**Software Requirements Analysis and Design Assignment**

**Capstone Project**

**COMP3059**

# 1.0 Introduction

## Purpose

The purpose of this Software Requirement Analysis and Design is to provide an overview of the software that will be constructed as well as to collect requirements for constructing an AI/ML based Chatbot. This document gives information of the many software demands and features at a high degree of abstraction without diving into application design. The requirements of all stakeholders dealing with the system at various levels are thoroughly examined. It may also be used to evaluate the produced application.

## Scope

The scope of this document is to describe the functional requirements of the AI/ML based Chatbot in details. Chatbot is used by the clients of the IT Clan Consulting Services to perform features for customers like visual flow builder, omnichannel messaging support, live chat handover and sentiment analysis. It is also equipped with NLP, machine learning and API to offer human-like responses and improve interactions with customers at the same time. Moreover, it serves clients with data security system to ensure customer’s safety and safeguard any sensitive information. Overall, AI/ML based Chatbot is to be designed as a user-friendly, secure, and reliable system.

# System Overview

The Chatbot Web App will serve as a first-line communicator to the customers. It will provide information within the IT Clan's data regarding the customers' queries. When the customer's question is far beyond the Chatbot's knowledge, it can hand in the customer to a real agent. The Chatbot also can display menu options and FAQs. It will be trainable and can converse naturally with customers.

## Project Perspective

The Chatbot Web App is a stand-alone bot based on AI. It can integrate into the IT Clan Consulting Services website and serve as the first line of communication. It is trainable that can evolve using machine learning features.

## System Context

IT Clan Consulting Services currently uses conventional methods like emails and phone calls to serve queries from the intended users. It causes lagged communication and is a reputational risk. The Chatbot foresees an opportunity where it can serve as a first-line communicator to the customers. It will provide information to the customers' queries. It will also help the company to become more productive and will lessen the lagged communications.

## General Constraints

Language

The Chatbot will only cater to standard English as of now.

Question Scope

The Chatbot will only answer a related question from IT Clan Consulting Services.

## Assumptions and Dependencies

Agent not available

If there is no agent available, the Chatbot cannot transfer a call to a live agent.

## 3.0 Functional Requirements

This section describes specific features of the software project. If desired, some requirements may be specified in the use-case format and listed in the Use Cases Section.

### 3.1 <Functional Requirement or Feature #1>

### Chatting

* Introduction
  + The chatbot provides the user the experience of chatting with a human by providing the suitable answer to the user’s query. User will feel that they are chatting with a human and not a robot.
* Inputs
  + The user will have to type the query or question in English.
* Processing
  + The chatbot accepts the users input, the software will fetch some keywords and will compare the keywords to the queries that are already present in the database. Using a matching algorithm, the software will return the most suitable answer to the user.
* Outputs
  + Output will be the suitable answer to the user’s question.

## 3.2 Use Cases

**Use Case #1:** Initiate Conversation

**Actor:** Customer

**Description:** Whenever the customers are on the website, they can initiate a conversation with chatbot.

**Use Case #2:** Close Conversation

**Actor:** Customer

**Description:** Customers are able to close conversation anytime they want.

**Use Case #3:** Input Queries

**Actor:** Customer

**Description:** Customers can input queries to chatbot and get an answer from it.

**Use Case #4:** Request Hand Over to Agent

**Actor:** Customer

**Description:** If the customers don’t get the answer they want or incorrect answer, they have the option to hand over the question to an agent.

**Use Case #5:** Give Rating

**Actor:** Customer

**Description:** Customers can give ratings about their experience on chatbot.

**Use Case #6:** Report Bug

**Actor:** Customer

**Description:** Customers can report bugs based on what they experienced.

**Use Case #7:** Request Transcript

**Actor:** Customer

**Description:** Customers are able to request transcripts from the chatbot.

**3.3 Data Modelling and Analysis**

* Activity Diagrams

Diagram

Description automatically generated

* Sequence Diagrams

Diagram

Description automatically generated

**3.4 Process Modelling**

* Data Flow Diagram

Diagram

Description automatically generated

## 4.0 Non-Functional Requirements

**Performance**

* The average time it would take for the server to respond will be approximately no longer than 3 seconds.

**Reliability**

* The software is heavily based on artificial intelligence and machine learning, as customers use chatbot time over time, the answers will get more reliable.

**Availability**

* The software can be accessed and used 24/7. There is no need to wait in queue.

**Maintainability**

* The developers will fix the reported bugs by the customers. In the future, updates will be available and it can easily adapt to company changes.

**Portability**

* The software is mainly based on python, it can be easily be uninstalled or installed to other system.

## 5.0 Logical Database Requirements

## 

**Data Formats**

* The application uses SQL database architecture for necessary ER model needed for the system.
* The application allows import / export a list of requirements from / to MS Excel sheet via CSV data format.
* The application stores project data in JSON format to enable easy integration with 3rd party applications.

**Storage Capabilities**

* Data and statistics storage will be done to train the bot; thus, the application cumulatively stores all the user inputs into the system and gradually increase in size. As the application will be integrated into the client’s system, storage will also be the same as its server.

**Data Retention**

* For training the bot using AI techniques, user inputs are not removed after a certain period and that will remain for this system.

**Data Integrity**

* The application shall maintain data integrity by keeping backups of all updates to the database for every user interaction.

## 6.0 Other Requirements

**Data Privacy**

The server on which the Chatbot WebApp resides will have its own security to prevent unauthorized write/delete access. Only the application will be able to read the user inputs. The use of email or number of the user is up to the client systems and therefore external to the system. The application shall not send any user data over the Internet.

**7.0 Approval**

The signatures below indicate their approval of the contents of this document.

|  |  |  |  |
| --- | --- | --- | --- |
| Project Role | Name | Signature | Date |
|  |  |  |  |
|  |  |  |  |
|  |  |  |  |