Sri Lanka Institute of Information Technology

PROJECT REGISTRATION FORM

(This form should be completed and submitted on or before 4.00 PM, Friday 6th January, 2015)

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	**Smart Dentassist ; Interactive System for Dental Support and Patient Management.**
RESEARCH GROUP	**Medical Image Processing**
PROJECT NUMBER	(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
1	R. M. S. M. Rathnayaka (GROUP LEADER)	IT 12038510	0775685929	dfnmahesh@gmail.com
2	B. L. H. M. Gunarathna	IT 11229162	0775055557	hasithmalinga89@gmail.com
3	A. H. E. D. Kumara	IT 12043842	0771644890	damindaeshan@gmail.com
4	K. G. L. Bogahawatte	IT 12062034	0779112919	kavindibogahawatte@gmail.com

SUPERVISOR

Dr. Rohan Samarasinghe		
Name	Signature	Date

CO-SUPERVISOR (will be assigned by the Supervisor, if necessary)

Name	Signature	Date

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

Name	Affiliation	Contact Address	Contact Numbers	Signature/Date

ACCEPTANCE BY PROJECT COORDINATOR

Mr. Jayantha Amararachchi		
Name	Signature	Date

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PROJECT DETAILS

Brief Description of your Research Problem:

Oral examinations using mouth mirrors are a cumbersome as well as a time consuming process for the dentist as well as the patient. Viewing the condition of a tooth is rather inconvenient for both parties. Although intraoral cameras have been introduced, the usage of it is not so widespread.

Decision support systems for dentists, using the images captured by intraoral cameras is yet to be introduced to Sri Lanka. Although dentistry requires maintaining patient details, doing so manually is not sufficient. A complete knowledge base along with decision supporting software would be extremely useful and time saving for dentists.

Even though a dentist explains a patient's condition or disease, due to limitations of mouth mirrors, the patient may not be able to view and comprehend the situation. A system that will enable the patient to see the output of intra oral camera will improve the patient's satisfaction. Although the dentist may explain the results of a particular treatment, the patient may not be able to visualize it. A system that will simulate the effects of treatment in the form of 3D graphics will help the patient understand the treatment and have confidence in the dentist.

Forgetting medical check-up appointments is another commonly occurring issue in the society. A system that will send reminders to patients automatically will be helpful and useful for the patients.

Description of the Solution:

The hardware components are wireless Intraoral camera to capture the oral images of the patient and a desktop/laptop computer as well as a tablet PC to display its output as the hardware components.

The software system will process the images captured by the intraoral camera and display relevant medical information on the screen to assist the dentist in decision making process.

Main expected outcomes of the project:

- The system will be able to analyze and predict diseases after processing the captured images.
- These captured images can be stored in the patient database to create a knowledge base for the dentist.
- Patients' history will be stored in the system and reminders will be sent to the patient regarding appointments and treatments.
- Registered patients' dental structures could be modelled and updated constantly after different treatments.
- The dentist should be able to get a complete idea of the patients' conditions and previously carried out treatments from just one glance at the image.
- During a dental surgery, the system will allow the dentist to stream the video to a consultant in a different location and get needed advice in a video conference.
- The system will model the patients' dental structures in a way that the patient would be able to view the results of treatments carried out / to be carried out in the form of 3D graphics.
- Once patients arrive, the reception will check them into the system. The dentist's computer will display the list of patients waiting to be treated.
- The system will suggest drugs and treatments after processing the images captured from intra oral camera.
- The system will allow the dentist to refer the knowledge base and see previously treated cases.
- The system will transmit a live stream of video captured by the intra oral camera, on to a tablet for patients' viewing.

WORKLOAD ALLOCATION (Please provide a brief description about the workload allocation)

MEMBER 1	K. G. L. Bogahawatte - IT 12062034

Patient Management

The system must register new patients by taking the essential details such as name, date of birth, gender, address, telephone numbers, email address, allergies.

The system will generate a unique barcode for each patient. When the barcode is scanned, the patient's details will be displayed.

The system will generate a folder for each patient. Images captured from intra oral cameras, medical history and all other relevant data will be stored in it.

The system will generate a virtual waiting list for the dentist. When patients arrive at the dental clinic, they will be entered into the system at the reception. The dentist will be able to view the patient being treated as well as the list of patients who are waiting for their turns.

The system will maintain an independent timer for each person to track appointments and to send reminders.

MEMBER 2	A. H. E. D. Kumara - IT 12043842

Treatment

The system will model a patient's lower and upper jaw and enable editing. Any modification of a tooth will be displayed on the 3D model. Standard tooth numbering system will be used.

The system will enable the dentist to create prescriptions, save a copy in patient's folder, and print a copy.

The system will maintain patients' history. Handwritten documents will be input to the system using a hand camera.

The system will save images captured by intra oral camera in the particular patient's folder. The system will also allow the dentist to comment on images and will store them accordingly.

The system will simulate the outcome of treatments using 3D modelling. These simulations will

be shown to the patient during explanations.

The system will suggest treatments based on the images captured and processed.

MEMBER 3	R. M. S. M. Rathnayaka - IT 12038510

Knowledge Base

The system will store images captured from intra oral camera along with their comments to create a knowledge base for the dentist.

The diseases will be categorized and images will be saved according to the disease.

This knowledge base should provide the dentist with treatment suggestions based on the data it stores.

If diagnosing is problematic, the dentist will be able to refer the knowledge base to check previously treated cases, treatments given, drugs used, and comments.

MEMBER 4	B. L. H. M. Gunarathna - IT 11229162

Tele-medicine

The system will allow the dentist to teleconference with other dentists to share images or to live stream video to get their opinions or support if needed.

The system will also transmit images or video from the intra oral camera to a tablet so that the patient will be able to see and understand the condition of the disease as well as the treatment being performed.

DECLARATION

"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 construe 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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