# LaykOS: The Implementation of Process Scheduling Algorithms in an Online Enrollment System

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***Abstract-*** Today queuing system has been an integral part of many systems processes and not limited to banks, restaurants, and movie theaters. In this study, the researchers developed an online enrolment that uses Process Scheduling Algorithm that determines the prioritization in an enrolment process. It uses historical data as its parameter dataset to analyze which Process Scheduling Algorithm to be performed.

***Index Terms***- Enrolment System, Online Enrolment, Process Scheduling Algorithm, Queuing System

## I. INTRODUCTION

The invention of computer technology has started a new chapter in technological development, bringing computers into daily life. Computers simplify everyone's life so that everyone can lead fulfilling lives. Computers are used often in home, work, and school. The educational system has benefited from technology in data processing, record keeping, teaching and learning, and enrollment procedures.

Information about a student is kept on file via enrollment systems. A sturdy one will lighten the burden on those who would typically have to perform all the labor. The enrollment procedure is beneficial, especially when the school can get crucial data from the student. The school can track the standings of the pupils in the enrollment system. The manual enrollment process in a school might result in incomplete student records, erroneous reports, wrong evaluations of student performance, and a poor enrollment processing speed. Students will be perplexed about what to do and how to do it in order to enroll. It is extremely beneficial in the school because it greatly simplifies the enrollment process.

Because transactions took so long to process, organizations were forced to create an automated system that would allow for online enrollment that was just as efficient as a manual approach. The majority of computerized enrollment systems' queuing procedures are a cause for concern nonetheless. A method called queuing aids in the effective management of clients by service providers. The system can make it easier to regulate consumer flow, which is helpful for a specific service provider. The queuing system was integrated into the digital enrollment process in the school environment, allowing for the reduction of crowds, time, and human effort [1]. This optimization included student enrollment, registration, and reports. It allowed for remote collaboration between the institution and the students and was a technologically advanced and innovative tool that shortens the enrollment processes' processing times in a fair and transparent way, ensuring freedom of choice and equal access to remote learning opportunities during pandemics.

The online enrollment procedure currently represents a technical path for educational institutions to enhance the enrollment process and provide students with a better educational experience. Technology was used in America to deal with the problem; the most popular applications were digital platforms, downloadable study materials, and online document and update delivery, which eliminated the long lines that parents formed to reserve a school.

A web platform is one that can be accessible online and provides dynamism and functions that adapt to specific instances. Its application is also predicted to cut registration time by 80% [2], increasing competition between educational institutions [3]. The enrollment procedure does not have to be difficult; rather, it should be as straightforward as possible for parents, leaving a positive impression on the institution. The enrollment procedure is a part of the administrative services; it keeps track of student activity, course registration, and credential distribution [4]. On the other hand, researchers also define enrolment process is a collection of steps and activities that ensure students remain enrolled in a certain institution of higher learning [5].

The most often used technologies for creating a web platform include HTML, CSS, JavaScript, and PHP. HTML is a type of markup language [6]. On the other hand, CSS is a technology used to improve the visual presentation of an HTML document, whereas JavaScript is a language used for client-side execution [7]. While PHP is a server-side language used to run and build dynamic websites [8].

Investigation into web accessibility at the University of Jordan in Jordan found that using an online system speeds up the enrollment process for students by 87%, which supports the significance of using digital enrollment platforms to do away with lines in educational institutions [9]. Similar to the Philippines, study on the online registration and qualification evaluation system's pre-registration process, revealed that the registration process is optimized by creating user profiles [10]. This finding suggests that one approach to developing the solution is to create user profiles for students, teachers, and administrators. In Nigeria, a study conducted in 2013 suggested that a unique web-based student academic record that operations must be sped up and unneeded delays reduced in order to optimize the academic record [11].

On the other hand, a mobile application with three processes—registration, monitoring, and control—is the best way to expedite and optimize the school enrollment process in Peru [8]. With the help of which these functions will resolve upcoming issues like note-taking and attendance control.
At the Santa Bernadette Children's Center in Spain, parents often form lengthy lines; this causes confusion and misunderstanding among the parents, who wait for hours while enduring the cold and insomnia. 95 percent of public institutions struggle with this issue [12].

Since parents are busier than ever, online registration has always offered convenience and efficiency. They anticipate the comfort and simplicity of submitting their paperwork online, but parents are not the only ones who profit from online registration systems. These systems are advantageous for both administrators and students.

Quezon City University, for instance, still uses the conventional enrollment process. Due to the university's roughly ten thousand registered students and the population growth it experiences each year, lecturers and enrolling officers find it time-consuming to maintain student records manually. Thus, the study primarily aims to develop an online enrollment system based from the primary concerns of Quezon City University students towards the process of enrolment. It also determines the efficiency, reliability, usability, and functionality of the turn-around time, waiting time and completion time of an online enrollment system developed in this study.

## II. METHODOLOGY

### 2.1 Research Design

The study adopted the experimental and qualitative research design. It used to suffice the research objectives presented in this study.

### 2.2 Locale of the Study

The study was conducted in Quezon City University during the Academic Year 2019-2020.

### 2.3 Respondents of the Study

Respondents of the study includes sixty-five (65) regular senior Bachelor of Information Technology (BSIT) students, eighteen (18) Information Technology fulltime faculty members, and three (3) department heads in the university.

### 2.4 Research Instrument

In gathering the necessary information for developing the system, the researcher used survey questionnaire, which serves as the statistical basis of the study especially in evaluating the system. The researcher designed the questionnaires based on Software Quality Characteristics - ISO 9126 published in 2001. Using the survey, the researchers will determine the respondents' desired quality or features of an online enrollment system and determine whether the quality of the proposed system is efficient, reliable, usable and functional.

The questionnaire was structured in such a way that respondents will answer it easily. The questionnaire is divided into several parts namely: (1) respondent's profile which contains questions based on the respondent's preferences, (2) problems of the current manual enrollment system, and (3) desired quality or features of an online enrollment system, and (4) assessment of the developed online enrollment system. Furthermore, the questionnaire was organized using the Likert scale format with five-point rating scale.

### 2.5 Validation and Distribution

Three information technology industry professionals were asked to validate the structure and content of the survey checklist in order to ascertain the validity of the instrument. Their feedback and recommendations were taken into consideration when the instrument took its final form. Additionally, fifteen respondents who were not involved in the study were invited to complete the online survey checklist. The data were then tested for reliability using the Cronbach's alpha formula. The instrument's results demonstrate its dependability, with a Cronbach's alpha value of 0.78.

After having found that that instrument is valid and reliable, the questionnaire was distributed to the target respondents.

### 2.6 Data Gathering

A survey questionnaire was provided by the researcher to help in the construction of the study by getting ideas from the respondents' experiences. The responses played a significant role in completing the study.

During the data gathering, the respondents were asked to answer the survey questionnaire to determine the common problems that they encountered during the enrollment procedure. Also, the questionnaire determines the desired qualities of an

online enrollment system that are preferred by the respondents. After that, the researchers started to develop the online enrollment system based on the results. When the system was ready, the researchers asked the same respondents to use and evaluate the newly developed online enrollment system (named LaykOS) accordingly. The researchers counted, computed, and tabulated the gathered data and determined how the respondents assessed LaykOS according to its features.

After gathering all the results, these were organized and interpreted using statistical methods. Among the statistical methods available, the researcher used percentages and a weighted mean.

### 2.7 Software Development

In developing the software, the researchers adopted the Iterative Development Model (Fig. 1), this model is almost an entirely different model, designed for quick prototyping and development. It takes some features of other models but incorporates these into a much more flexible model. Furthermore, in the Iterative Development Model, each stage of the system gets to a "releasable" state, which means that in every major or minor milestone, there is a working system.

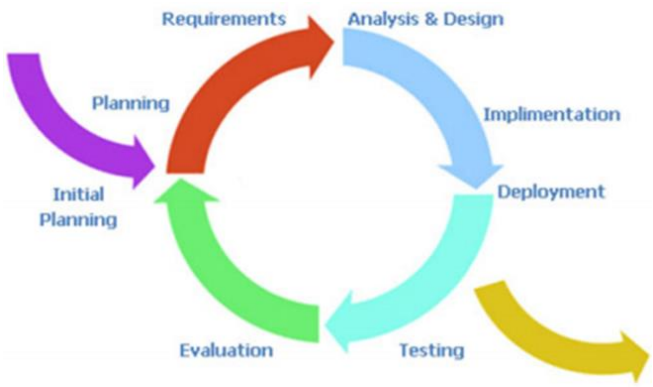


**Fig 1.** Iterative Development Model

During the Planning Phase, after the approval of the proposed system, the researcher planned on how to develop the system by identifying the necessary software and hardware requirements. A couple of consultation with experts done before proceeding to the next phase.

During the Requirement Phase, the researcher conducted several researches to determine the appropriate platform to be use for the development of the proposed system. Hardware requirements were also identified. On the software requirements of the system, the researcher interviewed and conducted a survey on what features should be included in the proposed system. After meeting with the beneficiary, the researcher finalized the features of the proposed system.

During the System Analysis and Design Phase, the researcher analyzed the gathered data and design appropriate GUI for the proposed system based on the suggestions of the stakeholders.

The Implementation Phase is the realization of technical specification or algorithm as a program, software component, or other computer system through computer programming and deployment. The responses made by the respondents towards the desired quality of an enrollment system served as the basis on how the researcher included the desired features in the proposed system.

During the Deployment Phase, the proposed system is presented to the beneficiaries in This phase is focused on how to deploy the proposed system to its beneficiaries, particularly to the Quezon City Polytechnic University. The responses made by the respondents towards the desired quality of an enrollment system such as efficiency and acceptability, served as the basis on how the researcher deployed the proposed system.

During the Testing Phase, the respondents used the proposed system to evaluate the developed enrollment system and determine whether their suggested features were all properly included and implemented. This can be seen as an irreplaceable usability practice, since it gives direct input on how real users use the system.

During the Evaluation Phase, the respondents evaluated the developed enrollment system by answering the survey evaluation form provided with them. This phase is very important, because this was the basis for improvement. In addition, the deployment of the proposed online enrollment system rests on the results of the evaluation.

Furthermore, PHP programming language was used for the service system and for the web site in developing the online enrollment system with the implementation of First Come First Served, Shortest Job First, and Priority Scheduling Algorithms. Also, MySQL was utilized for the back-end of the system.

### 2.8 System Architecture of the developed Online Enrollment System or the LaykOS

Figure 2 shows the system architecture of the developed online enrollment system called LaykOS.

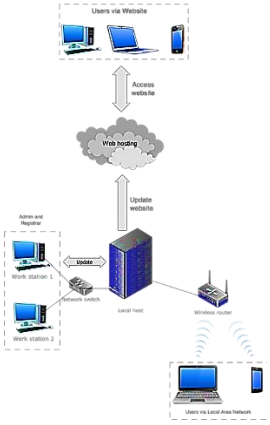


**Fig 2.** System Architecture for the Implementation of Process Scheduling Algorithms in an Online Enrollment System

In the developed online enrollment system (called LaykOS), the queuing service started when the student registers via website portal, he or she will now be enlisted and considered registered. After which, the registrar can now enroll 10 students by batch and the First Come First Serve, Shortest Job First and Priority Scheduling will be triggered.

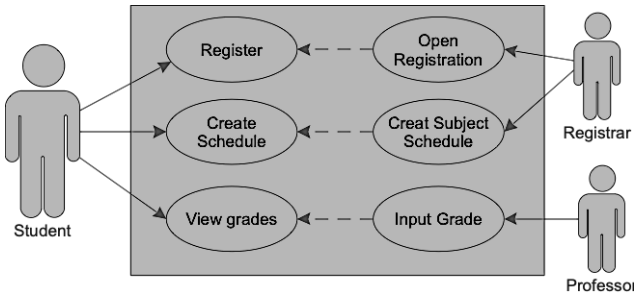


**Fig 3.** Use Case Scenario Diagram for Web service

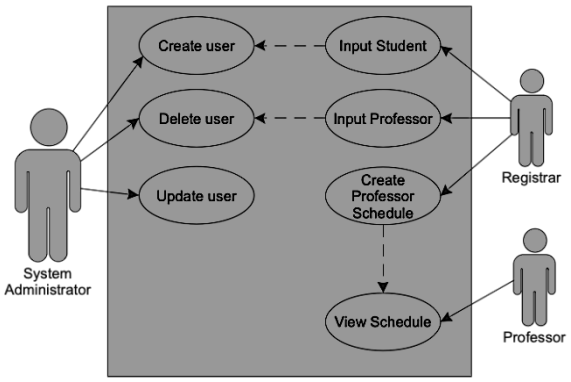


**Fig 4.** Use Case Scenario Diagram for System Administrator, Registrar and Professor

The process starts with registration when the student enrolls a subject(s). The arrival time will begin on the registration, once the student finished enrolling, the end time will be saved. The registrar will see the list of all students who enrolls and select whose student will be enrolled. For the First come first serve basis, the system will prioritize the student whose came first. The first student who finished enrolling will be the one who will be enrolled and next student will be accommodated only after the previous students are done enrolling. For the Shortest job first, the student who has the fewest subject enrolled will be prioritized. Finally, for the Priority basis, those students who are regular will be prioritized in the enrollment. To examine the FCFS, SJF and PS, the researcher computes the arrival time and burst time to determine and compare the turn-around time and waiting time of the said algorithms.

### 2.9 System Description

The LaykOS online enrollment system is an application that contains student services such as Enrollment and Registration Management and Scheduling with the use of three OS Algorithm namely, First Come First Served, Shortest Job First and Priority Scheduling OS Algorithms. Online Enrollment System Application includes (4) actors: (1) System Administrator, (2) Registrar, (3) Student and the (4) Professor. The role of the System Administrator is to manage all configurations and user management. Registrar has the full authority to access the enrollment and registration module. The student can view his/her profile, able to view and print his/her schedules and see the grades per subject using the system. Furthermore, the Instructor has navigation where he/she can view the lists of students per subject and course with his/her schedules and input grades per subject and course.

Furthermore, LaykOS contains business services such as Enrollment Management, Registration Management, User Profile Management, Account Registration, and Scheduling. The application consists of several application services such as the Information Record Services, Enrollment and Registration Services, User Management Services, and Scheduling Services. The proponent used PHP programming language for the front end of the system and MYSQL for the back end or the database of the system.

### 2.10 Logical Architecture

Logical Architecture Level, showing affected/used components and interfaces. LaykOS systems' logical architecture as shown above uses a browser, from personal computer to access the web application Online Enrollment System with the Implementation of Process Scheduling Algorithms. Moreover, the LaykOS will interact with MySQL server to record and retrieve data.

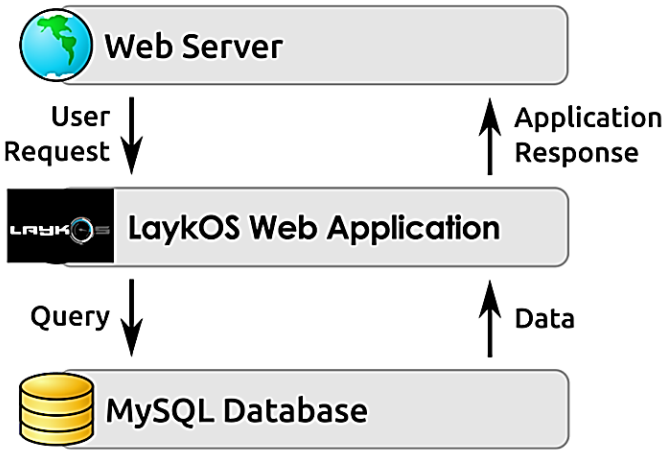


**Fig 5.** Logical Architecture

### 2.11 High Level Architecture

A representation of High-Level Architecture used here to show how the systems will interconnect. The figure below shows the high-level architecture of LaykOS. Users can use personal computer, laptop, etc. Then through a browser, the device or computer can access the application. Finally, the application is connected to enrollment's database server to access data.

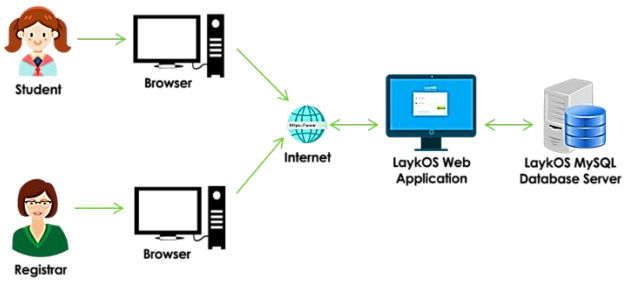


**Fig 6.** High Level Architecture

### 2.12 Process Flows

The process starts with registration when the student enrolls a subject(s). The arrival time will begin on the registration, once the student finished enrolling, the end time will be saved.

For the First come first serve basis, the system will prioritize the student whose came first. The first student who finished enrolling will be the one who will be enrolled and next student will be accommodated only after the previous student are done enrolling. For the Shortest job first, the student who has the fewest subject enrolled will be prioritized. Finally, for the Priority basis, those students who are regular will be prioritized in the enrollment.

### 2.13 Special Algorithm Process Flow

The Online Enrollment System is an application that contains student services such as Enrollment and Registration Management and Scheduling with the use of three OS Algorithm such as First Come First Served, Shortest Job First and Priority Scheduling OS Algorithms. This application includes (4) actors: (1) System Administrator, (2) Registrar, (3) Student and the (4) Instructor. The role of the System Administrator is to manage all configurations and user management. Registrar has the full authority to access the enrollment and registration module. The student can view his/her profile, able to view and print his/her schedules and see the grades per subject using the system. Furthermore, the Instructor has navigation where he/she can view the lists of students per subject and course with his/her schedules and input grades per subject and course.

With the use of three OS Algorithm, the system can display the average turnaround time and average waiting time in milliseconds and minutes per batch using the dashboard and by the implementation of the said OS Algorithm, the online enrollment will process effectively.

Testing was being done during each stage in the development. There is one (1) dedicated tester assigned on every sprint. The test cases for each sprint should be developed from the functional specification and use cases. Test Cases are based on the agreement during sprint planning of the Team depending on the timeline of a sprint. If a sprint will take 2 weeks, then it needs to determine how many can one (1) dedicated resource can execute in this timeline.

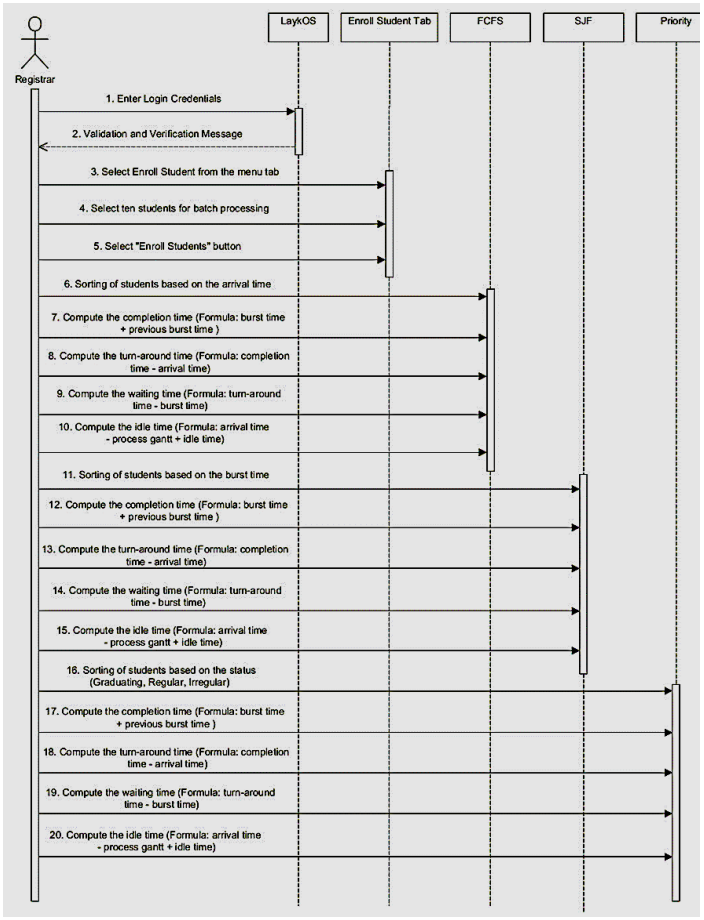


**Fig 7.** Algorithm Process Flow

## III. RESULTS AND DISCUSSION

### 3.1 Problems encountered by the respondents in the current manual Enrollment System

The problems encountered by the respondents in the current manual Enrollment System is presented in Table I.

**Table 1**
Problems Encountered by the Respondents in the Current Manual Enrollment System

| | Frequency | Percentage |
|---|---|---|
| 1. Enrollment takes too long because of the long queues. | 75 | 87.21% |
| 2. Queues are sometimes poorly managed and controlled. | 63 | 73.26% |
| 3. Inconsistency in data entry, room for errors, mis-keying information. | 45 | 52.33% |
| 4. Lack of data security. | 33 | 38.37% |
| 5. Duplication of data entry. | 36 | 41.86% |
| 6. Enrollment timelines are sometimes extended due to slow processing of related enrollment activities such as validation, etc. | 65 | 75.58% |
| 7. Instructions are not standard from enrollment officers. | 38 | 44.19% |
| 8. Delayed report generation. | 34 | 39.53% |
| 9. Subjects are not filtered per year level. | 28 | 32.56% |

Table 1 above describes the frequency and percentage of the respondents from Quezon City University and the rankings of the problems encountered in manual enrollment system. The table above shows the top nine most problems encountered in manual enrollment system, first on the ranking is Enrollment takes too long because of the long queues with 75 responses, second rank is Enrollment timelines are sometimes extended due to slow processing of related enrollment activities such as validation, etc. with 65 responses, third is Queues are sometimes poorly managed and controlled with 63 responses. Inconsistency in data entry, room for errors, mis-keying information is on the fourth rank with 45 responses, followed by Instructions are not standard from enrollment officers with 38 responses. Sixth rank is Duplication of data entry with 36 responses, followed by Delayed report generation with 34 responses. On the eight ranks is Lack of data security with 33 responses while 28 stated that Subjects are not filtered per year level.

### 3.2 Respondents' Level of Satisfaction on the Use of LaykOS

The respondents' level of satisfaction on the use of LaykOS in terms of: 1.) Efficiency; 2.) Reliability; 3.) Usability; and 4.) Functionality is presented in Table 2.

**Table 2**
Respondents' Level of Satisfaction on the Use of LaykOS

| Statement | | Mean Response | Interpretation |
|---|---|---|---|
| 1. Efficiency | | 4.48 | Very Satisfied |
| 2. Reliability | | 4.45 | Very Satisfied |
| 3. Usability | | 4.53 | Very Satisfied |
| 4. Functionality | | | |
| 4.1 General Features | 4.53 | | Very Satisfied |
| 4.2 Detailed Features | 4.65 | 4.59 | |
| **Overall** | | **4.51** | **Very Satisfied** |

Table 2 shows the satisfactory rate of the respondents. As shown in the table, Functionality got the highest mean response of 4.59 with an equivalent verbal interpretation of "Very Satisfied". Next to that is Usability with 4.53 mean response and a verbal interpretation of "Very Satisfied" followed by Efficiency with 4.48 mean response and a verbal interpretation of "Very Satisfied". Lastly, in terms of Reliability, it has a mean response of 4.45 that can be interpreted as "Very Satisfied". Overall, the total mean response on the level of satisfaction of respondents on the use of LaykOS got 4.51 with a verbal interpretation of "Very Satisfied".

*Efficiency*

The respondents' level of satisfaction on the use of LaykOS in terms of Efficiency is presented in Table 3.

**Table 3**
Level of Satisfaction on the use of LaykOS in terms of Efficiency

| Statement | Mean Response | Interpretation |
|---|---|---|
| 1. LaykOS provides appropriate response time, processing time when performing the various functions. | 4.51 | Very Satisfied |
| 2. The LaykOS system can handle several inputs at any given time. | 4.44 | Very Satisfied |
| 3. It can locate operations & information quickly. | 4.47 | Very Satisfied |
| 4. The system performs a sequence of operations (data input) with economy of motion. | 4.50 | Very Satisfied |
| **Overall** | **4.48** | **Very Satisfied** |

As seen in the table, the respondents are very satisfied on the use of LaykOS in terms of Efficiency; this is revealed by the obtained overall mean assessment of 4.48. According to the respondents' assessment, in terms of LaykOS provides appropriate response time, processing time when performing the various functions, it has a mean response of 4.51 and a verbal interpretation of "Very Satisfied" ranking first. Placing second is, the system performs a sequence of operations (data input) with economy of motion with a mean response of 4.50 and a verbal interpretation of "Very Satisfied". Ranking on the third place, with a mean response of 4.47 and a verbal interpretation of "Strongly Agree" is it can locate operations & information quickly. Lastly, in terms of The LaykOS system can handle several inputs at any given time, it has a mean response of 4.44 that can be interpreted as "Very Satisfied".

*Reliability*

The respondents' level of satisfaction on the use of LaykOS in terms of Reliability is presented in Table 4.

**Table 4**
Level of Satisfaction on the use of LaykOS in terms of Reliability

| Statement | Mean Response | Interpretation |
|---|---|---|
| 1. Maturity – LaykOS system is capable of accepting work arounds on functionalities which are not present | 4.43 | Very Satisfied |
| 2. Fault Tolerance – LaykOS has the ability to maintain a specified level of performance or continue | 4.48 | Very Satisfied |
| 3. Functioning in the event of software fault(s) | 4.45 | Very Satisfied |
| **Overall** | **4.45** | **Very Satisfied** |

As seen in the table, the respondents are very satisfied on the use of LaykOS in terms of Reliability; this is revealed by the obtained overall mean assessment of 4.45. Fault Tolerance – LaykOS has the ability to maintain a specified level of performance or continue got the highest mean response of 4.48 with an equivalent verbal interpretation of "Very Satisfied". Next to that is functioning in the event of software fault(s) with 4.45 mean response and a verbal interpretation of "Very Satisfied" followed by Maturity – LaykOS system is capable of accepting work arounds on functionalities which are not present with 4.43 mean response and a verbal interpretation of "Very Satisfied".

*Usability*

The respondents' level of satisfaction on the use of LaykOS in terms of Usability is presented in Table 5.

**Table 5**
Level of Satisfaction on the use of LaykOS in terms of Usability

| Statement | Mean Response | Interpretation |
|---|---|---|
| 1. Understandability – LaykOS uses standards in its User Interfaces | 4.56 | Very Satisfied |
| 2. Learnability – LaykOS displays straightforwardness of performing tasks and maintains a level of pleasant User experience | 4.55 | Very Satisfied |
| 3. Operability – The system exhibits clarity and consistent instructions | 4.55 | Very Satisfied |
| 4. Attractiveness – LaykOS offers richness in the pleasant presentation of interface | 4.47 | Very Satisfied |
| **Overall** | **4.53** | **Very Satisfied** |

*Functionality*

The respondents' level of satisfaction on the use of LaykOS in terms of Functionality is presented in Table 6.

**Table 6**
Level of Satisfaction on the use of LaykOS in terms of Functionality

| Statement | Mean Response | Interpretation |
|---|---|---|
| 1. General Features | 4.53 | Very Satisfied |
| 2. Detailed Features | 4.65 | Very Satisfied |
| **Overall** | **4.59** | **Very Satisfied** |

As seen in the table, the respondents are very satisfied on the use of LaykOS in terms of Functionality; this is revealed by the obtained overall mean assessment of 4.59. Detailed Features got a 4.65 mean response with a verbal interpretation of "Very Satisfied" while General Features got a 4.53 mean response that can be interpreted as "Very Satisfied".

*General Features*

The respondents' level of satisfaction on the use of LaykOS in terms of General Features is presented in Table 7.

Table 7 shows the satisfactory rate of the respondents. As shown in the table, LaykOS is capable of providing functions which meet the stated and implied basic needs of professionals under specified conditions of usage (what the software does to meet needs) got the highest mean response of 4.57 with an equivalent verbal interpretation of "Very Satisfied". Next to that is the system successfully implements identified algorithms for better performance with 4.56 mean response and a verbal interpretation of "Very Satisfied" followed by the system ensures a secure set of user privileges (role-based access control), which determine permission levels (creation and updating data) that users need to control, manage, and update content with 4.51 mean response and a verbal interpretation of "Very Satisfied". Lastly, in terms of Maintenance of the following which are important for personal expenses are well taken by LaykOS, it has a mean response of 4.48 that can be interpreted as "Very Satisfied". Overall, the total mean response on the level of satisfaction of respondents on the General Features of LaykOS got 4.53 with a verbal interpretation of "Very Satisfied".

**Table 7**
Level of Satisfaction on the use of LaykOS in terms of General Features

| Statement | Mean Response | Interpretation |
|---|---|---|
| 1. LaykOS is capable of providing functions which meet the stated and implied basic needs of professionals under specified conditions of usage (what the software does to meet needs) | 4.57 | Very Satisfied |
| 2. The system ensures a secure set of user privileges (role-based access control), which determine permission levels (creation and updating data) that users need to control, manage, and update content. | 4.51 | Very Satisfied |
| 3. The system successfully implements identified algorithms for better performance | 4.56 | Very Satisfied |
| 4. Maintenance of the following which are important for personal expenses are well taken by LaykOS | 4.48 | Very Satisfied |
| **Overall** | **4.53** | **Very Satisfied** |

*Detailed Features*

The respondents' level of satisfaction on the use of LaykOS in terms of Detailed Features is presented in Table 8. The researcher found it necessary to identify the acceptability of the system on a per user basis, because one of the goals of the system development is to make the system more user centered. Having that in mind it is imperative that specific responses are classified to achieve this objective. Usability and user experience (UX) have always been the predominant concerns of software products thus the researcher's conviction to present the findings in this manner.

**Table 8**
Level of Satisfaction on the use of LaykOS in terms of Detailed Features

| Statement | Mean Response | Interpretation |
|---|---|---|
| 1. Registrar / Department Head | 4.42 | Very Satisfied |
| 2. Students | 4.75 | Very Satisfied |
| 3. Instructor/Professor | 4.78 | Very Satisfied |
| **Overall** | **4.65** | **Very Satisfied** |

As seen in the table, the respondents are very satisfied on the use of LaykOS in terms of Detailed Features; this is revealed by the obtained overall mean assessment of 4.65. Instructor/Professor got a 4.78 mean response with a verbal interpretation of "Very Satisfied" followed by Students got a 4.75 mean response that can be interpreted as "Very Satisfied". Ranking on the third place is the Registrar/Department Head got 4.42 mean response that can be interpreted as "Very Satisfied".

## IV. CONCLUSION

Based on the data analyzed and the findings of the study, the study revealed that the common problems encountered by the respondents in the current manual enrollment system includes: enrollment takes too long because of the long queues; enrollment timelines are sometimes extended due to slow processing of related enrollment activities such as validation, etc.; and queues are sometimes poorly managed and controlled. Automation should go with revising policies and procedures otherwise it could become an exercise in futility.

Furthermore, the study revealed that the assessments of respondents on the importance of the different features of online enrolment systems is "Very Satisfied". It is imperative therefore that the identified features should form part as basic features of the system. These were embedded in the system during and are working properly during testing.

The combination of the Operating System's algorithms First Come First Served, Shortest Job First and Priority Scheduling made the system's process more efficient and more testable. The researcher's confidence level in combining the three algorithms to speed up the enrolment process in the system is high because of an automated testing and simulation capability in a debugging mode is embedded in the system.

Overall, the level of satisfaction rate of respondents on the use of LaykOS is "Very Satisfied". This is because they were able to test several scenarios while testing the system and were assured on the efficiency of the system during the Users Acceptance Test (UAT).

## V. RECOMMENDATIONS

Based on the results and conclusion of this study, it is highly recommended that management starts building a different organizational culture thru new policies and procedures getting rid of the problems of the existing system. Two options can be done the university may opt to adopt this system and become technology driven. This would mean revising the policies and procedures in the context of the developed system. Another option is to entirely begin from policies to procedures and come up with an automated system later. All the identified options call for a strong university leadership.

Since Iterative Development Model was adopted as the development methodology and framework of this study, the study suggests a semiannual review of evolving requirements. This way the system evolves depending on the requirements of the user's avoiding extinction in the near future. The study also suggests a real-time and not a by batch implementation in the online enrolment. This would mean the inclusion of another Operating System's algorithm – pre-emption. This will improve the internal enrolment process. Lastly, the likelihood of a sustainable satisfaction of users is to continuously evolve. The researcher strongly suggest that the next version includes a mobile app.

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