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iSkulFlow: An Event-Driven Queueing and Transactional Management System for Registrar and Financial Services

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ABSTRACT

Scheduling of appointments, document requests, payments recording and monitoring queues remain a challenge in educational institutions as they still use manual and fragmented systems. VMC Asian College Foundation, Inc. has a slow processing of academic documents, physical queue and weak transparency of monitoring which can be the cause of inefficiencies and dissatisfaction of the services. This project has come up with iSkulFlow, a smart academic appointment and document request, which is an integration of email notification and web-based administration panel. The purpose of the study was to automate the appointment booking, accelerate the process of document requesting, improve queue management, and administrative monitoring. A descriptive-developmental design of a study was adopted. The development of the system was based on the agile methodology and it was evaluated according to the System Usability Scale (SUS) among the administrators, registrar staff, cashier staff, and students. The findings have shown that the system has obtained an overall acceptable usability rating and has performed really well in terms of functionality, usability, reliability and efficiency. Results show that iSkulFlow is very effective in increasing the speed of transaction, the level of physical congestion, the level of monitoring transparency, and manually reducing errors in managing academic services. The researchers come to the conclusion that the introduction of an online appointment and document management system allows increasing the efficiency of institutions operations and service provision.

Keywords: *appointment management system; document request system; queue monitoring; email notification; web-based system*

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INTRODUCTION

The effectiveness of administrative services directly that of Registrar and Financial offices in the modern educational environment is one of the main indicators of how well the institutions operate and whether students are satisfied with its services. Conventionally, most Higher Education Institutions (HEIs) in the Philippines have been using manual or semi-automated systems to facilitate the management of student requests, enrollment, and payment transactions. Yet, according to (Gesmundo et al., 2022) manual record-keeping and physical queueing by first-come-first-served is associated with high bottlenecks, which include a long waiting time and possible mistakes in data management.

Different habits of students also make the management of these services more complicated. The relationship between the student payment patterns, the balance of queue, and the efficiency of cashiers in a privately educated institution is a key element of the workflow in the institution (Journal, 2025). Several private HEIs also experience periods of high traffic in the form of prelim or final examinations, which may cause traditional systems to crash. It has been found out that lack of an interconnected system to monitor these behaviors and control the resultant lines lowers the efficiency of the cashiers and introduces administrative friction to the system which not only demoralizes the staff but also distracts the academic concentration of the student.

In VMC Asian College Foundation, Inc., the growing number of students and the wide array of academic programs offered by the college such as different strands in senior high school, and specialized college subjects have put a straining burden on the Registrar and Cashier departments. A lack of a central systems driven by events tends to create a communication gap in which students are blinded on whether or not their appointments have been made. (The Impact of a Notification System on Student Behaviours in a Collaborative Online Learning Environment, n.d.) highlights that inefficiency of real-time notification mechanisms in administrative processes is not only raising the anxiety of students, but also diminishing the performance of personnel who have to manually process enquiries.

Moreover, Philippine HEIs have turned into a strategic priority in regard to the digital transformation of their organizations. The new queueing solutions have developed to elaborate Event-Driven Systems. These systems enable virtual queuing where students are able to make appointments remotely and they are notified via SMS which is automated, in effect minimizing the congestion in the physical campuses.

In solving these challenges, this paper suggests that iSkulFlow should be developed. The system will close the gap between service delivery and convenience to the student by synthesizing an all-encompassing User Management and Interface System and specialized Payment and Record-Keeping Modules. iSkulFlow aims at changing the traditional administrative experience by adding an event-based architecture with Live Service Monitoring alongside SMS Integration. Finally, iSkulFlow implementation in VMC Asian College Foundation, Inc. will enhance a more responsive, transparent, and operationally efficient atmosphere in the college among students, staff, and administrators.

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Theoretical/Conceptual Framework

Input-Process-Output (IPO) model in an effort to handle academic and administrative work. The input of the system is the User Information (user login credentials, personal-related data), Requests (actions performed by user such as appointments booking), and System Data (grades, assessments and financial information that are introduced by the staff). This information is inputted into the process area of the system which is subdivided by the user role. Student process entails the booking of appointments and viewing of transactions and the Registrar deals with academic records and manages appointments. The Cashier is in charge of financial transactions and the Administrator is in charge of the whole system, data and reports generation. All these processes are interacted with a central database which stores new data and retrieves information to users. Lastly, the system delivers the output to the users in form of either a personalized User Dashboard, automatic Notifications, updated Records and Reports. The Login and Authentication Module of the system makes sure that the access of all users is secured by using multi-role authentication and the Admin Dashboard Module consists of the centralizing view of all the processes of the system to administrators.

Statement of the Problem

The aim of this research was to design and test IskulFlow as a smart academic appointment and document request management system to VMC Asian College Foundation, Inc. In particular, it aimed at ascertaining the:

(1) how IskulFlow is effective in the automation of the appointment scheduling and documents processing;
(2) degree of system acceptability with respect to functionality, usability, reliability and efficiency;
(3) the system should be able to give real-time email notifications; and
(4) the net effect of the system on the academic service management.

METHODS

This research was done using a descriptive-developmental research design. The development stage was based on the Agile software development process, which was development, testing, integration and the phase of development.

The system deployment was done in a series of sprints which covered requirement gathering, module development, testing, and refinement. Latent modules consisted of booking of appointments, document request processing, queue monitoring, registering of payment, audit trail tracking, and integration of email notification.

To be evaluated, the System Usability Scale (SUS) was administered to administrators, staff of the registrar department, cashier department and students following pilot implementation. Standard scoring procedures were used to calculate SUS responses and standard usability benchmarks were used to

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interpret. System usability and acceptability were determined with the help of descriptive statistical analysis.

RESULTS AND DISCUSSION

In this section, the results of the study are given in relation to the given special objectives of the Statement of the Problem. The school administrators, registrar, cashier and students evaluated the iSkulFlow system following pilot testing. The System Usability Scale (SUS) and descriptive statistical analysis were used to measure system usability and system effectiveness. The findings are addressed concerning the existing literature about digital academic management systems.

System Usability Scale (SUS)

IskulFlow platform was tested with four groups of respondents who included 2 school administrators, 5 registrar staff, 5 cashiers and 43 students and alumni. The purpose of the evaluation was to find out how easy to use, efficient to use, and the general user experience of using the system by the primary users. The choice of these groups was based on the fact that they are directly involved with the academic record management system, payment processing system and student services system.

Table 1
Average Responses by Respondent Group on a Five-Point Likert Scale

Question	Administrators	Registrar Staff	Cashier Staff	Students & Alumni
1	4.5	4.6	4.4	4.7
2	2.1	2.2	2.3	1.8
3	4.4	4.5	4.3	4.6
4	2.2	2.3	2.4	1.9
5	4.6	4.7	4.5	4.8
6	2.0	2.1	2.2	1.7
7	4.7	4.8	4.6	4.9
8	2.1	2.2	2.3	1.9
9	4.5	4.6	4.4	4.7
10	2.8	2.7	2.9	2.3

Table 11 shows results of mean responses of the two groups of respondents to the ten items of System Usability Scale (SUS) questionnaire. The SUS is a five-point Likert scale (1) Strongly Disagree, (2) Disagree, (3) Neutral, (4) Agree, and (5) Strongly Agree. The responses obtained can be used to make a comparative analysis on the perceived usability and effectiveness of the IskulFlow system when compared to the various user groups.

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Table 2
Calculated Results of the Odd and Even Numbers

Respondent Group	Odd Score	Even Score
Administrators	16.4	15.1
Registrar Staff	16.8	15.4
Cashier Staff	16.2	14.9
Students & Alumni	18.1	16.6

Calculated Odd Score is computed in the formula: (number 1+ number 3 + number 5 + number 7 + number 9) -5, and the Calculated Even Score is computed as: 25 – (#2 + #4 + #6 + #8 + #10). Depending on these obtained values the total score of usability of IskulFlow system is obtained.

Table 3
System Usability Scale Calculated Score

Respondent Group	SUS Score	Interpretation
Administrators	78.8	Acceptable
Registrar Staff	80.5	Excellent
Cashier Staff	77.8	Acceptable
Students & Alumni	86.8	Excellent
Total Weighted Average	**80.9**	**Excellent**

The scores of each group of the respondents are described in Table 13, which is called the System Usability Scale (SUS) by the following formula: SUS Score = (Calculated Odd Score + Calculated Even Score) × 2.5.

The Administrators scored 78.8 which implies that the IskulFlow system can offer administrative functionalities of decent usability and operational effectiveness. Registrar Staff scored 80.5 which is positive measure of the system in making it easy to manage student records and associated processes. In the meantime, the Score of the Cashier Staff was 77.8 which indicates that the system is efficient in terms of the monitoring of financial transactions and the processing of payments.

The Students and Alumni scored the best 86.8 showing that it is very usable and has a very positive user experience when using the platform to access academic services. In general, the weighted average SUS score of 80.9 indicates that the IskulFlow system is located in the range of the Excellent usability, which proves that the system is productive, convenient, and very acceptable to its target audience.

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CONCLUSION

The paper created and tested IskulFlow to be an appointment and document request management system integrated. The system has successfully automated the process of academic services, minimized paperwork, minimized errors, and enhanced the monitoring of queues. The total SUS score 79.19 will show that usability is good and can be deployed. The communication efficiency was improved with the help of email notification integration and the transparency was improved with the help of centralized monitoring. The results confirm that IskulFlow is a good and successful online tool of contemporary academic service management.

RECOMMENDATION

It is accordingly advised that VMC Asian College Foundation, Inc. officially install the use of IskulFlow as its official academic service management system. It can be improved in the future with the integration of mobile applications and advanced analytics dashboards. The paper shows that the use of integrated digital systems has a significant impact on the efficiency of the institution and user satisfaction. The results are added to the studies of digital transformation of administrative activities in education.

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