

## THE DESIGN OF FOREIGN LANGUAGE TEACHING SOFTWARE IN SCHOOL COMPUTER LABORATORY

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### Abstract

The development of technology and science have recently been very fast and affecting the teaching of foreign languages. In Indonesia, foreign language, especially English has been included as a compulsory subject in the curriculum applied for . Hence, a language laboratory which can be a media to support the teaching of foreign language cannot be afforded by most schools in Indonesia due to its high cost. This research is aimed to develop software to facilitate the teaching of foreign language which can function in accordance with the needs of a language laboratory as well. Nowadays, most schools in Indonesia have already been equipped with a computer laboratory. Accordingly, the laboratory can be utilized to implement the designed application in order to set up a language laboratory. With the development of the digital technology, it enables some features to be added to make the application more sophisticated. The application is going to use streaming media technology for multimedia based-teaching. Moreover, the streaming process is carried on a high speed computer network. Thus, the paper describes the design of the intended software to be implemented in a computer laboratory to set up a language laboratory to facilitate the teaching of foreign languages. The design comprises the software requirement model for a language laboratory features, and the architecture design, data, process, and features of a language laboratory. With this designed software, it is expected that most schools in Indonesia do not have to spend much money to build a language laboratory since they can utilize their available computer laboratory to enhance the teaching of foreign language process.

**Keywords:** Language Laboratory, Computer Laboratory, Foreign Language Teaching, Streaming Media .

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## 1. Introduction

### 1.1 Background

The development of technology and science in this globalization era bring us to global life. In social life, it needs a language as a tool of communication, both spoken and written. In the global system, people are required to master several languages in order to be able to interact with the world community. In Indonesia, foreign language competence is necessary in order to compete with foreign countries both in regional level like South East Asia and in international level. Therefore, a foreign language, especially English language, as the most global language spoken all over the world is included in the national curriculum and regarded as a compulsory subject.

To support the teaching of foreign language, some schools in Indonesia have already been equipped with a language laboratory. However, setting up a language laboratory costs a fortune. Whereas, more and more schools and universities have already provided the students with computer laboratories. Therefore, this research will develop software using the latest web-based programming technologies and streaming media that can be run on a high speed computer network (LAN). With the

development of these technologies, it is intended to generate much better streaming media quality since a LAN can connect many computer networks so many more clients are also connected. Therefore, a computer laboratory can be utilized as a language laboratory.

Nowadays, most of schools in Indonesia has a computer laboratory with access to a LAN. Thus, it is necessary to optimize the computer laboratory functions as a language laboratory as well. With the development and implementation of the software to perform the function of a language laboratory, schools do not require much funds to build a language laboratory, which has still been hardware based. In addition, it will also increase the use of computer laboratory and also improve the access of the students to be able to learn a foreign language well.

## **1.2 Research Purposes**

The following are the objectives of the Design Software for Foreign Language Learning by Utilizing the Computer Laboratory at the School;

1. To create a software architecture relevant with a topology of a computer laboratory.
2. To create a specification for software requirements for foreign language teaching process and the conventional language laboratory minimum requirements.
3. To create data model, process, and features required to implement the designed software.

## **2. Literature**

### **2.1 Related Research Results**

Previously, Dolzani (2005) developed Streaming Video system through the Internet to support the learning process called LODE system. In its implementation, it can be shown that 66% of students have been accessing and using these systems in their learning process. Also in the form of live video streaming, video application in the learning process can be in the form of Video on Demand (VoD). By using VoD, learners can look back on an explanation of the teaching material in the form of a video, at any time he wants. At VoD systems, the server will provide streaming of data in the form of video to users, based on user requests. Rozi (2013) has been conducting research on VoD to support the implementation of distance education at the Polytechnic of Malang. The system can organize and manage learning video data, user data and provide services to users in the form of instructional video appearance in accordance with the request of the user.

### **2.2 Media Streaming Technology**

Streaming according Austerberry (2005) is the process of sending data from the source to the client which is done in real time. This process runs continuously and does not require local storage media to store data. Opposed to the method download and play, it means the data media is firstly downloaded and stored in local storage media and then is run. This process does not run continuously.

Video and audio data capture results, will further encoded or compressed with a particular format and saved in a file. The file is then deployed into the server to then be sent to the client. In the process of streaming data from the server to the client, there are some protocols that are often used, among other things;

1. Real-Time Protocol (RTP) is a standardized package for sending audio and video on IP networks.
2. Real-Time Control Protocol (RTCP) functions to monitor the statistics of the transmission and quality of service (QoS) and helps synchronize multiple streams.
3. Real-Time Streaming Protocol (RTSP) is used by the program to arrange the delivery of multimedia streaming data in real time, which does not depend on the transport protocol.

### 2.3 Language Laboratory

According to Big Indonesian Dictionary (KBBI) language laboratory is defined as a room equipped with the tools of language teaching purposes such as tape recorders, cassettes, projectors, and records, used separately or together ([http:// KBBI.web.id/laboratorium](http://KBBI.web.id/laboratorium)). In addition, Atmowardoyo (2005) mentions that the language laboratory refers to a set of audio-video electronic equipment consisting of instructor console as the main engine, equipped with language repeater learning machine, tape recorder, DVD player, video monitors, headsets and students' booth installed in a soundproof room. In addition, language teachers can also explore their skills in facilitating students to engage in active communication process through a headset and microphone are available on each table learner.

### 2.4 Real Time Protocol

RTP is an Internet-standard protocol that is used in real-time data transportation. The data could be audio and video. RTP was designed by the Internet Engineering Task Force (IETF) and today, it is in widespread used. RTP usually runs over UDP/IP. RTP can work over both of multicast and unicast network services. RTP consists of a data and a control part (RTCP). RTP is used for the exchange of multimedia data, while RTCP is the control part and is used to periodically obtain feedback control information regarding the quality of transmission associated with data flows. RTCP will monitor the data delivery in a manner Figure 1 shows the use of RTP illustration. The blocks formed by such bit streams are encapsulated in RTP packets and then in UDP and IP packets (Duresi, 2005).

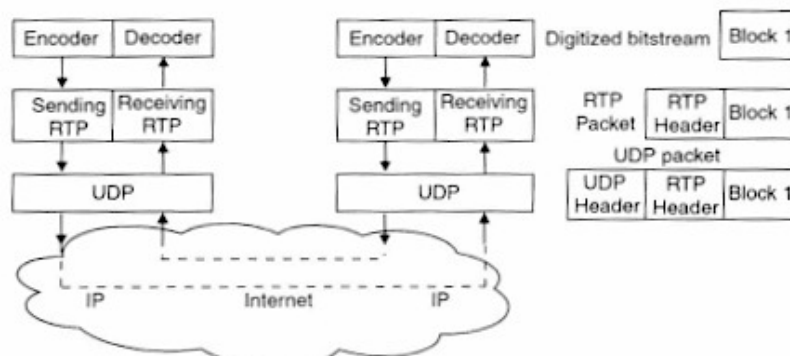


Figure 1: RTP illustration

RTP is designed to support a wide variety of applications. One of application type that usually use RTP is an Audio and Video Conference. Audio and video media used in the conference, are transmitted on the separate RTP sessions. In the implementation of audio and video streaming application, RTP is used by a Streaming Server to stream the audio and video media. Streaming server is an application installed in a specific server that will facilitate a real-time audio and video

streaming. Some of advantages of using a streaming server in an audio and video streaming application are;

1. User who are viewing video can jump to a specific time without buffering the entire video.
2. Video data will not be saved at user local computer. It means that the data will be more secure.
3. Video streaming requires less bandwidth.
4. Streaming to more than one clients/users can be run through one channel only.

### 3 The Design

#### 3.1 Software Requirements

At this stage of the process will be collecting information from the users of the language laboratory. Collecting data is done with the survey, data analysis, and questionnaires that will generate the software requirements specification. Both the need for system and software documented and addressed to the customer.

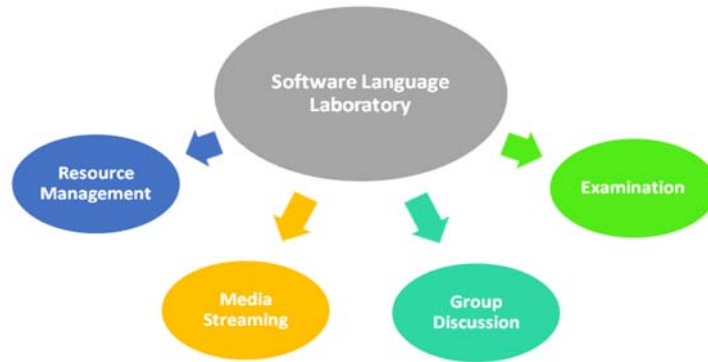


Figure 2: The Basic Model Language Lab Software

The basic need of the software is illustrated in figure 2 consists of resource management needs, media streaming, group discussion, and examination. There are two types of users, there are control panel and booth. Control panel is a teacher. Teachers have a role or task to control the teaching and learning activities of the students in the language lab, for example the provision of learning materials, create quiz, create a group for discussion, confirm their attendance. Each booth has one IP and students.

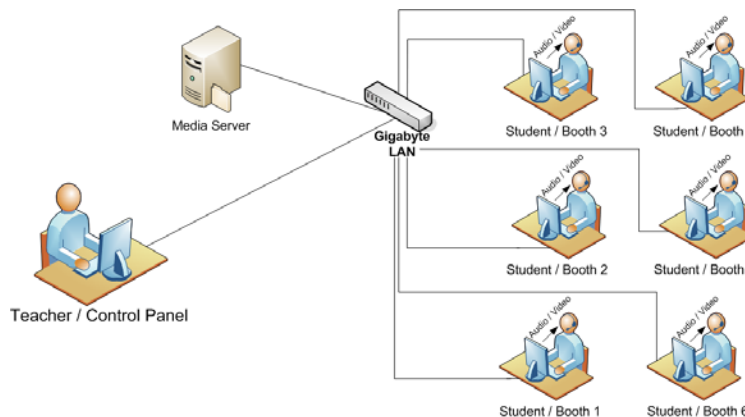


Figure 3: Topology of Software

Teaching and learning activities in this system using the LAN network, where the LAN network is the liaison between the teacher and the student, meaning that when teachers will be conducting teaching in the language lab, the teacher will be entered into the system and use the facilities of the media interactive learning where the learning materials, will be distributed or shared to all students in the language lab through a LAN network. All students who are in the laboratory will be able to access the instructional media and instructional media that contains a file of learning in the form of audio or video stored on the media server.

### 3.2 Use Case Model

This model is the Design of application of foreign language teaching by utilizing computer laboratory use case.

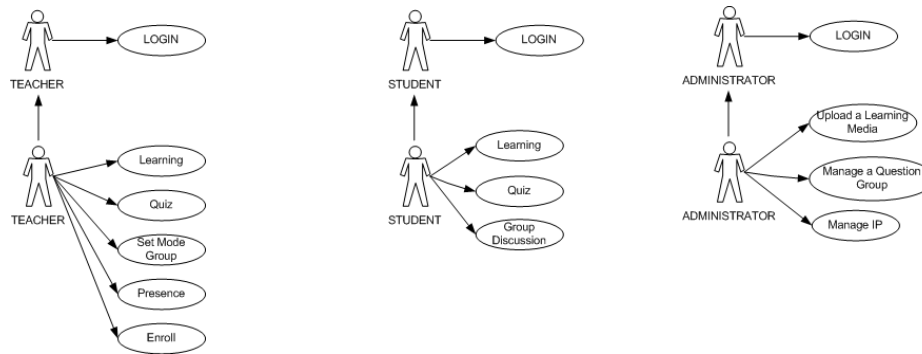


Figure 4: Use Case Diagram

Figure 4 is the use case diagram that has three actors, there are teacher as a control panel, students as a booth, and admin, where the control panel functions as a controller of all existing booth at the lab or can be meaning is an Instructor Control Panel. Within this system, the first thing to do is teachers as a control panel and students as a booth must be entering in the software by via the login page.

After logging in, the user will entering in the homepage. Begin page belong to teacher have 6 (six) features, including feature learning, quiz, group, presence, enroll and IP monitoring. While the initial page belongs students have 3 (three) feature which is a feature of learning, quiz, group discussion. In this software, teachers can confirm students' attendance automatically through presence features.

In addition there is a monitoring IP feature where the teacher or the control panel can see which students or booth are already running the software. Feature IP monitoring running when the student or the booth run a programs or software and automatically will be send IP booth on the control panel so that teachers can see which students who are at the laboratory.

In addition to these features, there is a learning feature in which there are video and audio learned which possessed by both users but a different way of accessing this media. In other words, this feature can be run if the control panel selecting learning materials and turning on the learning materials in the media player then automatically learning materials will be rebroadcast to all booths, but it must be

ensured that all the booths have pressed one of the buttons to turn off or stop the media player belongs to them, so that the learning materials through the media will be heard in the headset and appears on the monitor screen.

In addition to these features, the software's control panel or the teacher can create a discussion forum through the Group Discussion feature consisting of several groups that have been determined by the teacher. In other words, the teacher can choose anyone in the group's members from each booth so that the device of each students can be connected with their group members.

In addition to these features, in this system has a features quiz where this feature is owned by teachers and students, but for the using this feature is different. Features belonging to teachers is more complex than student belong, in other words the teacher can be managing data quizzes by adding, modifying, and deleting quiz or question. While students just run the quiz by answering the questions that have been provided by the teacher through the quiz feature.

#### 4. Data Requirements

User entity which has 3 (three) attributes there are id user, username, and password which has been related with three entities namely Administrator, Teacher entities, and Student entities by using ISA relation and then three entities has a attributes that are owned by the entity User.

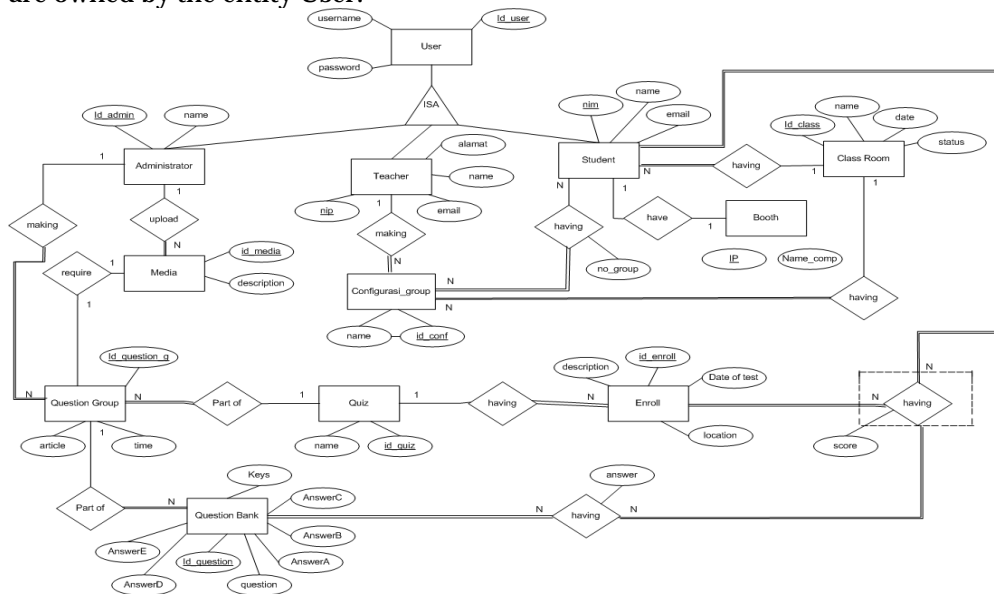


Figure 5: Entity Relationship Diagram

In the chart we can see that the admin can manage the media entity in the sense that the admin can upload instructional media by using a relation in a one to many (1 to N), and administrators can also manage group by using a relation one to many (1 to N) where the Entities media require or need a question group by using a relation one to one (1 to 1).

And a question group is also a part of the question bank and quiz where 1 (one) question group has a lot of question bank, and many group soal have one (1) quiz. And in the chart there is also a teacher entities which can manage the configuration group by using a relation one to many (1 to N).

In a group configuration, teachers can make a lot of groups and in many groups can have a lot of students or in many groups have a lot of students that can be seen from the relationship many to many (N to N) between the student entity and the configuration group entity. But in many of the configuration group has only one (1) class, or it can be said that one class has many groups and many groups owned by a class that can be seen from the relation one to many (1 to N) between the entity class and the entity configuration group.

Moreover in this system each student has their own IP, in other words only one IP is owned by one students as reflected in the relation one to one (1 to 1) between the entity student and the entity booth. And in this system students can register a test that is administered by the teacher where it can be seen from many students can have a lot of examination schedule in relation many to many (N to N) between the entity student and the entity enroll. Whereas the exam schedule has a quiz for the used in test and can be seen from the many-to-one relationship (N to 1) between the entity quiz and the entity enroll.

## 5. Process Diagram

Context diagram of the language laboratory applications there are three user admin, teachers and students. Admin can manage the matter and media. Teachers can give value, learning, quiz, discussion groups, and enroll attendance. While students can access discussion groups, spelling quizzes and doing the learning.

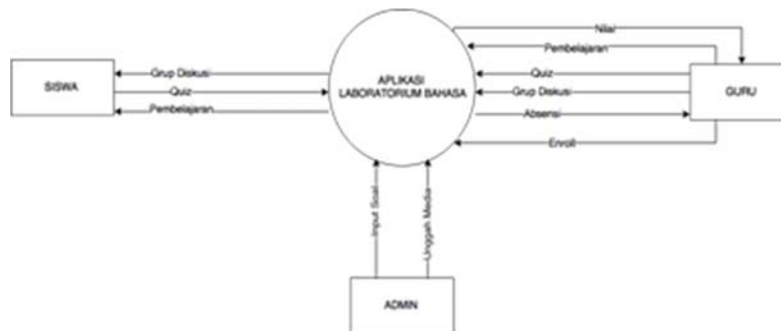


Figure 6: DFD Context Diagram

## 6. Software Feature

There are some services and some existing reports in this system. Here are the features of the existing services in the system:

### 6.1 Learning Media Features

In this feature, there are three actors who can have the features of this service including the admin, teachers, and students. Whereas in this feature admin can upload media files both audio and video learning, whereas teacher can share any materials or files while teaching in the language laboratory. Moreover, student can download the learning materials or files in the system.

### 6.2 Group Discussion Feature

In this feature there are two actors there are teachers and students, where teachers can create discussion groups within the system and students can conduct discussions within the group that have been made by the teacher through this Group Discussion Feature.

### **6.3 Quiz Features**

In this feature, there are three actors: admin, teachers, and students. In this feature admin can manage group, while teachers can create questions and answers and manage the test, and students in these features just do an online test.

### **6.4 Attendance List Feature**

This feature is owned by the teacher where teachers can confirm their attendance online just by looking at the booth whichever is active, because each student has been given the IP.

## **7. Conclusion**

From the results of this research it can be concluded that;

1. The computer laboratory which owned by a school can be used in the process of learning a foreign language, because the topology within has already supported the software architecture of learning a foreign language designed in this study.
2. This research has resulted in the data model, process, and features to be implemented into foreign language learning software. This design is based on the requirements of language learning software that will be implemented in a computer laboratory.
3. In the proposed design, streaming technology is implemented to optimize the process of multimedia data transport from the teacher's central control- teacher to student booth.



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