A Review of the Computer Science Literature Relating to AI Customer Support

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Abstract

We design a web-based customer support system that using machine learning. This system can be installed on any website. With our project, we aim to reduce the time wasted and cost of customer service. Artifical Intelligence based support systems are at the center of attention of customers and companies. These systems are rapidly replacing with old systems. In our research, we searched about how artificial intelligence can be integrated into support systems in general and why it should be used.

1 Introduction

Nowadays, most successful companies provide customer service. A customer support system helps an organization manage customer service requests and interact with customers to resolve them. Customers receive answers to their questions or seek solutions to their problems. Company officials also try to solve problems. It is a very challenging stage for companies to answer questions in a continuous, uninterrupted, accurate and fast manner. Continuous live support to customers is a very high cost. We will work on a much more practical system to reduce the cost of this service. We want to solve the problems of people in this area easier, faster and more accurately. Customers will not expect their questions to be answered by the authorities. They will receive quick answers directly generated by the system. Customers will not expect their questions to be answered by the authorities. They will receive quick answers directly generated by the system. We think this is very important for customer satisfaction.

Our system, which can be installed automatically, will not require any code information from the users and thus the users will be able to use our system easily. We want to create a machine-integrated forum with robust infrastructure with advanced, easy-to-use panels.

In this literature research, we will investigate the following subjects; live support systems, artificial intelligence, machine learning, deep learning, web development, related computer issues, etc.

2 About Our Project

We are aiming to create a web system that can be installed on any website. In our system, we will be creating a customer support system which is machine learning based program that can train itself according to the questions asked and also answers given by the non-machine (human) supporters. For every website, our program will have its' own dataset on the computer it is installed. For every solved issue which means question and its' true answers at the end (does not matter how many questions asked and true or false answers given between these two), machine learning program will create a model and after a while it will start answering questions instead of non-machine supporters.

AI Customer Support will be focused on E-Commerce websites. We will develop our project on this scope. Our project is designed to create its own specific dataset for companies but during development we will use ready datasets to test, train and develop our machine learning algorithm. Also our program can only understand English language.

3 Why We Choose This Project?

This service is a service where customers can ask the authorities live the problems they have with the company or the product. Customers receive answers to their questions or seek solutions to their problems. Company officials also try to solve problems. It is a very challenging stage for companies to answer questions in a continuous, uninterrupted, accurate and fast manner. Continuous live support to customers is a very high cost. We will work on a much more practical system to reduce the cost of this service. We want to solve the problems of people in this area easier, faster and more accurately.

4 What Is CRM?

CRM ,which is called Customer Relationship Management, is a technology for managing all your company's relationships and interactions with customers[1]. A CRM is important for companies because every customer can have problems with their products or softwares. To make it easy for customers to stay connected with customer service, companies use CRM. But even though we are in nearly 2020, CRMs are not still automated by machines. Our goal is to create a machine learning based AI system that can handle problems by itself without any help from us, humans.[2]

4.1 CRM Usage

There are many companies[3] that provides CRM programs for other companies. Many of them are using "Ticketing System" that is mailing to the customer service via CRM program. We are not aiming to create a ticketing program, instead we want a support system that can be used publicly. Like a form, people can interract with other problems and say they have the same problem or offer another solution.

The companies we found throughout our search are not using a system that has any artificial intelligence in it and also many companies use CRMs that use Ticketing System which is we don't want to use.

5 Systems And Frameworks

5.1 What Is Jenkins?[4]

Jenkins is a automation tool. Jenkins is often used by organizations to speed up the software development process. Jenkins provides these with build, deploy and test capabilities that can be provided automatically. This tool writen by Java and it is very important for Continuous Integration. Jenkins is already a server-based application and it can run with Apache web server.

Since we wanted to do Continuous Development while developing the project, we installed this tool on our own compute engine. In this way, we gave everyone the opportunity to work from anywhere. This tool, which is actively working on our server, automatically builds the site files every time the commit comes and everyone can see the change on live.

5.2 What is jQuery?[5]

JQuery is basicly a JavaScript library that more easy than other JavaScript libraries. Most of biggest companies are using jQuery in development proccess. We choose jQuery to use PHP more dynamically.

5.3 What is Bootstrap?[6]

Bootstrap is a popular CSS Framework that allowing responsive design. We are considering a responsive design in the project and we decided to use this CSS framework. In this way, we plan a system that works well on all platforms.

6 Why Machine Learning?

Machine learning is an application of artificial intelligence (AI) that provides systems the ability to automatically learn and improve from experience without being explicitly programmed. Machine learning focuses on the development of computer programs that can access data and use it learn for themselves.[7]

Data is the lifeblood of all business. Data-driven decisions increasingly make the difference between keeping up with competition or falling further behind. Machine learning can be the key to unlocking the value of corporate and customer data and enacting decisions that keep a company ahead of the competition. We asked to ourselves, why don't we use the questions and answers asked to companies as data?

When companies integrate our system, they will use machine learning in the background so that they can provide automatic answers to customers in the live support system.

In our project’s machine learning part, we want to use Python as a programming language. In the light of the information we have found from different source throughout our research, 9 out of 10 sources put Python first. The reasons behind our Python decision are the existence of a massive number of frameworks and libraries for machine learning and great source of information on the internet.[8]

7 Algorithms

7.1 Text Analysis

We've decided to use Natural Language Processing to match issues that are relevant to the questions asked and to direct them to appropriate answers. We have decided that the best algorithm for this is TF-IDF. Machine learning algorithms traditionally work better with numbers, TF-IDF algorithms help them decipher words by allocating them a numerical value or vector. This has been revolutionary for machine learning, especially in fields related to Natural Language Processing such as text analysis.[9]

7.2 Machine Learning Algorithms

Machine learning algorithms can show various success rates depending on the type of data set. It is very difficult to decide exactly which algorithm to use without trying these success rates on the dataset.[10]

In our research we found that we need to use the following algorithms :

5 supervised learning techniques- Linear Regression[11], Logistic Regression, Naïve Bayes, KNN.[12]

3 unsupervised learning techniques- Apriori, K-means, PCA.[13]

8 Why We Want To Use Web?

Web development has been improving since its founding.[14] Every company, small businesses, artisans need websites. Also, with the development of the technology sector, serving the customer easily and succesfully has become even more important. As you can see Web Development and Customer Services are non-ending industries. With the help of internet, we aim to reach as many people as we can.

In our project's web part, we will be using PHP, Python, JavaScript, HTML and CSS as programming languages.[15] HTML, CSS and JavaScript are must programming languages for web development. We will use Python for machine learning program as we mentioned earlier. Also, PHP offers a great database management, dynamic and fast usage. In addition, PHP has a big source of information.

9 Similar Companies To Our Project

9.1 Company Name : DigitialGenius[16]

DigitalGenius is an AI platform that uses speech in autopilot to understand conversations, automate repetitive processes. How to use DigitalGenius in customer support operation DigitalGenius is installed as an application to your existing customer service software. Connects your CRM to our AI platform; then train your first buy model and start answering the given questions. Once DigitalGenius is configured and the model is self-taught, you can add it to your agents and start automating incoming queries from start to finish.

9.2 Company Name : Maruti Techlabs[17]

Wotnot is a chat creation platform that creates intelligent, identifiable bots for your company. WotNot enables your company to automate interactions with your users, obtain information, and manage multiple communication channels. Increases your sales and marketing support with virtual assistant.

9.3 Company Name : LivePerson[18]

LivePerson is a company that is focused on AI-based Technologies such as chatbot and messaging platforms. LivePerson company has 2 main products which are AI-powered Bots and Messaging Channels.

Messaging channels are an interface between customers and brands via an AI chatbot and makes it easy to find products and purchasing.

AI-powered bots are simply a chatbot creation program that you can automate up to %70 of messaging conversations on your website, SMS, Facebook Messenger, WhatsApp etc.

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