INTRODUCTION

1.1 OVERVIEW

Intelligent Customer Help Desk With Smart Document Understanding

The typical customer care chatbot can answer simple questions, such as store locations and hours, directions, and maybe even making appointments. When a question falls outside of the scope of the pre-determined question set, the option is typically to tell the customer the question isn't valid or offer to speak to a real person.

In this project, there will be another option. If the customer question is about the operation of a device, the application shall pass the question onto Watson Discovery Service, which has been pre-loaded with the device's owners manual. So now, instead of "Would you like to speak to a customer representative?" we can return relevant sections of the owners manual to help solve our customers' problems.

To take it a step further, the project shall use the Smart Document Understanding feature of Watson Discovery to train it on what text in the owners manual is important and what is not. This will improve the answers returned from the queries.

Scope of Work

- Create a customer care dialog skill in Watson Assistant

- Use Smart Document Understanding to build an enhanced Watson Discovery collection

- Create an IBM Cloud Functions web action that allows Watson Assistant to post queries to Watson Discovery

- Build a web application with integration to all these services & deploy the same on IBM Cloud Platform.

1.2 PURPOSE:-

- Create a customer care dialog skill in Watson Assistant
- Use Smart Document Understanding to build an enhanced Watson Discovery collection
- Create an IBM Cloud Functions web action that allows Watson Assistant to post queries to Watson Discovery
- Build a web application with integration to all these services & deploy the same

THEORITICAL ANALYSIS

2.1 BLOCK DIAGRAM:-

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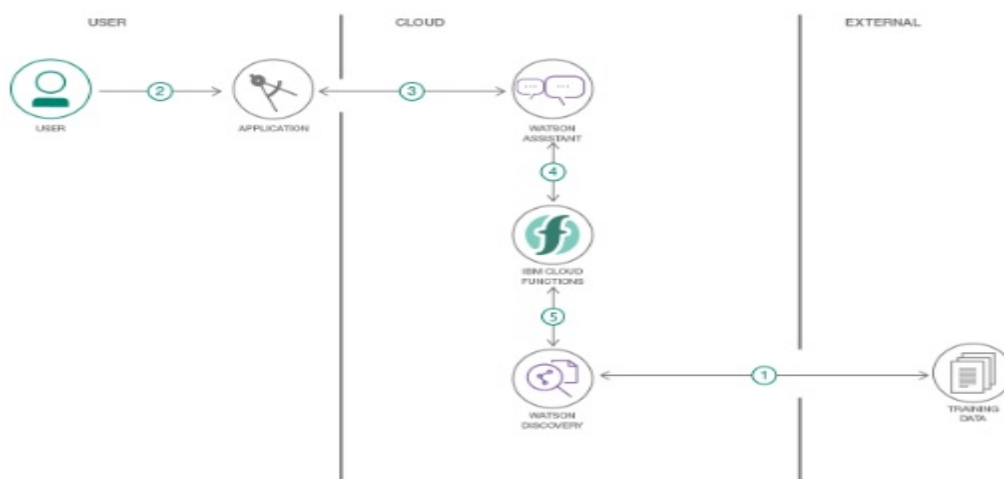
2.2 SOFTWARE USED:-

1. IBM CLOUD:-

   IBM Cloud is a set of cloud computing services for business offered by the information technology company IBM.[1] It combines platform as a service (PaaS) with infrastructure as a service (IaaS). The platform scales and supports both small development teams and organizations, and large enterprise businesses. It is globally deployed across data centers around the world.[2] IBM's main competitors in the cloud computing market include Amazon Web Services, Microsoft Azure and Google Cloud Platform.[3]

2.Watson Discovery:-

Traditional enterprise search and search engines don't provide employees and customers with exact answers. They can't understand the nuances of phrases and acronyms in your industry and accurately search through your complex documents in a timely manner.

Watson Discovery solves these challenges. It is enterprise search that delivers specific answers to your queries while also serving up the entire document and supporting links, allowing your employees and customers to make informed decisions with confidence.

3.Watson Assistant:-

IBM Watson Assistant is marketed as a solution for companies of any size looking to build their own voice or touch-activated virtual assistant. IBM has partnered with BMW and Harman Kardon to incorporate Watson Assistant into the auto manufacturers' models. Watson Assistant allows drivers to ask their cars questions like: "Do I have enough gas to make it to work without stopping?" and get an answer based on real-time user data.

Watson Assistant can also act like an in-suite hotel concierge, providing suggestions and information about the local area as well as responding to individual questions. Upon request, Watson Assistant can connect to a hotel thermostat and change the room's temperature or be programmed to ask guests if they would like to turn lights off or close the drapes at preidentified time.
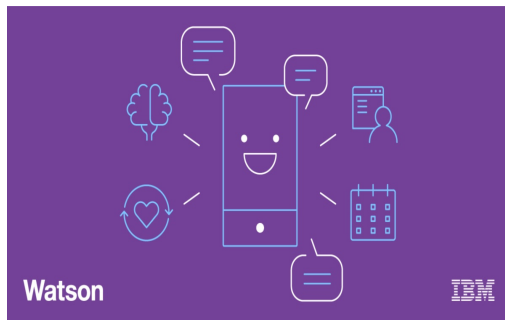
4.NODE RED:-

Node-RED is a flow-based development tool for visual programming developed originally by IBM for wiring together hardware devices, APIs and online services as part of the Internet of Things.[2]

Node-RED provides a web browser-based flow editor, which can be used to create JavaScript functions. Elements of applications can be saved or shared for re-use. The runtime is built on Node.js. The flows created in Node-RED are stored using JSON. Since version 0.14, MQTT nodes can make properly configured TLS connections.[3]

In 2016, IBM contributed Node-RED as an open source JS Foundation project.
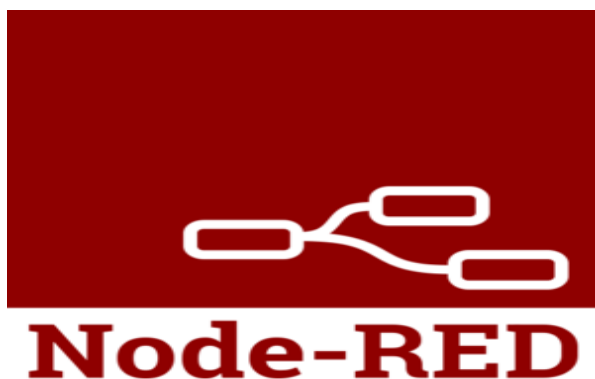
5.Github:-

GitHub, Inc. is a United States-based global company that provides hosting

for software development version control using Git. In 2018, it became a subsidiary of Microsoft for US$7.5 billion.[3] It offers the distributed version control and source code management (SCM) functionality of Git, plus its own features. It provides access control and several collaboration features such as bug tracking, feature requests, task management, and wikis for every project.

6. SLACK:-

Slack offers many IRC-style features, including persistent chat rooms (channels) organized by topic, private groups, and direct messaging.[14] Content, including files, conversations, and people, is all searchable within Slack. Users can add emoji buttons to their messages, on which other users can then click to express their reactions to messages.[21]

Slack's free plan allows only the 10,000 most recent messages to be viewed and searched.[22]

EXPERIMENTAL INVESTIGATION

A. *cloud function code:-*

```
/**
 *
```

```
 * @param {object} params

 * @param {string} params.iam_apikey

 * @param {string} params.url

 * @param {string} params.username

 * @param {string} params.password

 * @param {string} params.environment_id

 * @param {string} params.collection_id

 * @param {string} params.configuration_id

 * @param {string} params.input

 *

 * @return {object}

 *

 */


const assert = require('assert');

const DiscoveryV1 = require('watson-developer-cloud/discovery/v1');


/**

 *

 * main() will be run when you invoke this action

 *

 * @param Cloud Functions actions accept a single parameter, which must be a JSON object.

 *

 * @return The output of this action, which must be a JSON object.

 *

 */
function main(params) {
  return new Promise(function (resolve, reject) {
```

```javascript
let discovery;

if (params.iam_apikey){
  discovery = new DiscoveryV1({
    'iam_apikey': params.iam_apikey,
    'url': params.url,
    'version': '2019-03-25'
  });
}
else {
  discovery = new DiscoveryV1({
    'username': params.username,
    'password': params.password,
    'url': params.url,
    'version': '2019-03-25'
  });
}

discovery.query({
  'environment_id': params.environment_id,
  'collection_id': params.collection_id,
  'natural_language_query': params.input,
  'passages': true,
  'count': 3,
  'passages_count': 3
}, function(err, data) {
  if (err) {
    return reject(err);
  }
```

```
   return resolve(data);

   });

  });

}
```

## 2.ASSISTANT SKILLS:

3.NODE RED:--

4. Chatbot:-

APPLICATIONS

#1. Content delivery

Media Publishers have realized that chatbots are a powerful way to engage with their audiences and monitor engagement to gain valuable insights on reader interests. Chat with the CNN and Wall Street Journal Chatbots on Facebook Messenger and receive the latest news directly in Messenger, without having to visit their websites.
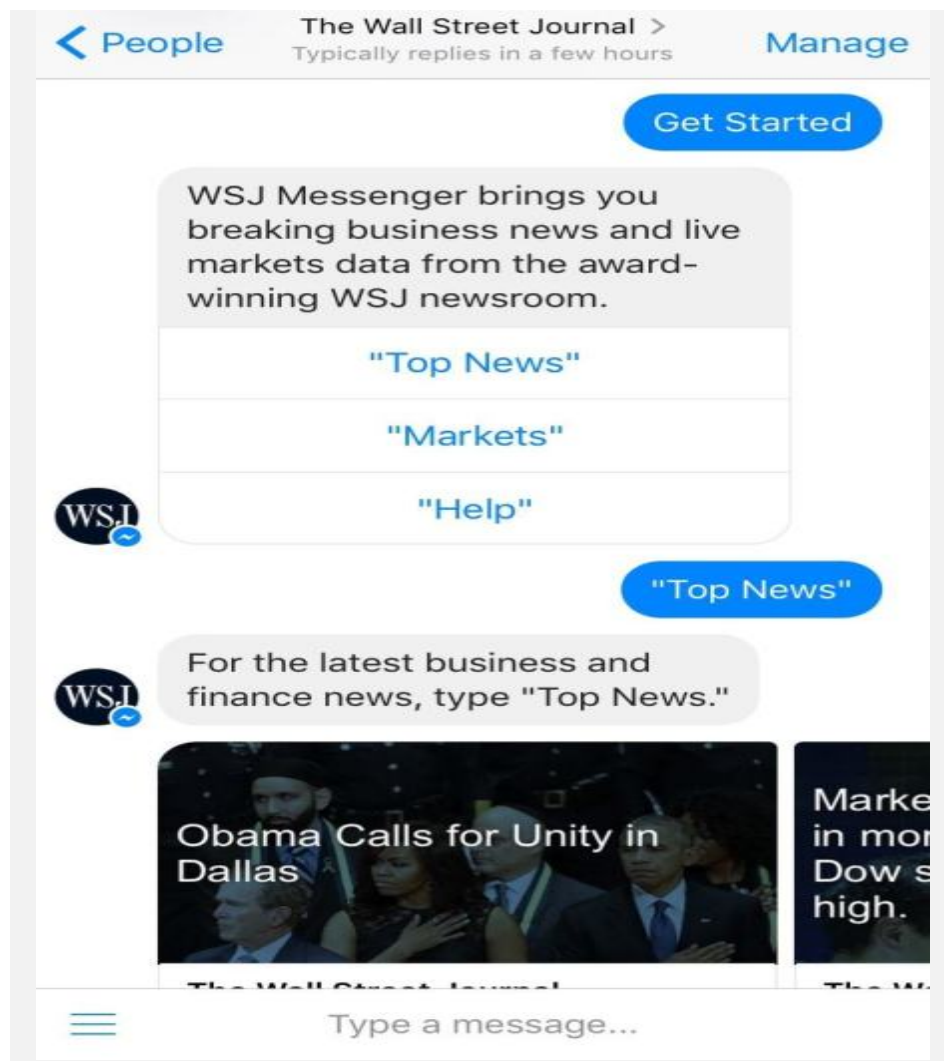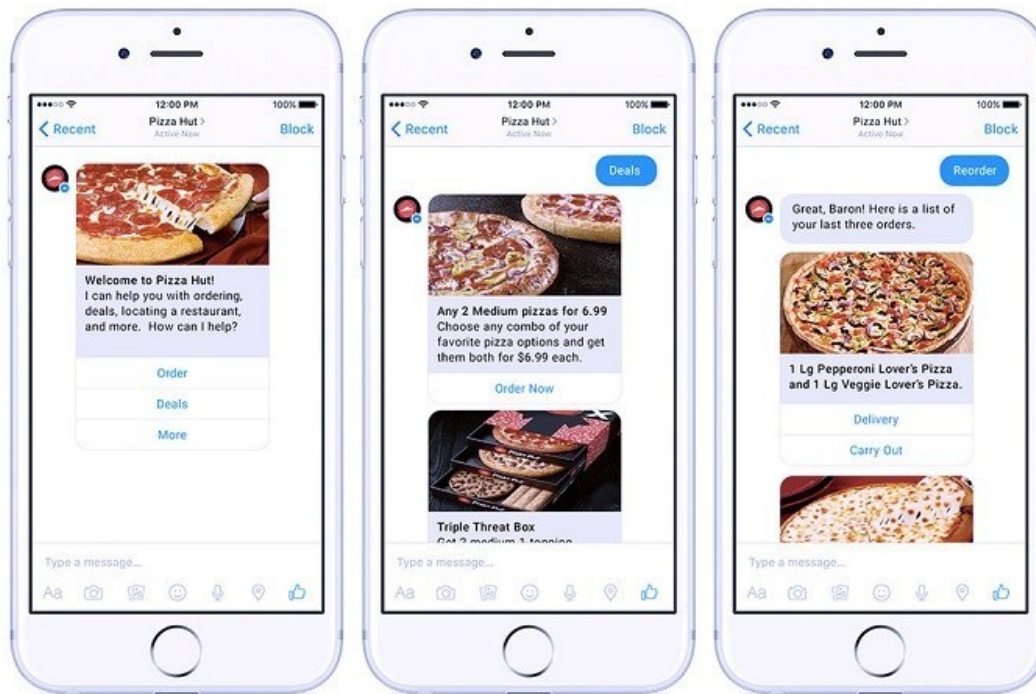

The Wall Street Journal Chatbot

A lot of publishers are also harnessing AI and machine learning

technology within their chatbots to anticipate what content their consumers may be interested in. This is sure to lead to immediate and more personalized content than ever before.

#2. Order Food

Various fast food giants like KFC and Pizza Hut have invested in Chatbots that enable customers to place their orders through conversations. Taco Bell went a step further to improve the conversational experience by giving their Chatbot named TacoBot some personality. It cracks jokes, uses emojis, answers trivia questions, and will even add a cup of water to an order if the customer mentions being hungover.

#3. Book Flights
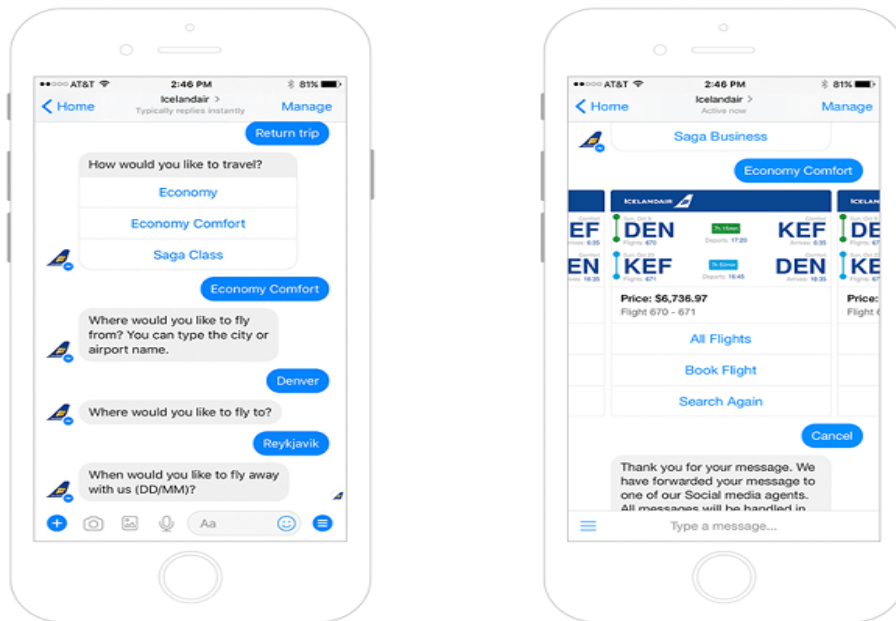
Icelandair's chatbot gives their customers the ability to search for and book flights in a text-based conversational manner. Instead of drop-down menus, customers enter the information themselves. These features give customers more control over how the flight is booked and it also keeps the entire conversation in one thread so that the purchase information can be reviewed and called up with ease.

#4. Companionship

Russian technology company Endurance developed its companion chatbot for Senior People and Patients with Alzheimer's Disease. The primary function of the chatbot is to be a virtual companion – To speak with senior people on general topics like the weather, nature, hobbies, movies, music, news, etc. The chatbot asks questions, reacts to the answers, is able to speak on various topics, and share interesting news and facts from Google
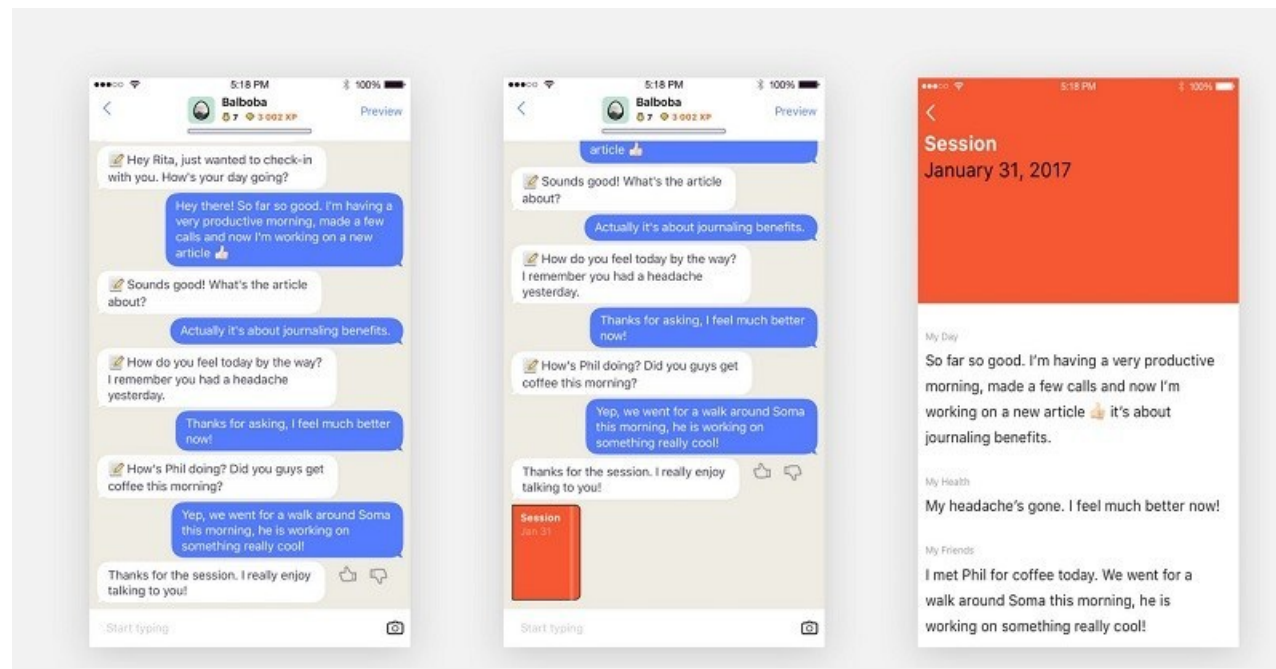

Image source: Medium

Another companion bot worth mention is Replika. If you need a friend whenever you feel lonely, you can have a chat with Replika. This bot is more like your A.I. friend whom you can tell everything – the bot learns from you, matches your personality and becomes your best friend. Replika can act as your safe space to share thoughts and feelings without fear of being judged. It is available for free on Google Play & Itunes.
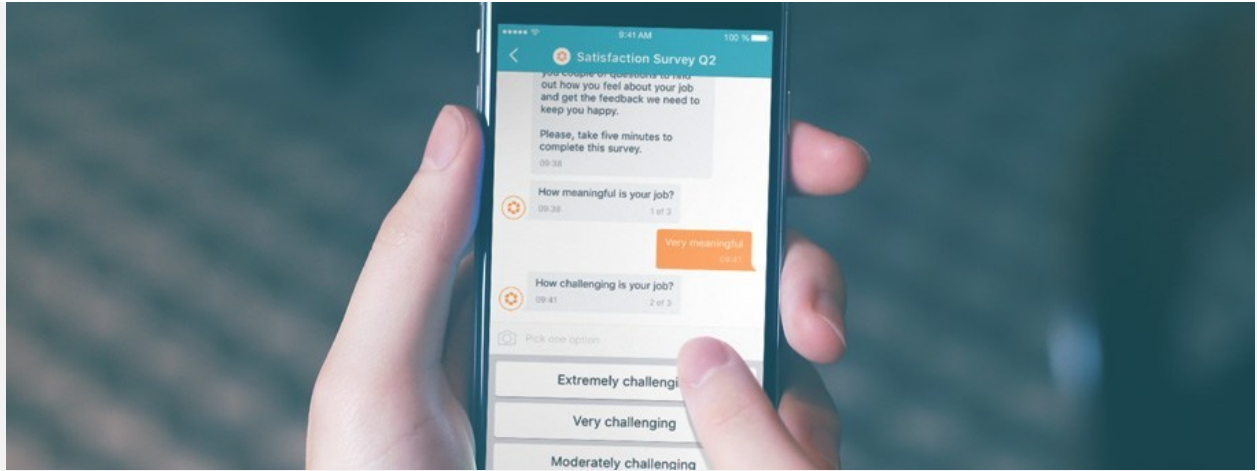
#5. Market Research

Image: beekeeper.io

The way market researchers get in touch with respondents is changing as many respondents may prefer to be contacted on WhatsApp or the Facebook messenger. Instead of having a dedicated survey app, many research firms are developing Chatbots to have personalized, engaging conversational surveys with respondents to improve the experience and increase completion rates.

**Read: 7 Important Tips For Creating Awesome Surveys**

#6. Transportation

Uber in partnership with Facebook has enabled users to sign up for Uber and request a ride, without having to leave Messenger or download the Uber app. Ride status updates and ride receipts are delivered to a private conversation between the customers and Uber on Messenger, making it easy to track Uber rides and payment history.

#7. Health Care

Chatbots have also made their way into health care by easing the burden on medical professionals by facilitating faster medical diagnosis, answering health-related questions, booking appointments and lots more.

A Chatbot like Super Izzy can track menstrual cycles, dates and fertile windows. The bot also asks menstruation related questions and learns to give information about menstrual health and sexual issues.
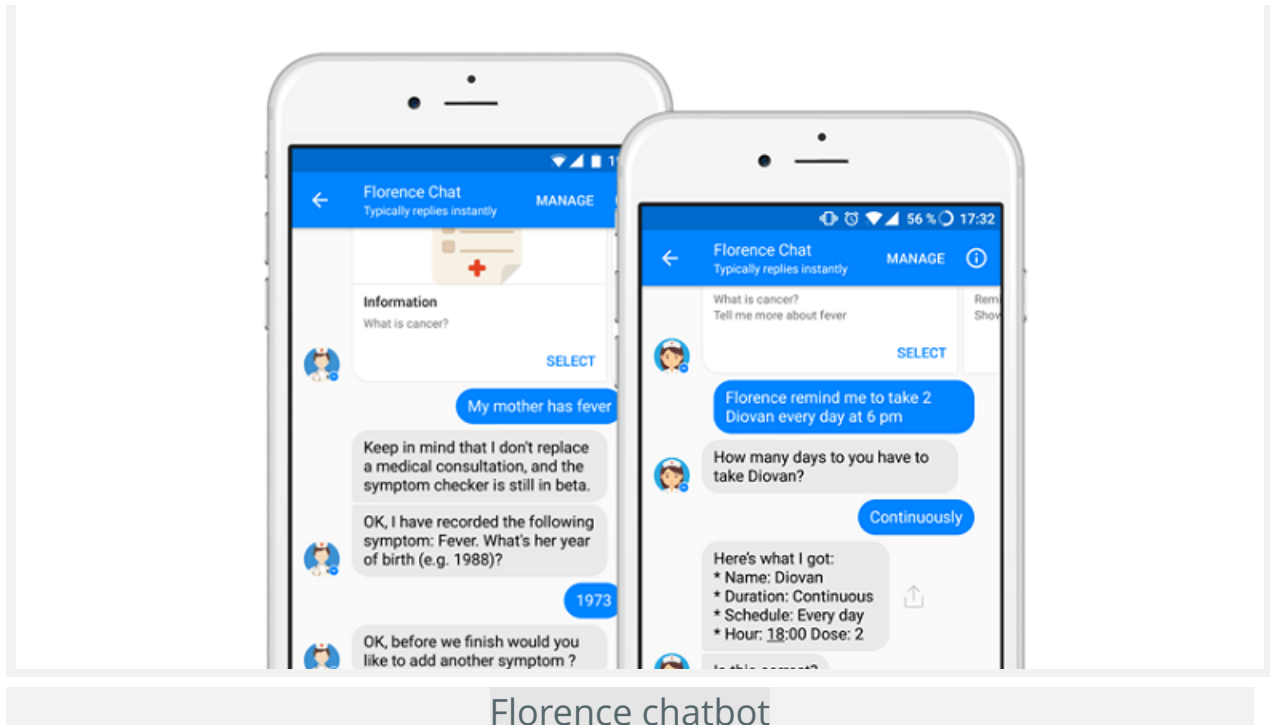

Florence chatbot

Another interesting Chatbot in health care is named Florence. This bot is more like a virtual nurse and has her office on Facebook Messenger. Florence can remind patients to take their pills, all they need to do is write the name of the medicine in chat, the number of times a day they must

take it and at what time. Florence sends a message in chat every time the patient must take their meds

#8. E-commerce

The e-commerce industry is also improving shopping experience with Chatbots. Customers can now search and shop more conveniently with the help of chatbots. eBay has invested in Chatbot technology with their ShopBot, a virtual shopping assistant that helps customers find the items they want at the desired price range.
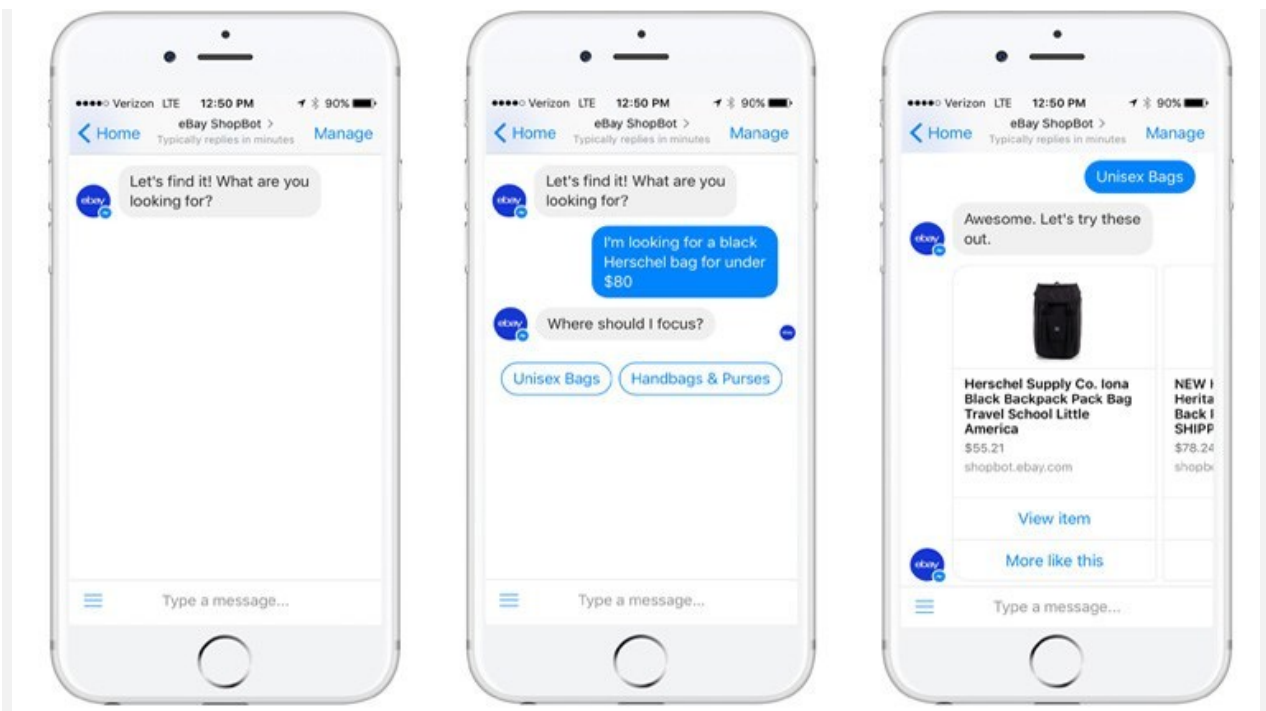
eBay ShopBot

Customers only need to type in details of what they are looking (e.g. Telescopes under $150), ShopBot will ask you all the relevant questions to find the best match. This a great example of how Chatbots can improve the shopping experience beyond what regular e-commerce sites can offer.

Update: eBay Shopbot was discontinued in September 2018

#9. Hospitality

Chatbots have been put to use in the hospitality industry in various ways. Radisson Blu Edwardian hotels use a virtual host called Edward to help guests with a variety of things from; online check-in, to handling customer inquiries, letting them know their rooms are ready and more.

Edward has his own personality, can automatically escalate complaints should a request be not followed up. The Chatbot is so good at his job that most guests don't know they are dealing with a ChatBot, and praised him with glowing reviews on TripAdvisor. The Edwardian Hotels team also leverages data from Edward to improve their services as they monitor common guest requests and trends.

A customer review on TripAdvisor

#10. Legal

Chatbots have also shown their practicality in the Legal industry as well, they are a great way of optimizing work processes to save both lawyers and their clients time and money. Montreal-based law firm EXEO

launched a smart virtual assistant called IVA to help future immigrants. IVA (Immigration Virtual Assistant) makes the process of immigration much easier and less stressful.

IVA is accessible via Facebook Messenger and provides users with information regardings opportunities available for them such as; different immigration program categories, work permit applications, student visas, and permanent residence programs.

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2)
https://www.cxservice360.com/2018/06/27/10-interesting-applications-of-chatbots-2/

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