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AI-powered chatbots in recruitment from Indian HR professionals' perspectives: Qualitative study

1- Mohand Tuffaha* (*Corresponding author)
Faculty of Business and Economics
Birzeit University
E-mail: mtuffaha@birzeit.edu
2- Bharti Pandya
Faculty of Business, Higher Colleges of Technology.
United Arab Emirates.
E-mail: bharti.pandya@hct.ac.ae.
3- M Rosario Perello-Marin
Associate Professor – Universitat Politècnica de València
E-Mail: rperell@upvnet.upv.es.
Facultad de Administracion y Direccion de Empresas (School of Management)

Abstract:

Although artificial intelligence (AI) is broadly extended worldwide, full potential is not being reached in human resource management (HRM) so far. In fact, there is still a gap in analyzing the usefulness and limitations of chatbots in recruitment. This piece of research attempts to cover part of this gap paying particular attention to the Indian market. A qualitative analysis has been undertaken in selected Indian companies. One of the main conclusions drawn from the study is the need for mature chatbots in recruitment. Although chatbot has several features from HR professionals' perspectives, our paper reveals that chatbot has particular limitations in hiring mid-level and senior-level positions. Furthermore, there is a gap between what are Indian IT companies offering for recruiters and what are recruiters know about the latest development of the chatbots. The paper contributes as a food for thought for HR managers and academia by provides an extensive analysis of the usefulness and limitations of chatbots in the recruitment process in India.

Keywords: Artificial intelligence; human resource management; chatbots; recruitment; India.

Introduction:

Many of the changes occurring today, and perhaps much more so in the future, will be driven by emerging technology and increasing access to human resource (HR) data (van den Heuvel & Bondarouk, 2017). Artificial intelligence (AI) plays a singular part in the emerged technological revolution that takes part in our organizations. It does not only transform organization activities, but also the way of organization attracts and assesses potential employees (Flanagan & Walker, 2021; Magistretti et al., 2019). Moreover, it increasingly forms an essential context for the performance analysis and distribution of manpower within workplaces driven by data generated from AI applications (Flanagan & Walker, 2021).

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AI refers to the big umbrella of computer science that allows the performing of human tasks including human intelligence (Zhu et al., 2021), decision making, analysing data, and recognizing the pattern of speak-visual-interpret (Bongard, 2019). AI has reached all organization areas including customer service, finance, production, and human resource management (HRM) (Kitsios & Kamariotou, 2021; Magistretti et al., 2019; Strohmeier & Piazza, 2013; Ziebell et al.,2019). It should be noted that, although AI began as a field of research in the 1950s (Jatobá, et al., 2019), it was not widely extended until the current so-called industrial revolution 4.0, as an evolution of the digital age. This development is affecting many areas of organization, including recruitment processes (Rhemananda et al., 2021). Paying attention to the HRM area, although HR managers are witnessing of growing technology–human interaction (Bondarouk & Ruel, 2009), AI full potential is not being reached in HRM functions, particularly in recruitment (Kshetri, 2021). According to comprehensive research conducted by the Boston Consulting Group, the recruiting function has the most significant influence on firms' revenue growth and profit margins when compared to any other function in the field of HRM (Sullivan, 2012). Indeed, improper hiring decisions can result in not just underperforming employees but also fast employees resignation. High turnover may have a direct impact due to employee replacement costs (e.g., interviews and rehiring fees, training and productivity loss, overtime of other workers), as well as indirect impacts such as poor customer service or a drop in staff morale (CIPD, 2016). Thus, improving organizational recruiting procedures via employing the best candidate has a significant influence on organizational performance (Pessach, et al., 2020).

Recently, organizational's recruiting is linked with the technological revolution, which has triggered major efforts to attract qualified candidates (van Esch et al., 2021). Therefore, technology-human interaction is currently reshaping the functionality of the recruitment process from a necessary HR task to a major strategic concern for companies (Black & van Esch, 2020). The value and efficiency of such technology–human interaction is increasing as a reason for moving the technological revolution from just big data to machine learning, or even beyond, to AI (Nawaz, 2019). AI-enabled chatbots in recruiting systems have evolved from nice to talk about to necessary to utilize (Black & van Esch, 2020).

Chatbots can be used as an AI-based recruitment tool, which is utilised to interact with the candidates to facilitate the recruitment process (Kulkarni & Che, 2019). It is noteworthy that chatbots do not act just as an employees' serving tool but enhance learning by changing the perspective from 'organising' knowledge and expertise of employees to 'servicing' them (Flanagan & Walker, 2021). Minimizing the cost and job displacement will always be a motive for the employer to invest in AI (Upchurch, 2018). However, there are still a lot of barriers to overcome, and the technological singularities of robots and chatbots are still far from imminent (Upchurch, 2018). In fact, despite multiple apparent advantages, surveys showed that CEOs and other senior executives are delaying in embedding AI-powered tools (as it could be chatbots) due to, among other reasons, an ambiguous vision of the usefulness of chatbots in recruiting and the reflection on employee's performance (Bughin et al., 2019).

For this reason, this paper tries to analyse the current situation of chatbots in recruiting and the reflection of this technology on recruitment effectiveness. Paying particular attention to the Indian market. The study is based on data retrieved from interviews with professional experienced recruiters among a group of the largest Indian companies, which are adopting advanced technology in recruiting. This study is one of the first papers analysing the advantages and drawbacks of chatbots' implementation for an AI-powered solution in recruitment at the Indian market, one of the world's most advanced in-tech developments according to the Stanford AI index 2021 (Saxena, 2021). On the

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one hand, it contributes to enhancing AI knowledge in HRM from an academic point of view. On the other hand, it offers background and reference for recruiters and HR professionals to consider the status of chatbots in the recruitment processes.

This study is organized as follows: first, it discusses the practical and theoretical context of AI, recruitment and chatbots. Then, the research methodology and data collection are explained. Next, case studies and interviews are examined and discussed. Finally, research conclusions are summarized.

Literature Review

Artificial intelligence-powered chatbots in recruiting

This section is intended to provide an in-depth look at what is currently known about chatbots in recruitment. For this purpose, a brief review of literature has been carried out to identify relevant academic studies in this area. Furthermore, technical reports on HRM, AI and recruitment have been considered. The main keywords selected and used to cover complete literature include artificial intelligence, human resource, chatbots, employee performance and recruitment.

AI is one of the most ambitious technological developments that is able to mimic humans in terms of thinking and performing tasks that usually require human intelligence (Canhoto & Clear, 2020; Lexcellent, 2019). In the last five years, a growing body of literature has examined AI and its applications. Some of the most studied aspects found in the literature are AI-algorithms, big data and cloud computing. It has been shown that the central role of AI is to correctly interpret external and internal data in order to derive information and knowledge (Frey & Osborne, 2017; Wamba et al., 2021). It should be noted that academics have paid attention to AI within the context of industrial revolution 4.0 due to their uncountable possibilities of automated cognitive tasks (Frey & Osborne, 2017). Optimists believe that thanks to the symbiosis between human and AI; AI will soon help to improve our lives every day (Paschen et al., 2020).

Today, AI is reshaping companies' ways to facilitate workforce planning, which reflects on overall productivity and employee performance. AI has an impact on staffing, talent acquisition, training, performance appraisal and succession planning (Jarrahi, 2018).

The use of AI in the recruiting process has been placed at the heart of this transformation (Black & van Esch, 2020) . One of the most time-consuming activities in HR is the recruiting process. HR professionals invest a lot of time in order to select the right candidate. Traditional recruiting implies physically screening CV, assessing applications, scheduling and conducting interviews (Chapman & Webster, 2003). However, from the lens of digital recruiting 3.0, employers could take advantages of today's technology by adopting AI in recruitment. These advantages would enable recruitment officers to perform recruitment activities more quickly, more efficient and hence reducing costs in the overall process (Vardarlier & Zafer, 2020). Moreover, enrich HR professionals' role in adding strategic value for the organization (Lee & Shin, 2020; Upadhyay & Khandelwal , 2018).

The core advantages of AI in recruitment come from AI's ability to digest data and make decisions at mass and rates far above human capabilities (Black & van Esch, 2021). For instance, information of potential candidates could be extracted from LinkedIn, Facebook, Instagram, Pinterest, and Twitter, then matching this essential information with job requirements (Campbell et al., 2020).

Recruitment is traditionally the first step in building and structuring an organization (Acikgoz, 2019). It involves efforts aimed at attracting bright candidates who meet the organization's requirements

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(Vardarlier & Zafer, 2020). It should be noted that recruitment is also a key factor for organizational performance and corporate strategies since it affects corporate brand and production level (Kim et al., 2011). The recruitment process is divided into three main stages: generating applicants, maintaining applicant status, and influencing job selection (Barber, 1998). Each stage informs others to ensure job description formulation, vacancy advertising, CV screening, and interview candidates (Chapman & Webster, 2003).

The review of a candidate's application and resume in HR processes is called the pre-screening of candidates (Vardarlier & Zafer, 2020). In this stage, based on the analytical data, pre-screening should be performed to assess whether the candidate possesses the necessary competencies for the position, as well as the required skills and experience (Grabara et al., 2016). The primary goal of the pre-screening process is to gather and analyse data for the next phases by determining the candidate's eligibility for the vacant position. The resulting data from the recruiting process is widely considered one of the most time and cost consuming in HR processes (Laumer et al., 2015). Furthermore, the determinant of employee performance in the future (Podgorodnichenko et al., 2020). Therefore, this activity is one of the most likely to be aided by a technological innovation aiming to reduce costs and time while maintaining or even enhancing the quality of data interpretation and conclusion.

Based on this proposition, current AI solutions have been screened, and chatbots are found to be a plausible solution to cover the aforementioned need (Black & van Esch, 2020). Analysing the current AI solutions available in the market, chatbots are nowadays one of the most popular ones (Hill et al., 2015). Chatbots are interactive, virtual agents and computer programs that engage in verbal interactions with humans (Albert, 2019; Nawaz & Gomes, 2019). This technology is a type of human-machine interaction as they are designed to interact with users through the usage of natural language based on AI advancement (Przegalinska et al., 2019). It's worthy for highlighting that, around 80% of customer services in companies are using or plan to use chatbots in the near future as an interactive tool in answering customer inquiries (Ashfaq et al., 2020).

According to the McKinsey Global Institute (2017) report, adopting automation technologies could affect 50% of the world economy, or 1.2 billion employees. Where just four countries (China, India, Japan and the United States) account for over half of these totals (McKinsey, 2017). Therefore, AI-powered applications and services have quietly become widely available in several Indian business sectors (Darwish et al., 2020). Within this context, the Indian government had increased in 2018 the budget of AI, Machine learning and the Internet of things to accelerate the spread of AI applications across various sectors (AIMA, 2018).

HR activities such as recruitment are considered one of these sectors that gain momentum in the Indian market. For instance, the 'people strong' company developed the first Indian HR Chabot "Jinie". It acts as an employee's work assistance. At the same time, 'phenom people' company launched the "PhenomChatbot" that allows candidates looking for jobs (Mohan, 2019). According to a survey conducted in the Indian market in 2017, 65% of employees think technology will improve their job prospects and recruitment experience in the future (PWC, 2018). On the same side, 47% of participants felt that job automation within their sectors was likely in the near future, with partial automation and humans being retained for specific expertise (AIMA, 2018).

Having analyzed the current development of AI in HRM, and specifically how chatbots technology is gaining potential in many countries all over the world, this paper tries to cover the following gap: How AI-powered chatbots are seen in India Market as a plausible tool for being used in HRM context and particularly in recruiting.

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Research methodology and data analysis

Given the lack of deep knowledge in the field where the present study is framed, a qualitative approach has been selected in order to take a more holistic perspective on the analysis (Hesse-Biber, 2010; Patton, 2005; Saunders & Townsend, 2016). It has been seen that, especially in management research, qualitative approach is the most suitable when studying new (or not already studied in-depth) phenomena or testing perceptions and causal mechanisms (Bluhm et al., 2011). In particular, aiming at discovering and better understanding how firms are currently using chatbots in recruitment, case study methodology has been selected since it enables practical examination of new phenomena in a real-life context (Rashid et al., 2019). The methodology used for data collection was expert interviews. This technique was used to record interviewees' ideas, views and attitudes (Ketokivi & Choi, 2014). The selected samples are national Indian companies that have strong roots in the Indian market. To tap in the most relevant information, key informants of each company have been targeted in order to collect and analysis technology's adoption in recruitment. Therefore, senior HR managers were contacted. In case HR manager faced difficulties in providing us with sufficient details of specific knowledge required for this study. He referred us to the in-charge employees in adopting new technologies in recruitment (as it could be: recruitment manager, or recruitment officer). Descriptive information of the interviewees (5 in total) and the interview data is provided in table 1. This table includes anonymized position, title, company activities and chatbot solution that the company was using at the moment of the study. This information enables comparability of the interviewees but without revealing the identity of the interviewees (as it has been required confidentiality).

Table 1: Interviewee data

Num.	Title / Position	Years of experience	Area of experience	Chatbot solution	Company activities	Interview style	Interview duration
1	Senior Technical Recruiter	15	Hiring people across different levels up to the director or senior manager in the IT industry	Planning to adopt in the short term (but not yet)	The company provides Food services and Support services to the business sector, healthcare sector, education sector, sports & leisure sector, and defense sector across more than 45 countries	Online interview (Via Zoom)	26 min.
2	HR Head – B2B E-Commerce	15 plus	Recruiting and data HR analytics	Crash: only for internal purposes	One of the top 60 Global retailer groups with retail outlets all over India	Online interview (Via Zoom)	21 min
3	CEO and ex VP-Head of HR Analytics	20	Analysing structured and unstructured data in HR	Planning to adopt in recruitment	Converting HR Data into organization competitive advantage using advanced analytics and AI solutions	Online interview (Via Zoom)	22 min

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4	Senior HR Manager	14 years	Artificial intelligence, robotics process, automation, chatbots	Planning to adopt in recruiting	Digital recruitment and Data analysis solution	Online interview (Via Zoom)	20 min
5	Global Head of Talent acquisition	17 and half years of experience	AI in talent acquisition	The initial stage in adopting chatbot in recruiting	A multinational company supporting business to grow through using data analytics and data-driven solutions	Online interview (Via Zoom)	24 min

The interview questions were developed based on the pros and cons of recruiting chatbots from Indeed (2020), in order to cover new trends of chatbots in recruitment, moreover, reflect what is going on in the business field in academia (Myers, 2019).

Research has been designed covering two steps, which were conducted in series in order to analyse chatbots in recruitment from a different perspective. These steps started with a pilot study, conducted to find issues and barriers regarding recruiting emerged technology in recruitments. Later, a pilot of the questions was tested with three respondents and amended following their feedback (Kim Y. , 2010). The second step consisted of semi-structured expert online interviews. The interviews were carried out based on interview guideline questions resulting from the previous step (Leech, 2002).

To increase the value of the findings, we adopted Braun and Clarke (2006) phases of thematic analysis in order to identify, analyse and report patterns (themes) within data. Interviews were verbatim transcribed from audio records. The resulting texts were coded. Codes were assigned to relevant information and comments mentioned during the interview (Weston, et al., 2001). Later, codes were reviewed and refined as the analysis progressed (Vaughn & Turner, 2016). The thematic analysis of the interview transcripts was browsed, coded and interpreted by using ATLAS.ti qualitative data analysis software (Paulus & Lester, 2016). After recognizing the main themes along with all the five transcripts, authors used ATLAS.ti to refine the specifics of the overall story and generate clear definitions and names for each theme. Finally, interpreted data, which then served as a vehicle for communicating our findings.

Case findings and discussion

The following subsections present the most relevant findings of this piece of research grouped thematically. It is worth noting from the outset that the implementation of AI-powered chatbots in recruitment in the Indian market is still in an emerging stage, and what the recruiter (user) is expecting from chatbots is not reflecting the real potential of chatbots within this context. However, it can be noted the growth in the accuracy of AI which makes chatbots more efficient and suitable in dealing with sophisticated incidents.

Chatbots in HR functions

According to interview data, it could be noticed that Indian HRM experts have separated between the potential advantages of chatbots from HR professional's perspective and candidate's perspective. These different views and perspectives could be attributed to different adoption levels of chatbots in HRM (Moeuf, et al., 2020). As far as the relevant features of chatbots from an HR professional's

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perspective are concerned (Pandya & Al Janahi, 2021), it can be pointed out, the advantages of chatbots are spinning between recruitment, selection and employee onboarding.

> *"If you considered chatbot for HR. It will help you in doing your onboarding, doing your recruitment, and also your employee engagement."*

> *"I've been recommending chatbots for the screening process, scheduling interviews, and onboarding. Furthermore, it could also be used for engagement and talent acquisition".*

Interviewees have agreed about the effectiveness of chatbots in recruitment and selection (Budhwar et al., 2022). As they have the ability to nominate candidates much faster and more efficiently than humans, taking into account the qualifications, competencies and skills of each individual which may assist in maintaining the organization's strategic objectives.

> *"Chatbots can help in recruitment and selection through calling out data from social platforms like LinkedIn and Facebook to give insightful information about candidates".*

Among the most common features of chatbots identified from the perspective of the HR professionals, it could be highlighted their usefulness in employees' development:

> "*They are very useful in assessing and understanding at individual level. Furthermore, they are able to identify gaps in employees' profiles and then to look for educational references for each individual*".

> "*Chatbot could use learning management system (LMS), in order to track and analyse the knowledge progress of individuals*".

Moreover, "*Chatbots can offer quick answers for the employees such as, how to apply for short leave or what is their leave balance or answering any other frequent inquiries to HR help desk*".

In addition, chatbots "*can completely digitalize not only onboarding process, but also exit interviews or resignation. To illustrate, a chatbot could interview a resigned employee to identify the factors behind the resignation. It could use this information to further improve employee satisfaction in the company*".

Regarding features from the candidate's perspective, they all agreed that chatbots meaningfully improve candidates' experiences and give them much more personal and humane attention and support (Kshetri, 2021).

> "*Through help at the application stage and application status from a candidate perspective*".

In other words, "*by using chatbots; candidates applying to the firm would feel as, they were the only one applying to this position in that firm and they were getting positive and interactive communication with the potential employer*". To illustrate, chatbots are able to "receive resumes and quickly skim it, screen it, see whether it is relevant or not, and in the case that it wouldn't be good enough, they are able to write back to candidates and explain them the status of their applications". Even more, some chatbots can guide candidates to the most suitable vacant position (Haugeland et al., 2022), for instance, "*if you land on a website, a popup will come and the chatbot would ask you: how could I help you? And then, different options for vacant positions in the company would appear. Chatbots could whether guide the candidate through the website offering vacant positions matching their qualifications, or in the case that the candidates were not satisfied, the chatbots will direct him to contact center*". "*Chatbots could ask some basic questions so that candidates would apply to a*

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relevant job and even used across functional ability, they could also link candidates with more than one company having a similar vacant position".

Recruitment activities powered by Chatbots

The quality and accuracy of data is a significant issue for our Indian HR experts (Silva & Alahakoon, 2022). The majority of interviewees believed that data generated from chatbots is positively influencing recruitment activities. In fact, chatbots are "interactive search engines with very customize functions".

> "*They are able to reach out the targeted candidates by going into the internet and find out these active candidates*".

> "*Suppose the job has been raised in your company's website. The moment a job seeker will apply to that particular job post, the chatbot will open a window and it will start asking: What is your total experience? What is your location? What kind of salary are you expecting, and what are your skills?. The chatbot will automatically decide whether the candidate fits with the vacant position or not. If yes, it will automatically route the candidate to the interview centre*".

Chatbots considerably simplify the job of the recruiter (Wang et al., 2022). The process followed by chatbots start with "*the understanding of what is written on the job description". Then, "they may start reading resumes and confirming whether the candidate might be suitable for the vacant position or not*". And finally, "*they could rate CVs based on the skills required and showed by the candidate*". The result and data generated from chatbots are more accurate and faster than in-charge employees.

> "*Recruiter can set a particular alarm that goes off with any CV covering 70% of the job description; this CV would pass to the screening stage. Then chatbots could start with their work, as it could be: Hi, we're looking at four to six years of experience. Are you 4 to 6 years' experience in […]? Yes, OK, have you worked on [….]? Yes, have you worked on […] as have you worked on [….]? Yes".*

> *"Then chatbots can do the screening. So chatbots could nominate 10 to15 people out of 100 or 300 without human intervention. Then I will be engaged with 10 instead of 300*".

Another feature drawn from this study is related to the ability of chatbots to conduct sentimental analysis.

> "*When a candidate is asked a question, a chatbot will respond. But if the candidate comes with something that is not relevant, a chatbot will provide the candidate with a new window helping the candidate to focus on what is looked for*".

In this vein, most of our interviewees argue that "chatbots lower down the workload of HR in recruitment from 100% to 50%". Furthermore, increase the productivity of the HR department allowing them to run deeper and more strategic tasks (Majumder & Mondal, 2021).

Advantages of chatbots in recruitment from the Indian perspective

According to the results of this study, companies adopting chatbots in recruitment could acquire three main advantages. Firstly, saving time/cost whilst minimizing wasting efforts. Particularly, these two pillars have a vital role in expanding the strategic functions of recruiters.

> "*If you are able to save the time of a recruiter; the saved time will be used more effectively and strategically to other activities that could support strategical functions of HRM*".

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This argument is based on the ability of chatbots in sourcing and screening.

> "*So, once the profile has been sourced from different channels, a chatbot could help in initial screening". "This is the power that we're talking about, sourcing and screening of {…} number of applications within seconds or minutes*".

Along similar lines, interviewees also reported that chatbot plays a role in conserving time and effort by digitalising the entire onboarding through "*verifying individual background, introducing company's handbook and explaining the channels of communications within the company without human intervention*". Therefore, chatbots are very helpful also in personalizing onboarding with certain flexibilities on time, location, etc., based on the employee's desire. Therefore, the saved time from mentioned activities could expand the recruiter's role in supporting HRM in strategy-oriented functions (Votto et al., 2021).

Another advantage pointed out by interviewees was related to the fact that chatbot has a vital role in minimizing or ideally eliminating bias within the recruitment process. Discrimination against gender, colour and ethnicity in the recruitment process has been subject to debate in recruitment ethics (Yarger et al., 2020). Adopting chatbots in recruitment could eliminate these concerns by automatically sorting candidates according to the job description.

> "*Chatbots are new technologies around machine learning and artificial intelligence that prevent biases in the job description which should lead to avoiding biases in screening and selecting*".

The third advantage referred to the influence of chatbots on candidate's satisfaction. Chatbots can assist recruiters by answering applicant's questions, such as application status or basic inquiries about the business culture, practices and career responsibilities. This fact not only saves a tremendous amount of time but also leads to a positive candidate experience.

> "*The role of chatbot could increase candidate's satisfaction by around 20% to 30% which could be reflected on company's reputation*".

> "*It's a completely experienced product from the organization point of view; it really impacts your brand and reputation in candidates minds as well*".

Moreover, interviewees also brought to light the advanced role of chatbots in replacing recruiters at the early stage of the interview. Chatbots in the first stage of the interview could analyze and study the logic and body language of candidates by asking general questions (Majumder & Mondal, 2021). This feature enhances the flexibility and minimize time restrictions of recruiters.

> "*Once a profile gets screened or shortlisted, the auto interview can also be aligned using chatbots. In that case, an auto mailer will go to stakeholders (stating that, this is the profile we are looking for, and we are looking for availability of yours to schedule an interview). Once the interview gets scheduled, a chatbot can help you with multiple levels of follow-ups*".

> "*Suppose tomorrow at 3:00 o'clock your interview is aligned, and something happens, and your manager is not available. So, a candidate with a certain set of questions could still be interviewed by a chatbot. That interview would be recorded and it would be shared to the stakeholder's mail ID. So, after two days, three days or a week, depending on the manager's availability, he/she could review that interview and give his/her remarks. So, candidates did not wait for managers availability*".

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Chatbot limitation in recruitment activities

Despite the potential advantages of chatbots in recruiting, all interviewees have expressed concerns about the limitations of this technology. These barriers (listed in Table 2) may minimize chatbots' willingness to achieve the desired goals or exploit all their potential.

Table 2: Chatbots limitation in recruitment

No	List of main limitations
1	Chatbots are more effective in recruiting low managerial level employees.
2	Chatbots are unable to handle intangible skills of candidates.
3	Chatbots are unable to handle a qualitative conversation.
4	Disclose sensitive organization's data to candidates due to weak NLP.
5	Mistakes in extracting and understanding all information in CV's.

One of the biggest concerns agreed by interviewees, are related to the scope and the ground of chatbots in recruiting. Chatbots could interact with all vacant positions within the organization, no matter the position, from managers to receptionists. However, chatbots are facing challenges in analysing data extracted from candidates for senior positions. Based on the fact that, managerial positions are depending on tangible and intangible skills.

> "*I believed that chatbot applications could really work a lot better for maybe middle to bottom of the pyramid of the organization. But when it comes to the upper half of the pyramid, it would continue to be a lot more human-driven. Because there are more about network or leadership*".

> "*Recruiting for high senior positions, assessed based on the leadership and managerial (intangible) skills of candidates; this is difficult to implement by chatbots*".

> "*Chatbot can only replace the transactional query. It can't really have a qualitative conversation. Especially hiring chatbot is not helpful if you are talking about a mid-level and senior-level*".

Another concern is related to interpreting data. For example, chatbots have difficulties in extracting and understanding all information in CV's correctly, which reflects on candidate assessment.

> "*There could be a situation that it may roll out extremely good candidates because the CV is not made in the way that chatbot is able to read it. Or it can also shortlist terrible candidates*".

These incidents are related to, on the one hand, the weak algorithm of natural language processing (NLP) in chatbots, which may disrupt communication between users (Rhim et al., 2022); as interviewees reported:

> "*Chatbot couldn't be developed without NLP algorithm, because it's a key for successful communication*".

On the other hand, fuzzy words and grammatical mistakes may confuse chatbots to interpret candidate's inquiries correctly (Schildknecht et al., 2018).

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On these grounds, the authors raised a question: If chatbots could replace all recruitment activities? All interviewees had shared the same opinion that chatbots need a large amount of data and still far away from replacing all employee's activities. Limited training data results in poor performance (Rhim et al., 2022), which may further discourage the use of chatbots as a recruiter. Below are some citations for interviews respondents:

> "*Chatbot replaces recruiter, definitely no. There are elements that only human can do them. For instance, understanding the person's ability under pressure; analyzing the teamwork skills of a group of candidates; understanding the cultural background of the candidates. So Chatbots cannot do that*".

> "*No, I don't see that possibility at all, because chatbots are still unable to analysis IQ and soft skills*".

Overall, we are still in the stage of chatbots-recruiter correlation because "*the technology hasn't really evolved to that level where you would be able to mimic completely what recruiter do or think*".

AI-powered chatbots in India

All interviewees had declared the need for more mature chatbots in recruitment as the fact that no chatbots perform all recruitment processes in the Indian market.

> "C*hatbots for full recruitment activities are not available as of known in India*".

> "Pure Indian chatbots for recruiting are not available, however some global companies developed their own chatbots such as *Mya, Olivia, Jobpal. These are examples of advanced chatbots that built based on NLP and machine learning*".

This claim from our interviewees forced authors to analyize the Indian commercial brands of chatbots in HR. The motivator for this investigation is Stanford University's claim that India is ranked as the top developed AI country according to the Global Vibrancy Ranking 2020 (Saxena, 2021).

Investigation reveals that, many IT Indian companies developed several HR Chatbots to facilitate the functions of the HR department in several areas and not limited to recruitment (Mohan, 2019). See table 3.

Table 3: Indian developer for HR Chatbots

No	Company Name	Chatbots Name	Chatbots functions
1	People Strong	Jinie	Employees receive personal work aid and support with job-related issues such as applying for leaves and addressing corporate policy inquiries.
2	Phenom	Phenom Chatbot	Allows individuals to search for opportunities, ask questions about registered firms, and obtain customized job suggestions
3	Param.ai	Parami AI	Automate candidate screening, shorten the time it takes to fill jobs, and provide a better candidate journey
4	Mettl	Mettl Dark Personality Inventory	Skill assessment tools, proctoring, and online assessment software

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5	Talview	Talview Behavioral Insights	End-to-end, AI-powered hiring and proctoring solution
6	Tech Mahindra	UVO chatbots	AI-powered technology that aids in the selection of the best candidate based on the job description

Based on the above details, Indian HR consultants are not following the latest development of local AI-powered chatbots in recruitment. As a result, the competitive advantages of Indian companies may be affected by losing opportunities in attracting high skilled candidates.

Chatbot's future in recruitment activities

It becomes obvious from our interviews that although chatbots in recruitment were perceived as a source of debate, it was challenging for the HR experts in our Indian case companies to ignore the bright future of chatbots in recruitment; as one interviewee said:

> "*To be very honest, the future is already very bright for these chatbots. Chatbots always come as a supporting hand to us. If I work alone, I will be productive but with the help of a chatbot I will be double productive at the end of the day*".

Most of our interviewees admitted that HR professionals should rethink about the interaction style of chatbots. In other words, voicebot will probably replace text conversation dialogue.

> *"We are currently don't know exactly what is the future of the chatbots. In my personal opinion, chatbot will not remain as a chatbot but may move to a voicebot. Is something that I see from a longer perspective".*

> "*I am assuming that, these voices assistants and chatbots will come with fewer restrictions, high productivity and they will be able to get a bigger portion of the recruiter in the nearest future*"

According to our interviewees, the future of chatbots depends on the development of two factors. Firstly, the development in data analysis and NLP. This factor is in parallel with Rahman et al. (2017) argument, that getting NLP is one aspect of designing and developing chatbots while Machine Learning is another aspect of chatbot design and development.

> "*Chatbots coupled with the development data analytics and NLP in solving the problems of recruiters in terms of time and sourcing*".

Secondly, the ability of chatbots in dealing with unstructured conversation;

> "*The future of chatbots is linked to the ability to drive information from unstructured conversation*".

> "The future of chatbot is linked with the *moment you ask a question not related to previous one, even in the different format; but in the end, you get answers for diverse questions,*".

Based on that, interviewees tried to predict some future functions for chatbot/voicebot in recruitment. For instance:

> "*Incoming years there will be plenty of voice assistants, avatar, who will do onboarding in a couple of hours. We are actually looking forward to those multitasker chatbots in future*".

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> "*Future chatbots should integrate cognitive computing with multitasking problem solving in order to balance between job search versus job recommendation*".

> "*In the future, chatbot comes up and says: We just had one candidate who just logged into the system, and he is being recommended by our job search algorithm; he got 70% out of it. I have done an assessment and he or she fits the requirements. So, the recruiter could spend additional time talking to this candidate and give him the offer at the end of the day*".

This technology has been successful in simplifying the work of HR professionals and also in collecting information related to candidates. But, still not clear the future of chatbots especially regarding the involvement level and the scope of their implementation in recruitment.

Conclusion

This piece of research has been designed to explore the usefulness and limitations of chatbots in the recruitment process in India. This topic has been selected since it potentially represents a novel paradigm in how recruiters may interact and understand chatbots in the future. It has been shown that, although the first investigation about AI-powered chatbots has emerged in the last few years, there is a clear lack of empirical investigations into the use of AI-Powered chatbots from an HR professional's perspective, specifically in the Indian market (Srivastava, 2018). The findings of this study show several insights and practical implications. One of the main conclusions drawn from the study is the need for mature chatbots in recruitment, since the significant positive effects of recruitment on employee performance. This result is matching with Pahos and Galanaki (2019) argument that organizations are invited to invest in recruitment to maintain the performance and efficiency of employees.

Furthermore, as it has been seen that, there is a gap between what are Indian IT companies offering for recruiters and what are recruiters know about the latest development of the chatbots in the Indian market.

In terms of practical applications, based on the results of this study, the current approach of chatbots in recruitment in India could be mapped as shown in Figure 1. These contributions could enhance the awareness of CEOs and stakeholders in terms of adopting chatbots in recruitin

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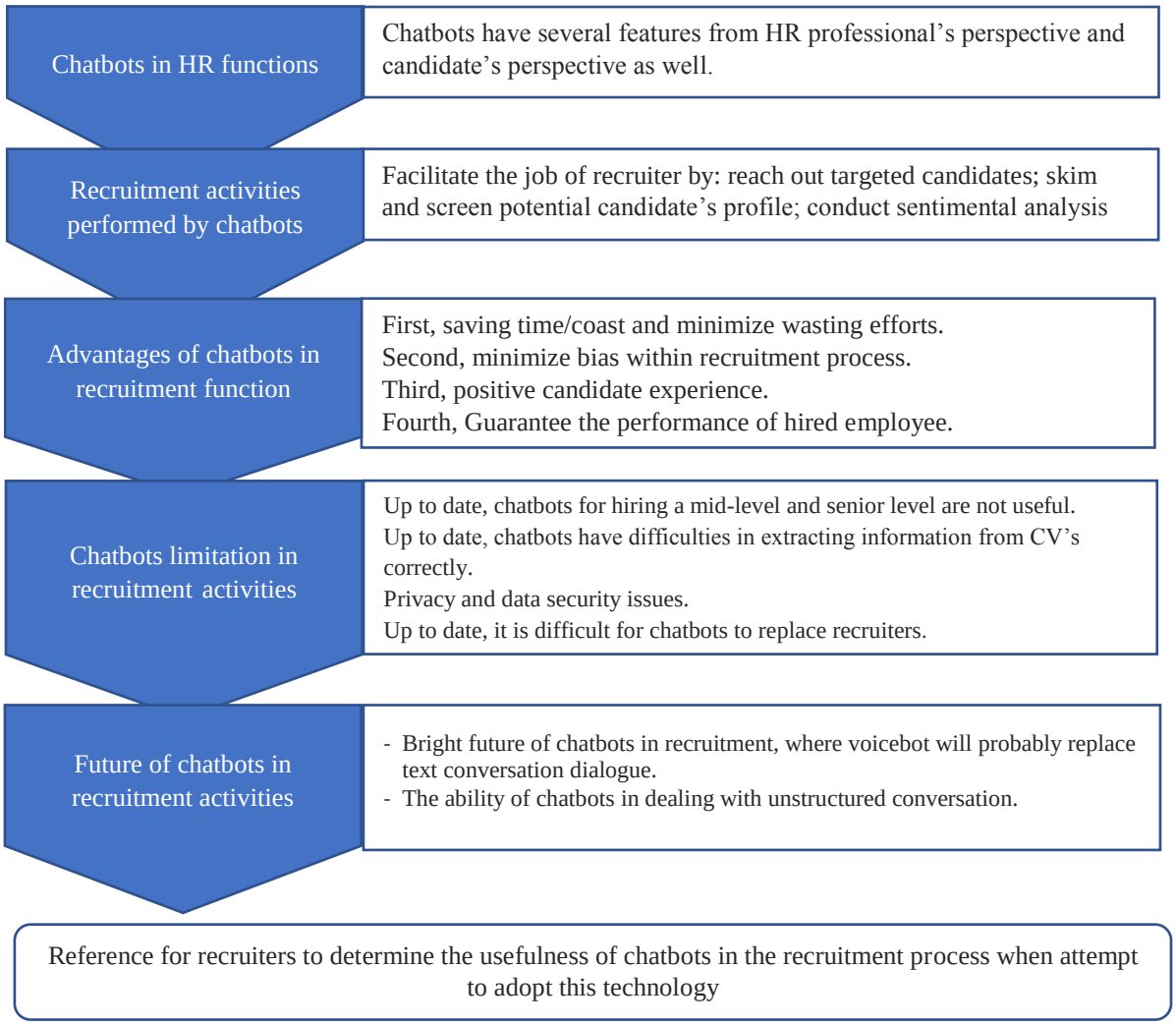
Figure 1: current approach of chatbots in recruitment from Indian HR perspective



The present study is subject to limitations. Due to the novelty of the research, a qualitative study has been performed and the sample of interviewees is relativity small compared to a huge market like India. Therefore, conducting a quantitative study with a larger sample could be an interesting challenge for future investigations. Especially, when scholars differentiate between the role of chatbots in recruitment based on different business areas like logistics or marketing.

Moreover, this study doesn't consider several geographical regions and languages in India; it is essential to note that there are 255 official languages all over India (Javaid, 2021). Therefore, replicating the study in specific regions or languages, instead of English, may lead to different results.

Due to the fact that chatbots in recruitment are still an emerging technology, identifying the transforming role of AI-powered chatbots on the part of HRM functions such as: staffing, training and development and motivation; would be another possible line for future research.

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