea of collective knowledge as a result of the integration and aggregation of individual knowledge, but also of the enterprise as an organization that transforms capital, expertise and labor into productions that incorporate knowledge. Human resources are thus a strategic investment pe companies: they are the most complex, economically significant and long-lasting investment that corporate management is called upon to govern in order to ensure returns, with continuity over time, in terms of results for users and positive responses to the correct expectations of employees.

APPLICATION OF STRATEGY TO PERSONNEL MANAGEMENT

Strategy studies, both in general and with reference to their application to personnel management, refer to two approaches:

1) The first concerns the basic approach formulated by Porter, which can be broken down:

a) Studying firm competitiveness derived from industry positioning (macro perspective) through the 5 forces model. Porter states that the average performance of each industry tends, in the long run, to vary as a function of 5 fundamental forces:

- Threat of new entrants

- Market power of buyers

- Market power of suppliers

- Intensity of competition within the industry

- Threat of substitute products or services

b) In addition, studying positioning in the competitive environment (micro perspective). In this case, the strategic analysis tools are:

- Porter's basic competitive strategies matrix, useful for addressing or exploiting to one's advantage the strengths of an industry sector and gaining a competitive advantage over one's rivals through a low-cost or differentiation strategy

- The value chain, which is crucial for understanding where the company's competitive uniqueness lurks and on which the strategic competitive design rests

2) With respect to Porterian logic, when speaking in terms of the sustainability of competitive advantage; Richard Rumelt speaks of isolation mechanisms to indicate the impediments a firm places to imitating its own.

THE PERSONNEL ACQUISITION PROCESS

The personnel acquisition process aims to find and place in organizational positions people with the appropriate characteristics for the demands of the organization itself.

The steps in this process are:

A. **COLLECTING APPLICATIONS**: set of activities through which the organization expresses its demand for labor and activates in its regard the potential supply of labor.

B. **SCHEDULING AN INTERVIEW**: the process of choosing from among the candidates identified by recruitment those persons who best meet the characteristics and requirements sought.

C. **HIRING**: concerns the pre-enrollment information stage.

D. **ONBOARDING**: first period of presence in the organization with training/formal content.

The recruitment process aims to find and place in organizational positions people with the appropriate characteristics for the strategy demands. There may be obstacles to long-term hiring policy planning:

- Organizational changes, driving rapid evolution of roles and skills;
- Changes in markets, accelerating the timing of obsolescence of distinctive skills;
- Regulatory changes that act on contract rules change organizational logics

The first stage of the hiring process is related to defining the profile of the person to be placed. The process of defining the worker to be sought is divided into two stages:

1) The first is the definition of the job description and concerns the characteristics of the position to be filled by the person, and this is in terms of:

- Title, position label,
- Assigned goals, both productive and financial,
- Organizational placement and definition of internal relationships,
- Environmental working conditions,
- External relations,
- Main tasks to be performed,
- Levels of autonomy and responsibility,
- Working tools,
- Main professional requirements needed to fill the position.

2) The second stage occurs with the definition of the person specification. It relates to the profile of knowledge, skills and abilities required to fill the position. The definition of the profile sought closes with the specification of specific requirements derived from the general characteristics of the job description with respect to labor market conditions, such as: age of birth; geographic limits of residence; experience in particular sectors or positions; educational qualifications and certifications

necessary to fill specific roles; availability for mobility and relocation; and characteristics of the contract offered and salary package.

The recruitment and selection process represents the first step in creating the relationship between worker and enterprise. Recruitment and selection can represent a simple reaction of the enterprise to the need to meet its personnel requirements, or they can take the form of activities through which the organization creates the preconditions for the development of a strategic resource base. From the approach taken, different orientations arise in the choice of tools and methods by which to conduct the entire process. One can choose tools deemed objective (tests and assesment centers) managed with impersonality sometimes by external professionals or see selection as a moment in which the psychological contract between worker and company is established or renewed.

A different cultural attitude in terms of strategy, values and culture, toward personnel management must also be considered. Firms that aim to optimize the matching of candidate and job characteristics will have a short-term attitude toward personnel management and a tendency to take advantage of cost opportunities offered by market conditions. Firms that adopt a less deterministic attitude will tend to listen to the market, seeking to attract workers who have the appropriate characteristics to enrich the firm's intellectual capital. In the first case, an orientation that prioritizes efficiency (speed of response, recruitment and selection costs) is adopted; In the second, effectiveness is prioritized, and efforts will be made to involve line management to achieve greater consistency with strategy and other human resource development policies.

RECRUITMENT AND SCREENING

Recruitment and selection processes aim to identify, source and place individuals with the right characteristics to match the demands of the company's strategy in the right organizational positions. Propaedeutic to the initiation of recruitment is the definition of the profile sought. Companies absolutely must understand the characteristics of the role to be filled and the knowledge, skills and competencies of the individual chosen to fill that role.

The central moment of this process is the recruitment and selection phases. Recruitment is the set of activities through which the company expresses its demand for labor and activates in its regard the potential supply of labor, at the same time monitoring the evolving dynamics of the market. Closely related to this is selection, which is identified in the process of choosing among the candidates identified by recruitment who best meet the characteristics required by the company.

The goal of recruitment is to contact in the shortest possible time a sufficient number of candidates to best meet the needs of the organization at a low cost (Costa 1997).

Transmitting a strong, well-defined image and culture to the market is a means for the company to attract people with values, expectations, and skills consistent with organizational values, expectations and skills.

Through this "self-selection" it is possible not only to reduce recruitment time, but also to maximize the probability of finding people who will be placed in the company more easily.

The company needs to define its recruiting pool by asking itself, "Where do I look for the person to join the company?"

WHO TO INCLUDE IN THE COMPANY?

The first phase of the recruitment process is an "internal" moment within the company and relates to defining the profile of the person to be placed. This phase is particularly complex, since it appears difficult for companies to make explicit the skills profile and detail the tasks that the individual will have to perform. The process of defining the figure to be sought is divided into two stages: 1) Job description, which is the definition of the characteristics of the role or position that the person will have to fill in the company. Making a good job description means describing the characteristics of the role in terms of:

- o Assigned goals (productive or financial economic);
- o Organizational placement and definition of internal relationships;
- o Environmental working conditions;
- o External relations;
- o Main tasks to be performed;
- o Levels of autonomy and responsibility;
- o Working tools;
- o Main professional requirements needed to fill the position.

It becomes clear that writing an accurate job description becomes a difficult action to implement under dynamic and evolving labor market conditions.

2) Person specification, which is the definition of the profile of knowledge, skills and abilities required to fill the position in the company. A good person specification eliminates some of the most common selection problems, including "mirroring," which is the recruiter's tendency to choose those who reflect his values and culture, rather than the most suitable candidates to fill the role. It also allows candidates to assess their own suitability against the requirements of the proposed role, which also improves the speed of the selection process.

The definition of the profile sought closes with the definition of a set of specific requirements, which constitute elements through which to direct more effective recruitment channels.

These requirements are:

- Master age range;

- Geographic limits of residence;

- Experience in particular areas of work;

- Qualifications and certifications needed to fill specific roles.

WHERE TO LOOK FOR STAFF?

When the position sought by the company is not well defined due to changing organizational and strategic conditions, the search for personnel is transformed from an activity aimed at finding a perfect fit for a position to an activity of exploring and listening to the labor market. In this case, the company must define its recruitment pool, which depends on a number of variables:

- Consistency between recruitment and selection process with corporate culture;

- The transmission of a strong company image so as to attract talent;

- General and target labor market conditions, i.e., the size of supply, meeting requirements, spatial mobility, and wage differentials;

- The company's need to cope with the domestic labor market situation and the availability of company resources dedicated to selection activities;

- Constraints of a legislative and union nature, which can constrain the options of choice for the company, such as targeted employment, which obliges public and private employers to hire a certain number of disabled workers depending on the number of staff hired;

Therefore, it is not possible for companies to set a single recruitment policy, but different strategies must be planned for different market segments. The two main sources of research are the internal market and the external market.

INTERNAL RECRUITMENT

When a new position is created or an existing one becomes vacant, the Dru immediately checks whether there are people in the company who possess required characteristics. However, the use of internal mobility requires the presence of an up-to-date professionalism monitoring system and tools to estimate the consequences of displacements.

Choosing workers from the domestic market allows the following benefits to be pursued:

- Lower selection and placement costs compared to the external market;
- Preservation and strengthening of the elements of stability that characterize the domestic labor market;
- Increased return on investment in training related to the development of specific skills;
- Improved labor relations, especially when stability of employment and control of inflows and outflows are among unions' priority goals.

However, the following costs must be faced:

- Risk of obsolescence of organizational human capital, which is not "renewed" through outside insertions and must be continuously updated through training courses;
- Rigidity of internal mobility processes, which in the case of a potentially closed internal market can be more onerous than searching the external market. This risk is found to be exacerbated in depressive phases of economic or business cycles, where the phenomenon of oversized workforce increases;

- Administrative activities for internal mobility procedures;

- Planning activities related to estimating the availability of personnel against requirements.

Internal recruitment tools are:

(a) Research on corporate databases; in fact, it is essential for an organization to have a personnel information system developed to have at its disposal a wealth of information regarding the professional status of its employees.

(b) Job posting systems, which are a kind of job bulletin board in which vacant positions in the company are advertised so that employees can learn about them and can apply. One of the risks of job posting, is managing the moment when the person who has applied receives feedback: in the event that he or she is not selected for the position, it is important that he or she obtain clear reasons as to why the position was not filled, otherwise the rejection can turn into demotivation.

EXTERNAL RECRUITMENT

External recruitment is a crucial element in the development and success of modern companies. In an ever-changing work environment, companies are constantly looking for new talent to enrich their skills and stimulate innovation.

The external recruitment process involves searching for, identifying, and attracting qualified candidates from outside the organization. This approach offers several benefits, including a fresh perspective, new skills, and a potential increase in diversity in the team. In fact, diversity is a catalyst for creativity and problem solving, thus contributing to the sustainable growth of the company.

External recruitment enables companies to meet emerging challenges with an open and flexible mindset. Candidates from diverse backgrounds bring with them unique experiences that can be

synergistically integrated with the existing corporate culture. This enriches not only the workforce, but also overall business strategies.

However, it is critical that the external recruitment process is guided by well-defined and transparent criteria. Accurate assessment of candidates' skills, experience, and adaptability is essential to ensure that the new entry integrates positively into the organization. In addition, it is crucial to foster an inclusive environment that fosters fairness and respect, thereby encouraging collaboration and productivity.

In conclusion, external recruitment is a valuable means of enriching companies with new talent and prospects. With a well-planned strategy and judicious evaluation, companies can fully exploit the potential of this practice to dynamically address market challenges and build resilient and competitive organizations.

The enterprise at the time that it makes use of the external market, attempts to pursue the following benefits:

- Outsourcing of part of the cost of creating the required professional characteristics (training and education) and the associated risk of obsolescence, in case the search is for people already trained;
- Activating competition among internal workers between internal and external workers, inducing some fluidity in the internal labor market as well;
- Injection of new skills and hybridization of corporate culture, especially important in old and stiffened companies.

However, it is necessary for the company to cope with the following costs:

- Information gathering and dissemination;
- Recruitment activities, the costs of which are higher the larger the market segments to be activated;

- Selection activities, the costs of which tend to increase as the number of candidates screened and the degree to which the selection mechanisms are refined;

- Administrative costs of managing inflows and outflows;

- Costs of training and induction of new entrants for adjustment between features demanded and features offered;

- Conflict, which emerges when unions press for control of the recruitment and selection process.

Research tools in the external market are numerous:

(I) Self-nominations: spontaneous sending of one's resume by people applying for a position in a company.

(II) Word of mouth: is an informal search that relies on interpersonal contracts. It is a preferred search tool for small and medium-sized enterprises where recruitment and selection systems are limited.

(III) Businesses can apply directly to school and university placement services: these offices provide lists of students and recent graduates and flag particularly bright people with resumes that match the company's staffing needs.

(IV) Professional and business associations and trade unions: provide support to companies or registered workers in their job search.

(V) Publication of advertisements in press organs in sections devoted to job announcements.

(VI) Job center: these are public facilities that provide services to job seekers and hiring firms free of charge.

(VII) Employment agencies: these are the evolution of temporary agencies. These agencies qualify as true multipurpose entities authorized by the Ministry to provide additional services to facilitate entry and re-entry into the labor market.

(VIII)   Online recruiting: is the set of technological and organizational tools to provide valuable support for managing the recruitment and selection process.

The main forms of online recruiting are:

- Website recruiting. That is, the presence within the company website of an area dedicated to people who want to send their applications to the company. In this area, it is possible to send in one's resume or fill out a form in which all the information that the company will use in screening must be indicated.

- The spread of the Internet has encouraged the emergence of new sites and increased the attractiveness of the Italian market for European multinationals. Employment agencies have begun to offer their brokerage services through the web, such as Adecco, Manpower, Randstad and Monster.

- The evolution of Web 2.0 has developed innovations in the social and economic spheres; in fact, social networking sites such as Facebook, LinkedIn, Twitter, and FaceCv are spreading for recruitment purposes. These tools reduce the information asymmetry typical of the moment when job supply and demand meet; in fact, employers and search firms can browse social networking sites to collect information, including extra-work and personal information that helps to understand the behavioural profile, which cannot be identified by the resume.

The limitations of online recruitment can be:

- Assessment of whether potential candidates are familiar with the computer tool
- Volume of data that the organization faces
- Poor network visibility of small-scale companies.

- Executive search firms or head hunters, headhunters. The process, which takes longer than normal searches (an average of 4 months), begins when a client company commissions the consultant to search for a manager to fill a particular organizational position.

Although the objective of recruitment is not to make selection among candidates, who offer their willingness to work, already during this phase activities are carried out preliminary screening. This activity is usually done automatically directly by software in the case of digital resumes.

The company's goal is to identify, within the pool of candidates from recruitment, those individuals with a set of personal and professional characteristics that will ensure their success in the position for which they are selected.

Making mistakes in selection can lead to two kinds of consequences:

On the one hand, a person may be hired who later proves, at the time of placement, to be ill-suited to the organizational context and thus unable to perform in line with expectations; on the other hand, a candidate may not be selected who later, in the course of his or her career in other companies, demonstrates skills that the company was unable to recognize during selection.

In addition, the time of selection is delicate because there is information asymmetry between the enterprise and the candidate, generating uncertainty with respect to the selection outcome. On the one hand, the enterprise does not know all the characteristics of the candidate, and on the other hand, the worker also knows only part of the characteristics of the enterprise.

THE SELECTION PROCESS

At the bottom of the recruitment process, in the preliminary screening stage, candidates are filtered according to threshold characteristics. Following the initial screening, there follows one carried out by recruiters who check and analyze the information provided by the candidate in the resume. This phase aims to identify candidates who possess both characteristics necessary to qualify for the job and present a professional profile that is potentially attractive to the organization. This screening is based on information such as: demographic factors, knowledge, experience profile, and aptitude. Once this phase is completed, the shortlist of candidates is identified who will be called to conduct interviews and selection tests.

The heart of the selection process is the assessment phase, which can be carried out using a variety of techniques such as interviews, tests and other group simulation techniques; these techniques can be used in conjunction if the company's goal is to identify a person's potential, and this is possible with the assessment center.

Let us first see what the different techniques may be:

1) The CV screening: Curriculum screening in recruiting processes is a crucial step for filtering candidates and identifying those who possess the minimum requirements to proceed to subsequent stages of selection. This is the first interaction the offering company will have with the counterpart, so it effectively occurs at the beginning of the recruitment process and aims to eliminate all profiles that do not meet the company's needs. The main objective is to simplify subsequent recruitment stages and accelerate the entire process, reducing the Time to Hire. During screening, recruiters, or as we will see later, specific phrasing analysis and AI

tools, analyse resumes searching for profiles that may potentially possess the required skills, necessary soft skills for the role, and other criteria such as personal data, hobbies and interests, and growth mindset. This phase can be supported by tools such as Applicant Tracking System (which we will see later), which automate part of the selection process. These tools offer functionalities such as pre-selection forms, intelligent search algorithms, and automatic CV sorting to facilitate candidate evaluation. Furthermore, automation in recruiting, including the use of AI and advanced software, helps speed up the selection process, ensuring a better match between job descriptions and candidates with the necessary skills. However, it is important to balance automation with attention to the quality of results and the candidate experience, avoiding overly robotic processes that could damage the company's reputation and discourage talent.

In summary, curriculum screening in recruiting processes is a crucial step to identify the most suitable candidates, optimize selection phases, and ensure effective and efficient recruitment.

2) The selection interview: the interview is a two-way communication tool in which subjects exchange certain information, appropriately coded, through a variety of means. The interview should be aimed at:

- Verify and deepen the information obtained in the screening phase;

- Clarify what the expectations of the company are with respect to the role to be filled.

- Present the enterprise and transfer a good image of it.

Questions to be included in a structured interview to assess the match between the candidate's profile and the position can be of different types:

▫ Behavioral interviews: taking as an assumption that past behaviors are the best predictor of future ones, the recruiter will ask the candidate to recount his or her behaviors by referring to specific professional situations;

- Situational interviews: the assumption here is that intentions can determine acts, so the interviewer asks the candidate how he or she would deal with the problem posed.

Interviews can be: one-to-one interview; panel interview where several recruiters interview the same candidate simultaneously; serial interview where the candidate undergoes a series of interviews in sequence with different recruiters; group interview:

3) A second selection technique is testing: tests provide support for the investigation of characteristics and skills that do not emerge from a person's resume or experience narrative.

The most commonly used tests in selection activities refer to two categories:

- Cognitive tests and are divided into general ability, psycho-aptitude and knowledge tests. Cognitive tests are aimed at measuring a candidate's intelligence; the 'assumption of these tests is that the most intelligent people are the ones who perform better at work. Psycho-aptitude tests consist of the questionnaires and tests that are designed to detect the possession of specific skills that are considered important for the performance of a given job. Knowledge tests, on the other hand, measure how much a candidate knows or can do in a specific skill area; such as language proficiency, knowledge of software, laws, and procedures.

- Personality tests verify the emotional, motivational, interpersonal and attitude characteristics that underlie an individual's interaction with his or her target environment. Personality is measured to determine the reactions of individuals in normal work situations. Personality tests are subject to criticism due to the fact that the attempt to predict worker behavior directly on the basis of certain personal characteristics may be affected by numerous limitations such as: the existence of significant differences in the requirements possessed by different 73 subjects, the not always demonstrated relationship between the possession of certain requirements and a person's success in performing a certain task, and the difficulty of measuring requirements and assessing the relationship between test results and job outcome.

The assessment center is a complex assessment instrument involving several moments of assessment carried out with different techniques and multiple raters. The particularity of this technique lies precisely in the fact that, by using multiple raters and multiple tests, both individual and group, it tends to reduce the assessment biases inherent in individual interviews and single tests. At the end of an assessment process, which lasts 1-2 days, the company has at its disposal a series of judgments from the comparison of which the final selection decision arises. The purpose that CA is intended to serve as a methodology is to identify the set of attitudinal characteristics and behaviours that represent an individual's personal substrate with respect to the optimal coverage of an organizational role.

The CA is an evaluation process aimed at reducing the error inherent in the evaluation process by multiple observers and observation techniques. Particularly characterizing an AC, unlike other assessment procedures, is the fact that multiple observation techniques are used jointly; this is put in place by multiple assessors whose final result arises from the comparison and integration of the different observations.

Particularly used in the assessment center are simulations, which make it possible to simultaneously assess skills and personality dimensions such as: oral communication, planning skills, leadership, control, stress tolerance, and adaptability.

Among the techniques used in the assessment center is leaderless group discussion, a tool that simulates interaction in small groups to solve a problem; it is a leaderless group discussion, and group members are prompted to cooperate or compete to solve the situation, thus bringing out their personality traits.

Candidate selection can be approached by the company with a very wide and diverse portfolio of tools: interviews, tests, assessment centres. The choice of which technique to choose in each case depends both on the objectives of the selection and on the characteristics of the instrument itself. It is important to consider the evaluation of the selection tools, which can be carried out in light of certain criteria: validity, reliability, sensitivity and cost-effectiveness.

- Validity refers to the degree of precision and accuracy with which the selection technique measures what it proposes to measure. The attribute of validity can be distinguished into validity with respect to content and validity with respect to criterion. In the first case, the parts that make up a selection test must accurately reflect the set of content of which the test itself is a sample. In the second case, the validity of an instrument is measured as the relationship that exists between its results and the job performance of the candidate.

- Reliability refers to the consistency of the ratings obtained by the same individual when subjected to the same selection test several times. o Sensitivity relates to the ability of the instrument to bring out differences among candidates, not by concentrating, but by distributing the ratings among the different achievement classes.

- The cost-effectiveness of an instrument is relative that its results must be satisfactory compared to the cost incurred in its design and administration. For example, if only the interview was used in the past, the additional cost required to switch to a more complex tool such as an assessment must be less than the additional benefit expected in terms of improving the selection process.
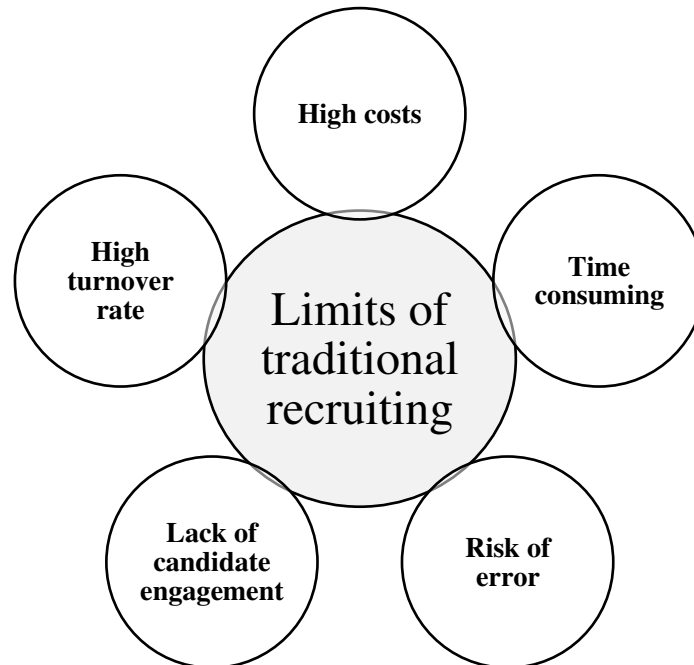
ACCOMPLISHMENT

Once the search for the most suitable person to fill the vacant position is over, the recruitment and selection process reaches the welcoming phase. These are actions directed at providing the new hire with the information he or she needs to become better acquainted with the environment he or she has entered, the tasks to which he or she is destined, the people with whom he or she will have to work, and the procedures to be followed. It is a process by which the individual gains awareness of what the company attaches importance to, the system of values, norms, and behavioral patterns deemed essential to the company. Generally, the reception phase is the responsibility of the personnel function.

INSERTION

The company has a range of contractual tools at its disposal to facilitate a soft entry of young people into the world of work by referring to internships, apprenticeship contracts, insertion contracts, and fixed-term supply contracts. Contractual tools make it possible to reduce the costs associated with false positives. Therefore, to increase the possibility of successful placements, initiatives must be introduced to manage the initial phase of adaptation between worker and company. On-boarding programs aim to facilitate the new employee's placement through orientation training interventions, shadowing of more experienced workers, and periods of rotation between different activities and functions. The recruitment and selection process and the induction phase do not always achieve the desired goals. The company must therefore be able to handle the possibility of the worker leaving the company with the outgoing selection process. This choice may arise, either at the head of the worker who decides to leave the organization, or it may have as its protagonist the company that can operate with direct actions aimed at terminating the employment relationship. The worker's exit may be a sign of errors in personnel planning, individual development and career management policies in selection, for this reason, enterprises use to conduct exit interviews to systematically collect and interpret all possible information related to each case to get feedback on the policies adopted.

LIMITS AND CHALLENGES OF TRADITIONAL RECRUITMENT

The limitations and challenges of traditional recruiting can lead to a number of problems, including:

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                        High costs

      High                                    Time
    turnover          Limits of           consuming
      rate            traditional
                      recruiting

          Lack of                   Risk of
         candidate                   error
        engagement
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- High cost: Traditional recruiting can be expensive, as it requires the use of tools and resources, such as posting job ads, using temp agencies, and evaluating candidates.

- Time-consuming: traditional recruiting can be time-consuming, as candidates need to be identified, evaluated, and the right candidate selected.

- Risk of error: traditional recruiting can be prone to error because it is based on subjective assessments and human biases.

- Lack of candidate engagement: traditional recruiting can be perceived by candidates as an impersonal and unengaging process.

- High turnover rate: without proper assessment of skills and cultural appropriateness, new hires may not integrate well into the work environment, leading to a high turnover rate.

High costs

Traditional recruiting can be costly, as it requires the use of tools and resources, such as posting job ads, using temp agencies, and evaluating candidates.

Posting job ads can be expensive, particularly for highly specialized positions. Using temporary employment agencies can also be expensive, as agencies charge a fee for each candidate hired. Evaluating candidates can be expensive, as it requires the time and expertise of experienced recruiters.

Long timescales

Traditional recruiting can be time-consuming, as you need to identify candidates, evaluate them, and select the right candidate.

Identifying candidates can be time-consuming, as it is necessary to use a variety of recruitment channels and analyse a large number of applications. Evaluating candidates can be time-consuming, as it is necessary to review resumes, cover letters, psycho-aptitude tests, and performance during job interviews.

Risk of error

Traditional recruiting can be prone to error because it is based on subjective assessments and human biases. Subjective assessments can be influenced by human biases, such as gender, race, or age biases. Human biases can lead to discrimination against some candidates. Indeed, hiring decisions can be influenced by unconscious biases or personal judgments, leading to selection that is not always based on merit. This point has always been much discussed by candidates, as at the human level, it comes to touch on very subtle, almost imperceptible differences of how a candidate should be and from how

he or she really is often creating unfounded impartiality that can lead to some not inconsiderable career turns.

Lack of candidate involvement

Traditional recruiting can be perceived by candidates as an impersonal and unengaging process. Candidates may feel that they are just a number and not people with skills and experience to offer. Candidates may also feel frustrated by the long time it takes to complete the recruiting process. This often happens when companies with more classical structures, well-defined hierarchies, and an administrative structure that is not very up-to-date. In fact, the message that unfortunately reaches the candidate is that he or she does not feel represented, important, and a true asset to the company. This lack of attention to detail may then lead to a detachment from the company's reality and a fast job transition, hence high turnover.

High turnover rate

The high turnover rate in traditional recruitment can be attributed to several interconnected factors. One of the main ones is the mismatch between the candidate's expectations and the reality of the role and the company. This can occur when the nature of the job, growth prospects and cultural style of the company are not clearly communicated during the selection process. In addition, poor assessment of skills and cultural fit during recruitment can lead to the hiring of individuals who are unable to effectively perform the job or integrate into the work environment. This often results in a quick sense of dissatisfaction on the part of the employee and a desire to seek better opportunities elsewhere.

Another critical issue is the lack of professional development within the company. If employees do not see opportunities for growth and career advancement, they may be more inclined to leave the company in search of new challenges and learning opportunities. All of these factors are interrelated

and contribute to a turnover cycle that can be detrimental to the company in terms of lost talent, repeated recruitment costs, and low productivity. Addressing this challenge requires a more sophisticated approach to recruitment that not only assesses candidates' technical skills, but also their cultural fit and provides opportunities for professional development within the company.

OPPORTUNITIES FOR AI IN HUMAN RESOURCE PROCESSES

Artificial intelligence (AI) offers a number of opportunities to overcome the limitations and challenges of traditional recruiting. AI can be used to automate repetitive and labor-intensive tasks, such as searching for candidates and evaluating applications. AI can also be used to reduce human bias and improve the candidate experience.
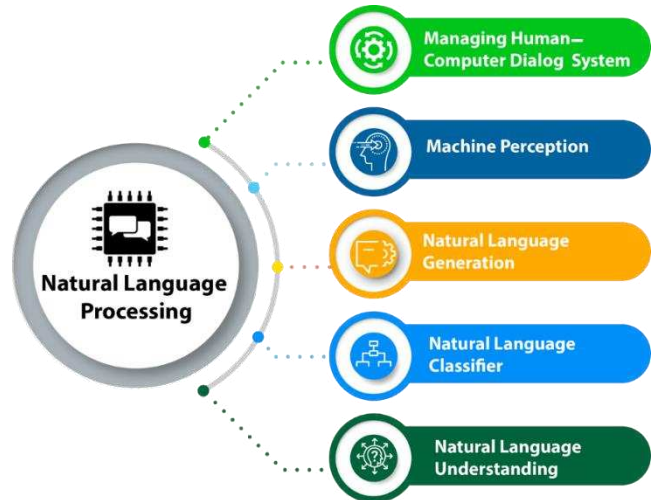
For example, AI can be used for:

- Identify the most suitable candidates for a vacant position using artificial intelligence algorithms that analyze candidate data, such as resumes, cover letters, and performance during job interviews.
- Assess candidates' skills and knowledge, using psycho-aptitude tests and virtual job interviews.
- Personalize the candidate experience by providing them with content and information relevant to their needs and interests.

The use of AI in recruiting processes has the potential to reduce costs, improve efficiency and reduce human bias. AI can also help companies find the most suitable candidates for their vacant positions.

Artificial intelligence has been used in human resources to identify high-quality candidates even before job seekers apply. During the candidate attraction part of the talent lifecycle, the goal is to find as many potential candidates as possible who have the required skills for a given position, and encourage them to apply for the role if they are a good fit. An example of AI in candidate attraction is the use of specialized chatbots. These, when used during candidate attraction, can offer the candidate the opportunity to ask questions that are interpreted and answered using natural language processing (NLP).

NATURAL LANGUAGE PROCESSING

Natural Language Processing, (NPL) is an interdisciplinary field that combines computer science, linguistics and machine learning to study how computers and humans communicate in natural language. The goal of NLP is for computers to be able to interpret and generate human language, improving human work efficiency and facilitating interaction with machines. This field helps bridge the interaction gap between humans and electronic devices. NLP involves the use of computational techniques to process and analyze natural language data, such as text and speech, in order to understand the meaning behind language. It is used in a wide range of applications, including machine translation, sentiment analysis, speech recognition, chatbots and text classification. Some common techniques used in NLP include tokenization (decomposition of text into words or phrases), part-of-speech tagging (assignment of grammatical category to each word in a sentence) and named entity recognition (identification and categorization of named entities such as people, places and organizations in text).NLP is fundamental to many everyday technologies such as voice assistants, email spam filters, search engines and grammar correction. This field has seen significant evolution in recent years through the use of statistical approaches such as machine learning. The automation made possible by NLP makes it one of the most sought-after methods for implementing machine learning. In summary, NLP is crucial for computers to be able to understand and generate human language so as to improve interactions between humans and machines, leading to greater efficiency and ease of use in everyday activities.

Recruiting processes are undergoing a significant transformation due to the integration of Artificial Intelligence (AI) and Natural Language Processing (NLP). NLP, which is a part of AI, enables

computers to understand, interpret and manipulate human language in meaningful and useful ways for specific tasks. In the recruiting context, NLP allows computers to analyze textual data in depth, extract relevant details, and understand the nuances of language and wording. This capability makes NLP an excellent ally in recruiting, allowing it to interpret industry-specific terms or acronyms found in resumes and match them to job requirements.

AI in recruiting plays a key role in filtering the large number of applications received for each job position. Compared to traditional screening methods, AI-based recruitment systems offer a quick and more objective approach. Using algorithms and machine learning, these systems can quickly analyze resumes, assess candidates' qualifications, and even predict aspirants' potential success in specific roles.

In summary, the integration of NLP into the candidate screening process is not just a passing technological innovation, but represents a fundamental shift in the approach to recruiting. By harnessing the power of AI and NLP, companies can optimize their hiring processes, reduce bias, and ultimately make more informed and strategic hiring decisions

NLP TASKS

Several NLP tasks analyze human speech and textual data in a way that helps the computer make sense of what it is ingesting. Some of these tasks include the following:

Speech recognition, also known as speech-to-text, is a challenging task that involves converting voice data into text data. This technology is essential for any application that requires voice commands or spoken responses. However, people's speech habits, such as speaking fast, slurring words, using different accents, and incorrect grammar, make speech recognition even more difficult.

Part-of-speech tagging, also known as grammatical tagging, is a crucial process that determines the part of speech of a specific word or piece of text based on context and usage. For example, it can identify "make" as a verb in "I can make a paper plane" and as a noun in "What make of car do you own?"

Word sense disambiguation is a process of semantic analysis that selects the most appropriate meaning of a word with multiple meanings based on the given context. This process is useful for distinguishing the meaning of the verb "make" in "make the grade" (reach) from "make a bet" (place).

Named entity recognition (NEM) identifies useful entities or phrases, such as "Kentucky" as a location or "Fred" as a person's name. Reference resolution is the task of identifying when two words refer to the same entity, such as determining that "she" refers to "Mary." Sentiment analysis is a process that seeks to extract subjective qualities from the text, including attitudes, emotions, sarcasm, confusion, and suspicion.

Natural language generation is the opposite of speech recognition, in that it involves inserting structured information into human speech. In general, understanding these processes is essential to building effective natural language processing systems.

MONKEY LEARN

MonkeyLearn is a leading company in the field of Natural Language Processing (NLP) solutions, using artificial intelligence to understand and analyze text accurately and efficiently. Their platform offers advanced text analysis tools that leverage machine learning algorithms to extract meaning and information from a wide range of textual sources.

Thanks to NLP, MonkeyLearn enables users to create and customize text analysis models for a variety of tasks, such as information extraction, document classification, sentiment detection, topic identification, and much more. These models can be trained using existing data or customized to fit the specific needs of each user or industry.

MonkeyLearn's intuitive interface makes it easy for users to train and deploy NLP models without requiring in-depth knowledge of machine learning or data science. This allows businesses to leverage the capabilities of NLP to analyze large amounts of text quickly and efficiently, gaining valuable insights to make informed decisions and improve business operations.

Through this strategic choice of making the platform as intuitive as possible, not only does it make the software much more reliable and marketable even to those who have long been reluctant to evolve and adapt their recruiting processes to the times, but it also, and I would say especially, speeds up the entire job market.

In conclusion, MonkeyLearn offers a cutting-edge NLP-based text analysis platform, enabling businesses to fully leverage the potential of textual data to improve customer understanding, optimize business processes, and make strategic decisions.

NEED FOR INNOVATION AND MODERNIZATION

The evolving employment landscape, characterized by increasing complexity and rapid change, has posed several challenges that require an innovative and modern approach to recruiting. The need to adopt new strategies and technologies is fuelled by several key factors that shape the current human resources and recruiting environment.

Globalization and Competitive Labor Market

The process of globalization has made the labour market extremely competitive. Companies are no longer limited to finding talent locally, but face global competition. The need to attract highly qualified professionals, regardless of their geographical location, has made it crucial to adopt recruiting tools and strategies that overcome geographical and cultural barriers.

Complexity of Skills Required

The skills required to meet business challenges are evolving rapidly. The complexity of modern job roles requires an increasingly broad range of skills, ranging from technical to soft skills, from creativity to change management. Innovation in recruitment is needed to effectively identify and assess these multidimensional skills and ensure close alignment with organizational needs.

Candidate Expectations and User Experience.

Today's candidates, accustomed to instant access to information and a personalized user experience, place high expectations on the recruitment process. Modernization is key to delivering a candidate experience that is fluid, transparent and engaging. This requires the adoption of advanced technologies, such as intelligent chatbots and user-friendly candidate platforms, to improve the overall perception of the company brand.

Operational Efficiency and Cost Reduction

Companies are constantly looking for ways to streamline their operations and contain costs. Innovation in recruiting can contribute significantly to this goal by reducing selection time, increasing the efficiency of the assessment stages and, as a result, lowering the overall costs of the recruitment process.

In summary, the need for innovation and modernization in recruiting is driven by a number of global challenges, from the complexity of skills required to candidate expectations and the need to streamline operations. Artificial Intelligence and other emerging technologies emerge as key answers to meet these needs, enabling companies to remain competitive and adapt to the changing dynamics of the world of work.

ARTIFICIAL INTELLIGENCE AND ITS APPLICATIONS IN RECRUITING

The term "Artificial Intelligence" refers to a branch of computer science that studies the design and development of hardware and software systems that are endowed with capabilities typical of human beings and capable of autonomously pursuing a defined goal by making decisions that, until then, were usually entrusted to humans. Typical human capabilities relate specifically to understanding and processing natural language and images (visual and spatiotemporal perceptions) and learning, reasoning and the ability to plan and interact with people, machines and the environment (logical-decisional perceptions). Unlike traditional software, an AI system is not based on programming, but on learning techniques defined by specific algorithms that process a huge amount of data from which it is the system itself that must derive its understanding and reasoning capabilities. In human resource management, specifically in the recruitment phase, the goal is to use new technologies and artificial intelligence to make hardware and software capable of autonomously performing actions such as reading and analyzing candidates' resumes, allowing recruiters to focus on the profiles that are truly appropriate for the search. The software and hardware made should be able to perform typical human functions and actions:

- To act humanly, that is, indistinctly with respect to a human being;

- Thinking humanely, solving problems with cognitive functions;

- Thinking rationally, using logic;

- Acting rationally, initiating a process to achieve the best expected outcome based on the information at hand, which is what a human being, often unconsciously, does out of habit.

These features are important because they allow artificial intelligence to be classified into two major groups:

1) Weak artificial intelligence (weak artificial intelligence): this includes all those technological systems that can simulate some cognitive functions of humans but do not achieve the real intellectual capabilities of human beings.

2) Strong artificial intelligence (strong artificial intelligence): this includes all technological systems that can develop their own intelligence without emulating human-like thought processes or cognitive abilities, but developing one autonomously.

From the perspective of intellectual abilities, the operation of an artificial intelligence is substantiated mainly through three different functional levels:

1) Comprehension: through the simulation of cognitive ability to correlate data/events, artificial intelligence is able to recognize text, images, tables, video and voice and extract information from them;

2) Reasoning: through logic, systems are able to connect the multiple pieces of information collected (through precise mathematical algorithms and in an automated way);

3) Learning: this refers to systems with specific functionality for analyzing data inputs and correctly returning them to output.

In fact, what characterizes Artificial Intelligence from a technological and methodological point of view is the learning model by which the AI system is able to perform a task or action. These learning models distinguish Machine Learning and Deep Learning: the term Machine Learning refers to a set of methods, through which software is allowed to learn the information needed to perform a task without there being a pre-programmed system that determines how an AI should behave and react. As for Deep Learning, these are newly developed learning models inspired by the structure and functioning of our brains.

These models attempt to emulate the human mind and require purpose-designed artificial neural networks and a very powerful computational capacity that enables the system to withstand different layers of computation and analysis (such as the neural connections of the human brain); Based on these models, a classification of algorithms can be made that enable the software to function properly:

- algorithms with educational supervision, which allow learning through input and output examples so that the software understands how to behave;

- algorithms without educational supervision, which allow the software to classify the results of different tasks that will then be performed by the artificial intelligence (learning by analysis of results);

- reinforcement learning, implemented through the use of an algorithm to be included within the system that allows the software to learn and adapt to changes in the reference environment, through the distribution of a "reward," called reinforcement, which consists of the evaluation of the artificial intelligence's performance. The use of systems with artificial intelligence in the selection phase represents an innovative key that allows HR managers to adapt to the changes taking place in the world of work due to technological progress.

According to AIDP (associazione italiana direzione personale) research, 58 percent of HR managers have started using digitized and automated software in the recruitment and selection process over the past three years. In particular, more than six out of 10 HR managers use them in the screening phase.

This is because the use of these new technologies brings benefits to both job providers and job seekers. On the business side, artificial intelligence applied to software:

● Facilitates the search for interesting candidates and new talent, as they help the recruiter find individuals who are not engaged in an active search (those who do not respond to ads), but who may still be intent on changing jobs;

- It helps to optimize searches, especially for very specialized positions, since the requirements stated in advertisements are often not realistically matched, and the software allows the profile sought to be defined on the basis of the candidates actually available;

- It automates the screening phase, thereby reducing both the time and cost of the process, because new software allows all the data contained in a resume to be captured automatically. This allows companies to fill open positions in a much shorter time frame and makes the entire selection process much more efficient.

On the candidate (job seeker) side, technologies with artificial intelligence are crucial because:

- They create more opportunities to find jobs because the recruiting companies themselves often search for candidates;

- They present greater impartiality when screening resumes, as automation reduces the risk of experiencing bias;

- They drastically reduce the time of both the selection process and the time to know the outcome.

Specifically, artificial intelligence in the recruitment and selection process is applied to software so that it can analyse texts syntactically and semantically, comparing the individual information obtained to assign a specific value to them. This activity is called "CV parsing," which is the automatic analysis of a resume to extract relevant data from it. Software thus makes it possible to examine all resumes quickly, more accurately and precisely, synthesizing all the data obtained to compare them in order to easily identify the most suitable profiles for a job position.

APPLICANT TRACKING SYSTEM (ATS) SOFTWARE

An **applicant tracking system**, usually known by the abbreviation ATS, is an AI-powered software designed to ensure effective and comprehensive management of the recruitment process in the company.

This software allows a company to collect and organize all the data of candidates in their resumes, thereby reducing the time spent in conducting the screening phase. In addition, ATSs can also be used to post job ads on the company website, organize resumes and interview candidates.

The software allows users to create a customized form (an interface that allows users to enter and submit one or more data) with questions focused on the main requirements of a search: it is possible, for example, to filter out all candidates with a specific degree or with work experience in a specific field by entering these specific questions into the software, which will automatically highlight all candidates who meet the requirements.

Another advantage that can be realized with the use of an ATS is the standardization of the recruitment process by archiving all data and information obtained from the screening phase. In this way, the recruitment phase is progressively improved, which enables recruiters to make decisions, not based on their own impressions, but based on hard data. In addition to creating customized forms, ATS software allows applications and all cvs to be organized in a centralized company-owned database, searchable by keyword entry. All cvs received via e-mail will also subsequently be automatically entered into the database. All of this is possible through the use of specific mathematical algorithms that provide instructions to the software and allow the realization of the ranking of candidates most in line with company requirements. Thanks to these ATS software, the time required to carry out the cv screening activity is reduced by as much as 75%. This allows recruiters to devote themselves to other activities with higher added value.

IN-RECRUITING

In-Recruiting is an applicant tracking system (ATS) that supports the entire recruiting process, from job posting, resume screening, to job offer, significantly shortening the time to hire. The software also facilitates social media posting and optimizes candidate selection, so that the ideal person is found quickly and more efficiently. In-recruiting is built on the principle of flexibility, so companies can align the software with their recruitment process. You can define different selection processes for different roles, choose where to post job ads, and compile them in different languages.

Such ads can be placed on the company website or social networks. The system automatically publishes and removes ads created using data recorded in the initial preparation form (in this way the page remains continuously updated and inactive ads are deleted).

This ATS allows the entire recruitment and selection process to be streamlined, as HR managers can review each individual resume or application and record the corresponding feedback online; interview schedules are visible to all interested persons so that the entire process is smoother and faster. Data and information obtained from cv screening are stored directly in the software database and are available to recruiters in real time. In addition to everything, it is possible to create keywords (so-called tags9) for resumes so as to conduct much faster searches, check which cv collection sources are working best, and keep track of the time and costs incurred in the selection phase.

ALLIBO

Allibo is an applicant tracking system used to simplify the management of the entire recruiting process. With this software it is possible to manage the posting of job advertisements on websites and social networks, centrally collect all resumes sent via web and e-mail, and speed up the screening process by entering all the information collected within a private database. This private database is created by the software, and within it all resumes sent to the user company are collected and classified, regardless of their format, their source (company sites, social networks, classifieds sites, or search

engines), and the mode used to send them (web application, e-mail, or scanning of paper cvs). The classification and analysis of cvs is done automatically in the database, where they remain at the complete disposal of the company and are easily traced through a search engine that uses mathematical algorithms that allow for the quick and efficient identification of job profiles best suited to the organization's requirements. The goal is to save time in screening through automatic measurement of the degree of correspondence between the data contained in the CVs and the requirements indicated for each open job position, so that the company can immediately identify the most suitable candidate to hire. Profile correspondence is calculated by Allibo both on new incoming resumes and on those previously collected in the database at the beginning of each selection. This software feature makes it possible to greatly expand the pool of possible candidates, while also increasing the likelihood of finding potential talent. In addition, Allibo provides the company with some of the most comprehensive and efficient data analysis and measurement tools in the market, which make it easy to keep track of key points in the recruiting process, such as the progress of job postings, the status of activities, the time invested to fill each open position, the level of performance achieved by the sites used to publish job openings, and the measurement of "time to hire10." The combination of all these elements makes the entire recruiting process smooth, fast, efficient and measurable, with a net cut in costs to be incurred.

MACHINE LEARNING

Machine learning is a branch of artificial intelligence (AI) that deals with creating systems that learn from data and improve their performance without being explicitly programmed. In other words, machine learning systems are able to self-learn and self-improve by analyzing large amounts of data.

The process of machine learning is based on three main stages:

1. Data acquisition: The first step is to acquire a training dataset that represents the problem that the machine learning system must learn to solve. The data can be of different kinds, such as text, images, audio or video.

2. Pattern training: The machine learning system is then "trained" on this training data. During training, the system identifies patterns and relationships in the data that will enable it to make predictions or decisions in the future.

3. Evaluation and use of the model: Once the system has been trained, it is evaluated on a test dataset for accuracy. If the system is sufficiently accurate, it can be used to make predictions or decisions on new data that it has not seen before.

There are several types of machine learning, including:

- Supervised learning: In this type of learning, the system is trained on a training dataset that includes both input and desired output data.

- Unsupervised learning: In this type of learning, the system is trained on a training dataset that includes only the input data. The system must then independently identify patterns and relationships in the data.

- Reinforcement learning: In this type of learning, the system learns to perform a task through trial and error. The system receives positive or negative feedback based on its actions, and this feedback helps it improve its performance over time.

Machine learning is used in a variety of applications, including in the recruiting process.

Artificial intelligence (AI), through machine learning, is rapidly emerging as an indispensable ally in the recruiting process, revolutionizing the way companies identify and select top talent. Using machine learning algorithms, AI can analyze huge amounts of data from a variety of sources, such as resumes, online profiles, and performance data, to identify the most suitable candidates for a given position. This ability to process and understand complex data enables companies to identify patterns and trends that are difficult to detect with traditional methods, thus improving the quality of hiring. In addition, AI can automate many of the steps in the recruiting process, such as resume skimming, meeting scheduling, and skills assessment, allowing recruiters to focus on high-value-added activities, such as soft skills analysis and candidate relationship management. In this way, AI not only simplifies and accelerates the recruitment process, but also helps reduce bias and discrimination, promoting diversity and inclusion in the workplace. As artificial intelligence and machine learning technologies continue to develop, the role of these technologies in recruiting is set to grow further, offering companies new opportunities to attract and select top talent more efficiently and effectively.

RECRUITING GAMIFICATION: WHEN SELECTION BECOMES A GAME

The term "recruiting gamification" refers to a new form of the recruitment process that combines video game mechanics and design with the use of digital tools in order to engage and motivate people to achieve their goals. This process currently supports companies in a number of ways: increasing customer engagement and employee motivation, making employee selection and training more effective, and facilitating company performance evaluations. Specifically, recruiting gamification uses alternative selection methodologies to traditional ones, leveraging the use of specific games to more likely assess the real skills, abilities and aspirations of candidates, with the aim of attracting and identifying the best talent. This discipline integrates the logic of gaming and selection through challenges and tests to be passed, step paths with corresponding scores, interactive games, timed quizzes and, even, board games, to test the specific skills required by companies. The first application in the area of personnel selection dates back to 2011, when a major U.S. hotel chain, "Marriot International," exploited the potential of the social game "My marriot hotel "with the intention of filling 50,000 vacant positions in one year. This game, which players access through Facebook, is about managing a virtual restaurant where you have to deal with all the aspects that you would face in reality. Players gain and lose points based on how satisfied customers are and are rewarded for actions that make a profit. Marriot International was certainly a forerunner, but there are currently many companies using recruiting gamification to attract potential talent, such as Pepsi and l'Oréal.

RECRUITER'S ADVANTAGES

As explained earlier, the traditional recruitment and selection process includes several stages and involves carrying out a series of actions related to job planning and communications to be provided internally and externally to the company. Often this phase becomes time-consuming and difficult, despite the urgency of filling vacant positions. Recruiting gamification has transformed the entire process, eliminated the preliminary screening phase and thus allowed recruiters to save time. Whereas with the traditional process most of the energy is invested in reading all the CVs received (often sent without a real interest in the position), this new frontier of recruiting allows for the evaluation of an unlimited number of candidates/players who are genuinely interested in the job position.

Moreover, through the use of recruiting gamification, recruiters are able to quickly assess both hard skills and soft skills through the creation of a virtual environment very similar to the real one, where the challenges to be overcome are designed specifically for the different positions sought. In this way, the recruiter will be able to predict the candidate's future behavior in the company with a greater degree of reliability, through objective and less discretionary judgments.

COMPANY'S ADVANTAGES

Recruiting gamification allows candidates to present themselves with an innovative and future-oriented approach, thereby conveying a valuable corporate image and communicating to prospective employees the characteristics that make a particular job unique. Companies are recognized by the younger generation as an established brand in their industry, thus diversifying them from competitors. Regarding the cost of the process, despite the necessary initial investment (the creation of ad hoc software presents a high cost), the inclusion of a gamification recruiting process allows the organization to save time in selection. In fact, such a tool significantly reduces the operational costs arising from the recruiting and selection stages and decreases the time lag between the first contact with the candidate until recruitment. These advantages also save the company money in the short term.

CANDIDATE'S ADVANTAGES

In the traditional recruiting process usually, candidates have to go through lengthy selection processes that they often do not even understand the meaning of, waiting a long time for feedback (evaluation) from the recruiter. The innovative and interactive methodology of recruiting gamification engages candidates through the use of simple and intuitive games and makes them protagonists of the selection process, motivating them more to achieve the goals necessary for recruitment. The competition inherent in the human mind is met through the challenges present in the games and by the immediate gratification through rewards provided at each stage of the game, which incentivize candidates to focus on their potential and to overcome their limitations. Finally, this technology allows the creation of an environment resembling a business environment, recreating the right work environment. In this context, the candidate faces the same challenges that he or she would face in the company in the case of employment, and is accustomed from the start to familiarize himself or herself with the tasks of the job he or she would be performing. The whole game process makes it easier for candidates to identify useful information regarding company policy and dynamics. The candidate, therefore, gets in touch with the corporate culture and can compare it with his or her own ideologies and personal characteristics, thus getting a good idea of the role and the context where he or she will be working. As a result, both the candidate and the recruiter will have had the opportunity to learn aspects that they would not have been able to detect by a traditional method.

Vgen

Founded in 2018 by Vincent Lonij, Swyg was created to provide a solution to two macro-problems plaguing today's recruiting processes. On the one hand, companies too often let excellent and highly qualified candidates slip through their fingers because of the excessive automation of their recruiting process that is heavily geared toward finding specific keywords. On the other hand, the lack of automation in the process leaves the field open to cognitive bias, prejudice and human error, especially when the recruiter is faced with meaningful but incomplete data such as CVs to which less than 2 minutes are devoted on average. As a result we get that more than 20% of corporate turnover can be traced back to wrong decisions in the selection phase. We must also take into consideration the point of view of candidates, who in 94% of cases request feedback from their interviews, but only 41% are satisfied. This lack does not allow a complete self-critical analysis useful for the growth of each individual.

How can such a "delicate" process be recast from the ground up? Swyg's answer is certainly singular. Through several 1:1 live chats, candidates interview each other using predetermined questions. By increasing the number of chats, in fact, the influence of bias in selection is largely reduced, according to Lonij. This is coupled with an AI designed to calibrate the different interviews in real time with processes to detect, remove or correct bias and human error. Such AI by going to study the profiles of each candidate is able to detect and eliminate any misbehavior or misleading assessments by the different candidates. The latter will also receive unbiased and detailed feedback regarding their technical and interpersonal skills at the end of each selection process.

Inda - INtelligent Data Analysis

It is a proprietary artificial intelligence technology for data analysis and interpretation, specifically designed for the HR world and aimed at optimizing the recruiting process. Through Deep Learning and Natural Language Processing (NLP) algorithms, it helps recruiters identify and attract the best talents. Another strength of Inda's approach is its self-learning ability, specializing according to the needs and specificities of individual clients.

Starting from the upload of a CV file, Inda is able to extract candidate information and store it within the database. Using Computer Vision and Natural Language Processing techniques, it distinguishes and recognizes structures, texts, and images, facilitating the import of personal, professional, educational, and skills data. The CV Information Extraction and Parsing system simplifies the automatic completion of the application form, both in the case of CV upload by the recruiter and in the case of direct application by the candidate. The candidate's uploaded CV can be anonymized through an Anonymous Resume/CV anonymization system developed by Inda for incognito selections. It is a tool for blind recruitment that allows generating a real-time anonymous copy of the candidate's CV to share with colleagues, company users, or externally with client companies. The anonymous CV "obscures" information such as name, surname, phone number, email, gender, nationality, date of birth, photo, links in the CV, cover letter, or other digital documents.

The semantic engine operating in our artificial intelligence solution tracks the most qualified candidates based on specific keywords - with variable weight - and words with similar meanings. In this way, the semantic search for the ideal candidate extends from profiles that exactly match the entered search key to those that present semantic proximity. This speeds up the search and selection process compared to traditional search methods. Semantic analysis of CVs also allows assigning a relevance/pertinence score to the candidate, indicating the percentage of correspondence to the search. This system allows creating an always updated ranking of applications. The combined work

of artificial intelligence techniques and processes simplifies semantic matching activity. Based on a Job Description or a candidate's profile, Inda is able to identify a set of candidates similar to the one under examination or resulting from a search for a specific job posting. Candidate analysis and evaluation, validated by scoring, also enable a more functional match between job posting and candidate. Inda easily integrates with third-party software thanks to appropriate APIs (Application Programming Interface). Thanks to the work carried out internally by the Data Science team, the APIs allow integrating Inda's functionalities into any software. The documentation provided below provides all the necessary information to support companies towards the technical implementation and correct use of Inda's functionalities in their respective processes.

Performa Group

Performa AI offers a cutting-edge artificial intelligence-based approach that leads to superior performance in personnel selection and talent acquisition. Thanks to the use of deep learning algorithms and advanced data analysis, Performa AI can identify the best candidates for a given role, thereby improving the quality of hires and reducing the risk of selection errors. The four main functionalities are:

- CV matching

- Resume Parsing

- Pre-screening

- Semantic Search

Performa, an innovative startup, utilizes artificial intelligence (AI) for CV matching through the use of Applicant Tracking System (ATS) software that allows setting keywords directly on the website that collects CVs. This system automatically groups resume based on keywords and candidate requirements and can also sort them based on their relevance to the job position. To optimize one's CV for ATS software, the Performa team recommends using clear and professional formatting, as well as selecting the right keywords for the job position. Furthermore, it is important to keep an eye on the job posting and tailor the CV according to the specific needs of the position. The ATS software can also be used to evaluate candidates' profiles on social media, so it is important to update the CV on LinkedIn and other social media profiles before applying.

In summary, Performa uses AI for efficient and precise CV matching, enabling the selection of the most qualified candidates for a specific job position. To optimize one's CV for ATS software, it is important to use clear and professional formatting, select the right keywords, and tailor the CV according to the specific needs of the position. Based on this, the concept of the need for continuous

monitoring of one's CV and updating one's social media profile before applying is conceived, as the ATS software can also be used to evaluate candidates' profiles on social media.

Furthermore, Performa utilizes resume parsing technology, which allows candidates to fill out the application form in seconds by simply uploading their CV to the website. Resume parsing automatically extracts and processes data, thanks to the use of AI, and can process any type of CV format (such as pdf, docx, jpeg, etc.). This way, CV data is transformed into an easily accessible and structured form, which can be used to build a candidate database and achieve a digitized recruitment process. The CV parser helps recruiters create an efficient talent database to streamline the candidate screening and screening process and find ideal talents more quickly. CV parsing tools also eliminate cognitive biases that could lead to excluding a suitable worker due to gender, age, ethnicity, and so on. AI that bases its decisions solely on objective data without being influenced by biases offers significant advantages in personnel selection. First of all, this approach ensures fair treatment for all candidates. Since AI does not consider personal characteristics such as gender, age, or ethnicity, there is no risk of discrimination or bias against certain groups. AI decision-making is more reliable as it is based on objective and consistent data. This can lead to more accurate decisions in personnel recruitment, as they are not influenced by subjective or emotional judgments. AI's ability to quickly analyze large amounts of data also enables more efficient and faster decision-making than manual processes. This means that a larger number of candidates can be evaluated more efficiently without compromising the quality of decisions.

Overall, AI that relies only on objective data and is not subject to biases contributes to promoting a more inclusive, fair, and reliable work environment. In summary, Performa uses AI for CV matching through the use of ATS software and resume parsing, which allows for the analysis and structuring of data contained in resumes, transforming them into an easily accessible and structured form. This enables a significant reduction in the time spent on manual resume review, the elimination of

cognitive biases, and the creation of an efficient talent database to streamline the candidate screening and screening process.

Randstad Business Case – Increasing productivity thanks to AI

Productivity can be enhanced by generational AI, particularly by Chat GPT solutions, especially regarding writing and editing tasks. For decades, people have been concerned that new technical developments might lead to widespread automation and job loss (Zach Winn, 2023). A study found that ChatGPT increases workers' productivity for some writing tasks (MIT News Press Office). Since the launch of ChatGPT in November 2022, social debate has intensified around advanced artificial intelligence (AI) technologies now available to the public and usable by everyone for free, without requiring any computer skills (Randstad Position Paper, 2023, p.3). However, what specific advantages can generative AI offer to the hiring team? Labor markets are known to adapt to fundamental changes. New technologies can create new jobs and can benefit the economy overall if they increase workers' productivity. Although it's evident that AI is already changing how companies work, it's difficult to predict its exact impact on the labor market (Randstad Position Paper, 2023, p.3). We define AI as a set of technological components that gather, process, and act on data in ways that simulate human intelligence. Like humans, AI solutions can apply rules, learn over time through acquiring new data and information (i.e., via ML), and adapt to changes in their environment (Ana Isabel Canhoto et al., 2019). AI tools use machine learning to generate responses or perform basic tasks based on input criteria. Some of the most well-known AI tools are: (i) for writing and content

creation: ChatGPT, Copy.ai, GrammarlyGO, ClickUp, Google's LaMDA, Meta's LaMDA; (ii) for meetings (transcribing spoken conversations, providing advanced analysis): Spinach, Sembly, tl;dv, Otter.ai; and (iii) for HR and Recruiting (automating tasks in the hiring process, such as candidate screening, interview scheduling, and onboarding): Paradox.ai, Textio, HiredScore, Attract, Effy (Haillie Parker, 2023).

Theoretical Context

In order to expedite and enhance human connection between job seekers, consultants, and clients, this company has experimented with a variety of cutting-edge technologies over the years. Currently, Randstad is implementing modern technologies, including AI tools and digital strategies, without compromising human engagement. This company offers solutions more oriented towards people's needs by combining technology with the enthusiasm of human resources professionals. According to Randstad, once implemented, any legislative framework on AI should have a positive impact on labor, innovation, and entrepreneurial prospects in labor markets worldwide. The initial implementations of these regulatory frameworks are currently under development in China (the AI Regulatory Framework), the United States (the AI Law in New York), and Europe (the AI Act) (Randstad Position Paper 2023. The Labor Market and AI, p.4.).

Research Methodology

For data collection in this research, an internal survey was conducted between 100 recruiters among Randstad employees based in Europe. Anonymity and confidentiality of each participant were

ensured. The group of interviewees was defined by: (i) position (country of residence), (ii) gender (male, female, prefer not to say), (iii) age (18-24 years, 25-34 years, 35-44 years, 45-54 years, 55-64 years, 65+ years), (iv) highest level of education or education level (High School Diploma, Bachelor's Degree, Master's Degree, Doctorate or higher), and (v) number of years of experience in the recruitment industry (<1 year, 1-5 years, 5-10 years, 10+ years) and (vi) number of years they have been with Randstad (<1 year, 1-5 years, 5-10 years, 10+ years). The questionnaire consists of ten questions: six questions regarding sociodemographic variables and four questions exploring employees' opinions on AI tools, based on the Likert Scale, i.e., AI tools will be very useful for the recruiting industry in the near future and the reply is going to be in form of: Sstrongly agree, agree, neutral, disagree, strongly disagree. The survey is based on one of the well-established Likert Scale Questionnaires. In its final form, the Likert scale is a five (or seven)-point scale used to allow an individual to express how much they agree or disagree with a particular statement (Saul Mcleod 2023).

Results

Among the 200 respondents, all from the European Union, 73.5% were women, 23% were men, and 2.9% preferred not to specify. The age range of the participants was between 25 and 64 years old. In terms of age groups, the highest percentage (58.8%) was in the 25-34 age group, followed by 29.4% in the 35-44 age group, 5.9% in the 45-54 age group, and the remaining in the 55-64 age group.

Age group

■ 18-24 years ■ 25-34 years ■ 35-44 years ■ 45-54 years ■ 55-64 years
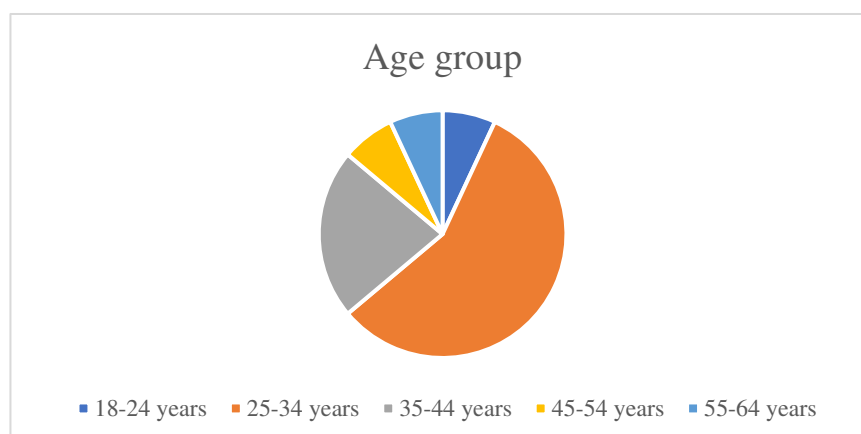
Regarding the highest level of education or education level, the majority of interviewed employees (41.2%) have a Bachelor's Degree, 38.2% have a Master's Degree, and 20.6% have only a High School Diploma.
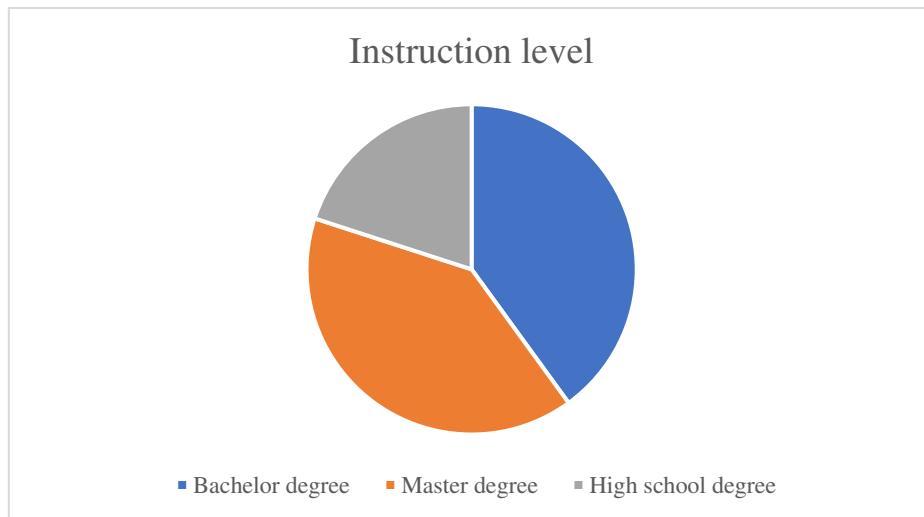
Concerning the number of years of experience in the recruitment industry, 52.9% of participants have been working in this field for 1-3 years, 23.5% for 3-6 years, and also 23.5% for over 10 years. Regarding the number of years spent in this company, 79.4% have been with Randstad for 1-3 years, 11.8% for 3-6 years, and 8.8% for over 6 years.
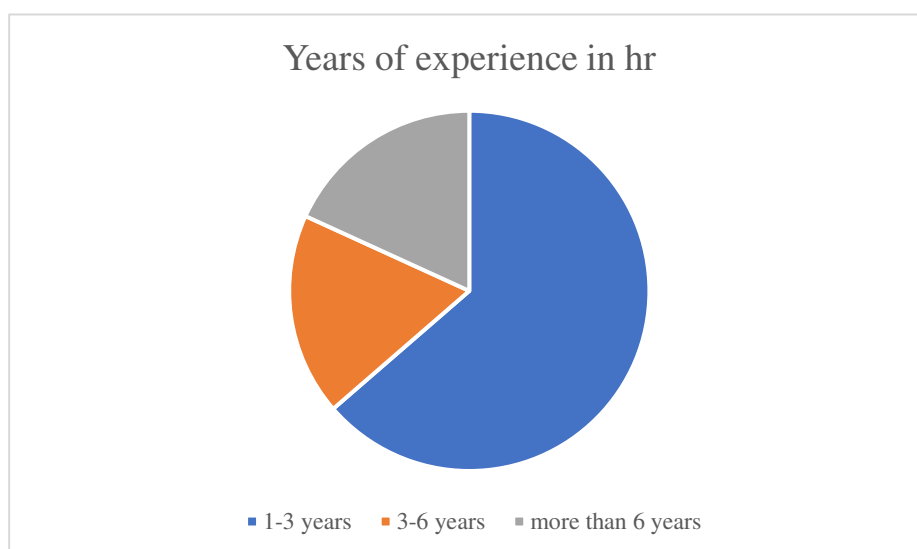
Recruiters expressed their opinions regarding AI tools through a questionnaire based on the Likert scale, which is composed by five points that allows them to express their degree of agreement or disagreement on various statements. The results indicate that the majority of participants strongly believe in the future effectiveness of AI tools in the recruiting industry. 41.2% indicated they "strongly agree" with this perspective, while 35.3% expressed a more general agreement. Only 5.9% disagreed.
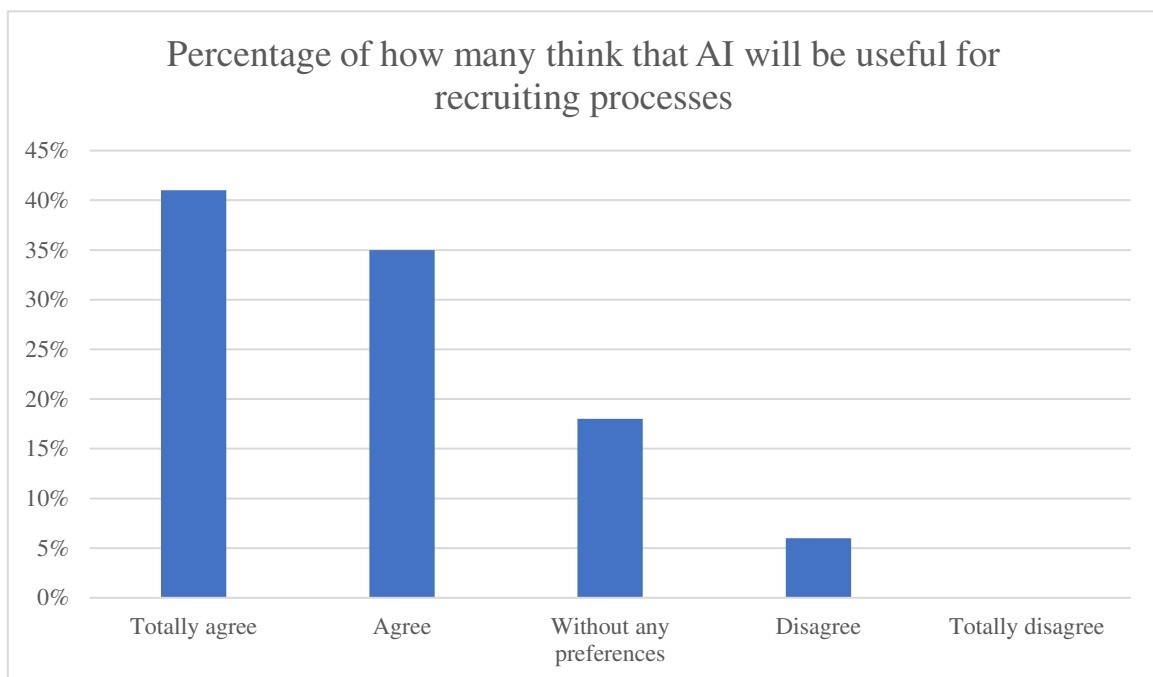

The results clearly show that the majority of participants have a strong belief in the future effectiveness of AI tools in the recruiting industry. A substantial 41.2% "strongly agree" with this perspective, reflecting a high level of confidence in AI's potential to enhance recruitment processes. Additionally, 35.3% expressed general agreement, further indicating widespread optimism and acceptance of AI's role in the industry. In contrast, only a small minority of 5.9% disagreed, suggesting that skepticism is relatively limited. Overall, these findings highlight a positive outlook towards AI in recruitment, with most participants anticipating significant benefits from its implementation.

Regarding the potential issues that AI tools could cause in the recruiting industry, opinions were more varied. While 41.2% of participants remained neutral, 32.4% showed a positive opinion (with 11.8% expressing strong agreement), and 26.5% highlighted a negative view (with 20.6% indicating strong disagreement).

AI tools are trustworth
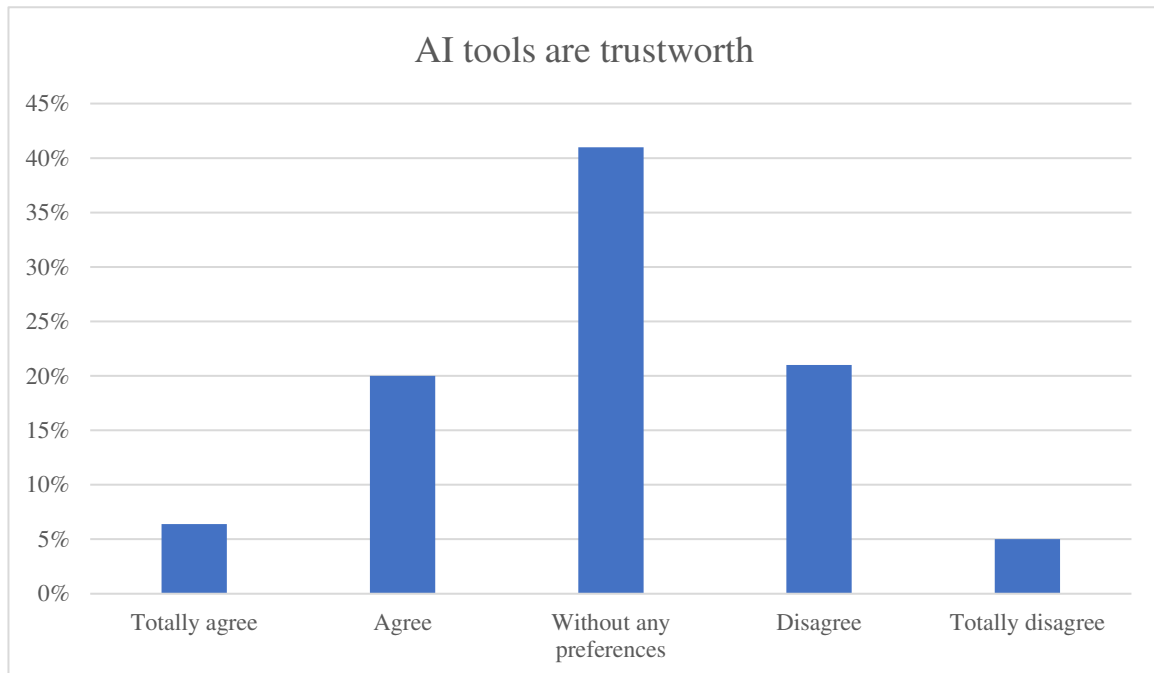
The data indicates a diverse range of opinions on the potential issues AI tools could cause in the recruiting industry. A significant portion, 41.2%, remained neutral, suggesting uncertainty or a wait-and-see approach among many participants. Positive opinions were held by 32.4% of respondents, with 11.8% expressing strong agreement, showing that there is a notable group who see AI tools as beneficial despite potential issues. Conversely, 26.5% had a negative view, with a substantial 20.6% strongly disagreeing, highlighting concerns or skepticism about the potential drawbacks of AI in recruitment. These varied perspectives underscore the need for ongoing dialogue, transparency, and evidence-based assessments to address concerns and build confidence in AI applications within the recruiting industry.

Trust in AI as a recruiting tool is a topic that has not yet been widely explored. 47.1% of participants preferred to remain neutral on this issue, while only 26.4% expressed agreement (6,4% totally agree and 20% agree), and 26.5% disagreed.

AI can cause issues in the recruiting process
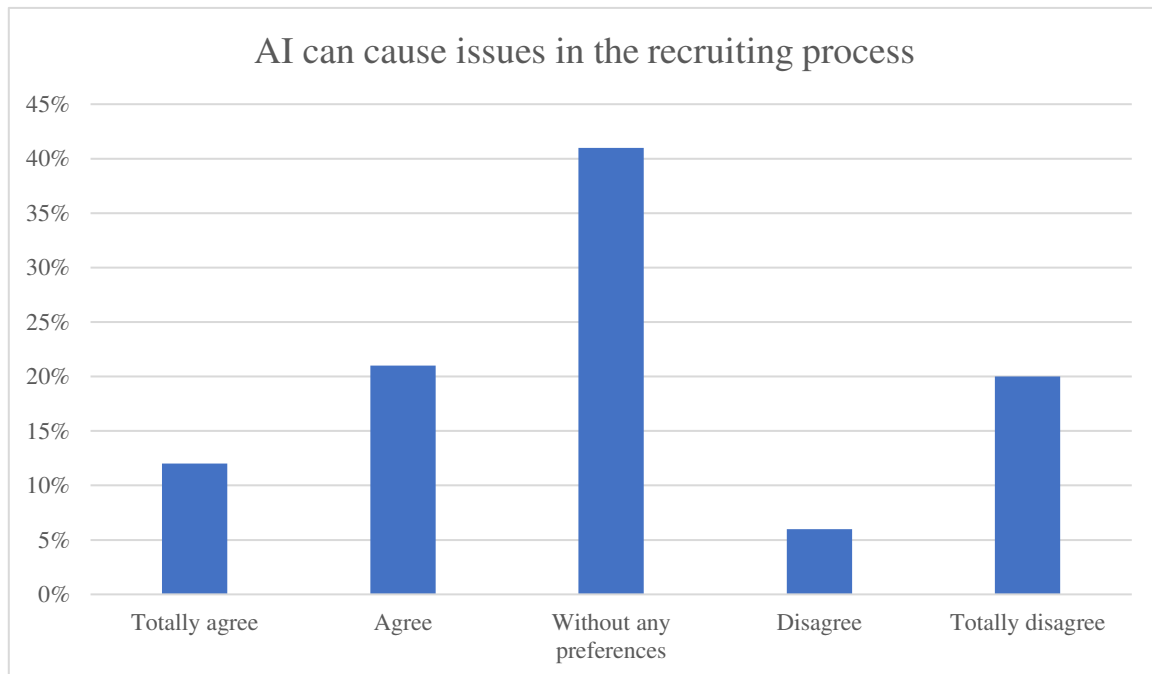
The data reveals that trust in AI as a recruiting tool is still an area with considerable uncertainty among participants. A substantial portion, 47.1%, chose to remain neutral, indicating that many individuals might be undecided or lack sufficient information to form a strong opinion. Only 26.4% of participants expressed agreement (with 6.4% totally agreeing and 20% agreeing), showing that while there is some level of trust, it is not overwhelmingly high. Meanwhile, 26.5% disagreed, reflecting a significant portion of skepticism or concern regarding the use of AI in recruitment. These mixed sentiments suggest that more research, education, and possibly evidence of successful AI implementations could be necessary to build greater trust in AI as a reliable recruiting tool.

However, the majority of participants (76.4%) are open to integrating AI tools into their daily recruiting tasks. Only 5.9% are not in favour of this integration, while 17.6% remained neutral.

Open to integrate AI into their recruiting tasks
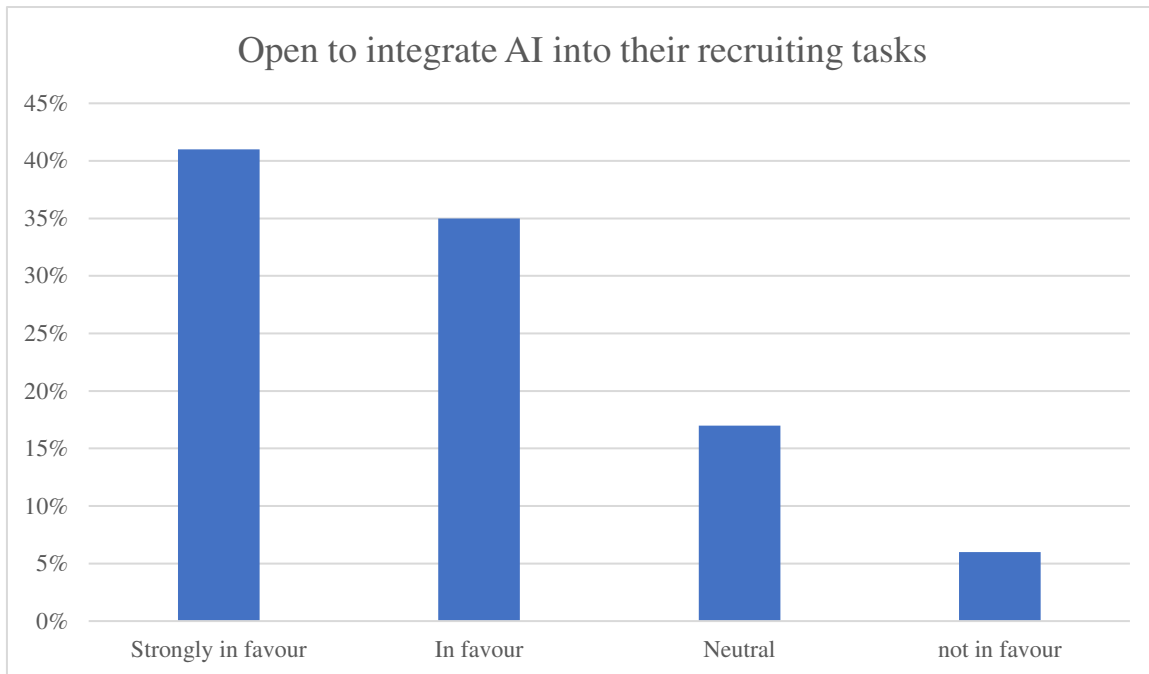
The data indicates a strong openness among the majority of participants towards integrating AI tools into their daily recruiting tasks. With 76.4% in favor, it is clear that there is significant interest and willingness to adopt advanced technologies to improve the efficiency and effectiveness of the recruitment process. Only a small minority, 5.9%, are opposed to this integration, suggesting that concerns or resistance are limited. The 17.6% of participants who remained neutral might indicate a need for further information or evidence of the benefits of AI tools before expressing a definitive preference. Overall, these data reflect a positive trend towards the adoption of AI in the recruitment sector.

To sum up, the social debate on AI will evolve over time at the same pace as the development of these technologies. One of the conclusions that can be drawn from this study is that Randstad employees are primarily interested in AI tools and how they can be incorporated into their regular recruiting procedures. However, they tend to show extreme caution when it comes to the potential issues that AI tools could bring in the near future. For this reason, an appropriate and balanced

regulatory approach is necessary, taking into account the speed of AI development and adoption, government policies, and societal responses. AI in the recruiting industry has the potential to improve labor market outcomes for all stakeholders and increase the effectiveness and transparency of this market when applied correctly. Furthermore, as AI advances in this market sector, the human element should not be forgotten. Human interaction is still crucial because, while decisions based solely on AI output can make sense, they do not always lead to the fairest solution. Since only individuals are capable of grasping such nuances, recruiting remains an interpersonal practice.

The Future of Recruitment: Emotional Algorithms and Artificial Intelligence

Artificial intelligence enables systems to develop increasingly accurate recruiting processes, taking advantage of the machine's ability to reason, learn and plan, similar to human capabilities. This allows programs and companies to understand the environment in which they operate, solve complex problems and continuously improve by processing ever-expanding amounts of big data. According to a report in the Journal Of Society, Economics And Management, human resources are taking on an increasingly strategic role within companies, no longer limited to purely administrative tasks but becoming crucial to business success. In the current landscape, Artificial Intelligence and Machine Learning have become crucial tools in the recruitment process. These technologies allow a vast amount of data to be instantly examined in order to identify candidates who meet the specific criteria of a given search. In particular, AI is extremely useful in recruiting so-called "passive candidates," i.e., those who are not currently seeking new employment but may be interested in interesting job opportunities. The number of qualified passive candidates is significantly higher than the number of

active job seekers. The ability to efficiently identify the desired target among the entire population of possible candidates enables more inclusive and effective recruitment. The use of artificial intelligence in the recruitment process makes it possible to narrow down the number of candidates and provide valuable data on a given group of them in a matter of seconds, compared to what would take weeks of research in the past. This represents tremendous added value and greater efficiency in recruiting personnel.

What has changed in recruitment and interviewing in the digital age?

An emblematic example of collaboration between Industry 4.0 and recruitment is the case of the Vera robot, developed in 2018 by Strafory, a Russian start-up. IKEA decided to use Vera for personnel selection, thus enabling the multinational company to draw psycho-social profiles of job applicants.

Vera has advanced artificial intelligence and predictive algorithms that enable it to interact with candidates, analyzing their responses and emotions. However, although AI can help HR personnel, some believe that the final hiring decision should remain the prerogative of humans. Vera is primarily concerned with identifying suitable candidates for a specific job offer, facilitating the initial selection process through its ability to conduct thousands of interviews a day. However, once potential candidates are selected, they are evaluated by human resource experts, as humans still remain the best evaluators. Similarly, Randstad Italy, part of a Dutch multinational recruiting specialist, recently adopted a search engine based on recruitment management software. This program is responsible for monitoring the entire application journey, from the publication of advertisements to the selection of profiles. Randstad Italy also plans to introduce new chatbot-based features to conduct more in-depth interviews and assessment tools to share data among colleagues, such as cross-referencing. During job interviews, the answers given by candidates assume a crucial role in the assessment, but equally relevant become the ways in which these answers are expressed, as well as the candidate's emotional state, level of attention, anxiety and stress, along with the speed and confidence with which he or she

responds. Therefore, the nonverbal aspects of communication become crucial in candidate selection, thus delineating the characteristics required of those designing new virtual recruitment tools.

The artificial system adopted by Randstad Italy, for example, can evaluate up to 29,000 resumes per day, subsequently selecting profiles of interest based on available positions. This approach is radically revolutionizing the recruitment process, with many companies relying on automatons even for initial contact with candidates, through chatbots or email exchanges that schedule a face-to-face meeting with the recruiter, thus minimizing human intervention until the actual interview. Emerging ways of recruiting staff include video recruitment, which allows companies to conduct an initial screening through video questions to be answered by candidates via clips. This method has already found wide use in a number of companies, enabling them to make faster hiring decisions and offering candidates the opportunity to prepare for questions from the comfort of home. These automations bring tangible economic benefits, with estimates showing investment in automated recruitment exceeding $200 billion, and this figure is expected to continue to grow. By 2030, AI is expected to contribute $15.7 trillion to the global economy, with a significant portion of this contribution coming from artificial intelligences dedicated to the recruiting industry. To fully understand the use of AI in recruitment, it is interesting to look at its applications in large multinational corporations. For example, Unilever, one of the oldest and largest multinationals operating in the United States, uses AI in the recruiting process, claiming to have saved about 50,000 hours of interviews. Unilever is leveraging technologies such as HireVue and Pymetrics, with HireVue using video analytics to screen candidates, allowing them to record their responses to a set of questions and thus making it easier for recruiters to evaluate applications. The algorithm behind this technology is complex, consisting of some 25,000 interrelated features that allow candidates to be evaluated by considering a wide range of factors. These include eye contact, enthusiasm, smiling, facial and body expressions, clothing, and voice nuances. Pymetrics, on the other hand, is a game-based platform that measures behavioral and social traits, logical-rational thinking skills, risk-taking, motivation to succeed, and how candidates approach

problems and offer solutions. These game-based tests are more engaging than traditional question-based tests and foster authentic behaviors by reducing stress. DeepSense, a company based in San Francisco and New Delhi, uses Artificial Intelligence to assess candidates' personalities based on their Resumes, using the Ocean model used for more than 20 years in marketing to understand consumer behavior. Candidates are evaluated on five variables: open-mindedness, conscientiousness, extroversion, amiability and neuroticism.

But why should we rely on artificial intelligence for personnel selection?

The answer is simple: AI and machine learning make the search for new staff more efficient and manage the entire selection process more efficiently. Businesses require increasingly specialized figures, and thanks to AI, recruiters can make targeted selection by analyzing large amounts of data. In addition, pre-selection activities such as resume analysis can be automated to make the process faster and allow recruiters to focus on the most suitable candidates. There are many advantages to using software and algorithms: they are tireless, performing routine tasks reliably and quickly; they are scalable and inexpensive, with costs marginal compared to the benefits; and they are adaptable, allowing changes to perform new tasks as long as there is sufficient data. Large multinational companies such as Microsoft, IKEA, Pepsi, Burger King and many others have already automated a significant portion of the tasks associated with the millions of interviews they conduct each year, and many steps in the recruitment process lend themselves easily to automation. For example, Machine Learning algorithms can be used to write and evaluate job ads, using terms and phrases that maximize the number of candidates who will respond. The AI, when specially trained, can also choose the most suitable publishing platforms, based on the characteristics of the ad and the history of responses collected over time. After the posting stage, the AI can sift through the collected resumes to rank them and begin selecting the most suitable candidates. Another great advantage of AI is that it makes decisions based only on available data, without opinion or emotion. But automation is not without

risks. One such risk is "machine bias," which occurs when there are incorrect assumptions in machine learning processes. This can result from problems in data collection or use, where systems draw improper conclusions due to biased or distorted data. In addition, there are concerns about the ability of AI to eliminate human biases. Algorithms learn from examples and may replicate human biases in the recruitment process. In addition, the software's lack of flexibility could lead to the exclusion of people with profiles other than those established. To address these challenges, it is important to use a variety of tools in personnel selection, not limiting oneself only to psycho-aptitude tests. Attention must be paid to the biases embedded in personnel selection technologies, which can lead to discriminatory results. An example of this was Amazon's use of a machine learning system that tended to discriminate against women in recruitment. The team of engineers responsible for developing the staffing software had trained the algorithm to recognize some 50,000 terms in applicants' resumes over the past 10 years. However, the catch was that most of these resumes came from men, which meant that the verbs used were in the masculine form, leading to a disadvantage for women in the recruitment process.

The challenge of overcoming biases, even unconscious biases, is one of the great challenges of being human. But as technology advances, with algorithms taking an increasingly prominent role in personnel selection, there is an opportunity to reduce the influence of bias in the world of work.

Some recruiters working in start-ups (Vgen, Inda or Performa Group as we saw before) that specialize in recruitment using machine learning believe that algorithms can be trained to rule out any bias a priori. However, this is a complex goal, as in some cases algorithms have ended up amplifying human biases rather than eliminating them. For example, the Tay hatbot developed by Microsoft was intended to interact with young American millennials, but it was quickly corrupted by social media users who trained it with racist and xenophobic messages. Some companies, such as Mya Systems, are working to develop chatbots that systematically ignore factors such as race, socioeconomic status, or gender when skimming applicants. However, it is important to note that artificial intelligence

cannot make final decisions about hiring, as these are inevitably influenced by human biases. Although artificial intelligence cannot completely replace human intelligence, it is important to understand that the two are different: AI excels at handling regularities and statistical patterns, while the human brain excels at dealing with exceptions and unexpected situations. However, the use of artificial intelligence in managing candidates for job positions can pose significant risks. Neural networks, for example, base their evaluations on data used for training, which can be steeped in biases and inconsistencies. Therefore, it is essential to be aware of these risks and ensure proper governance in the use of AI in staff recruitment. In addition to considering the parameters used to evaluate candidates, it is important to think about the ethical implications of certain criteria. For example, using voice to estimate reliability could favor specific accents or particular tones of voice, resulting in discrimination. Also, judging a personal physiological attribute, such as voice, may not be relevant to the characteristics of the ideal candidate and raise ethical issues. In addition, words used in questions may have different meanings for different individuals.

Should a robot be aware of the variety of mental representations of each concept and take them into account in candidate evaluations?

There is a need for the AI to be able to rephrase questions if necessary, just as a human recruiter would do to ensure the interlocutor's understanding. An effective strategy could be to supplement test results with other methods, such as one-on-one interviews or group assessments, to obtain more complete information about the candidate's real aptitudes. In this way, AI can be used as an integrative tool to enhance the capabilities of human recruiters. However, it is important not to underestimate the risks associated with the use of AI in recruiting. Without human oversight, AI could provide irrelevant data, ignore human peculiarities, and overlook qualified candidates. Therefore, it is critical that AI in human resources is always used under the supervision of experienced professionals in order to maximize its benefits and minimize potential inefficiencies.

Will the profound change in personnel recruitment affect the privacy and rights of employees?

Companies must ensure the preservation of employee rights, including privacy, during automated decision-making processes and act to correct any errors or discrimination caused by algorithms. From a legal perspective, it is important to consider that social media and online platforms provide a valuable source of information for AI used in recruiting. However, analysis of such data can reveal private and sensitive details that candidates would not have voluntarily shared with companies.

Regulation in this area is fragmented: while the European Union has adopted GDPR to protect privacy, there is a heterogeneous approach in the United States that varies from state to state. This regulatory diversity makes it difficult to understand what data is being collected, with what conditions, and for what purposes. Some U.S. states are passing laws to restrict the use of Big Data by employers in the selection of applicants. In addition, there is protection for protected categories. European and U.S. states have tools to protect vulnerable groups in the world of work. However, the use of machine learning technology raises unresolved questions about inclusiveness. In some cases, AI has been shown to discriminate against vulnerable groups during selection. To address this issue, new neural network models and data management approaches are being developed to balance evaluation systems and reduce bias against protected categories. One must consider that the use of artificial intelligence gives recruiters access to an increasing amount of personal information about candidates, including their private lives and personal characteristics. This can lead to decisions that emphasize negative traits without assessing the overall contribution a person can make to the company. Finding an ethical solution to this problem is complex: on the one hand, limiting the potential of AI might seem economically senseless, but on the other hand, a neural network cannot be allowed to influence people's futures with biased decisions. Regulation could help resolve this ethical dilemma, but legislative fragmentation and the lack of tools to scientifically evaluate the work of artificial intelligence are significant obstacles. The issue of privacy is another major ethical dilemma in the use of AI in human resources. For example, monitoring employees to identify stressed

areas can be useful in improving employee well-being, but it raises concerns about privacy and control over workers. It is essential to establish clear limits on the collection and use of personal data at work, ensuring transparency and accountability to employees. In addition, it is important that workers are informed about how the information collected is used and have an adequate system to challenge AI-based decisions.

Transparency is critical to ensure that decisions made are understandable and acceptable to all stakeholders. In addition, it is important to recognize that AI may not be as unbiased as one might expect. Understanding how algorithms work and sharing decision-making processes with collaborators can help ensure that decisions are balanced and fair.

European legislation and the AI ACT Artificial Intelligence Act proposal

Recently, the European Parliament voted in favor of a draft regulation called the AI Act, which regulates the use of artificial intelligence in the European Union. This regulatory text is an important step forward in establishing clear rules for the use of AI, with a number of safeguards to protect citizens' rights. For example, there are prohibitions on the use of biometric identification systems in public spaces without judicial authorization, as well as on the use of technologies that categorize individuals based on sensitive characteristics such as political or religious beliefs.

Citizens will have the right to file complaints about AI systems and receive explanations of AI-based decisions that affect their rights. This regulation consolidates the EU's position as a global leader in technology regulation and represents a world first in the field of AI. Generative AI models such as OpenAI's ChatGPT and Google's Bard will be allowed to operate, provided their final outputs are clearly labeled as AI-generated.

Personnel selection, will it still value the so-called "human touch?

However, despite the adoption of the european regulation, the question still remains whether the "human touch" will continue to have value in personnel selection. It is likely that the recruitment industry will require practitioners to be fully aware of the AI programs being used, the associated risks, and potentially to take action to ensure that the process is carried out in accordance with the principles of non-discrimination. It will be essential for recruitment professionals to understand how their AI tools work and to closely monitor their performance.

The European Commission has classified artificial intelligence systems used in employment, labour management and access to self-employment as high risk to security and fundamental rights as early as 2021. These systems must be registered in an EU database. One risk inherent in the adoption of AI is to believe that personnel selection can be fully automated without any human interaction. However, the human touch will remain inescapable in this process, as it relies on subtle assessments that can only emerge from a direct relationship between two people. The proposed European Regulation has classified recruitment software as high-risk systems because they can significantly affect people's future careers and livelihoods. It will therefore be necessary for such systems to be subject to strict requirements before they are widely used. Delegating tasks and services to AI in complex areas such as justice and human resources will require ethical guidance. It is critical that digital and technological development be underpinned by human values, governance, and accountability. The relationship between human and digital beings is one of the major challenges the EU is facing, as evidenced by the establishment of the Chair in "Ethics for an Inclusive DigiTale Europe (EDIT)" at the University of Macerata. This is the first academic track in Europe dedicated to the ethics of artificial intelligence.

Conclusions

Artificial intelligences (AIs) can significantly improve the personnel selection process, making it more efficient, fair, and data-driven. By using machine learning algorithms, AIs can quickly analyze large volumes of candidates, evaluating resumes, cover letters, and social profiles with precision and speed impossible for humans. These tools can identify key skills, relevant experiences, and personality traits that best fit specific role requirements, reducing the risk of unconscious biases that can influence human decisions.

Additionally, AIs can enhance operational efficiency by automating repetitive and time-consuming tasks, such as scheduling interviews and managing communications with candidates. They can also be used to provide initial assessments through interactive chatbots and skill tests, ensuring an initial selection based on objective criteria.

Historically, humans have demonstrated that, when acting with common sense and discernment, they can leverage available tools to achieve superior results. From the invention of the wheel to the advent of computing, each innovation has enhanced human capabilities, allowing us to overcome previously insurmountable limits. The key to success lies in the ability to integrate new technologies with wisdom and awareness, maintaining a balance between automation and the human touch. Just as past tools required responsible management, the adoption of AIs in personnel selection processes must be guided by ethical principles and human oversight to ensure that decisions are fair and respectful of candidates' dignity.

AIs also offer advantages in diversity and inclusion, as they can be programmed to eliminate systematic biases historically embedded in selection processes. They can evaluate candidates based solely on skills and qualifications, contributing to a more equitable and diverse work environment. Furthermore, using AI in recruitment can improve the candidate experience by providing quicker and

more personalized feedback and ensuring that human resources can focus on more strategic and value-added aspects, such as talent development and career management.

In conclusion, while AIs represent a powerful tool for improving personnel selection processes, it is essential that their use is balanced with human intuition and supervision. This hybrid approach ensures not only efficiency and precision but also humanity and fairness in decisions, maximizing the benefits of advanced technologies in the context of recruitment and human resource management.

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