

IT Service Desk Chatbot Experiment

1. Purpose

The main goal of the project was to build a ‘chatbot’ which will improve users’ experience using the University of Birmingham’s IT Services online platform. The ‘chatbot’ is focused on assisting users who want to report a problem with their software or their hardware devices. Together with the user’s problem, the program needs to collect user’s private information (email, telephone, etc.) and send all the data to the IT Services Desk. The most interesting and fascinating part of the ‘chatbot’ is that it needs to understand the request based only on a non-restricted plain text entered by the user.

2. Design

The system is designed in a way to represent a chat conversation between a user and a virtual assistant (bot). The ‘chatbot’ is constantly asking question and requiring some information from the user, while the user only answers these questions based on the problem he has. The conversation flow can be divided in three parts regarding of the kind of questions the assistant asks.

2.1 Personal details

The first part of the conversation is where the ‘chatbot’ asks personal questions. In the beginning, the virtual assistant introduces itself and requires your name, email address, telephone etc, as well as general questions about the problem

The screenshot shows a chat interface with the following messages and user inputs:

- Chatbot:** Hello, I am the IT Service Desk virtual assistant. Before you report your problem I need some information from you. Enter your full name?
- User:** Simeon Kostadinov
- Chatbot:** Thank you, Simeon Kostadinov! Now I will need your email address?
- User:** simeon@simeon.com
- Chatbot:** Wonderful! What is your telephone number?
- User:** 12345678910
- Chatbot:** Perfect! Now I need the location of the fault. A university building, room number, street name, city, etc.
- User:** Room 117, ERI Building, Pritchatts Road, University of Birmingham, Edgbaston, Birmingham
- Chatbot:** I would like you to enter a full description of your problem, including error messages, device type and name, etc. (describe)

At the bottom, there is a text input field with the placeholder "Start typing..." and a "Send" button.

like ‘the location of the fault’ etc.

2.2 Bonus questions regarding the type of problem

I would like you to enter a full description of your problem, including error messages, device type and name, etc. (describe)

I have a problem with my outlook account.

I need to ask you bonus questions regarding the problem with your email address.
Are you a student or a member of staff? (staff/student)

Staff Student

Are you able to log into my.bham.ac.uk or canvas.bham.ac.uk? (y/n)

Yes No

Your account may be locked out. You need to unlock it at my.password.bham.ac.uk - this must fix the issue! Do you still have a problem? (y/n)

Yes No

Your problem might be in the email. Please, tell me how are you trying to view your email? (web/client) ?

Web mail Email client

Try viewing you email at 'outlook.bham.ac.uk'. Are you able

Then, the user needs to give a full description of his problem. The 'chatbot' will recognise the type of problem and based on it, a certain conversation flow will be proceed. Here the second kind of questions come - ones regarding the particular fault. The virtual assistant asks for some details, gives suggestions and assumptions for different solutions. The conversation can end here with a problem solved or, due to inability of understanding the issue, it can be forwarded to the next part.

2.2 Final questions and send an email

Here comes the third and last part of the conversation where the user needs to enter really specific characteristics of the problem (error messages etc.). The whole data collected from the user will be send to the IT Services Desk. In a structured way, a person from the staff can review the fault and give an appropriate solution.

Issue must lie with the account. Further investigation needed. Before I proceed your problem to our team, I need some further information from you.
 What is the name of your computer? (computer name)

My computer name

Thank you. Now I will need you to enter all the error messages that you receive.

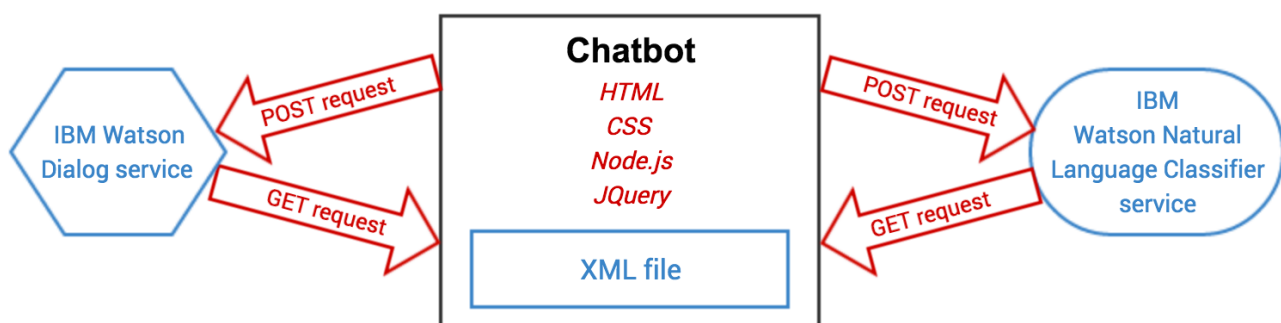
Error messages

Wonderful! Your information is - Name: Simeon Kostadinov, Email: simeon@simeon.com, Tel: 12345678910, Location: Room 117, ERI Building Pritchatts Road University of Birmingham Edgbaston Birmingham, Problem: Email, Type of user: Student, Name of computer: email issue My computer name, Error messages: email issue Error messages. I will send it to our team.
 Do you have any other problems? (y/n)

Start typing... Send

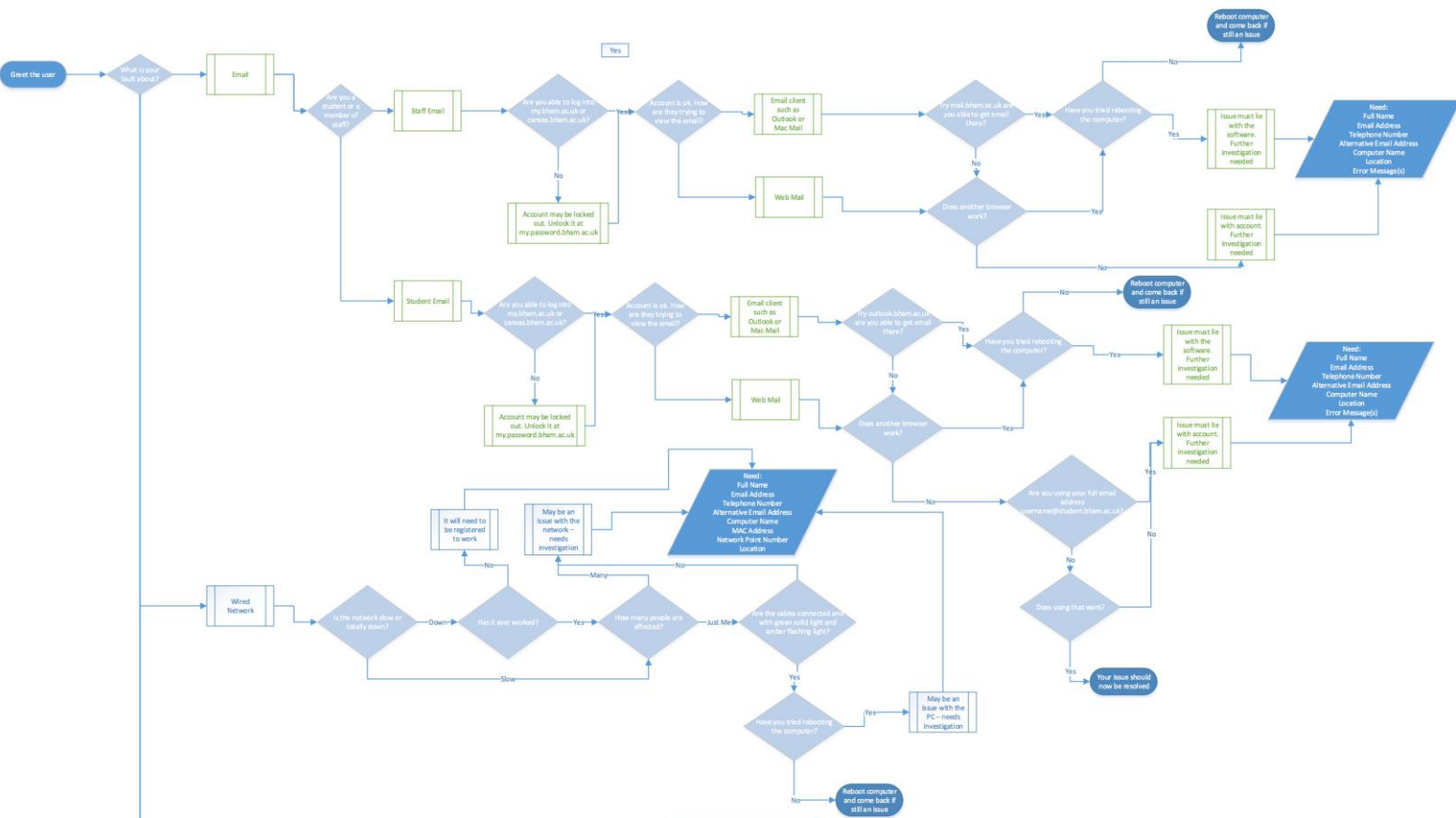
3. Implementation

The system is build using the IBM Watson Developer Cloud service called IBM Watson Dialog. This service allows you to build a conversation flow using only one large .xml file. Using javascript GET and POST requests, the system interacts with this .xml file through the Dialog service. Both the server and the client side of the project are written in javascript (server - node.js, client - jquery). Together with the Dialog service, the 'chatbot' uses another helpful service provided by the IBM Watson Developer Cloud - Natural Language Classifier. Using machine learning and natural language processing algorithms, this service offers the ability to predict the topic of a plain text. This is how the system recognises the user problem and forwards the conversation in different direction.



Finally the system sends the data, collected from the user, to an external email address using the Google's SMTP Server. Considering the front end side of the project, HTML and CSS are used, together with state of the art styles and user interactions.

Right now there are two conversation workflows implemented in the system. They are for problems connected with the email and the wired network. The user has the ability to report an issue regarding one of them and the 'chatbot' will force the conversation to the right workflow.



4. Future Work

The presented work can be extended to participate more intelligently. Below are listed a couple of ways to achieve that:

- The 'chatbot' can understand text more accurately
- The amount of questions can be reduced
- The project can be made live (establishing connection between the 'chatbot' and the IT Service Desk online platform)
- The program can cover more workflows
- More and different type of problems can be recognised
- The user can receive an instant feedback more often

The project is based on the innovative idea to use intelligent systems to improve user experience, save time and offer more efficient way of dealing with customers.

5. Conclusion

The project is based on the innovative idea to use intelligent systems to improve user experience, save time and offer more efficient way of dealing with customers. The project will improve user experience using the IT Service Desk platform and provide efficiency to the staff dealing with the problems. Bringing intelligent technology to different services is a wonderful step in order to help people in an easier and better way.