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SCHOLARLY ARTICLE

Effective Management of the Computerized Student Results Processing System at Enugu State Polytechnic

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ABSTRACT

This study is to ascertain the effective management of the computerized student results processing system at Enugu state polytechnic. The study's objectives include: lessening the staff's workload; making it simpler for the safe, efficient archiving and retrieval of student academic records; and reducing the time spent processing results. This study adopts a system strategy for completing this goal to build a platform employing programming expertise and design to produce an interface that allows instructors and students to communicate with one another for effective study. PHP, HTML, JavaScript, and MYSQL are some of the programming languages that can be used for the database structure. The study shows that the system's goals and objectives were achieved at the end of development, and the issues with the previous system were reduced. It is a great and fruitful effort because of how quickly it operates, how effectively it operates, and how well it does its role in computing student results. We concluded that the system produces accurate documentation, lowers the possibility of error and miscalculation, sorts each student's record in accordance with certain criteria, and shortens the time needed for result calculation. We recommended that all higher institutions in Nigeria be encouraged to adopt an electronic processing system for computing student results to increase productivity in result processing.

Keywords: *Effective Management; Computerized Student Results Processing System; Enugu State Polytechnic*

Introduction

One of the most crucial factors in schools is the outcome of the student examination. Processing student data under strict management is necessary in order to process exam results in a straightforward manner. One cannot overstate how important it is for students to have timely access to accurate findings. Students must receive their exam results in order for them to know how well they performed in the various courses they took. Additionally, in order to repeat the tests, students must be aware of the courses they failed. The goal of the result-processing system is to relieve lecturers of the burden of accumulating student results and to perform other administrative chores, such as student registrations. With this approach, instructors can take tests and grade exams without having to mark vertical or horizontal lines on a large piece of paper. There is no need for lecturers to perform any type of mathematical computations. The system handles everything, so they do not need to grade pupils in accordance with their performance in each subject. Common information processing systems or organizational information systems on applicants' admission and performances include the admission processing system, Results in processing system, and Course registration system.

The outcome of the quiz should be made available to the students so they may identify any areas that require additional study in order to ace the final test. The staff members who are in charge of processing student results are also responsible for teaching, conducting research, marking exams, and handling other administrative duties. These additional responsibilities have an impact on how quickly and accurately findings are processed. The amount of work involved in registering students and computing their exam scores is rather amazing. The fact that these procedures are carried out during each academic semester, subjecting the workers to an ongoing cycle of increasing demands, is rather alarming. The use of computers in educational institutions has increased as a result of the ability of computers and the right software to offer solutions that will facilitate the evaluation of students' tests or exams. The importance of using computerized evaluation and outcomes in a scenario involving a large number of students cannot be understated. Teachers can perform their duties more quickly and properly by automating the assessment process, which will subsequently promote effective academic administration and management.

Multiple errors in the computation of results and the inability to rapidly access necessary information based on evaluation are problems that most institutions face. This creates a significant issue for the administration of student's academic records. Because it takes a long time, does not allow for the quick presentation of assessment reports, and generates a lot of paperwork, manual computation of assessment findings is not sufficient. Adopting a computerized approach to school assessment will address these issues. Hence, the aim of this study is to ascertain the effective management of the processing system of computerized student results at Enugu state polytechnic. The objectives of the study include: (1) to lessen the staff's workload; (2) to make it simpler for the safe, efficient archiving and retrieval of student academic records, and (3) to reduce the time spent processing results.

Review of Related Literature

Management of the System

The coordinators of the department are responsible for documents and file keeping. The coordinator is also responsible for updating student records. The school secretary also keeps part of the student records, which are housed in the administration office. The current system is managed by labelling each section of files so that documents may be accessed quickly. This section needs a strong management system and shouldn't be overlooked.

Result Processing System

Creating meaningful information known as "result processing" involves gathering all result items together and conducting operations on them to extract the necessary result from them. Previously, electro-mechanical devices were frequently utilized for processing results, but their death was accelerated by the development of adaptable microcomputers (Eludire, 2011). To understand each student's talents, it became crucial that results be processed in educational institutions like schools. It's necessary for grading. Promote your best qualities among others. So, result processing is required. The term "distributed result-processing system" refers to the result-processing system.

The National Computer Center defines it as a system with many autonomous but cooperating processors and/or data stores at various geographical locations. Distributed processing, in other terms, connects various computers. A central computer and a second, often smaller computer placed at various places and connected by a data communication network may be used in distributed processing (Anigbogu, 2000). A remote micro with a keyboard and VDU, for instance, can function as a network. For instance, distant micros equipped with a keyboard and NS VDU can function as intelligent terminals to a mainframe in the center. On the smaller computer, a central location must house all of the results files (Anigbogu, 2000).

Instead of conducting all processing from a single central computer with a set of central files, a distributed system architecture, but the fundamental characteristics of distributed processing sites distinguish a distributed result processing system from a centralized one. Although the design of such a computer system is flexible, the following characteristics of distributed processing are present: There are many computers scattered throughout a large area. sharing files, or the capacity of one computer in the system to access the data files of another computer in the system. The capability of system computers to process data cooperatively or interactively. Distributed result processing is typically related to one of the following: Each stand-alone microcomputer runs independently of the others (either a wide area network or a local area network), resulting in a number of different departments in a school (Anigbogu, 2000).

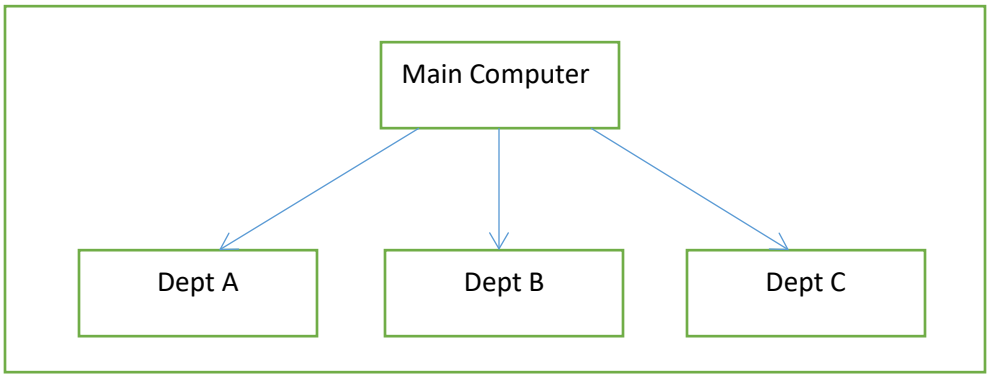


Fig 1 Result Processing System

Centralized Result Processing

A centralized location, such as a head office, is referred to as having a centralized result when it comes to data processing. A large area may be used to collect the data for processing, such as all local offices, and a large area may also be used to distribute the output. However, the data files are really processed and held centrally. Data can be sent electronically to a remote terminal in the local office that is connected to the main computer, or physically by moving data records from their source to the central location. In most cases, centralized processing refers to the employment of a single computer—possibly a mainframe or minicomputer—for all computer data processing within an institution. Its benefits include ease of use, low cost, removal of redundant computer hardware, and effective utilization of data processing resources. Data fed in from a wide area.

Output distributed from the central location

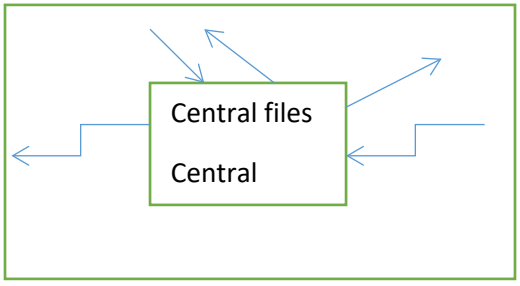


Fig 2 Centralized Data Processing

Decentralized Result Processing

Each location or department is given a computer system in a decentralized data processing system, albeit they may not necessarily share any characteristics. Each data processing center takes care of its own needs in this area and normally does not communicate with any other divisions or centers. It adapts fast to divisional requirements and works well with a decentralized management structure. Due to the duplication of facilities and files, it is however expensive. Processing in this case is independent of one another inside a department (Osaula, 1978).

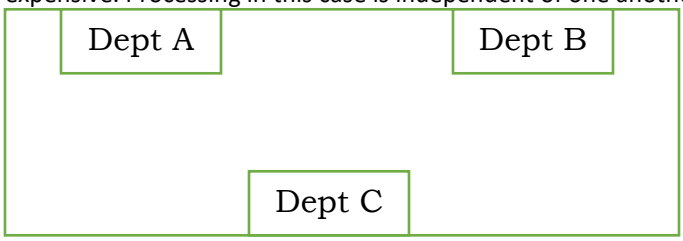


Fig 3 Decentralized Data Processing

Modes of Result Processing

1. Batch Processing: Prior to processing, objects that need to be coded and gathered into groups or batches must be done so. A batch is made up of either a practical number of records or a collection of records from a specific time period—daily, weekly, monthly, etc.—that have accumulated to the point where there are enough of them to warrant bulk updating of the master file. Using a file maintenance tool, each batch is utilized to update the master file and generate output. When the output is created in accordance with a planned processing cycle, this sort of processing is appropriate for business applications and semester results. The frequency of aster file updates typically determines how this type of system processes information. Results processing often has a cheap cost. There is no need for extra hardware, such as terminals or direct access storage units. Because trailer records may be submitted and contain totals for significant variables, the system lends itself to control. The techniques are safe because they allow for upgrading by coping. However, it makes the school more rigorous. Deadlines that are due each week or month must be met, and workload peaks happen. The result is created just once every period and is only current as of the time of the result collection of the previous update run.

2. Real-time Processing: Real-time means instantly. results must be processed quickly enough to be available in time to affect the activity or process being monitored or managed at the moment they are obtained. The system processes the master file as it happens, applying the results to the file as needed.

3. On-line Processing: It relates to hardware that is connected to or re-engaged with the CPU and main program, such as teletype units, consoles, card readers, OCR readers, VDUs, etc. This equipment at least allows for one-way communication between CPU and terminal operators.

4. Time-sharing Processing: The system interacts with a large number of users, providing quick individual attention to each of them on a time-slice basis. A time-sharing system requires multiprogramming (Murdick, 1971).

Types of Result Processing

There are essentially two forms of result processing: traditional result processing (manual) and computerized result processing. The output can be processed manually or with the help of simple instruments like calculators or tabs, which require laborious manual input. Automatic data processing is the general term for the method of processing results by machines that minimizes the need for manual processing (ADP). Electronic data processing is the term used when the majority of the result processing is carried out by computers (EDP)

The following procedures are used to process results:

a. Manually Method: This involves actions taken by a clerk who may be supported, if requested, by particular tools such as an adding machine or pocket calculator. This kind of processing is only appropriate when there is a modest number of results to be processed and little focus is placed on the precise time the operation must be finished. The processing is straightforward, and the problem of time restrictions is typically resolved by adding more hands. The update of handwritten outcome records is one instance.

b. Mechanical Method: This involves actions that are carried out by a keyboard-based computer yet are initiated by a user depressing the necessary key. The outcomes of this form of processing are printed in designated columns on the documents. An illustration is the use of an accounting machine to post deposits and withdrawals to the personal customers' ledger.

c. Electronic Method: This is very similar to the mechanical technique, with the exception that the equipment being used in this instance is electronic and might have optional add-on peripheral devices attached to it. Payroll, stock schedule, and ledger updates are just a few of the accounting processes it can be utilized for. Computers are used in modern times. The keyboard, card reader, optical character/mark reader, tape reader, and other input devices are used to enter results for input, and the processed results are printed or saved on auxiliary storage. Due to its quick processing, it can manage a considerable number of results. Repetitive processing jobs are very well suited to this.

Students Result

The academic achievement of students in the classroom is used by Ezenma et al. (2014) to determine how capable each student is. The results of tests and exams taken by students are documented together with other necessary evaluations. After a period of academic work, the grades for all subjects or courses offered are combined to generate the student's final grade, which serves as a measure of how well the student performed in the cognitive domain. Even if the outcome may occasionally not reflect a student's true intelligence, in an ideal scenario, these findings speak eloquently about students' intellectual capacity and ability.

The outcome of a student's test amply demonstrates his or her level of aptitude and expertise. Common errors made during result processing must be avoided. Sometimes, processing errors might be disastrous to the school as well as the academic success of a student. Because they can affect some parts of life, it is crucial that the results of students are not handled carelessly. The concerned individuals, including the professor, assistant lecturer, exam officer, and IT officer in charge of result uploading, must then methodically arrange the compilation, computation, and uploading or other dissemination of results. This cautious processing of students' results is very significant because it has occasionally been noted that some students' results have a lot of discrepancies. In order to maintain the integrity of the system, disparities found in errors at various stages of result processing, such as compilation, computation, or even uploading, are typically handled at a point (Adom, Mensah, and Dake, 2020).

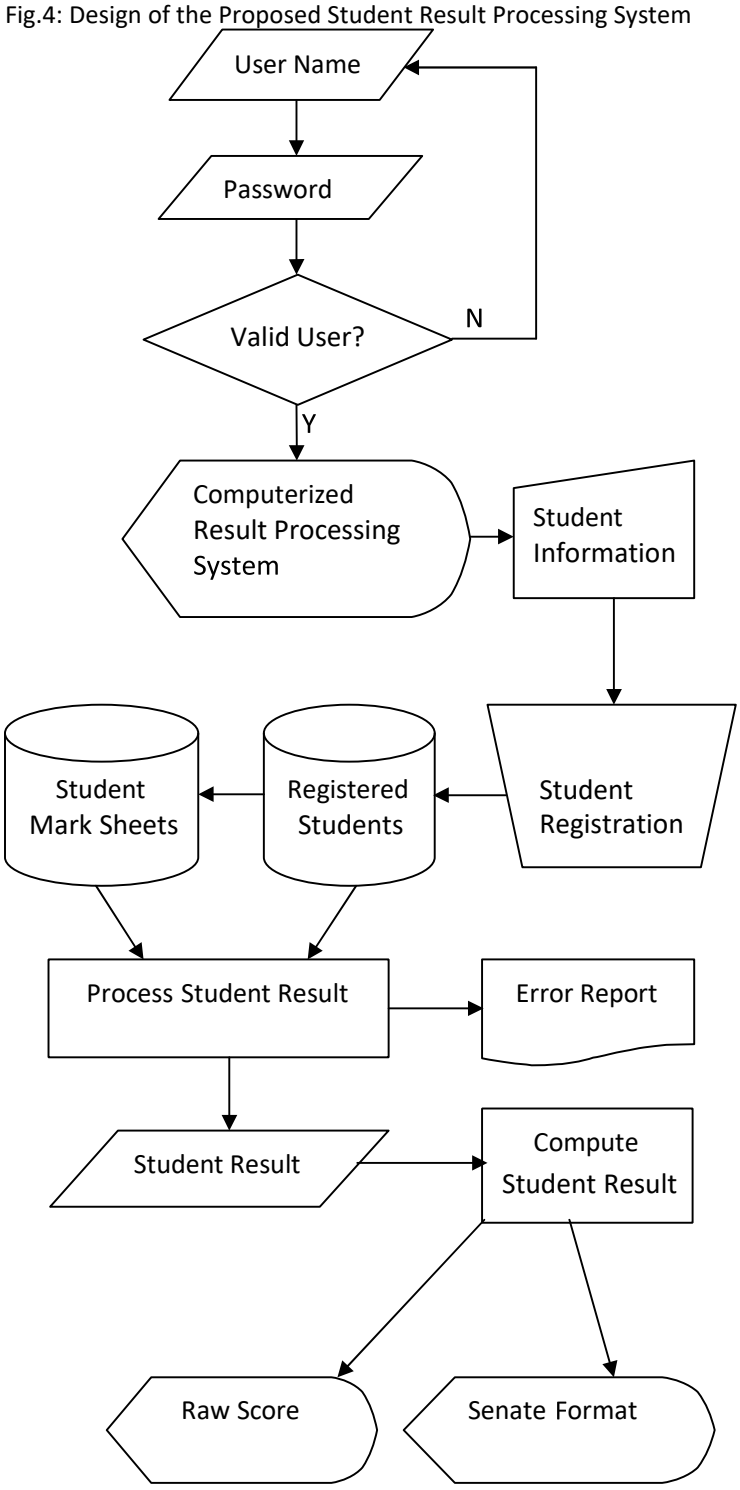
System Analysis

The system will be interactive and feature a database that stores information about students, available courses, and user authentication. Each user of the system will be required to enter his or her username and password, and access will only be permitted if they match those in the database. This method of accessing the system is known as user authentication. Access will not be allowed otherwise (Amadin, and Ukaoha 2014). Microsoft Excel 2003 file format will be used to save the mark sheets. This will automatically be uploaded into the system. The outcome will then be calculated in order to get the raw score and senate format. This technology will enable accurate and error-free processing of student outcomes. It will be safeguarded from natural disasters and physical threats, and processing student results will happen more quickly. The system would be approached modularly, with each module carrying out a particular function (Amadin, and Ukaoha 2014). The system will then be formed by combining these parts. Java programming language, MySQL database server, and Apache Tomcat web server will all be used in the software development process to construct the software interface. It will be developed and tested using Windows XP (Amadin, and Ukaoha 2014).

System Design

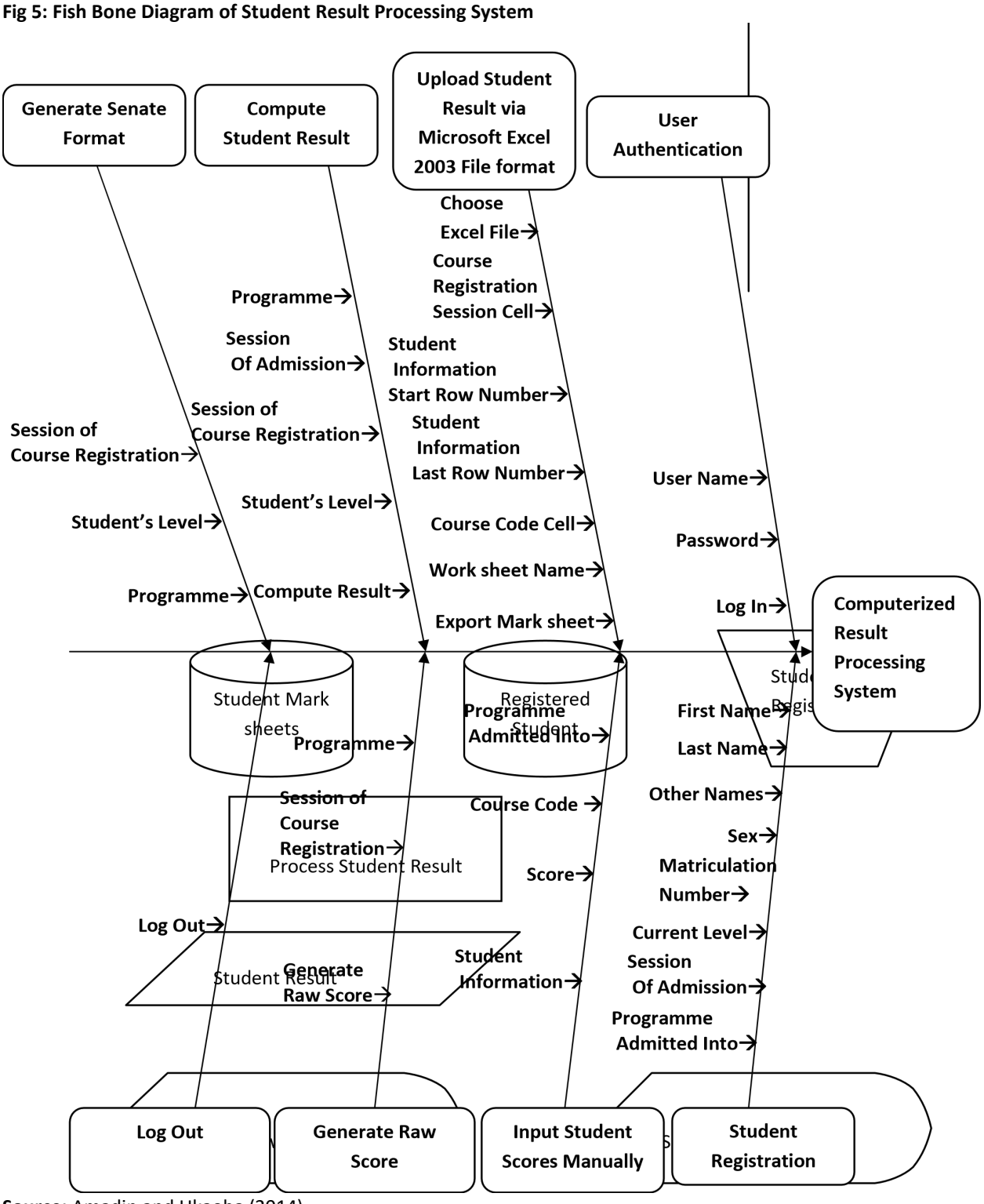
The Fish Bone Diagram of the Student Result Processing System and the Proposed Student Result Processing System Architecture.

Fig.4: Design of the Proposed Student Result Processing System



Source: Amadin and Ukaoha (2014)

Fig 5: Fish Bone Diagram of Student Result Processing System



Source: Amadin and Ukaoha (2014)

Continuous Assessment

There is little doubt that a teaching-learning process must include ongoing assessment (Sasikala and Sunil, 2018). Learning assessment is a continuous, iterative process rather than a single action. It entails the method of carefully planning and organizing the process of reviewing, reflecting on, and improving the learning approaches (Mohammad et al, 2017). Continuous assessment is when the teacher does the evaluation in the classroom on an ongoing or continuous basis (Prouty and George, 2003). Omebe (2014) defines continuous assessment as a system that allows for the objective administration of a student's final grade in the cognitive, emotional, and psychomotor domains of all of his or her academic achievement over the course of a certain time of education. The new education strategy in Nigeria places a strong emphasis on continuous assessment, which is one of its distinguishing characteristics.

Continuous assessment is described as "a means of determining what the pupils/students received from learning activities in terms of information, thinking and reasoning, character development, and industry" in the Federal Government Handbook on Continuous Assessment from 1985. In their work, Abonyi et al. (2005) also defined continuous assessment as a method of evaluation in which the teacher periodically or intermittently determines what the learner has gained in terms of knowledge, thinking, reasoning, and character learning activities using a variety of tools like tests, assignments, projects, observation, interviews, and questionnaires. This view is incomplete because the accurate record of the data generated is still being filled in for the purpose of sharing it with parents, guardians, students, and other stakeholders in the education sector who may want to use it to support the learner's continued development or update records in local, state, and federal ministries' departments of education.

Methodology

This study adopts a system strategy for completing this goal to build a platform employing programming expertise and design to produce an interface that allows instructors and students to communicate with one another for effective study. PHP, HTML, javascript, and MYSQL are some of the programming languages that can be used for the database structure.

Analysis of Findings

Result Processing

The students are subjected to a variety of exams over the course of a semester, commencing with the first continuous assessment, moving on to the second continuous assessment, and concluding with the exam. The results of the students are processed and recorded. While the examination is based on 60 marks, the first and second assessment tests are each worth 20 points, for a total of 40 points. Achieving 100% or total success. For each class, a list of students has already been created. These were made feasible with the use of the information about the pupils obtained from their registration forms.

Outputs from the System

The following are the outputs from the system:

1. Student information gathered in paper files.
2. Student results are kept in the Departmental office.
3. Score Sheet.

Statement of Result of Students
Description: To view and print the final statement of results of students
Output Media: Monitor
Fields Display

Fields Name	*Fields Type*	*Field size*
Student Name		
List of Subjects		
Scores in each subject		
Lecturer comments		

Entry for Students' Quiz and Exams Scores

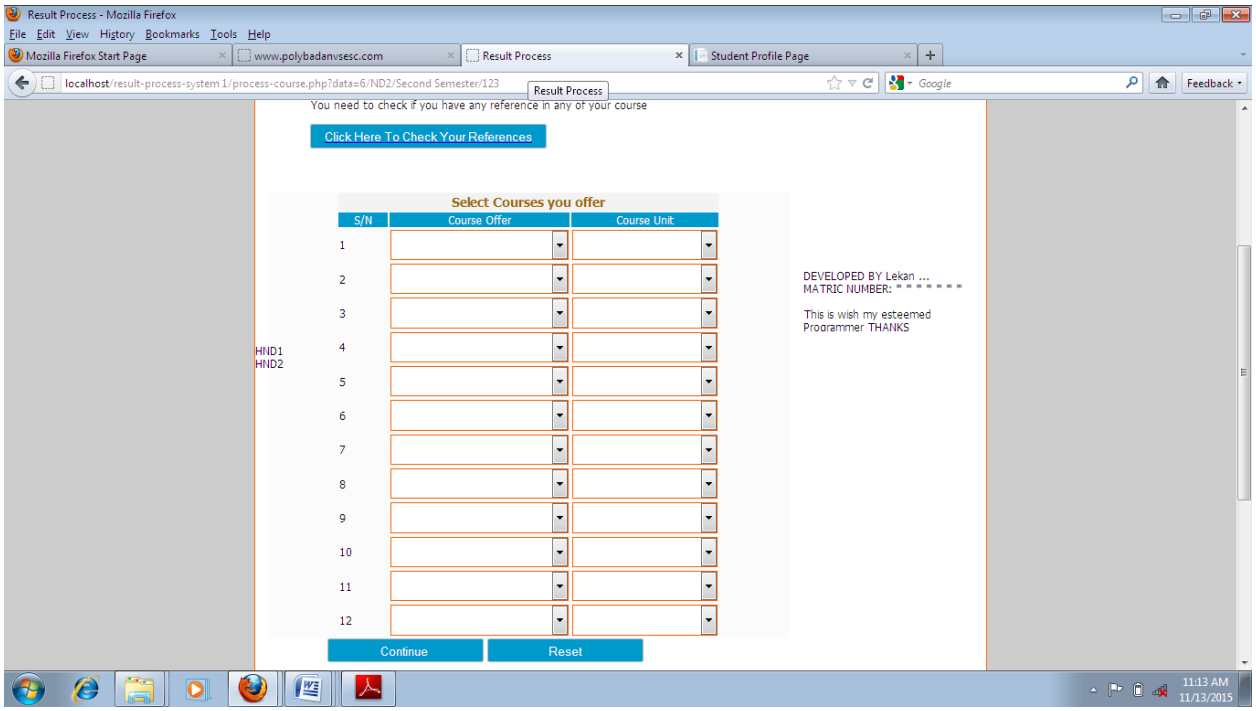


Fig 6: Description A figure showing a form to select Courses

Storage Design
The storage design provides a thorough explanation of the database design, covering the database table and the fields of the representations. The database system utilized by the system that processes results is;

a) Design of Database Used

A database can be an extremely complex set of software programs that controls the organization's storage and retrieval of data (fields, records, and files). The database accepts requests for data from the application program and instructs the operating system to transfer the appropriate data. When a database is used, the information system can be changed much more easily as the organization's information requirement changes new categories of data can be added to the database without disruption to the existing ones. The database used for the storage of this new project is the result. MySQL

a) **Description of the file Used**

The following are the tables used in the description of fields:

1. Staff login table - It is used to store staff login information
2. Student table - It is used to store students' information
3. Result table

b) Record Structure of All Files Used

Staff login table

S/N	*Fields*	*File Types*	*Length*
1.	Username	Text	15
2.	Password	Varchar	10

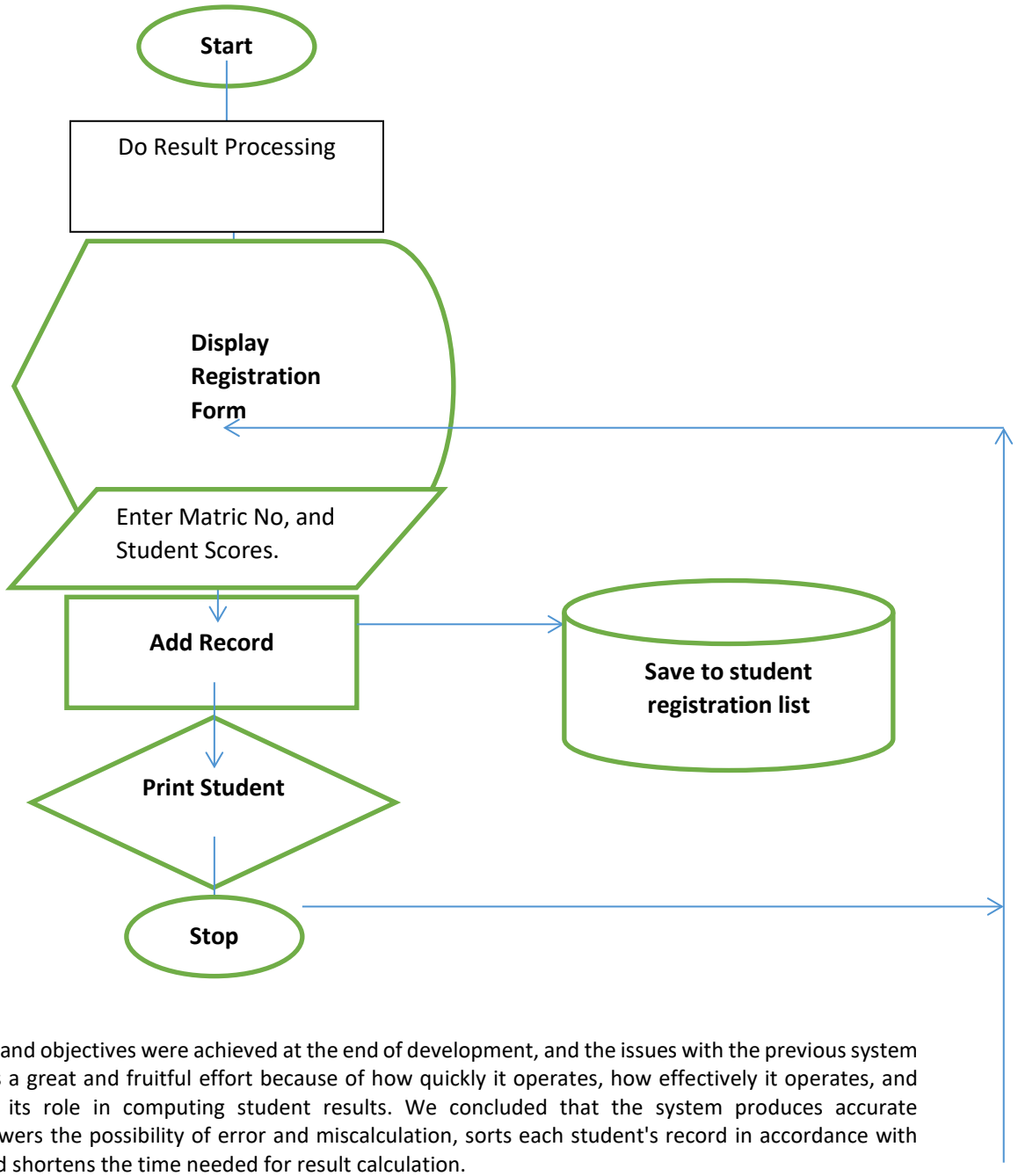
Student table

S/N	*Fields*	*File Types*	*Length*
1.	Surname	Text	30
2.	Matric Number	Varchar	15
3.	Department	Text	2
4.	Course	Text	6
5.	Level	Varchar	20

Result table

S/N	*Fields*	*File Types*	*Length*
1.	Student Name	Text	30
2.	List of subjects	Text	20
3.	Grade Point	Text	3
4.	Cumulative Grade Point	Date	3
5.	Status	Text	Indefinite

Fig 7: Result Processing Flowchart



Conclusion

The system's goals and objectives were achieved at the end of development, and the issues with the previous system were reduced. It is a great and fruitful effort because of how quickly it operates, how effectively it operates, and how well it does its role in computing student results. We concluded that the system produces accurate documentation, lowers the possibility of error and miscalculation, sorts each student's record in accordance with certain criteria, and shortens the time needed for result calculation.

Recommendation

We recommended that all higher institutions in Nigeria are encouraged to adopt an electronic processing system for computing student results to increase productivity in the area of result processing. The lecturer and other staff members should also receive training on how to use computers and other emerging technology.

References

Abonyi, S. O., Okereke, S. C., and Omebe, C. A. (2005). The first course in Educational Measurement and Evaluation. Published by Fred Ogah Publishers. Emene-Enugu.

Adom, D., Adu-Mensah, J. and Dake, D. (2020). Test, measurement, and evaluation: Understanding and use of the concepts in education. *International Journal of Evaluation and Research in Education (IJERE)*. **9**(1): 109-119. 10.11591/ijere.v9i1.20457.

Amadin, I. F. and Ukaoha, K. C (2014). Computerized Result Processing System, University of Benin, Benin City

Anigbogu, S. O. (2000). Computer Application and Operation First Edition. Awka: Optimum Press (Printers, Publisher, and Designers)

Braun, H., Kanjee, A., Bettinger, E., and Kremer, M. (2006). Improving Education Through Assessment. Innovation, and Evaluation. *The American Academy of Arts and Sciences*

Coleman, A. M. (2001). The Dictionary of Psychology. *Applied Cognitive Psychology*, **15**(3): 349-351.

Eludire, A. A. (2011). The Design and Implementation of Student Academic Record Management System. *Research Journal of Applied Sciences, Engineering and Technology*

Ezenma A. A., Emmanuel B. and Choji D. N. (2014). Design and Implementation of Result Processing System for Public Secondary Schools in Nigeria. *International Journal of Computer and Information Technology,* 03(01)

Kizlik, R. J. (2012). Measurement, assessment, and evaluation in education, 2012. Retrieved on October 2019. [Online]. Available: https://www.adprima.com/measurement.html

Mohammad I., Samiullah I. and Aysha A., (2017). Effect of Continuous Assessment Techniques on Students Performance at Elementary level. *Bulletin of Education and Research,* 39(1), 91-100

Murdick, D. (1971). Management Theory of Computer.

Ogunboyede M. O. and Akinnodi P. A. (2016) Tests and Measurement. Published by Alasfas Nigeria Company.

Omebe, C. A. (2014). Continuous Assessment in Nigeria: Issues and Challenges. *International Journal of Humanities, Arts, Medicine and Sciences (IJHAMS).* ISSN 2348-0521 Vol. 2, Issue 9, Sep 2014, 89-96

Osaula, E. C. (1978). Introduction to Research Methodology Ikeja, Lagos State: kon Press. Oxford Advance Learner's Dictionary of Current English.

Prouty, J. D and George. E. S. (2003). Continuous assessment: A practical guide for Teachers American Institute for Research.

Sasikala K. and Sunil W. (2018). Continuous Assessment Methods: Critical Review for Quality Improvement of the Post Graduate Diploma in Education Programme of the Open University of Sri Lanka. *International Research Journal of Human Resources and Social Sciences*, 5(10)

Tripathi, R. and Kumar, A. (2018). Importance and Improvements in the Teaching-Learning process through Effective Evaluation Methodologies. *ESSENCE Int. J. Env. Rehab. Conserve*, **9**(1): 7-16.

Tahir R. (2017). Introduction to Test and Measurement. www. slideshare.com