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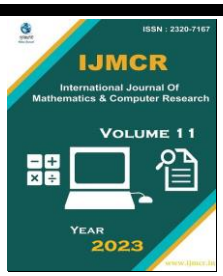

Implementation of a Cohesive Student end Result Manager

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ABSTRACT

The advanced turn of events and the effect of personal computers and the Web on our lives have been a beneficial to civilization. Higher institutions examinations are performed with broad human intercession physically, the results are produced through a bookkeeping page application and afterward imprinted on a paper, appended to a board for the assertion, and afterward put away. Due to the increasing number of students in recent years and some human limitations, lots of problems have been encountered in area of Students registering of course which are not included in the program which they study, omitting carry-over courses during result compilation, students offering more or less credit load than required and lack of adequate guidance in course registration. This research aims at making a web-based cohesive student result management system for higher institutions to lessening the time, effort, and improving the security of compilation of results by designing and implementation of the database, user-based interface, user access privilege and business logic. The strategy received for the elaboration of the venture depends on the subjective study. The functional result management system was developed using Django as the template and HTML and CSS as the view. The database used in iSRM (the student result management system) was designed with SQLite Database Management System (DBMS) which serves as the model.

KEYWORDS: HTML; CSS; ISRM; Examination; result; GPA; CGPA; DBMS; SQLite; Dashboard

1.1 INTRODUCTION

The first automated integrated student information system using punch-card input was implemented in the early 1970s. In 1984 Punch-card system was replaced by a database system on an Intercom platform. In 1988 Intercom system was replaced by an Integrated Database Management System (IDMS) database system. An IDMS is primarily a network database management system for mainframe computers. The student information system was created by IBM & SMPL before 2005 to provide a more effective means for the registration of courses, grading of courses, and analysis of the student results as well as tracking student's attendance. A student information system (SIS), student management system, school administration software, or student administration system is a management information system for education establishments used to manage student data, (Wikipedia, 2020).

An integrated student result manager refers to a computerized platform that strives to improve the effectiveness and efficiency of an institution as well as combat the problem of slow computation of student results which arises from a large amount of data to compute. Examinations are a basic vital piece of education and student lifecycle. They are the apparatuses used to quantify the achievement and adequacy of the teaching processes and methodologies. Examinations are as stressful for the teachers and administrators of the student community, for different reasons. Students only need to worry about preparation and performance, whereas teachers and administrators have a great deal to do on their part. Registration, security, assessments, candidate verification, and organization of results are some of the important aspects of effective exam administration. Overseeing exams at a bigger scope can be considered all the more burdening. Traditionally, examination and result computation system involves huge volumes of answer-paper scripts that become difficult to manage and are vulnerable to risks that include damaged and misplaced answer scripts. The resulting system also requires manual sorting, evaluation, and safeguarding, which contributes to the risk of errors and biases, security concerns and may ultimately cause delays in announcing the results. The solution lies in switching over to a digital and automated student result processing system from the current manual result processing system. An automated

digital student mark analysis system is a real boon to educational institutions and testing bodies. From planning and preparing to evaluate, the student examination result processing system, in effect, frees up administrators and teachers who can focus their attention on the other important tasks.

1.2 DATA PROCESSING

Data processing techniques have been used in various aspects of lives. The need for data processing arose after the creation of computers. During these very early days, computer scientists had to write custom programs for processing data and these were most likely stored on a punch card, (Krettek, 2019). The invention of the database paved the way for the widespread use of a simpler form of data processing, where the need for skilled programmers was eradicated due to the simplicity of the database. Data processing involves the manipulation of data by the central processing unit (CPU) in a computer. It is an operation that performs upon raw facts, whether or not by electronic means, such as collection, recording, organization, storage, or alteration to convert it into useful information.

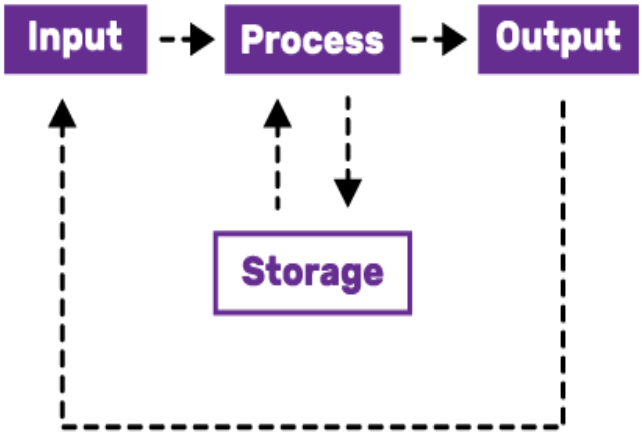

Figure I: Data Processing

1.3 DATA PROCESSING CYCLE

The data processing cycle comprises a progression of steps where crude information (input) is taken care of into a cycle (CPU) to deliver significant experiences (yield/output). Each progression is taken in a particular request, yet the whole cycle is rehashed cyclically. The principal information preparing the cycle's yield can be put away and taken care of as the contribution for the next cycle. There are six stages of the data processing cycle;

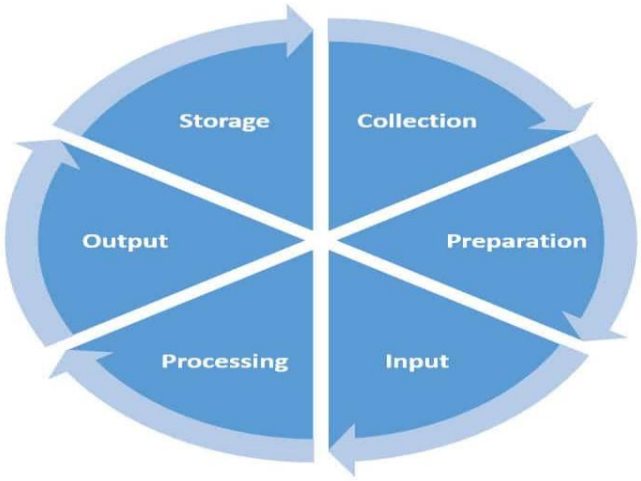

Figure II: Data Processing Cycle

i. ***Collection***: The collection stage, which is the first stage of the data processing cycle, needs to guarantee that the information accumulated is both characterized and precise, so resulting choices dependent on the discoveries are substantial. This stage involves the collection of raw data which could include grades, full name, age, amount, etc.

ii. ***Preparation*:** The preparation stage involves the manipulation of information into a structure appropriate for additional examination and processing. It is also referred to as data cleaning where the raw data is sorted and filtered to eradicate inaccurate and unnecessary data. This is done to guarantee that only high-quality data is taken into the processing unit.

iii. ***Input:*** The input stage is where confirmed information is coded or changed over into machine comprehensible structure with the goal that it very well may be prepared through an application. This can be in the form of data entry through a keyboard, scanner, or any other input source.

iv. ***Processing***: The processing stage is when the high-quality data is exposed to different methods and strategies for ground-breaking specialized controls utilizing Machine Learning and Artificial Intelligence calculations to produce a yield or translation of the information. This stage may vary fluctuate from process to process depending on the source of data being processed.

v. ***Output:*** In the output stage, the information is at long last communicated and shown to the client in a meaningful structure like diagrams, tables, vector records, sound, video, reports, etc. The output should be deciphered so it can give significant information that will manage future choices of the organization.

vi. ***Storage:*** In the storage stage, which is the last stage, where data and metadata (data information) are held for future use. This takes into consideration snappy access and recovery of information at whatever point required, and permits it to be utilized as a contribution to the following data processing cycle straightforwardly.

1.4 TYPES OF DATA PROCESSING

There are several methods and techniques which can be adopted for the processing of data depending upon the requirements, time availability, software, and hardware capability of the technology being used for data processing. There are several types of data processing methods:

i. ***Batch Processing***: It is one of the widely used types of data processing. Here, Data is collected and processed in batches. Used for large amounts of data, e.g., payroll system.

ii. ***Online Processing:*** This processing method is a part of the automatic processing method. Data is automatically fed into the CPU as soon as it becomes available. It is used for the continuous processing of data. e.g., barcode scanning

iii. ***Real-time processing***: Data is processed within seconds when the input is given. It is used for small amounts of data. e.g., withdrawing money from Automated Teller Machine (ATM)

iv. ***Multi-processing***: This type of processing perhaps the most widely used type of data processing. Data is broken down into frames and processed using two or more CPUs within a single computer system. It is also known as parallel processing. e.g., weather forecasting

v. ***Time-sharing***: Time-based use of the CPU is the core of this data processing type. It allocates computer resources and data in time slots to several users simultaneously.

1.5 DATA PROCESSING METHODS

There are several methods and types of data processing. Based on the data processing system and the requirement of the project, suitable data processing methods can be used. Three methods of data processing have been presented below:

i. ***Manual Data Processing***: In this data processing technique, information is prepared physically. The whole cycle of information assortment, separating, arranging, estimation, and other intelligent activities are finished with human mediation without the utilization of some other electronic gadget or computerization programming. It is an easy strategy and expects practically no apparatuses, however, creates high blunders, high work expenses, and bunches of time.

ii. ***Mechanical Data Processing:*** Data is processed precisely using gadgets and machines. These can incorporate straightforward gadgets, for example, adding machines, typewriters, print machines, and so forth straight forward information handling tasks can be accomplished with this technique. It has a lot lesser mistakes than manual information preparation, yet the expansion of information has made this strategy more intricate and troublesome.

iii. ***Electronic Data Processing:*** Information is handled with present-day advances (technologies) utilizing data processing programming and projects. A bunch of directions is given to the product to handle the information and yield. This strategy is the costliest yet furnishes the quickest handling speeds with the most elevated dependability and exactness of yield.

1.6 MANAGEMENT INFORMATION SYSTEM AND ITS ROLE

The MIS area emerged in the early days of the electronic digital computer era. Before the emergence of MIS, organizations primarily focused on using computers to perform tasks, activities, and processes that had previously been done manually, e.g., invoicing, the creation of financial reports, and order processing. The business department that operated the computers and performed these automation projects were then generally referred to as electronic data processing (EDD) (King, 2022). Management Information System often referred to simply as MIS, is a planned system of collecting, storing, and disseminating data in the form of information needed to carry out the functions of management. Management information systems have six eras; mainframes, minicomputers, personal computers, client/ server networks, enterprise computing, and cloud computing. Management covers the planning, control, and administration of the operations of a concern, Information means the processed data that helps the management in planning, controlling, and operations, and a system is made up of inputs, processing, output, and feedback or control. Thus, Management Information System means a system for processing data to give proper information to the management for performing its functions (Square, 2019).The benefit of MIS cannot be overemphasized as its merits far out-ways its demerits. The benefit of MIS cannot be overemphasized as its merits far out-ways its demerits. It should be noted that MIS is not only meant to enhance the efficiency and productivity of an organization,(Olayinka, 2014) increase its merits scopes as they also assist in:

i. Improvement of the Performance of an organization.
ii. Better accountability of records
iii. Work is done more quickly and efficiently.

1.7 DATABASE MANAGEMENT SYSTEM

An organization should have exact and dependable data for successful choice making. To this end, the organization keeps up records on the different features keeping up connections among them. A database system is an integrated collection of related files, along with details of the interpretation of the data contained therein. A database system is nothing more than a computer-based record-keeping system i.e., a system whose overall purpose is to record and maintain information/data (Gunjal2003). A Database Management System (DBMS) is a collection of programs that manages the database structure and controls access to the data stored in the database. In a sense, a database resembles a very well-organized electronic filing cabinet in which powerful

software (the DBMS) helps manage the cabinet's contents. A database is a collection of related data which represents some aspect of the real world. A database system is designed to be built and populated with data for a certain task (Guru99, 2020). The benefits of a database management system vary from data independence, efficient data access, data integrity control, security control, concurrent access, and crash recovery, to reduced application development time. A Database Management System is a complex structure that is used to manage, store and manipulate data and the metadata used to describe the data. It is utilized by a large variety of users to retrieve and manipulate data under its control. A system is composed of a set of interrelated components.

- At least one person owns and is responsible for the database.
- A set of rules and relationships that defines and governs the interactions among elements of the database.
- People who put data into the database.
- People who get data out of the database.
- The database itself.

Database design is the strategy of the database structure that will be utilized to store, what is more, oversees information instead of the plan of the Data Based Management System programming. When the database plan is finished, the Data Based Management System handles all the confounded exercises needed to interpret the planner's perspective on the structures into structures that are usable to the Personal Computer. An ineffectively planned database will in general produce blunders that are probably going to prompt terrible choices. An awful database plan ultimately can act naturally amending: associations utilizing ineffectively planned information bases frequently come up short because their supervisors don't have access to timely (or then again even right) information, in this manner ruling the awful database base plan. The accessibility of a Data Base Management System makes it conceivable to handle unquestionably more modern employments of the information assets if the database is intended to utilize that accessible force. The sorts of information structures made inside the database and the degree of the connections among them assume a ground-breaking part in deciding how viable the Database Management System is. Consequently, database plan has become an urgent movement in the database environment. Database plan is made a lot less complex when we use models. A Database model is an assortment of sensible constructs used to represent the data structure and the data connections found inside the database for example streamlined reflections of genuine occasions or conditions. On the off chance that the models are not sensibly stable, the database plans got from them won't convey the information base framework's guarantee to compelling data drawn from a proficient database. (Gunjal, 2003). There are several types of Data Based Management System such as hierarchical database, network database, relational database, object-oriented database, graph database, ER model database, document database, and NoSQL database.

2.1 RELATED WORKS

The Literature review presented the detailed analysis of the basic operations of the various units of this research, also, the previous researches, significances and operations of student result management systems in the world today, the history of result management in schools, and problems with existing systems made.

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1988 through to 2005 IDMS frameworks were constantly upgraded and altered to meet new necessities and changing innovation utilizing the Internet, many interfaces have been assembled and removed made to support countless free frameworks across universities and its environment.

The student information system was created by IBM & SMPL before 2005 to provide a more effective means for the registration of courses, grading of courses, and analysis of the student results as well as tracking student's attendance. A student information system (SIS), student management system, school administration software, or student administration system is a management information system for education establishments used to manage student data, (Wikipedia 2022).

Krettek et al. 2010 emphasized on data processing techniques which have been used in various aspects of our lives. The need for data processing arose after the creation of computers. During these very early days, computer scientists had to write custom programs for processing data and these were most likely stored on a punch card.

King et al. 2002 proposed the MIS area emerged in the early days of the electronic digital computer era. Before the emergence of MIS, organizations primarily focused on using computers to perform tasks, activities, and processes that had previously been done manually, e.g., invoicing, the creation of financial reports, and order processing. The business Department that operated the computers and performed these automation projects was then generally referred to as electronic data processing (EDP).

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minicomputers, personal computers, client/server networks, enterprise computing, and cloud computing. Management covers the planning, control, and administration of the operations of a concern, Information means the processed data that helps the management in planning, controlling, and operations, and a system is made up of inputs, processing, output, and feedback or control. Thus, Management Information System means a system for processing data to give proper information to the management for performing its functions.

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A Database model is an assortment of sensible constructs used to represent the data structure and the data connections found inside the database for example streamlined reflections of genuine occasions or conditions. On the off chance that the models are not sensibly stable, the database plans got from them won't convey the information base framework's guarantee to compelling data drawn from a proficient database (Gunjal, 2003).

Eramuthu et al. 2014 presented a paper titled analysis of student results using clustering techniques. This paper proposed that educational data mining is an emerging discipline concern with developing methods for exploring the unique type of data that come from educational settings and using those methods to better understand students and the setting in which they learn. For better achieving this quality objective, these organizations need deep and enough knowledge to better do assessing, evaluating planning, and decision-making process.

Walia et al. 2014 presented a paper titled a framework for a web-based student record management system using PHP. It modeled a supportive framework with a specific end goal to make simplicity to the client, the framework was created by utilizing Xampp Server interfacing with a database that is using 'PHP' language as the dialect or guideline of the framework. This new framework utilized a database idea to store all the data related to area application forms. By utilizing this database idea, a few issues, for example, information misfortune and harm could have stayed away.

Liu et al. 2010 presented a paper titled design and implementation of student information management system. This paper describes the system functional and architecture design and emphasizes the system's functionality, database design, and functional modules, etc. Fully functional, flexible, and convenient application and friendly interface provide a good guarantee for student information management.

Ibrahim et al. 2013 presented a paper titled Student Performance Analysis System (SPAS). The proposed system offers a predictive system that can predict the students' performance in the course, which in turn assists the lecturers from the Information System department to identify students that are predicted to have bad performance in the course. The proposed system offers student performance prediction through the rules generated via data mining techniques. The data mining technique used in this project is classification, which classifies the students based on students' grades.

Yu-fang et al. 2009 presented a paper titled design and implementation of college student information management system based on web services. This paper introduces database design, a specific realization of each function module, and key technologies used in the system. In the .NET environment, using ASP.NET technology, Visual C # and JavaScript as a programming language, this system accesses the database of Microsoft SQL Server 2005 with ADO.NET technology and could be employed by users with high security following the access control mechanism of RBAC (Role-Based Access Control) on Web Services.

Bharamagoudar et al. 2013 presented a paper titled web-based student information management system. The system utilizes user authentication, displaying only information necessary for an individual's duties. Additionally, each sub-system has authentication allowing authorized users to create or update information in that subsystem.

Yue et al. 2010 presented a paper titled the development and design of the student management system based on the network environment. This paper discusses the method of management information in higher education. Based on a comprehensive investigation and analysis on the student

management in higher education, they establish the models of the college students' management information by adopting the advanced information technology and construct the student management information platform. Moreover, they analyzed the characteristics of information management in higher education, and elaborate on the methods to solve the difficulties confronting the student's management of higher education. Finally, the key method and technology to carry out the information management platform are presented.

Ekanem et al. 2017 presented a paper titled development of students' results management system: A case study of the University of Uyo. In this paper, an automated platform for managing the result of all categories of students seamlessly and interactively is presented.

Lawal, 2018 presented a paper titled development of computerized Students' Results Processing System. This paper examined the inadequacies involved in the manual method of compiling students' results in Kwara State, Nigeria Government Secondary Schools. The problems with the manual result processing were identified, and a new computer software application system was developed and implemented to facilitate the automated processing of the results.

3.1 METHODOLOGY

The methodology includes all the methods, processes, and details of the design of the integrated student result management system.

Grading System

A grading system in education is a method of evaluating a child's educational achievement solely on the basis of points. Grades are averaged in certain countries to get a grade point average (GPA). The amount of grade points a student gets in a specific period of time is used to compute GPA. GPAs are often calculated for high school, undergraduate, and graduate students, and they can be used by future employers or educational institutions to evaluate and compare candidates. A cumulative grade point average (CGPA), often known as GPA, is a measure of a student's overall achievement across all of his or her courses.

Table I: Five Point Grading System for Universities

MARKED RANGE	LETTER GRADE	GRADE POINT
70% and above	A	5.0
60% - 69%	B	4.0
50% - 59%	C	3.0
45% - 49%	D	2.0
Below 45%	F	0.0

Table II: Cumulative Grade Point Average

CGPA	Degree
4.50 and above	First Class
4.49 – 3.5	Second Class Upper
3.49 – 2.5	Second Class Lower
2.49 – 1.5	Third Class
1.49 – 1.0	Pass

Because the courses differ in their demands and complexity, a university program's courses are assigned several credit units that range from one to the next. As a result, some courses are given more credit units than others. The weighted average earned by a student in any course is calculated by multiplying the grade's point value (numeric grade) by the course's credit unit. The total weighted average is produced by totaling up the weighted average of all the courses provided. The Grade-Point Average (GPA) is derived by dividing the total weighted average by the sum of credit units of all the courses offered at that time. Thus,

$$WA = Grade\ Point\ Value \times Course\ Credit\ Unit \quad \text{(i)}$$

$$G.P.A = \frac{TWA}{TUT} \quad \text{(ii)}$$

$$CTUT = PTUT + TUT \quad \text{(iii)}$$

$$CTWA = PTWA + TWA \quad \text{(iv)}$$

$$C.G.P = \frac{CTWA}{CTUT} \quad \text{(v)}$$

***Where*;**

WA = Weighted Average
TWA = Sum all of the weighted average of all courses taken in that semester
TUT = Total course credit unit taken
PTUT = sum of all previous total course credit unit taken
PTWA = sum of all previous weighted average of all courses taken
CTUT = Cumulative total course credit unit taken
CTWA = Cumulative of the weighted average of all courses

3.2 SOFTWARE DEVELOPMENT MODEL

The model used for this project is the Waterfall model of software development. This model follows a sequential order which ensures that a phase is completed before another phase begins. This system model emphasizes planning in the early stages is used in projects where all the system requirements are known and in addition, its intensive documentation and planning make it work well for projects in which quality control is a major concern.

3.3 REQUIREMENT ANALYSIS

This phase entails the gathering of requirements from users of the system. The requirements are collected in a requirements specification document.

3.3.1 Functional Requirements

The functional requirements highlight the specific functions the system should be able to carry out. The system should be able to do the following:

i. On-line student course registration and result viewing.
ii. Creates a platform for the user to input, modify, or delete student grades.
iii. Enables security, rights, or privileges for users.
iv. Creates a template to generate student transcripts.
v. Computes student grades and generates student results.

3.3.2 Non-Functional Requirements

These are constraints that should be imposed on the services provided by the proposed system. The system was designed to fulfill the following non-functional requirements:

i. All its operations should be correct, that is, should produce expected results when supplied with the right inputs.
ii. Allow users to use it simultaneously on computers with minimum system requirements.
iii. The system should be reliable, up and running every time its operations are needed.
iv. It should give the fast, accurate, and inexpensive process of results to users

3.3.3 Actor Description

Name: Administrator

The administrator will supervise the entire system and will have access rights to all the modules and pages of the application.

Name: Student

The student will register and print out their list of courses

Name: Lecturer

The lecturer will assign scores to students offering the course(s) assigned by the administrator.

Name: Exam Officer

The exam officer will have access to the broadsheet and transcripts of the department assigned by the administrator

3.3.4 User Requirements

The user requirements specify the functionality of the users in the system. The requirements assigned to each user are shown using the use case diagram below.

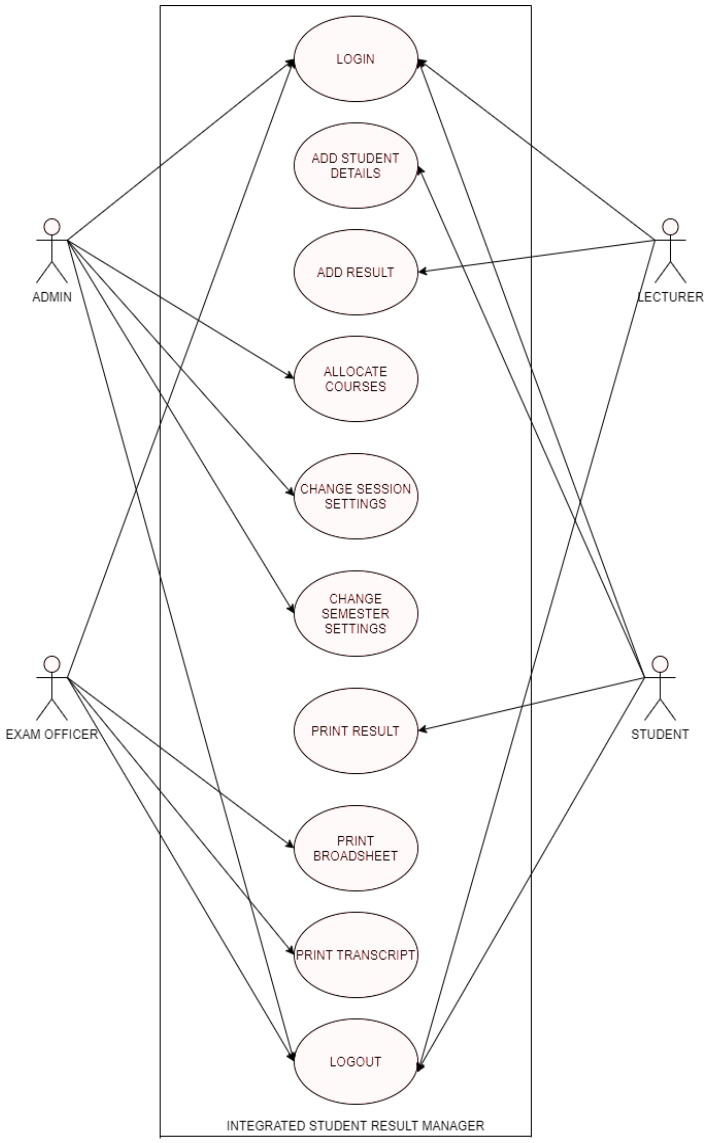

Figure III: Use Case Diagram for the Users

3.4 SYSTEM DESIGN

This phase entails the design of several systems. This stage was all about the details of the design of a workable framework. It focuses on converting design specifications into code performance specifications; the system's development is divided into two phases: logical and physical design.

We had previously defined the system's functional and non-functional specifications and produced the analysis model. The following are discussed in this section: system architecture, design constraint, and systems flowchart.

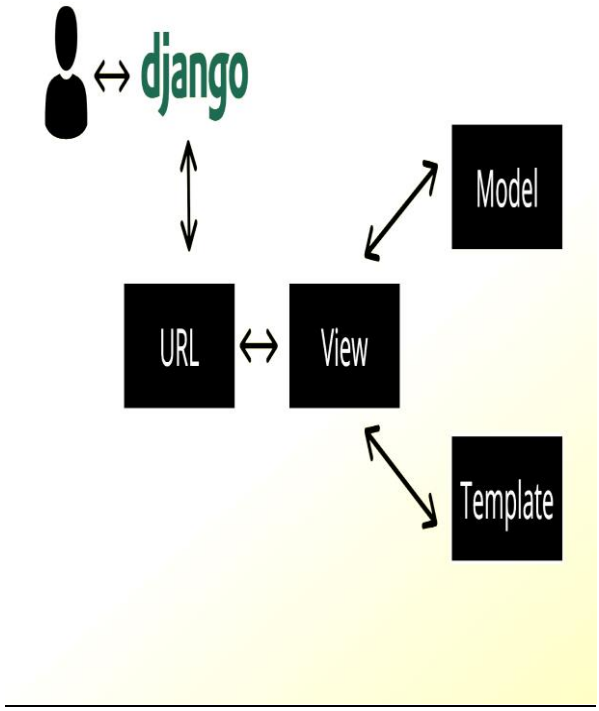

Figure IV: System Architecture

In this case, the model component and its function are the same. The template part is in charge of how the data is displayed to the user in general. The view part in this case specifies what data is displayed, regardless of how it is displayed. The system takes over the controller portion, which also manages URLs. Callback functions are used to execute views, and they return data for a certain URL (All views are included in the 'views.py' file). Templates in Django are nothing more than HTML files combined with Django Template Language that is rendered using views (DTL). (All HTML files for managing templates should be placed in a different 'Templates' folder). All of the Versions are included in a separate 'models.py' format. MTV is also known as 'MTV + Controller,' but the Controller part is usually omitted because it is already part of the system.

3.4.1 Design Constraints

MVT is a great architecture design, but it does have some drawbacks. Not every object will fit neatly into the model, view, or controller categories. Backward compatibility is a priority for the framework. Over time, it continues to get larger and heavier. Even in Python, speed is a concern, but Django has opted to specify other stuff. Django is more concerned with developer usability and backward compatibility than it is with pace.

3.4.2 System Flowchart

A flowchart is a diagrammatic representation of the (finite) sequence of steps that must be taken or operations that must be performed to solve a problem. This tool is particularly helpful during the software development process's systematic review and design phases. It's used to describe the old system's algorithm (during analysis) or the new system's algorithm (during development) or (during design). The system flowchart represents or specifies the overall system in brief, while the program flowchart represents the overall system in depth.

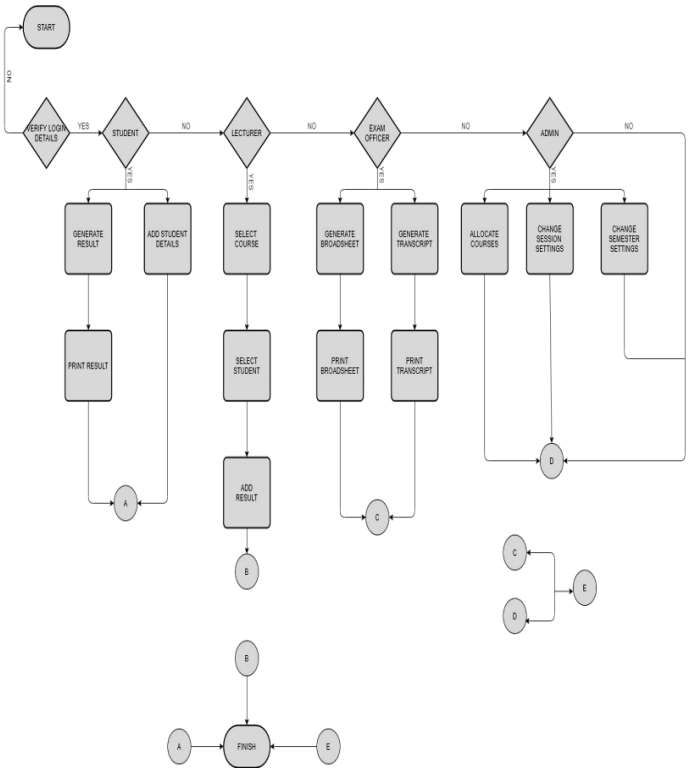

Figure V: System Flow chart

4.1 RESULTS AND DISCUSSION

Several analyses were done to ensure the web application performs properly. It entailed testing each module separately since this is the most effective way to debug the error discovered at this stage. The implementation of the system was done by testing. It also contains a general discussion of the method that has been applied.

4.2 SYSTEM DESCRIPTION

Figures vi to xii is the descriptions of some interfaces.

Figure VI: System Login Page

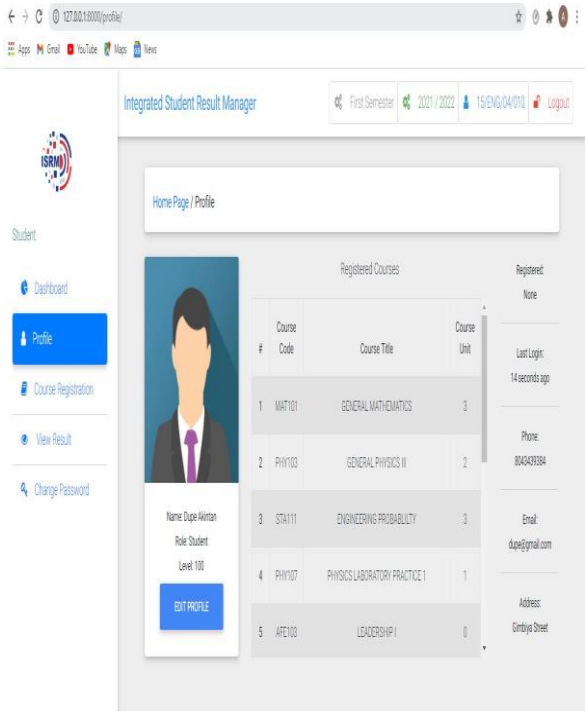

Figure VII: The Student Profile Page

The system login page enables authorized staff to have access to the system.

The profile provides information about the user. They are customizable to meet the specific needs of the institution. Here, it shows the registered courses, last login, phone number, email, address, role, and level.

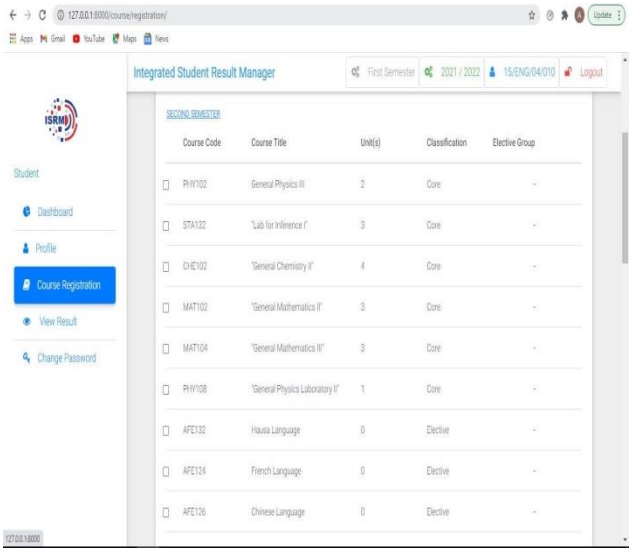

Figure VIII: The Student Course Registration Page

The course registration page allows the student to register for courses for each semester. Students can register for courses on this page, as well as remove already registered courses.

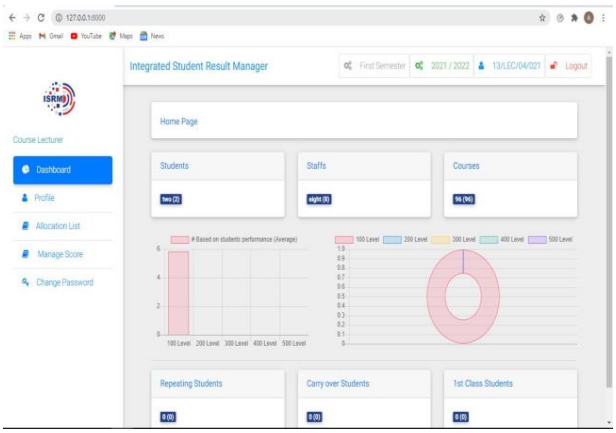

Figure IX: The Course Lecturer Dashboard Page

The dashboard often provides an at-a-glance view of the side of the lecture of the system. They are customizable to meet the specific needs of an institution. Here, it shows the number of registered students, number of carry-over students, number of repeating students, and the number of first-class students.

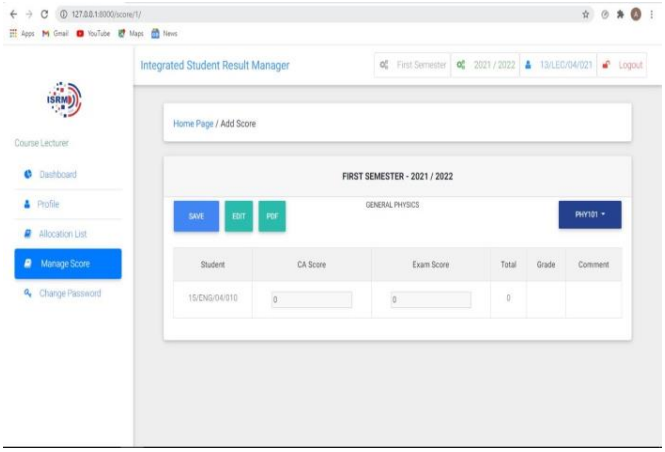

Figure X: The Manage Score Page

The manage score page allows the lecturer to add the CA score and exam score for each student. Lecturers can register student scores on this page, as well as delete or edit the existing details of students.

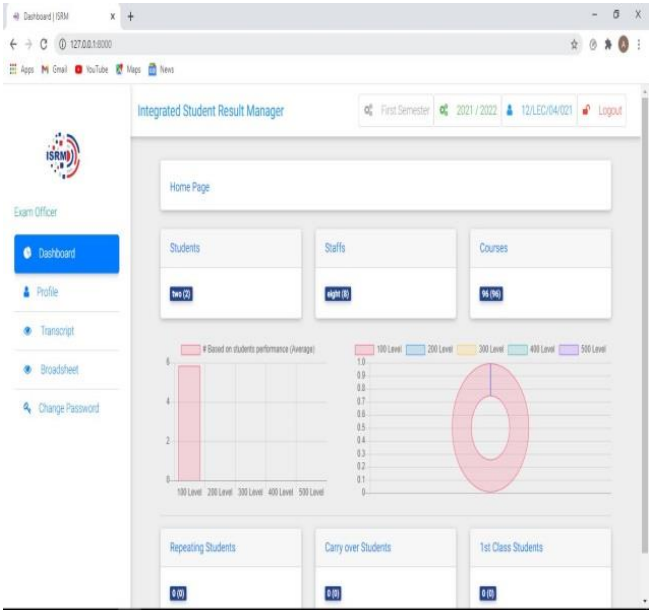

Figure XI: The Exam Officers Dashboard Page

The exam officer's dashboard provides an at-a-glance view of the exam officer side of the system. They are customizable to meet the specific needs of an institution. Here, it shows the number of registered students, number of existing staff, number of courses, number of carry-over students, number of repeating students, and the number of first-class students.

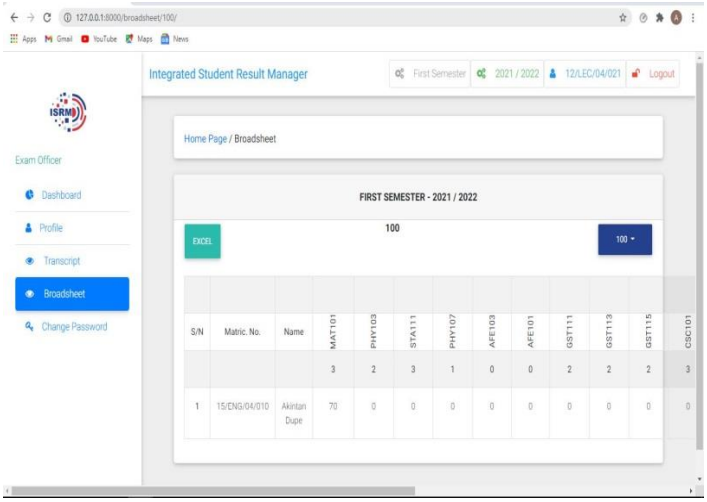

Figure XII: The Broadsheet Page

The broadsheet page allows the exam officer to generate a broadsheet showing all the results of students in a particular department, college, level, and session. The broadsheet is generated based on the lecturer's score input.

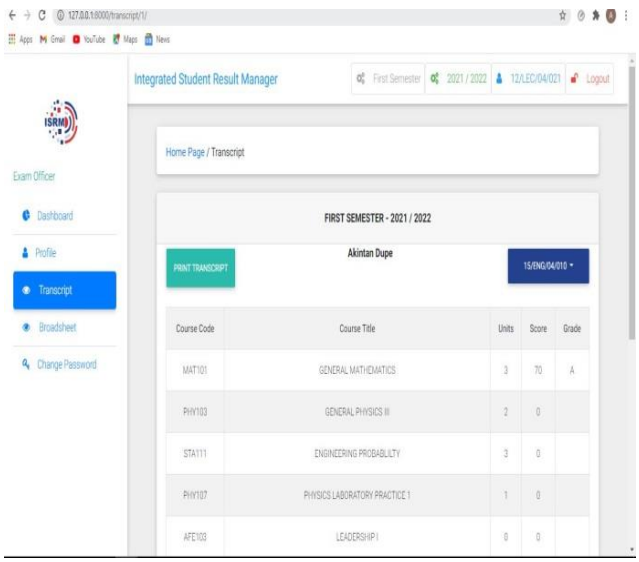

Figure XIII: The Transcript Page

The transcript page allows the exam officer to generate a transcript showing the results of a particular student in a particular department, college, and level from the moment of entry into university to the present time.

4.3 Testing

Testing was carried out to ensure that the program is error-free and working as expected. Testing is in three stages;

- ***Unit/module testing*** where errors are pruned**.** This ensures that each module performs as it ought to.
- ***Integration testing*** to check for any errors that may exist in the course of combining the modules.

4.4 **System testing** is the final testing. The purpose of this test is to evaluate the system's compliance with the specified requirements and for error detection. In the course of integration, some errors might have been generated; this testing makes them visible and hence they are taken care of.

4.5 Unit testing

The different unit of this project was tested by different individuals and its workability was perfectly approved which makes the whole system a success. This comprises the test data, expected test result, and actual test result.

5.0 DISCUSSION

This research on a cohesive student end result manager was designed and implemented to improve the efficiency and effectiveness of the computation of student results. The integrated student result management system was developed with Django, SQLite, HTML, CSS, JAVASCRIPT and was hosted locally with Django. In addition, the software development methodology was based on a flow chart. To explain the system's major functionalities, a functional decomposition of the system and its key modules is provided. A use case diagram is also presented to show the various categories of system users as well as the various functionalities associated with each of them. The system requires an active internet connection to operate, as it makes the real-time entry of data in a cloud database without storing it on the device possible. This implies that it can be used both staff and students from wherever there is an Internet connection. It's simple to upgrade and manage, and it's compatible with a variety of smartphones, implying a wider scope. This also prevents the data from interruption or destruction, which might occur if the data is stored on a physical computing device. The machine is limited by the fact that it cannot function if the Internet is inaccessible.

5.1 RECOMMENDATION

In regards, the following observations and recommendations for future work similar to this one can been made to ensure better performance. Further work can be done to incorporate a system that can allow the attendance to be stored automatically in the system by the use of RFID scanners. Also, the use of online platforms for the examination process and submission of assignments, where the system automatically marks the examinations and stores the scores in the database, can be incorporated into the system to improve the efficiency of the result management system.

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