

Sri Lanka Institute of Information Technology

**Institue Management System**

Project Proposal

Information Technology Project (IT2080)

2018

ITP-2018-MLB-G1-12

Submitted by:

1. IT16067684– Ramanayaka R.A.M.M.P
2. IT16063556– Vijeyanga M.S.O.V
3. IT16065154– Maduranga G.D
4. IT17128278– I.C.S. Ileperuma
5. IT17124690– Wijesekara W.A.M.P

Submitted to:

…………………………..

(Supervisor’s signature)

# Table of Contents

[**1.** **Introduction** 2](#_Toc330011719)

[**1.1** **Problem Specification** 2](#_Toc330011720)

[**1.2** **Solution Outline** 2](#_Toc330011721)

[**1.3** **Key Benefits** 2](#_Toc330011722)

[**2.** **Objectives** 2](#_Toc330011723)

[**3. Procedure** 2](#_Toc330011724)

[**3.1** **Flow of the Project** 2](#_Toc330011725)

[**3.2** **Milestones** 2](#_Toc330011726)

[**4.**  **PROJECT BREAKDOWN STRUCTURE** 2](#_Toc330011727)

[**5.**  **Software and Hardware** 2](#_Toc330011728)

[**6.** **References** 2](#_Toc330011730)

**1. Introduction**

Kings Academy is an EFL (English as a Foreign Language) Institute which offers various courses dedicated to quality English. It is a registered institute by Sri Lankan government which was established on 2015. The academy is equipped with all relevant amenities including sophisticated lecture halls, study areas and a small library, and approximately three hundred current students, more or less. With a good reputation among people and the frequent growth, a computerized system seemed essential for Kings Academy to maintain their activities, which led to the inauguration of this project.

The academy is located in the center of the Ratnapura city and currently one of the well-known and most recommended institutes for students looking for English courses dedicated to IELTS. It also offers long time programs for students following Ordinary Level and Advanced Level examinations, as well as short time courses for Adults and Employees to improve their existing knowledge in a short period of time.

The system required by the Kings Academy mostly concerns on making several important functions to be performed quicker than the present way and it requires an effective way to keep records of all the related parties such as Students and Employees. This information is often used with the payment processes and students progress evaluations. For instance, a full report of each individual student (including attendance, exam marks etc) is given to the student at the end of each course. Also, the system should help the management in every possible aspect when it comes to adding and removing new users, attendence marking, employee salary calculations, assiging lecture halls etc.

The system should also provide a solid platform for students and teachers to interact with each other. Students should be able to post their own questions into a Q&A section where teachers can help them by answering these questions. Teachers can also publish new articles and provide course materials via the system. This platform acts like a mini social network where students and teachers are connected for educational purposes.

Kings Academy also has a small library where students can borrow physical copies of books under certain terms and conditions. This information should also be tracked by the system, and notify the System Admin when students are misusing the library against the terms.

As a startup company, Kings Academy does not have any website at the moment. They need the front page of the web application to be a static web page where unauthorized users can grab information like contact numbers and latest courses.

## **Problem Specification**

Kings Academy is currently using a system which is mostly based on traditional methods such as recording data in books, which is anxious and vulnerable in many ways. Storing and maintaining all the records on order and retrieving information are done manually which costs more time and energy.

Currently, there are about 300+ students studying at the instute and these numbers are rapidly growing. Using a file based system to maintain students information is very problematic and it makes the most of other tasks to be perfomed slower with less efficency. For instance, generating a report for a specific student takes hours of research in records books. The same problem applyies to all other users such as teachers.

The library management has also become extremely problematic since there is no way to notify the system admin about any activity against the library rules. Currently, they have to check all the books and other materials in the library per month to identify any violation.

Building a digital platform for students to clarify their questions is one of the primary needs of the Kings Academy. According to their expirience, most students are hesitating to directly talk to their teachers, and teachers do not have enough time to pay attention to each individual student. Finding a solution to this problem is a primary goal of this project.

By the use of the system all the functions will be recorded/edited/maintained in a computer based system which will increase the efficiency and saves time, energy and money.

## **Solution Outline**

By analyzing the issues faced by Kings Academy, our group members suggested to come up with an automated system to manage the entire process of the institue. All manual processes that are currently handled will be automated. Our focus is to develop a web application that can be used by any related party of the institue under different permission levels. For instance, a student can login to the system, post their questions and check exam marks, but he/she cannot view the admin panel.

Student management, Employee management, Library management, Event Management and Q&A Platform are some main functions that will be automated via this system.

## **1.3 Key Benefits**

* Easy data entry and maintainance.
* Information will be secured.
* Modern UI (will make a possitive attraction).
* Quick report generation.
* Application users are managed with ease.
* Easier to monitor students.

# 2. OBJECTIVES

**User Management**

* Add, Remove and Update Application Users.
* Generate a new account for each user.
* Authentication and Authorization system.

**Employee Management**

* Calculate the employees salary based on their activities (OT Hrs).
* Record employees attendence.
* Track which employee has done any certain activity.

**Q&A Section**

* Students should be able to post their questions.
* Teachers can answer students questions.
* Students can post private messages to teachers (OPTIONAL).
* System Admin can manage students questions by Removing unrelated questions.
* Teachers can publish new articles and course materials.

**Library Management**

* Adding, Removing and Updating books.
* Keep track of all the books.
* Track the student information who borrows any material.
* Notify the system admin about any violation against the rules.
* Notify the students when overdue.
* Check the availability of a book via the system.

**Attendence Marking**

* Attendance of Students and Employees should be marked.
* Students attendance will be bound to a particular course and Attendance will be checked using the student Id.
* Barcode reader for checking attendance (OPTIONAL).
* A full report of the attendance will be generated if requested.

**Events Management**

* Adding, removing and updating events related to the institute.
* Keep track of all the interested users of the event.
* Ability send messages as a batch to the users who are interested in the event.
* Managing two state of an event: GOING and NOT-INRESTED.

# 3. PROCEDURE

# 3.1 Flow Of The Project

**1. Requirements Gathering and Feasibility Study**

The project team conducted special interview to get an overview of the main requirements and the scope of the system. We could analyze the existing software and hardware resources at the Kings Academy to get a better understanding of the scope of the project. A meeting was held with the client to gather most of the required information to start the project at this stage. After the initial discussion with the client, we could identify the main problems they face and come with new ideas to help overcome those issues.

Before move on to the next phase we finalized all the requirements and understood their explicit and implicit requirements. We are hoping to convert these requirements to the SRS.

**2. Designing**

At this stage, the requirements that are specified in the SRS document will be transformed in to a suitable form for implementation in a programming language.

We will be using use case diagrams to model a high level overview of the system. And EER diagram is used to mode a conceptual view of the database which will be later mapped into relations.

**3. Implementation and Unit Testing**

After implementation of the database we would start to code the system. Each module of the system is going to be implemented independently as a standalone unit. After each module is completely implemented we test them independently to make sure that they are working as a single unit. We’ll get a set of independently working modules as the final outcome of this process.

Also we'll use Git for version controlling and managing branches of the application

in a logical way. That way, team members can work their coding independently,

and once a piece of code is finished, the particular branch will be re-based into the

master branch. And the project will be hosted on Github.

**4. Intergration**

In this phase we will merge the resulted modules from the previous phase and

combine them together. We will make sure that each module works without any

issue.

**5. Installation**

We'll find a suitable hosting provider considering pricing and subscription plans. And the number of expected concurrent users should also be considered and we're planing to have a discussion with the client at this stage.

**6. Maintainance**

Even though we develop, tested and delivered the system to the client, there are possibilities that there can be some error that we were unable to detect while testing phase. Such errors have to must be identify and correct as soon as possible.

**3.2 Milestones**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Task Title | Status | % Completed | Start Date | End Date |
| Finding a client | Completed | 100% | 1/6/2018 | 10/6/2018 |
| Requirement Gathering | Completed | 100% | 10/6/2018 | 18/6/2018 |
| Analyze the Requirements | Completed | 100% | 18/6/2018 | 22/6/2018 |
| Devide functions among Members | Completed | 100% | 22/6/2018 | 23/6/2018 |
| Project Chartar Submission | Completed | 100% | 23/6/2018 | 2/7/2018 |
| Project Proposal Presentation | In Progress | 0% | 2/7/2018 | 17/7/2018 |
| Final Chater Submission | Not Started | 0% | 17/7/2018 | 31/7/2018 |
| Implementation | Not Started | 0% | 31/7/2018 | 31/8/2018 |
| Integration and Unit Testing | Not Started | 0% | 31/8/2018 | 6/9/2018 |
| Final Report Submission | Not Started | 0% | 6/9/2018 | 15/9/2018 |
| Final Project Demonstration and VIVA | Not Started | 0% | 15/9/2018 | 30/9/2018 |

# 4. WORK BREAKDOWN STRUCTURE

|  |  |  |  |
| --- | --- | --- | --- |
|  | Name | Function | Description |
| 1 | Ramanayaka R.A.M.M.P | Q&A Section | * Dashboard for teachers and students to post questions and articles. * Displaying the relavant articles and course materials only to relavant students. * Sorting the students questions based on impression rates. * Allowing the system admin to review and remove students questions. * Upload and Download course materials. |
| 2 | Maduranga G.D | Library Management | * Keep track of all the books in the library. * Track the student information who borrows any physical material. * Notify the system admin about any violation against the rules using notification system. * Notify the students when overdue any library asset. * Check the availability of a book via the system (online). |
| 3 | Vijeyanga M.S.O.V | Event Management | * Adding, removing, updating events. * Changing the state of the events for each students, employees and teachers. * Making the event so that it can be marked as GOING or NOT INTERESTED. * Count all the users who are going to the event and send them email new updates. |
| 4 | Wiesekara W.A.M.P | Employee Management | * Managing employee details & creating and updating employee profiles. * Employee salary, time organizing and OT calculating. * Maintaining employee’s medical and other leave allowance. * Generating salary slips. * Managing employees salary based on attendance and other activities. |
| 5 | I.C.S Ileperuma | Attendance Marking | * Managing and record employees attendance. * Record students attendance. * Generate reports based on attendance sheets. * Sending mail messages to students when they dont attend the classes regularly, and notify the teacher about these students. * Implementing and establishing a barcode reader for quick attendence marking. |

# SOFTWARE AND HARDWARE

This application does not contain much CPU bound operations such as Video encoding, Image processing etc. It's mostly comprised of IO bound, data-intensive operations like database queries and network access, which lead to a technology that makes asynchronous programming relatively easier. Most application frameworks out there still use the older methodologies like 'thread per request', which is a waste of server resources for an application like this.

A better UX is specially requested by the client as it makes a big possitive attraction about the institute to unauthorized users. So we'll take big care of the UX design. We'll first wireframe the design and hopefully Adobe XD will be used to design the initial user interfaces. Those designs will be later transformed into HTML pages.

As a summary, the client needs performance and scalability. and the application must be ready for future extensions. a subset of features should be available via a public API that communicates using JSON over HTTP(s).

To satisfy all these requirements, Node.js is an ideal choice. It has a single threaded, asynchronous architecture which makes it an ideal choice for a data-intensive application like this. Since Node is single threaded in nature, scalability becomes high as well. And Node has the largest eco-system of open source libraries on the planet, which reduces hours of development time.

Although Node is mostly used along with NoSQL databases such as MongoDB, use of such DBMS isn't a good choice considering the dataset related to Kings Academy. This application uses a considerably large Relational data for keeping track of information like Students and Courses. This relational data model leads to a traditional RDBMS like MySQL, SqlServer etc. Since the application server should be cross-platform, MySQL is selected as the underlying database engine.

As development tools, we’re going to use PostMan for testing HTTP endpoints, and Git for version controlling.

This application can be accessed by any device by nature of being a web application.

**6. REFERENCES**

**Books**

1. Gantt Charts - Software Engineering I textbook, SLIIT
2. Class Concepts - Software technology II textbook, SLIIT
3. ER Diagrams, Normalization - Data Base Management System I textbook, SLIIT

**Web**

* <http://www.youtube.com> :-Video Tutorials (Node.js, MySQL, UnitTesting)
* <http://stackoverflow.com> :- Javascript, MySQL, Node