

HR Based Interactive Chat bot (PowerBot)

Prof Shabana Tadvī
Department of Computer Engineering
M.H Saboo Siddik College of
Engineering
Mumbai, Maharashtra 400008
shabanatadvi15@gmail.com

Sultanat Rangari
Department of Computer Engineering
M.H Saboo Siddik College of
Engineering
Mumbai, Maharashtra 400008
sultanat.rangari@gmail.com

Ammar Rohe
Department of Computer Engineering
M.H Saboo Siddik College of
Engineering
Mumbai, Maharashtra 400008
ammarrohe@gmail.com

Abstract— In the age of machine intelligence, Computer Science has had a lot of advancements in the past decade, and Artificial Intelligence definitely stands distinguished among them. A chat bot is a type of application which is generated by a computer. It's capable of having a simulated interaction with the user in such a way that they don't feel like talking to the machine directly. The human-like response during a conversation is initiated by a computer program which is a verbose operator, commonly recognized as a chat bot. For a chat bot to imitate a human dialogue, the input inured by a user should be precisely analyzed and should forge significant and pertinent feedback. Now a day, people interact with systems more than humans. This project is aimed to implement an HR chat bot using tools that expose artificial intelligence methods such as natural language Understanding. Allowing users to interact with the chat bot using natural language input and to train the chat bot using appropriate methods so it will allow to generate a response. This chat bot will allow users to view all details regarding the company all from within the chat bot. As we have seen, for any of the basic requirements, the employee has to go to the team leader or to the HR. To overcome these challenges faced by the employees, we are trying to present a chat bot which would fulfil the requirements such as applying for leave, reimbursement, applying for a allowance and many such. The Chabot will provide personal and efficient communication between the employee and their HR to manage their job and get assistance when needed, such as; answering any queries and requesting for leave. The Chabot will allow users to feel confident and comfortable when using this service regardless of the employee's computer literacy due to the natural language used in messages. It also provides a very accessible and efficient service as all interactions will take place within the one chat conversation negating the employee for the user to navigate through a system.

Keywords— HR, chat bot, natural language

I. INTRODUCTION

A chat bot is an artificial intelligence (AI) software that can simulate a natural language conversation (or chat) with a user via messaging applications, websites and mobile apps, or by telephone [1]. A chat bot is a computer application that makes use of auditory or textual techniques to conduct a communication in an herbal language, apprehend the user's purpose, and provide a response based totally on the organization's business policies and knowledge. A chat bot is a software program software used by companies to automate human interplay on the idea of a predetermined rule list [5].

1.1. Function of Chat bot

The main character that lies in back of chat bots is NLP and Machine Learning. When a question is presented to a chat bot, a chain of complicated algorithms method the

acquired input, recognize what the person is asking, and based totally on that determines the answer suitable to the query. Chat bot have to rely upon the capacity of the algorithms to come across the complexity of each textual content and spoken words. Some chat bots perform thoroughly to the factor it turns into difficult to differentiate whether or not the consumer is a gadget or a human. However, handling complicated conversation is a big challenge; where there may be a utilization of diverse figures of speech, it may be difficult for machines to understand [2].

1.2. Chat bot processing Human Language

A chat bot resembles like a normal app at first. There is a layer of programs, a server and external resources called APIs. UI is recouped with chat interface in a chat bot situation. Although chat bots are user-friendly, it adds complexity to the handling of the software. There is a general concern that the client's purpose cannot be interpreted by the bot. The bots are trained first with real data [3].

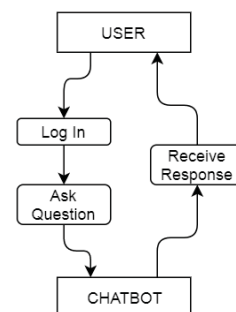


Figure 1: Flow of Chat bot

1.3. Architecture of Chat bot

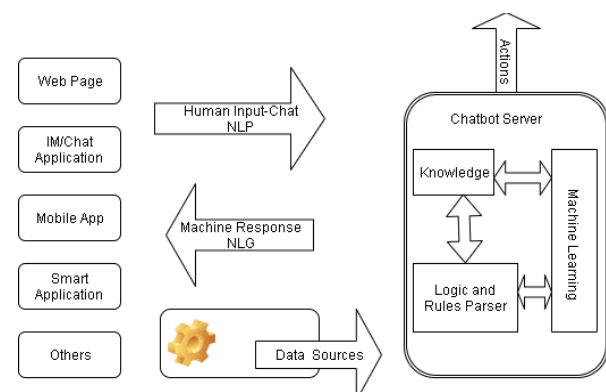


Figure 2: Architecture of Chat bot

1.4. Chat bots and HR

Chat bots are Artificial Intelligence packages that perform conversations. They proffer a variety of functions in areas of sales, marketing, and customer service, but this particular aspect is prohibited since chat bots are making their way into the workplaces replacing human minds. The main target of the HR department is to recruit staff, develop employee engagement, reduce bias and enhance productivity. This is in several ways cognate to how recruiters evaluate several applicants and select worthy candidates as they move rapidly to final hiring stages [5]. The handling of AI has helped the way and HR team converses with the workforce spread over several locations. Simple queries like application status or basic questions about the business enterprise culture, rules and information etc., are respectively answered by chat bots. Besides this, chat bots can also lineup meetings, connect with applicants and act as the personal assistants to recruiters. The task of integrating various systems of files and retrieving information can be profusely carried out by a chat bot for providing a front-end system of engagement to the workforce. A critical function of talent acquisition, performance management, attrition prediction, identity of illegal and unethical behavior of employee, and in their training and development, is executed by way of AI. Analyzation of candidate's sentences and phrases to detect a basal pattern is functioned by a chat bot.

The HR chat bots answer the repetitive questions and queries with diligence as their processes involve such interrogation. Learning for employees is made simpler by breaking down the videos and tutorials into smaller consumable bites with the help of an HR chat bot. These are then accompanied up via multiple desire questions to assess what employees have accrued from the getting to know module. These days, recruitment chat bots can fulfil an array of functions, including resume parsing and asking probing questions to decrease the number of candidates for screening, henceforth making chat bots an irresistible means for pre-screening of the candidates. Chat bots can captivate multiple candidates at the same time, and work 24/7, thereby lessening the timelines significantly. The efficiency of compliance-related processes by answering employees' queries rapidly, supporting them through the paperwork and joining formalities is improved in certain ways by a conversational HR chat bot. Additional tasks such as making the employees aware with respect to new regulations, imminent deadlines or reminders for submitting important documents can be instilled in an HR chat bot specifically.

II. SCOPE

It might be tough to believe, however a simple chat-based totally bot can solve all the challenges listed above. HR chat bots sit on pinnacle of more than one structures of statistics from varied sources to provide a front-end gadget of engagement to employees. There is no need for the employee to consult any other tool or platform because the HR chat bot delivers accurate and instant answers to queries. The high-quality part is that on account that most employees have already got used to WhatsApp/Messenger/WeChat

before, using a talk bot comes evidently and requires no schooling or learning, not like gift isolated organization applications. New and existing personnel can ask the chat bot surely just about anything – go away policy, organization policy, benefits, rewards and so much more. But even that's not all; the intuitive design and interface of the chat bot will activate the worker to take an action primarily based at the nature of their query. For instance, if an employee enquires approximately the quantity of ultimate leaves, after tending to the question, the chat bot will verify if the worker wants to apply for a go away. Further, it's going to also set off if conferences. For the said length of depart ought to be routinely cancelled (because its miles integrated with the calendar). This one conversation-based totally system turns into the unmarried point-of-contact for the whole lot HR, and will growth the turnaround time, enhance the accuracy of answers, and remove the want for more than one structures to perform simultaneously. HR leaders and personnel will get more of one in every of the maximum precious assets today, strategic problems like skills management, leadership agendas etc. By taking the role of a data center for multiple applications, HR chat bots verticalise themselves as an intelligent system of delivery and empower the HR to do things that weren't possible before. Let's take a look at some of the ways in which HR chat bots can help the HR function become more efficient.

2.1. Local Scope

The local scope of our project will be confined to setting up a chat bot for the product. The tasks to be accomplished under local scope are:

- Free up the HR from tedious admin tasks.
- Helps increase productivity and performance.
- Preserves employee's time as well

2.2. Global Scope

The global scope of our project will deal implementing the same chat bot for a much larger crowd. The tasks viewed to be accomplished under global scope are:

- Easing Compliance-Related Processes.
- Gathering Valuable Employee Data.
- Making Employee Engagement Seamless.

III. LITERATURE REVIEW

Chat bot has the ability to make HR's role more strategic than a mere function of support. While chat bots have been popular among consumers who use them for basic customer service functions, a number of HR solutions and service providers have also recently focused most of their efforts on creating bots.

Much HR time is invested in managing routine processes and activities that could be handled instead by chat bots. This would allow HR personnel to focus on activities of higher priority. Teams have limited time left to provide individual attention to employees when dealing with sensitive personal issues. This is a greater use of the resources of the HR staff while the more traditional, basic tasks are done by the chat bots. This will enhance the HR

team's ability to engage proactively, guide and mentor employees through their career paths.

3.1. BITA

Any conversation with the company, either through a task posting, exploring the job portal, interacting with an organization or recruiting manager, or the real software and interview system can certainly have an effect at the company's remark of the process seeker. Such candidates choose to join or not to join an organization based on how well they are treated by a company executive and how well informed they are all through the process, and most importantly if they are treated as a human being or just as pieces of paper. [6] This paper focuses on the analysis for an improvised experience of the role of Chat bots in the HR domain. AI can perform perfectly while being synchronized with HR processes, especially in recruitment feature, and HR Chat bots are the live example. Both business units need to handle their work by putting the business as a whole first and at the centre of the discussion. The aim of the proposed study is to analyse BITA's role in directly or indirectly optimizing an organization's profitability by properly aligning the recruitment process with IT via Chat bots.

3.2. ELIZA

ELIZA is the first-ever chat bot to have passed the Turing test. Basically, ELIZA had a set of certain keywords [7]. Every time it received input from the user, it looked up the input for those keywords, applied values to them and then converted it into a response.

3.3. Artificial Intelligence Chat bots are the New Recruiters

The motive of the paper is to evaluate the synthetic intelligence chat bots have an effect on at the recruitment process. The researchers talk how chat bots inside the recruitment process furnished carrier delivery to attract and interact candidates. The study's objective is to describe the effect of chat bots throughout the recruitment process. The study is based solely on secondary sources such as analytical reports, articles reviewed by peers, and blogs are used to present the current document. The paper observed that chat bots of synthetic intelligence are very effective tools within the recruitment process and could be useful in planning a recruitment method for the industry. It additionally focuses extra on solving complicated troubles in the recruitment process. Increasing interest among researchers via the amalgamation of the artificial intelligence recruitment process, there's still an possibility to explore inside the field. The paper provides destiny research avenues inside the area of chat bots and recruiters [8].

3.4. smHRty

smHRty turned into conceptualized and conceived preserving in mind the load of HR oldsters when dealing with cumbersome admin paintings on each day basis. [9] The top goal of our HR chat bot is to unfastened up your HR group from tedious admin work and permit them consciousness on other critical tasks that require a human touch. We all understand that HR folks are tied up dealing with habitual duties that save you them from participating in

management decisions. smHRty could unencumber your HR professionals from the burdensome admin chores. In fact, employees can without difficulty take their leave details by having access to ESS portal without bothering the HR team.

3.5. Use of Chat bot in Project Management

The paper aims to show the ability to use chat bots in project management and to prove the hypothesis of the researchers- using AI chat bots in project management can save project managers (and project team) time and the project failure factors. The concept was tested with prototypes of AI chat bot. The paper contains an analysis of current chat bots and potential project management support possibilities, proof of concept (POC) for chat bot implementation, and a brief insight into established chat bot prototypes [10].

3.6. A Study of Artificial Intelligence and its role in Human Resource Management

Collect accurate data in the competitive world of industries and analyse the data collected for the use of business growth and daily work is important. Artificial Intelligence allows the company to complete the work more quickly and efficiently. Artificial Intelligence enters various departments such as a department of human resources, department of finance, department of advertising and development. Through the use of AI system management, current output and everyday tasks can be told. In market stress, the effect of artificial intelligence on the workplace was recognized by stern managers. There is a concise aspect of the research paper. The researcher was used to gather secondary information from research papers, journals, forums, HR articles, survey results, etc. The study's core objective was to explore the role of artificial intelligence in the department of human resources and to understand the challenges in the department of human resources. The research study concluded that AI's role is greater in various human resource functions where robotics companies can handle recruitment, hiring, data analysis, data collection, workload reduction and workplace efficiency enrichment [12].

IV. PROPOSED SYSTEM

The proposed solution is to create a Chabot to simulate a human conversation to assist employees with their needs and to provide a more personal experience. Advancements in artificial intelligence, machine learning techniques, improved aptitude for decision making, larger availability of domains and corpus, have increased the practicality of integrating a Chabot into applications. Users will be able to ask any HR related queries in natural language that they are comfortable using such as; view salary information, reimbursement and check balance leaves. The Chabot will identify and understand what the user is asking and generate an appropriate response based on the conversational context. Immediate responses will be provided by the Chabot to redeem the need for the employee to have to call or visit their HR for assistance.

The flowchart of the system displays how the PowerBot performs. Initially, the PowerBot welcomes the employee and then ask for the query. It gets the user defined language query thus identifying the intent and entities. Fetching the data from the database, if answer found, it will display the

answer else it will request the employee to give a more precise answer. Once done with all the queries, it will display a goodbye message.



Figure 3: Sample of 1 Proposed System

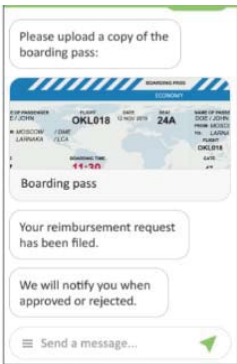


Figure 4: Sample 2 of Proposed System

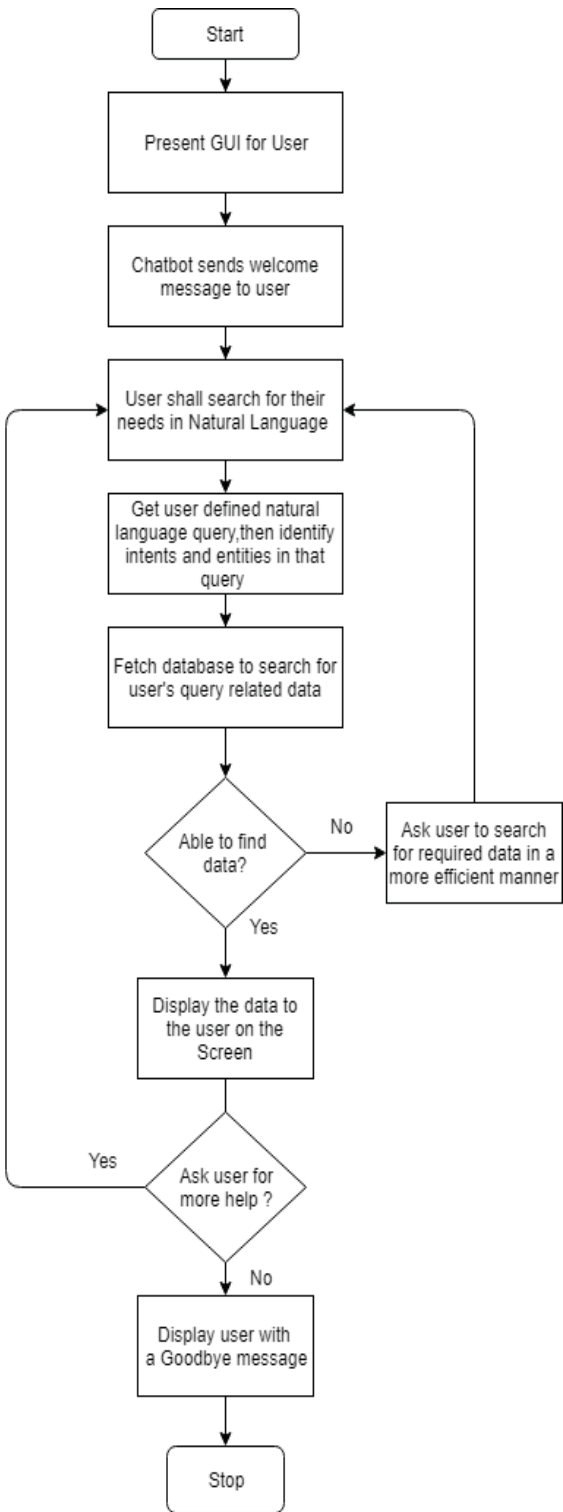


Figure 5: Flow Chart of Chat bot

V. DESIGN

5.1. Selection of OS

Windows is used for this project because it's user-friendly as well as robust.

5.2. Selection of Software

PyCharm is used for programming in Python

5.3. Creating Chat bot

For creating a Chat bot, a program has to be written. Python programming language is used for programming. The chat bot is created in such a way to help the employees, improve the communication amongst them.

5.4. Creating a chat

Chat is created using a pattern that is regarded to the user and will be easily understood.

5.5. Pattern Matching

It is a way of Artificial Intelligence used inside the design of a talk bot. The data is matched with the inputs saved inside the database and the corresponding reaction is returned.

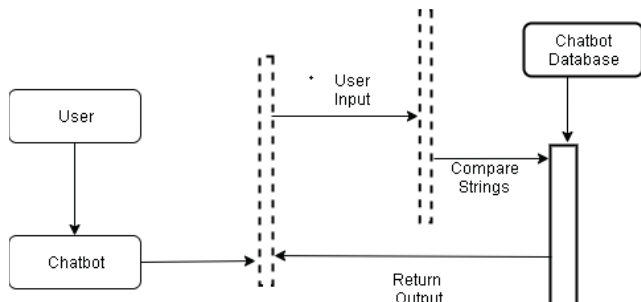


Figure 6: Design 1 of Chat bot

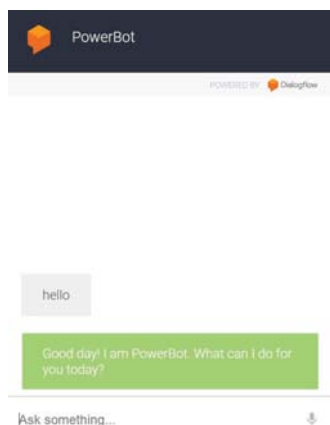


Figure 7: Design 2 of PowerBot

The chat bot is also known as “PowerBot”. The design is shown in Figure 7. Graphical User Interface (GUI) is an important component of any system. The front-end is developed using HTML and CSS.

VI. ABBREVIATIONS

- AIML – Artificial Intelligence Mark-up Language
- SSMS – SQL Server Management Studio
- NLP – Natural Language Processing
- GUI – Graphical User Interface

VII. CONCLUSION

We like to connect more on instant messaging than before with the new millennials in the workplace. To decorate employee engagement, the advent of chat bot may be a thrilling idea. Even although we understand that chat bot is

smart, please remember that it takes time to educate a bot so if you want to do it then please think about what location to begin with first and plan it properly. Implementing a Chat bot will reply to queries 24/7 in real time. The Chat bot will also be able to create the query list, so understanding which area needs to be improved could be valuable data for the HR team. With the employee's hectic schedule today, chat bot deployment could be a way to reduce the time taken away from them. The data collected will be more reliable and the bot can be used to make reminders easier. The chat bot has proven to meet the demand of users who want data and resources on instant access and availability.

With the new millennial into the workforce, they prefer to interact extra on immediate messaging that before. The implementation of chat bot might be an interesting concept to enhance employee engagement. Although we understand that chat bot are smart but please keep in mind it takes time to teach a bot thus if you have purpose to do it then please think via which area first of all and plan it correctly. Implementing a chat bot may be capable of solution queries in actual time 24/7. The chat bot may be able to build up the database of questions asked therefore it is probably valuable information to the HR crew to recognize what vicinity want to enhance. With the demanding time desk of employee nowadays, implementation of chat bot might be possible manner of lowering the time some distance from them. Data collected might be greater particular and reminders can be carried out easily the usage of the bot. The chat bot has demonstrated to fulfil the call for users wanting instantaneous get right of entry to and availability facts and services.

VIII. FUTURE SCOPE

HR chat bots help growth productivity and overall performance by selling a particular query analysis. Chat bots research from enjoy and interactions with users, the accuracy of the replies only permits up with time and consequently, the demand for human operators to move in decreases.

Instead of AIML based bot, other algorithms can be implemented. We can include voice-based queries. The users will have to give voice input and the system will give the text output. Also, after the successful execution of chat bot in the HR domain, we can implement it in other domains like medical, forensic, sports, etc. It will be beneficial in all the fields as without spending much time, we are accessing the relevant information and that too without any sorting.

ACKNOWLEDGMENT

We wish to express thanks to our Director Dr. Mohiuddin Ahmed and our Principal Dr. Ganesh Kame, M.H. Saboo Siddik College of Engineering for providing us all the facilities, support and wonderful environment to meet our project requirements. We would also express our humble gratitude towards the Head of Department of Computer Engineering Dr. Zainab Pirani for supporting us in all aspects and for encouraging with her valuable suggestions to make our project success. We are highly thankful to our internal project guide Prof. Shabana Tadvī whose valuable guidance helped us understand the project better, her constant guidance and willingness to share her vast knowledge made us understand this project and it's

manifestations in great depths and helped us to complete the project successfully. We would also like to acknowledge with much appreciation the role of the staff of Computer Department, especially the Laboratory staff, who gave the permission to use the labs when needed and the necessary material to complete the project. We would like to express our gratitude and appreciate the guidance given by other supervisors and project guides, their comments and tips helped us in improving our presentation skills. Although there may be many who remain unacknowledged in this humble note of appreciation but there are none who remain unappreciated.

REFERENCES

- [1] <https://expertsystem.com/chat-bot/>
- [2] <https://www.einfochips.com/blog/a-complete-guide-to-chat-bot-development-from-tools-to-best-practices/>
- [3] <https://marutitech.com/chat-bots-work-guide-chat-bot-architecture/>
- [4] Dahiya, Menal. "A tool of conversation: Chat bot." *International Journal of Computer Sciences and Engineering* 5.5 (2017): 158-161.
- [5] Mohan, Reenu. "The Chat bot revolution and the Indian HR Professionals." (2019).
- [6] Joshi, Deepika. "BITA: Stepping into HR-Chat bots for Improved Experience-A Review." *International Journal of Research in Engineering, IT and Social Sciences, Impact Factor* 6 (2018).
- [7] Weizenbaum, Joseph. "ELIZA---a computer program for the study of natural language communication between man and machine." *Communications of the ACM* 9.1 (1966): 36-45.
- [8] Nawaz, Nishad, and Anjali Mary Gomes. "Artificial Intelligence Chat bots are New Recruiters." *Artificial Intelligence* 10.9 (2019).
- [9] <https://www.pockethrms.com/hr-chat-bot.php>
- [10] https://link.springer.com/chapter/10.1007/978-3-030-30275-7_4
- [11] <https://www.thebalancecareers.com/use-chatbots-to-automate-hr-many-services-4171964>
- [12] Yawalkar, Mr Vivek V. "A Study of Artificial Intelligence and its role in Human Resource Management." (2019).
- [13] Sharma, Vibhor, Monika Goyal, and Drishti Malik. "An Intelligent Behaviour Shown by Chatbot System." *International Journal of New Technology and Research* 3.4 (2017).
- [14] Colace, Francesco, et al. "A Conversational Workflow Model for Chatbot." *SEKE*. 2017.
- [15] Deshpande, Aditya, et al. "A survey of various chat bot implementation techniques." *International Journal of Computer Engineering and Applications* 11 (2017).