**COMP 3059 – Capstone Project I**

**Software Requirements Analysis and Design Assignment**

# 1.0 Introduction

The Virtual Assistant will first be available in Windows and is coded in Python, which will perform the same functions as Siri, Cortana and Google, while also breaking some limitations, making us stand out from our competitors.

## Purpose

Purpose of this virtual assistant is to Complete some chores like sending emails, setting alarms and many more tasks can be performed over voice command and not only that you can ask some questions of which you don’t know answers like simple math problems and questions about history and assistant can give you information and resources to look upon. This technology will definitely save time which makes it very useful in daily life. So basically, the purpose of this virtual assistant is to save time affectively and do things by voice command.

## Scope

* This virtual assistant will be designed to do day to day tasks by voice, so user don’t need to do it manually. This can include some tasks such as Search with voice commands, basic math operations, Wikipedia search to show meaning, which would otherwise have to be performed manually. This assistant can also set alarm / timer and keep records of your to-do list and remind you. there will be multiple language support in assistant to make it user friendly and more convenient.
* More specifically, this assistant is designed to keep track of your previous activity and also it will break some limitations of other window’s virtual assistant which will be the major plus point for our assistant.

# System Overview

* Our virtual assistant (Alita) will interact with user using user’s voice command. We are planning to implement this concept on laptop as of now. First of all, user will wake-up the system through wake-up calls such as “hey Alita”, so now system is ready to take any voice commands from current user. Then, user will be able to perform each and every day-to-day task with their voice commands without putting hands on keyboard at all. As of now, our operating environment would be windows, database will be mongo dB and platform are python.

## Project Perspective

* The core goal of this project is to perform the regular and common task, to make life much easier for mankind. On top of that, humans do not need to remember everything on their head, rather computer will do that on their behalf such as reminders and scheduled messages.
* We are deriving and extending this project from Cortona. Cortona is not capable of performing these kinds of tasks. Aleta as a virtual assistant accepts voice of user and work accordingly.

Diagram

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## 2.2 System Context

Increases productivity and guarantees that clients are responded to in a timely manner. If a client is too busy to complete simple tasks such as sending an email or setting an alarm, Alita can assist the client with these and other chores by responding to the client's voice commands.

## 2.3 General Constraints

* The internet connection is a constraint for the application because the application communicates with the external system to retrieve the response data over the internet, and it is essential that internet connection should be available all the time.
* The user must have a PC or computer in order to install and use the application.
* Application has a language barrier i.e.; the application supports only few languages for the user to use it.
* User must have at least windows 10 or above operating system installed the users PC or computer.
* Alita must be turned on manually by the user.

## 2.4 Assumptions and Dependencies

Assumptions

* Assuming that the user who plans to use Alita, will have a PC or a computer with a proper internet connection to complete their tasks.
* Installed proper OS on the device.
* Will be speaking language like English which is most common language.

Dependencies

* Most of the features depends on the web search via voice command
* If in any other case than that occurs, the voice command is stored in a database
* Mathematical calculation depends on the math function which operated all the math equation
* Setting Alarm, meeting and timer depends on the clock function
* To create a to-do list depends on the database to store the list
* Weather forecasting depends on the internet for the accurate information
* Search the meaning of a specific word also depends on the internet for the correct information

## 3.0 Functional Requirements

The project is about the personal virtualized assistant. This assistant will help you to perform your daily routine tasks in a very easy and simple way. This assistant software will take voice commands form a user and try to perform those tasks. Some interesting features about this software are scheduling an email and automate the message for the user which a very new idea. Those features are described in below use case.

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

* Introduction

Virtual Assistant is accessible by voice commands given by the user. It takes commands from the user and forward it to the backend system to perform those given tasks. Now, those all the data stores in an Alita’s own database.

* Inputs

As an input for our software, Assistant will take user commands to perform the necessary action. Whenever user runs the software, Assistant will greet the user and ask for the command which user wants to give.

* Processing

When assistant takes a command, it will pass through backend in its own system and request those tasks to perform. Then, data will go in the system database, and it will verify the data and return it to the system and respond to the task.

* Outputs

## To conclude the response of given task, the system throws the data/necessary information to the assistant, and it will respond it back to the user and that way, the user gets his/her task done.3.2 Use Cases

### 3.2.1 Use Case #1

Diagram

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* Student - The system must allow users to create a to-do list for students to schedule a timetable for study. The system must allow users to set an alarm through a system setting. The system must allow users to make a reminder about the classes. The system must allow users to search on google by voice commands to surf internet faster.
* Professor - The system must allow the users to calculate mathematical problems by voice command. The system must allow users to change and play songs for relaxation. The system must allow users to schedule an email by system automatically. The system must allow users to show weather forecast by voice commands.
* Writer- The system must allow users to search words meanings and synonyms by voice command. The system must allow users to support various languages in system while giving commands to assistant. The system must allow users to open a game application and play games to relax and to keep mind fresh.
* Programmer- The system must allow users to set a timer to take frequent breaks while coding. The system must allow users to automate a WhatsApp message and send it on given time by user. The system must allow users to make a call via voice command. The system must allow users to open different applications to perform on machine by giving a voice command.

**3.3 Data Modelling and Analysis**

* Normalized Data Model Diagram

Table

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* Activity Diagrams

Diagram

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* Sequence Diagrams

Diagram

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* UML Class Diagram

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**3.4 Process Modelling**

* Data Flow Diagram

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## 4.0 Non-Functional Requirements

* This Virtual Assistant will be user-friendly.

***ID:*** NFR1

***Category:*** Performance

***Description:*** A system should not take more than 40 sec to recognize the

commands given by user.

***Priority:*** High

***ID:*** NFR2

***Category:*** Performance

***Description:*** A system should perform the actions correctly according to

The commands given by user in less than a minute.

***Priority:*** High.

***ID:*** NFR3

***Category:*** Maintainability.

***Description:*** Each unsuccessful command should be recorded in

database. So, admins can see what needs to be change in

the system.

***Priority:*** Medium.

***ID:*** NFR4

***Category:*** Security.

***Description:*** User email id, password and other confidential information

Should be encrypted when they trying to send emails and

Messages through voice commands.

***Priority:*** Medium.

***ID:*** NFR5

***Category:*** Efficiency

***Description:*** The system should handle more than 1000 voice commands

From the user. It should not shutdown automatically after

Couple of commands

***Priority:*** Mandatory.

***ID:*** NFR6

***Category:*** Efficiency

***Description:*** The system should not exceed more than 2-3 mistakes

While performing the tasks.

***Priority:*** Mandatory.

***ID:*** NFR7

***Category:*** Maintainability

***Description:*** The system should be alerted and consistent while

Interacting with user.

***Priority:*** Medium.

***ID:*** NFR8

***Category:*** Reliability

***Description:*** The system should wake-up immediately when wake-up has

been called.

***Priority:*** Mandatory.

***ID:*** NFR9

***Category:*** Portability

***Description:*** The System should work on specified device.

***Priority:*** Mandatory.

***ID:*** NFR10

***Category:*** Portability

***Description:*** The System should work on specified operating system.

***Priority:*** Mandatory.

## 5.0 Logical Database Requirements

We will use database in our Alita and that will be mongo DB. For now, it seems like mongo DB is the most suitable data base for virtual assistant.

Storage capabilities – mongo dB provide us to 21 GB database size

Data retention:

* Organization will destroy media when it is no longer needed for business or legal reason
* Personal data will not be kept longer than it is necessary for the purpose for which the personal data are processed.
* Personal information such as email and phone number can be disclosed if requested
* If user have added financial information like credit card number, it will be in storage for 5 years after it will be discarded and if use still using our service should have to insert again.

Data integrity:

Data integrity is a term to understand the health and maintenance of any digital information.

* Entity Integrity: In or database, there will be columns, rows, and tables. In a primary key, these elements will be as numerous as needed for the data to be accurate. None of these elements should be the same and none of these elements should be null. For example, a database of users should have primary key data of their name and a specific “user number”.
* User-Defined Integrity: There will be sets of data, created by users, outside of entity, referential and domain integrity. If an employer creates a column to input corrective action of employees, this data would be classified as “user-defined.”

## 6.0 Other Requirements

In our project we need to use some libraries in python in order to operate our Alita (The virtual assistant).

* Speech\_ recognition – to recognize voice and convert that into a meaningful statement
* Datetime - to get time and perform time related activity like show time, set alarm, set timer
* Wikipedia – to extract any information from Wikipedia to respond any question of user
* Web browser – to search on web and open ant website to do web searching

**7.0 Approval**

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

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