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## C.A.B-CAREER ADVISORY BOT

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### ABSTRACT

Chat bots are Software agents used by humans to interact with computer in natural language. Just as people use language for human communication, chat bots use natural language to communicate with human users. The main aim of their creation was to resemble a human being in the way they perform say interaction, trying to make user think that they are communicating to a human. This paper will discuss about basics of Artificial Intelligence and describe how a chatbot can be used as a career advisory bot i.e., for analyzing users queries related to career options and provide an appropriate result to the query of the user. The user can ask questions about career related query through the system. The user does not need to go a career counsellor personally for the same. It also provides the details of exams need to written in order to follow the path they have chosen. Firstly, the system analyses the question asked by the user and then provides a suitable answer to it as if it is answered by the counsellor. The system helps the user to choose a right career that they should follow according to their interests and capabilities

**Keywords:** *Artificial Intelligence ,chat bot , A L I C E ,Knowledge Base, Expert System.*

## I. INTRODUCTION

Career guidance is a domain which involves human experts such as councilors who provide advice to select appropriate career paths for individuals after considering the personal information and available options. This facility is vital to any higher education institute, because student tends to consult experts in determining their career paths. This activity takes place when students are not confident regarding their future career and when they have problems in determining what is best for them out of the available options

### 1.1 About the Project

This expert system will pave way for the students to get advice on their career path that they wish to choose according to their interests. For the students who do not have a clear vision about a career path, C.A.B will provide the possible path that one can take based on their past track records and their preferences. It will also provide alternatives and options that students can take in order to mitigate the risk that could prevail in some paths although the student opts for certain subjects.

A chatbot is successful only when it reaches the correct audience in a correct and meaningful way it is possible only when one is clear about the target audience. In case of C.A.B the targeted audience are the students who have been completed their under graduation and are planning for post graduation such as Diploma, Master and PhD which have benefits like flexibility, learn while you earn, put theory to practice, less competition as well as drawbacks like availability, longer duration, excessive stress, etc.

### 1.2 Objectives

- To design a virtual real-time intelligent bot that can support the academic advising process or act as a substitute for the human advisor.
- To incorporate “inter-activeness” and history taking/persistence in the advisory system using permanent information store.
- To aware students about the opportunities that they don't know.
- It also provides the list of the top colleges or universities.
- Students can save their time by using C.A.B since they need not consultant the career advisor personally.

**1.3 Scope**

Through our chatbot we are trying to help students in choosing their career after under graduation based on their interest. There are many opportunities available that we are not aware of for example, there are many courses like Post graduation diploma in Human resource management, Post graduation diploma in Banking and Finance, MBA, Post graduation diploma in Hotel Mngement.

**1.4 Advantages**

- Discard Confusion.
- Educational Guidance and support.
- Career related to education is made clear.
- Get to know the availabilities.
- Testing to determine Strengths and Weaknesses.

**1.5 Disadvantages**

- Uncertainty.
- Multiple Solutions.
- Only students who are under graduates can get advices using C.A.B

**1.6 Application**

- Enhanced Student Engagement
- Better Student Support
- Instant Help to Students

**1.7 Software Requirements**

Watson is a question-answering computer system capable of answering questions posed in natural language, developed in IBM's DeepQA project by a research team led by principal investigator David Ferrucci. Watson was named after IBM's first CEO, industrialist Thomas J. Watson. The key difference between QA technology and document search take keyword query and returns a list of documents, ranked in order of relevance to the query (often based on popularity and page ranking), While QA technology takes a question expressed in natural language, seeks to understand it in much greater detail, and returns a precise answer to the question.

**II. LITERATURE SYRVEY**

Dinkel J.J, Mote J and Venkataraman M.A. Has proposed a paper “An Efficient DecisionSupport System For Academic Course Scheduling”.This particular chatbot describes a networkbased decision support system approach to the most general form of the academic coursescheduling problem. The dimensions of faculty,subject,time and class room are considered byincorporating a penalty function into a network optimisation approach. The approach, based on anetwork algorithm, is capable of solving huge problems. Such situations include: scheduling ofexams,time tables and rooms in an academic setting etc.[1]

Wehrs W.E has proposed a paper “Using an Expert System to Support AcademicAdvising, Journal of Research on Computing in Education” which says there are widespreadperceptions that academic advising is not done well enough in public higher education.Computer-assisted advising is a delivery system that has been used effectively in support of theconventional advising process. Computer-assisted advising is a well suitable application domainfor expert systems.[2]

Pokrajac D and Rasamny M has proposed a paper “Interactive Virtual Expert system forAdvising” and developed InVESTA-Interactive virtual expert system for advising- which isuseful to assist undergraduate students and their advisors in providing timely,accurate andconflict free schedules. The proposed system is based on java and object-relational databasetechnologies and consist of the database layer, scheduler and the web based front-end. The front-

end provides the user interface. In this paper, they have discussed the structure and functionality of the system with particular emphasis on database design and specified the scheduling algorithm.[3]

Olawande D, Onyeka E, Ibukun A, Charles A has proposed a paper “Implementation of an Intelligent Course Advisory Expert System” and implemented an intelligent Course Advisory Expert System(CAES) that uses a combination of rule based reasoning(RBR) and case based reasoning(CBR) to recommend courses that a student should register in a specific semester, by making recommendation based on the students academic history. The evaluation of CAES yielded satisfactory performance in terms of credibility and usability.[4]

Deniz D.Z and Ersan I ha proposed a paper “An Academic Decision Support System Based on Academic Performance Evaluation for Student and Program Assessment” according to which statistics plays an important role in assessment and evaluation of performance in academic environments. Universities need to have extensive analysis capabilities of student achievement levels in order to make appropriate academic decisions. Conversely, academic decisions will result in academic performance changes, which need to be assessed periodically and over spans of time.[5]

Archana Parab, Siddhesh Palkar, Satish Maurya, Sonal Balpande has proposed a paper “An Intelligent Career Counselling Bot A system for counselling” which describes efforts in the development of an intelligent career counselling bot. Career counselling project is built using artificial intelligence algorithms that are used for analysing users queries and understand users message. It provides some valid result to the query of the user. The user can query any career related query through then system. The user doesn't have to personally go to career counselor for the same. The system analysis the question and then answers to the query as if it is answered by the counsellor. This system helps the user to choose the right career that they should follow according to their interest and capabilities.[6]

Wilson Nwankwo has proposed a paper “Interactive Advising with Bots: Improving Academic Excellence in Educational Establishments” which is the first part of the study aimed at creating a balance in the foregoing situations by presenting a design of a faceless automated “Advisor Bot” based on the bot framework. The design reflect a virtual support system model which could be adopted to enhance student support and course advising efficiency. The design follows a mix of agent and object-oriented approaches and produces and implementation-ready specification whose full implementation would effectively support students during their studies. The system facilitates the process of advising by providing

quick and easy access to a valuable information, and giving important feedback on several issues involved in student advisement, which otherwise would take considerable time.[7]

### III. PROPOSED SYSTEM

The aim of career advisory bot is to cry out a conversation between humans and machine. some knowledge has been embedded into the machine so that it identifies the sentences and making a decision itself as response to answer a question .The response principle is to extract the tokens from the sentence process on that find the goal of sentence by matching the input sentences from user.

This System can be used by any user who is confused about choosing the future career or anyone who wants to know what career they should choose that would be beneficial for them in future. The bot will help the users who have graduated as it suggests the courses available after their under graduation for them in order to build up their future.

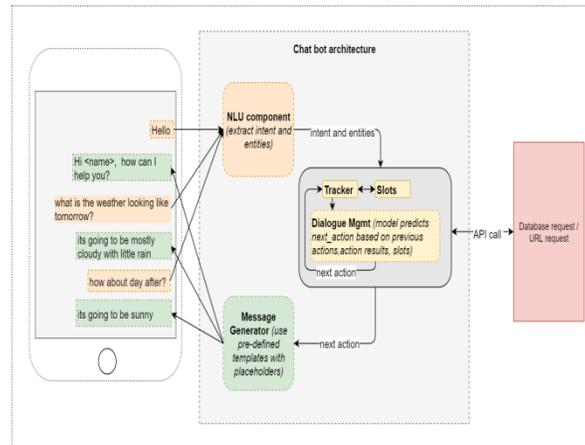


Figure 1 : Architecture

### 3.1 Natural Language Processing(NLP)

Natural language processing (NLP) is related to artificial intelligence, computer science which is concerned with the interactions between computers and human (natural) languages and, in particular, concerned with programming computers that is used for processing large natural language corpora. Various aspects in natural language processing frequently involve natural language understanding, natural language generation, connecting language and machine perception, managing human-computer dialog systems, or some combination thereof.

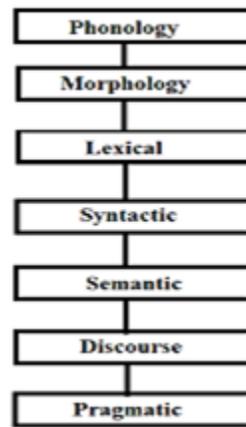


Figure 2:NLP

### 3.2 Knowledge Base

A Knowledge base (KB) is a technology used by a computer system to store complex structured and unstructured information. The initially it was used in connection with expert systems which were the first knowledge-based systems.

The knowledge base is an important part of a chatbot. All the important data that the chatbot processes and requires in order to interact with the user is kept in the knowledge base of that chatbot.

### 3.3 Natural Language Understanding(NLU)

It has 3 specific concepts like:

- Entities: Entity basically represents a concept in your chatbot. It might be a payment system in your Ecommerce chatbot.

- Intents: It is basically the action chatbot should perform when the user say something. For instance,intent can trigger same thing if user types "I want to order a red pair of shoes", "Do you have red pair of shoes", all of these user's text show trigger single command giving users options for red pair of shoes.
- Context: When a NLU algorithm analyzes a sentence, it does not have the history of the user conversartion. It means that if it receives the answer to a question it has just asked, it will not remember the question. For differentiating the phases during the chat conversation, it's state should be stored. It can either be flags like "Ordering Pizza" or parameters like "Restaurant: 'Dominos'". With context, yu can easily relate intents with no need to know what was the previous question.

### 3.4 How chatbots actually work ?

The chatbots work by adopting 3 classification methods:

- Pattern Matchers
- Algorithms
- Artificial Neural Networks

For each kind of question, a unique pattern must be available in the database to provide a suitable response. With lots of combination on patterns, it creates a hierarchical structure. We use algorithms to reduce the classifiers and generate the more manageable structure. Computer scientists call it a "Reductionist" approach - in order to give a simplified solution, it reduces the problem.

Multinational Naive Bayes is the classic algorithm for text classification and NLP. For an instance, let's assume a set of sentences are given which are belonging to a particular class. With new input sentence, each word is counted for its occurence and is accounted for its commonality and each class is assigned a score. The highest scored class is the most likely to be associated with the input sentence.

For example sample Training set

```
class: greeting
"How you doing?"
"good morning"
"hi there"
```

Few sample Input sentence classification:

```
input: "hello good morning"
term: "hello"(no matches)
Term: "good"(class: greeting)
term:"morning"(class: greeting)
classification: greeting(score=2)
```

With the help of equation, word matches are found for given some sample sentences for each class. Classification score identifies the class with the highest term matches but it also has some limitations. The score signifies which intent is most likely to the sentence but does not guarantee it is the perfect match. Highest score only provides the relatively base.

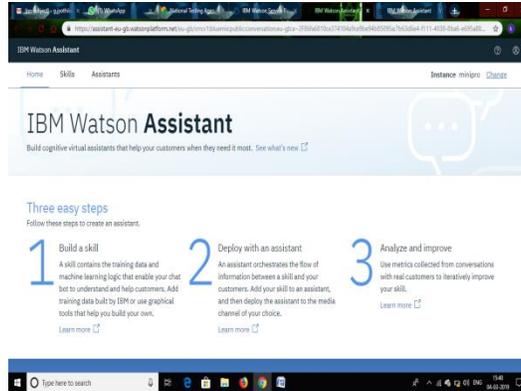


Figure 3: Watson Assistant

Watson Assistant is a platform that allows developers & non-technical users to collaborate on building conversational AI-powered assistants. It is a powerful visual editor, industry-leading NLP capabilities, flexible API.

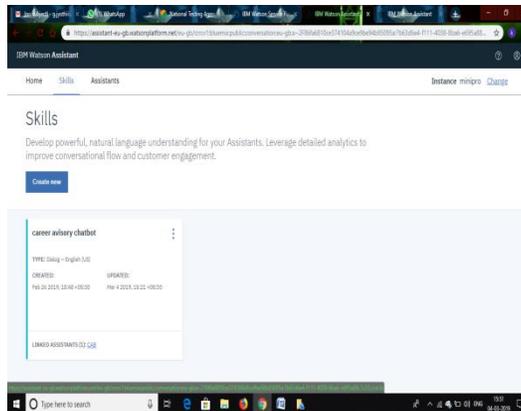


Figure 4: Creating Skills

We have to create a new skill by clicking the create new button, then we have to give a name and description (optional), then select a language and click on create. Then a new skill will be created.

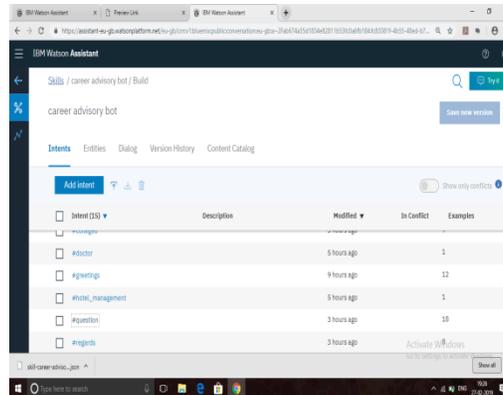


Figure 5: Intents



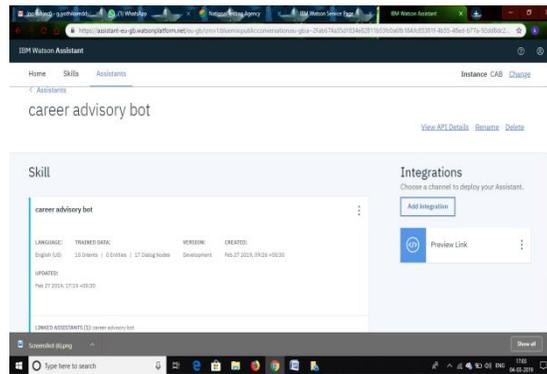


Figure 8: Preview link

After completing flow 1 in Node RED, now we have to integrate preview link. By finishing this we will be creating a link for our chatbot using which we can access our chatbot from any place

## V. RESULTS AND DISCUSSION

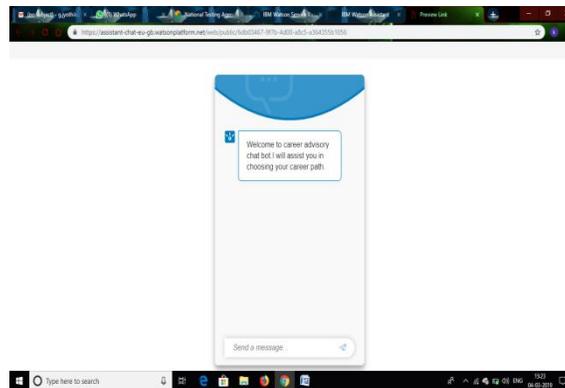


Figure 9: Welcome message

we have created our assistant using IBM Watson which responds in the following manner. First the assistant Welcomes the user and introduce about itself that what it can do for the user.

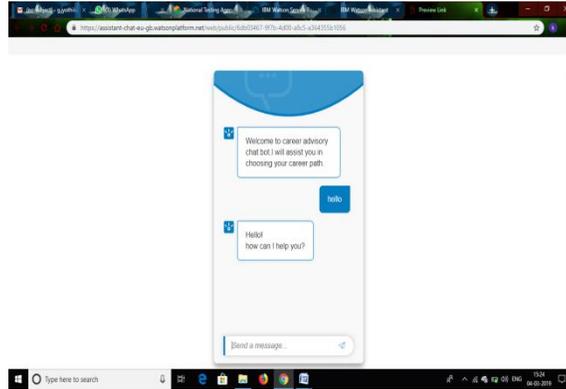


Figure 10: First question

If the user replies with greetings it responds with greeting and asks the user that how can it help him/her.

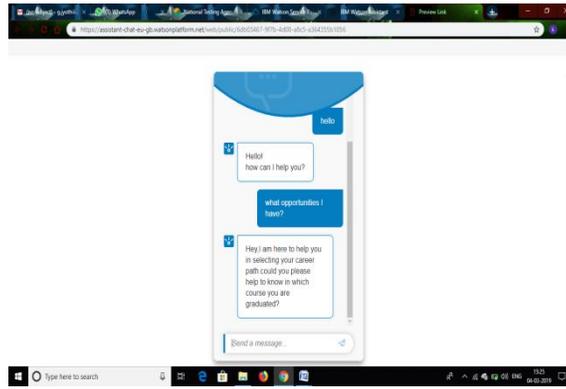


Figure 11: output for first question

If the user asks question like what are the opportunities he have after undergraduation then the bot asks the user in which course he has completed his graduated. If the users reply is like MBBS then it shows the list of courses he can do.



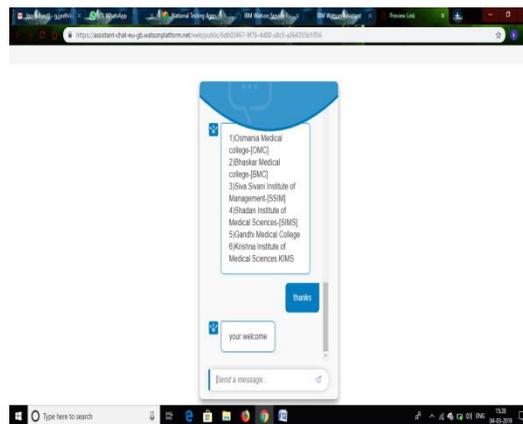
Figure 12: Response to the user answer

It shows the courses available for the user after MBBS with Exams to clear in order to join the respective college.



**Figure 13:Response to user query or question**

If the asks for the top colleges he have, it shows the top 5 to 10 colleges present in India according to their rankings.



**Figure 14: Response to user regards**

If the user satisfies with the output and says thanks the chatbot replies 'your welcome' taking that as regards.

## VI. CONCLUSION

Our C.A.B helps users know the courses available and top 5-10 colleges available in India. This paper proposes an intelligent chatbot system for career advice, which will help user in choosing the right career by giving an appropriate response to users query. This system will be helpful in reducing the stress of the students as students need not browse all the websites to know about the courses available after their under graduation. It also helps users to know about the Exams to clear to join the courses they are interested. We have included courses for the students who have graduated in B.tech/B.E, B.sc,B.Com,BA, MBBS and Hotel management. Due to an accurate knowledge base, quick answers will be given to user. We like to include all the courses available for all the graduates and even for 10th & 12th grade students so that it will be helpful to all in deciding their career by sitting at home itself as they need not consult career counsellor personally for the same. They need not take stress about their future. We would like to integrate our career advisory chatbot with other social media platforms so that it reach out many people

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