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IS ARTIFICIAL INTELLIGENCE (AI)
IN RECRUITMENT GETTING
BETTER?

by

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ABSTRACT

IS ARTIFICIAL INTELLIGENCE (AI) IN RECRUITMENT GETTING BETTER?

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In recent years, the use of artificial intelligence (AI) in the recruitment process has seen a significant increase, with many companies relying on third-party vendors to streamline their efforts. While AI has numerous advantages such as improving efficiency, reducing costs, and identifying the most qualified candidates, there are concerns about algorithmic bias and unfair treatment. Possible causes of these issues include insufficient training, improper technology use, and inadequate parameter specifications. The study examines the sentiment surrounding AI hiring over the last decade and determines whether advancements in technology and a better understanding of AI have made it mature enough to recruit without bias. As a result of a literature review and sentiment analysis, the aim is to provide insight into the overall perception of artificial intelligence in recruitment from the public's perspective, both academically and non-academically. Recruitment is a critical

aspect of organizational success, and with AI increasingly utilized by HR managers and recruitment companies, this research could potentially lead to more inclusive and fair recruitment processes.

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CHAPTER 1

INTRODUCTION

1.1 From Human to Machine: The Rise of AI in Recruitment

Over the last decade, there has been a noteworthy shift in the recruitment approach of companies, with an increasing adoption of artificial intelligence (AI) in the screening process. This technology has gained momentum across various industries, not only among major tech companies like Amazon and Meta but also through third-party vendors employed by many firms. Despite this, the usage of artificial intelligence in recruitment has raised apprehensions regarding likely partiality and prejudice in appointing prospective employees. Hence, the evaluation of AI recruitment research becomes imperative in judging if it is apt for automating a hiring process utilizing this technology and assessing whether AI introduces bias into the hiring process due to inadequate training.

1.2 Why AI in Recruitment Matters: Understanding the Significance

Artificial intelligence possesses the capability to revolutionize the recruitment procedure by enhancing efficiency, reducing expenses and promoting inclusivity, but concerns around algorithmic bias and discrimination highlight the need to carefully assess the benefits and risks of AI adoption in recruitment. The increasing demand for unbiased AI over time suggests that the benefits of AI are beginning to outweigh the risks of biases. Through AI-based global workforce acquisition, HR management strategies can gain a competitive advantage in the workforce and increase diversity, allowing hiring managers to allocate their time and expertise to improving Human Resource Management (HRM)

strategies effectively. Company case studies, such as Amazon and The Co-operative Bank, have shown that using artificial intelligence for recruitment can result in an increase in their reach of candidates and improved candidate satisfaction, a reduction in bias, and increased diversity.

1.3 Defining the Scope: The Purpose of the Study

This study aims to investigate the current state of AI recruitment, including its potential biases and ethical concerns. Through literature review and sentiment analysis, the research examines whether ethical concerns have impacted the popularity of AI in recruitment, or if its efficiency and ability to identify diverse candidate pools have sustained its use. The study seeks to provide insights into the evolution of biases in hiring practices caused by AI and guide readers through opposing viewpoints in existing literature about its implementation in hiring practices. By exploring the trends observed, the study demonstrates that the increasing demand for unbiased AI suggests that the benefits of AI recruitment are beginning to outweigh the risks of biases. The findings of this study have the potential to improve the inclusivity and fairness of recruitment processes with the ethical and unbiased implementation of AI.

CHAPTER 2

LITERATURE REVIEW

2.1 AI in Recruitment: Advantages and Disadvantages

2.1.1 Advantages

According to most advocates of artificial intelligence in the recruitment industry, AI is a revolutionary breakthrough in Human Resource Management (HRM) relating to hiring process efficiency. It is advantageous to use AI in recruitment because it "saves organizations money and efforts" (Fraij et al, 2021), and it leads to process efficiency and qualitative gains for both clients and candidates (Upadhyay & Khandelwal, 2018). Furthermore, recruiting through AI helps hiring professionals overcome challenges of finding "[the] best talent and managing diversity in the workforce" (Upadhyay & Khandelwal, 2018). Third-party AI vendors like HireVue and Fetcher "are committed to fair hiring, because [they] believe every candidate deserves to be treated with respect" (HireVue, n.d.), and ensure that "the profiles reflect diversity in terms of gender and demographics" (Strazzulla, 2022) respectively. A study by Kimberly A. Houser shows that by incorporating AI in employment decisions, companies can mitigate unconscious bias in human decision-making. Additionally, she argues against those who claim "AI in decision-making creates discriminatory results" by pointing out that the reason for such occurrences are humans and not the AI (2019). Lastly, as per an interview-based study in 2019, Ochmann concluded, "the conducted interviews show that an unbiased AI can support in coping with discrimination during the recruiting process" (Ochmann, 2019) caused by

human decision making, hence proving that fairness in recruitment can be achieved using AI.

2.1.2 Disadvantages

On the contrary, there are some who advocate against the use of AI since “even well-intentioned algorithms are not neutral and should be audited for morally and legally unacceptable decisions” (Yarger et al., 2019). A look at the infamous case study about Amazon’s AI hiring tool that learned to prefer male candidates demonstrates how AI, intentionally or unintentionally, can still become biased against gender and minority groups (Dastin, 2022).

In an article by Tolulope Edionwe, it is revealed that “algorithms help propagate inequity” when the training datasets do not represent a population adequately (Edionwe, 2017). It is therefore possible for biases to be embedded in algorithms as a result of “design principles, feature selection, and training data” (Dastin, 2022).

According to an article in Harvard Business Review, “72% of resumes are weeded out before a human ever sees them” however, due to such efficient and extensive processing, it is difficult for a human to check the “weeded out” pile of resumes to ensure no error was made (O’Neil & Mann, 2017). The authors claim that the algorithms reflect the inherent prejudices of the coder “lead[ing] to machine learning mistakes and misinterpretations” which yields an unfavorable outcome for the minorities and those who were not properly represented in the training dataset (O’Neil & Mann, 2017). Lastly, the reliance of hiring managers on AI “systematically benefits some at the expense of others” due to the lack of adequate “regulatory regimes” such as proper training of the models,

results in ineligibility to “identify and address inequities in data-centric hiring systems” which eventually cause more harm by “amplifying existing issues” (Rosenblat et al., 2017).

2.2 The Evolution of AI Hiring: From Hype to Reality

Based on the research conducted, the attitudes of industry experts and literary authors over time have been slowly shifting towards the usage of artificial intelligence (AI) for hiring practices. AI was relatively new when it was introduced, so people were able to identify the risks and weigh them against the benefits. However, as technology has evolved, the risks have become more complex to determine. In earlier literature from 2017 to mid 2018, it was found that most authors were cautious of AI’s usage as it was riddled with biases and resulted in unfair outcomes of the candidates, with little to no way of grasping the solution.

The underlying issue faced by companies using AI for recruitment in the early days, whether using their own AI or outsourced to an AI-vendor, was the non-reliability and ineffectiveness of data (AI results). As a point of reference, the research conducted by Pauline discusses two types of AI tools that could be used by an employer: Facebook’s “lookalike audience” tool and the screening or scoring tool. Both types of AI tools use the “Automated decision-making programs” to function adequately, which requires a huge amount of data for analysis and to “find statistical relationships between variables” (2018). When using predictive analysis from past data or a “source” data, most commonly the AI creates correlations between two variables that are closely related, even when there is no “causal relationship”, this results in “significant errors or biases”. Furthermore, Pauline states, “... if non-causal correlations are used to decide who should be hired, some workers will lose out on jobs for reasons that turn out to be completely arbitrary.” (2018)

In recent literature, from late 2018 to 2022, it was noticed that advancements in AI model processing made it possible to avoid "confirmation bias", which would have occurred if a human recruiter were screening an applicant (Alexandru et al., 2022). Additionally, according to Jora et al., it is evident that “the use of AI is increasingly important for building a diverse workforce”, especially in a world where work from home is the norm. The proper use of AI in the company’s HRM strategy can result in the company potentially accessing labor markets around the world without having to screen through CVs, Resumes, and can even conduct interviews using third-party AI vendors like HireVue and Fetcher. According to Wiles, “it will still take 5 to 10 years for causal AI to reach mainstream adoption”, however, the benefits are expected to be high such as greater “efficiencies” in defining the correlations between two features, “reduced bias in AI systems” through explicit causal links, “more robustness and adaptability” to produce relevant results in such everchanging times and “better explainability” of the cause-and-effect relationships created by AI (2022).

2.3 Challenges and Limitations of AI in Recruitment

Despite the potential benefits of AI in recruitment, there are still many challenges and limitations that need to be addressed. One of the most significant challenges is the ethical and legal implications of AI decision-making. As Rosenblat et al. (2017) suggest, the reliance of hiring managers on AI can systematically benefit some at the expense of others. Inadequate regulatory regimes, such as improper training of models, can lead to the inability to identify and address inequities in data-centric hiring systems, amplifying existing issues (Rosenblat et al., 2017). Moreover, Johansson & Herranen propose several challenges associated with using an AI-based system for job recruitment processes

including safeguarding personal privacy while managing appropriate handling and analysis of workforce analytics whilst simultaneously avoiding "unconscious discrimination" during candidate selection(Johansson & Herranen, 2019).

Lastly, according to Upadhyay and Khandelwal (2018), while AI-based recruitment systems excel in identifying talent, there are certain tasks, such as cultural fit assessment, negotiation, and building rapport, that are better carried out by humans. The inescapable truth is that AI's prowess within the recruitment space has its own limitations, and therefore necessitates human interaction to guarantee a fruitful hiring outcome.

CHAPTER 3

METHODOLOGY

This methodology chapter outlines the research design, data collection and processing, and sentiment analysis used in this study to identify patterns in AI hiring practices by analyzing mainstream media coverage and peer-reviewed academic research. The data was collected from news articles and reliable publishers, and sentiment analysis was performed using the Orange: Data Mining tool, which generated sentiment scores to classify text into positive, negative, or neutral sentiment categories.

3.1 Research Design

The purpose of this study was to analyze mainstream media coverage and peer-reviewed academic research using sentiment analysis to identify patterns in AI hiring practices. The majority of the research material was manually sourced, but Octoparse's Web Scraping function was also used to collect data from news articles and peer-reviewed journals that contained the keyword "AI Hiring" in the title or body. The data collected ranged from 2013 to February 2023, to assess whether sentiment around AI hiring had changed significantly over time. However, the initial search of eight journals yielded no results matching the keyword "AI Hiring", so other reliable publishers were used to find relevant sources.

During the search for news articles and scholarly research, a gradual increase in the number of search results was observed from 2017 to 2019, with 8, 9, and 11 results respectively. However, there was an abrupt increase in the number of search results in

2020, with 24 results, followed by 26 in 2021, and 42 in 2022. Data collection was ceased in February 2023, so it is unclear whether the sudden increase in search results in 2022 will continue to drastically increase in 2023 or level off for the coming years.

Table 3.1: Search Results Trend Overtime

Year	Search Results	Year	Search Results	Year	Search Results
2013	1	2017	8	2020	24
2015	1	2018	9	2021	26
2016	1	2019	11	2022	42

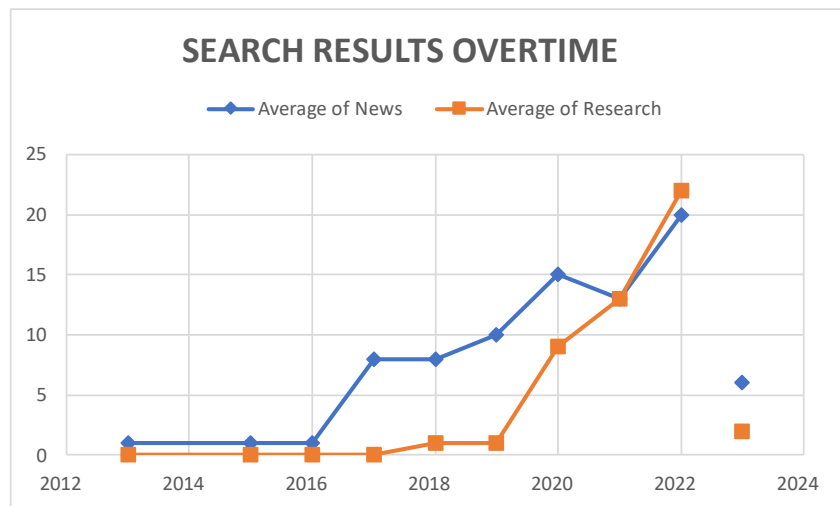


Figure 3.1: Comparison of News and Scholarly Research Search Results Overtime

The preliminary analysis of the data and search results supports the hypothesis that the use of AI in hiring is experiencing a Hype phase, as depicted in the 2021 Gartner Hype Cycle. Prior to 2019, there were very few search results for both mainstream media and scholarly research related to AI hiring. Commencing from the year 2020, there was a noticeable surge in the outcome of web explorations.

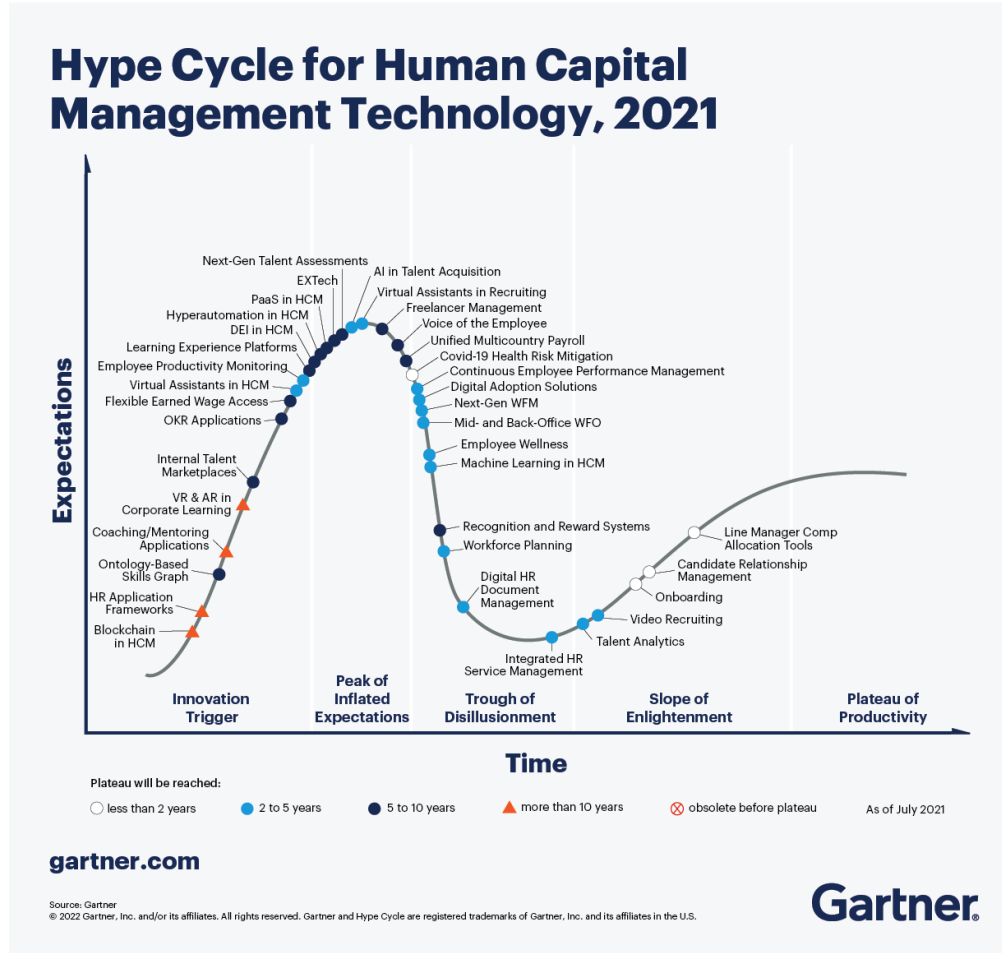


Figure 3.2: Gartner Hype Cycle 2021 – depiction of AI in Talent Acquisition at the Peak of Inflated Expectations

3.2 Data Collection and Processing

To acquire viewpoints from consumers regarding the recruitment practices pertaining to AI, articles that incorporated the term "AI Hiring" within their title or content were investigated on well-known news websites such as CNN, The New York Times, ABC News, NBC News, G Yahoo News and more. Besides this, a search for peer-reviewed journals containing "AI Hiring" in its abstracts or titles was conducted using an Information System's "basket" consisting of eight leading journals. These journals included MIS

Quarterly (MISQ), Journal of Strategic Information Systems (JSIS), and the European Journal of information systems (EJIS). However, there were no relevant reports connecting with the keyword were found within academic publications. Therefore, navigation was directed towards other trustworthy sources such as Elsevier, Springer, Taylor & Francis, Pew Research Center, Nature etc., to obtain suitable research material.

The collected data was stored in an Excel file and then cleaned to retain only relevant columns for sentiment analysis. The following columns were kept: Text, which contained the text to be analyzed; Date, an ordinal numeric value indicating the publication date of each article or research to observe trends over time; Type, a categorical variable used to identify each record as News or Research, and ID, a unique numeric value given to each record for ease of identification. After cleaning, the Excel file was converted to a CSV file for further analysis.

ID	Type	Text	Date
54	News	New technology brings great promise, and as many problem	24-Jul-18
62	News	A growing number of American economists are bullish about	27-Jan-20
131	News	A handful of companies are luring away top researchers, but	1-Nov-17
97	News	A sign hangs in a shop window reading "We're hiring!"Dozer	9-Oct-20
84	News	A trio of blue-chip companies carried the Dow 171 points hig	23-Jan-19
88	News	A version of this article first appeared in the "Reliable Sourc	26-Mar-19
20	Research	AbstractArtificial intelligence (AI) applications are widely en	25-Aug-21
23	Research	AbstractAs the role of Artificial Intelligence (AI) becomes mc	24-Feb-22
25	Research	AbstractIn recent years, artificial intelligence (AI) has revolu	5-Mar-20
32	Research	AbstractOrganizations are making massive investments in a	14-Feb-22
18	Research	AbstractThe use of artificial intelligence (AI) in hiring entails	21-Jun-22
28	Research	AbstractThere is a deluge of AI-assisted decision-making sys	24-Jul-22
40	Research	AbstractThis chapter explores China's catching-up in artifici	10-Dec-21
16	Research	AbstractWhile rapid advances in artificial intelligence (AI) hi	19-Apr-22

Figure 3.3: Data Table Depicting the Cleaned Data for Processing

By collecting data from a variety of sources, including news articles and scholarly research, the aim was to capture a broad range of opinions about AI hiring practices. This

approach enabled the analysis of sentiment across a variety of sources and the identification of any trends or patterns over time. Lastly, the types of data collected allowed for obtaining opinions from both the general public’s viewpoint, reflecting a generic understanding and implication of AI in hiring, and the academicians’ viewpoint, reflecting a deeper understanding and implication of AI in hiring.

3.3 Sentiment Analysis

By employing the Orange Data Mining software, a freely available program that facilitates data analysis and visualization via an intuitive programming interface, an appraisal of the emotional tone in the accumulated datasets was conducted. The cleaned CSV file containing the relevant columns was uploaded to the tool and its pre-built sentiment analysis model was utilized to preprocess the text data, generate features, and train the model for text classification into positive, negative, or neutral sentiment categories.

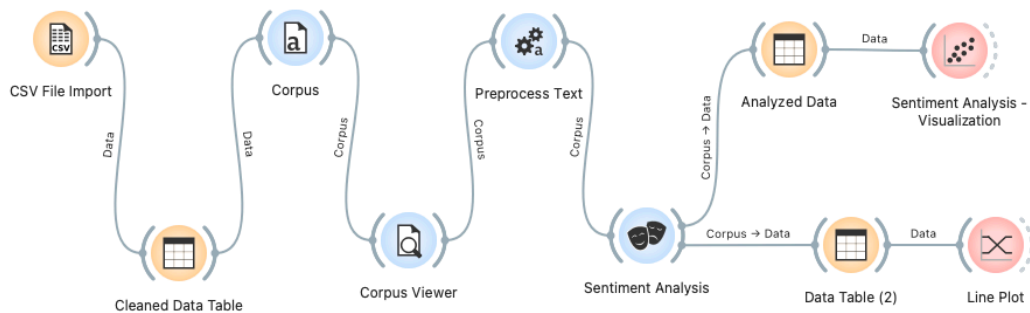


Figure 3.4: Workflow of Orange: Data Mining Tool’s Sentiment Analysis feature for processing cleaned data and analyzing the results

To gauge the disposition of every textual entry, an evaluation was conducted resulting in a spectrum from negative (denoted by -1) to positive (indicated by +1). The computation entailed observing whether affirmative or dismissive terms were employed

and factoring them into account alongside neutral language. The compound score was used to analyze the data and draw conclusions about the sentiment trends regarding AI-based hiring practices in the mainstream media and scholarly research.

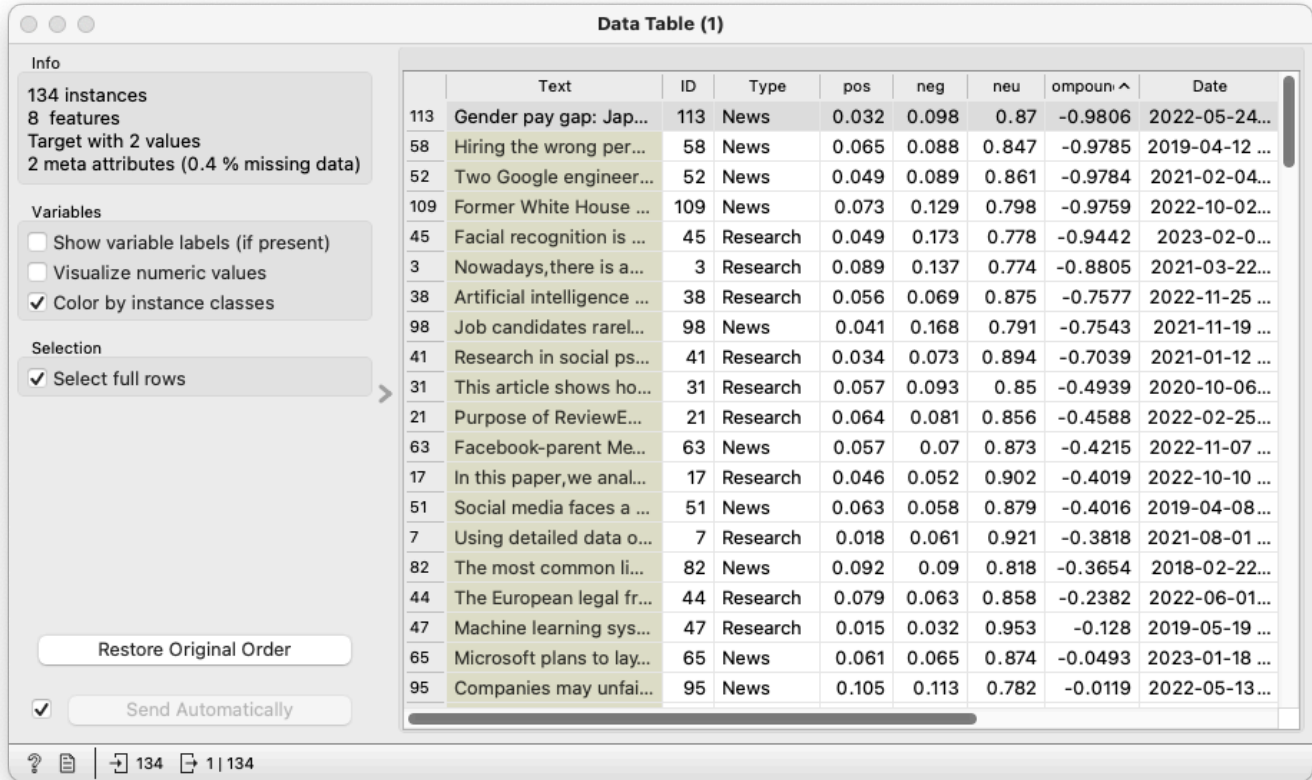


Figure 3.5: Data Table Depicting the Sentiment Analysis Results

in recruitment and its implications. The news articles' word cloud contained broad, vague, and generic terms, while the scholarly research word cloud had a more focused and targeted viewpoint of AI in hiring

4.1.2 Trends in Sentiment Over Time

Initially, the hypothesis was that AI in Hiring is an “emerging technology” and is currently experiencing a great deal of “hype” around its usage. After completing the sentiment analysis, the data was used to plot two separate scatterplots, one for each type of data, to observe the trends of sentiment over time and test the hypothesis by observing the positive and negative attitudes.

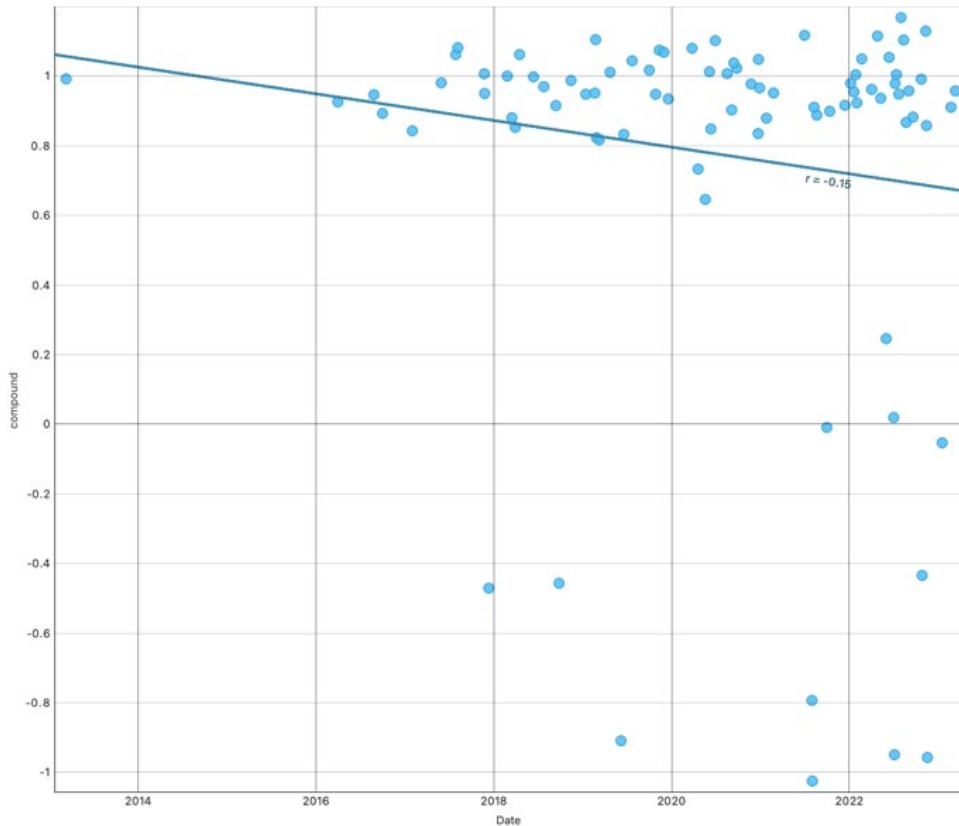


Figure 4.3: News Articles' Sentiment Over Time

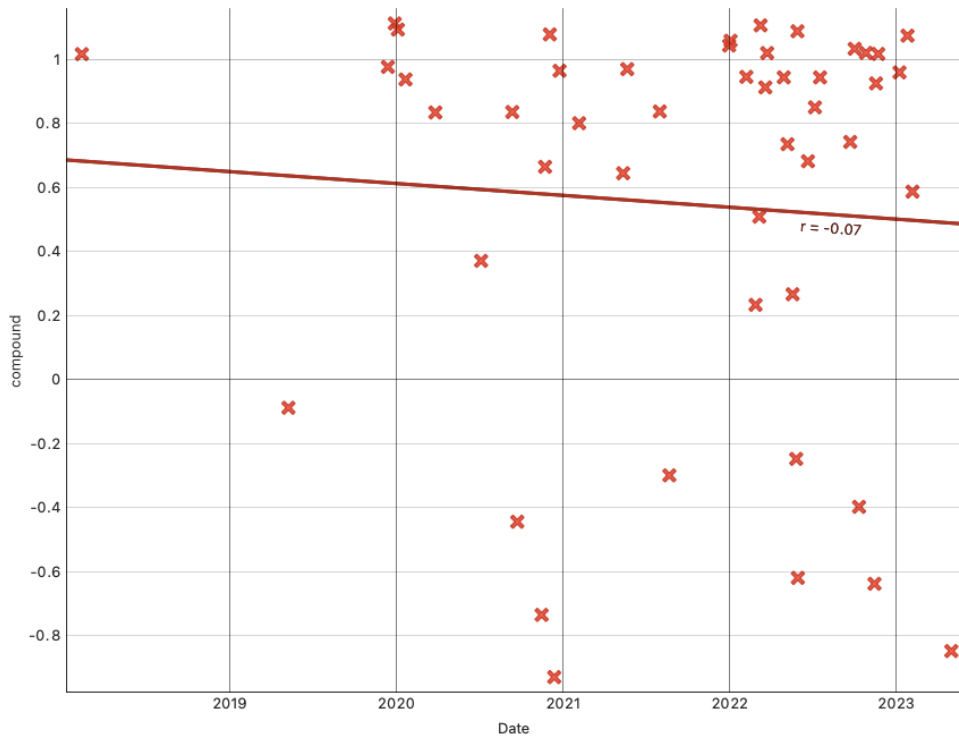


Figure 4.4: Scholarly Research Articles’ Sentiment Over Time

Based on the results of the scatterplots, it can be observed that the data points are predominantly scattered towards the positive sentiment score since the beginning. As knowledge of AI in hiring increases over time, there is a slight decline towards the negative sentiment score. Therefore, this sentiment analysis confirms the initial hypothesis that AI in hiring is currently experiencing a great deal of “hype” around its usage.

4.2 The Gartner Hype Cycle and AI Hiring

A Gartner Hype Cycle is a valuable tool used to represent the maturity, adoption, and social impact of specific technologies by Gartner, a leading consultant and research firm. It utilizes a five-phase model to describe the stages of maturity of emerging technologies (Gartner Hype Cycle Research Methodology | Gartner, n.d.). The five phases of a Gartner Hype Cycle are as follows:

1. Technology Trigger: At this stage, new technologies are introduced, and people get excited about their potential.
2. The Peak of Inflated Expectations: There is a great deal of hype around a technology at this point, and everyone is talking about it, and people are expecting great things from it.
3. Trough of Disillusionment: People begin to realize that technology is not as revolutionary as they thought. Some early adopters may give up on technology at this point.
4. The Slope of Enlightenment: People in this phase begin to identify practical uses for the technology.
5. Plateau of Productivity: By this stage, the technology has become mainstream, it has become fully integrated into society, and it is widely accepted. The benefits are well understood, and the technology has become reliable.

According to the Hype Cycle for Human Capital Management Technology, 2021 (Gartner, 2021b) the use of AI in Hiring and Recruitment practices falls under the “AI in Talent Acquisition” category. As shown in Figure 3.2, this category has not yet reached the second stage of maturity, which is the Peak of Inflated Expectations as of July 2021. Additionally, the graph indicates that AI in Talent Acquisition is expected to reach the final stage, the Plateau of Productivity, within 2 to 5 years.

4.3 Discussion of Findings and Interpretation of Results

According to the sentiment analysis, there is a growing variety of perspectives regarding the utilization of AI in recruitment processes. The data, as illustrated by Figure 4.5, showcases a relatively equal number of optimistic and pessimistic views being expressed on the matter.

pos	neg	neu	compound ^	Type	Date
0.032	0.098	0.87	-0.9806	News	2022-05-24...
0.065	0.088	0.847	-0.9785	News	2019-04-12 ...
0.049	0.089	0.861	-0.9784	News	2021-02-04...
0.073	0.129	0.798	-0.9759	News	2022-10-02 ...
0.049	0.173	0.778	-0.9442	Research	2023-02-08 ...
0.089	0.137	0.774	-0.8805	Research	2021-03-22 ...
0.056	0.069	0.875	-0.7577	Research	2022-11-25 ...
0.041	0.168	0.791	-0.7543	News	2021-11-19 ...
0.034	0.073	0.894	-0.7039	Research	2021-01-12 ...
0.057	0.093	0.85	-0.4939	Research	2020-10-06...
0.064	0.081	0.856	-0.4588	Research	2022-02-25...
0.057	0.07	0.873	-0.4215	News	2022-11-07 ...
0.046	0.052	0.902	-0.4019	Research	2022-10-10 ...
0.063	0.058	0.879	-0.4016	News	2019-04-08...
0.018	0.061	0.921	-0.3818	Research	2021-08-01 ...
0.092	0.09	0.818	-0.3654	News	2018-02-22 ...
0.079	0.063	0.858	-0.2382	Research	2022-06-01 ...
0.015	0.032	0.953	-0.128	Research	2019-05-19 ...
0.061	0.065	0.874	-0.0493	News	2023-01-18 ...
0.105	0.113	0.782	-0.0119	News	2022-05-13 ...
0	0	0	0	News	2021-06-16 ...
0.033	0.026	0.941	0.1406	Research	2022-01-01 ...
0.071	0.071	0.857	0.2617	News	2022-05-12 ...
0.033	0.02	0.947	0.2732	Research	2020-08-14...
0.087	0.083	0.83	0.2795	Research	2022-02-24...
0.087	0.077	0.836	0.4208	Research	2021-11-06 ...
0.049	0.026	0.926	0.4404	Research	2022-11-11 ...
0.075	0.023	0.903	0.6124	Research	2021-10-01 ...
0.053	0.027	0.92	0.7579	Research	2022-09-22...
0.124	0.114	0.762	0.7714	Research	2021-06-25 ...
0.068	0	0.932	0.7717	Research	2022-02-24...
0.119	0.086	0.795	0.7766	Research	2021-01-01 ...
0.069	0.047	0.884	0.8027	News	2021-01-05 ...
0.103	0	0.897	0.8271	News	2020-01-15 ...
0.228	0.078	0.694	0.833	Research	2020-04-16...
0.1	0.044	0.856	0.8378	Research	2020-03-05...
0.098	0.069	0.834	0.838	Research	2021-12-15 ...
0.093	0.082	0.825	0.85	News	2018-08-08 ...
0.186	0.114	0.7	0.8858	Research	2021-11-11 ...
0.148	0.063	0.789	0.8957	Research	2023-01-01 ...
0.064	0.022	0.914	0.9151	Research	2022-07-24...
0.123	0.09	0.787	0.9201	News	2019-05-20 ...
0.084	0.068	0.847	0.9243	News	2017-10-04 ...
0.087	0.079	0.834	0.9304	News	2020-10-09...
0.116	0.016	0.868	0.9313	Research	2022-09-01 ...
0.131	0.062	0.806	0.9313	Research	2022-04-19 ...
0.065	0.029	0.906	0.936	News	2018-04-03...

Figure 4.5: Sentiment Analysis Data Table With Ranging Compound Scores

This shift towards mixed sentiment shows that people are recognizing the ethical and financial complexities involved in using AI in recruitment, including the risk of model training errors and the cost of developing AI technology and hiring professionals knowledgeable about its appropriate usage. Furthermore, people are considering various perspectives, such as the potential advantages of increased efficiency and access to a more diverse candidate pool. This departure from a single viewpoint suggests that people are becoming more thoughtful and informed when evaluating AI in hiring practices.

In addition, people are becoming more reasonable and thoughtful in their evaluation of the technology's potential benefits and drawbacks, moving beyond the initial excitement and hype surrounding the use of AI in recruitment. As companies continue to experiment with AI in recruitment, they will undoubtedly make mistakes and face challenges. Nonetheless, through the method of experimenting and correcting mistakes, a more sophisticated and polished technique for implementing AI in hiring will be achieved gradually. This will ultimately result in an increase in efficiency when it comes to utilizing AI within recruitment processes.

4.4 Limitations and Future Directions

4.4.1 Limitations of the Study

One limitation of this study is the use of a single sentiment analysis tool, Orange: Data Mining, to analyze the online debate surrounding AI in recruitment. While the Orange: Data Mining tool has been widely used in performing various types of sentiment analysis previously, it is possible that other sentiment analysis tools may have produced different results. Additionally, the study only analyzed sentiments extracted from a limited

number of platforms, which may not be representative of the broader population's opinions on AI in recruitment.

An additional constraint pertains to the absence of exploration into job seekers and hiring managers' experiences utilizing AI for recruitment. The exclusion negates an opportunity, which can generate beneficial insights concerning both effectiveness and ethical concerns affiliated with this technology. Additionally, such analysis facilitates distinguishing between exaggerated claims or expectations from reality by scrutinizing the practical implications that arise in real-world applications of these systems during recruitment processes.

4.4.2 Future Research Directions

To overcome the deficiencies of this study, forthcoming research could potentially expand its scope by implementing a more diverse array of sentiment analysis instruments to scrutinize an even broader selection of virtual conversational threads. Moreover, it is plausible for forthcoming research to delve into the encounters of prospects seeking employment and employers who have employed artificial intelligence in recruitment procedures to obtain an all-encompassing awareness of its potency and moral ramification.

Another area for future research could be an investigation of the impact of AI in recruitment on diversity and inclusion. Although recruitment AI has the potential to yield benefits such as enhanced efficiency and broader access to candidates who are more diverse, there exists a possibility that it could reinforce pre-existing biases or even introduce novel ones. A study focused on the impact of AI in recruitment on diversity and inclusion could help identify best practices for using the technology in a way that promotes equity and fairness.

4.5 Practical Implications for HR and Recruitment

Based on the findings of this study, there are practical implications for HR and recruitment professionals who are considering the use of AI in hiring practices. Primarily, it is of utmost importance that institutions possess cognizance on how artificial intelligence functions as a tool to employ individuals and not misconstrue it as an instant remedy. It must be recognized that there are bounds to its efficiency in this regard. Therefore, HR and recruitment professionals should approach the use of AI with a critical and informed perspective, taking into account the limitations and risks associated with the technology.

Subsequently, it would be judicious for entities to allocate resources towards proficiently instructing both their human capital and AI algorithms dedicated to HR procedures. This includes educating professionals on the ethical and legal ramifications of artificial intelligence when utilized during hiring processes, as well as developing comprehensive testing standards that must be met before an algorithm can gain approval for use. Furthermore, businesses ought to maintain a high degree of transparency with prospective employees regarding the implementation of such technology in recruitment practices; this should necessitate expounding upon how data is collected from candidates while rendering the factors essential within decision-making apparent. Ultimately, leveraging AI holds promise concerning streamlined operations across all levels whilst broadening accessibility to more diverse candidate pools - without unfairly discriminating against anyone's individuality or identity traits - provided proper adherence protocols have been instituted beforehand by careful calibration between humans and machines alike operating together seamlessly.

CHAPTER 5

CONCLUSION

The present study has illuminated the surging acceptance of artificial intelligence in recruitment, which has brought to light possible merits and demerits. Recruitment systems leveraging AI have demonstrated their potential for effectiveness by promptly identifying suitable candidates. However, worries persist over algorithmic partiality as well as unjust procedures. Despite these perceived hazards, the discoveries suggest an increasing number of businesses are adopting this approach for candidate selection purposes. Nevertheless, owing to a relatively recent introduction into recruitment processes, there is ample opportunity for growth and advances within this field. As the field develops further towards progress in efficiency with each stride taken through innovation, companies ought to scrutinize ethical ramifications meticulously. They should ensure impartial decision-making mechanisms continue to be implemented effectively throughout such advancements using AI technology in recruiting personnel practices efficiently and without prejudice whatsoever at any stage during operations, endeavoring therein to achieve maximal efficacy with assured prudence.

Moreover, the present use of artificial intelligence in recruiting is located at a peak level for inflated expectations on Gartner's hype cycle. Despite arousing intense enthusiasm among its users, apprehensions about likely biases and ethical concerns related to utilizing AI during recruitment persist. Preliminary innovators have already begun confronting various difficulties while employing this advanced technology. Once AI advances further,

it will likely progress through other phases of Gartner's Hype Cycle. Consequently, widespread adoption of AI could occur along with more sophisticated and practical applications emerging for recruiters' usage.

After careful consideration, it is evident that while AI-based recruitment systems have demonstrated their efficiency and effectiveness in the hiring process, companies must not overlook ethical implications nor risks of algorithmic bias. The relative novelty of utilizing AI for this purpose implies there remains much room for growth with respect to development. Thus, it becomes imperative that enterprises evaluate moral considerations tied to integrating these technologies into recruiting practices by ensuring impartiality through unbiased and equitable procedures. With ongoing advancements in the field of artificial intelligence, the overall expansion will continue as applications become more refined and practical across various industries. This includes HR services, where candidate selection facilitation programs powered by artificial intelligence engines lend further credence to its promising prospects. As the field of artificial intelligence advances, it is rapidly maturing, propelling a proliferation beyond bounds and giving rise to an entirely new era that sets itself apart from traditional norms, which were hitherto unconceived!

REFERENCES

- AIS. (2011, December). Senior Scholars' Basket of Journals. Association of Information Systems (AIS). <https://aisnet.org/page/SeniorScholarBasket>
- Alexandru, B. V., Arabela, B., & Daiana, M. M. (2022). Advantages And Disadvantages of Using Artificial Intelligence In The Recruitment And Selection Processes In The Context Of Covid-19. *Labour Market New Challenges: The COVID-19 Pandemic Context*. https://www.researchgate.net/profile/Victor-Alexandru-Briciu/publication/359628838_Advantages_and_Disadvantages_of_Using_Artificial_Intelligence_in_the_Recruitment_and_Selection_Processes_in_the_Context_of_COVID-19/links/6245d54f21077329f2e491e9/Advantages-and-Disadvantages-of-Using-Artificial-Intelligence-in-the-Recruitment-and-Selection-Processes-in-the-Context-of-COVID-19.pdf#page=3
- Dastin, J. (2022). Amazon Scraps Secret AI Recruiting Tool that Showed Bias against Women *. *Ethics of Data and Analytics*, 296–299. <https://doi.org/10.1201/9781003278290-44>
- Edionwe, T. (2017, May 24). The fight against racist algorithms. *The Outline*. <https://theoutline.com/post/1571/the-fight-against-racist-algorithms?zd=1>
- Gartner. (2021b, July). *Hype Cycle for Human Capital Management Technology, 2021*. [gartner.com. https://emtemp.gcom.cloud/ngw/globalassets/en/articles/images/3-trends-from-the-hype-cycle-for-human-capital-management-0.png](https://emtemp.gcom.cloud/ngw/globalassets/en/articles/images/3-trends-from-the-hype-cycle-for-human-capital-management-0.png)

Gartner Hype Cycle Research Methodology | Gartner. (n.d.). Gartner.

https://www.gartner.com/en/research/methodologies/gartner-hype-cycle?utm_source=google&utm_medium=cpc&utm_campaign=GTR_NA_2022_GTR_CPC_SEM1_BRANDCAMPAINMQ&utm_adgroup=141653137818&utm_term=hype%20cycles&ad=618363632093&matchtype=e&gad=1&gclid=CjwKCAjw6IiiBhAOEiwALNqncWCcHDjzxLouPehoUF8OvwrL2zzkh2bSMovaq_Pmc5prCfa3m42v-hoCcFoQAvD_BwE

HireVue. (n.d.). Why HireVue? Solutions for Hiring At-Scale Online. hirevue.com.

<https://www.hirevue.com/why-hirevue>

JihaD FraiJ, & Várallyai László. (2021). literature Review: Artificial Intelligence Impact on the Recruitment Process. *International Journal of Engineering and Management Sciences*, 6(1), 108–119.

Johansson, J. V., & Herranen, S. (2019). The application of Artificial Intelligence (AI) in Human Resource Management: Current state of AI and its impact on the traditional recruitment process. *JÖNKÖPING UNIVERSITY*. <https://hj.diva-portal.org/smash/get/diva2:1322478/FULLTEXT01.pdf>

Kimberly A. Houser. (2019). Can AI Solve the Diversity Problem in the Tech Industry? Mitigating Noise and Bias in Employment Decision-Making. Social Science Research Network.

O’Neil, C., & Mann, G. (2017, February 22). Hiring Algorithms Are Not Neutral. *Harvard Business Review*. <https://hbr.org/2016/12/hiring-algorithms-are-not-neutral>

- Ochmann, J. (2019, December). Fairness as a Determinant of AI Adoption in Recruiting: An Interview-based Study. AIS Electronic Library (AISeL).
<https://aisel.aisnet.org/digit2019/16/>
- Pauline T. Kim. (2018). Big Data and Artificial Intelligence: New Challenges for Workplace Equality. Social Science Research Network.
https://papers.ssrn.com/sol3/Delivery.cfm/SSRN_ID3296521_code44780.pdf?abstractid=3296521&mirid=1
- Rosenblat, A., Kneese, T., & Boyd, D. (2017). Networked Employment Discrimination. Data & Society Research Institute. <https://doi.org/10.31219/osf.io/dp5aq>
- Strazzulla, P. (2022, October 31). The Top 7 Best AI Recruiting Tools - 2022. Select Software Reviews. <https://www.selectsoftwarereviews.com/buyer-guide/ai-recruiting>
- Upadhyay, A. K., & Khandelwal, K. (2018). Applying artificial intelligence: implications for recruitment. *Strategic HR Review*, 17(5), 255–258.
<https://doi.org/10.1108/shr-07-2018-0051>
- Wiles, J. (2022, September 15). What’s New in Artificial Intelligence from the 2022 Gartner Hype Cycle. Gartner. <https://www.gartner.com/en/articles/what-s-new-in-artificial-intelligence-from-the-2022-gartner-hype-cycle>
- Yarger, L., Cobb Payton, F., & Neupane, B. (2019). Algorithmic equity in the hiring of underrepresented IT job candidates. *Online Information Review*, 44(2), 383–395.
<https://doi.org/10.1108/oir-10-2018-0334>

BIOGRAPHICAL INFORMATION

Usra Asghar Qureshi is a senior undergraduate student earning an Honors Bachelor of Science in Business Analytics at The University of Texas at Arlington. Upon graduation, she is launching her career as an Implementation Analyst at Fidelity Investments Inc in Westlake, TX. She has previously worked at a CPA Firm and a Law Firm which piqued her interest in pursuing a career in Organizational Behavior and Management Consultancy. While completing her course requirements at UT Arlington, she has worked on projects including Data Mining and Feature Extraction along with conducting research related to the use of artificial intelligence (AI) in criminal justice and recruitment processes.

During her two-year journey at UT Arlington, she has held many leadership positions including President of Pakistan Student Association, Chair of Academic Affairs, and a College of Business Senator for Student Government. She has also been a member of multiple organizations on campus including Delta Sigma Pi, the Honors College, and Women in Business. Such interactions and affiliations have helped her get the advantage she needs to set herself apart from her graduating peers.