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# Exam Reference Bot

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## ABSTRACT
Chatbots, or conversational interfaces as they are also known, present a new way for individuals to interact with computer systems. A chatbot allows a user to simply ask questions in the same manner that they would address a human. The most well-known chatbots currently are voice chatbots: Alexa and Siri. However, chatbots are currently being adopted at a high rate on computer chat platforms. Chatbot is widely used now-a-days and catching speed as an application of computer of computer communication. This paper presents a survey on the comparison is made between different designs techniques from nine carefully selected papers according to the main methods adopted. These papers are illustration of the significant improvements in Chatbots in the last decade. A chatbot can be used anywhere a human is interacting with a computer system.

***Keywords:*** *Chatbot, Artificial Intelligence, AIML, conversation, Facebook.*

## 1. INTRODUCTION

In the field of computer science, artificial intelligence (AI), sometimes called machine intelligence,is intelligencedemonstrated by machines, in contrast tothe natural intelligence displayed by humans and other animals. Computer science defines AI research as the study of "intelligent agent": any device that perceives its environment and takes actions that maximize its chance of successfully achieving its goals. More specifically, Kaplan and Heinlein define AI as "a system's ability to correctly interpret external data, to learn from such data, and to use those learnings to achieve specific goals and tasks through flexible adaptation". Colloquially, the term "artificial intelligence" is applied when a machine mimics "cognitive" functions that humans associate with other human minds, such as "learning" and "problem solving". The scope of AI is disputed: as machines become increasingly capable, tasks considered as requiring "intelligence" are often removed from the definition, a phenomenon known as the AI effect, leading to the quip in Tesler's Theorem, "AI is whatever hasn't been done yet." For instance, optical character recognition is frequently excluded from "artificial intelligence", having become a routine technology. Modern machine capabilities generally classified as AI include successfully understanding human speech, competing at the highest level in strategicgame systems(such as chess and Go), autonomously operating cars, and intelligentroutingin contentdelivery networks and military simulations.

Artificial intelligence was founded as an academic discipline in 1956, and in the years since has experienced several waves of optimism, followed by disappointment and the loss of funding (known as an "AI winter"), followed by new approaches, success and renewed funding. For most of its history, AI research has been divided into subfields that often fail to communicate with each other. These sub-fields are based on technical considerations, such as particular goals (e.g. "robotics" or "machine learning"), the use of particular tools ("logic" or artificial neural networks), or deep philosophical differences. Subfields have also been based on social factors (particular institutions or the work of particular researchers). The traditional problems (or goals) of AI research include reasoning, knowledge representation, planning, learning, natural language processing, perception and the ability to move and manipulate objects. General is among the field's long-term goals. Approaches include statistical methods, computational intelligence, and traditional symbolic AI. Many tools are used in AI, including versions of search and mathematical optimization, artificial neural networks, and methods based on statistics, probability and economics. The AI field draws upon computer science, information engineering, mathematics, psychology, linguistics, philosophy, and many other fields.

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Chatbot also known as Chatterbots or chatter robots, is the computer system that can communicate with human in the form of messaging app. They can also understand multiple question requested by human. They also have the ability to differentiate uniqueness of word including emoticons. In order to get best quality of Chatbot conversation, they need to have richness of vocabulary of conversation among people. Chatbot may look like a normal messaging app, they have application layer, a database and also APIs (Application Programming Interface) working at the background. User interface represents the interface to make easy contact with user. While Chatbot is easy to use at background it has the complexity to achieve. Most of Chatbots have logs of conversation and developer use the logs in order to understand user requests. The logs is used to improve the Chatbot conversation. Chatbot works by matching question from user with the help of machine learning. For example, if the user question is, "Show me the university list of programs" or "I need the program list", both mean the same. The developer need to train the Chatbot to understand similar questions by delivering the same output. According to the Chatbot is being trained through the analysis of thousands of logs from human conversation. If there are more logs then the application will become more intelligent.

Speech is one of the most powerful forms of human communication. Hence, it is the researchers' ambition in the human-computer interaction research field to improve speech interaction between the human and the computer in order to trigger human-human speech interaction. Speech interaction with modern network computing devices has received increasing interest in the past few years with contributions from Google, Android and IOS. Because they are more natural than graphic-based interfaces, spoken dialogue systems are starting to form the primary interaction method with a machine. Therefore, speech interaction will play a significant role in humanizing machines in the near future. Spoken dialogue systems had received increased interest because they are potentially much more natural and powerful methods of communicating with machines than current graphics-based interfaces. Wired for Speech presents basic research in psychological and sociological aspects of voice synthesis and recognition.

Chatbot applications streamline interactions between people and services, enhancing customer experience. At the same time, they offer companies new opportunities to improve the customers engagement process and operational efficiency by reducing the typical cost of customer service. To be successful, a chatbot solution should be able to effectively perform both of these tasks. Human support plays a key role here: Regardless of the kind of approach and the platform, human intervention is crucial in configuring, training and optimizing the chatbot system.

To give suitable answers to keywords or phrases extracted from speech and to keep conversation continuous, there is a need to build a dialogue system (programme) called a Chatbot (Chatter-Bot). Chatbots can assist in human computer interaction and they have the ability to examine and influence the behaviour of the user by asking questions and responding to the user's questions. The Chatbot is a computer programmer that mimics intelligent conversation. The input of this programme is natural language text, and the application should give an answer that is the best intelligent response to the input sentence. This process is repeated as the conversation continues and the response is either text or speech.

Building a Chatbot needs highly professional programming skills and experienced developers to achieve even a basic level in realism. There is a complicated development platform behind any Chatbot which will only be as good as its knowledge base which maps a user's word into the most appropriate response. The bot developers usually builds the knowledge base as well. However, there are some platforms which provides a learning environment. Writing a perfect Chatbot is very difficult because it needs a very large database and must give reasonable answers to all the interactions. There are number of approaches to create a knowledge base for a Chatbot and include writing by hand and learning from a corpus. Learning means here saving new phrases and then using them later to give appropriate answers for similar phrases.

We want to design a chatbot that suggests and advices books to refer for public exams and also advices syllabus to cover for exams. The chatbot that we are designing is an adviser. It can be used by any student who is preparing for public exam or government exams. The student can also know the courses to choose after intermediate or graduation. This chatbot shows results according to the search of the person, it suggests reference books to aspirants. It can be used widely by students, since youth i.e.; students are in major proportion in society those are in need of

jobs mostly in government sector. This Chatbot is used at the time of exams that which book should be referred during exam time. In this bot we show the most referred books during exam time. It is more helpful for the students to refer during preparation time. In this bot we used main courses like engineering exams, NEET, civils, etc.

**Organization of Thesis**

The rest of the thesis is organized as follows:

- Chapter 2 describes the relevant work on chatbot travelling chatbots.
- Chapter 3prefers the Artificial Intelligent travel systems chatbots.
- Chapter 4 discusses the procedure and implementation.
- Chapter 5 concludes then follows by references.

## 2. LITERATURE SURVEY

**Proposed Chatbot**

Chatbot that we are going to design works on text input and voice output. It's a chatbot that suggests and advice reference books for students preparing for public exams, and also advices courses for further education. It's useful to students in order to prepare for exams, this chatbot makes it easy. Students find it difficult to study for public exams due to lot of syllabus to complete and they don't have correct access to find exact reference books to make it easy and to lighten the burden.

Chatbots are the new way where individual interacts with computer system, the way we interact with human beings. It's a virtual adviser, suggests things, and makes searches easy, works like a virtual guide in many ways. Speech input and outputs are being popularly in used due to their rapidity in conversation. For this speech to work we need NLP, which can be done either by java or python. But in this chatbot design we didn't use NLP. So, speech output is possible but not input. Input in speech is not possible because it needs a program and a compiler to convert a high-level-language to a machine level language. A computer could only respond to us only when the data is converted.

Public exams are very crucial for every student who are in search of job or are taking up higher studies. Such as engineering entrance exam, medical entrance exams, CAT, GRE, RRB, Govern. Jobs, etc. The students preparing for these exams need to read a lot and cover lot of portion, they may have a need of reference books, and this chatbot suggests reference books.

Chat works best if kept short and simple. Here are the 10 steps to make a chatbot:

**STEP 1:** First, consider use-cases where chat works best to solve a user query. Start thinking about your product around those use cases.

**STEP 2:** Next, define the exact goal of the bot.

**STEP 3:** On the basis of the set goal, work on the personality and tonality of the bot. The tonality of the chatbot is very important as it defines how the bot shall respond to the end user.

**STEP 4:** Now, list out the specific tasks a user can perform with the chatbot. Make the task-flow on a paper/whiteboard.

**STEP 5:** Convert the task-flow to a chat. Write a script and build a prototype of the script, on chat.

Here are some frequently used prototyping tools:

- *Botsociety*- It's a web-based software with all the chat elements for different chat platforms like Facebook messenger, Google home, Slack etc. This helps in making the prototype quickly.

- *Sketch + Marvel*-You can easily get templates for chat elements online. Start making art boards with messages and make them flow on a marvelapp. This helps in making prototypes which are very specific to your messaging platform.
- *Whatsapp*- Simply steal your friend's phone and start typing on your and his phone. Take screenshots and (please) return his phone once you are done :P

So far, this was the easy part. Just about 10% of the work. Here's where the hard work begins:

**STEP 6:** All content required for building the chatbot, such as personality questions, chat flow, headers, tasks, break responses etc. must be collated in a common excel sheet. This acts as a handoff kit from the designer to the developer, for him to start building the chatbot.

Once the bot is developed on the bot builder platform, start interacting with the actual chatbot.

**STEP 7:** Ask test users to have conversations with the chatbot. You will notice exactly where the chat flow is breaking.

P.S.—Quality check is VERY important!

**STEP 8:** Once you realize where the bot is breaking, keep training your bot continuously. Make note of all experiences and use cases which were missed in the first place and work around them.

**STEP 9:** Now, some overtly creative users will start asking random questions to the bot. Train your bot to say "no" in a subtle and polite way. The bot must clarify specific tasks that he can assist with.

**STEP 10:** Pay special attention to casual talk. Simple words like 'Great!', 'Howdee!', 'Hello!' etc. should have well-crafted responses, based on the bot personality. This form of casual talk helps in strengthening the chatbot's personality.

**Tips and Tricks for building an engaging personality for your chatbot:**

**TIP 1:** Give directional cues to the user

A chatbot should ask relevant questions from the user and provide suggestions that are simple 'tap to answer' message buttons. This helps in utilizing the chatbot's capabilities to the fullest and understanding instances where the bot needs training. If the user does not know what to say, the chatbot must come up with suggested tasks that he can perform for the user.

**TIP 2:** Connect with the user on a personal level

An effective chatbot should probably start with asking the user who he is, how he's feeling etc. Basically, it's good to start the conversation and break the ice. :Taking the user's name frequently, greeting him, congratulating him etc. are some practices, which make conversations more personalized.

**TIP 3:** Sometimes, it's all about timing

In some use-cases, it takes certain amount to time to process the user's request. In such cases, add fillers to keep the user engaged. Don't keep the user waiting!

**TIP 4:** Add emotions to your conversation

A big part of chat is emotion. ♥ The emotion behind your conversation should be in accordance with the purpose/goal of the bot. If the user has accomplished a task, give a cheerful response. If the user could not accomplish a task, feel the inconvenience and convey it in the correct manner. The right kind of emotions depend on the personality of the bot. UNLESS YOU ARE DESIGNING—A "Hodor bot" :P Hence in most cases, emotions should be based on context of the situation.

**Well-designed chatbots work best!**

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Interestingly, a chatbot has the ability to provide solutions to numerous use cases with a common interface. There's hardly any need to learn new gestures, UI elements or navigation. When it comes to chatbots, copy is the new design. This is the ultimate mantra for designing a magical chatbot. The personality of a chatbot is built out of relevant use-cases. As a bot builder, you must design a chatbot with a clear goal of getting a task completed instead of leaving it open to imagination.

## 3. ARCHITECTURE FOR NODE-RED

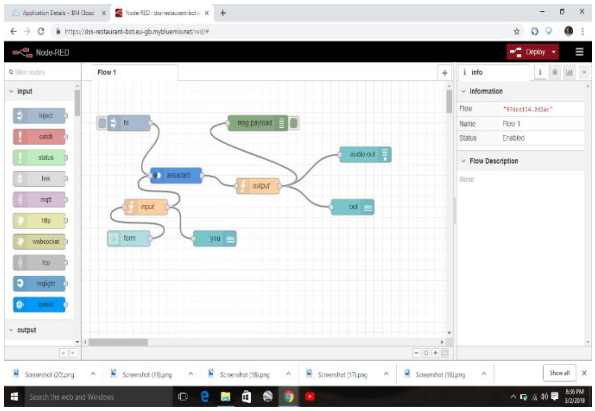

***Figure 1***

In IBM Watson assistance, Node-red is used, which is a flow-based development tool for visual programming developed by IBM for wiring together hardware devices. In this we firstly, drag and drop inject node for which we give payload as 'hi'. Then drag and drop a function node and name it as input writefunctiontoit as 'msg.payload=msg.payload.text', and give input as text. In the same way do, it for outputgivefunctionas'msg.payload=msg.payload.text'. Now get edit assistant node and drop it by connecting its input to input function node and inject node and its output to output node. Drop edit text node and edit form node. Now connect input function to form node and output of input node to text node by giving it as you.

Drag and drop debug node by editing it as msg.payload, connect it to output node' output. Drop audio node as out, text node name it as bot connect this both to output of output node. In the above architecture, in the form node the input and output is displayed it works as platform. Input and output functions work for input and output applications respectively. Assistant node assists between input and output nodes. Text node 'you' says that input is given by you that's a user, in the same bot is the dialogs or output by bot. Debug node is used to debug and execute the flow. Audio out is given as we enable audio output, we could access output through audio

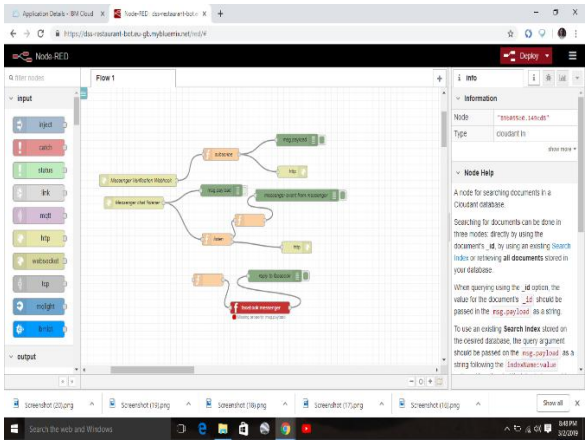

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*Figure 2*

Take a http node as a messenger verification web hook, drop a function as subscribe connect it to http node. Connect function output to a debug node and also http node. Drag and drop a http node give its name as messenger chat listener, connect a function node with two outputs as listen and a debug node. Connect one output of listen function to a empty function node and other node to http node. Now connect a debug node that is meant to messenger event from messenger.

Drop a function node, connect its output to input of facebook messenger node's input, then connect facebook messenger node's output to reply to facebook debug node. The architecture that we constructed here is done for facebook messenger application. The chatbot we designed is executed on facebook messenger. The conversation between bot and user is done on a platform as which we used facebook messenger. So, we could conversation with bot on facebook messenger. By subscribing facebook page an user can proceed.

As a developer, we have created a facebook page, and subscribed to it through this flow. As said above there requires a platform for chatbot and a user to communicate, to display input and output. To achieve this we have choose facebook messenger. In this flow, we have just connected messenger to design or architecture of chatbot. The first photo here shows the complete messenger flow. The next one shows how to connect messenger and the design, such that it works accordingly.

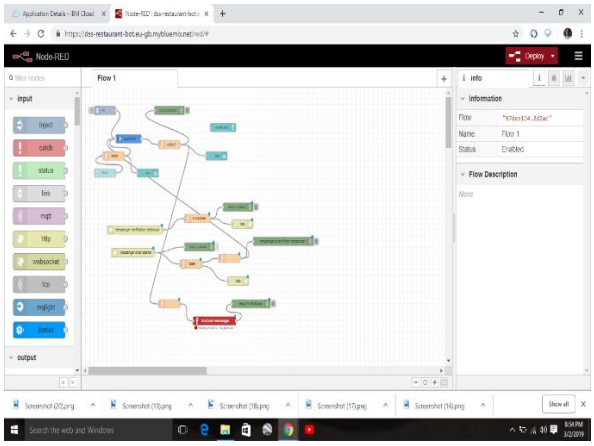


*Figure 3*

The connections go this way, connect input function to listen function's output empty function and then facebook messenger input function to assistant node. Facebook messenger and design are connected in such a way that it's embedded to work in sync. Input given on platform is converted into a machine level language, so that the system could understand. It is processed, data is fetched from the database as we gave dialogs for bot to answer and intents that are to be given by user. So, the bot finds the appropriate answer for the question asked by user checks it. It is converted into human understandable language before answering or replying. Then the reply is displayed on the same platform where the input has been presented or given. In this complete process, database is held in IBM assistance, facebook messenger acts as a platform, compilers are used to conversions of languages.

## 4. RESULT

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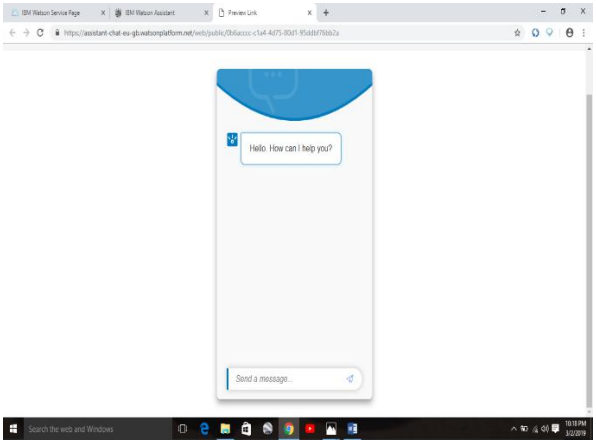


*Figure 4*

In the IBM Watson assistant we can create our own assistant .The assistant responds in the following manner. It's a preview link result. Firstly the greetings are given to the assistant bot when we open the preview link it directly gives that "Hello, How can I help you?" User gives an input with a greeting as hi or hello. Bot's reply is as "hi, welcome to exam reference bot. press the course" with some options of courses. There are some courses like AIEEE(All India Engineering Entrance Exam), GRE( Graduate Record Examinations), NEET(The National Eligibility cum Entrance Test) and UPSC( Union Public Service Commission). Then user should select any course of these. It shows that we have some reference books

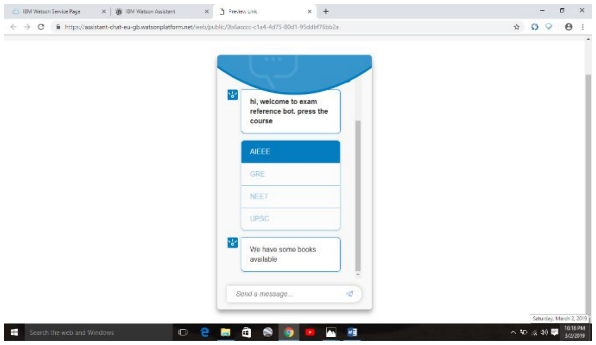


*Figure 5*

Then the user gives an input as if the user want to refer books on AIEEE then users input will be reference books for aieee, books for aieee. If the user want to refer books on GRE the users input will be reference books for gre, books for gre. If the user want books on NEET then users input will be reference for books on neet, books for neet. If the user want book on UPSC then the users input will be reference books for upsc, reference books for civils, and books for civils.

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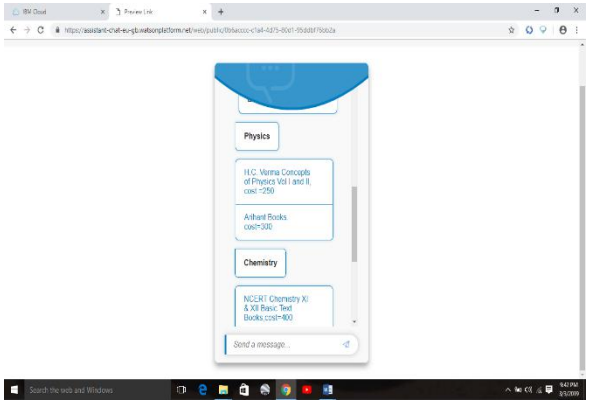


*Figure 6*

The bot reply's by showing books for aieee, gre, neet, upsc. In this we can easily refer books for preparation during exam time. In this I referred books on AIEEE, then bot reply's by showing some books on physics, chemistry and math. Mainly AIEEE says that it the entrance exam for engineering it is shown in the fig-6, 7.

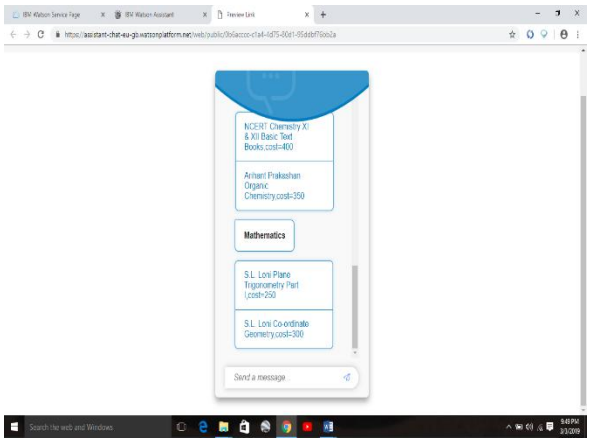


*Figure 7*

## 5. CONCLUSION

These days, consumers expect to be able to find the information they're looking for online quickly and easily. And when a business can't provide that type of experience, they become frustrated. Chatbots are poised to ease these frustrations by providing the real-time, on-demand approach that consumers are seeking out. The top three potential benefits of chatbots that consumers reported in our survey: 24-hour service (64%) instant responses (55%) answers to simple questions (55%) Compared to other business communication channels, chatbots scored the second-highest when it came to consumers expecting instant responses, only losing out to online chat. But by using chatbots in combination with online chat, businesses can deliver a level of real-time service that they'd be unable to achieve using either technology on its own. And while chatbots can't replace phone or email when it comes to providing in-depth answers to technical questions (some things will always require a human touch), they are poised to become the new apps. The chatbot that we are designing is an adviser. It can be used by any student who is preparing for public exam or government exams. The student can also know the courses to choose after intermediate or graduation. This chatbot shows results according to the search of the person, it suggests reference books to aspirants. It can be used

widely by students. This Chatbot is used at the time of exams that which book should be referred during exam time. In this bot we show the most referred books during exam time.

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