



Sri Lanka Institute of Information Technology

PROJECT REGISTRATION FORM

(This form should be completed and uploaded to the Cloud space on or before XXXXXXXXX)

The purpose of this form is to allow final year students of the B.Sc. (Hon) degree program to enlist in the final year project group. Enlisting in a project entails specifying the project title and the details of four members in the group, the internal supervisor (compulsory), external supervisor (may be from the industry) and indicating a brief description of the project. The description of the project entered on this form will not be considered as the formal project proposal. It should however indicate the scope of the project and provide the main potential outcome.

PROJECT TITLE

(As per the accepted topic assessment form)

Medical Prescription Detection and Health Guidance System Using Machine Learning

RESEARCH GROUP

(as per the Topic assessment Form)

ICT for Development (ICTD)

PROJECT NUMBER



TMP-2022_23-48

(will be assigned by the lecture in charge)

PROJECT GROUP MEMBER DETAILS: (Please start with group leader's details)

	STUDENT NAME	STUDENT NO.	CONTACT NO.	EMAIL ADDRESS
Format	Perera C.D.D	ITxxxxxxxx	0712345678	itxxxxxxxx@my.sliit.lk
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SUPERVISOR, CO_ SUPERVISOR Details

SUPERVISOR Name	CO-SUPERVISOR Name
Mr. Ravi Supunya	Ms. P.K. Suriya Kumari
Signature	Signature
<p>Re: Project Charter Report</p> <p> Ravi Supunya <ravi.s@slit.lk> 4:49 PM</p> <p>To: Hewapathirana L.L. it19025322</p> <p>[EXTERNAL EMAIL] This email has been received from an external source – please review before actioning, clicking on links, or opening attachments.</p> <p>Dear Hewapathirana, This is ok. You can submit.</p> <p>N.H.P. Ravi Supunya Swarnakantha (MSc, PGd, BSc, MCSSL), Lecturer Faculty of Computing Department of Information Technology SLIIT Matara Center 041 754 4509/0714209799 ravi.s@slit.lk</p> <p>Attach the email as Appendix 1</p>	<p>Re: TMP-2022_23-48-Medical Prescription Detection and Health Guidance System Using Machine Learning-Topic Assessment for Co-Supervisor Suriya Kumari Endorsement.</p> <p> Suriya Kumari <suriya.k@slit.lk> 10:58 AM</p> <p>To: Hewapathirana L.L. it19025322</p> <p>[EXTERNAL EMAIL] This email has been received from an external source – please review before actioning, clicking on links, or opening attachments.</p> <p>Dear CDAP project Team,</p> <p>Now document seems fine.</p> <p>I confirm the project co supervision of the above research group providing the necessary guidance needed to successfully complete the CDAP project.</p> <p>Best Regards, Ms.Suriyaa</p> <p>Attach the email as Appendix 2</p>
07 th Sep 2022	07 th Sep 2022
Date	Date

EXTERNAL SUPERVISOR Details (if any, may be from the industry)

				Attach the email as Appendix 3
Name	Affiliation	Contact Address	Contact Numbers	Signature/Date

ACCEPTANCE BY CDAP MEMBER (This part will be filled by the RP team)

Name	Signature	Date

PROJECT DETAILS

Brief Description of your Research Problem: (extract from the topic assessment form)

- People have several communication challenges due to the current economic situation. People must make a phone call or visit the laboratory to get information about the reports listed in the prescription, report pricing, and whether they have to abstaining before taking the tests. It is both an expensive and time-consuming procedure.
- Most people are having trouble discovering pharmaceuticals in pharmacies and determining the availability of medicines in pharmacies due to the current economic situation. Patients must go to many pharmacies in search of the medication because there aren't enough medications available. It takes a lot of time and effort to do this. Individuals may be unable to find the prescribed treatment in an emergency.
- While buying medicine, people must check in many pharmacies to find drugs to a fair price. Because they are unable to obtain the medications at a reasonable price .But most of the time patients must ended up in the low-quality drugs for lower prices.
- Due to lack of durability and easy to lose the prescription, paper-based prescriptions can sometimes be inaccurate or unclear for patients. Most of the time a prescription is issued in as papers, which is influenced by the patient and external factors and is, therefore, more prone to destruction. Therefore, there are obstacles to identifying the medicine correctly and the patient may have difficulty buying the medicine.
- On the other hand, after taking the medication once, the same tip should be taken again while taking the medication and thus the medical history of the patient is recorded, but if it is destroyed, it can affect to doctor while writing the medicine according to his patient history.
- After the diagnosis, in the prescription given by the doctor, write down the patient's details about the patient's diagnosis and the relevant medicines and the times they should be taken, but most of the time they cannot be read correctly. Therefore the problem we identified was the lack of readability and understand of information on prescription.
- The patient often does not have an idea of how much medication to take at the right time and the period of time to take it. Due to the lack of guidance in taking the medicine, problems can arise due to taking the wrong dose of medicine or taking it in an unnecessary amount and taking the medicine at the wrong time. These lead to life-threatening health problems.

Description of the Solution: (extract from the topic assessment form)

The proposed mobile app will primarily focus on the relevant areas that are supposed to be covered in order to fulfil the needs of patients by providing the necessary services such as detecting prescriptions and visualizing drug in the bottles according to the disease, identifying the best available pharmacy, voice recognition and e-prescription generation, lab report reviewing and monitoring the side effects. The team's top priorities are to recognize essential services that must be offered through the mobile application and to deliver exceptional service with minimal interruptions.

This mobile app is made up of four major components. Each component evaluates four potential areas that patients may encounter when attempting to understand the handwritten prescription. The first component is handwritten prescription detection, and the system will automatically visualize the number of bottles with the correct number of pills by reading the number of days on the prescription. The device will assist the patient by reminding him to take his meds before and after meals. The amount of pills in the bottles will automatically change when the patient consumes the tablet on a regular basis. The primary solution in this component is for the patient to interact with his doctor knowing a little bit about the drugs they are taking daily and remembering the names of the drugs according to the disease. The second component helps the patient in identifying suitable pharmacy based on ratings provided by users of the app, and pharmacies are confirming their available drug specifics by confirming the alert message, giving the customer with cost statistics, and the patient may also place an order through the app. The third component is the use of speech to generate an e-prescription, which saves time and energy by just speaking to the program rather than writing the prescription on paper. It also generates an e-prescription, which may be accessed directly from the document file, reducing medication errors. The final component assists to analyze the information in the reports and the patient have a brief understanding about the side effects may occur when the drug is taken at a normal dose and during an overdose.

Main expected outcomes of the project: (extract from the topic assessment form)

Main Objective:

The primary goal of our research is to develop an innovative mobile application that allows users to easily access and understand what drug names are prescribed on a doctor's prescription by utilizing many features such as mobile app tracking the drugs' names in the prescription, tracking the best pharmacy to collect drugs, generating the voice recognition prescription, and also classifying the drugs according to the disease (Example: Metformin for diabetes) with necessary information.

Sub Objective 1: The mobile application recognizes the pharmacological names of the prescribed medications and classifying them as either painkillers, symptom-controlling drugs, or symptoms controlling drugs. And based on the amount of medications in the prescription, the system will automatically visualize the number of bottles with the appropriate quantity of tablets. Furthermore, there is a chat bot option for patients to connect with lab consultants by implementing Speech-To-Text feature to understand more about lab report pricing, whether it is necessary to fast before taking the reports or not, and the purpose for why we are taking those reports.

Sub Objective 2: Identify the best pharmacy through a confirmation message which is send to all the pharmacies registered under the app for drug collection. When identifying the best pharmacy we are considering relevant pharmacy information such as drug availability, drug prices and the nearest location to the patient. The drug availability will check by considering the confirmation message results of the pharmacies and provide a drug ordering option via the app.

Sub Objective 3: The patient is registered by the doctor's assistant using an app. The program is managed by the assistant, and it begins writing the prescription by detecting the doctor's voice and filling in the diagnostic and medicine category areas. The prescription will also generate a PDF document.

Sub Objective 4: The mobile app scans the prescription and detects drug adverse effects. The app will estimate the patient's health status based on data patterns (normal dose/overdose) and then propose steps to take. Here, we list two specific medications that are correlated with the diseases (arthritis, kidney and dengue). Additionally, a photo must be uploaded for a lab report review. The information provided determines if the report is connected to kidney and arthritis.

WORKLOAD ALLOCATION (extract from the topic assessment form after the correction suggested by the topic assessment panel.)

(Please provide a brief description about the workload allocation)

MEMBER 1	Detecting prescription and filtering the drugs in a visualizing bottles to help patients.
<p>This is an innovative mobile application that uses Artificial Neural Network (ANN), a deep learning architecture, to recognize the handwritten prescription text. According to the previous application, they classified the drugs with a combination of main features like color, shape, and imprint. In this component, we are supposed to classify the drug names in the prescription as disease-modifying drugs, pain killers, and symptom-controlling drugs using a classification algorithm. Afterward, the system will automatically determine the number of bottles with the appropriate number of drugs in the prescription. The system will remind the patient which drugs should be taken before and after meals according to the disease that the drug is prescribed for. (After meal: Lasix Oral drug – to reduce the extra protein in the body). Then the quantity of drugs in the bottles will automatically change when the patient takes the pills on a regular basis. As well as the patient getting a remainder before the two days that their drugs are to run out and displaying the remaining amount of drugs in each container. The patient will be provided a sheet with relevant drug names to confirm whether or not he has taken them. Furthermore, there is a chat bot option for patients to connect with lab consultants by implementing Speech-To-Text feature to understand more about lab report pricing, whether it is necessary to abstaining before taking the reports or not, and the purpose for why we are taking those reports. (Example: FBC – To measure fasting Blood Count).</p> <p>Data set: To collect the relevant data set for this component we are using the support of consultancy of pharmacies.</p>	
MEMBER 2	Offer the top pharmacies that are readily available so that customers may effortlessly order medications.
<p>The economic crisis has made it more challenging for many individuals to buy medications. We are launching an innovative mobile app as a solution to identify the best pharmacy to collect all the drugs at one place. First, we register the top pharmacies for the app and use an Artificial Neural Network (ANN) to recognize the prescription. Then, using a confirmation message, they send the drug name list in the prescription to the different pharmacies to see if the drugs are available. Following that, we are training a machine learning (ML) model to predict the best pharmacy based on customer reviews, price comparison, and location. While submitting their prescription through the app, the patient may also specify how long they want to take the drug for, such as a week or a month. They can pick up their order from that pharmacy after placing it. Users may also cancel their orders with the support of this app.</p>	

Data set: To collect the relevant data set for this component we are using the support of consultancy of pharmacies.

MEMBER 3

Use speech recognition to generate an electronic prescription.

According to the country's current position, there is a scarcity of paper. As a result, electronic prescriptions are the best option. Because adopting this option saves time and cuts down on paper waste. When the doctor speaks the drug names that are given for the diagnosis, the system is able to recognize the drug names using Voice-To-Text method and propose comparable names for that drug by using Name Entity Recognition (NER) model. The generated transcripts' information will be extracted using Natural Language Processing (NLP). After that a PDFs document will be generated and the doctor send it to the patient via email or phone number. And also including the digital signature to a prescription to show the authenticity of the e-prescription.

MEMBER 4

Evaluating prescriptions and monitoring the adverse effects of heavy drugs.

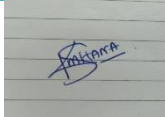
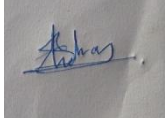

Using a natural language processing (NLP) model trained to predict the side effects of the specified drugs at low and high doses, we are using an Artificial Neural Network (ANN) in this component to detect prescriptions and identify two specific drugs related to the diseases (arthritis and kidney). We must upload an image of the lab report using Conventional Neural Network (CNN) in order to evaluate the lab results. The data in the report is then analyzed using PCR (Printed Character Recognition). It is evaluating from the information provided whether the report is connected to arthritis, kidney or dengue, comparing it to a healthy person in the case of dengue, and demonstrating the different stages of the dengue patient. (1st stage, 2nd Stage and severe stage). Only the FBS, ESR, and RF reports for arthritis and the antigen reports and FBC reports for dengue are evaluating by this system.

Data set: To collect the relevant data set for this component we are using the support of consultancy of pharmacies and lab assistants.

DECLARATION (Students should add the Digital Signature)

"We declare that the project would involve material prepared by the Group members and that it would not fully or partially incorporate any material prepared by other persons for a fee or free of charge or that it would include material previously submitted by a candidate for a Degree or Diploma in any other University or Institute of Higher Learning and that, to the best of our knowledge and belief, it would not incorporate any material previously published or written by another person in relation to another project except with prior written approval from the supervisor and/or the coordinator of such project and that such unauthorized reproductions will constitute offences punishable under the SLIIT Regulations.

We are aware, that if we are found guilty for the above mentioned offences or any project related plagiarism, the SLIIT has right to suspend the project at any time and or to suspend us from the examination and or from the Institution for minimum period of one year".

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