Recruitment Chatbots Design and Dialog: HCAI Perspective

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Abstract

This research aims to explore the integration of Human-Centered Artificial Intelligence (HCAI) into recruitment processes, with a specific focus on personalized dialog structure. The goal is to address the existing gap in designing recruitment chatbots and their personalized dialog structure, while examining their potential impact on the User experience (UX) for job seekers and recruiters. Through qualitative methods, a comprehensive HCAI framework will be developed to provide practical recommendations for companies incorporating chatbots in recruitment, with the intention of enhancing the design, usability, and effectiveness of these systems. The findings from this research will contribute to the advancement of recruitment chatbot design and the overall improvement of the recruitment experience for job seekers and recruiters.

1. Context and Motivation

Recruitment practices have undergone significant transformations with the increasing integration of AI systems, and data-driven tools[1]. However, many of these technologies have been developed and deployed without adequately considering human factors, resulting in a lack of user-centered perspective [2]. This gap hinders their ability to address crucial aspects such as job seekers' experience, recruiters' needs, and trust. To overcome these challenges, there is a need for a Human-Centered AI (HCAI) approach that focuses on developing intelligent systems aligned with human objectives and usability [3, 4].

In the field of recruitment, researchers have recognized the importance of applying HCAI principles to create intelligent systems that prioritize both technical proficiency and the user experience [5, 6]. This research aims to integrate HCAI into recruitment practices, with a focus on personalized dialog structure for different user groups for best user experience [7]. By utilizing qualitative methods, a comprehensive framework intends to be developed to provide practical recommendations for organizations seeking to incorporate chatbots into their recruitment processes. The concept of personalized dialog structure involves designing and implementing chatbots that customize their conversational style, tone, and content to meet the unique needs and expectations of an individual [7, 8]. This approach enhances the user experience (UX) by tailoring the chatbot's conversational style, tone, and content to meet the

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specific needs and expectations of different stakeholders. It allows for personalized and engaging interactions, resulting in improved usability and effectiveness of recruitment chatbots.

In the context of recruitment, chatbots serve as virtual assistants that streamline various aspects of the hiring process [9]. They can assist job seekers by providing information about job vacancies, conducting initial screenings, scheduling interviews, and answering frequently asked questions. For recruiters, chatbots offer time-saving capabilities, improved efficiency in screening and shortlisting candidates, and enhanced data-driven decision-making [10].

Our research underscores the importance of considering human factors in AI recruitment and the need to optimize their effectiveness [11]. It highlights the significance of achieving a balance between system autonomy and user control. Preliminary evidence and guidelines will realize the benefits of AI recruitment while mitigating potential issues such as bias, lack of nuance, and poor job seeker experience. Furthermore, our work intends to address the research gaps related to the design of personalized dialog structure that resonates with the preferences and expectations of job seekers and recruiters [10]. By understanding the impact of personalized dialog structure on the overall user experience, the research seeks to develop chatbots that effectively engage with stakeholders and foster positive interactions. Through the findings of this study, valuable insights and practical recommendations will be provided to enhance the design, usability, and effectiveness of chatbots in the recruitment context. By integrating dialogue structure design, personas analysis, and human-centered design principles, this research aims to fill the gap between AI recruitment and human factors. The goal is to leverage AI technologies to enhance the recruitment experience, promoting efficiency, effectiveness, and a positive user experience.

2. Related Work

This section explores the research on the evolving field of Human-Centered-Artificial Intelligence (HCAI), which refers to the changing nature of human interactions with computer systems as automation technology becomes more advanced. It also discusses recent studies on the use of HCAI recruitment chatbots and highlights gaps in the existing research, which will be addressed in the doctoral research.

From HCI to HCAI. The fields of human-computer interaction (HCI) and human-centered AI (HCAI) share a vision of technology enhancing human well-being [12]. HCI designs interfaces seamlessly to support people while HCAI develops AI amplifying human capabilities [13]. Research and applications in this area are not new, promoted under labels like human-AI/machine teaming [14, 15], human-AI interaction [16, 17], human-agent interaction [14] and human-autonomous system interaction [15]. Although with distinct focuses, these look at how people interact with the "machines" in AI systems (i.e., intelligent agents, AI agents, autonomous systems) powered by AI technology.

HCAI offers a profound understanding of human cognition, values, and experiences [16]. It cultivates AI as a tool for human meaning, purpose, and fulfilment rather than just metrics. HCAI also balances AI and human control, enabling their symbiosis and empowering rather than governing humans. By incorporating HCAI, the scope of human-computer interaction (HCI) expands to encompass AI, emphasizing the importance of user experience.[17].

HCAI Chatbots in Recruitment. Recruitment chatbots have been appreciated for their

ability to streamline the hiring process, improve candidate screening, and enhance the candidate experience [9, 10, 22]. However, there is a lack of research on these tools' user experience and usability, particularly from a job-seeker perspective.

While chatbots have the potential to provide a more efficient and personalized recruitment experience, it is crucial to understand how users perceive and interact with them [11]. For instance, more research is needed to investigate job seeker's attitude toward chatbots, their expectations, and their satisfaction with the overall experience. This information can help developers design usable chatbots that facilitate the recruitment process and work in tandem with human recruiters [11]. This can help to ensure that chatbots are integrated seamlessly into the recruitment process and that they complement rather than replace human recruiters.

While previous work has established the potential of human-centered recruitment chatbots, more research is needed to understand their impact on the user experience and to ensure that they are practical tools for job seekers and recruiters alike.

Personalized dialog structure of Recruitment Bots. Recruitment chatbots have gained recognition for their potential to streamline the hiring process and enhance the job seeker experience. However, the existing literature lacks in-depth studies on the personalized dialog structure employed by these chatbots [7, 23]. This research gap calls for further investigation to better understand the impact of different users assumed by chatbots during interactions.

Our research intends to fill this gap by examining the influence of dialog structure on the user experience of both job seekers and recruiters within our study's users. We aim to investigate various assignments of characteristics to chatbots and assess how these characteristics affect user perceptions, engagement, and satisfaction.

3. Current Result and Expected Contribution

After performing comparative analysis study on existing Recruitment bots, we conducted an elicitation study to gain insights into the perceptions and experiences of job seekers and recruiters regarding the integration of chatbots into the recruitment process. The findings revealed several themes, including the potential benefits and limitations of chatbots, the significance of accurate programming and data-driven screening, the practicality and cost- effectiveness of chatbots, and the importance of integration with other systems.

This research examined the personalized dialog structure adopted by chatbots in recruitment from the perspectives of developers, clients, job seekers and recruiters. We identified the various roles chatbots can assume, such as providing job information, customization, and personalization, conducting pre-screening assessments, or facilitating interview scheduling. By understanding how these distinct roles influence the dialog between chatbots and stakeholders, our research aims to enhance the design, usability, and effectiveness of recruitment chatbots dialog structures.

Based on the interview results, we found that recruiters and job seekers have distinct expectations and preferences for chatbot interactions. Recruiters value chatbots as time-saving tools for screening and scheduling, emphasizing the need for efficient and accurate information exchange. Job seekers, on the other hand, prioritize a personalized and engaging experience, seeking chatbots that can understand their unique skills and preferences.

This work aims at making the following contributions:

1. Provide a comprehensive understanding of the challenges and potential benefits of integrating chatbots into the recruitment process, considering the personalized dialog structure from the perspectives of job seekers and recruiters.
2. Develop a framework that follows best practices for chatbot development in the recruitment process, incorporating all stakeholders dialog strategies to cater to the expectations and preferences of both job seekers and recruiters.
3. Address the potential impact of chatbots on diversity and inclusion in the hiring process, advocating for fair and objective recruitment practices within the context of dialog interactions.
4. Provide practical recommendations for organizations seeking to implement chatbots in their recruitment processes, emphasizing the importance of integrating dialog structure with other systems and recognizing the value of human decision-making and soft skills evaluation in combination with chatbot interactions.

By focusing on the integration of chatbots in recruitment, including their role-based dialog structure and stakeholder perspectives, this study contributes to the advancement of recruitment chatbot design and improves the overall recruitment experience for both job seekers and recruiters.
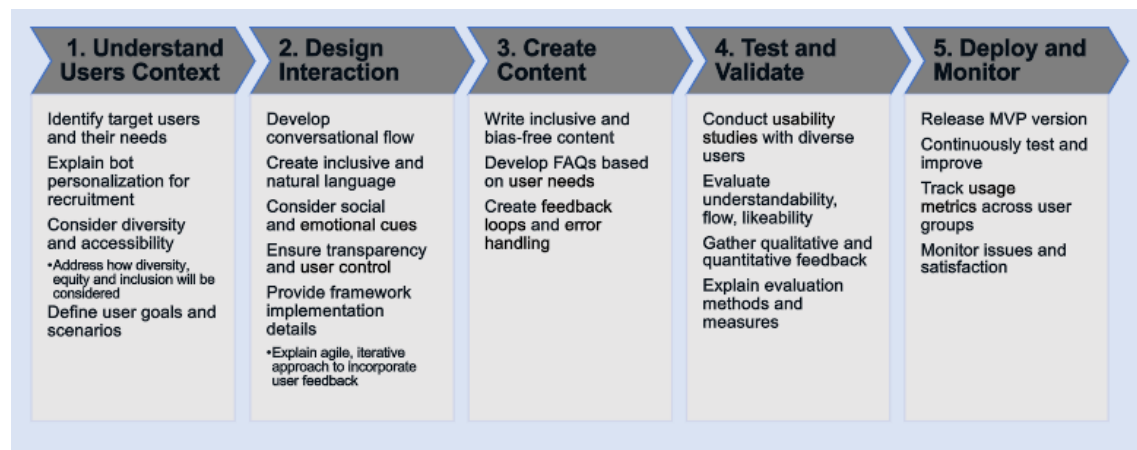

Figure 1: Tentative Conceptual Framework for Human Centered Chatbot

The presented conceptual framework in Figure 1 proposes a tentative approach for designing human-centered chatbots with a specific focus on creating effective recruitment chatbots. Building upon preliminary interviews and analysis of existing recruitment chatbots, our initial proposed framework aims to be personalized, inclusive bots optimized for end-user experience. The framework follows an iterative, user-centered design process across five phases. (1) First, we intend to conduct in-depth research to understand diverse users and their needs, informing bot personalization techniques like custom user profiles and adaptive dialog. (2) Next, conversational interactions will be designed using principles of inclusive language, transparency, and emotional

intelligence, aligned to user preferences through co-creation sessions. (3) Then, we will develop tailored content like FAQs and error messages that specifically address job seeker and recruiter goals. (4) Rigorous testing will follow through methods like usability studies, surveys, and metrics analysis of factors including understandability, flow, and satisfaction for diverse users. (5) Finally, the bot will be deployed in a real-world pilot, gathering feedback to continuously improve functionality and monitor adoption across user groups. While initial elicitation studies provided baseline insights, ongoing reciprocal collaboration with users will refine the framework. By taking a human-centered, responsive approach, this framework aims to deliver recruitment bots that resonate with job seekers and recruiters.

4. Dissertation Status and Long-Term Goals

In the 2nd year of my Ph.D., we focus on qualitative studies with a larger user sample. These studies aim to incorporate the findings from data analysis and synthesis to develop a proposed framework for best practices in chatbot development within the recruitment process.

RQ1: How does the framework's emphasis on understanding users and context through research improve the recruitment chatbot experience? The framework focuses on identifying user needs and goals to inform the design of personalized dialog structures.

RQ2: What challenges does the framework address in integrating human-centered chatbots into recruitment processes? The framework considers principles like inclusive language, transparency, emotional intelligence and user control to enhance the user experience.

RQ3: How does the framework's iterative development process that incorporates user feedback enhance recruitment chatbot dialog structures? The phases of content creation, testing and validating, and continuous monitoring enable refining the chatbot through feedback from diverse users.

These questions highlight:

- The importance of user research to improve the chatbot experience
- How the framework addresses challenges of integrating human-centered chatbots
- The value of an iterative process that incorporates user feedback to refine the dialog structure

By the end of 2024, this research work will contribute to the advancement of chatbot technology in the recruitment industry. It will provide valuable insights and practical tools for organizations seeking to improve their recruitment processes under the best practices of Human-Centered Artificial Intelligence (HCAI). The main goal is to equip developers with a deep understanding of user interaction, usability, and user experience (UX), while defining and testing appropriate methodologies and techniques to create effective intelligent systems, such as recruitment chatbots, that address the personalized dialog structure and interactions with different stakeholders in a recruitment context.

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