

# Smart Classroom Application

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*Abstract*—Smart phones are playing a vital role in our day to day life, especially in the field of education. A student can use his personal smart phone for carrying his softcopies of his lecture notes (as storage device), for reading the lecture notes (display device), even it is a complete encyclopaedia due to the technological inventions in smart phone area. Even though smartphones have all these educational advantages, mobile phones are banned in many educational institutions as students misuse the phones during the class, by chatting with friends, playing games.

This project involves research and survey to identify how usage of mobile phones at education institutions can be made under the control of authorities and how 1000s of lecture hours can be saved in a year using this device. We propose a mobile application which will help institution authorities to control the students' mobile phones and attendance will be taken by the students itself for saving the time of taking attendance. Students will be forced to run this application as their attendance will be marked through this application. This will also save the lecture time to some extent and will reduce the chances of students marking proxy attendances. Authorities can configure the list of white listed applications students can use in their phones when they are inside the campus.

## I. INTRODUCTION

Text summarization is the process of automatically creating compressed version of a given document preserving its information content. Automatic document summarization is an important research area in natural language processing (NLP). The technology of automatic document summarization is developing and may provide a solution to the information overload problem. The process of text summarization can be decomposed into three phases: analysis, transformation, and synthesis. The analysis phase analyzes the input text and selects a few salient features. The transformation phase transforms the results of the analysis into a summary representation. Finally, the synthesis phase takes the summary representation, and produces an appropriate summary corresponding to users' needs. In the overall process, compression rate, which is defined as the ratio between the length of the summary and that of the

original, is an important factor that influences the quality of the summary. As the compression rate decreases, the summary will be more concise; however, more information is lost. While the compression rate increases, the summary will be larger; relatively, more insignificant information is contained. In fact, when the compression rate is 5–30%, the quality of the summary is acceptable. Text summarization can be categorized into two approaches: extractive and abstractive. Extractive summarization methods simplify the problem of summarization into the problem of selecting a representative subset of the sentences in the original documents. Abstractive summarization may compose novel sentences, unseen in the original sources. However, abstractive approaches require deep NLP such as semantic representation, inference and natural language generation, which have yet to reach a mature stage nowadays. In Smart classroom application the main purpose is to do the interaction between the teacher and student. In this application we are creating interactive Question answering sessions like MCQ type Questions. and also include Speech to text summarization and generates informative summaries. There are many paid application but we are making general application. In this application students can perform their task online in a smart environment and send their query to the teacher. Modern technology is becoming easier for students as well as teachers to perform their task more efficiently.

## II. PROBLEM DOMAIN

Android software development is the process by which new applications are created for devices running the Android operating system. Google states that "Android apps can be written using Kotlin, Java, and C++ languages" using the Android software development kit (SDK), while using other languages is also possible. All non-JVM languages, such as Go, JavaScript, C, C++ or assembly, need the help of JVM language code that may be supplied by tools, likely with restricted API support. Some programming languages and tools allow cross-platform app support (i.e. for both Android and iOS). Third party tools, development environments, and language support have also continued to evolve and expand

since the initial SDK was released in 2008. In addition, with major business entities like Walmart, Amazon, and Bank of America eyeing to engage and sell through mobiles, mobile application development is witnessing a transformation. The official Android app distribution mechanism to end users is Google Play; it also allows staged gradual app release, as well as distribution of pre-release app versions to testers. The Android software development kit (SDK) includes a comprehensive set of development tools. These include a debugger, libraries, a handset emulator based on QEMU, documentation, sample code, and tutorials. Currently supported development platforms include computers running Linux (any modern desktop Linux distribution), Mac OS X 10.5.8 or later, and Windows 7 or later. As of March 2015, the SDK is not available on Android itself, but software development is possible by using specialized Android applications. Until around the end of 2014, the officially-supported integrated development environment (IDE) was Eclipse using the Android Development Tools (ADT) Plugin, though IntelliJ IDEA IDE (all editions) fully supports Android development out of the box, and NetBeans IDE also supports Android development via a plugin. As of 2015, Android Studio, made by Google and powered by IntelliJ, is the official IDE; however, developers are free to use others, but Google made it clear that ADT was officially deprecated since the end of 2015 to focus on Android Studio as the official Android IDE. Additionally, developers may use any text editor to edit Java and XML files, then use command line tools (Java Development Kit and Apache Ant are required) to create, build and debug Android applications as well as control attached Android devices (e.g., triggering a reboot, installing software package(s) remotely).

### III. TECHNICAL PROBLEM DEFINITION

The smart classroom application is an android application which is helpful for both students and teachers in the online environment. In smart classroom application there are many modules which help students to learn in an online environment. Students are not properly attending all lectures, so they miss lectures. In smart classroom voice to text summarization is an important module so the students can catch all the missed lecture information in summarization format. Also that includes a Poll and quiz module that check the attention of students during the lectures, give the result after the quiz and display the name of students who got the highest points. So using modern technology the education for the students is getting very easy, smart and simple to handle. There are also many modules in smart classroom applications like general notification window, assignment sharing.

### IV. EXISTING SYSTEM

The classroom booking issue is characterized to discover an answer that proficiently assigns various addresses to classrooms mulling over imperatives like classroom limits and college directions. The issue likewise endeavors to streamline the execution criteria and convey the courses decently to classrooms contingent upon the proportion of classroom limits to course enlistments.

## V. DATA FLOW DIAGRAM

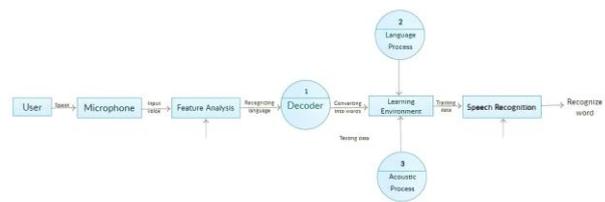


Fig. 1. Zero Level DFD - Summarization

**Text Summarization :-** In this module teacher voice is recorded using microphone. This voice is stored in local variable text format using android default library speech recognition. And this text is get summaries format.

#### A. Speech Recognition Technology :-

They are used in speech to text summarization. There are two stage summarization methods consisting of important sentence extraction and sentence compaction. The ratio of sentence extraction and compaction are controlled accordingly to a summarization ratio initially determined by the user. Speech to text engine can also provide data entry options for blind.

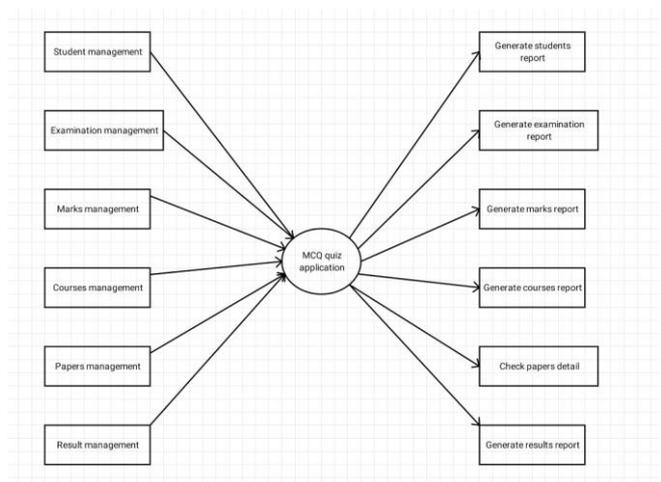


Fig. 2. First Level DFD - MCQ Quiz and poll

#### B. Infrared Technology

This technology is used in online quiz and poll. The main advantage of this technology gives students special remote to submit answer. Each student is assigned a number that is displayed on the screen so the students can see if his answer is correct or not. The main motivation for this tool is for teacher to get a statistical distribution of correct and incorrect answers.

#### C. Analysis of the questions

Now, we analyze the questions in order to determine which have not been answered, which have been well answered, etc.

The analysis was made by category, as shown in the following figures.

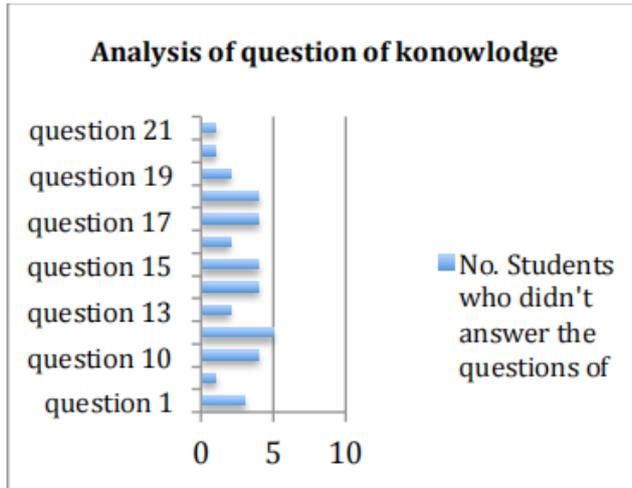


Fig. 3.a. Questions of knowledge by number of students

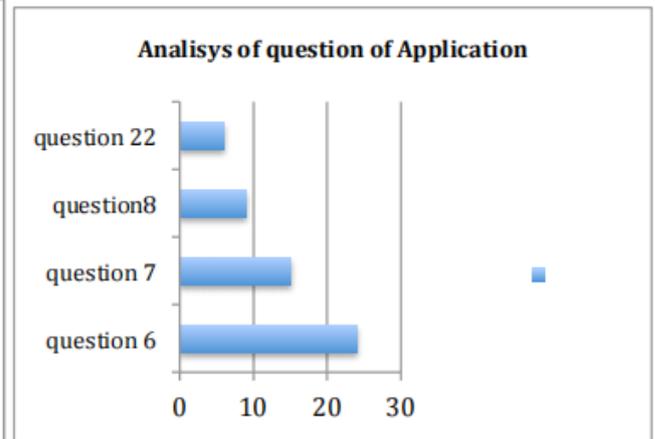


Figure 4.a Questions of application by number of students

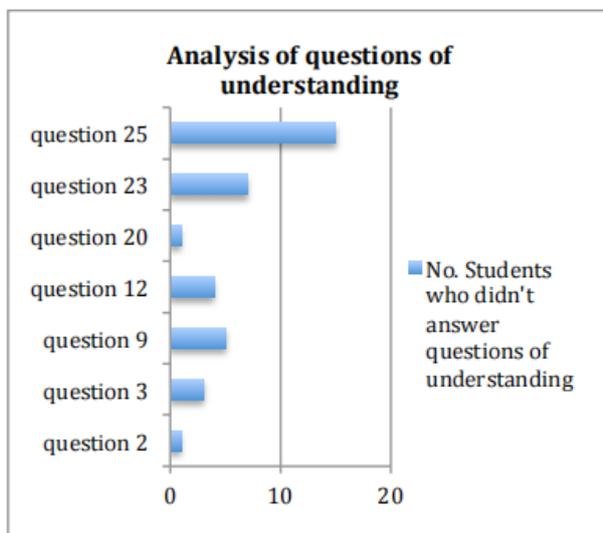


Fig. 3.b Questions of understanding by number of students

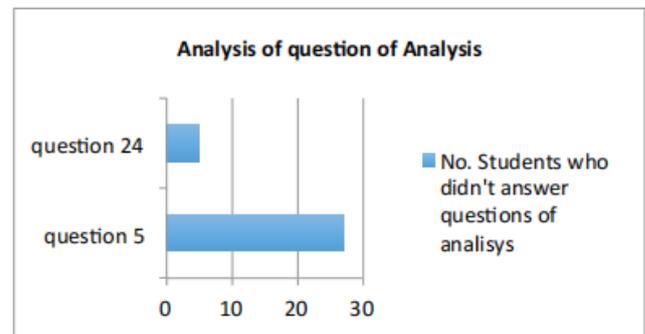


Figure 4.b Questions of analysis by number of students

The Fig. 3 Analyses the questions about Knowledge and Comprehension categories. In Figure 4.a, we can see that few students who did not answer knowledge questions. The question 11 is reflecting some difficulty, although the number of students who do not respond is not significant, compared with other types of questions that correspond to other categories. To improve the performance in question 11, some aspects to evaluate are: level of complexity, lack of knowledge. Analyzing the Figure 3.b, the question that needs more attention is the question 25. More than 10 students have not answered, it is considered a significant value. Some factors can influence in this score are: the formulation of the question, the contents covered in the question, if they are consistent or not with what is being taught in the course, among others. On the other hand, other factors related to the students that can be extracted from the analysis of the evaluation of the courses are:

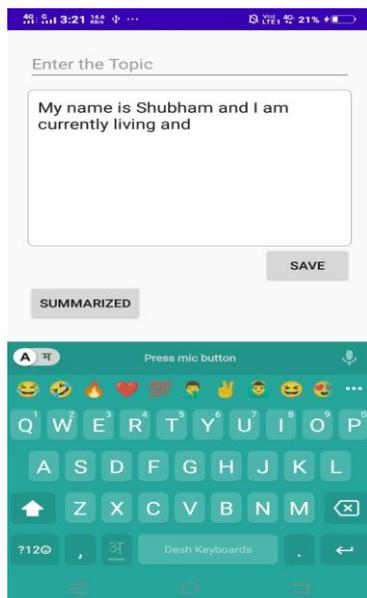
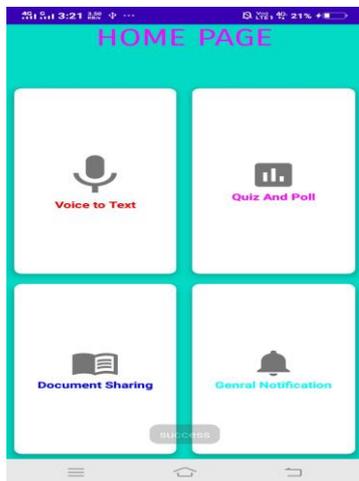
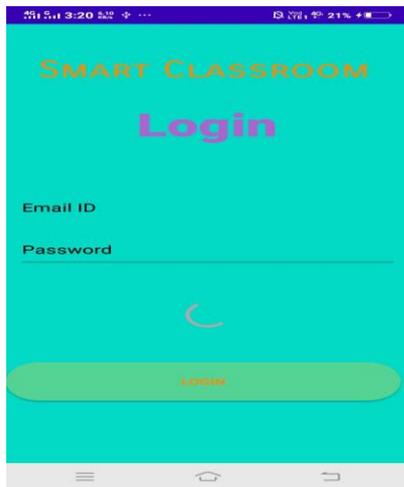
- Students did not understand the course contents,

- Students did not study the evaluated subject, or
- Students did not have enough time to answer the question.

The Fig.4 analyses the questions about the Application and Analysis categories. In the Figure 4.a and 4.b we can see that an important number of students have problems in questions of application and analysis, which means that the focus must be in these types of categories. For these cases, the problem can focus on some topics such as the formulation of the questions, the contents developed in the course related to the items being evaluated within these levels of learning, the digital materials available on the course that support the development of these kinds of questions, ambiguous content, the contents are not sufficient to solve these questions, etc. There are also implicit factors to students, such as: lack of preparation at the issues to be evaluated, the student does not understand how to apply the knowledge of the course during the analysis of problems, among others. Also, the formulation of the activities in order to exploit these categories must be reviewed. For example, some activities that could be included are: argue ideas, define experiments, analyze data, build conclusions, define workgroups, etc. These activities should be supported by educational resources that help students in their learning, such as: papers or books, exercises, case studies, collections of problems, databases, among others. Finally, we could conclude that not all the courses require all categories of Bloom's taxonomy, this depends on the syllabus and the learning outcomes of the courses. Particularly, in this case study, the synthesis is not covered. This category considers important aspects like the

utilization of past ideas to create new ones; the generalization capability, etc.

## VI. SAMPLE RESULTS



## VII. CONCLUSION

Text summarization is growing as sub – branch of NLP as the demand for compressive, meaningful, abstract of topic due to large amount of information available on net. Precise information helps to search more effectively and efficiently. Thus text summarization is need and used by business analyst, marketing executive, development, researchers, government organizations, students and teachers also. It is seen that executive requires summarization so that in a limited time required information can be processed. For our specific case study, we conclude that the questions covering topics about Analysis and Application in Bloom's taxonomy, are the categories in which students had greater problems, which means that these questions require more attention in the smart classroom. The smart classroom must include new activities during the course, and improve the quality of the questions, in order to improve the performance of these categories. Also, some categories are no covered, and must be incorporated in the next evaluations. The main aspect that the smart classroom must consider to improve the final score (TOTAL) of the students is the quality of the assessments.

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