Use of Artificial Intelligence and Automation of Interview Process using the Chat Bot

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AbstractThe AI and the Interview Chat bot used in the system will be the future for any recruitment process as it effectively saves the time /effort and improves the efficiency of the recruitment process. The selection process through the bot will be unbiased and also will be speedy as multiple interviews can be done at the same time. Chatbots will also make the interviewee comfortable as it may be integrated on mobile platform. To summarise, the future of the interviewing process will be made simple by use of the chatbots.

***Index Terms*: Chatbots, summarise,AI and the Interview Chat.**

I. INTRODUCTION

The role of Human Resources(HR) Manager assumes greater significance in the context of hiring as enormous effort is required to recruit right resources for the growth and productivity of the organization. In today's world, the job of HR Manager is reduced to merely sourcing the candidates using online/offline sourcing tools that are currently available in the market. The meticulous and manual process of recruitment manager reaching out to ideal candidates based on job description by applying various filters is a laborious and time-consuming process. The follow-up activity of scheduling interview with the various internal teams and extending offer to the right candidates is another hectic process. Thus, a significant amount of time of hiring manager is squandered doing these tedious and tiresome activities when a HR Manager ideally should be focusing more on innovative policies and increasing the productivity of the associates.

The Artificial Intelligence (AI) has made inroads into HR space now. The HR organization can now adopt the latest available AI tool in making the recruitment process much simpler, cost-effective and productive.

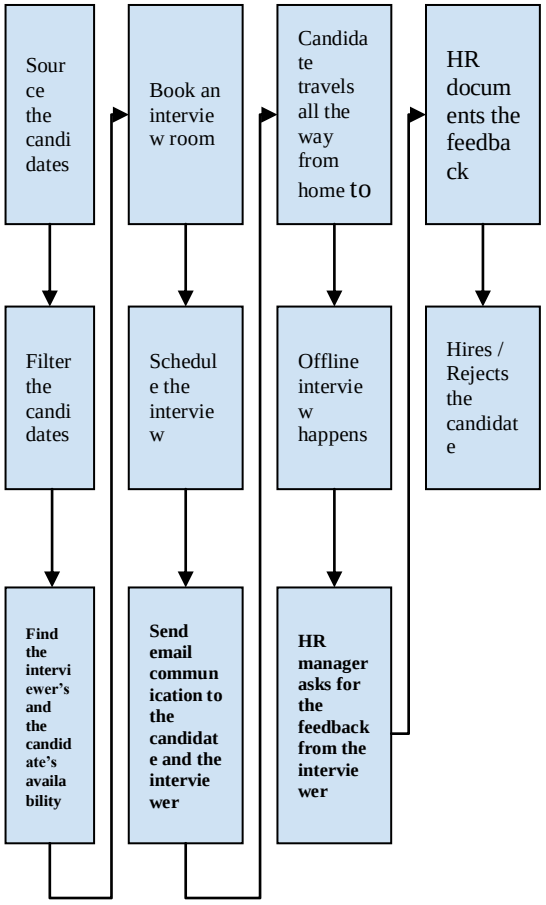

Fig. 1 – Traditional Interview process

II. ONLINE INTERVIEW SYSTEM(INPIQ)

To ease the job of doing recruitment, we have devoped an online Interview system. In this system, the recruiter has to login, select the candidate/interviewer mail IDs, choose the date of the interview, fix the duration of the interview, choose the profile and click on **Schedule**. The interview is scheduled without manual intervention.

The following are the steps involved:

1. The candidate and the interviewer would receive email notification, SMS and whatsapp about the scheduled interview. The system generates all these reminders fifteen minutes prior to the interview again. (The best part about the system is, the interviewer and the candidate need not login in to the system. The interview link with encrypted details will be sent to all communication channels to identify the user of the system).
2. The interviewer and the candidate clicks the link, joins the video call interview. (The interview room is equipped with real time video, real time chat, real

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time codepad). Both the interviewer and candidate can switch to phone call if the internet bandwidth is not supporting the video call.

3. At the end of the interview, the interviewer fills the feedback about the candidate in the system. (Studies have been conducted in to using AI technique based intelligent system which were used to streamline, select and even help in retaining talents of higher caliber (Chien and Chen, 2007))

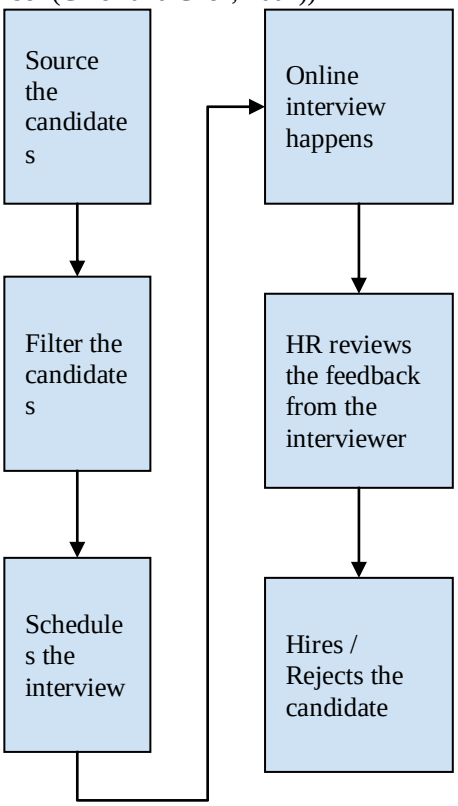

Fig.2 – Online Interview process

Video recording of the entire process is taken care by the system. Once HR manager logs in to the system, he/she can find audio/video recording, Code pad submission (in case if the interview technical), the chat history and feedback about the candidate. In the end, HR manager is empowered to hire or reject the candidate.

III. LITERATURE REVIEW

The emergence of Artificial Intelligence has changed the landscape of human resource planning and development. AI has become an integral part in many fields including automobiles, international business and also educational institution. AI has been used to change the HR practices followed in the company while attempting to reduce the error and cost involved in the HRM services (Hmoud and Laszlo, 2019).

Artificial Intelligence has been defined as to "create computer and/or hardware systems that exhibit thinking comparable to that of humans, to display characteristics usually associated with human intelligence" (Lucci and Kopee, 2016). Chui et al (2015) described intelligence as the ability to perceive the information, analyze it and make prediction based on historical data available without help of any human mind.

The traditional HR activities have long evolved leading to change in the recruitment and selection process due to advancement in the technological front. Employee selection process has become technology driven (Evers et et al., 2005). Automated systems are used to source and refine applications received and provide support in process of selection. With new data techniques and processors, neural networking and data mining algorithms and artificial intelligence has started dominating the AI field (Kantardzic, 2011)

Intelligent decision support system has recruitment functions is used to improve the efficienct of job matching and recruitment (Maum et al., 2018). Algorithm based web search engine uses AI techniques to search the internet for profile best fitting the job description (Strohmeier and Piazza, 2015). These searches result in comprehensive and best finding possible than any human searches (Lucci and Kopec, 2016). AI techniques could be used for streamlining resumes for the process of screening (Strohmeier and Piazza, 2015).

IV. INTRODUCING THE BOT

The vision set out for the BOT project is to reduce the recruitment effort of Human Resources(HR) manager. The time and effort needed to schedule an interview and hire a candidate is considerably reduced in the above method. We also delved into evolving a system where the HR manager just speaks and gets things done. Adding another layer, **CHAT BOT** gives the much-needed relief. The CHAT BOT primarily aims in reducing the work of the HR manager by scheduling the interview in no time and assessing the performance of the candidate in a few words.

Product and Use

This chat bot mainly uses Google dialogue flow for creating and configuring the chat bot. It uses node js and MongoDB in the backend for the backend process and persistent storage. It also uses Google analytics for analyzing the users behaviour, pattern and demographic. By introducing the Bot, the manager doesn't have to login and schedule the interview; instead the bot schedules the interview. The manager just has to just open the bot just using google assistant/web, telegram/Facebook and just tell the required information.

For example, HR Manager opens the bot and tells "Schedule an interview for Aravind with John for the position of Java Developer tomorrow 9 AM and keep it for 45 mins". Your bot replies, **"Interview scheduled."(fig.7)**

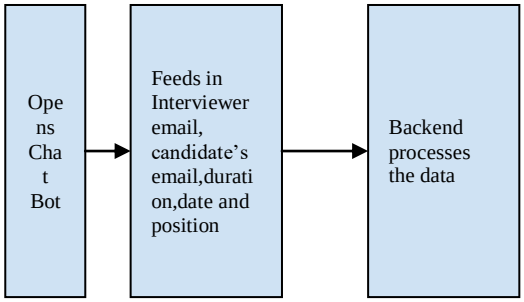

Fig. 3 – BOT enabled Interview System

After the bot has acquired the required information, it triggers a fulfillment request. The bot

then sends the acquired information as a filament request to the web hook which is nothing but a server side code. The web hook receives the data sent by the bot and validates the data.

Here are some things that api Layer validates:-

- validates whether the interviewer and candidate's email are in the email format
- Validates whether or not the email exists in the real world
- Validates the date and time

If all the above data are valid, the data is inserted into the database MongoDB. Then with the help of the received data, an Email regarding the interview(fig.9) is sent both the interviewer and the candidate. The system shares a link to both upon confirming the date and time of the interview. The link will be activated(fig. 10) only on the date and time specified already in the system.

The video recorded during the interview process is then stored an object storage for evaluation purposes. A code gets triggered(fig.11) which can evaluate a candidate based on the below- mentioned parameters:

- candidate's confidence level
- candidate's expressions (sentiment)
- candidate's coding style (erased/rewritten)
- rate of speech

In the end, the final result will be stored in the database that can be retrieved when the HR manager queries the bot about the performance of the candidates. For example, the HR asks "Who performed well during the technical round for the position of Java Developer last week?" and then the Bot responds as "It's Aravind. Do you want to hire him?".

The manager can also retrieve the interview results of a specific candidate. If the manager has a doubt about the best candidate he can also verify by asking the bot to show the interview details which includes recorded video, audio, codepad(fig.11), chat and feedback.

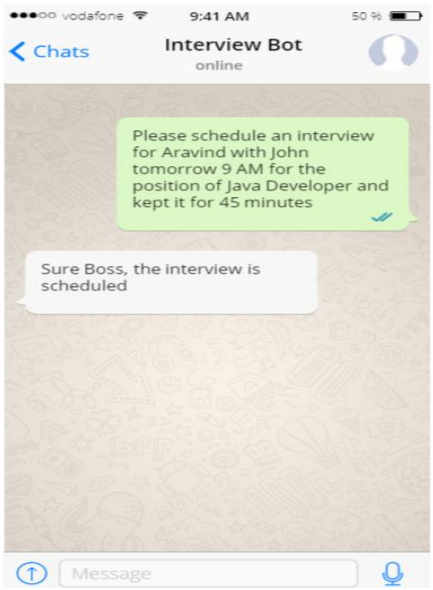

Fig 4. -Scheduling the interview using Interview Bot

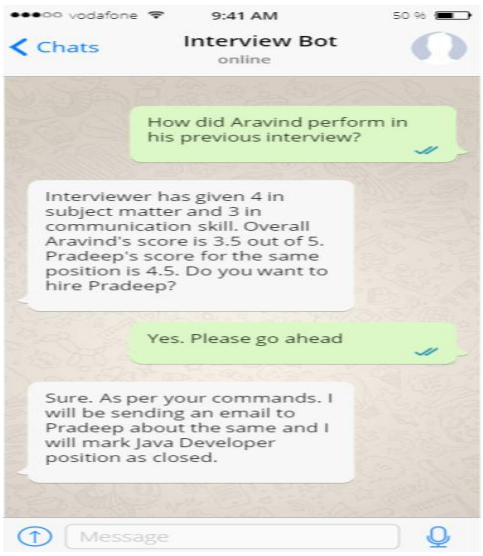

Fig 5. Bot analysing the performance of the candidates and helping the HR to hire the best candidate

This is how Bot analyses the performance of the candidates and helping the HR Manager to hire the best candidate for the company.

V. TECHNICAL ARCHITECTURE

The online system developed(Inpiq) uses the following technical architecture.

Dialogflow

Dialogflow is a Google-owned developer of human–computer interaction technologies based on natural language conversations. The company is best known for creating the Assistant, a virtual buddy for Android, iOS, and Windows Phone smartphones that performs tasks and answers users' questions in a natural language. We have used Dialogflow for creating Rule based machine learning chat bot.

NodeJS

Node.js is an open-source, cross-platform JavaScript run-time environment that executes JavaScript code outside of a browser. We have used nodejs for running our backend webhook system that can handle the fulfillment from Dialogflow. NodeJS is hosted on top of AWS Lambda.

AWS Lambda

AWS Lambda is an event-driven, serverless computing platform provided by Amazon as a part of the Amazon Web Services. It is a computing service that runs code in response to events and automatically manages the computing resources required by that code. It was introduced in November 2014. Since using Lambda will decrease our cost of running our own server and will increase the efficiency of our code, we decided to host the nodejs in AWS Lambda.

MongoDB

MongoDB is a cross-platform document-oriented database program. Classified as a NoSQL database program, MongoDB uses JSON-like documents with schemata. MongoDB is developed by MongoDB Inc. and licensed under the Server Side Public License. We have used mongodb for persistent data storage which in future will help us

increase our data store. This can exponentially improve our machine learning model.

PHP

Hypertext Preprocessor is a general-purpose programming language originally designed for web development. It was originally created by Rasmus Lerdorf in 1994; the PHP reference implementation is now produced by The PHP Group. We have used PHP for RESTful web api's. Sending emails, reminders, interview room, codepad, phone call all these features are developed using PHP. We have used a framework called as CodeIgnitor which gives us all the advantages of MVC design pattern. For the model, we have used a PHP framework called SLIM.

POSTMAN

Postman is a Google Chrome app for interacting with HTTP APIs. It presents you with a friendly GUI for constructing requests and reading responses. The people behind Postman also offer an add-on package called Jetpacks, which includes some automation tools and, most crucially, a Javascript testing library. We have used postman to test our PHP built APIs and NodeJS APIs.

Redis

Redis is an in-memory data structure project implementing a distributed, in-memory key-value database with optional durability. Redis supports different kinds of abstract data structures, such as strings, lists, maps, sets, sorted sets, HyperLogLogs, bitmaps, streams, and spatial indexes. We have redis for caching data and keeping in memory.

VI. FEW SNAPSHOTS OF THE ONLINE SYSTEM

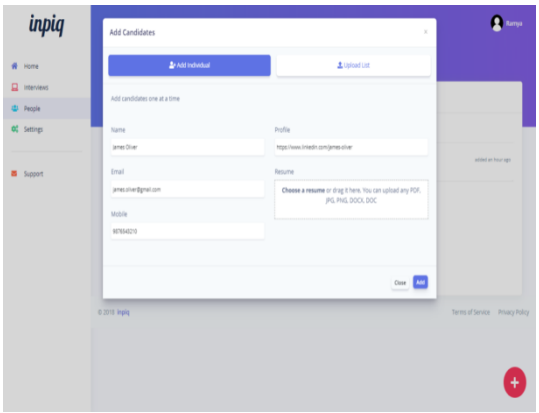

Fig 6 Adding a candidate to the system using online web based system

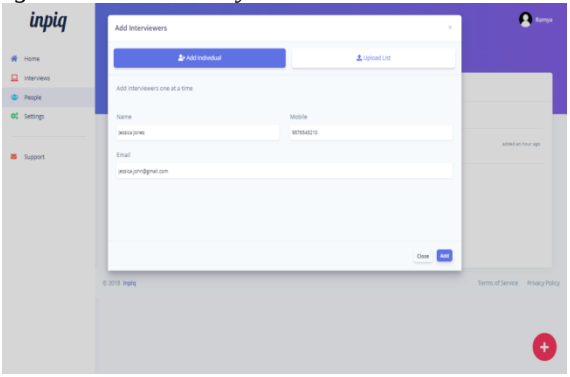

Fig.7 – Adding an interview

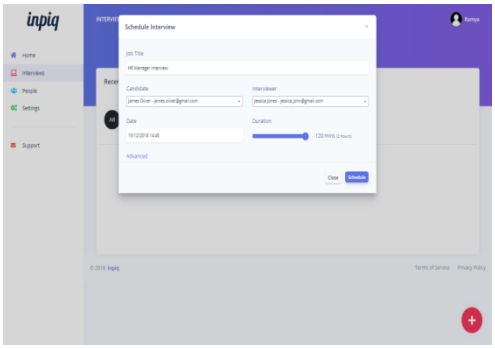

Fig8 - Scheduling an interview

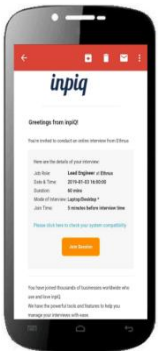

Fig. 9 - Email communication

Fig.10 - Candidate and Interviewer meeting online

Fig. 11 . Coding in the platform by the candidate

VII. CONCLUSION

With the current US visa restrictions, many of the IT companies and IT captives of consulting, banks, analytics and product companies have set up their development centres in India. With the world moving towards artificial intelligence and automation, these companies have received good projects that require experienced personnel to execute these projects. With a conventional selection process, it is going to be difficult to select candidates within the required time lines. The recruitment manager apart from the recruitment function is usually involved in other HR roles. As he is always banking on the support of technical expert or project manager, this tool will be able to save the time and effort in the recruitment process.

Reviewing the performance of the candidate in the interview is an additional bonus.

This system will be also useful for the startups where the entire selection process is coordinated without a full time HR manager.

The system also may help in the campus recruitment process as it can do the process for multiple candidates at the same time. If programming is involved in the campus recruitment interview process, the bot will be able to compare the codes written by the candidates and can give inputs on the performance of the candidates.

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