



# **Web Based Application for Learning Sinhala Language**

**A dissertation submitted for the Degree of Master  
of Information Technology**

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## Abstract

With the evolving use of technological interferences in education, e-learning systems contribute massively in educational delivery in the modern world. This project is a platform for Sinhala language education based on e-Learning and crowd-sourcing concepts. When it comes to large collection of data or services crowd-sourcing is a commonly used concept. In order to get input from people from different talents and capabilities it was decided to use the crowd-sourcing concept to the system. This will add more variety to the lessons so that it will fit most of the targeted audience.

This project is designed to teach Sinhala language for children under the age of 10 years. But this can be used by any person who is willing to learn the Sinhala language from the beginning. For the kids' parents are allowed to pick the lessons based on the content, comments, instructor, and etc. More importantly, they can select the lessons according to their choice. For example, If the kids really hate to study then Parents can pick the lessons presented in an artistic way and see if the kids are interested. If not, they can change it to cartoons and see if they like it.

The requirements have been gathered from a well-known pre-school in the Matara city- Sakura Montessori and pre-school. They are targeting to enhance the Sinhala speaking and reading skills of the kids. In this specific pre-school each year there are few kids who were born and brought up out of the country and moved back recently. These kids are not familiar with the Sinhala language. Sinhala Learning application can be introduced to them and monitor the progress closely with the help of the teachers of the pre-school.

This system is named as “අකුරු මිතුරු” and it provides a single platform to educators, parents and child to communicate through the internet. Qualified educators can register to the system and upload the lesson. One objective of this system is to provide a way to earn extra income to those who are willing to contribute the lessons. Specially university students can do this as a part time activity. Since the Parents are able to be involved with this system, they can also guide the child through “අකුරු මිතුරු”.

The system was implemented using Laravel framework and WAMP server (PHP, MySQL) technology and has been successfully implemented. Since the system was designed web based, it can be easily implemented. This system will be improved further to address the issues and requests of the customers and the service providers(teachers).

## Declaration

The thesis is my original work and has not been submitted previously for a degree at this or any other university/institute.

To the best of my knowledge it does not contain any material published or written by another person, except as acknowledged in the text.

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This is to certify that this thesis is based on the work of Ms. M.W.A.C.R Wijesinghe under my supervision. The thesis has been prepared according to the format stipulated and is of acceptable standard.

Certified by:

Supervisor Name: Ms. M.W.A.C.R Wijesinghe

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Signature:

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Date:

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# Chapter 1

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## Introduction

### 1.1. Motivation

Internet is the most booming technologies in the past decade so as the online services. Along with the other online services E-learning also has gotten a massive attraction in the developed countries. Although e-learning cannot replace the traditional classrooms, it can be used in many ways. In Sri Lanka we mostly use traditional classroom methods which is very boring for students and tiring for the teachers. But the competition in our education has become like never before. Even though school education starts at the age of 6, to keep up with the competition parents tend to start educating their kids at really small age.

Sinhala language is only spoken in Sri Lanka, but even within Sri Lanka there is no priority for learning proper Sinhala. Those who take English medium education do not pay much attention to Sinhala education. One reason for that is lack of resources.

Early childhood education is the first stage to creates supportive and constructive learning for children of all ages. Children, especially those age under 5 years, need exposure to early stimulation and need to learn life skills that will prepare them for school and day-to-day life. [1]

From the age 3 years onwards, children learn from the preschools and it is organized learning method

However, a majority of preschools in Sri Lanka are privately owned and managed, which many parents simply cannot afford. Also those schools are unregulated and not standardized. Some are with a lack of resources and technical guidance. So they are unable to provide quality educational system. Also only around 39 per cent of all preschool teachers have received at least one year of professional training. [1]

This project is basically focusing on early childhood education in Sinhala Language. Early childhood is known to be the best age to learn languages. But the learning process should be very attractive for this age range as they get bored in a very short period of time. To keep the maximum interest on the lesson this project plans to have interactive and visually pleasing lessons. This is a community collaborated system. Those who have the interest and talent to teach kids in interesting ways can

contribute to lesson pool. Lessons can be in different manners, like storytelling, cartoons, songs. Depending on the kids' interest and the reviews of the lessons parents can select the lessons. For an example if the kid is interested in cartoons, parents can select lessons based on cartoons. There is a review system as well, so parents can rely on the reviews provided by other parents when they select lessons for their kid. There will be Free lessons as well as paid lessons. Paid lessons will be available for the kids when the parents select the lesson and make the payment.

Even though this is focused mainly on local kids in their early childhood, this system can be used in many different ways. “අකුරු මිතුරු” system can be used from anywhere in the world. Sri Lankans who live abroad find it hard to teach their kids Sinhala language, which creates many social issues as well. Some of the issues these kids face are they cannot communicate to their relatives back in Sri Lanka, when they come back to Sri Lanka they feel left behind, etc. If the parents can enroll their kids in “අකුරු මිතුරු” system, it will be addressing the language barrier issues these kids face. This system can be used to reach the children who are differently abled. Parents of these children with special needs may find it hard to take them to schools, tuitions. But these e-learning systems can be used to reach these kids very easily while their parents monitoring and helping these children.

Apart from the kids learning this system can be used by the community to make an extra income and make use of hidden talents. In Sri Lanka there are many people who have talent in different arts which is rarely used at their work. If people who have these talents can put them in to lessons it can bring them some extra income and bring satisfactory feeling making use of their talents in some way.

This thesis is explaining further more on the project, “අකුරු මිතුරු” which is a community collaborated e-learning system. In chapter 2, I have explained about the requirements analysis, related existing systems and their pros and cons. In chapter 3, I have mentioned how the system is implemented. Then the evaluation mechanism of the system is described in the chapter 4. Final chapter 5 describe the conclusion of the overall system.

## **1.2. Objectives**

The objective of the project is to provide society contributed learning platform to improve the Sinhala language skills among children with an interesting and simple way. Especially for the children in their early childhood age, when they are learning faster and when their personality develops. Also, to use the technology to teach children in interesting ways rather than using traditional classroom methods. To create an easy and user-friendly platform for educators and learners (children).

# Chapter 2

---

## Background

### 2.1 Analysis of Requirement

This is a community driven, crowdsourced application. Professional teachers, Child psychiatrists, University students, Cartoonists, Story writers, and etc can provide lessons to improve Sinhala language skills of the children. Following are the basic features of this system.

#### Administrator

- Authenticate the educators and grant them the privilege to upload the documents to the system
- Evaluate the lessons uploaded by the educators and publish in the system
- Manage the payments of learners and educators

#### Educator

- Register to the system providing their qualifications and some sample lessons
- Provide lessons in different categories like videos, presentations, cartoons and etc
- Answer the children's and parents' questions in the forum

#### Parent

- Parents are allowed to register to the system by adding their children to the system. Children get a separate login.
- Make payments for the lessons
- View the marks for the online tests
- Able to comment in the forum

#### Child

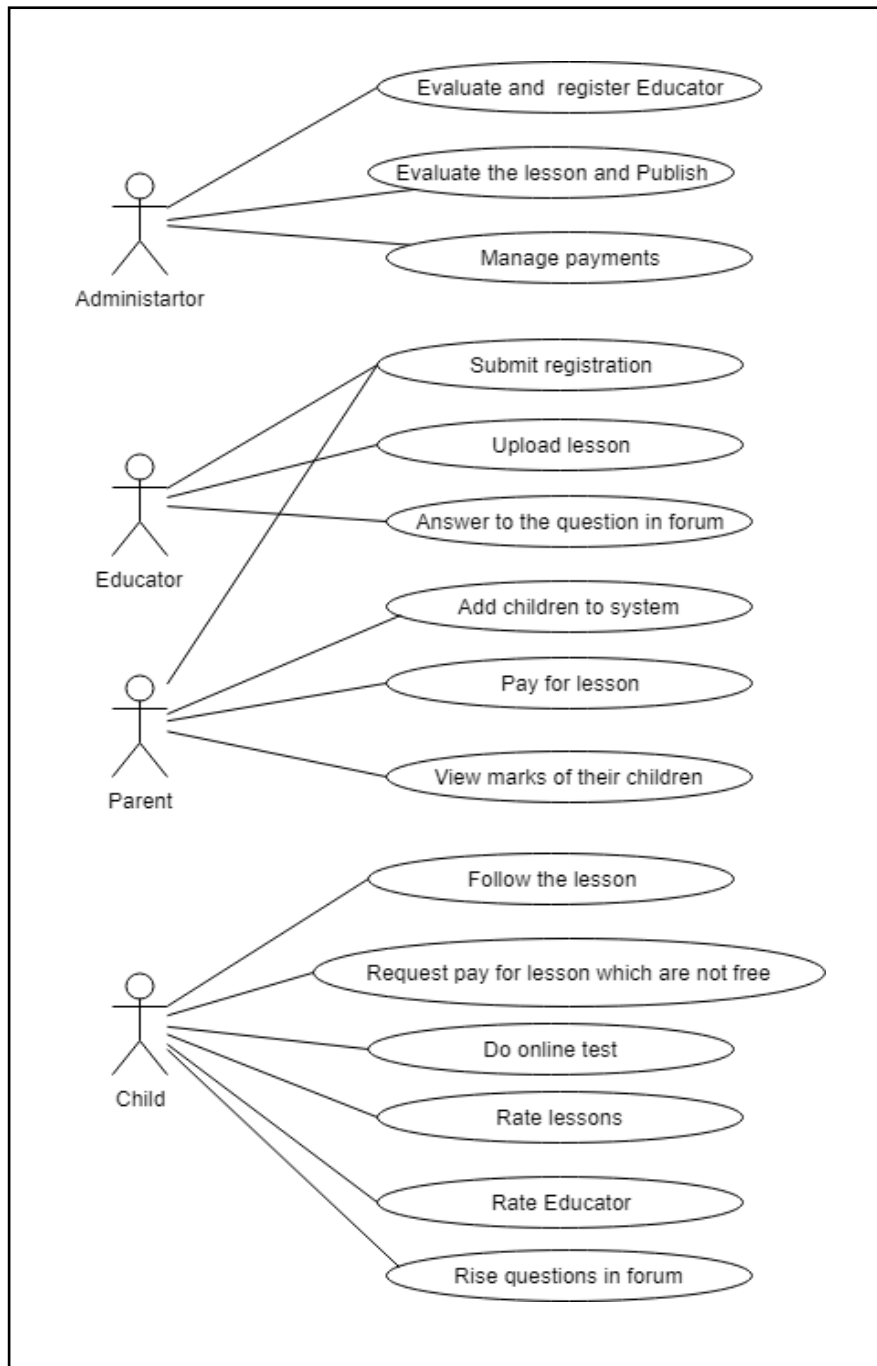
- After parent registration process is completed, children are allowed to access to the system by a separate login

- Children can follow the lessons. If a particular lesson is free, children can follow that without paying. If it requires a payment, when the lesson is selected by the child, parents get a message to pay for the lesson. When the parent completed the payment, the particular lesson is visible to the children
- Take the online tests and score the marks. According to marks children are allowed to follow the upper level lessons
- Rate the educator or the lesson which affects the educator and the lessons ratings
- There is a forum for children to raise their questions

Further the system will provide educational games and evaluate children through the games to encourage them to learn through the system.

## **2.2 Use case diagram for the system**

Following figure 2.1 shows the use case diagram for the system developed.



*Figure 2.1 Use case diagram for system*

Use case diagram describes the boundaries of the system, actors and their activities within the system. According to the above (figure 2.1) use case diagram the system boundary defines conceptual boundaries of the system. System was developed within this boundary. It can be used to help group logically related elements. Actors are usually individuals involved with the system defined according to their roles. The actor can be a human or other external system. According to the figure 2.1 this system has four actors such as Administrator, Educator, Parent and child. Actors accomplish their goals using the system. It

is described by the use cases in the use case diagram. Use cases are initiated by a user to fulfill goals describing the activities and variants involved in attaining the goal.

The relationships between the actors and the use cases are defining in the use case as well.

According to the use case diagram the Administrator involves three activities. Such as Evaluate and register educator, evaluate lesson and publish and manage payments. Educator and parent both submit registration to the system. Other than that the educator's major activities are to upload lesson and answer to the question in the forum. Parents other activities are adding child to the system, pay for lesson and view marks of their children. According to the use case diagram the child has more activities in the system such as follow the lesson, request pay for lesson which are not free, do online test, rate lessons, rate educator and raise questions in forum.

### **2.3 Review Similar Systems**

E-learning has been introduced as a tool in the learning process in the majority of the international universities worldwide. The term "e-learning" is defined by Mahmoud M, Ann Nosseir and et al., in a research study on the effect of E-Learning on Higher Education as "any learning that involves using internet or intranet." A year later made the definition more generalized by indicating that it is "anything delivered, enabled, or mediated by electronic technology for explicit purpose of learning". According to them, "e" in e-learning should not stand for electronic; it should be an abbreviation for "evolving, enhanced, everywhere, every time and everybody." This quotation shows most of the advantages of e-learning for learners and instructors. [2]

Some researchers have shown that the interaction and cooperation provided in the e-learning systems are low compared with the interaction and cooperation in the available environments social requirements. [3]

When it comes to learning Sinhala definitely there is always a low interaction and cooperation by the children. But in most Sri Lankan schools, students have to learn Sinhala or Tamil language as a compulsory subject as the mother tongue. It is very useful for building good platform to learn Sinhala through internet.

Crowdsourcing is the newest mechanism to collect data from a very large crowd. According to the International Journal of Asian Social Science, the term 'crowdsourcing' was first coined by Howe in

2006. It is a distributed problem solving and production process that involves the act of outsourcing tasks to an undefined, large group of people or community i.e. the crowd, through an open call [4].

Further they have explained, crowdsourcing has been successfully applied in business or other profit-making sectors such as Threadless, InnoCentive, Google MapMaker, Building Maker, and iStockphoto. Nevertheless, the practices of crowdsourcing in other domains have been explored too. These include cooperative traffic (e.g., Google Map and Waze), geo-social networking (e.g. Google Latitude and Loopt), product testing (e.g., uTest), user-generated content (e.g. Youtube), user optimization experience (e.g., Google personalized search), and leveraging mass reach (e.g., Google SMS Trader). [4]

In the web there are many e learning systems to learn various subjects, languages and etc. such as Duolingo, nemo Sinhala, Coursera.

### **2.3.1 Duolingo**

Duolingo is a free online language learning site. Duolingo allows extracting the exact time of use/study by date and time and by Different activities: Time used for lessons, time used for translation and time used for other activities. Duolingo is an effective application to learn a language. This offer 68 different language courses for 28 different languages. This app has about 200 million registered users across the world. According to the research, most of them succeeded in improving their knowledge of Spanish. The research has done with Dulingo users who were at least 18 years of age, native speakers of English and not advanced users of Spanish. [5]

According to research they found the below results.

- Dulingo users Overall the average improvement in language abilities was 91.4 points and the improvement were statistically significant. And the effectiveness measure showed that on average participants gained 8.1 points per one hour of study with Duolingo.
- The 95% Confidence Interval for the effectiveness is from 5.6 points to 10.7 points gained per one hour of study.

Although Duolingo provide 28 languages and it is an effective and user-friendly software, it does not facilitate to learn Sinhala language. [5] Following figure2.2 shows the home page of the web-based solution of Duolingo.[6]

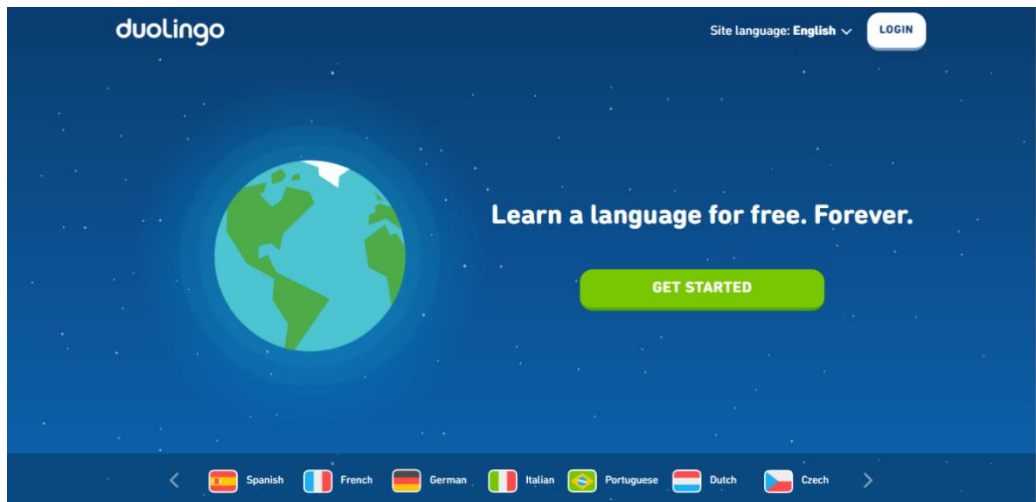


Figure 2.2 Home page of the Duolingo

### 2.3.2 Nemo Sinhala

Nemo Sinhala is another software which is developed for android and mac app for learning Sinhala. This can be downloaded via mobile devices from iTunes or Play Store. It has voice recognition facility, from that it provides speaking and listening activities as well. But this is not a crowdsource based application.

### 2.3.3 Coursera

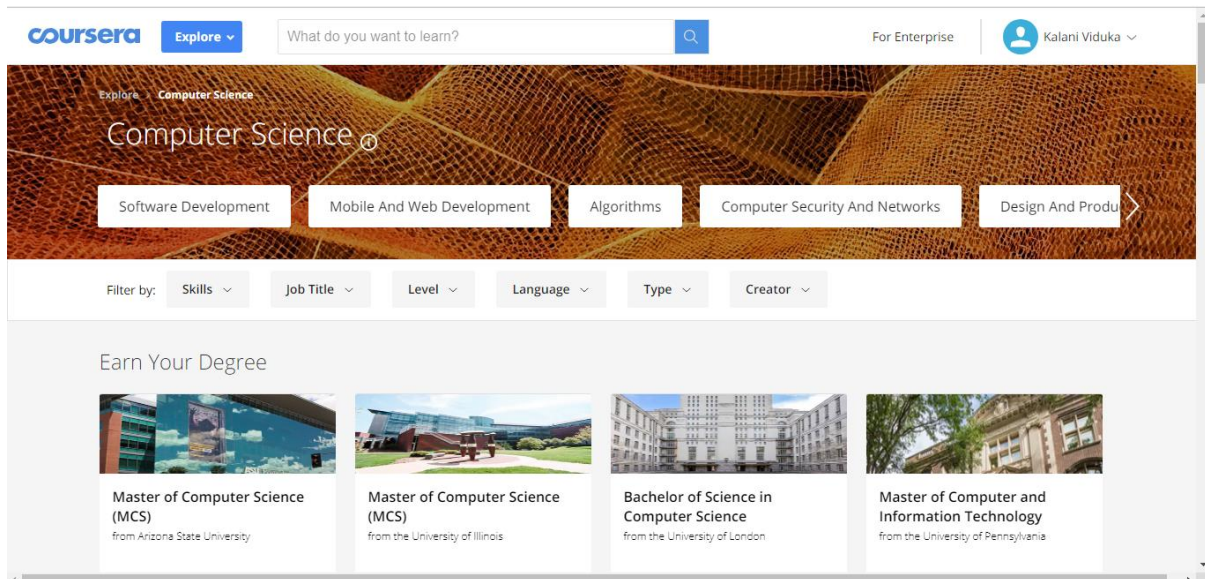
Coursera is also another famous e-learning web-based application. Courses include recorded video lectures, auto-graded and peer-reviewed assignments, and community discussion forums. Coursera offers most flexible and affordable online courses from the world's top universities & companies. This allows to connect with other learners and debate ideas, discuss course materials, and allow to get help mastering concepts. [7]

Coursera provide official recognition certificates to the learners, because of that most of students are willing to follow that kind of lesson. [7]

This provides courses for any subject not only the language learning but also any other courses related to computer science, Data science, Business, Personal Development, information Technology, Math and logic, Social Science Arts and Humanities, Physical Science and Engineering and etc.



Also coursera offers courses, specializations, professional certificate, Mastertrack certificates and, degrees to the students. [7] Following figure 2.3 shows the Computer Science module interface of the coursera web application. [7]



*Figure 2.3 Home page of the Coursera*

### **2.3.4 Bussu**

“busuu” is also one of world’s largest community for language learning, providing courses in 12 different languages on web and mobile to more than 90 million learners worldwide. Learners can sign up for free, or subscribe to a Premium membership to unlock further features like advanced grammar lessons, Offline Mode, McGraw-Hill Education certification or adaptive Vocabulary Trainer. [8]

Busuu busuu formed a partnership with McGraw-Hill Education, one of the world’s largest and most respected education companies. They have created an official certification to allow students to validate their language learning. These tests measure mastery of the core topics in A1, A2, B1 or B2, the levels of the Common European Framework of Reference (CEFR). After successfully passing a test, students will receive an official level certificate awarded by McGraw-Hill Education. [8] Because of that most of students are willing to follow the courses in busuu.

This provide a good learning environment to universities, schools, companies as well. The platform allows organizations to get access to busuu’s Premium language courses and measure students' progress over time. Instructors are able to create classrooms, invite students, access the full busuu curriculum and follow their progress within an interactive dashboard.

“busuu” offers 12 different languages with speaking, writing, reading and listening lessons for every language. All the courses are crafted by a specialized in-house team and it can run in offline mode as well without the internet connection. To run this app in the market it needs a professional team and it will be costly. [8]

Over 75% of busuu users increased their oral proficiency by at least one level. [9]

### 2.3.5 Hapan

If we consider the mobile apps for learning languages or Sinhala language, Hapan is one of attractive mobile application to teach Sinhala or English letters and numbers for Sri Lankan kids in Sinhala medium. Figure 2.5 shows few interfaces of the mobile application of Hapan mobile application. This is developed in Sri Lanka to provide more attractive & interactive way to learn. Kids can listen to the lessons on how to write each letter & they can practice the letters by their own. Hapan guides the kids with voice & graphics when they practice writings letters & correct them if they make any mistakes. The parents can evaluate the kids' learning by referring the Report Card through a special parent only accessible section of the app. [9]

Hapan is a commercial product and the lessons are not update frequently. It provides attractive game kind of funny interface and interactive learning experience for kids guided by voice & graphics. Teaches the kids how to write each Sinhala/English letter and practice kids. Payments can be done via Dailog mobile connection or accredit/ Debit card. [9] Following figure 2.4 is Hapan web site home page.

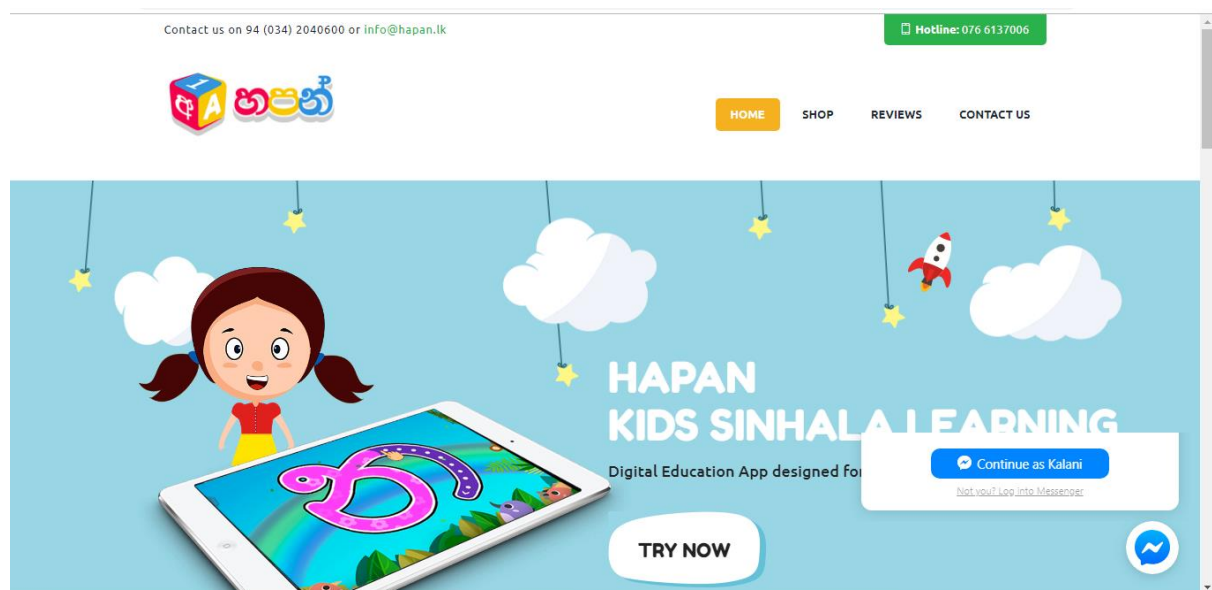


Figure 2.4 Web Site of the Hapan app

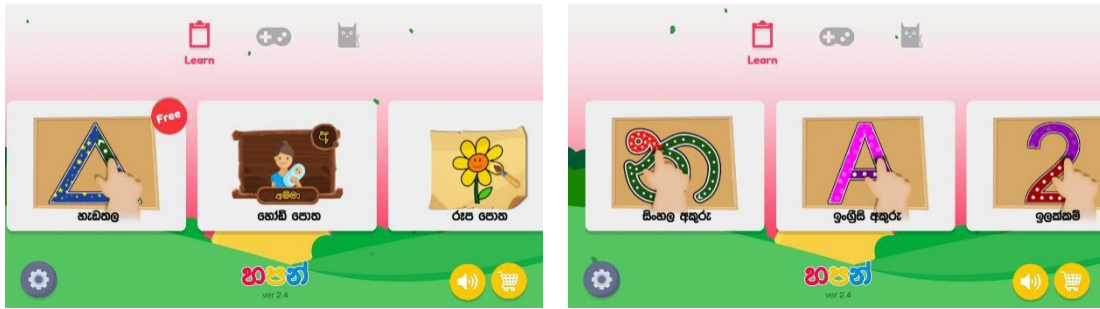


Figure 2.5 Mobile app Screens of Hapan

Also, all above systems are not providing the lessons according to the students' requirements and they are basically adopted with the university or institute culture. And they are not crowdsourcing based applications to get the community contribution.

This project is important as this system uses crowdsourcing for educational purposes. It will be useful for both the students and educators.

# Chapter 3

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## Methodology

### 3.1 Software Development Methodology

#### 3.1.1 Incremental and Iterative Model

The Incremental and iterative Model is a method of software development. Using this model, software can be designed, implemented and tested incrementally. Components are added each time until the product is finished. It involves both development and maintenance.

The product is divided into a number of components, each of which is designed and built separately. Multiple development cycles iteratively work here. Cycles are divided up into smaller, more easily manageable modules. According to the figure 3.1, each module passes through the requirements, design, implementation and testing phases. The first module is often a core product where the basic requirements are addressed, and supplementary features are added in the next increments. Once the core product is analyzed by the client, there is plan development for the next increment. Each subsequent release of the module adds function to the previous release. The process continues till the complete system is achieved.

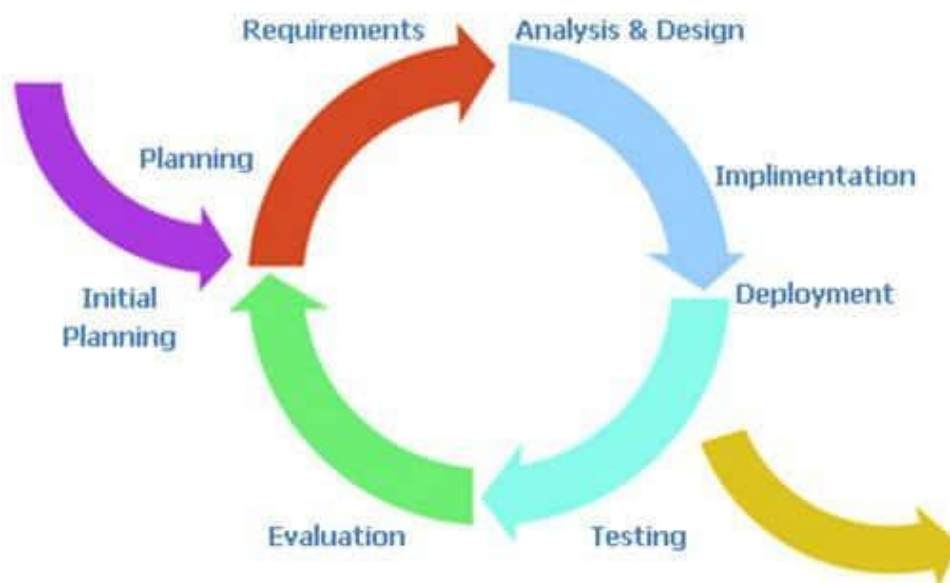


Figure 3.1 Incremental and iterative Model

## 3.2 System Design

Following few paragraphs describe the system design and architecture of the system to get the overall picture of the system.

### 3.2.1 System Architecture

System architecture design shows how the system will work in a graphical representation. There are four types of users. Registered Educators upload the lessons to the system and it will be published after the admin acceptance. It will be saved in the database.

Parent and their children can enroll to the lessons and get the lessons. Following figure 3.2 shows the graphical representation of the system architecture.

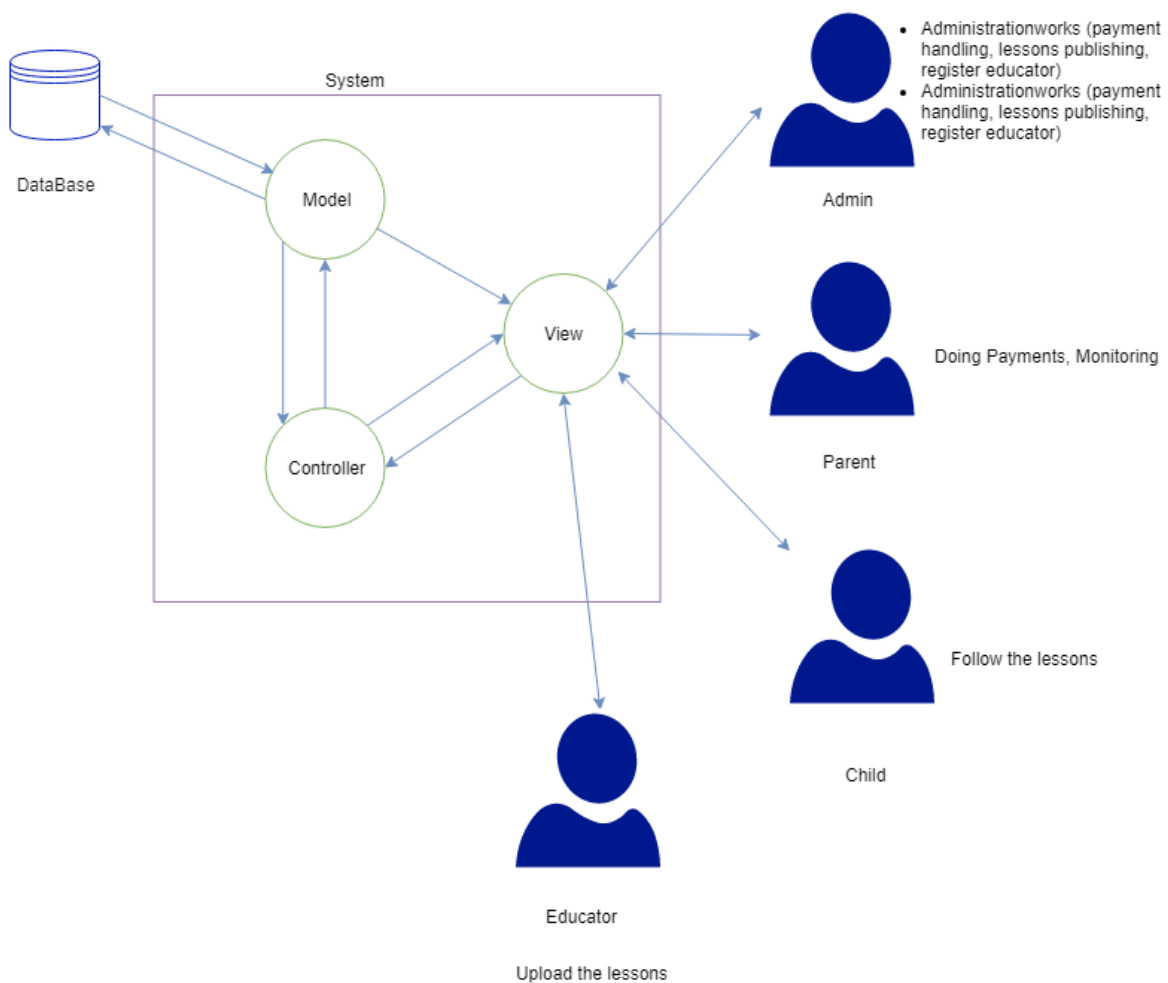


Figure 3.2 System Architecture

### 3.2.1.1 Registration of the users

There are four user types in this project.

- Administrator
- Educator
- Parent
- Child

Admin is the owner of the system. He has an administrative account to handle all the administration work related to this system.

Educator has to request to register to the system by filling the online application form providing all the qualification of the educator. After acceptance of the request of the educator by admin the educator gets the access to the system.

Parent can register to the system by filling the online application. Following figure 3.3 shows registering flow of the educators and parents.

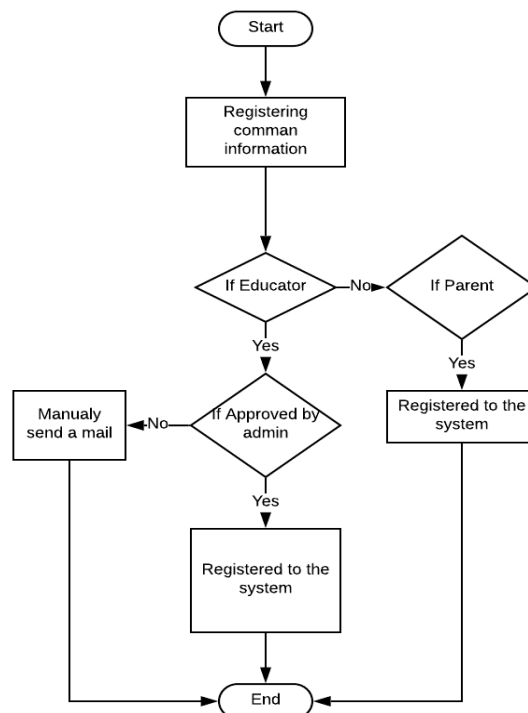


Figure 3.3 Flow Chart for user registration process

Interface of the Parent registration form is as figure 3.4.

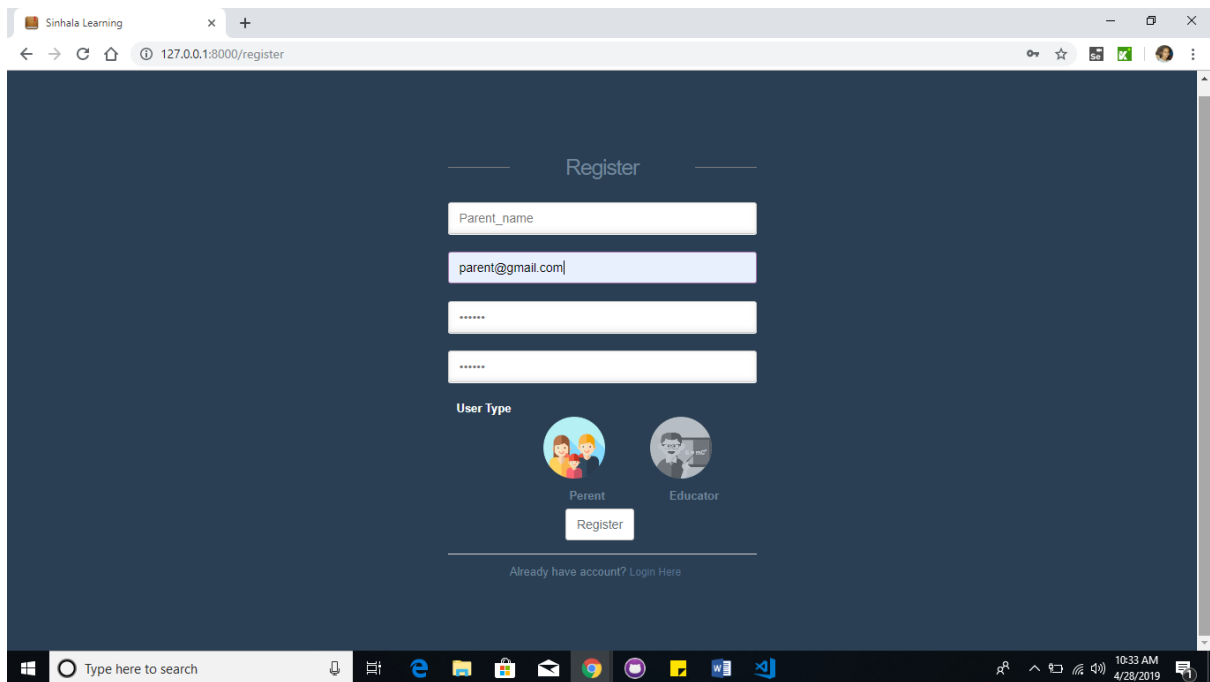


Figure 3.4 Registration interface of the Parents

Interface of the Educators registration form is as figure 3.5.

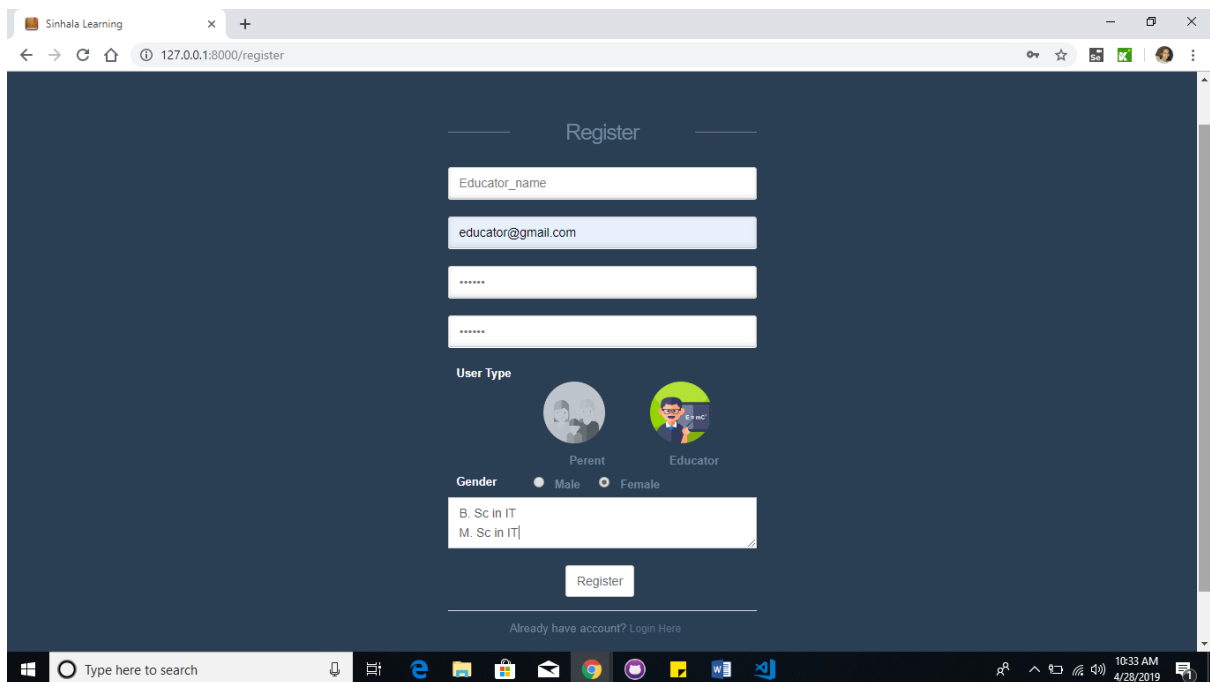


Figure 3.5 Registration form interface of Educator

From the above page figure 3.5 educators can request the registration. But until administrator accepts the request, educators cannot login to the system. Following figure 3.6 shows the administrator's view of educators list.

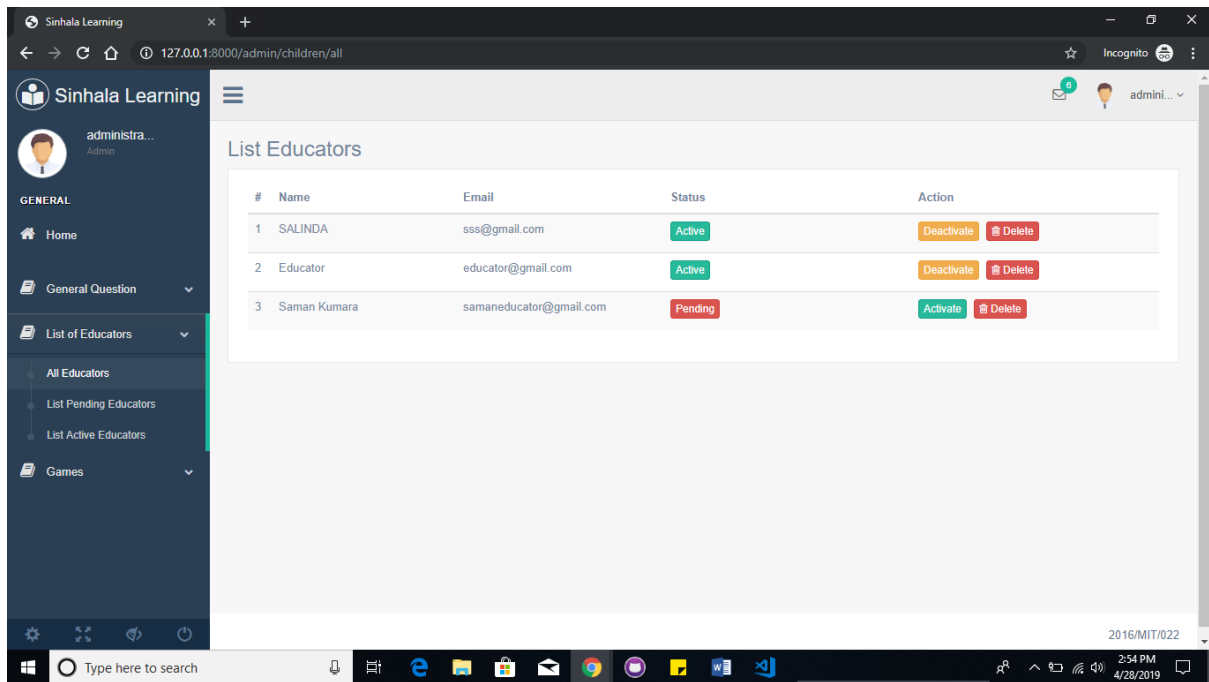


Figure 3.6 Educator List interface

### 3.2.1.2 Add Child to system

When parent is registered with the system the parent can add their child to the system. This process flow is shown in the figure 3.7.

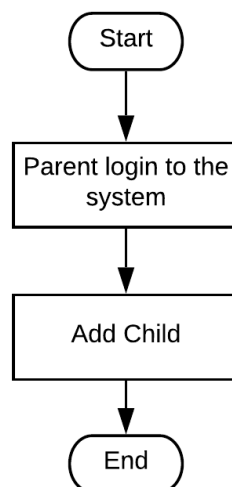


Figure 3.7 Flow chart for add child



When the student first login to the system, student has to face a set of simple multiple-choice questions.

Following figure 3.8 shows children registration page once login to the system as a parent.

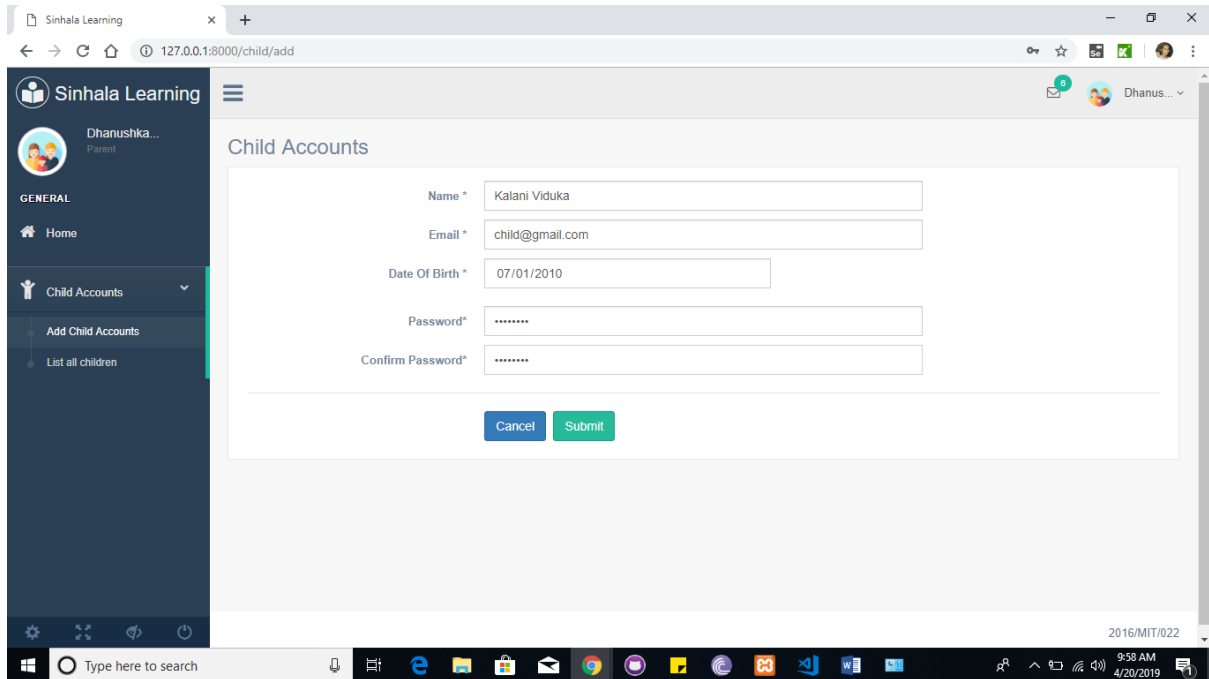


Figure 3.8 Child Registration interface

### 3.2.1.3 Login to the system

After registering to the system, parents and children can login to the system directly. Educators should be accepted by the administrator.

Following figure 3.9 shows the login page of all the users.

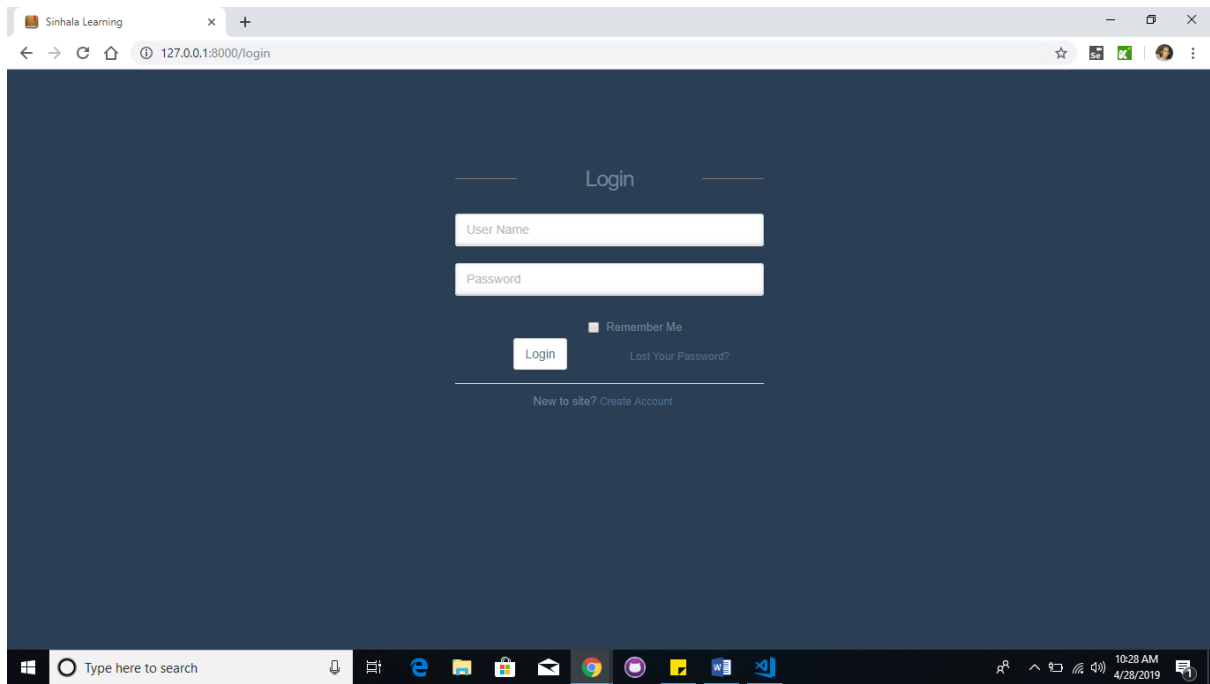


Figure 3.9 Login interface

### 3.2.1.4 Upload lessons

Once the educator is registered he/she can upload the Sinhala lessons to the system according to the flow in the figure 3.10. Lesson upload screen is shown in the figure 3.11. It can be a video, a power point presentation or an image. And also, should be suitable for the particular selected level. It goes to the acceptance of the admin. After only the admin’s acceptance, lesson will be published.

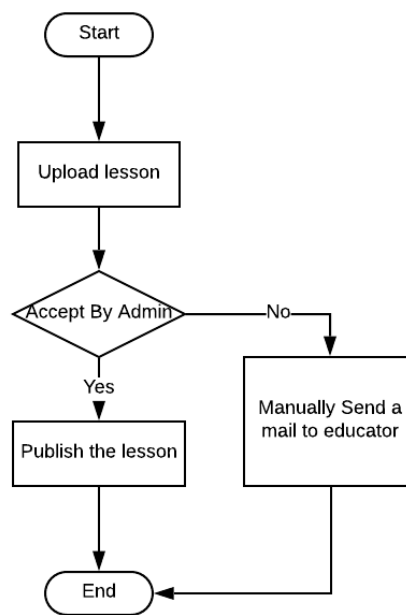


Figure 3.10 Flow Chart for Lessons Upload Process

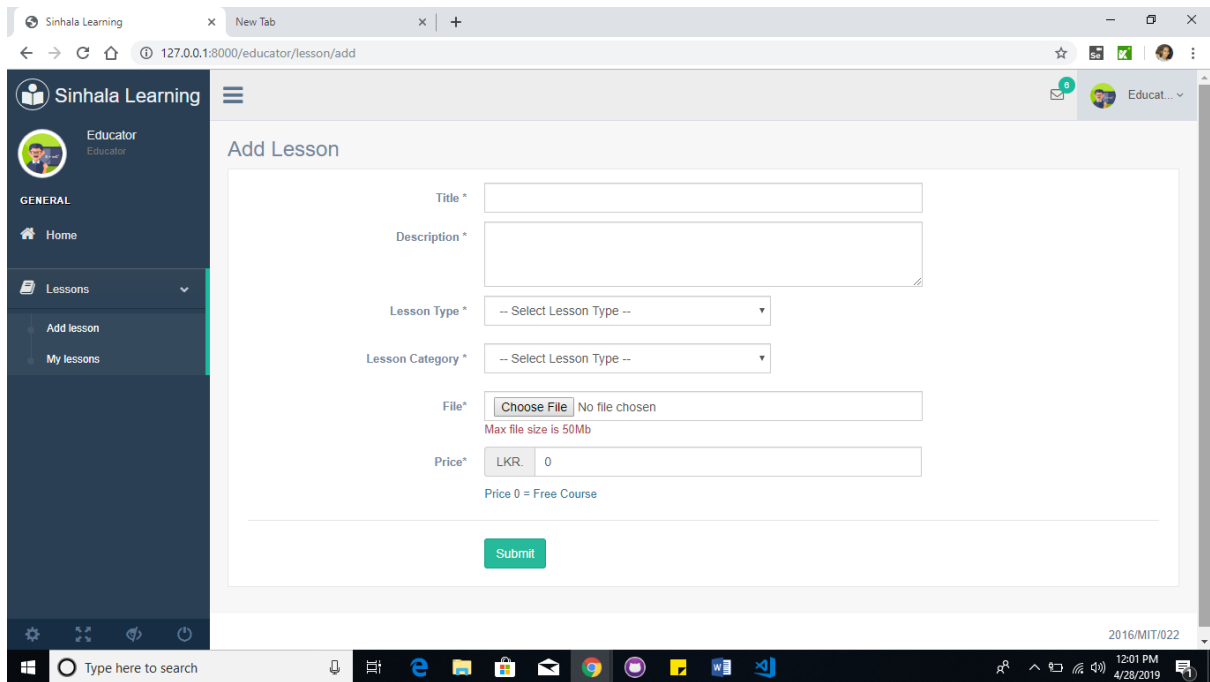


Figure 3.11 Lesson upload interface

### 3.2.1.5 Categorization of a child to a level

When the child login for the first time, the child has to face the level selection test which is a General Question paper. According to the marks in Table 3.1, the child will be allocated to one of the 3 groups.

Table 3.2 Level allocation according to marks

Marks	Level
100 - 70	Level 3
69 - 40	Level 2
39 - 0	Level 1

Following figure 3.12 is the interface of the child.

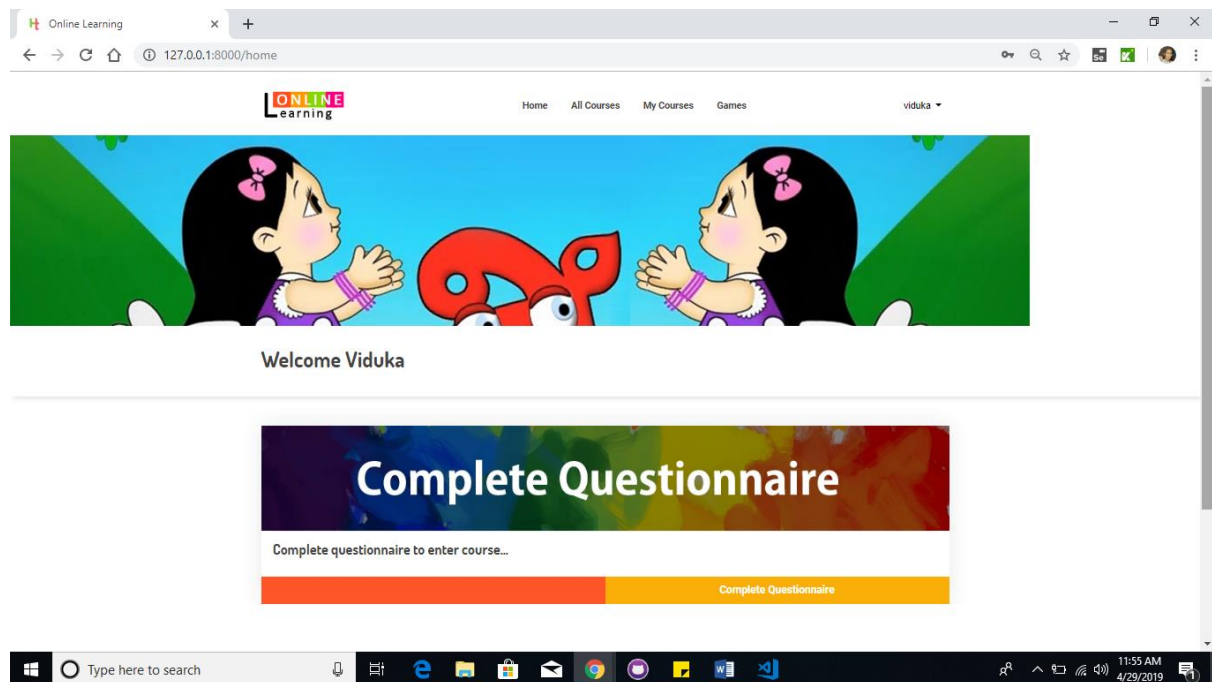


Figure 3.12 Interface of first login of the children

### 3.2.1.6 View and take the Lessons

Parents and children have access to view the details of the lesson. If it is a free lesson, directly child can follow the lesson. But if it is a paid one, the parent needs to pay for the lesson. If a child selects a paid lesson, the child can request by their parent to pay for the lessons. That request goes to the parent automatically as a notification. Only after the payment is made, the lesson can be followed by the children. This process flow is graphically describing in the figure 3.13.

Parent and child can rate the lessons or the educator. It will consider for the ratings of the lessons and educator. Child interface to view all the lesson related to the level is shown in the figure 3.14.

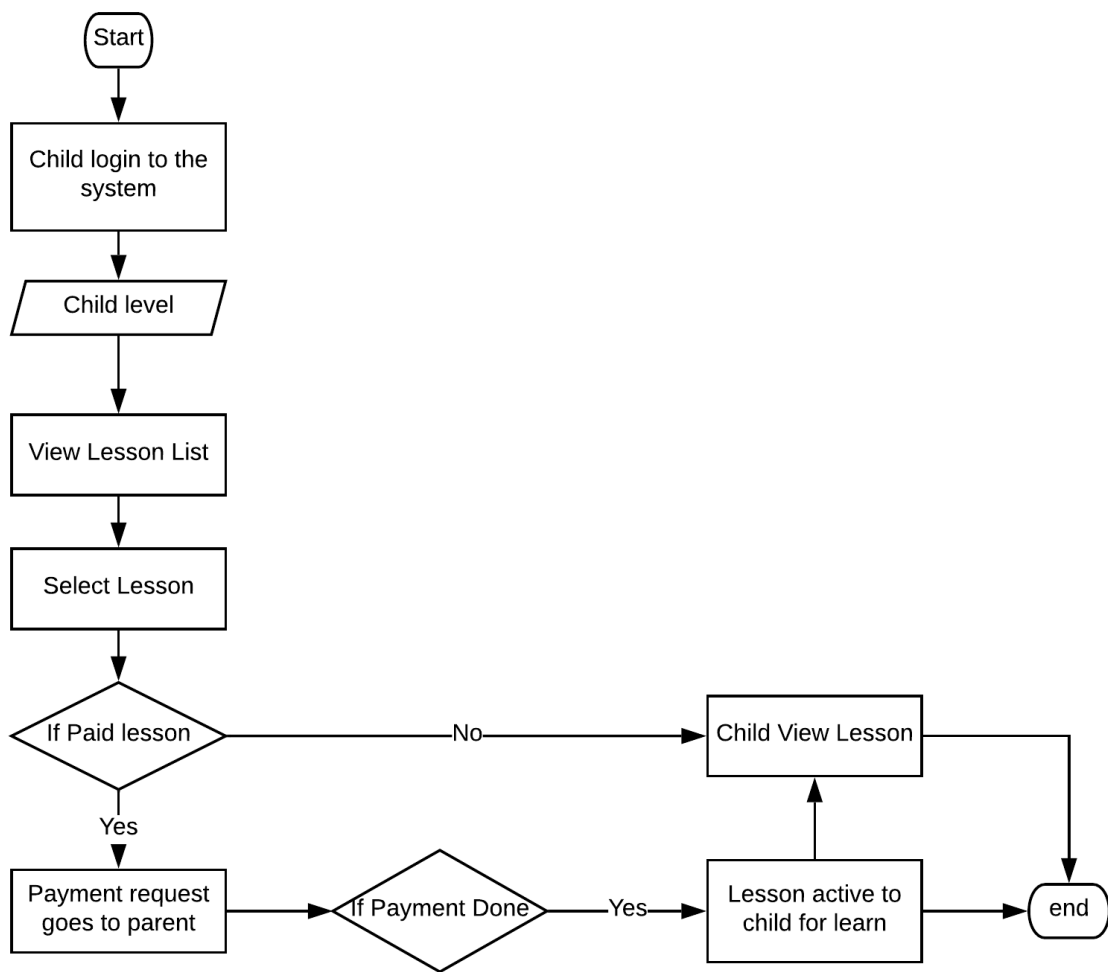


Figure 3.13 Flow Chart for Learning & Viewing process

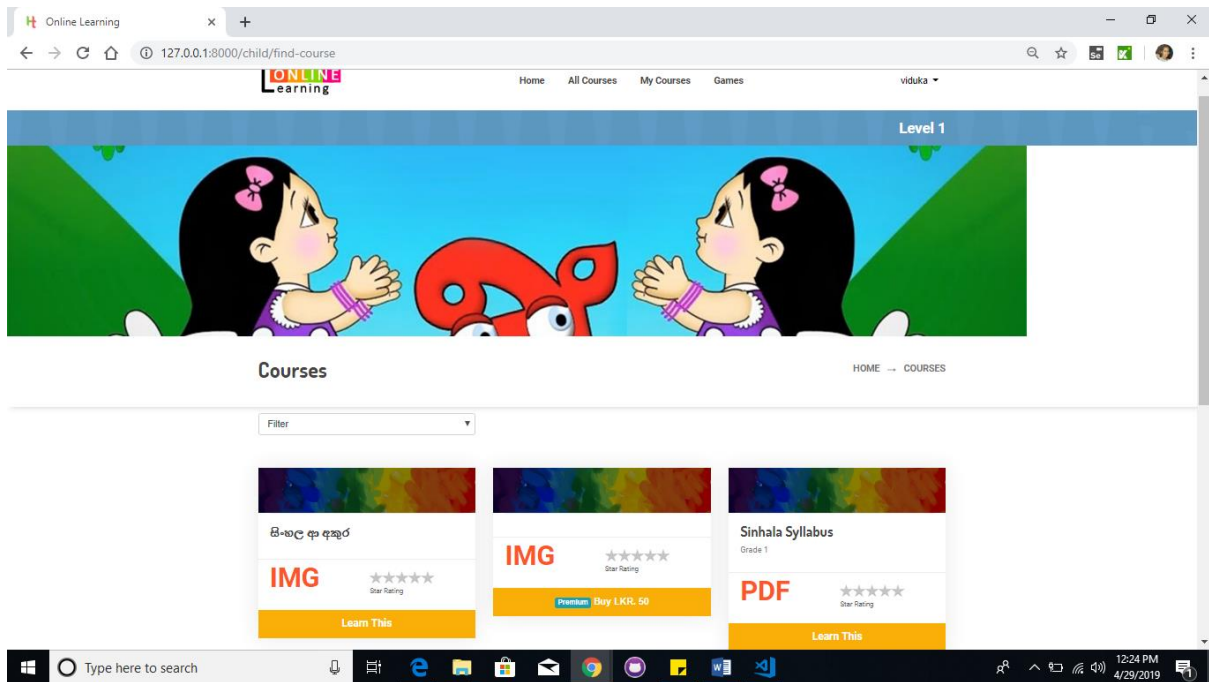


Figure 3.14 Interface of all the lessons related to the level

### 3.2.1.7 Payment process

Parent can pay for the lessons using a payment gateway. According to the income the educators get a payment from the administrator. Administrator gets 20% of the income as the service charge from each paid lesson.

### 3.2.1.8 Evaluation process

Educator can upload a test with multiple choice questions for each lesson. A child can face the test and score marks.

## 3.2.2 Class Diagram

Class diagram in the figure 3.15, defines the attributes and actions of a class in the system and also the constraints imposed on the system. [10]

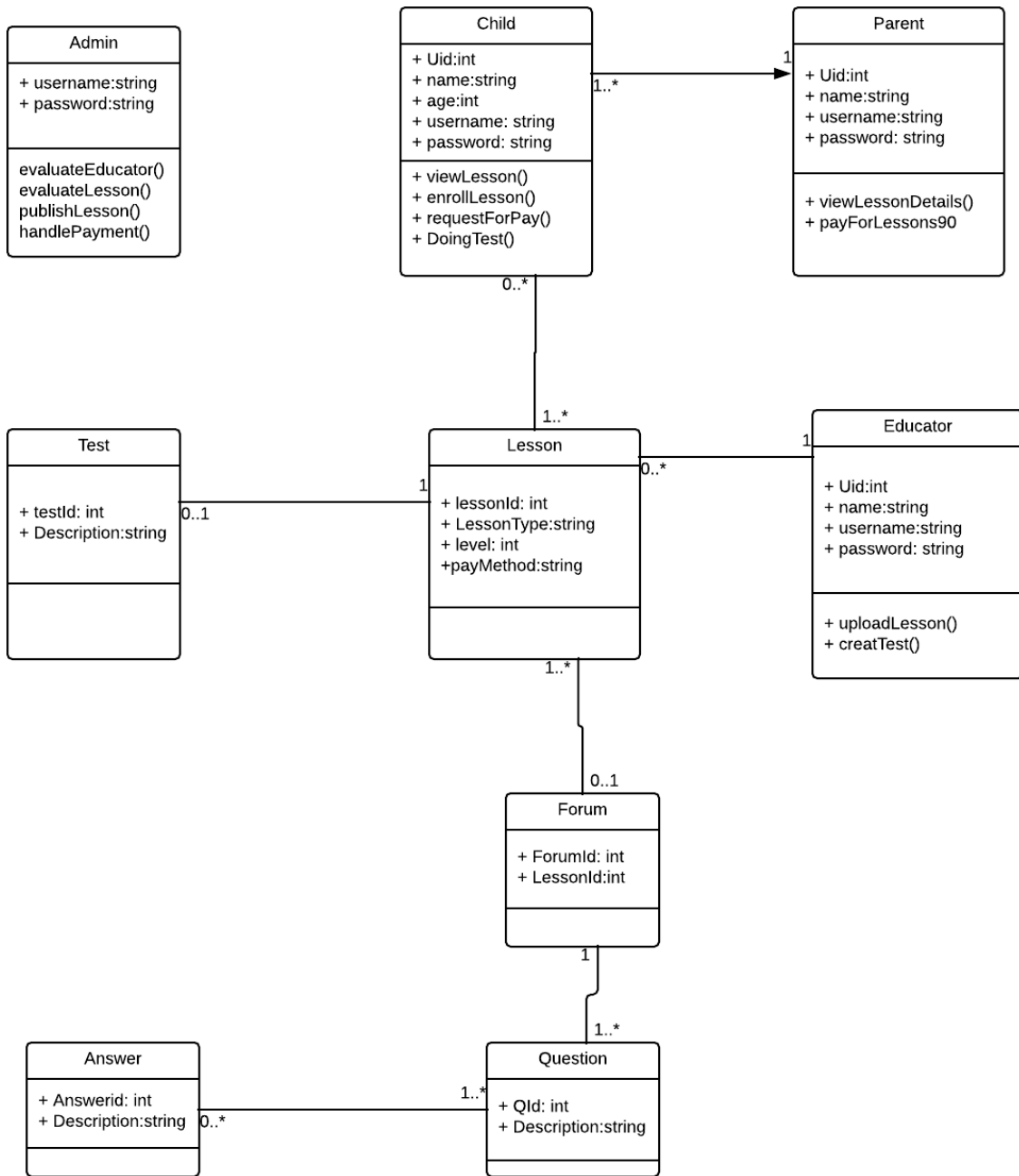


Figure 3.15 Class diagram of the system

### 3.2.3 ER Diagram

An entity relationship model, also called an entity-relationship (ER) diagram, is a graphical representation of entities and their relationships to each other, typically used in computing in regard to the organization of data within databases or information systems. An entity is a piece of data-an

object or concept about which data is stored. [11] Figure 3.16 describes the ER diagram for “අකුරු මිතුරු” system.

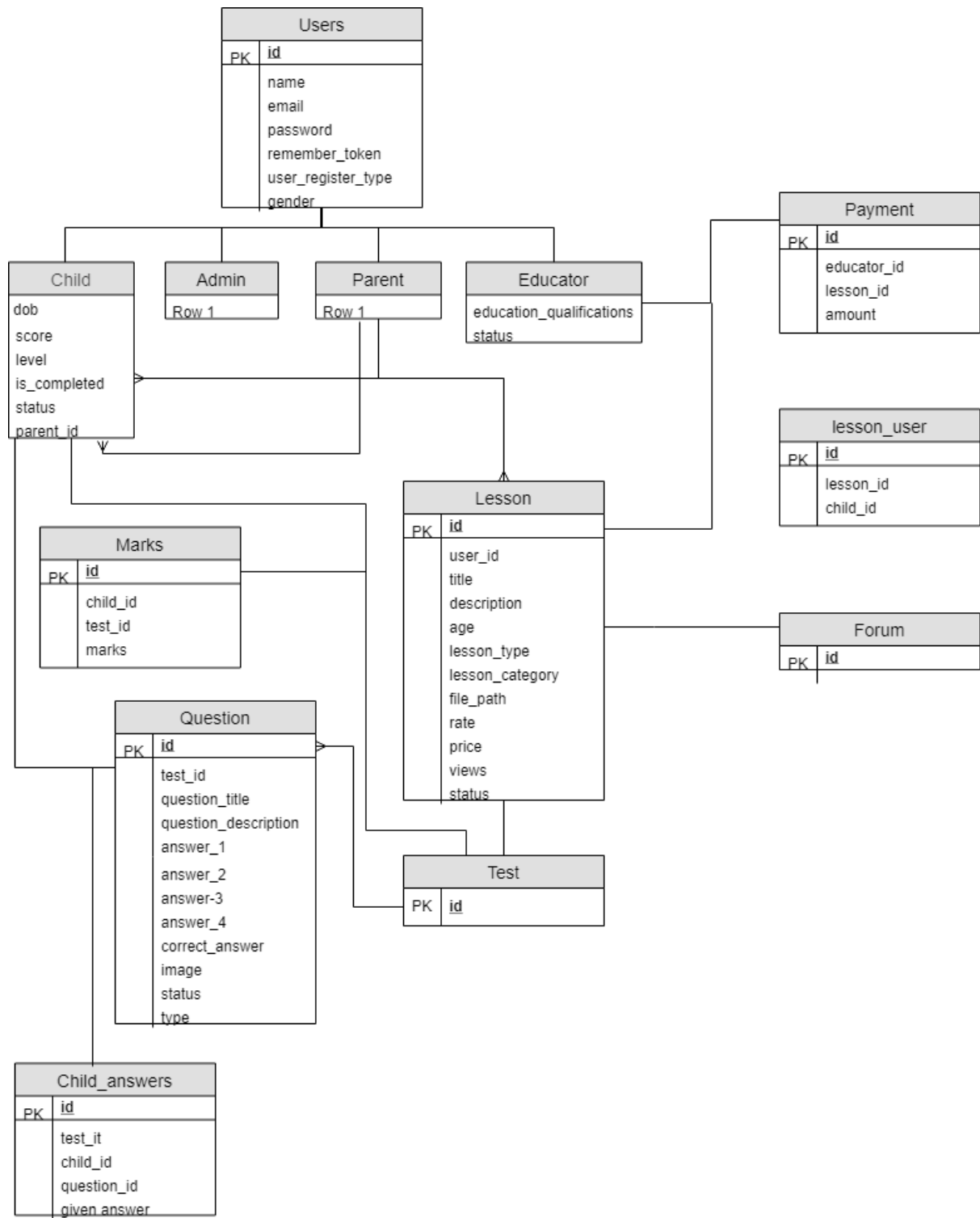


Figure 3.16 ER diagram of the system



### 3.3 Implementation

#### 3.3.1 Specification for system development

##### 3.3.1.1 Technologies

- Laravel frame work

Laravel is a web application framework that tries to ease the development process by simplifying repetitive tasks used in most of today's web applications, including but not limited to routing, authentication, caching and sessions. [12] Since it manages to do all essential tasks ranging from web serving and database management right to HTML generation, Laravel is called a full stack framework. Unlike other integrated environments, Laravel is unique in its way of prioritizing convention over configuration.

Laravel needs only a few lines of PHP code to be edited and it becomes ready to use. Avoiding or using a minimum amount of configuration files gives all Laravel web applications a similar code structure which is very characteristic and identifiable. [12]

Laravel is actually a fully-fledged MVC framework. MVC rapidly became the industry's standard practice used in every modern development environment. Many frameworks such as Ruby on Rails, ASP.NET, CakePHP and CodeIgniter make use of it to separate the logic behind the application from the representation layer. [12]

##### **MVC Architecture**

- **Model-** The developer can manipulate the data. It consists of a layer residing between the data and the application. The data itself can be stored in various types of database systems such as MySQL or even simple XML or Excel files. [12]
- **View-** The visual representation of our web application (presentation layer), they are responsible for presenting the data that the Controller received from the Model (business logic). They can be easily built using the Blade template language that comes with Laravel or simply using plain PHP code
- **Control-** Function of Controller is to handle requests and pass data from the Model to the Views. Thus, a Controller can be considered as the link between our Model and Views

### **3.3.1.2 Hardware Specification**

- Personal Computer

A personal computer which can be accessed to the internet. We preferred Google Chrome and Firefox browsers to run the application. For install google chrome browser the computer must have approximately 100MB of free hard drive space and 128MB of RAM. [13]

### **3.3.1.3 Software Specification**

- Operating System of the personal computer
  - Any operating system. Recommended Windows 8/10 professional 64 bit
- Web Browser
  - Used Google chrome / Firefox to log to the database stored in a hosted storage

### **3.3.1.4 Developing Languages and API**

- PHP, Java Script
- HTML
- SQL

## **3.4 Test Plan**

### **3.4.1 Testing Strategies**

#### **3.4.1.1 Strategic Approach**

To achieve real and effective testing it should deploy more effective technical reviews. By implementing this, many bugs and errors will be removed from the application before the testing commences. Testing creates at the component level and works outward towards the combination of the entire computer-based system. Different and new testing techniques are appropriate for various software developing methods and at different points in time. Debug and tests are different from each other, but debug must be included in any strategies using in testing.

#### **3.4.1.2 Verification and Validation (V&V)**

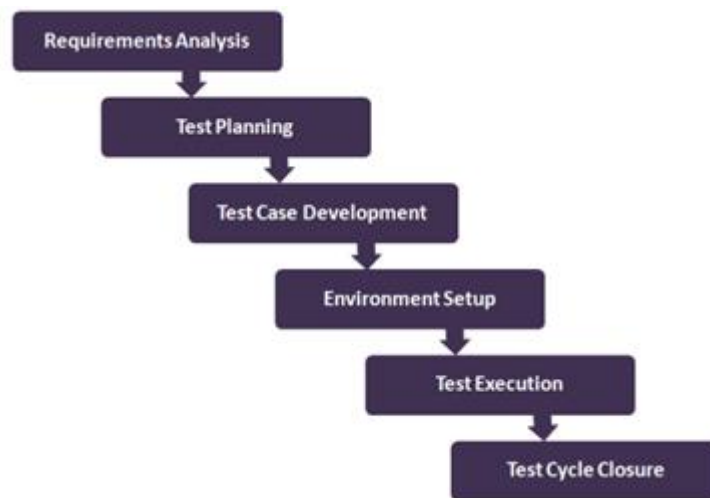
Verification mentions to the set of tasks that identify software properly to implement a specific function. Validation refers to a different set of tasks that ensure that the software that has been built is traceable to in customer requirements.

Another way,

- Verification is, are we building the product right
- Validation, are we building the right product

### 3.4.2 Test plan

Following figure 3.17 shows the software testing life cycle. Sinhala learning system also uses this process for the software testing.



*Figure 3.17 Test process plan*

- Requirement analysis

First stage of the software testing is identifying the requirement.

- Test plan

Identify and create test strategy, test policy test plan

- Test case development

Develop the test cases for each and every part of the system

- Environmental setup

Set up the environment to test. Install the necessary software and set up the running software

- Test Execution

Execute the test cases

- Test Cycle closure

If the test case passes the test cycle will be closed

### **3.4.3 Testing Types**

- Unit testing Under this check all the functionality of the specific scope.
- Integration testing Test the success of the integrated modules.
- Component Interface testing Test the handling of data passed between the subsystems.
- System testing Test the system to verify that the system meets the requirements.

### **3.4.4 Test Cases**

Following Table 3.2 and Table 3.3 are the sample test cases to test the system functionalities. All test cases are in the **Appendix II**

### 3.4.4.1 User Login Test case

Table 3.2 Sample Test Case 01

Test Case ID: 01

Test Design by: Viduka

Test Priority (Low/Medium/High):

Test Designed date: 2019/01/05

Module Name: Login

Test Executed by:

Test Title:

Test Execution date:

Description:

Pre-conditions:

Dependencies:

Test case #	Description	Action	Input Data	Expected Result	Actual Result	Pass/Fail
1.1	Validated whether the user will be directed to the 'User Login' of Sinhala Learning System	-	Click on the link	Login screen should appear in the middle of the screen		
1.2	Validate the user name	1.Leave username empty 2.Enter a Password 3.Click on 'Login' button	1.User Name- Empty 2. Password-123123	The system should give a message as username or password is invalid.		

1.3	Validate the user name	1. Enter mismatch username & password 2. click on 'Login' button	1. username-admin@gmail.com 2. Password-123abc	The system should give a message as username or password is invalid.		
1.4	Validate Password	1. Enter User name 2. Leave Password empty 3. Click 'Login' button	1. User name-admin@gmail.com 2. Password-Empty	The system should give a message as username or password is invalid.		
1.5	Validate whether 'Login' button will work for Educator	1. Enter valid User Name & password. 2. Click 'Login' button	1. User Name-Educator 2. Password- 123456	User should login to the system as a Educator with the given permission for that user.		
1.6	Validate whether 'Login' button will work for Parent	1. Enter valid User Name & password. 2. Click 'Login' button	1. User Name-parent 2. Password- 123456	User should login to the system as a parent with the given permission for that user.		
1.7	Validate whether 'Login' button will work	1. Enter valid User Name & password.	1. User Name-student 2. Password- 123456	User should login to the system as a student with		

	for Student	2. Click 'Login 'button		the given permission for that user.		
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### 3.4.4.2 User Registration Test case

Table 3.3 Sample Test Case 02

**Test Case ID:** 02

**Test Design by:** Viduka

**Test Priority (Low/Medium/High):**

**Test Designed date:** 2019/01/05

**Module Name:** User Registration  
(parent/Educator)

**Test Executed by:**

**Test Title:**

**Test Execution date:**

**Description:**

**Pre-conditions:**

**Dependencies:**

Test case #	Description	Action	Input Data	Expected Result	Actual Result	Pass/ Fail
1.1	Validated whether the user will be directed to the 'User Login' of Sinhala Learning System		Click on the link	Login page should open		
1.2	Add New user (parent/educator)	Click on the link "create account"	Click on the link	User registration page should open		

1.3	Add New parent	1. Enter valid email address and details and select the type as parent		<ol style="list-style-type: none"> <li>1. User create successful message appear and Redirect to the login page</li> <li>2. Parent details should save in the database.</li> <li>3. Parent should login by using the username and password to the system as a parent</li> </ol>		
1.4	Add New Educator	1. Enter valid email address and details and select the type as Educator, Enter the educational qualification		<ol style="list-style-type: none"> <li>1. User create successful message appear and Redirect to the login page</li> <li>2. Details should save in the data base.</li> <li>3. Until accept by the administrator educator should not have permission to</li> </ol>		



				login to the system		
1.5	Validate Registration form	Enter Valid email, Enter password with 6 characters.				

# Chapter 4

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## Evaluation

The project was a real challenge for me because the technology used, Web based development in PHP Laravel technology is a new area. More than that I had to learn and research with how it could be used in the practical environment. It was a real challenge to study the learning techniques and how it applies for the small children. Anyway, it was a valuable experience achieved during the development period.

With the project, I got a chance to develop the project managing skills and meeting the deadlines throughout the whole project including the research and getting familiar with the technologies. Apart from that I got a chance to develop the analyzing skills and understanding the business environment.

Objective of my project is to provide a society contributed learning platform to improve the Sinhala language skills among children with an interesting and easy way to reach children. I have developed a web-based solution to achieve my objectives. According to the potential clients' requirement I have developed the system. Also, I have studied how kids use the technical devices and apps like YouTube and take ideas and also the suggestions of parents and teachers are taken into consideration.

I have used a questionnaire to get the feedback from the School teachers, university students and parents to evaluate the system. First, I have given a brief explanation about the system to them and they were given a demonstration about how application works. After demo was done, allowed them to work with the application. After they have some experience with the system I obtained the feedback using the questionnaire.

Using the feedback that I was able to improve the usability of the system and I have taken the inputs when doing functional and non-functional testing.

Following Table 4.1 shows the sample taken for evaluate the system and Table 4.2 show the result of the questionnaire

Table 4.1 Sample for evaluate system

User Type	No of sample
Educator	10
Parent	10

Table 4.2 Evaluation results of Questionnaire

	Criteria	a) Strongly Agree/ Very Good	b) Agree/Go od	c) Neutral	d) Disagree/ Bad	e) Strongly Disagree/ Very Bad	a) & b) answer %
1	Please indicate whether a Sinhala Language Learning application is critical for the operation of your school/Institute.	8	8	4	0	0	80
2	Do you think it is important for kids to learn Sinhala as a language?	8	6	4	2	0	70
3	Do you think traditional classroom-based system still work with children in modern era?	14	2	2	2	0	80
4	Does the Sinhala Language Learning System fulfil the needs and wants pertaining to the requirement?	10	6	4	0	0	80
5	Do you think it is important to connect all three user types (Parents, Teachers, Students) in Sinhala Language Learning System?	6	4	8	2	0	50
6	How would you rate Sinhala Language Learning System compared to others in the market?	4	8	8	0	0	60

7	Please rate on the level of accuracy of information relayed on the online student services	12	8	0	0	0	100
8	Does this system provide a proper Q&A option?	16	4	0	0	0	100
9	Does Sinhala Language Learning System track students Sinhala Language Skills?	6	8	4	2	0	70
10	How would you believe about adding parents into the Sinhala Language Learning System	10	2	4	4	0	60
11	Please rate how satisfied about generating student progress by system.	10	4	6	0	0	70
12	How would you rate the ability to connect and share idea between students and educator in Sinhala Language Learning System	10	8	2	0	0	90
13	Please rate how satisfied Sinhala Language Learning System is	12	8	0	0	0	100
14	Do you think all the requirements mentioned were reached from the application?	14	6	0	0	0	100
15	Do you like this application interface?	14	4	2	0	0	90
16	Is it easy for you to find out how to use application?	12	8	0	0	0	100
17	Do you think this is easy for children to find out how to use application?	14	4	2	0	0	90
18	Do you think this will motivate children to study Sinhala language?	12	4	4	0	0	80

19	Do you think this application is useful to day-to-day life?	16	2	2	0	0	90
20	As an educator, Do you think it is useful and can earn extra money from this system?	7	3	0	0	0	100

Following pie chart (figure 4.1) describe the result of the evaluation in graphically.

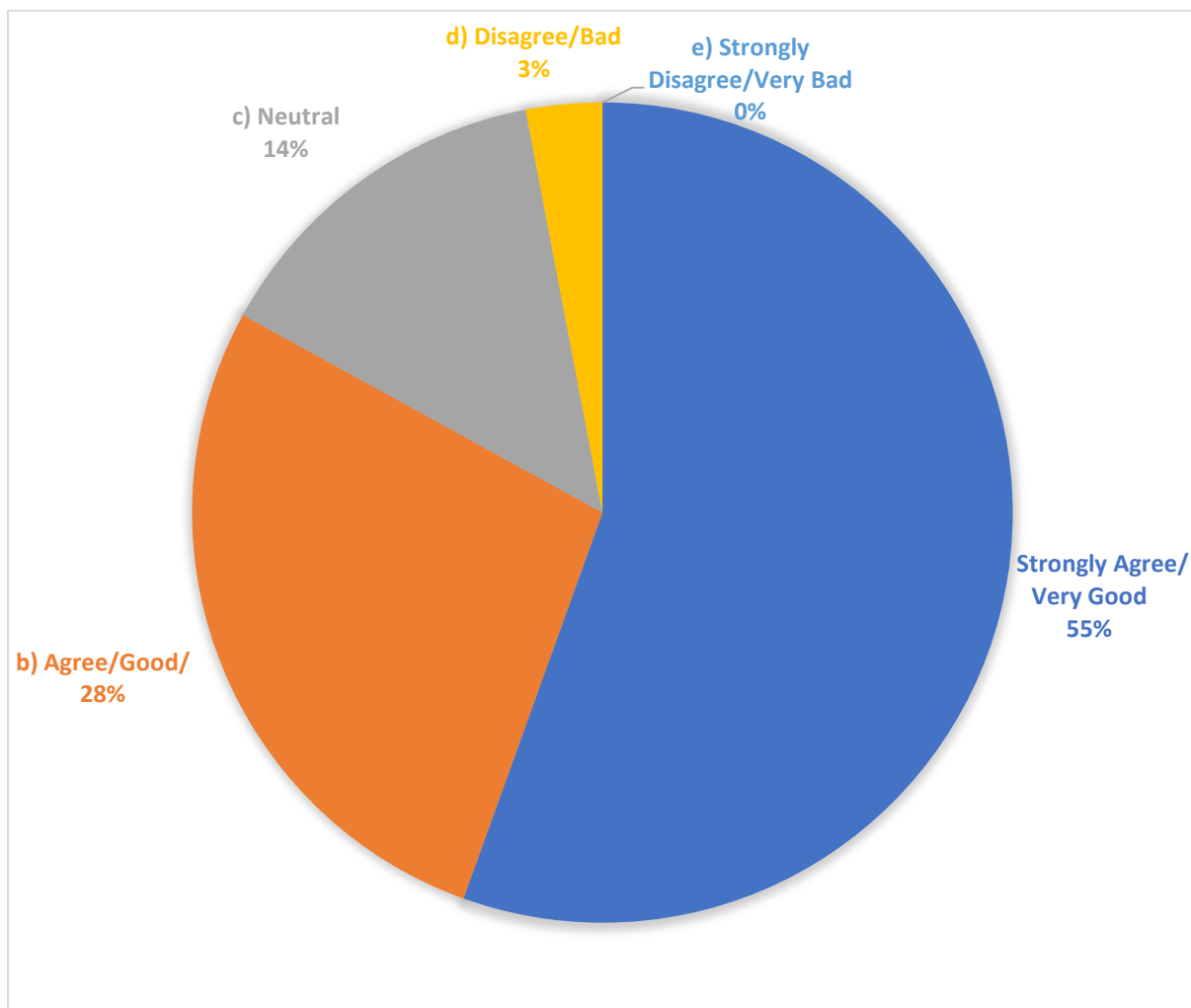


Figure 4.1 Evaluation result in pie chart

According to the user evaluation questionnaire, more than 50% of potential users select a) and b) answers for all the question. a) and b) answers are the most positive answers on evaluating the system. User evaluation showed that the potential users have a positive idea of the system.

# Chapter 5

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## Conclusion

The system was to develop an application to connect Educators, Students and parents in learning/teaching Sinhala language and monitoring kids' Sinhala learning skills. This system increases the efficiency, and quality of the eLearning methods for learn Sinhala language. Also Since this is crowdsourcing application, it enhances the participation of the other users too. By incorporating crowd sourcing it can collect more innovative and new ideas to teach the students meanwhile Educators can earn extra income.

### 5.1 Future Development

According to the client requirements and to the time schedule, I have selected limited features to develop within the scope. But this system can be touched in a vast area and can develop more features to the users. Business can be scaled up by that. It will improve the number of users and income of the system as well.

Currently this system is designed and developed to learn Sinhala language. But further we can develop to learn multiple languages and also can develop for any other subject which is useful for the students. So, the large number of educators can provide the lessons to the system and large number of students can learn through the system. It will facilitate Single platform to learn multiple subjects.

On the other hand, this system can be converted to any local language according to the use. If the students are more comfortable with Sinhala, English or Tamil or any other subjects we can provide that facility as well.

This system is developed for a specific client. They need this system for the students who are under the age of 6 years. But this system can be used for students of any age with different other subjects. Then we can have more levels in the system to the children and then more students who are in primary or secondary can interact with the system.

Likewise, we can further scale up this system to a large e learning system.

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## Appendix Section

### Appendix I: General Question Paper

රූපයට අදාළ වචනය තෝරන්න (Select the word for the image)

1.



- I. මාලය
- II. කරඬුව
- III. වළල්ල
- IV. මුදුව

2.



- I. කන
- II. අත
- III. ඇස
- IV. නහය

3.



- I. අලියා
- II. තාරාචා
- III. කොටියා
- IV. සමනලයා

4.



- I. රච
- II. ගඟ
- III. කන්ද
- IV. මුහුද

5.



- I. ගස්
- II. ගල්
- III. මුවා
- IV. පලතුරු

හිස් කැනට සුදුසු අකුර තෝරන්න

6.



ද ...

- I. ද
- II. ජ
- III. ඡ
- IV. ජ
- V. ඡ

7.



ඉ ... උ

- I. ද
- II. ජ
- III. ඡ
- IV. ජ
- V. ඡ

8.



ක...

- I. ද
- II. ජ
- III. ඡ
- IV. ජ
- V. ඡ

9.



ආ...ඵ

- I. ද
- II. ජ
- III. ඡ
- IV. ජ
- V. ඡ

10.



කළ...

- I. ද
- II. ජ
- III. ඡ
- IV. ජ
- V. ඡ

දී ඇති වචනයට සමාන වචනය තෝරන්න .

11. දහය

- I. දහය
- II. වම
- III. තාත්තා
- IV. ටකය

12. වම

- I. දහය
- II. වම
- III. තාත්තා
- IV. ටකය

13. පාලම

- I. පාලම
- II. වම
- III. තාත්තා
- IV. ටකය

14. තාත්තා

- I. දහය
- II. වම
- III. තාත්තා
- IV. ටකය

15. ටකය

- I. දහය
- II. වම
- III. තාත්තා
- IV. ටකය

උස්පිල්ලම හා උදුපිල්ලම ඇති වචන (හල් කිරීම) තෝරන්න .

16.

- I. පාසල
- II. වට්ටක්කා
- III. ඉඬ්බා
- IV. තාරාවා

17.

- I. පන්සල
- II. පාලම
- III. අම්මා
- IV. බසය

රූපයට ගැලපෙන වැකිය තෝරන්න

18.



- I.හරකා ගස උඩ
- II.හරකා ගස යට
- III.හරකා කෑ ගසනවා
- IV.හරකා ගසට නගීනවා

19.



- I.නංගී අතුගානවා
- II.නංගී මල් කඩනවා
- III.නංගී වතුර ගේනවා
- IV.නංගී පාඩම් කරනවා

20.



- I.හඳ පායලා
- II.ඉර පායලා
- III.තරු දිලිසෙනවා
- IV.වලාකුළු පායලා

## Appendix II: Test Case Document



# Web Based Application for Learning Sinhala Language

## Test Cases

**Submitted By:**

H.M.K.V. JAYARATNE

2016/MIT/022

Date:

15<sup>th</sup> January, 2019

## **Table of Content**

1. Login
2. User Registration
3. Admin Dashboard
4. Parent Dashboard
5. Student Dashboard
6. Educator Dashboard
7. Uploading Lesson
8. Following Lessons
9. Following Test
10. Analyzing Results

## Test Cases

<b>Test Case ID:</b> 01			<b>Test Design by:</b> Viduka			
<b>Test Priority (Low/Medium/High):</b>			<b>Test Designed date:</b> 2019/01/05			
<b>Module Name:</b> Login			<b>Test Executed by:</b>			
<b>Test Title:</b>			<b>Test Execution date:</b>			
<b>Description:</b>						
<b>Pre-conditions:</b>						
<b>Dependencies:</b>						
<b>Test case #</b>	<b>Description</b>	<b>Action</b>	<b>Input Data</b>	<b>Expected Result</b>	<b>Actual Result</b>	<b>Pass/ Fail</b>
1.1	Validated whether the user will directed to the 'User Login' of Sinhala Learning System	-	Click on the link	Login screen should appear in the middle of the screen		
1.2	Validate the user name	1. Leave username empty 2. Enter a Password 3. Click on 'Login' button	1. User Name- Empty 2. Password-admin	The system should give a message as username or password is invalid.		

1.3	Validate the user name	1. Enter mismatch username & password 2. click on 'Login' button	1. username-admin@gmail.com 2. Password-abc	The system should give a message as username or password is invalid.		
1.4	Validate Password	1. Enter User name 2. Leave Password empty 3. Click 'Login' button	1. User name-admin@gmail.com 2. Password-Empty	The system should give a message as username or password is invalid.		
1.5	Validate whether 'Login' button will work for Educator	1. Enter valid User Name & password. 2. Click 'Login' button	1. User Name-Educator@gmail.com 2. Password- 123456	User should login to the system as a Educator with the given permission for that user.		
1.6	Validate whether 'Login' button will work for Parent	1. Enter valid User Name & password. 2. Click 'Login' button	1. User Name-parent@gmail.com 2. Password- 123456	User should login to the system as a parent with the given permission for that user.		



1.7	Validate whether 'Login' button will work for Student	1. Enter valid User Name & password. 2. Click 'Login' button	1. User Name- student@gmail.com 2. Password- 123456	User should login to the system as a student with the given permission for that user.		

<b>Test Case ID:</b> 02			<b>Test Design by:</b> Viduka			
<b>Test Priority (Low/Medium/High):</b>			<b>Test Designed date:</b> 2019/01/05			
<b>Module Name:</b> User Registration (parent/Educator)			<b>Test Executed by:</b>			
<b>Test Title:</b>			<b>Test Execution date:</b>			
<b>Description:</b>						
<b>Pre-conditions:</b>						
<b>Dependencies:</b>						
Test case #	Description	Action	Input Data	Expected Result	Actual Result	Pass/Fail
1.1	Validated whether the user will directed to the		Click on the link	Login page should open		

	'User Login' of Sinhala Learning System					
1.2	Add New user (parent/educator)	Click on the link "create account"	Click on the link	User registration page should open		
1.3	Add New parent	1. Enter valid email address and details and select the type as parent		4. User create successful message appear and Redirect to the login page 5. Parent details should save in the database. 6. Parent should login by using the username and password to the system as a parent		
1.4	Add New Educator	1. Enter valid email address and details and select the type as Educator, Enter the educational qualification		4. User create successful message appear and Redirect to the login page 5. Details should save in the data		

				base. 6. Until accept by the administrator educator should not have permission to login to the system		
1.5	Validate Registration form	Enter Valid email, Enter password with 6 characters.				

<b>Test Case ID:</b> 03			<b>Test Design by:</b> Viduka			
<b>Test Priority (Low/Medium/High):</b>			<b>Test Designed date:</b> 2019/01/05			
<b>Module Name:</b> User Registration (adding Child to the system)			<b>Test Executed by:</b>			
<b>Test Title:</b> Adding child			<b>Test Execution date:</b>			
<b>Description:</b> parent add their child to the system						
<b>Pre-conditions:</b> should pass the test case 2 and 3						
<b>Dependencies:</b> test case 02, test case 03						
<b>Test case #</b>	<b>Description</b>	<b>Action</b>	<b>Input Data</b>	<b>Expected Result</b>	<b>Actual Result</b>	<b>Pass/ Fail</b>
3.1	Login as	Login to system by using parent	Username:	Redirect to the parents' Home		

	parent.	username and password	Password:	page		
3.2	Adding Child page open	In the Menu, go to Child Account, then go to Add Child Account menu.		Open the Add Child Account Window		
3.3	Name Field validation	Enter name of the child	Name: Kalani Viduka	Should be test field		
3.4	Email Field Validation	Enter Correct email id	Eg: Viduka777@gmail.com	When save the form should save		
3.5	Email Field Validation	Enter incorrect email id	Eg: #@%^%#\$@#\$.com	Should generate error message when save the form		
3.6	Date Of Birth Validation	Enter correct date	Eg: 05.04.2003	When save the form should save		
3.7	Date Of Birth Validation	Enter incorrect date	Eg: 01.05.2020	Should not allow to select future date		
3.8	Password & confirm Password validation	Enter password	Eg: Abc@123456	<ol style="list-style-type: none"> <li>1. Should contain at least 8 characters</li> <li>2. Should contain uppercase, lowercase, numeric value and special character.</li> </ol>		
3.9	Password & confirm	Enter different values to the	Eg: Password: Abc@12345	Should generate an error message		

	Password match	password and confirm password	Confirm Password: usgfgs@jih32	“Password mismatch”		
3.10	Adding child to the system successfully	<ol style="list-style-type: none"> <li>1. Enter valid name</li> <li>2. Enter valid email</li> <li>3. Enter valid date of birth</li> <li>4. Enter valid password</li> <li>5. Enter same as password value to the confirm password</li> <li>6. Click on “Submit” button</li> </ol>	<p>Eg:</p> <p>Name: Kalani Viduka</p> <p>Email: <a href="mailto:Viduka777@gmail.com">Viduka777@gmail.com</a></p> <p>Date of Birth: 10.07.2009</p> <p>Password: Abc@12345</p> <p>Confirm Password: Abc@12345</p>	<ol style="list-style-type: none"> <li>1. Should show message “Child Added successfully”.</li> <li>2. Should save the information in database</li> </ol>		

<b>Test Case ID:</b> 04		<b>Test Design by:</b> Viduka				
<b>Test Priority</b> (Low/Medium/High):		<b>Test Designed date:</b> 2019/01/10				
<b>Module Name:</b> User Registration		<b>Test Executed by:</b>				
<b>Test Title:</b> Child list		<b>Test Execution date:</b>				
<b>Description:</b> child list of the parent						
<b>Pre-conditions:</b> add child to the system						
<b>Dependencies:</b> Test Case 03						
Test case #	Description	Action	Input Data	Expected Result	Actual Result	Pass/Fail
4.1	Login as parent	Enter Parent	Username:	Redirect to		

		valid password and username to login to the system	Password;	the relevant parents' Home page		
4.2	View child list	<ol style="list-style-type: none"> <li>1. Go to Menu</li> <li>2. Go to "Child Accounts" menu.</li> <li>3. 3 Go to "List all Children"</li> </ol>		<ol style="list-style-type: none"> <li>1. Open the "List of child" page</li> <li>2. List all the children you added.</li> <li>3. View the level of child</li> <li>4. View the status of the quiz.</li> </ol>		

<b>Test Case ID:</b> 06				<b>Test Design by:</b> Viduka		
<b>Test Priority (Low/Medium/High):</b>				<b>Test Designed date:</b> 2018/03/19		
<b>Module Name:</b> Level Selection Test				<b>Test Executed by:</b>		
<b>Test Title:</b> Adding question for level selection test				<b>Test Execution date:</b>		
<b>Description:</b> administrator can add question for the level selection test						
<b>Pre-conditions:</b>						
<b>Dependencies:</b>						
Test case	Description	Action	Input Data	Expected Result	Actual Result	Pass/Fail

#						
	Login as admin	Enter admin username and password and click login button	Username: Password:	Redirect to the admin Home page		
	Adding question successfully	<ol style="list-style-type: none"> <li>1. Enter Title</li> <li>2. Enter Question</li> <li>3. Type answer 1</li> <li>4. Type answer 2</li> <li>5. Type answer 3</li> <li>6. Type answer 4</li> <li>7. Assign the correct answer form the radio button</li> <li>8. Attach an image (optional)</li> <li>9. Click on "submit" button</li> </ol>	Title: Description Answer 1 Answer 2 Answer 3 Answer 4 Correct answer mark as 1 File:	<ol style="list-style-type: none"> <li>1. Question and details should save in the database.</li> <li>2. Should show the message as "Successfully added the question"</li> </ol>		

<b>Test Case ID:</b> 07	<b>Test Design by:</b> Viduka
<b>Test Priority (Low/Medium/High):</b>	<b>Test Designed date:</b> 2018/03/19
<b>Module Name:</b> Level Selection Test	<b>Test Executed by:</b>
<b>Test Title:</b> View the list of question in level selection test	<b>Test Execution date:</b>
<b>Description:</b>	
<b>Pre-conditions:</b> administrator should add the question	
<b>Dependencies:</b> Should pass the Test Case 06	

Test case #	Description	Action	Input Data	Expected Result	Actual Result	Pass/Fail
	Login as administrator	Enter valid admin username and password and login to the system	Username: Password:	Redirect to the Home page of admin		
	Open the List of questions	1. Go to "General question" menu 2. Go to "List General Questions" menu		Should open the list of question page		

<b>Test Case ID:</b> 08			<b>Test Design by:</b> Viduka			
<b>Test Priority (Low/Medium/High):</b>			<b>Test Designed date:</b> 2018/03/19			
<b>Module Name:</b> Educator List			<b>Test Executed by:</b>			
<b>Test Title:</b> View the list of all educators			<b>Test Execution date:</b>			
<b>Description:</b> All the educators(pending and active)						
<b>Pre-conditions:</b> Educators should add the request for register						
<b>Dependencies:</b>						
Test case #	Description	Action	Input Data	Expected Result	Actual Result	Pass/Fail
	Login as administrator	Enter valid admin username and password and	Username: Password:	Redirect to the Home page of admin		



		login to the system				
	Open the List of Educator	<ol style="list-style-type: none"> <li>1.Go to “List of educators” menu</li> <li>2.Go to “List All Educators ” menu</li> </ol>		<ol style="list-style-type: none"> <li>1. Should open the list of all educators’ page</li> <li>2. View all the educators (both pending and active)</li> </ol>		

## Appendix III: User Evaluation Questionnaire

### Evaluation Questionnaire for Sinhala e-Learning System

1. Please indicate whether a Sinhala Language Learning application is critical for the operation of your school/Institute.  
a) Strongly Agree/  
Very Good      b) Agree/Good/      c) Neutral      d) Disagree/Bad      e) Strongly  
Disagree/Very Bad
2. Do you think it is important for kids to learn Sinhala as a language?  
a) Strongly Agree/  
Very Good      b) Agree/Good/      c) Neutral      d) Disagree/Bad      e) Strongly  
Disagree/Very Bad
3. Do you think traditional classroom-based system still work with children in modern era?  
a) Strongly Agree/  
Very Good      b) Agree/Good/      c) Neutral      d) Disagree/Bad      e) Strongly  
Disagree/Very Bad
4. Does the Sinhala Language Learning System fulfil the needs and wants pertaining to the requirement?  
a) Strongly Agree/  
Very Good      b) Agree/Good/      c) Neutral      d) Disagree/Bad      e) Strongly  
Disagree/Very Bad
5. Do you think it is important to connect all three user types (Parents, Teachers, Students) in Sinhala Language Learning System?  
a) Strongly Agree/  
Very Good      b) Agree/Good/      c) Neutral      d) Disagree/Bad      e) Strongly  
Disagree/Very Bad
6. How would you rate Sinhala Language Learning System compared to others in the market?  
a) Strongly Agree/  
Very Good      b) Agree/Good/      c) Neutral      d) Disagree/Bad      e) Strongly  
Disagree/Very Bad
7. Please rate on the level of accuracy of information relayed on the online student services  
a) Strongly Agree/  
Very Good      b) Agree/Good/      c) Neutral      d) Disagree/Bad      e) Strongly  
Disagree/Very Bad
8. Does this system provide a proper Q&A option?  
a) Strongly Agree/  
Very Good      b) Agree/Good/      c) Neutral      d) Disagree/Bad      e) Strongly  
Disagree/Very Bad
9. Does Sinhala Language Learning System track students Sinhala Language Skills?  
a) Strongly Agree/  
Very Good      b) Agree/Good/      c) Neutral      d) Disagree/Bad      e) Strongly  
Disagree/Very Bad
10. How would you believe about adding parents into the Sinhala Language Learning System  
a) Strongly Agree/  
Very Good      b) Agree/Good/      c) Neutral      d) Disagree/Bad      e) Strongly  
Disagree/Very Bad

11. Please rate how satisfied about generating student progress by system.
- a) Strongly Agree/  
Very Good      b) Agree/Good/      c) Neutral      d) Disagree/Bad      e) Strongly  
Disagree/Very Bad
12. How would you rate the ability to connect and share idea between students and educator in Sinhala Language Learning System
- a) Strongly Agree/  
Very Good      b) Agree/Good/      c) Neutral      d) Disagree/Bad      e) Strongly  
Disagree/Very Bad
13. Please rate how satisfied Sinhala Language Learning System
- a) Strongly Agree/  
Very Good      b) Agree/Good/      c) Neutral      d) Disagree/Bad      e) Strongly  
Disagree/Very Bad
14. Do you think all the requirements mentioned were reached from the application?
- a) Strongly Agree/  
Very Good      b) Agree/Good/      c) Neutral      d) Disagree/Bad      e) Strongly  
Disagree/Very Bad
15. Do you like this application interface?
- a) Strongly Agree/  
Very Good      b) Agree/Good/      c) Neutral      d) Disagree/Bad      e) Strongly  
Disagree/Very Bad
16. Is it easy for you to find out how to use application?
- a) Strongly Agree/  
Very Good      b) Agree/Good/      c) Neutral      d) Disagree/Bad      e) Strongly  
Disagree/Very Bad
17. Do you think this is easy for children to find out how to use application?
- a) Strongly Agree/  
Very Good      b) Agree/Good/      c) Neutral      d) Disagree/Bad      e) Strongly  
Disagree/Very Bad
18. Do you think this will motivate children to study Sinhala language?
- a) Strongly Agree/  
Very Good      b) Agree/Good/      c) Neutral      d) Disagree/Bad      e) Strongly  
Disagree/Very Bad
19. Do you think this application is useful to day-to-day life
- a) Strongly Agree/  
Very Good      b) Agree/Good/      c) Neutral      d) Disagree/Bad      e) Strongly  
Disagree/Very Bad
20. As an educator, Do you think it is useful and can earn extra money from this system?
- a) Strongly Agree/  
Very Good      b) Agree/Good/      c) Neutral      d) Disagree/Bad      e) Strongly  
Disagree/Very Bad