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New Education Model for Sri Lanka in Post Covid- 19 Pandemic Era

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ABSTRACT

High quality education and promoting lifelong learning opportunities for all is among the sustainable development goals of the United Nations. This paper aims for New Education Model for Sri Lanka in Post Covid- 19 Pandemic Era to survive the Sri Lankan education. As a education model in pandemic era it has to be eLearning model. This is achieved adopting an object-oriented approach and Unified Modeling Language (UML). The functional and dynamic views of the system are presented and explained within this framework. The functional system includes Use Case diagrams and activity diagrams which are developed based on predefined functional requirements of the system. Furthermore, in the dynamic view of the system, interaction diagrams are developed and explained in detail. The proposed models are a step towards efficient implementation of a complete Education model for Sri Lanka in Post Covid- 19 Pandemic Era.

INTRODUCTION

The Covid -19 pandemic brought a disaster to whole Sri Lankan education system. The normal face to face education pattern became to halt. The education of the country couldn't continue and totally collapsed. As a solution to this problem Online education began to appear in everywhere (Hayashi & Hewagamage, 2020). The pandemic halted education of Sri Lanka began to move again. But with a new facet as eLearning. But the eLearning system of Sri Lanka is not perfectly developed for this purpose. Large parts of Sri Lanka are not prepared for online educational delivery due to the multifaceted digital divide, (Liyanagunawardena 2021). This research paper is written for fill this digital device gap and introduce a new education model in post covid 19 pandemic era using UML diagrams.

METHODOLOGY

In this paper object oriented approach is used to model the online education system using UML models. Section first we will illustrate the context diagram. In section II the functional view of the system is illustrated by using use case and activity diagrams. Section III describes the dynamic view of the system using sequence diagrams. First we take the context diagram to see the whole picture of the new education model. This is to cover all aspects of new education model.

The context diagram is used to establish the context and boundaries of the system to be modeled which things are inside and outside of the system being modelled, and what is the relationship of the system with these external entities.

DISCUSSION

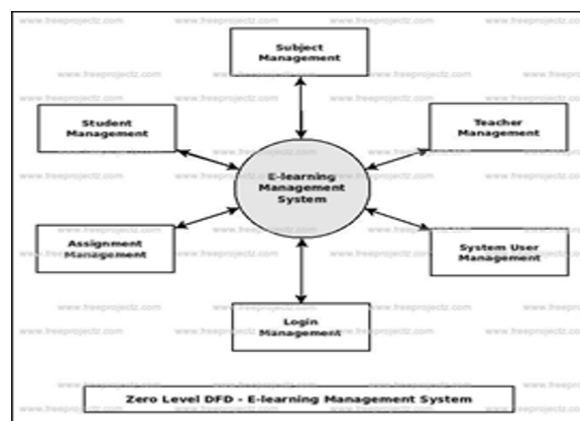


Figure 1: Context diagram (*E- Learning Management System Dataflow Diagram, n.d.*)

Then we take the illustration of all diagrams. new education system must be of high quality and available to all students providing them with the tools and skills enabling them to be competitive on a global level.

The Use Case Diagram

Information sharing is one of the most important aspects of an online educational system. To make sure that each actor is having the right access to the right information, Use Case Diagrams are developed. A UML use case diagram is the primary form of system/ software requirements for a new software program underdeveloped. Use cases specify the expected .The functional requirements of a system are best described

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by Use Case diagrams that is why they are employed to view the system from a functional aspect. To develop the Use Case diagram, the functional requirements of the system were defined as shown in Table.1. Regarding the

priority column, “M” means mandatory for the system to perform the function. “P” indicates that it is a preferred function. “O” means an optional function.

In UML, use-case diagrams model the behavior of a

Table 1: System’s Functional Requirements

No	Requirement Description	Priority
1	Learner/Teacher Enters personal info	M
2	Enters email/phone number or use social media account	M
3	System generates and send confirmation code	M
4	Learner/Teacher enters the sent code	M
5	Verify their qualifications through scanned documents and phone interview	P
6	View different majors/courses	M
7	Search courses by keywords	O
8	View course contents/teacher biography/prerequisites	M
9	Register/unregister in a course	M
10	Submit assignment	M
11	Solve quiz/exam	M
12	View grades	M
13	Set/cancel online appointment with TA	P
14	Chat with TAs/colleagues	P
15	Request private tutor	M
16	Join an online lecture/tutorial	M
17	Request document evaluation/proofreading/review	M
18	Request professional/educational technical assistance	M
19	Request a book/research paper	M
20	View available scholarships	M
21	Evaluate/Match learner's profile	P
22	View application video instructions	P
23	Request scholarship consultation	M
24	Edit biography/course contents	P
25	Add assignment/quiz/exam	M
26	Submit/edit grades	M
27	Accept/reject students' appointments	P
28	Accept/reject help with specific questions	M
29	Set live lectures timings	P
30	Accept document evaluation	P
31	Accept technical assistance	P
32	Accept scholarship consultation request	P
33	Pay through credit/any cash transfer service available	M
34	Professor/consultant receive payment on accounts	O
35	Address complaints	P
36	Rate the lecture/course/answer	P

system and help to capture the requirements of the system. Use-case diagrams describe the high-level functions and scope of a system. These diagrams also identify the interactions between the system and its actors. Use case diagram components are actors-The users that interact with a system, System A specific sequence of actions and interactions between actors and the system, and goals

The end result of most use cases.

This use case diagram is a graphic depiction of the interaction among the elements of eLearning system for Sri Lanka in Post Covid- 19 Pandemic Era. It represents the methodology used in system analysis to identify, clarify and organize the system requirements of the proposed system. The main actors of the eLearning system use case

diagram are Guest, Student, Teacher, Payment System and Administrator. The usecase diagram is shown below.

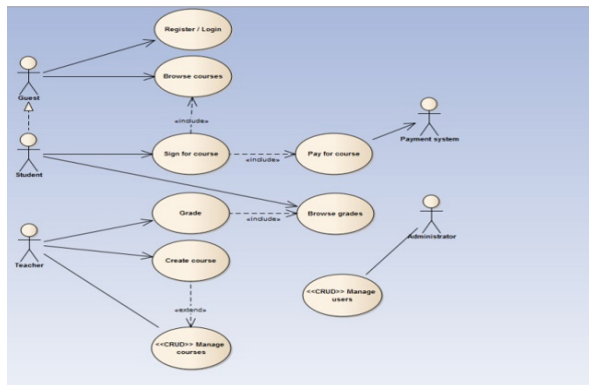


Figure 2: Use Case Diagram (UML Use Case Diagram for Simple E-Learning Platform, no date)

The relationships between actors and use cases in the proposed eLearning system.

- Guest entity - use cases of guest are Register/login and Browse courses
- Student entity – use cases of student are sign for course, pay for course and browse grades
- Teacher entity – use cases for teacher are Grade, Create Course and manage courses
- Administrator – use cases of Administrator are manage users
- Payment System- use cases of payment system are take the pay for course

Activity Diagram

Activity diagrams are also describing the functions of the system, but they consider the logical sequence of the system's major functions. Activity diagrams concentrate on the sequence and status for organizing low level actions. In activity diagrams, the objects needed to execute the functional requirements are identified. Furthermore, the responses taking place during the execution are clarified. It can be concluded that activity diagrams describe the functionality of the system from a sequential aspect .

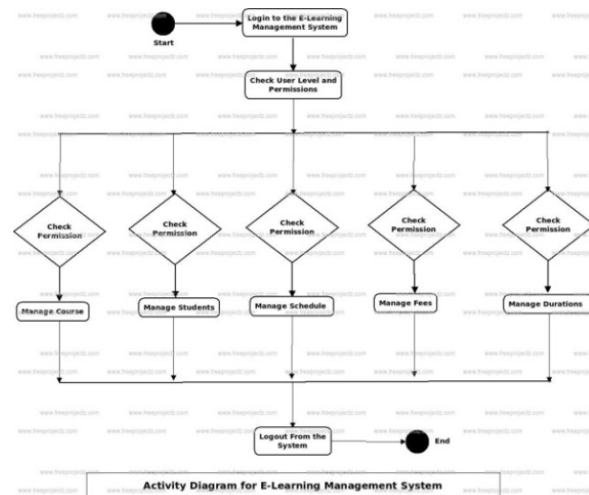


Figure 3: Activity Diagram for E-Learning system

The activity diagram in Figure. 3 shows the main activities of the eLearning Management process within the system. This is the login activity diagram of E-Learning Management System which shows the flows of login activity. Here admin will be able to login using their username and password. Then the system will check the user level and the permissions. After that system login operator can manage course, manage students, manage schedule, manage fees and manage durations.

Sequence Diagram

A sequence diagram is a type of interaction diagram because it describes how and in what order a group of objects works together. These diagrams are used by software developers and business professionals to understand requirements for a new system or to document an existing process. Below is a UML sequence diagram of the eLearning management system Model for Sri Lanka in Post Covid- 19 Pandemic Era. In the sequence diagram the admin process of login success, Course Management, Student Management, Schedule Management, Fees Report and Duration Management are described. By adopting this sequence diagram to Sri Lanka we can get the best beneficiary to the post covid-19 pandemic era.

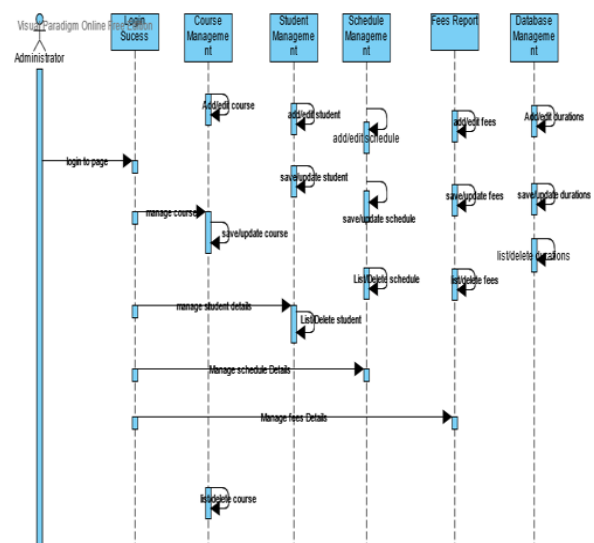


Figure 4: Sequence diagram of eLearning system

Class Diagram of the System

Figure 5 is a class diagram. In software engineering, a class diagram in the Unified Modeling Language is a type of static structure diagram that describes the structure of a system by showing the system's classes, their attributes, operations, and the relationships among objects. The main classes of eLearning management system Model for Sri Lanka in Post Covid- 19 Pandemic Era are course class, student class, fees class, Role class, schedule class and duration class. Course class manage all the operations of course, Student class manage all the operations of student, schedule class manage all the operations of schedule, fees class manage all the operations of fees, Training class manage all the operations of Training etc.

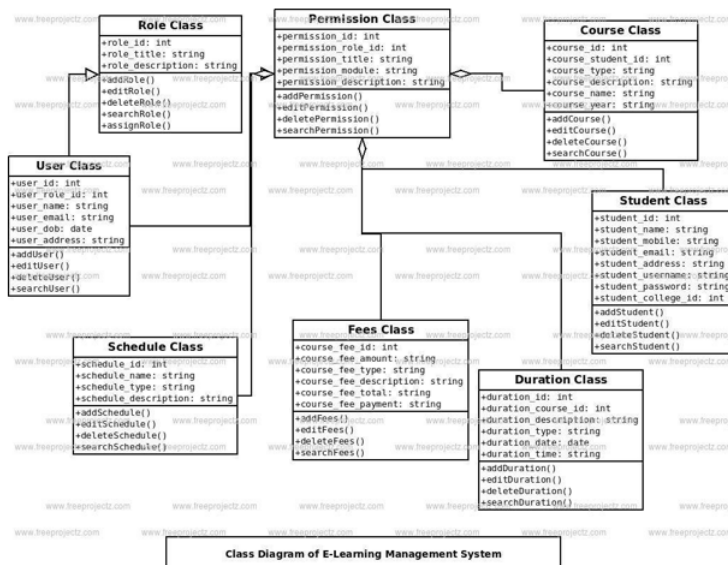


Figure 5: Class diagram of the eLearning system. (E Learning Management System Class Diagram, no date)

CONCLUSION

In this paper the author has described the situation in Sri Lanka in Post Covid- 19 Pandemic Era and eLearning management system model suggestion for it. Context diagram, Use case diagram, Activity diagram. Sequence diagram and class diagram are drawn and described. By adopting these UML diagrams to Sri Lanka the eLearning system of Post Covid- 19 Pandemic Era will be good, will be better and will be flourished. The implementation of these UML diagrams in software and the impact of it will be discussed in the next research paper. But the online eLearning system has it's set backs also. Sri Lanka is a developing country. Most of the students do not have the resources to go online. No wi-fi connections in rural areas, No computers or smart phones, no technical knowledge or skills to set up a eLearning device. Now a days a discussion has been built that only online learning is not sufficient to make a student to his full potential. Online and face to face learning has to be delivered accordingly. The percentage of that hybrid learning system will also be discussed in a future research paper.

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