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Recruitment Process using Federated AI: An Unbiased Approach

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Abstract
Artificial Intelligence is changing almost all aspect of one's life, directly or indirectly. Those who have nothing to do with computer science or its applications, cannot say that they are not at all affected by AI. Employment is something that affects everyone's life. AI is transforming the recruitment process significantly. For recruiters it is a big challenge to hire people who are most suitable for the positions they are being hired. Those being hired not just have to have the required skill set but also should be fit in the organization in all respect. They should be academically, technically and socially fit for the organization. Profile screening of the aspirants is vital in this regard. The most important aspect of such profiling and screening process is that it should be free from all biases and prejudices. AI technologies such as ML and FL are providing ground breaking breakthroughs. FL is especially being playing a significant role in the profiling process. After recruitment also AI is playing a critical role in workforce management. Application of technology is improving efficiency of both the recruiters as well the workforce. This paper presents an overview of AI techniques such as ML and FL on the recruitment process and workforce management. This paper also tries to assess the impact of this un-bias approach on the overall efficiency of the organization as well as of its workforce.
Keywords: *Cylinder block, V8 engine, design, analysis*

1. Introduction
Human Resource mobilization for a firm is as important as mobilizing any other resource. As a matter of fact, hiring high quality manpower is the most important aspect of resource mobilization. However, because of talent and skill shortage, the task of recruiting competent human resource is becoming challenging. Traditional methods of recruitment are no longer effective and has turned out to be cumbersome. In the staffing industry, AI is proving to be a game-changer, bringing innovative solutions to long-standing challenges. By integrating AI in recruitment processes, companies are enhancing their ability to identify top talent, streamline hiring workflows, and reduce biases. AI-powered tools are not only optimizing candidate matching but also providing valuable insights that help HR teams make more informed decisions. The shift from traditional to digital talent acquisition, accelerated by Industry 4.0, has transformed hiring practices. E-recruitment, including web-based job postings and social media hiring, has removed geographical barriers, increasing the volume and diversity of applicants. However, this influx poses challenges in screening candidates efficiently. AI-driven recruitment, such as Unilever's gamified selection process and Hot Topic's AI screening, helps manage scalability and enhances fairness. Despite its benefits, many companies hesitate to adopt AI due to uncertainty about its impact. The effectiveness of AI in hiring depends on whether companies adopt a transactional or relationship-based approach to recruitment. Modern AI Technique such as Federative Learning is a Machine Learning setting where multiple entities (clients) collaborate in solving a ML problem, under the coordination of a central server or service provider. Each client's raw data is stored locally and not exchanged or transferred; instead, focused updates intended for immediate aggregation are used to achieve the learning objectives. Federated AI is an advanced

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approach that enables machine learning models to be trained across decentralized devices or servers while keeping data localized. This method is particularly beneficial in recruitment, as it enhances privacy, security, and efficiency in handling large-scale applicant data. One of the biggest challenge in the conduct of fare recruitment process is handling personal biases. No matter how transparent the hiring processes are and even if the hiring process is making use of technology, human biases and prejudice find its place in the system and no one can claim that these two phenomenon's are not at all contaminating the whole process. [1-4]

2. Literature Review

For any enterprise, their human resource is their biggest and most valuable asset [1], it is something that competitors cannot copy. Other resources such as equipment and business models and policies can be replicated but person to person matching is almost impossible. Perhaps this is why, one of the most famous and successful innovator and entrepreneur, Steve Jobs, Founder and 1st CEO of Apple Inc. went on to say that – "The secret of my success is that we have gone to exceptional lengths to hire the best people in the world". Firms not just need to recruit talented people but also need to give them training from time to time so that they remain skill wise fit and productive for the organization [2]. The pertinent question before the management has always been that how much of talent gap can be filled by training. Offering training at regular intervals though is essential but has its own inherent challenges. First of all, it is expensive and time consuming. It also is a hindrance on the regular course of affairs for the enterprise because the period for which people will be involved on receiving training, their services will be not available for the firm. So it is double overhead for the organization. Therefore, it is always better to recruit people with relevant and modern skill set so that training is not needed f=to keep them updated and productive. The question is where to find such skillful and fit for the firm employees. Talent acquisition requirements can be fulfilled either from the in house people (employees of the enterprise) or it can be pooled from external sources [3]. According to [4], Recruitment focuses on filling immediate job vacancies by hiring the right candidates, while talent acquisition takes a broader, strategic approach. Talent acquisition involves identifying, attracting, and selecting top talent based on long-term business needs. It includes workforce planning, employer branding, candidate relationship management, and performance monitoring to ensure sustainable hiring and workforce development. The policy decision on talent acquisition can be highly driven by either enhancement of talent pool in the organization or by achieving a competitive edge over the other firms in the same domain, this often leads to a bigger decision such as outsourcing people from some agency [5]. AI and especially Federative AI can be the tool to manifest such a critical requirement. Because use of these cutting age technology would definitely improve the overall efficiency of the enterprise, elevates its service delivery capabilities and consolidates organisations image. Besides these, when such sophisticated technologies are applied in recruitment process, the managers of the organization can be involved more in the firm's decision making and monitoring on the implementations of the decisions taken [6]. The authors of [6], have proposed 5 goals of applying technology in the process of talent acquisition, namely – efficiency, service delivery, strategic orientation, manager's empowerment and standardization of the processes. Walford-Wright and Scott-Jackson [7] have conducted a research on how organization can utilize and enhance use of technology to tackle the challenges involved in talent acquisition with the following 3 major objectives,

- Reduce time to hire
- Reduce cost per hire
- Enhance quality of hire

Reducing time to hire refers to minimizing the time taken in the hiring process which can be done by reducing the manual processes to the minimum possible. Processes like resume screening, spotting the talent and filtering the spotted talent can be very easily and efficiently handled by technology such as Federative AI. Reducing cost per hire refers to utilizing internal efficiency and use of AI tools rather than getting the services of HR agencies and any other third party tools for that matter. Enhancing quality of hire can be measured by assessing the

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engagement, retention and performance of the recruited people. Technology contributes to competitive advantage by influencing cost efficiency and differentiation in value chain activities [8]. Competitive advantage is achieved through three generic strategies: cost leadership (minimizing costs to offer lower prices), differentiation (offering unique products or services), and focus (targeting a specific market segment). Integrating technology strategically helps businesses optimize costs, enhance differentiation, and strengthen their market position [9].

3. Federative AI and its application in Recruitment

Recruitment process in any organization is a critical task. It not just affect those who get hired, rather it affects the organization more that hires people. Hiring right people for the right job is crucial. The biggest problem with traditional approach of recruitment is that it is too much dependent on human approach, references given by existing employees and there is sufficient scope of human biases to creep in. besides these the entire process is little too slow as there is no way one can speed up peoples responses. A 2023 CareerPlug report found that candidates get frustrated when the interview process is slow and disorganized. Recruiters must pay close attention to *how* they hire people. The key is using the right technologies to improve the hiring process for recruiters and candidates. (Figure 1)

Figure 1 2024 Candidate Experience Report, Career Plug

The "do more with less" approach is common in talent acquisition (TA), with a majority of HR professionals (57%) working beyond regular capacity, according to a 2023-2024 State of the, Workplace Report. AI can reduce the manual load on recruiters, helping them focus on uniquely human, more strategic activities like conducting standardized interviews and making data-driven decisions. (Figure 2)

4. Advantages of Using AI in Staffing

Figure 2 Advantages of Using AI in Staffing

The application of Federative AI in staffing offers transformative benefits that go beyond traditional recruitment methods. By harnessing advanced algorithms and data-driven insights, AI enhances various aspects of the staffing process, from candidate matching to operational efficiency. AI driven knowledge discovery extracted by mining HR databases yields valuable insights. The knowledge discovered and insights gained enhances the hiring process by selecting most suitable aspirants and reducing the processing time. Following points further elaborates this Enhancing Candidate Matching and Reducing Bias: Federative AI systems analyze enormous datasets to identify patterns and correlations that improve candidate-role matching with high precision. By focusing on objective, data-driven criteria, AI minimizes unconscious prejudices, increasing diversity and inclusivity in employment decisions. Improving Candidate Experience and

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Engagement: Artificial intelligence tools enable tailored communication and automated interactions, keeping candidates informed and involved with the hiring process. Virtual assistants and chatbots can respond and provides answers to candidate questions and helps them with the application process protocols, improving their total experience and satisfaction. A 2023 CareerPlug report found that candidates get frustrated when the interview process is slow and disorganized. Therefor it is quite evident that real time interactions AI enabled responses to aspirants queries and unbiased processing are some of the most valuable benefits that AI enabled recruitment process has on offering. Real-time Data Insights: AI systems provide real-time data insights into recruitment metrics and candidate performance. These insights allow recruiters to make data-driven decisions, optimize their hiring strategies, and quickly adapt to changing requirements or market conditions. Speeding up the Hiring Process and Reducing Costs: By automating time-consuming tasks such as resume screening and interview scheduling, AI accelerates the recruitment process. This reduction in hiring time not only shortens the time to fill positions but also reduces associated costs, allowing companies to achieve more with fewer resources.[4]

5. Top Trends in Staff Augmentation Involving IT Technologies

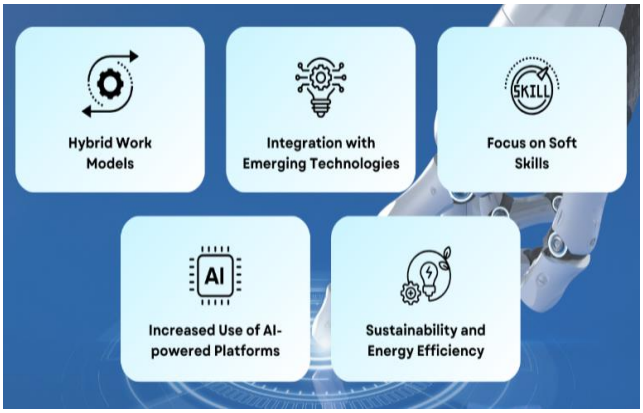

Figure 3 Staff Augmentation Involving IT Technologies

The landscape of staff augmentation is rapidly evolving with the integration of AI technologies, driving significant changes in how organizations manage and deploy their resources. As AI continues to advance, it brings new capabilities that enhance the flexibility, efficiency, and strategic value of augmented staffing solutions. (Figure 3)

5.1. Hybrid work Model

Hybrid work models have becoming more popular by artificial intelligence (AI) tools that facilitate smooth interaction and cooperation between distant and teams on the ground. AI technologies are employed to keep an eye on productivity, provide virtual environment security, they enable adaptable work schedules, enabling companies should continue operating efficiently while granting workers a better work-life balance[5]

5.2. Integration with emerging Technologies

To improve IT solutions, AI is being incorporated more and more with cutting-edge technologies like block-chain and IoT. This combination makes it possible for more secure higher value in staff augmentation initiatives through data management, enhanced system interoperability, and creative applications that tackle difficult business problems.

5.3. Focus on soft skills

As technical skills become more standardized, there is a growing emphasis on assessing and developing soft skills in IT professionals. AI tools are being designed to evaluate communication, leadership, and teamwork abilities, helping organizations build well-rounded teams that can adapt to diverse work environments and client needs.

5.4. Sustainability and Energy Efficiency

Through waste reduction and energy optimization, artificial intelligence is significantly contributing to the advancement of sustainability in IT operations. AI-powered solutions analyze use trends and environmental effects to assist businesses in implementing more environmentally friendly procedures that lower operating expenses and support CSR objectives. [6]

6. Some Corporate Use Cases of Federative AI in the Recruitment Process

6.1. Unilever's Use of AI for Talent Acquisition

Scenario: Unilever, a global consumer goods company, has integrated AI into its recruitment

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process to streamline hiring and enhance candidate experience. The company uses AI powered tools to assess candidates through digital game-based assessments and video interviews. [7]

Outcome: AI helps Unilever identify top talent by analysing candidate's responses and behaviours, improving the quality of hires and speeding up the recruitment process. This approach has reduced bias and increased efficiency, enabling Unilever to handle a large volume of applications effectively.

6.2. IBM's AI-driven Talent Management Scenario

IBM employs its own AI-powered platform, Watson Recruitment, to assist in talent acquisition and management. The platform uses AI to analyse job descriptions and candidate resumes, matching candidates with open positions based on their skills and experiences. [8]

Outcome: IBM's AI-driven approach has improved the precision of candidate matching, resulting in a more effective hiring process and better alignment of skills with job requirements. This has led to increased employee satisfaction and reduced turnover rates.

6.3. LinkedIn's AI for Job Matching Scenario

LinkedIn utilizes AI algorithms to enhance job matching and recruitment processes on its platform. AI analyzes user profiles, job postings, and engagement metrics to provide personalized job recommendations and candidate suggestions.

Outcome: LinkedIn's AI capabilities improve the relevance of job matches for users and help recruiters find suitable candidates more efficiently. This personalized approach enhances user experience and drives higher engagement on the platform.

6.4. Google's AI-enhanced Recruiting Tools

Scenario: Google employs AI tools to streamline its recruitment process, including resume screening and candidate sourcing. The company uses AI to analyze and rank resumes based on relevancy to job descriptions and required qualifications.

Outcome: Google's AI-driven approach enhances the efficiency of resume screening, helping recruiters quickly identify the most qualified candidates and focus on high-priority tasks. This leads to faster hiring cycles and better alignment of talent with job openings. [9]

Conclusion

AI has affected almost every sphere of our life. HR Augmentation and Management is no exception. Use of AI especially Federative AI is transforming the manner in which job is being searched and being offered. It is bringing efficiency in the whole process.it is reducing the operational cost as well as time. It is working like a perfect match maker and providing a win-win situation for both the recruiters as well as the job seekers

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