

## Development of a Robust Interactive Online Result Processing and Management System: A Case study of Osun State College of Technology, Esa-Oke, Nigeria

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### ABSTRACT

The grades assigned to students in tertiary institutions are meant to convey their performances in schools. The progress in the institutions as well opportunities in career development of the students revolve around these grades. Therefore, a robust and error-free grading system is a necessity for every tertiary institution. However, processing of results is definitely a tedious and error prone activity especially when carried out manually on large number of students. In recent times, many Universities and Polytechnics in Nigeria have started to develop different automated result processing systems. While many of the developed results processing system have brought enhanced reliability and convenience in computation and generation of student's result, there still exists the need for systems that will have minimal human interfaces, as well as bringing complete automation to almost all activities involved in results computation and generation, transcripts processing and verification of results. In this work, an online automated result processing system is developed. The system automates most of the tasks performed by Lecturers, Heads of Department, Deans, Directors and the Board of Studies. The needs for Special Examination/Result Operators are completely eliminated. The system was developed using XAMP server. PHP was used for server processes, authentication and connection with the database, while MariaDB database was used for storing and manipulating data in the database. Jquery Library file which was used for client side functionalities, while Hypertext Markup Language (HTML) was used to create page content with Cascading Style Sheet (CSS) for styling. The developed system has been already deployed in Osun State College of Technology for fully automated results processing and transcripts generation, and it is working well and producing expected results.

**Keyword:** Grades, Online Result Processing, Transcript, Database.

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#### CISDI Journal Reference Format

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### 1. INTRODUCTION

Result processing and management system in higher institution is a complex task that requires critical approach to ensure effectiveness, efficiency and quality assurance. There are different methods of computation of results, subject to the need and requirements of different institutions. The commonest approach is that each department or institution always submit their results to a central point called Management Information System (MIS) unit or Result Processing Management System Unit.

This innovative solution recently deployed is a special decentralized system whereby each lecturer or examiner having finished marking the course taught and the result moderated by the appropriate authority can upload the result into the College result database system and the computation is done automatically.

Each lecturer is expected to register with a unique password and secret question for authentication and accessibility to download the score sheet and upload the result seamlessly.

### 1.1 Aims and Objectives

The aim of this research is to reduce the human interfaces on the cycle of processing and management of the result for confidentiality purpose.

The specific objectives are:

1. To ensure adequate time management for prompt and timely delivery for the in-house students.
2. To assist the management in decision making and also in the prompt processing of the transcript and verification of results for old students.
3. To design and implement a robust, secured, online computerized result processing system that will eliminate transferring of results from one table to another for sanity and transparency.
4. To minimize the cost of processing and management of the results.

## 2. LITERATURE REVIEW

A number of solutions have been proposed to tackle some of the challenges associated with results processing in tertiary institutions. Ekenyong, Moses E., (2008), used Microsoft Excel spreadsheet program to build an Intelligent Knowledge-Based System (IKBS), making use of various programming API provided by that application (Excel). The programming was hard coded into the cells, and cell referencing which could be applied to monitor and track students' performances such as cumulative points. Personal Home Page Pre- Processor (PHP was used to interact with and manipulate the database. Graphic User Interface was developed using Adobe Dreamweaver. MYSQL Server, a Relational Database Management System, was employed to create the database tables and data. This application was tested and found to be working as expected.

Gunathilake et al (2009) proposed an open-source web-based MIS for the University of Ruhuna, Sri Lanka. The proposed solution was implemented using LAMP/WAMP technologies. They categorized their users based on administrator, super admin, top admin, general, lecturer and student. The pilot version was targeted at their Faculty of Science and they achieved a password encryption with the primary DES algorithm. Eludire (2011) observed that a number of problems associated with student academic record management include improper course registration, late release of student results, inaccuracy due to manual and tedious calculation and retrieval difficulties/inefficiency. He proposed that the development of database is the answer to these challenges, whereby the amount of redundant data is reduced. He developed an application interface which uses Microsoft Access 2003 database for processing students' academic records.

Idogho, Akpado and Agajo (2011) proposed a solution for Federal Polytechnic Auchi. The automated software works on several tiers with a browser at the front-end, a PHP engine, and a MySQL server at the back-end. Their system promised to reduce admission list processing to 24 hours using the PhpMyAdmin database management system. Nevertheless, the publication did not indicate the details of how the Student Exam Scores are entered into the system. E. O. Ukem and E.O. Onoyom-Ita (2011) developed a computer software application to facilitate the automated processing of students' results. The software was developed using the Waterfall Software Life Cycle model.

It was designed in the form of a database capable of running on a network. It has four sessions, namely, the Super Administrator, the Staff/Administrator, the Staff, and the Guest. Software tools employed included MYSQL Relationship Database Management System, Dreamweaver Integrated Development Environment, PHP, and JavaScript. E. O. Ukem et al (2012) proposed a result processing system that used back-up policies and audit trails. The solution was built with Java and MySQL database. The research did not address the cases of students with suspension, deferment of studies, supplementary exams. Ajay and Abhishek (2012) proposed a solution that relied on a good database. They developed their solution using PHP embedded in HTML and linked to MySQL database with a PhpMyAdmin that can run on both WAMP and LAMP. PHP was preferred because of the ease of use on diverse platforms with minimal change to the script; and for its compilation speed and efficiency. In their system, they added an 'export' feature to reduce the bulk of time taken for individual student registration. It can enroll students in bulk from one level to another.

B. Emmanuel and D. N. Choji, (2012), examined the inadequacies involved in the manual method of calculating Students CGPA (cumulative grade point average) and proposed a solution by developing a software Application to facilitate the automated processing of the results. The software was developed using PHP (Hypertext processor) scripting language and employing MYSQL Relational Database Management System in designing the database. The developed software was reported to work as expected.

Bharamagoudar, Geeta and Totad (2013) developed a web-based Student Information Management System in India which could send emails to students to validate their mailbox on registration. They were able to achieve this using HTML, CSS, Javascript, PHP and SQL. According to their description, it is a paperless work that assists in automating existing manual methods and can be remotely monitored and controlled on a server-based network.

Nmaju et al (2013) proposed an Academic Records Information System (ARIS) at the University of Port Harcourt, Nigeria using the incremental software model and prototyping technique. It was also reported in the proposed work that reporting sheets would only be generated when there are no pending scores for courses registered by students; which implies that the results of all such courses must have been approved by University Senate and uploaded on time. In an attempt to automate the management of students' academic records,

Ezenma, Emmanuel and Choji, (2014), examined the inadequacies involved in the manual method of compiling and processing students' results and developed a software application which facilitates automated processing of the results, though the study focused on public secondary schools in Nigeria.

Akinmosin James (2014) proposed result processing software for Nassarawa State University Keffi. The software has a login form for authentication of users and Student Registration forms for registering students every semester after payment of dues, before results are uploaded using internet browsers. The solution was built using Oracle Procedural Language/ Structured Query Language (PL/SQL), forms and reports. However, the interface widely uses "Grades form for inputting student grade and Grades Edit form for editing erroneously entered grades." This could pose a security threat in the application whereby intruders can easily access the database and change students' grade. Hemn and Wu Fei (2014) proposed a system that can provide students' general and educational information. In the proposed solution, the Students Information Management System (SIMS) can be used to create, read and update the details of a student and also generate reports about his/her skills and experience. Such systems are expected to save time of retrieval and prevent data loss.

Omilabu, O. L. et al., (2015), proposed a robust, reliable, efficient, and cost effective Digital Repository and Automated Result Processing System (DRARPS) to alleviate against the inadequacies in wrong computation of students' result, delay in processing and releasing of the results. The system is web-based using major web programming techniques. The frontend interface was designed using HTML5, CSS3 and JavaScript, while the backend functionalities are powered by PHP server side scripting language and MySQL which runs on a web server. It was reported that empirical evaluation of the system showed that the application quicken the processing of students examination results, preserves and provides students easy access to their records.

A. P. Beka & F. T. Beka (2015), proposed a system that promises proper routing and tracking of turned in results, improved processing efficiency of the system, and increased satisfaction for both the staff and students for processing of result. The system was designed to accommodate multiple points of entry and aid course advisers carry out their responsibilities effectively. The system was developed using Java programming language, and MySQL as the database. Bhatt et al (2016) proposed a Credit-based Grading Scheme (CBGS) in India. It is a PHP-MYSQL solution that can compile results of students. The reports of the system are generated in either excel or PDF format depending on the usage. Although the grading scheme differed from that of the Nigerian system, the formula for computing the Grade Point Average (GPA) is similar: the summation of the product of the credit hours and grade points divided by the summation of the credit hours. The system was reported to aid ease of searching and list generation.

Akpasam J.S, Simeon O., Afolayan J. J. (2017) developed an interactive automated platform for managing result of all categories of students seamlessly. The system was developed using PHP, CSS, HTML, MYSQL and was hosted locally using Apache web server. The software development methodology adopted is a participatory incremental process model (PIP Model). The data used were obtained from the Department of Electrical/Electronic and Computer Engineering, University of Uyo. Iweriebor E. E. (2017) proposed a system that accepts multiple inputs and aid course advisers carry out their responsibilities effectively. The system addressed a reliable way of tracking incoming results. In his work, a computer software application was developed to facilitate the automated processing of the results. The software was developed in Java programming language; employing PostgreSQL Relational Database Management System. Dada O.M., Raji A. K., and Oyedepo F.S. (2017) developed a web based application to facilitate the online processing of students' results. The software was developed using HTML5, CSS3, Java Script for client side, PHP (Hypertext Pre-Processor) as server side programming language and MySQL (My Structural Query Language Improved) as relational database. However, WAMP (Window Apache MySql and PHP) server was used for local hosting and testing. The developed system was reported to offer some qualities such as reduction in the cost of processing of information, reduction in time spent in computing GPA and generating transcripts, increased accuracy, and elimination of redundancies. Critical evaluation of many of the proposed systems confirmed that, most of them are not robust enough to meet many of the challenges facing students' result processing in Nigerian tertiary institutions.

### 3. METHODOLOGY

ORPS solution was designed using programming tools such as XAMP server which helps to configure the system as a server, PHP is used for server processes, authentication and connection with the database, MariaDB database, used for storing and manipulating data in the database, Jquery library file which is a used as for client side functionalities, Hypertext Markup Language (HTML), used to create page content, Sublime text is the editor for debugging the program while Cascading Style Sheet (CSS) for styling the template structure of the software.

### Conceptual Design of The ORPS System

Conceptual design is an early stage of design process, where functions and form of software design are implemented. The design of the ORPS software was carried out using the program flowchart.

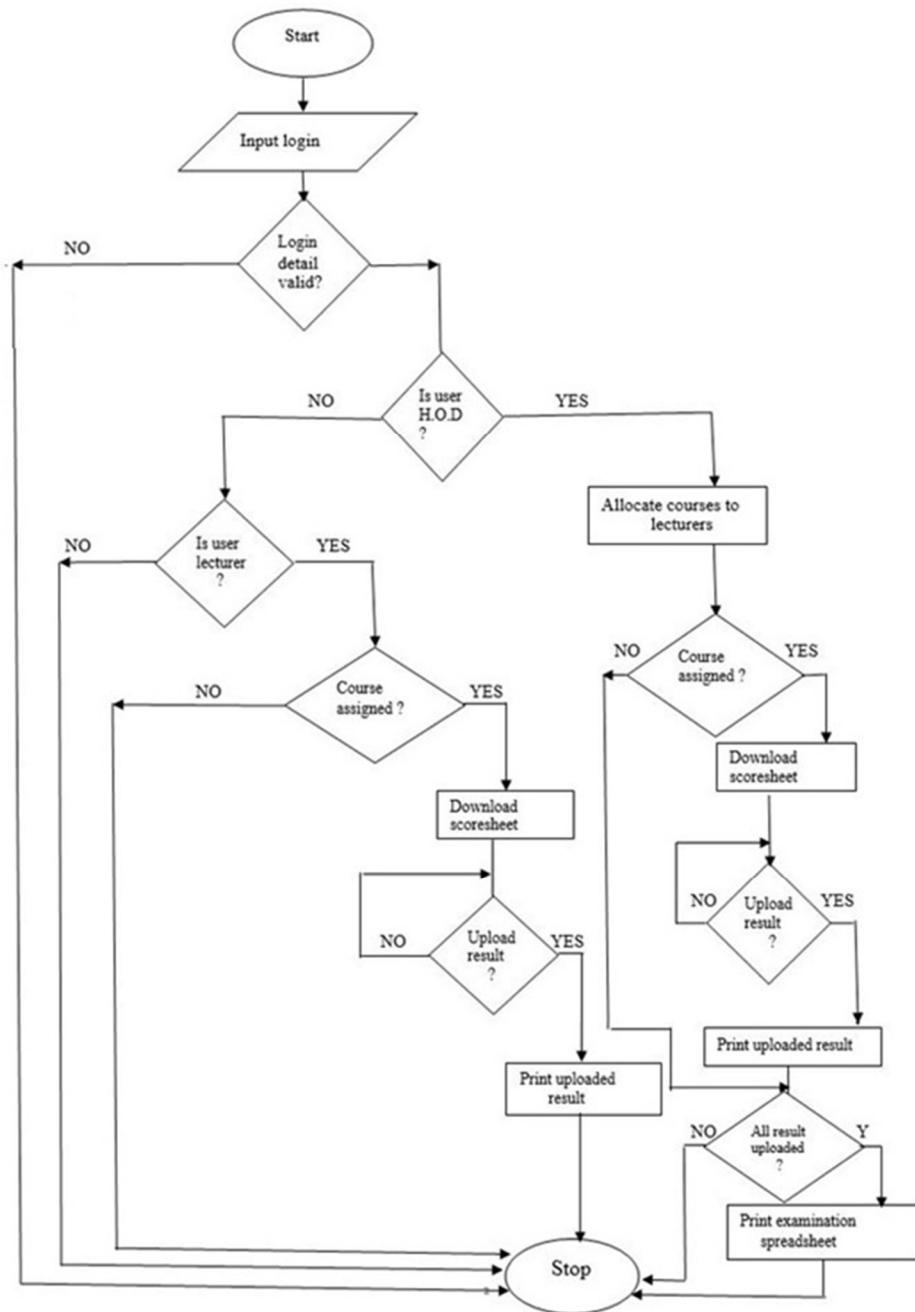
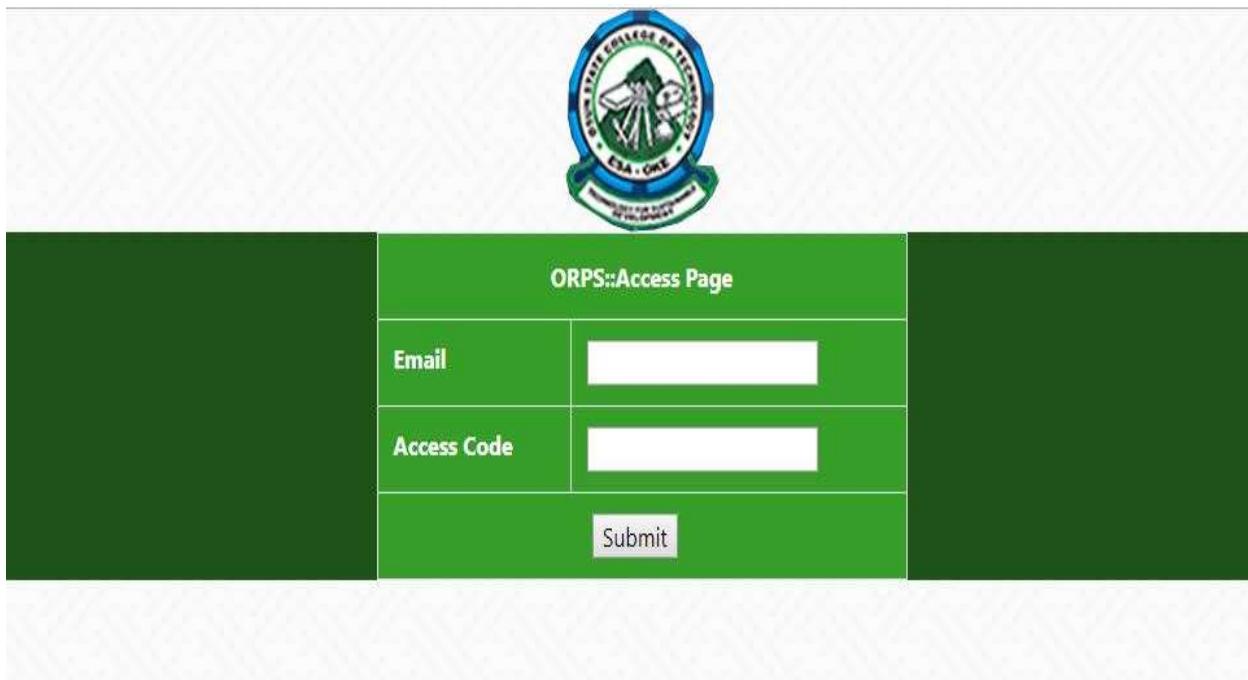


Fig 1: The flowchart of OSCOTECH Result Processing System

A program flowchart is a diagram that contains a set of standard graphical tools for analyzing processes, programs or systems. The program flowchart for the developed system as follows:



**Fig 2: Access login page for creating a profile**

 This image shows the 'ORPS - Profile Creation Page'. It has two columns of input fields separated by a vertical green line. The left column includes fields for Title (Dr), Surname (ADELEKE), Other names (MAKINWA OLUDELE), Designation (Principal Lecturer), Department (Electrical Electronic Engineering), Phone Number (07067852203), and Passport (Choose File com.jpg). The right column includes fields for Email (adeyemibamigbola@gmail.com), Secret Question (What was the house number an), Secret Answer (.....), Password (.....), Conf. Password (.....), and User ID (OSCO/EEE/278). At the bottom is a 'Submit Profile' button.

**Fig 3: Profile creation page for creating profile into the system**

**Authorized User Only**

Email:

Password:

Login as:



**OSCOTECH,  
ESA-OKE**

Fig 4: Login page for authenticating lecturers into the (ORPS Software)

RPMS

Account
OSCOTECH RPMS

**Welcome back Dr ADELEKE, MAKINWA OLUDELE**

### Dashboard

[Profile](#)
[Assigned Courses](#)
[Pending Task](#)

**Dr ADELEKE, MAKINWA OLUDELE**

OSCO/EEE/278 | Principal Lecturer

This is the Results Processing and Management System of Osun State College of Technology, Esa-Oke. If you encounter any challenges in the use of this software package, please contact the HelpDesk via [bosresult@oscotchesaoke.edu.ng](mailto:bosresult@oscotchesaoke.edu.ng) or Call 08027398128.

Note: [Please, ensure you sign out before leaving the portal.](#)

Biodata

**Principal Lecturer**, at Osun State College of Technology Esa-Oke, Osun State.

Department: Electrical Electronic Engineering

Staff Category: Academics

Last logged in: 17/07/2019

Fig 5: Lecturer's Home page in OSCOTECH Result Processing Software (ORPS)

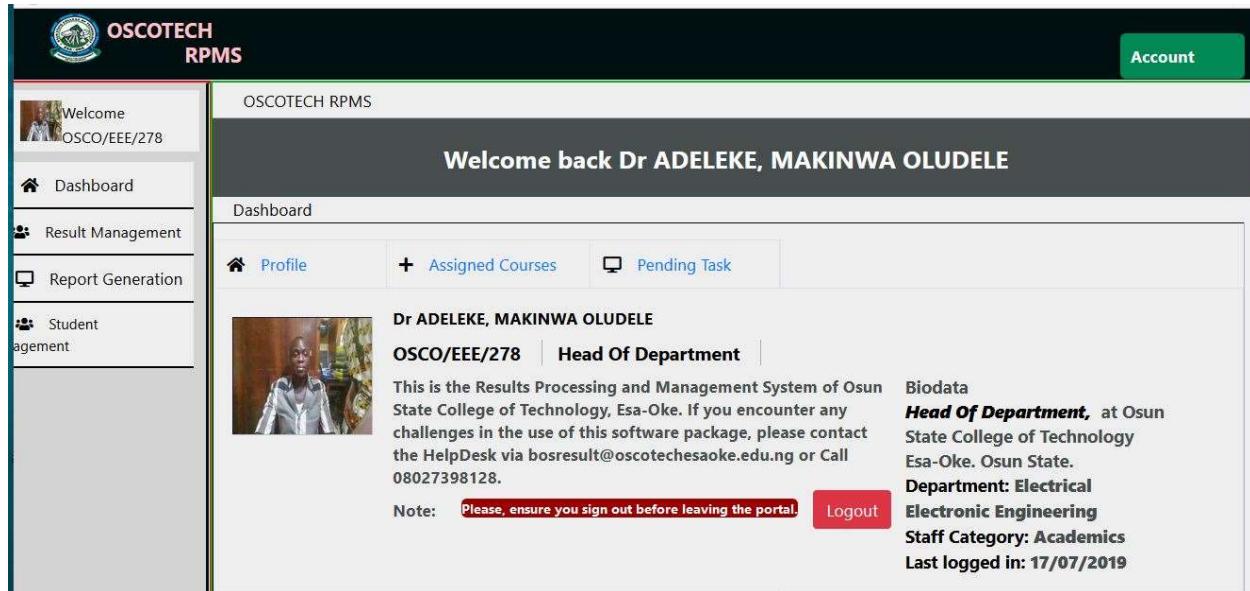


Fig 6: Head of Department Home page in Oscotech Result Processing Software (ORPS)

The screenshot shows the "Assigned Lecturers" section of the H.O.D Dashboard. On the left sidebar, there are links for "Report Generation" and "Student Management". The main content area has a search/filter bar for "Department Option" (set to Electrical Electronic), "Session" (2018/2019), "Level" (ND I), and "Semester" (First), with a "Load Departmental Courses" button. Below this, there is a form to assign lecturers to courses, with fields for "Course Title | Code", "Course Coordinator", and "Other Lecturer", and a "Assign Lecturer" button. The main table lists assigned lecturers:

S/N	Course Code	Course Title	Course Unit	Coordinator	Ass. Coordinator	Session	Level	Semester	Delete
1	EEC 111	ELECTRICAL GRAPHICS	2	Mr OLANIRAN NURENI OLAWALE		2018/2019	ND I	First	<button>Delete</button>
2	EEC 112	INTRODUCTION TO COMPUTER SOFTWARE	2	Mrs AJOSE ESTHER YETUNDE	Mr Fabiyi Paul Olawole	2018/2019	ND I	First	<button>Delete</button>
3	EEC 114	ELECTRICAL ENGINEERING	2	Mr ADENIRAN SAMUEL		2018/2019	ND I	First	<button>Delete</button>

Fig 7: Course allocation page in H.O.D Dashboard

OSUN STATE COLLEGE OF TECHNOLOGY, ESA-OKE					
FACULTY OF BUSINESS AND MANAGEMENT SCIENCES					
DEPARTMENT OF BUSINESS ADMINISTRATION AND MANAGEMENT					
COURSE ALLOCATION					
SESSION: 2018/2019 LEVEL: HND I SEMESTER: FIRST					
S/N	CODE	TITLE	UNIT	COORDINATOR	ASS. COORDINATOR
1	BAM 311	PRACTICE OF MANAGEMENT I	3	MR ADENIRAN JOHNADEROJU	DR ASABI OLUDELE MATTHEW
2	BAM 312	ORGANISATIONAL BEHAVIOUR I	3	MRS OKE BOLANLE BUKOLA	MRS OKE BOLANLE BUKOLA
3	BAM 313	QUANTITATIVE TECHNIQUES IN BUSINESS	3	MR OLALEYE OLALEKAN OLUMIDE	MISS KOMOLEHIN FOLASADE MARY
4	BAM 314	HUMAN CAPITAL MANAGEMENT I	3	MISS OLATOMI ELIZABETH OLUSOLA	MR ADU ADETUNJI OLUTIMILEHIN
5	BAM 316	ICT APPLICATIONS I	2	MR OLUBORODE KAYODE OLADIPUPO	
6	BAM 317	PUBLIC FINANCE	3	MRS AKINMAMEJI ADEBUKOLA AJOKE	MR OLOWE SUNDAY OLUWAGBEMIGA
7	BAM 318	FINANCIAL MANAGEMENT I	3	MRS OLUWATUYI CHRISTIANA ADESOLA OLUFUNMILOLA	

Fig 8: Course allocation print out page from ORPS

### Score Sheet Download

Result Management ->Download Score Sheet

Session	Level	Programme	Semester	<a href="#">View Courses</a>					
2018/2019	ND I	Full Time	First						
S/N	Department	Course Code	Course Title	Course Unit	Session	Level	Programme	Semester	Score Sheet
1	Banking And Finance	ACC111	PRINCIPLE OF ACCOUNTS 1	4	2018/2019	ND I	Full Time	First	<a href="#">Download</a>
2	Banking And Finance	BAM112	BUSINESS MATHEMATICS 1	2	2018/2019	ND I	Full Time	First	<a href="#">Download</a>

Fig 9: Score sheet download page in ORPS

S/N	Matric No	Full Name	Course_C	Session	Level	Score
1	1810710001	ABIOYE RIDWAN AYOMIDE	GNS 117	2018/2019 ND I	55	
2	1810710002	ADEBAYO YEMI SAMUEL	GNS 117	2018/2019 ND I	70	
3	1810710003	ADEFIOYE TAOHEED TOMIWA	GNS 117	2018/2019 ND I	68	
4	1810710004	ADEJOORIN ADESEWA BOLU	GNS 117	2018/2019 ND I	61	
5	1810710005	ADEKUNLE OPEYEMI WALIULAH	GNS 117	2018/2019 ND I	62	
6	1810710006	ADELEKE ISHOLA ABAYOMI	GNS 117	2018/2019 ND I	64	
7	1810710007	ADESANYA AYODEJI ISAAC	GNS 117	2018/2019 ND I	68	
8	1810710008	ADESANYA MAYOWA MERCY	GNS 117	2018/2019 ND I	68	
9	1810710009	ADEYELA EMMANUEL ADEDAYO	GNS 117	2018/2019 ND I	63	
10	1810710010	ADEYEMI MARY MIRACLE	GNS 117	2018/2019 ND I	63	
11	1810710011	ADIO ROSELINE AJIBOLA	GNS 117	2018/2019 ND I	75	
12	1810710012	ADUNOLA ABIOLA SIMEON	GNS 117	2018/2019 ND I	70	
13	1810710013	AGBOOLA NAFISAT MORENIKEJI	GNS 117	2018/2019 ND I	71	
14	1810710014	AJAO KALENI ABIDEMI	GNS 117	2018/2019 ND I	60	
15	1810710015	AJAYI TOLULOPE PEACE	GNS 117	2018/2019 ND I		
16	1810710016	AJAYI KEHINDE TOMIWA	GNS 117	2018/2019 ND I	72	
17	1810710017	AJAYI OLAWALE	GNS 117	2018/2019 ND I	73	
18	1810710018	AKINWUMI OLUWANIFEMI JOHN	GNS 117	2018/2019 ND I	73	
19	1810710019	AKONIYON SUNDAY OPEYEMI	GNS 117	2018/2019 ND I	55	
20	1810710020	ALABI AJOKE SOFIYAT	GNS 117	2018/2019 ND I	64	
21	1810710021	ALIU YUSUFF AYOBAMI	GNS 117	2018/2019 ND I	74	
22	1810710022	ASHAFA FATIMOH DASOLA	GNS 117	2018/2019 ND I	76	

Fig 10: A copy of the score sheet downloaded from ORPS

The screenshot shows the OSCOTECH RPMS interface. On the left, there's a sidebar with links like 'Welcome', 'Dashboard', 'Result Management', 'Report Generation', and 'Student Management'. The main area has tabs for 'Score Sheet' and 'Session Select Session'. A central modal window titled '2ND Level Authentication' contains a 'Secret Question' field with the question 'What is the middle name of your oldest child ?' and a 'Secret Question' field with masked input '\*\*\*\*\*'. A blue 'SUBMIT' button is at the bottom right of the modal.

Fig 11: 2<sup>ND</sup> Level authentication before granting access to Upload result page

The screenshot shows the OSCOTECH RPMS software interface. On the left is a vertical navigation menu with options: Welcome (OSCO/ACC/08), Dashboard, Result Management, Report Generation, and Student Management. The main area has a header 'OSCOTECH RPMS' and a welcome message 'Welcome back Mr BAMIGBOLA, Adeyemi'. Below this is a section titled 'Upload Result' with the sub-header 'Result Management ->Upload Result'. It contains five dropdown menus for Session (2018/2019), Level (ND I), Programme (Full Time), Semester (First), and Course Title | Code (COMPUTER PACKAGES). Below these are three buttons: 'Upload CSV', 'Choose File' (with 'No file chosen'), and a green 'Upload Result' button.

**Fig 12: Upload result page in ORPS**

#### 4. RESULT AND DISCUSSION

The following are samples of the result generated for the individual lecturer that uploaded the result and main examination result sheet which is the one generated after all result has been successfully uploaded into the ORPS software.

The screenshot shows a formal examination result sheet from the OSUN STATE COLLEGE OF TECHNOLOGY, ESA-OKE. At the top, it displays the college's name, faculty, department, programme, title, code, unit, session, level, and semester. Below this is a table of results:

S/N	MATRIC NO	STUDENT NAME	SCORE
1	1812310001	ABRAHAM VICTORY EMMANUEL	90
2	1812310002	ADEKUNLE ADEDOLAPO ALEX	65
3	1812310003	ADESINA OLUWASOGO TAIWO	78
4	1812310004	ADEWALE OLAMILEKAN SODIQ	54
5	1812310005	AJIBOLA OLUWASEUNFUNMI TEMIDAYO	88
6	1812310006	ANIMASAHUN HAMZAT OLANIYI	34
7	1812310007	AREELU ENIOLA ABIOLA	34
8	1812310008	BABALOLA ADEMOLA STEPHEN	34
9	1812310009	DAUDA OLUDAYO SAMUEL	34

**Fig 13: Individual lecturer's copy of the uploaded result in ORPS**

OSUN STATE COLLEGE OF TECHNOLOGY, ESA-OKE, OSUN STATE, NIGERIA.																																																																										
MAIN EXAMINATION RESULT																																																																										
PROGRAMME TYPE: FULL TIME BOS NO: PU/2019/MTE/ND I/A/9570																																																																										
FACULTY: ENGINEERING SESSION: 2018/2019																																																																										
DEPARTMENT: MECHATRONICS ENGINEERING LEVEL: ND I SEMESTER: FIRST DATE PRINTED: 24/07/2019																																																																										
<table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th colspan="15">Semester Courses</th></tr> <tr> <td>Code:</td><td>GNS 111</td><td>MCE 112</td><td>MCE 113</td><td>MEC 112</td><td>MTH 112</td><td>MCE 114</td><td>COM 111</td><td>MCE 111</td><td>MCE 111</td><td>EEC 111</td><td>MCE 115</td><td></td><td></td><td></td></tr> <tr> <td>Status:</td><td>C</td><td>C</td><td>C</td><td>C</td><td>C</td><td>E</td><td>C</td><td>C</td><td>E</td><td>E</td><td>E</td><td></td><td></td><td></td></tr> <tr> <td>Unit:</td><td>2</td><td>5</td><td>4</td><td>4</td><td>2</td><td>2</td><td>3</td><td>4</td><td>3</td><td>3</td><td>2</td><td></td><td></td><td></td></tr> </thead> </table>															Semester Courses															Code:	GNS 111	MCE 112	MCE 113	MEC 112	MTH 112	MCE 114	COM 111	MCE 111	MCE 111	EEC 111	MCE 115				Status:	C	C	C	C	C	E	C	C	E	E	E				Unit:	2	5	4	4	2	2	3	4	3	3	2			
Semester Courses																																																																										
Code:	GNS 111	MCE 112	MCE 113	MEC 112	MTH 112	MCE 114	COM 111	MCE 111	MCE 111	EEC 111	MCE 115																																																															
Status:	C	C	C	C	C	E	C	C	E	E	E																																																															
Unit:	2	5	4	4	2	2	3	4	3	3	2																																																															
S/N	MATRIC NO	STUDENT NAME													CURRENT GP TNU TCP GP	PREVIOUS TNU TCP GP	CUMMULATIVE TNU TCP GP	REMARK																																																								
1	1812310001	ABRAHAM VICTORY EMMANUEL	90	43	66	65	65	67	76	66	56	43	43		37 110.00 2.97	0 0.00 0.00	37 110.00 2.97	Passed																																																								
2	1812310002	ADEKUNLE ADEDOLAPO ALEX	65	55	56	65	88	65	98	78	89	98	66		37 129.253.49	0 0.00 0.00	37 129.25 3.49	Passed																																																								
3	1812310003	ADESINA OLUWASOGO TAIWO	78	44	66	45	76	77	55	65	76	56	66		37 113.753.07	0 0.00 0.00	37 113.75 3.07	Passed																																																								
4	1812310004	ADEWALE OLAMILKEKAN SODIQ	54	77	54	88	66	65	56	45	76	66	54		37 114.753.10	0 0.00 0.00	37 114.75 3.10	Passed																																																								
5	1812310005	AJIBOLA OLUWASEUNFUNMI	88	66	87	66	55	78	45	89	76	77	55		37 131.003.54	0 0.00 0.00	37 131.00 3.54	Passed																																																								

Fig 14: Final spread sheet after all result has been uploaded.

## 5. CONCLUSION

The research paper highlighted the conceptual framework, design and implementation of a developed customized software application that is meant to alleviate the burden of the management and the relevant stakeholders in times of transparency, robustness and effectiveness. The application was successfully developed, well tested and performed reliably as proposed. It is highly efficient in time of speed, accuracy, cost and storage facility. The system also eliminates redundancy and has high data integrity with the use of a relational database management system. It gives room for students to have easy access to their results through their E-wallet on the College web portal system.

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