SPS-7012-Movie ticketing bot

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Introduction

Artificial Intelligence (AI) increasingly integrates our daily lives with the creation and analysis of intelligent software and hardware, called intelligent agents. Intelligent agents can do a variety of tasks ranging from labor work to sophisticated operations.

A chatbot is a typical example of an AI system and one of the most elementary and widespread examples of intelligent Human-Computer Interaction (HCI)[1]. It is a computer program, which responds like a smart entity when conversed with through text or voice and understands one or more human languages by Natural Language Processing (NLP)[2].

In the lexicon, a chatbot is defined as “A computer program designed to simulate conversation with human users, especially over the Internet”[3]. Chatbots are also known as smart bots, interactive agents, digital assistants, or artificial conversation entities. Chatbots can mimic human conversation and entertain users but they are not built only for this. They are useful in applications such as education, information retrieval, business, and e-commerce. They became so popular because there are many advantages of chatbots for users and developers too. Most implementations are platform-independent and instantly available to users without needed installations.

Moreover, payment services are integrated into the messaging system and can be used safely and reliably and a notification system re-engages inactive users. Chatbots are integrated with group conversations or shared just like any other contact, while multiple conversations can be carried forward in parallel. Knowledge in the use of one chatbot is easily transferred to the usage of other chatbots, and there are limited data requirements

History

Alan Turing in 1950 proposed the Turing Test (“Can machines think?”), and it was at that time that the idea of a chatbot was popularized [4]. The first known chatbot was Eliza, developed in 1966, whose purpose was to act as a psychotherapist returning the user utterances in a question form [5]. Chatbots, like SmarterChild [7] in 2001, were developed and became available through messenger applications. The next step was the creation of virtual personal assistants like Apple Sir i [8], Microsoft Cortana [9], Amazon Alexa [10], Google Assistant [11] and IBM Watson [12].

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Why Chatbot?

Chatbots seem to hold tremendous promise for providing users with quick and convenient support responding specifically to their questions. The most frequent motivation for chatbot users is considered to be productivity, while other motives are entertainment, social factors, and contact with novelty. However, to balance the motivations, a chatbot should be built in a way that acts as a tool, a toy, and a friend at the same time [6].

Essential Concepts in Chat bot

Below are some fundamental concepts related to chatbot technology.

Natural Language Processing (NLP): an area of artificial intelligence, explores the manipulation of natural language text or speech by computers. Knowledge of the understanding and use of human language is gathered to develop techniques that will make computers understand and manipulate natural expressions to perform desired tasks. Most NLP techniques are based on machine learning.

Natural Language Understanding (NLU) : is at the core of any NLP task. It is a technique to implement natural user interfaces such as a chatbot. NLU aims to extract context and meanings from natural language user inputs, which may be unstructured and respond appropriately according to user intention.

It identifies user intent and extracts domain-specific entities. More specifically, an intent represents a mapping between what a user says and what action should be taken by the chatbot. Actions correspond to the steps the chatbot will take when specific intents are triggered by user inputs and may have parameters for specifying detailed information about it. Intent detection is typically formulated as sentence classification in which single or multiple intent labels are predicted for each sentence.

An entity is a tool for extracting parameter values from natural language inputs. For example, consider the sentence “What are the Movies on display?”. The user intent is to know the current movies which are in multiplexes. The entity value is Movies. Therefore, the user asks for the Movies in Multiplex. Entities can be either system-defined or developer defined.

Developer defined are designed by the developer. whereas sys.date , sys.number are system entities. For example, the system entity @sys.date corresponds to standard date references like 10 August 2019 or the 10th of August. Domain entity extraction usually

referred to as a slot-filling problem, is formulated as a sequential tagging problem where parts of a sentence are extracted and tagged with domain entities.

Finally, contexts are strings that store the context of the object the user is referring to or talking about. For example, a user might refer to a previously defined object in his following sentence. A user may input “Switch on the fan.” Here the context to be saved is the fan so that when a user says, “Switch it off” as the next input, the intent “switch off” may be invoked on the context “fan”.

Design and Development

Understanding what the chatbot will offer and what category it falls into, helps developers pick the algorithms or platforms and tools to build it. At the same time, it also helps the end-users understand what to expect.

The requirements for designing a chatbot include accurate knowledge representation, an answer generation strategy, and a set of predefined neutral answers to reply when user utterance is not understood(Anything else option).

The General architecture of chatbot is shown below in Fig 1.

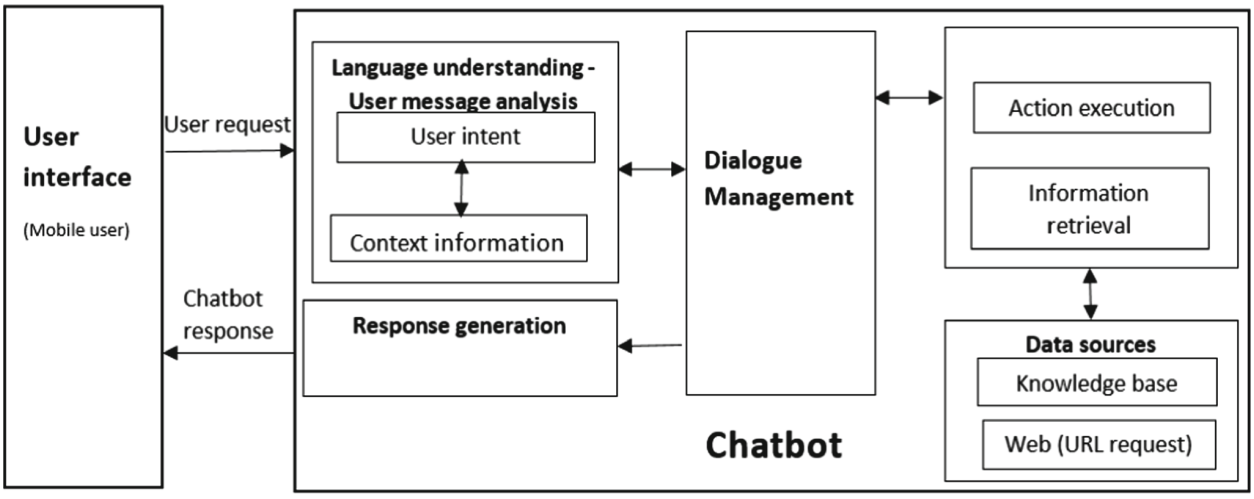

Fig 1: General Chatbot Architecture

The process starts with a user’s request. After the chatbot receives the user request, the Language Understanding Component parses it to infer the user’s intention and the associated information. When the request is understood, action execution and information retrieval take place. The chatbot performs the requested actions or retrieves the data of

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interest from its data sources, which may be a database, known as the Knowledge Base of the chatbot, or external resources.

There are distinguishing six leading NLU cloud platforms that developers can use to create applications able to understand natural languages: IBM Watson Conversation, Google's DialogFlow, Facebook's wit.ai, Microsoft LUIS, Amazon Lex, and SAP Conversation AI. All these platforms are supported by machine learning. They share some standard functionality (they are cloud-based, they support various programming and natural languages).

Objective

In this project, we will be building a Movie ticketing chatbot using IBM Watson assistant. This chat has the following capabilities:

1. Displays the list of movies available.
2. The Bot is able to show different show timings.
3. When a movie is selected the bot shows the availability of tickets and their respective prices.
4. The bot also guides the user to book tickets and complete process of booking seats.

Services Used:

1. IBM Watson Assistant
2. Node-Red

Architecture: The Architecture of Movie ticketing bot is as shown in figure 2 below.

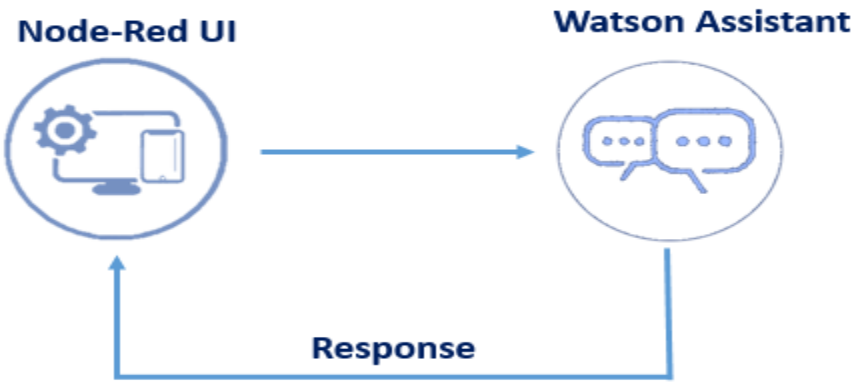

Fig 2: Movie ticketing bot Architecture

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This bot is designed with several intents and entities.
The intents start with # and includes :
1. Greetings,
2. Inquiry
3. Movies_Availability
4. Seats

The entities start with @ and the entities created for this project include :
1. Greetings,
2. Inquiry
3. Movies_Availability
4. Multiplexes
5. Payment
6. Region
7. Slots

The sys entities included are

1. sysdate
2. sysnumber(two instances of it)

The dialog skill includes several nodes(around 8) . These nodes take the user around a booking tour of Movies. This bot provides various options to the user in choosing a movie, the region where you want to watch the movie, number of seats, date of viewing and show timings, the different multiplex where the movie is on display etc.
This Movie bot also guides the user in choosing a payment option and complete the booking process.

Conclusions

Minimal human interference in the use of devices is the goal of our world of technology. Chatbots can reach out to a broad audience on messaging apps and be more effective than humans are. At the same time, they may develop into a capable information-gathering tool. They provide significant savings in the operation of customer service departments.
With further development of AI and machine learning, somebody may not be capable of understanding whether he talks to a chatbot or a real-life agent.

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