Review Article

Revolutionizing HR: The Role and Potential of Chatbots in Human Capital Management

Siddharth Sharma

Oracle HCM Solution Architect, JP Morgan Chase & Co

***Abstract** - In the modern and dynamic business environment, enterprises continuously explore ways to streamline their HR processes and increase productivity. Chatbots have a transformational potential in Human Capital Management (HCM) by automating and simplifying tasks across various domains, including recruiting, onboarding, core HR, absence management, benefits, performance management, and employee self-service. The implementation of chatbots enhances efficiency, minimizes human error, and improves the user experience for candidates, employees, and hiring managers throughout the recruitment process, onboarding, and daily HR tasks. The article outlines the lifecycle of chatbot implementation in HCM, emphasizing the importance of identifying use cases, design and development, training and testing, deployment, monitoring and evaluation, continuous improvement, scope review, and maintenance. It also discusses the necessity of conducting a cost-benefit analysis to evaluate the feasibility and return on investment (ROI) of chatbot implementation, considering factors such as future transaction growth, inflation, performance, maintenance costs, and chatbot accuracy and maturity. Despite the potential benefits, the article acknowledges challenges and limitations associated with chatbot implementation in HCM, including limited understanding and context, integration with existing systems, data privacy and security concerns, user adoption, language, and cultural barriers, maintaining a balance between automation and human touch, constant updates and maintenance, training, and development, initial costs and ROI, and scalability. By addressing these challenges and capitalizing on the advantages of chatbots, organizations have the potential to significantly enhance their management of human resources and revolutionize HCM processes.*

***Keywords** - Human Capital Management, Human Resource Information System, Human Resource Management, Chatbot in Human Resource, Technology Trend in HR, Digital Employee Experience, HCM Digital Transformation.*

1. Introduction
1.1. Definition of Chatbots and HCM

According to ADP, "Human capital management (HCM) is the process of hiring the right people, managing workforces effectively and optimizing productivity" [1]. HCM involves numerous functions like Recruitment and Hiring, Onboarding, Training and Development, Performance Management, Benefits, Compensation, and Workforce Planning. The practical implementation of HCM is crucial for organizations to attract, retain, and cultivate the best workforce, improve productivity and engagement, and achieve their business objectives [2].

According to IBM, "A chatbot is a computer program that uses artificial intelligence (AI) and natural language processing (NLP) to understand customer questions and automate responses to them, simulating human conversation" [3]. Chatbots can interact with users through text, voice, or other messaging interfaces and are designed to respond to user inquiries and perform tasks such as scheduling appointments, answering questions, and providing recommendations.

In the context of HCM, chatbots can automate many routine and repetitive HR tasks, such as answering common employee questions, providing on-demand training and development resources, and streamlining the performance management process. Chatbots can also improve the employee experience by providing a more personalized and responsive HR service and allowing employees to access HR information and support anytime from any device.

The two primary categories of chatbots are rule-based and AI-driven. Rule-based chatbots operate based on a predefined set of rules & answers and are better suited for uncomplicated and direct tasks. Conversely, AI-powered chatbots leverage machine learning algorithms to analyze user input and provide more authentic and customized responses. As AI-powered chatbots can learn and enhance their capabilities over time, they are well-suited for complex HR tasks requiring more advanced decision-making [4].

1.2. Importance of Chatbots in HCM

Chatbots are gaining significant importance in Human Capital Management (HCM) as they offer advantages such as automating repetitive HR tasks, providing instant

assistance to employees, and improving the overall employee experience. The following are some of the significant reasons that highlight the importance of chatbots in HCM:

1.2.1. Improved Efficiency and Productivity
Chatbots can quickly and accurately handle a large volume of HR inquiries and requests without human intervention. This can free HR professionals to focus on more strategic initiatives, such as talent management and organizational development. Additionally, chatbots can provide 24/7 support to employees, reducing the need for HR staff to work outside regular business hours [5].

1.2.2. Enhanced Employee Experience
Chatbots can provide a more personalized and responsive HR service, improving employee experience [6]. Employees can access HR support and information anytime, from any device, without waiting for a human representative's response. Additionally, chatbots can provide on-demand training and development resources, helping employees to develop new skills and knowledge at their own pace.

1.2.3. Cost Savings
Chatbots can help reduce administrative costs associated with HR tasks, such as responding to inquiries, scheduling interviews, and updating employee records [7]. By automating these tasks, organizations can save time and money while improving the quality and speed of HR services.

1.2.4. Data and Insights
Chatbots can provide real-time data and insights on employee inquiries and requests, allowing organizations to identify trends and areas for improvement in their HR processes. This can help organizations make more informed decisions about their HR strategy and resource allocation [8].

1.2.5. Improved Compliance
Chatbots can help ensure that HR processes and procedures are consistent and compliant with legal and regulatory requirements. By providing standardized responses and strategies, chatbots can help reduce the risk of errors and non-compliance [9].

Chatbots offer numerous benefits for HCM, including increased efficiency, improved employee experience, cost savings, real-time data and insights, and improved compliance. As technology continues to evolve and improve, chatbots are likely to become even more critical in the future of HR.

2. Applications of Chatbots in HCM
2.1. Recruiting
Chatbots can enhance the candidate experience across various stages of the recruitment process [10]. Here is an expansion on some of the use cases of chatbots for candidates:

2.1.1. Greetings
Chatbots can provide personalized greetings to candidates visiting the career portal, creating a warm and welcoming environment [11]. This helps engage candidates and makes them feel valued.

2.1.2. Search Jobs
Chatbots can assist candidates in searching for job openings relevant to their skills, experience, and preferences. The chatbot can recommend suitable job openings by gathering information about the candidate's background and interests, streamlining the job search process.

2.1.3. Create Candidate Profile
Chatbots can guide candidates through creating a profile on the career portal. By collecting relevant information, such as personal details, work experience, education, and skills, the chatbot can help build a comprehensive candidate profile that can be used for future job applications.

2.1.4. Upload Resume
Chatbots can facilitate the process of uploading a resume by providing clear instructions and ensuring the candidate's resume is uploaded in the correct format. This helps save time and reduces errors during the application process.

2.1.5. Apply for a Job
With a candidate profile and resume in place, chatbots can assist in applying for jobs by guiding the candidate through the application process, ensuring that all necessary information is provided and submitted correctly.

2.1.6. Check Application Status
Chatbots can help candidates track the status of their job applications, providing real-time updates on the progress of their applications and keeping them informed throughout the process.

2.1.7. Withdraw Application from Job
If a candidate wishes to withdraw their application, chatbots can guide them through the withdrawal process, ensuring that the request is submitted correctly and acknowledged by the system.

2.1.8. Schedule Interviews

Chatbots can coordinate the scheduling of interviews between candidates and recruiters. Chatbots can streamline the interview scheduling process by finding mutually convenient times for both parties and sending calendar invites, ensuring a seamless experience for both candidates and recruiters.

Chatbots can also improve the efficiency and productivity of hiring managers and recruiting team members. Here is an expansion on some of the use cases:

2.1.9. Check Candidate Status

Chatbots can help Hiring Managers and Recruiters quickly access information about a candidate's status in the recruitment process. This includes details such as the current stage of the process, the outcome of previous interviews, and any scheduled interviews or assessments. This helps the hiring team stay informed and make timely decisions.

2.1.10. Create Requisition

Chatbots can guide hiring managers and recruiters through creating a job requisition by collecting the necessary information, such as job title, department, location, job description, and qualifications. This streamlines the process of opening new job positions and ensures that all required information is accurately captured.

2.1.11. Access Requisitions

Chatbots can help Hiring Managers and Recruiters quickly access their job requisitions, allowing them to review the details of each position, track the progress of the recruitment process, and make updates as needed. This enables better organization and management of the hiring process, leading to a more efficient talent acquisition experience.

2.1.12. Access Offers

Chatbots can assist hiring managers and recruiters in accessing and manage job offers for candidates. They can provide information on the status of an offer, the proposed salary and benefits package, and any additional details or documentation required.

2.2. Onboarding

Chatbots can be employed to streamline and enhance the onboarding process for new employees [12]. Here is an expansion on some of the use cases of chatbots in HCM for candidates in the context of onboarding tasks:

2.2.1. Check Onboarding Tasks

Chatbots can help new employees keep track of their onboarding tasks by providing an updated list of pending, ongoing, and completed activities. This can include charges such as submitting necessary documentation, completing orientation modules, or attending training sessions. By

offering a centralized platform to view and manage onboarding tasks, chatbots enable new employees to stay organized and informed during their transition into the organization.

2.2.2. Action Onboarding Tasks

Chatbots can facilitate new employees' engagement with onboarding tasks by providing direct access to relevant resources, systems, or personnel. For example, a chatbot can guide a new employee through submitting required documents, enrolling in benefits programs, or accessing company policies and guidelines. Additionally, chatbots can help schedule and coordinate meetings, training sessions, and other onboarding events, ensuring a smooth and efficient onboarding experience.

2.3. Core HR

Chatbots can be employed to streamline and enhance various Core HR tasks [13]. Here is an expansion on the use cases of chatbots in HCM for Core HR areas:

2.3.1. Add New Assignment

Chatbots can help HR managers create new job assignments, capturing essential information such as job title, department, work location, and start date.

2.3.2. View Assignment Information

HR managers can use chatbots to access job assignment details or review historical assignment information quickly.

2.3.3. Check Contact Information

Chatbots can provide an employee's contact information, such as phone numbers, email addresses, and physical addresses.

2.3.4. Add Contact Information

Employees can use chatbots to update or add their contact information, ensuring the organization's records remain accurate and current.

2.3.5. Check and Add Direct Reports

Managers can use chatbots to view their direct reports, add new ones, or update the reporting hierarchy as needed.

2.3.6. Check and Add Email

Chatbots can help employees view or update their work email addresses.

2.3.7. Check and View Emergency Contacts

Employees can use chatbots to access and update their emergency contact information.

2.3.8. Check and Modify Hire Dates

HR managers can use chatbots to review or update an employee's hire date.

2.3.9. Check or Modify Job Details

Chatbots can assist HR managers in reviewing or updating job titles, responsibilities, or other essential job details for employees.

2.3.10. Check or Modify Work Location Details

HR managers can use chatbots to view or update work location information, such as office addresses or remote work arrangements for employees.

2.3.11. Check and manage a person's salary

Managers and HR personnel can use chatbots to access, review, or modify employee salary information.

2.3.12. Terminate Employee

HR managers can use chatbots to initiate the employee termination process, capturing relevant details such as the termination date and reason.

2.3.13. Transfer Employee

Chatbots can assist HR managers in transferring employees between departments, roles, or locations, streamlining the process, and ensuring accurate recordkeeping.

2.4. Absence Management

Chatbots can be used to streamline and enhance various Absence Management tasks [14]. Here is an expansion on some of the use cases of chatbots for Absence Management areas:

2.4.1. Inquire About Available and Requested Leave

Chatbots can provide employees with information on their available leaves, such as vacation, sick, or personal leaves, and help them submit them directly through the chat interface.

2.4.2. Check Absence Balance

Employees can use chatbots to quickly check their current absence balance, including the number of remaining days for each leave type, ensuring they stay informed and plan their time off accordingly.

2.4.3. Check Past and Future Absences

Chatbots can help employees access records of their past absences and view any scheduled future absences. This feature allows employees to keep track of their time off and plan upcoming absences more effectively.

2.4.4. Request Absence

Employees can use chatbots to submit absence requests for various leave types, such as vacation, sick leave, or personal days. The chatbot can guide employees through the request process, capturing essential information such as the leave type, start and end dates, and any additional notes or attachments.

2.5. Benefits

Chatbots can play a vital role in streamlining and enhancing various Benefits-related tasks [15]. Here is an expansion on the use cases of chatbots in HCM for Benefit areas:

2.5.1. Check Benefits Plan Coverage

Employees can use chatbots to quickly access information about their benefits plans coverage, such as health insurance, life insurance, dental and vision coverage, retirement plans, and other employee perks. The chatbot can provide detailed information on the coverage levels, eligibility, and any limitations or exclusions applicable to the employee's specific plan.

2.5.2. Check Benefits Plan Information

Chatbots can serve as a central source of information for employees to get comprehensive details about their benefits plans. This includes information on plan enrollment, premium contributions, waiting periods, plan features, and other relevant details. Employees can access this information in real-time, making it easier for them to make informed decisions about their benefits and take advantage of the offerings provided by their employer.

2.6. Performance Management

Chatbots can significantly improve the Performance Management process by facilitating seamless communication and information access [16]. The following are some expanded use cases of chatbots in HCM for Performance Management areas:

2.6.1. Access Feedback of Employees

Chatbots can provide employees instant access to their performance feedback from managers, peers, and other stakeholders. This enables employees to review their feedback, identify areas of improvement, and work on their personal and professional development.

2.6.2. Add Feedback for Employees

Managers and colleagues can use chatbots to submit feedback quickly and easily for an employee, which can be added to the employee's performance record. This streamlined process encourages more frequent and timely feedback, fostering a culture of continuous improvement.

2.6.3. View Performance Goals

Employees can use chatbots to view their performance goals, track progress towards achieving them and review the expectations set by their managers. This promotes alignment between individual goals and organizational objectives.

2.6.4. Add Performance Goals

Managers can utilize chatbots to add new performance goals for their employees, making it easy to update and communicate expectations as business needs change.

2.6.5. View Performance Evaluations

Chatbots can provide employees access to their past and current performance evaluations, allowing them to review their overall performance trends and identify areas for growth and development.

2.6.6. Complete Performance Evaluation

Managers can use chatbots to complete performance evaluations for their employees, providing ratings, comments, and overall assessments. This streamlined process simplifies the evaluation workflow and ensures that performance reviews are completed on time.

2.7. Employee Self Service

Chatbots can streamline the Employee Self-Service (ESS) process in Human Capital Management (HCM) by providing instant access to essential information and enabling employees to perform various tasks independently [17]. Here are some expanded use cases of chatbots in HCM for Employee Self Service areas:

2.7.1. Check Name

To ensure accuracy, employees can use chatbots to verify their name as it appears in the company's records.

2.7.2. Modify Name

Chatbots can facilitate name modifications in case of errors or changes, such as a legal name change due to marriage or other reasons.

2.7.3. Add Photo

Employees can upload their profile photos through chatbots, making it easy to personalize their employee records.

2.7.3. Add Emergency Contacts

Chatbots can guide employees through adding emergency contacts to their records, ensuring that critical information is readily available when needed.

2.7.4. Add Phone

Employees can use chatbots to update their phone numbers in the company database, ensuring their contact information remains current.

2.7.5. Add Email

Chatbots can assist employees in adding or updating their email addresses in the system, maintaining effective communication channels.

2.7.6. Create Referral

Chatbots can help employees create and submit referrals for open positions within the organization, streamlining the referral process and promoting internal talent acquisition.

2.7.6. Resignation

Chatbots can facilitate the resignation process by guiding employees through the necessary steps and providing information on exit procedures and requirements.

2.7.7. Check Payment Method

Employees can use chatbots to verify their current payment method for receiving salaries, ensuring accurate and timely compensation.

2.7.8. Add Payment Method

Chatbots can help employees update or add a new payment method for receiving their salary, streamlining the process and reducing the risk of payment issues.

2.7.9. View Payslip

Employees can access their payslips through chatbots, providing them with a convenient way to review their salary details, deductions, and other relevant information.

2.7.10. Access Tax Documents

Chatbots can provide employees quick access to their tax documents, such as W-2 or other income-related documents, facilitating tax preparation and filing.

3. Lifecycle of chatbots in HCM

The lifecycle of a chatbot can be described in the following stages:

3.1. Identify use Cases

Analyze business operations to determine which areas can benefit from chatbot implementation. This may include streamlining customer support, automating repetitive tasks, or handling frequently asked questions.

3.2. Design and Development

Design the conversational flow, intents, and responses to create a user-friendly and effective chatbot. Develop the chatbot using suitable programming languages, frameworks, and tools.

3.3. Training and Testing

Train the chatbot using sample data and conversations to improve its understanding of user inputs. Test the chatbot rigorously to ensure it can handle various user requests and scenarios effectively.

3.4. Deployment

Launch the chatbot in a production environment, making it available for actual users to interact with and benefit from.

3.5. Monitoring and Evaluation

Monitor the chatbot's performance, user interactions, and feedback to evaluate its effectiveness and user satisfaction.

3.6. Continuous Improvement

Iterate and update the chatbot by refining its responses, incorporating user feedback, and improving its accuracy and efficiency based on the data collected during the monitoring and evaluation stage.

3.7. Scope Review and Expansion

Regularly review the chatbot's scope in evolving business processes and explore opportunities to expand its functionalities and use cases to maximize automation and simplification.

3.8. Maintenance and Support

Provide ongoing maintenance and support for the chatbot, ensuring its continued performance, reliability, and relevance to users and business processes.
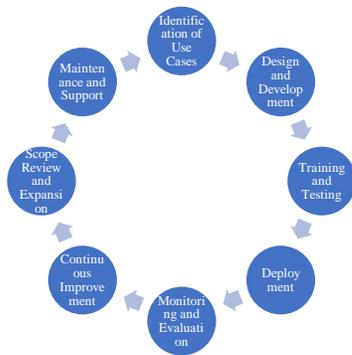

Table 1. Lifecycle of the chatbots in HCM

4. How to determine if Chatbot implementation is Cost Beneficial?

The following calculation can be used to decide if the chatbot will be helpful for the organization:

- Calculate the total requests received for each business function (N_Requests). This can be done by multiplying the number of unique business functions (5) by the number of requests received in each function's queue for small, medium, and large organizations (20, 200, 2000).
- Determine the average time to resolve a request (T_Solution) for each business function.
- Calculate the human cost (H_Cost) for the time invested in resolving requests by multiplying the average time to solution by the hourly wage of the employees handling these requests.

- Identify software applications utilized and their transaction costs (TC_App) for each request.
- Calculate the business cost (B_Cost) for the time invested by considering factors like lost productivity or opportunity costs.
- Calculate the total cost without chatbot (Total_Cost_No_Chatbot) by adding the human, transaction, and business costs: H_Cost + TC_App + B_Cost.

Now, compare this against the costs associated with implementing and maintaining a chatbot:
- Calculate the transaction cost of the chatbot (TC_Chatbot) per request.
- Estimate the human cost of implementing and maintaining the chatbot (H_Cost_Chatbot), considering initial setup, training, and ongoing maintenance factors.
- Estimate the volume of missed transactions from the chatbot (V_Missed) and the cost of covering those transactions outside the chatbot (C_Missed).
- Calculate the total cost with the chatbot (Total_Cost_Chatbot) by adding the transaction cost of the chatbot, the human cost of implementing and maintaining the chatbot, and the cost of covering missed transactions: TC_Chatbot + H_Cost_Chatbot + C_Missed.

Finally, compare the total costs with and without the chatbot:
- If Total_Cost_No_Chatbot > Total_Cost_Chatbot, implementing the chatbot benefits the organization.
- If Total_Cost_No_Chatbot < Total_Cost_Chatbot, the organization may have better options than implementing the chatbot.

5. Critical factors for cost-benefit Analysis

The following are essential factors to consider when conducting a cost-benefit analysis [18]:

5.1. Future Transaction Growth

Consider whether the number of transactions is expected to increase as the business grows. A higher transaction volume may necessitate additional resources, increasing the potential benefits of implementing a chatbot.

5.2. Inflation

Inflation factor when estimating future costs associated with human labour, software licenses, and other business expenses. Inflation can impact the overall cost projections and affect the investment's long-term viability.

5.3. Implementation and Maintenance Costs

Remember that implementing a chatbot is typically a one-time expense, while maintenance costs are ongoing but often decrease over time. Consider the balance between these costs when evaluating the overall investment required for chatbot deployment.

5.4. Chatbot Accuracy and Maturity

As the AI model behind the chatbot matures and stabilizes, the number of missed transactions should decrease, resulting in improved performance and increased efficiency—factor in this anticipated improvement when calculating the long-term benefits and cost savings associated with chatbot implementation.

By considering these key factors, you can perform a comprehensive cost-benefit analysis to help determine the overall value and potential return on investment of implementing a chatbot in your organization. This analysis will enable you to decide whether a chatbot is viable for your specific business needs and circumstances.

6. Challenges and Limitations of Chatbots in HCM

While chatbots have significant potential advantages, they also pose specific challenges and limitations when implementing them in HCM. By comprehending these issues, organizations can make knowledgeable choices and take appropriate measures to guarantee a successful integration of chatbots in their HCM procedures. In this segment, we will investigate some of these difficulties, which include comprehension and context, combining with current systems, securing data privacy, user satisfaction, and preserving a human element.

6.1. Limited Understanding and Context

Chatbots, especially rule-based ones, may need help understanding complex or ambiguous questions. They may only sometimes grasp the context behind a query, leading to incorrect or irrelevant responses, which can frustrate users [26].

6.2. Integration with Existing Systems

Integrating chatbots with various HCM systems can be challenging. Ensuring seamless data transfer, compatibility, and communication between the chatbot and other HCM components may require significant time and resources.

6.3. Data Privacy and Security

Chatbots deal with sensitive employee information, making data privacy and security a top concern. Ensuring compliance with data protection regulations and maintaining a high level of security can be a significant challenge.

6.4. Adoption and User Experience

Employees may initially be hesitant to use chatbots, especially if they are unfamiliar with the technology or if the chatbot's user interface could be more intuitive. Encouraging adoption and providing a positive user experience are critical for the success of chatbots in HCM.

6.5. Language and Cultural Barriers

Chatbots must cater to employees from diverse linguistic and cultural backgrounds [20]. Developing multilingual chatbots that can handle different languages, dialects, and cultural nuances can be challenging.

6.6. Maintaining Human Touch

While chatbots can automate many tasks, they can only partially replace the human touch required in specific HR processes [21]. Balancing automation with human intervention to maintain empathy and personalization in HR interactions is essential.

6.7. Constant Updates and Maintenance

Chatbots need regular updates to stay relevant and provide accurate information. As policies, processes, and regulations change, chatbots must be updated accordingly, which can be resource intensive [22].

6.8. Training and Development

Implementing a chatbot in HCM requires investing in training and development. Employees must learn how to use chatbots effectively, while HR teams need to be trained in chatbot management and maintenance [23].

6.9. Initial Cost and ROI

Implementing a chatbot can involve significant upfront development, integration, and training costs. Determining the return on investment and ensuring the long-term benefits of chatbots outweigh the initial outlay can be challenging [24].

6.10. Scalability

As organizations grow, their HCM processes may become more complex. Chatbots must be designed to scale with the organization and adapt to the changing needs and requirements of the HCM system [25].

In conclusion, while chatbots have the potential to revolutionize HCM processes, organizations must address these challenges and limitations to ensure a successful implementation and maximize the benefits of using chatbots in HCM.

7. Conclusion

In conclusion, chatbots have the potential to significantly impact Human Capital Management (HCM) processes by automating and streamlining various tasks. They can be employed in diverse areas such as recruiting, onboarding, core HR tasks, absence management, benefits, performance management, and employee self-service, resulting in improved efficiency, reduced human error, and enhanced user experience.

In the recruiting process, chatbots can help candidates search for relevant jobs, create profiles, upload resumes, apply for jobs, check application status, and schedule interviews while assisting hiring managers and recruiters in managing requisitions, candidate statuses, and job offers. Chatbots can help new employees track and complete tasks in onboarding, ensuring a smooth organizational transition.

Chatbots also play a critical role in core HR tasks, such as managing assignments, contact information, direct reports, work location details, salaries, and employee terminations or transfers. They can facilitate absence management by allowing employees to inquire about leaves, check absence balances, and request time off while helping with benefits management and performance evaluations. Moreover, chatbots offer valuable support in employee self-

service tasks, such as updating personal information, accessing tax documents, or managing payment methods. They can be customized to cater to diverse linguistic and cultural backgrounds, providing a more inclusive and accessible HCM experience.

To successfully implement chatbots in HCM, organizations must follow a lifecycle that includes identifying use cases, designing, and developing the chatbot, training and testing, deployment, monitoring and evaluation, continuous improvement, scope review, and maintenance. A cost-benefit analysis should be conducted to ensure that the investment in chatbot technology will yield a positive return for the organization.

However, there are challenges and limitations when implementing chatbots in HCM. These include limited understanding and context, integration with existing systems, data privacy and security concerns, user adoption, language, cultural barriers, balancing automation and human touch, constant updates and maintenance, training and development, initial costs and ROI, and scalability. By addressing these challenges and leveraging the benefits, chatbots have the potential to revolutionize HCM processes and significantly improve the way organizations manage their human resources.

References

[1] ADP, What Is Human Capital Management (HCM)?, 2020. [Online]. Available: https://www.adp.com/resources/articles-and-insights/articles/w/what-is-human-capital-management.aspx

[2] Michael J. Kavanagh, and Richard D. Johnson, *Human Resource Information Systems: Basics, Applications, and Future Directions*, Sage Publications, 2020. [Google Scholar] [Publisher Link]

[3] IBM, What is a Chatbot?, 2021. [Online]. Available: https://www.ibm.com/topics/chatbots

[4] Harris, J. G, "Chatbot HR Manager-Role and Skills," *Journal of Human Resources Management and Labor Studies*, vol. 6, no. 1, pp. 23-32.

[5] Nishad Nawaaz, and Anjali Mary Gomes, "Artificial Intelligence Chatbots are New Recruiters," *International Journal of Advanced Computer Science and Applications,* vol. 10, no. 9, 2019. [CrossRef] [Google Scholar] [Publisher Link]

[6] Alshamsi, A., and Sarker, S, "An Exploration of the Potential Applications of Chatbots in the Context of Human Resources Management," *Journal of Organizational Computing and Electronic Commerce*, vol. 29, no. 3, pp. 151-169, 2019.

[7] Paul Daugherty, and H. James Wilson, *Human + Machine: Reimagining Work in the Age of AI*, Harvard Business Review Press, 2018. [Google Scholar] [Publisher Link]

[8] Robin Singh, 7 Ways Chatbots Can Increase Business Efficiency and Productivity, 2019. [Online]. Available: https://chatbotsmagazine.com/7-ways-chatbots-can-increase-business-efficiency-and-productivity-707d284b96c5

[9] Martin Adam, Michael Wessel, and Alexander Benlian, "AI-Based Chatbots in Customer Service and Their Effects on User Compliance," *Electronic Markets,* vol. 31, pp. 427-445, 2021. [CrossRef] [Google Scholar] [Publisher Link]

[10] Charles Joseph Tawk, "Chatbots: Recruitment Game Changers?" *International Journal of Business Management and Economic Research*, vol. 12, no. 2, 2021. [Google Scholar] [Publisher Link]

[11] Ines Hungerbuehler et al., "Chatbot-Based Assessment of Employees' Mental Health: Design Process and Pilot Implementation," *JMIR Formative Research*, vol. 5, no. 4, 2021. [CrossRef] [Google Scholar] [Publisher Link]

[12] Ingrid Sörensen, Expectations on Chatbots among Novice Users during the Onboarding Process, 2017. [Google Scholar] [Publisher Link]

[13] Lin Grensing-Pophal, How HR is Using Virtual Chat and Chatbots, 2022. [Online]. Available: https://www.shrm.org/resourcesandtools/hr-topics/technology/pages/how-hr-is-using-virtual-chat-and-chatbots.aspx

[14] Quest Oracle Community, Absence Management Chatbot for Peoplesoft HCM, 2023. [Online]. Available: https://questoraclecommunity.org/learn/blogs/absence-management-chatbot-for-peoplesoft-hcm/

[15] Nigel Guenole, and Sheri Feinzig, The Business Case for AI in HR with Insights and Tips on Getting Started. [Online]. Available: https://www.ibm.com/downloads/cas/agkxjx6m

[16] Chiarizia Stefanom, Chatbots and the Employee Selection Process: What Lies Ahead? 2021. [Online]. Available: http://essay.utwente.nl/88275/1/master%20thesis%20stefano%20chiarizia.pdf

[17] Tina Taule, Asbjørn Følstad, and Knut Inge Fostervold, How Can a Chatbot Support Human Resource Management? Exploring the Operational Interplay, 2022. [Online]. Available: https://www.researchgate.net/publication/358151739_how_can_a_chatbot_support_human_resource_management_exploring_the_operational_interplay

[18] Stanislav Hristov Ivanov, and Craig Webster, "Adoption of Robots, Artificial Intelligence and Service Automation by Travel, Tourism and Hospitality Companies – A Cost-Benefit Analysis," *International Journal of Contemporary Hospitality Management*, p. 9, 2017. [Google Scholar] [Publisher Link]

[19] Uma Raman, "Human Resource Management System," *SSRG International Journal of Economics and Management Studies*, vol. 7, no. 7, pp. 139-141, 2020. [CrossRef] [Publisher Link]

[20] Mohit jain et al., "Evaluating and Informing the Design of Chatbots," *In Proceedings of the 2018 on Designing Interactive Systems Conference*, pp. 895-906, 2018. [CrossRef] [Google Scholar] [Publisher Link]

[21] Helly Raval, "Limitations of Existing Chatbot with Analytical Survey to Enhance the Functionality Using Emerging Technology," *International Journal of Research and Analytical Reviews,* vol. 7, no. 2, p. 4, 2020. [Google Scholar]

[22] Doris Chi, Chatbot Challenge #3 Maintenance and Optimization, 2019. [Online]. Available: https://chatbotslife.com/chatbot-challenge-3-maintenance-and-optimizations-6f8f61b05e42

[23] Sonia Mendoza, "A Model to Develop Chatbots for Assisting the Teaching and Learning Process," *Sensors*, vol. 22, no. 15, pp.1-21, 2022. [CrossRef] [Google Scholar] [Publisher Link]

[24] Oracle, the Total Economic Impact of Oracle Digital Assistant, 2022. [Online]. Available: https://www.oracle.com/a/ocom/docs/total-economics-impact-of-oracle-digital-assistant-forrester-research.pdf

[25] Alistair Barros, Renuka Sindhgatta, and Alireza Nili, "Scaling Up Chatbots for Corporate Service Delivery Systems," *Communications of the ACM*, vol. 64, no. 8, pp. 88-97, 2021. [CrossRef] [Google Scholar] [Publisher Link]

[26] Asbjørn Følstad, and Petter Bae Brandtzæg, "Chatbots and the New World of HCI," *Interactions*, vol. 24, no. 4, pp. 38-42, 2017. [CrossRef] [Google Scholar] [Publisher Link]