MOBILE STUDENTS' ACADEMIC RECORD MANAGER

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***ABSTRACT*:** With increasing ownership of smart phones and the prevalent use of mobile apps among the students, the necessity to develop mobile applications useful to assist students' daily lives and academics arises. This study therefore attempts to develop a user friendly mobile application that is usable in education systems for managing academic records of students. A lot of applications have been developed for use by institutions, faculties, and departments to document the official record of student's work, but some of these applications are not accessible to students while some accessible ones did not take into consideration the security issues, thereby giving an unauthorized user a free access to intrude privacy of others. The system was implemented using Java and deployed into an APK file using Android Studio while SQLite was used as database backend. Though, the database of undergraduate courses offered in various departments of the Faculty of Engineering, Ladoke Akintola University of Technology was used, the system is flexible and can be generalized to other faculties or schools with little modification. The new system was tested and evaluated by 70 students from all the departments within the faculty and the performance of the system was established to meet design expectations.
KEYWORDS: Academic Record, Smartphone, Mobile App, Students.

INTRODUCTION

Nowadays, mobile phone has been found extensively useful in almost all aspect of human endeavor. In fact, in academics, it has proven to be a useful tool that helps students' activities in diverse ways as it was observed by Chen at al. ([C+14]) that Mobile technology has become ubiquitous in the lives of students in higher institution of learning as smart phone ownership is prevalent among them thereby making it an integral part of their daily lives. The positive outcome of portable handheld devices was attributed to availability of applications that support features like connectivity, ease of information gathering, communication functionality, cameras, sensors, GPS, its ability to send and receive messages within a short time and make recordings i.e. they can now record raw observations and analyze data ([C+14]).

Mobile applications (commonly referred to as "apps"), are considered to be one of the fastest growing trends in information systems industry ([Edd11]). Users enjoy the varieties of features that mobile apps can provide quickly and without introducing unnecessary complexity. As a result, mobile apps present a more popular interface for interaction even in education systems.

The oldest practice is by recording the student information in a record book but advances in technology has brought about development of various applications to manage the students' records. For instance, Emmanuel and Choji ([EC12]); Añulika, Bala and Nyap ([ABN14]); and Barker ([Bar11]) developed web applications to automate students result but the applications are not accessible to student, have no facility to store data and requires internet connection to function. Also, Ukem and Ofoegbu ([UO12]); Kansham, Ningthoujam and Kansham ([KNK15]) implemented window based software for speedy computation of students result. These applications are only used by the exam officers, department or school therefore not accessible to students.

This research therefore proposes a mobile application to manage the students' academic records. The application will allow students to register courses, supply the scores they have obtained in the registered courses, process the scores into grades and compute the GPA (Grade Point Average) of every semester as well as the CGPA (Cumulative GPA) up to the final year. Hence, the app automatically generates the final CGPA as well as the class of degree.

The limitation of the system includes the fact that the application is a standalone system which allows a single account to be created on an Android phone. The backend of the system was created using course bank of undergraduate courses offered in different departments of the Faculty of Engineering, Ladoke Akintola University of Technology.

The grading system will be based on 5.0 grading scale.

METHODOLOGY

In this section, the conceptual design, flowchart and implementation strategies of the system are presented.

Conceptual Design - *Use Case Diagram*

This describes the functionality provided by a system in terms of actors, their goals represented as use cases and any dependencies among those use cases. The "STUDENT" who is the only actor interacts with the use cases (REGISTER INFO, LOG-IN, REGISTER COURSES, UPLOAD RESULT, EDIT ENTRY and VIEW REPORT) of the system as depicted in the fig. 1.

Flowchart

This is the diagrammatic representation of step by step solution to a particular problem. The flowchart of the proposed system is shown in fig. 2.

System Implementation

The courses offered at all levels in various departments in the faculty of engineering as listed in the faculty handbook were typed and stored using database engine called SQLite.
The Integrated Development Environment (IDE) for the programming language used for the implementation of the project work is known as Android Studio as shown in fig. 3. It provides platform for designing, coding and building the system into an Application file. The native language of android studio is Java.

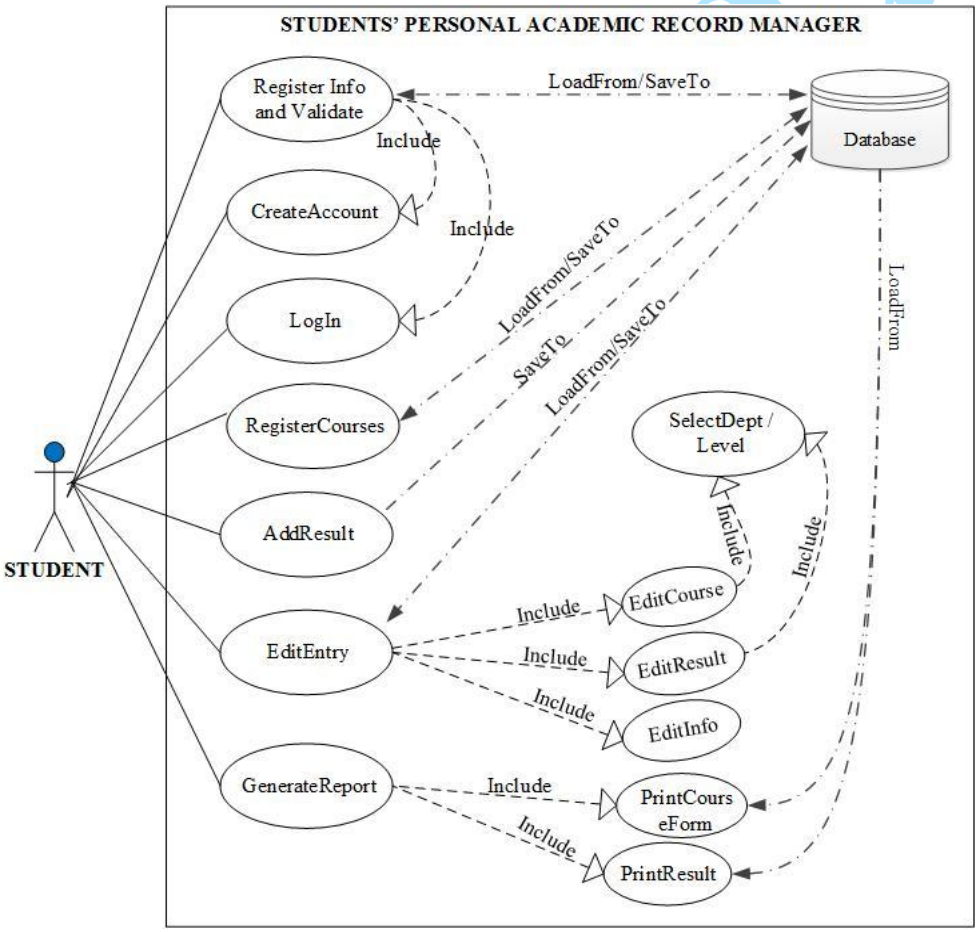

Fig. 1: Use Case Diagram of the Students' Academic Record Manager

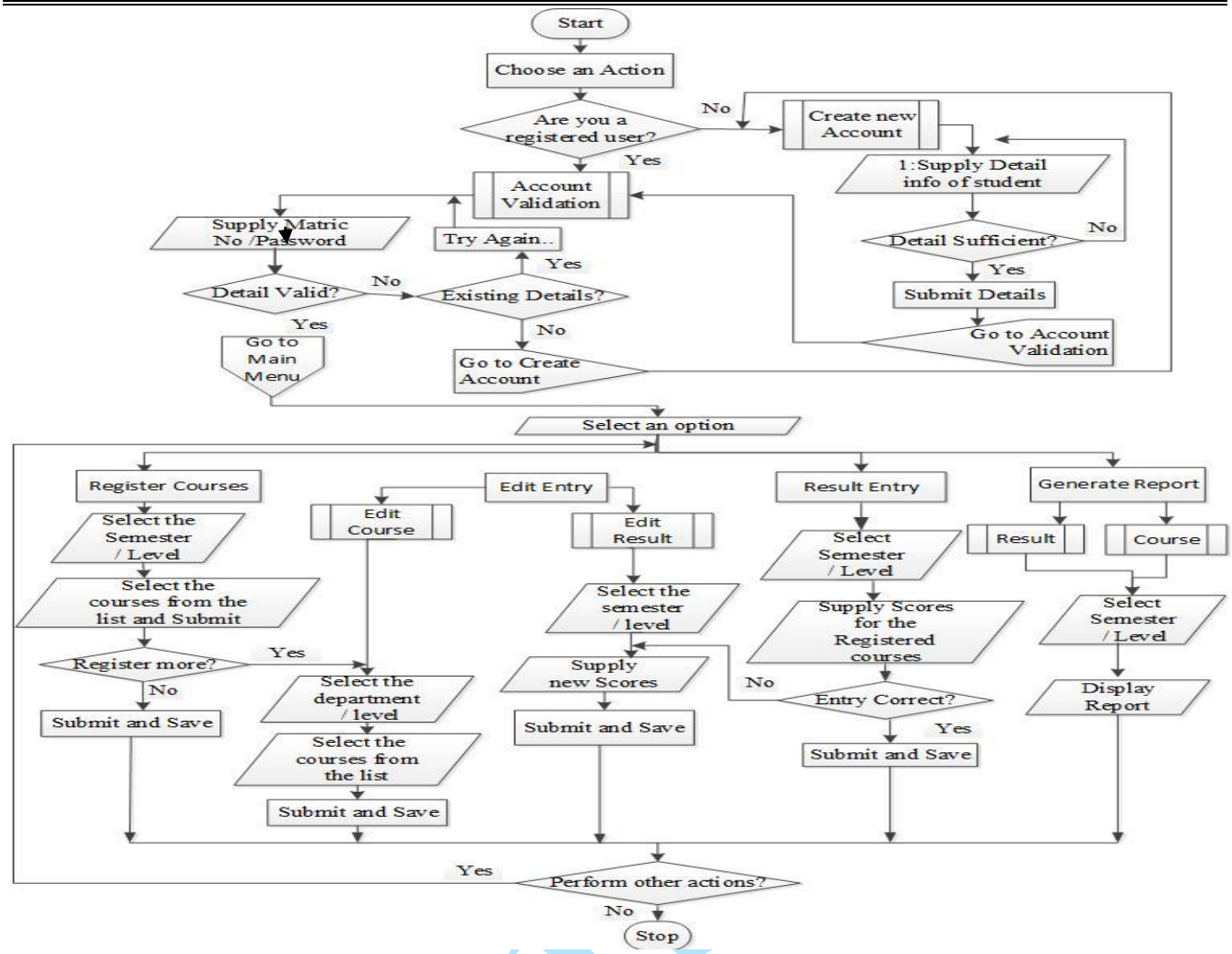

Fig. 2: Flowchart of the CGPA System

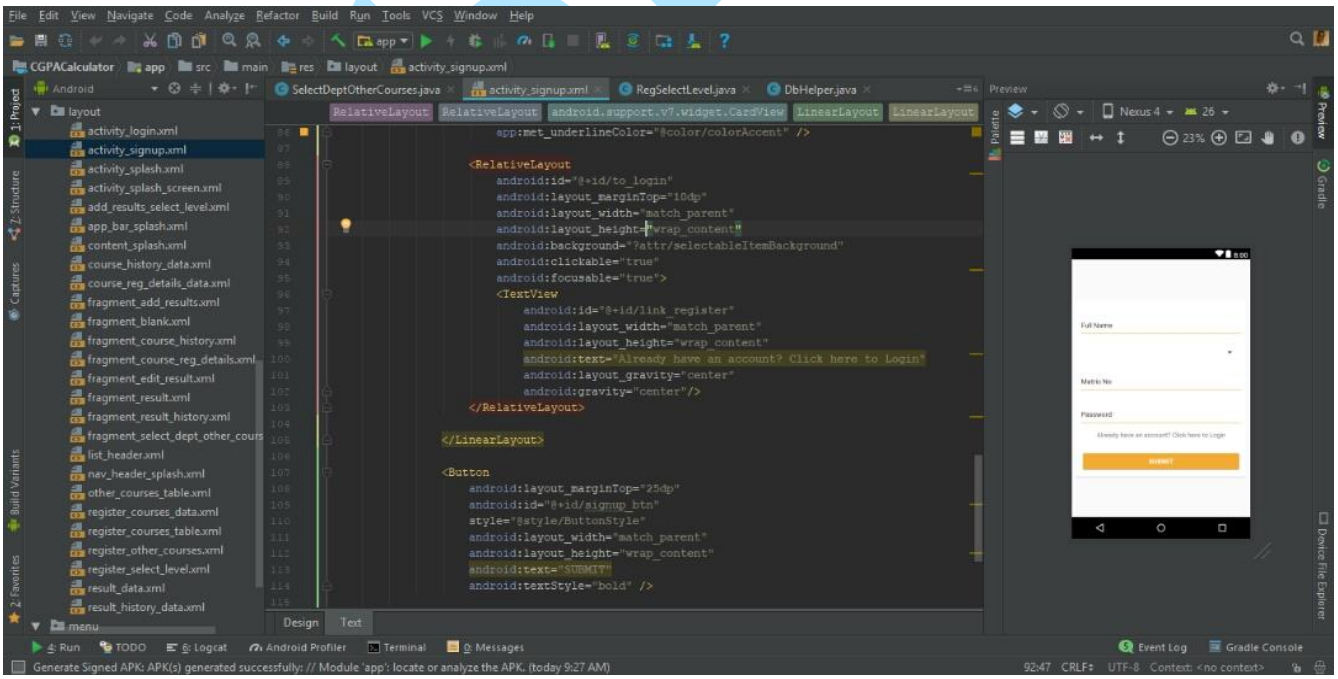

Fig. 3: Android IDE used for Deployment

RESULT AND DISCUSSION

The result of implementation is discussed under the following subheadings:

The Application Homepage
Once the application is launched on a mobile phone, for the first time, the user clicks on Sign up link which redirects the user to Registration page shown in fig. 4.

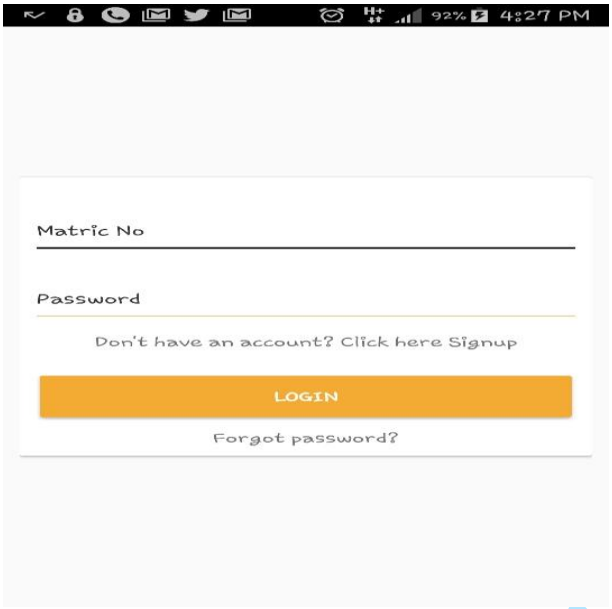

Fig. 4: The App Home Page with choice for a New and Existing User

Registration Page
The registration page where student is required to supply the details such as the name, department, Matric number and password is shown in fig. 5.

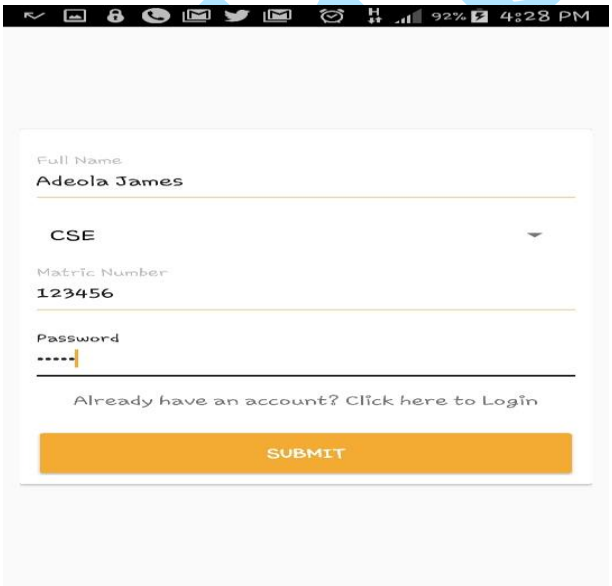

Fig. 5: Registration Page for a New User

The Main Menu Page
Various operations of the mobile app are presented in the menu options of the main page. To perform any of the operations, student only needs to click on the menu option assigned for the operations shown in fig. 6.

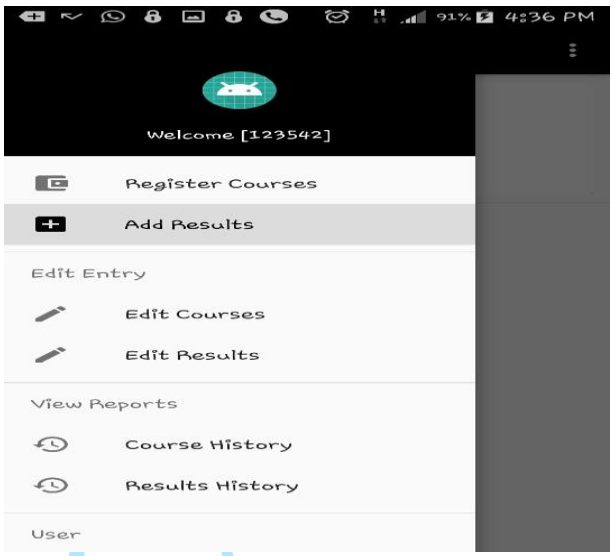

Fig. 6: Welcome Page / Menu option

Course Registration Option
This option allows students to register for courses by selecting the level and semester for which courses are to be registered. The list of courses offered at the selected level/ semester will be displayed as shown in fig. 7.
To add courses from other level or other department, the "Add Other Courses" button will be selected which will request for the department, level and semester from which the courses is to be added.

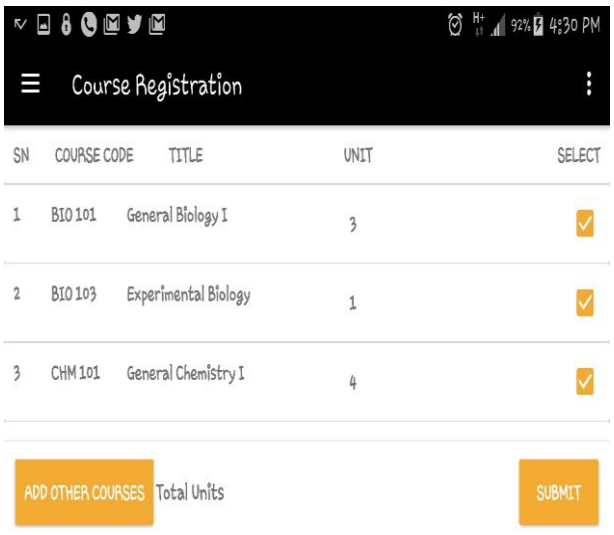

Fig. 7: Course Selection / Registration

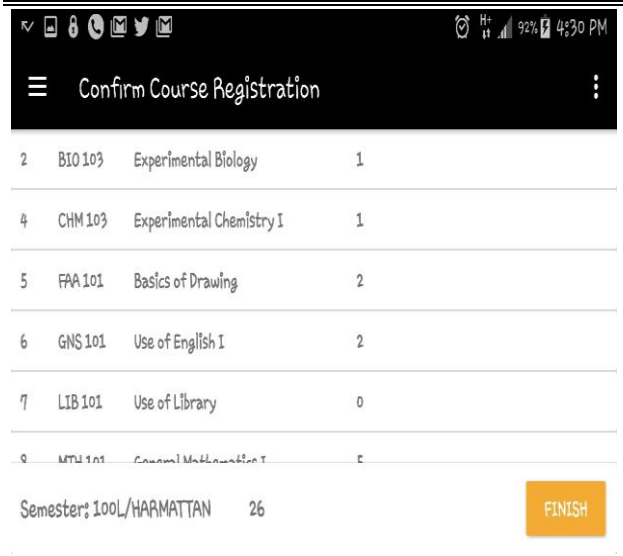

Fig. 8: Course Registration Confirmation

The preview of the selected courses and their total units is shown in figure 8forvalidation. To submit the course form, the student will click on "finish" button.

Result Uploading

The course registration template for each courses registered for in a semester will be loaded form the database. The interface shown in fig. 9 accepts scores obtained in each of the courses.

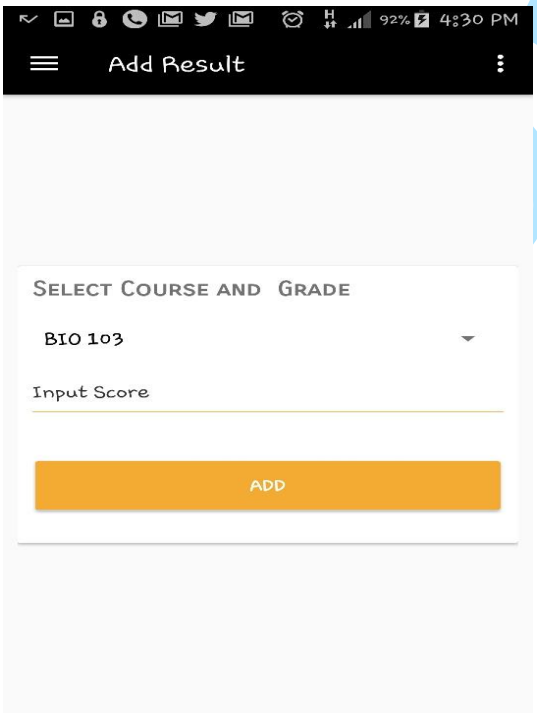

Fig. 9: Result Upload page

Course / Result Updating

To add or remove a course from the course form, the student will select the semester and level of the course to be updated. This is shown in fig. 10.

The course registration template for the selected semester will be loaded from the database for students to deselect the unwanted courses or click "Add More Courses".

To update / edit result (especially in case of Awaiting Result), the student will select the semester and level of the result to be added. The result template for each of the results that has been added earlier for a particular semester will be loaded form the database. The interface will display the previous score which the student can easily edit. This is depicted in fig. 11.

To submit the edited course form or results, the students will select "finish" button.

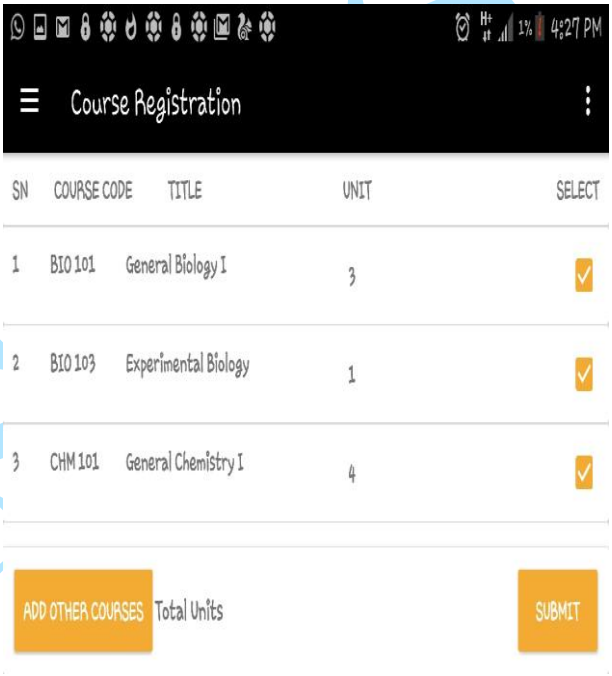

Fig. 10: Course Update / Edit Page

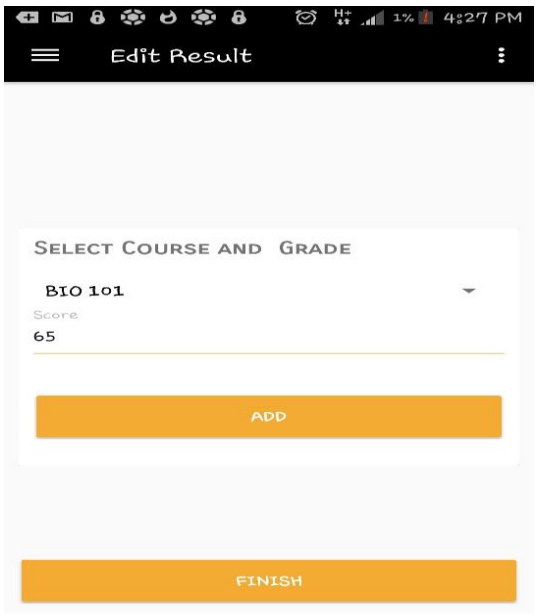

Fig. 11: Result Update / Edit Page

Report Generation- Result History

In order to view report and generate result for a particular semester, all the results that has been added by the student so far are listed here as it is in fig. 12 for the student to click on the needed report. The result obtained by a student in first semester 100 level is displayed in fig. 13.

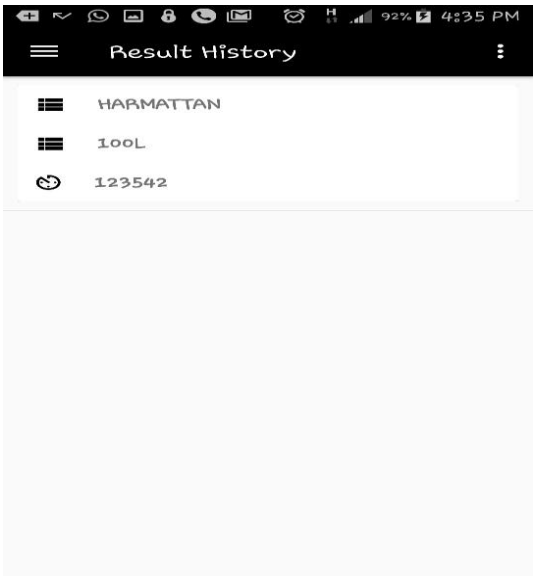

Fig. 12: Result History

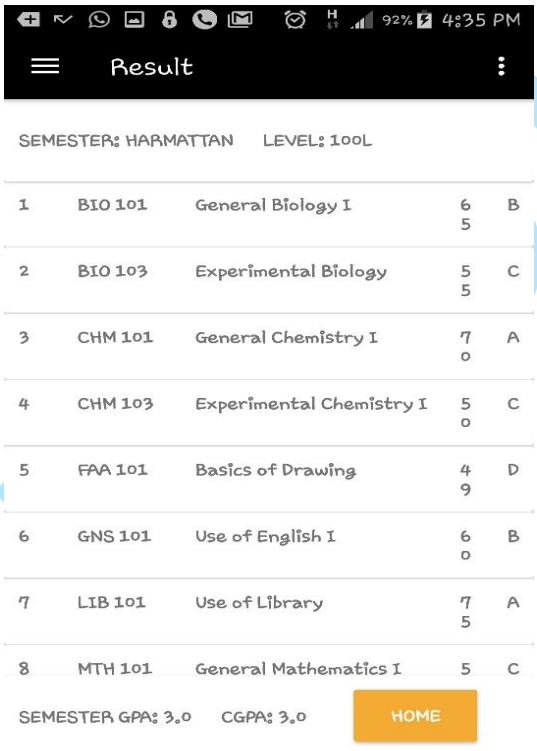

Fig. 13: Result View for 100 Level Harmattan Semester

EVALUATION

To evaluate the performance of the system, 10 students each from all the departments within the faculty were randomly selected to use the system. Ten(10) evaluation criteria were used in this research and questions were formulated for each criterion. For instance, the questions formulated for the measure of relevancy of the system are shown in table 1.

Table 1: Sample Questions on Relevancy of the System Platform

	Relevancy of the System Platform	SA	A	U	D	SD
1	My phone can be used exclusively in lieu of computer					
2	Phone are easier to use than computers					
3	Mobile phones are immensely used for academic activities					
4	Mobile phone are affordable than computer					
5	Mobile phones are easily available/ portable than computers					

All the questions were merged in a questionnaire with 5 likert items consisting of SA for Strongly Agree, A for Agree, U for Undecided, D for Disagree and SD for Strongly Disagree. The mean response of the respondents was obtained using the evaluation criteria as shown in table 2 below.

Table 2: Mean Response According to the Evaluation Criteria

	Items/Scale	SA	A	U	D	SD
		Agree			Disagree	
1	Flexibility of the System	35	29	5	1	0
2	Exceptions and Error Control	28	37	7	0	0
3	Efficiency of Access and use	21	38	4	5	2
4	Relevance of the developed system	58	10	2	0	0
5	Relevancy of the system platform	53	17	0	0	0
6	Functionality and Portability	46	19	4	1	0
7	Consistency and Correctness	37	24	5	3	1
8	Security	61	9	0	0	0
9	Performance and Efficiency	51	10	6	2	1
	Average	**43.33**	**19.78**	**5.11**	**1.33**	**0.44**

The plot of comparism of mean response obtained from the criteria used in evaluating the system in-line with the adopted likert items can be visualized as depicted in figures 14 and 15.

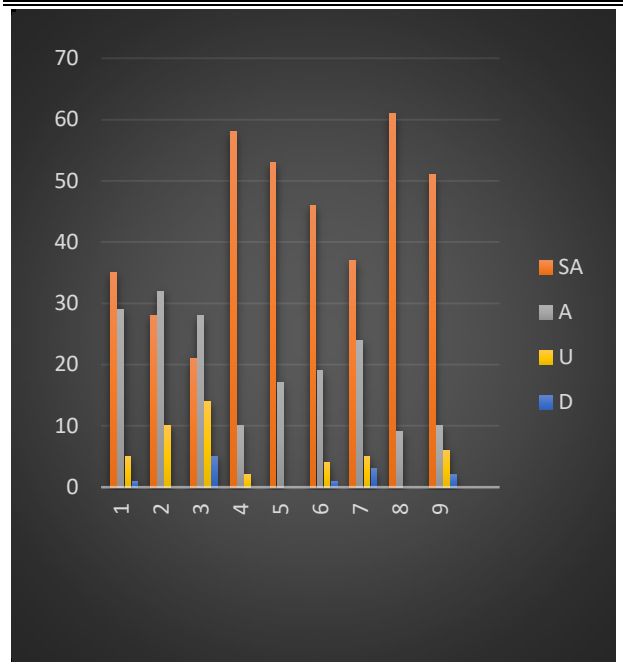

Fig. 14: Mean Response According to the Evaluation Criteria

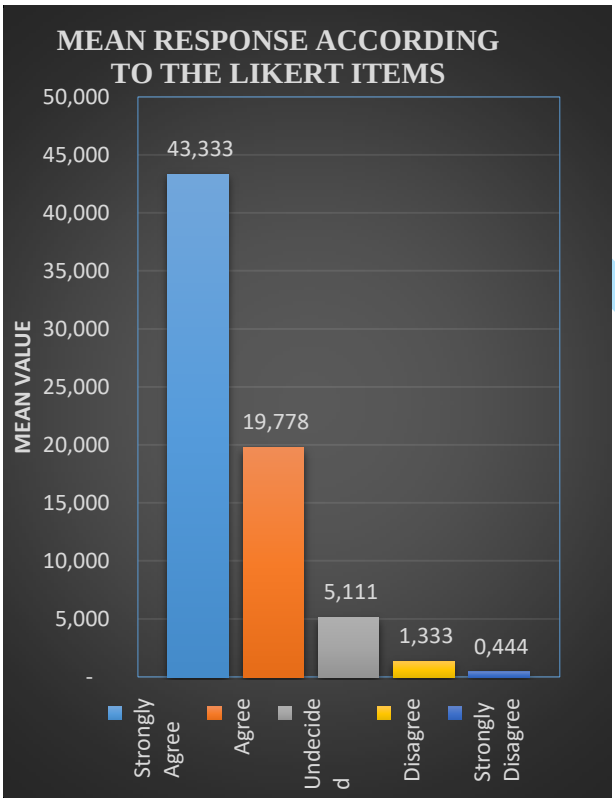

Fig. 15: Mean Response According Likert Item

The system was found to meet design expectations.

CONCLUSION

A mobile application that presents a friendly interface for interaction in education systems by keeping the academic record of students has been developed.

The application enables the students to keep their academic records at their reach by providing additional opportunity for students to keep and track their academic records from time to time in order to ensure improvement. The student will be fully aware of what effort he must put in to remain in the University or to graduate in a desired class at all time.

This means that unlike the existing method, students need not to keep the hardcopy of their results before they can be viewed and accessed. Also, it is expected to relieve the students of the cost incurred in making copies of the result for documentation purpose thereby making the exercise paperless. This makes the system to be highly economical.

The system is able to provide security measure that restricts unauthorized users from accessing the already created account on mobile phones.

Further work could be carried out on the system to make it web-enabled so that proper update can be made from time to time for the application so as to improve and increase its functionality and make it much easier for students to access.

The research work could be generalized or expanded to other faculties or other schools with little modification.

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