

Chapter 06

Requirements analysis of the software systems to capture interactions data and provide e-Learning Material

6.1 Introduction

The University of Moratuwa, Faculty of Information Technology (UOMFIT) e-Learning system encompasses many students following many courses which include many subjects. Student information and Course information are managed by the system administrator and course material related to subjects is provided by the Lecturers. All the above information is provided to the student through a web application (currently Moodle is used). An internet connection is necessary to access the system.

User interactions are captured and recorded by a tracer running on the client. The server has the capability to record the students' navigation data across the e-Learning system provided.



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6.2 Scope

The initial analysis of the system was for a **Model to identify human emotions in an e-Learning environment**. The scope was narrowed down to design a **Framework that can identify quantitative parameters obtained using interactions that can be used to identify emotions in learning in an e-Learning environment**. The framework is to develop software systems to provide learning material to students while capturing their interactions in the background. Collected data is analyzed to find suitable parameters.

The framework run on a web server which provides e-Learning study material to clients and a client side program which monitors and records user interactions with the system. After gathering data, the analysis will be carried out.

The system is a prototype and will be built as an add-on to the existing e-learning system of FIT upon identifying suitable parameters. Analysis will be carried out using Microsoft Excel. The scope is limited to carrying out the research in a controlled laboratory environment with a set of selected students.

The software design was done for the entire system. The functional prototype will contain only the mandatory modules to carryout the research work.

6.3 System environment

The research will be carried out for selected set of students from the faculty in a laboratory. E-Learning website is operated from the server provided by the faculty. When a student connects to the eLearning system, the web Server will connect to database server to provide study material to the student. Similar environment is available to the other actors of the system.

Hardware	Server and laboratory facilities available at Faculty
Network	Available network facilities at faculty laboratories
Web Server	xamp server or wamp server
Operation System	Windows 98 or above for clients, Windows 2000 or above for the server
Internet Connection	Existing internet connection



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6.4 User Characteristics

The system is intended for the online students pursuing their degrees in Bachelor of Science and Master of Science in Information Technology. Hence, users ranging from students just passed Advanced Level in any of the streams, to people experienced in IT with various knowledge levels is expected. Further, the faculty of FIT are expected to use the system in providing content. Lecturers and Administrators are the other users of the system who will provide e-Learning material to the system and who will be involved in administerting the system.

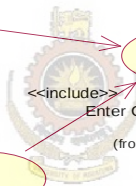
6.5 System requirements definitions

Functional Requirements are those that refer to the functionality of the system, i.e., what services it will provide to the user. Nonfunctional requirements (constraints) pertain to other information needed to produce the correct system at expected performance levels, and are detailed separately.

6.5.1 Functional Requirements

1. The system shall obtain course details, student's profile from the administration system. Course details will include subjects offered, keywords and applications to be used during a learning session. Student's profile will include his / her previous knowledge details related to the subject, and experience.
2. The system shall record user interactions when using the e-Learning system on client side
3. The server side system shall record student specific navigation interactions with the e-Learning system.
4. The system shall provide the facility for the lecturer to request to add new parameters for the subject under study
5. The system shall provide facilities to obtain parameter specific interactions data for analysis to identify relevant parameters.

High level use case diagram is given in Figure 4.2 in page 16. Detailed use case diagram is shown in figure Figure 6.1.



The diagram illustrates the flow of information from the Use Case View to the Information and Record Subject Profile, and then to the Analyze Interactions. The Use Case View is represented by a yellow oval on the left. Arrows point from the Use Case View to the Information and Record Subject Profile, which are also yellow ovals. From the Information and Record Subject Profile, an arrow points to the Analyze Interactions, which is a yellow oval on the right. The Analyze Interactions is labeled "(from Use Case View)".

Use case Descriptions and Activity Diagrams are given in Appendix A

6.5.2 Non-Functional Requirements

The Non-Functional requirements or the constraints the system must work within are listed below.

1. The client side program should work on windows environment.
2. Server should support 100 clients at a given time for a laboratory session.
3. The system should use same Internet security level presently used by FIT-UOM.
4. The students should be informed before their laboratory learning sessions that their interactions will be monitored during the session.
5. The system should not be used outside the controlled laboratory environment within the scope of this project
6. A fully functional prototype of the interactions capturing and lesson content providing should be developed that is needed for analyzing the parameters.



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