Impact Analysis of Integrated Digital Ticketing Systems on Support Services in Schools and Universities

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ABSTRACT

The research outlines the creation and use of an internal ticketing system via osTicket that aims at the enhancement of response time and operational efficiency among the teaching and non-teaching staff at First City Providential College (FCPC). The system is in accordance with the college's commitment to electronic transformation and service quality, and it is meant to facilitate the reporting and resolution of administrative and technical matters that are usually dealt with through manual procedures. The developmental research method was used and the study recorded the planning, the rollout, and the assessment of the ticketing platform on the local network. The indicators that were used to measure the performance were response time, communication clarity, and workload management. The findings show that there was a significant improvement in the time taken to resolve issues, manual task handling was reduced, and there was better organization of support requests through features that allowed categorization and prioritization. The user-friendly interface of the system and the built-in dashboard tools also assisted in basic reporting and tracking of issues, which in turn led to better resource distribution and internal collaboration. This project aligns with the goal of providing institutional service that is excellent through the use of digital solutions that are sustainable and in line with operational goals.

Keywords: osTicket, ticketing system, support services, administrative efficiency, digital transformation, workflow optimization, service delivery

INTRODUCTION

Modern academic institutions rely heavily on efficient technical and administrative support systems to sustain daily operations, ensure service reliability, and maintain a productive learning environment. As First City Providential College (FCPC) continues to expand its academic programs and administrative services, the volume of support requests—from classroom technology concerns to network-related issues—has likewise increased [1]. Traditionally, these requests were handled manually through walk-ins, phone calls, emails, or informal messaging, resulting in delays, lost reports, inconsistent documentation, and difficulty in monitoring the status of concerns. These inefficiencies not only disrupt workflow but also negatively affect the quality of services experienced by faculty and staff [2].

To address the growing demand for organized support and faster response time, institutions worldwide have adopted digital ticketing systems as part of their service management approach. Studies by Johnson and Brown (2021), Garcia (2020), Wang et al. (2022), and Cruz and Dela Peña (2023) highlight significant improvements in operational efficiency, communication, and issue resolution when automated ticketing platforms are integrated into organizational workflows [3]. These systems streamline submissions, automatically categorize concerns, and provide a centralized space for tracking progress—key features that enhance accountability and reduce resolution delays [4].

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In response to FCPC's operational challenges, this study explores the development and deployment of an internal ticketing system using **osTicket**, an open-source, customizable support platform widely used by organizations such as Hewlett-Packard (HP), Verizon, and the City of New York [5]. osTicket provides a structured method for logging, prioritizing, and resolving concerns while maintaining clear communication between support staff and end-users. Since FCPC's existing support process relies on manual reporting, the transition to a centralized digital system aims to eliminate bottlenecks, minimize miscommunication, and establish accurate documentation of technical and administrative issues [6].

This project adopts a developmental research approach to guide the planning, installation, customization, and evaluation of the osTicket platform within FCPC's local network environment. Key performance indicators include response time, communication clarity, user satisfaction, and workload efficiency among ICT personnel. Through real-time tracking, automated routing, and organized ticket management, the system is expected to significantly improve service delivery and support efficiency across the institution [7].

By implementing a digital ticketing system aligned with IT Service Management (ITSM) principles and the Data Privacy Act of 2012 (RA 10173), FCPC strengthens its commitment to operational excellence, transparency, and technological advancement. Ultimately, this study demonstrates how a structured, automated support mechanism can transform institutional workflows and contribute to a more responsive and efficient academic environment [8].

Related Studies

The rise of digital transformation has significantly reshaped multiple sectors, including education, transportation, and IT service management. One of the domains most impacted by this shift is ticketing systems, which have evolved from traditional manual reporting models to intelligent, automated platforms designed to enhance operational efficiency and communication. In higher education, the implementation of ITIL-based ticketing tools such as osTicket has demonstrated measurable improvements in institutional service performance. For example, Tawar demonstrated how osTicket improved service delivery by enabling structured issue categorization and supporting the creation of a knowledge base for recurring concerns [1].

Digital ticketing systems have also transformed the transportation sector. Adducul developed a mobile bus ticketing application evaluated using ISO 9126 quality standards, revealing improved usability and reliability compared to traditional systems [2]. Likewise, Shan et al. documented advancements in China's e-ticketing infrastructure, noting the importance of cloud computing, machine learning, and synchronized data streams for supporting high-volume commuter operations [3]. Yahaya et al. further emphasized the role of QR-based validation systems in preventing ticket fraud and enhancing accessibility in railway transport [4].

In IT service management, researchers have focused on optimizing ticket resolution workflows. Gupta et al. addressed inefficiencies in manual support systems by introducing automated prompts to gather essential user information, thereby reducing delays in issue resolution [5]. Xu, Tang, and Li proposed a Support Vector Machine (SVM)-based model capable of identifying complex "situation tickets" from system-generated alerts, enabling more accurate routing and faster mitigation of technical problems [6]. With automation becoming an industry standard, Wang et al. introduced AISTAR, an intelligent recommendation framework that uses multi-armed bandit algorithms to guide agents in resolving IT tickets more efficiently [7]. Security has become a major concern in digital ticketing platforms. Li et al. introduced a blockchain-based electronic ticketing system (CB-ETS) designed to mitigate fraud, scalping, and data tampering through ring signatures and multi-signature schemes [8]. In the educational sector, Abayomi-Alli et al. implemented RFID- and Bluetooth-driven ticketing for campus shuttle systems, revealing substantial improvements in security and operational transparency [9].

Usability plays a central role in ticketing adoption. De Amorim et al. evaluated a public transport ticketing interface and highlighted the importance of intuitive design for improving user satisfaction and system uptake [10]. Srivastava and Purohit found that commuter dissatisfaction in metro systems often stemmed from long queues and pricing concerns, underscoring the need for user-centered system development [11]. System

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architecture enhancements are also crucial; Dai, Shao, and Zhang stressed the role of edge computing in improving the scalability and responsiveness of sports ticketing systems [12], while Goecke traced the historical shift from mainframe-based reservation systems to modern cloud-powered booking platforms [13].

Emerging security-focused technologies have further advanced digital ticketing. Zhan et al. introduced PriTKT, a blockchain-enhanced ticketing framework that uses zero-knowledge proofs to secure user data and prevent double spending [14]. Shen and Pena-Mora also explored hybrid blockchain ticketing systems designed to prevent counterfeiting and unauthorized duplication [15]. From a sociocultural perspective, Erturan-Ogut studied the Passolig system in Turkey, critiquing its implications for surveillance, fan identity, and state control [16].

Business model considerations likewise shape system adoption. Apanasevic and Markendahl identified barriers to mobile ticketing in Northern Europe, including technological limitations, interoperability issues, and low consumer acceptance [17]. In corporate settings, research by Aglibar et al. on JIRA's usage highlighted its strengths in issue tracking but also noted feature limitations, prompting many organizations to turn to more flexible open-source solutions [18]. Mission reinforced this viewpoint by advocating multi-channel support platforms aligned with ISO/IEC 25010 quality standards [19].

Additional innovations include an integrated web–mobile ticketing platform developed by Shimomba et al., which addressed illegal operations and minimized passenger waiting times in bus transport [20]. Febrianti extended ticketing system principles to academic scheduling by designing a mobile reservation system for tutoring sessions, integrating GPS-based attendance verification [21].

DESIGN AND METHODOLOGY

Research Design

The research design specifies the branching of the study through its skeletal support and methodical direction. This project utilized a mix of developmental, experimental, and quantitative research designs to the fullest extent in the systematic creation, refinement, and also evaluation of an internal ticketing system via osTicket for FCPC (First City Providential College). Such combination of methods is very suitable for research based on technology because it allows the careful development of the system, the strict testing of its features, and the statistical evaluation of user acceptance and operational influence.

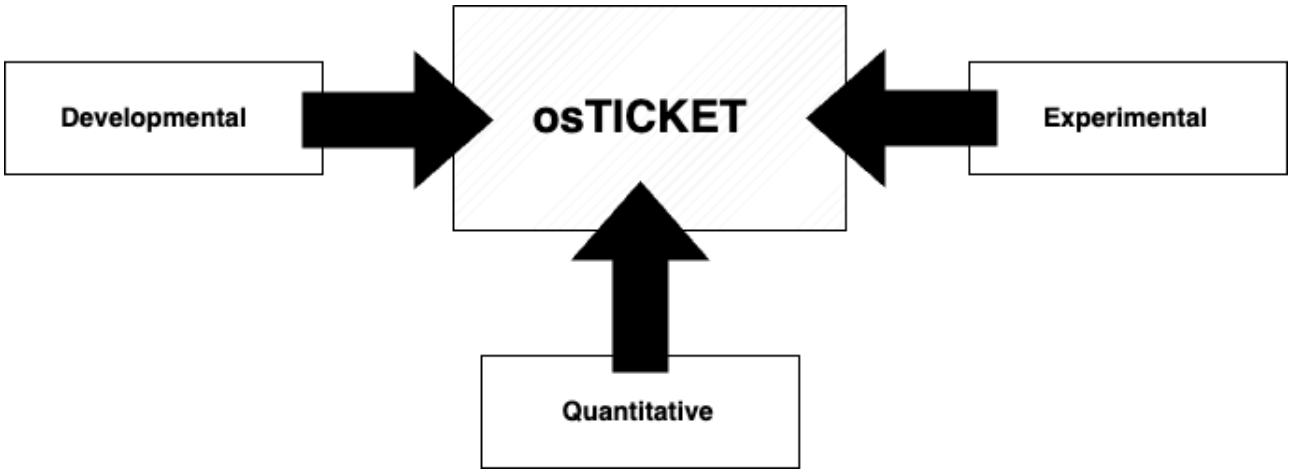

Figure 1. Research Design of the Study

Figure 1 illustrates the research design adopted in this study. The process begins with developmental research, which involves identifying system requirements, designing the workflow, and developing the osTicket prototype for institutional use. This is followed by experimental research, where the system's functionality, reliability, and performance are evaluated through controlled testing and user interaction. Finally, quantitative research is conducted to measure user satisfaction and system effectiveness using Likert-scale surveys and descriptive statistical analysis.

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Developmental Research Design

Figure 2. Agile Development Model

The system development began with Planning, where system requirements and objectives were identified to establish a clear foundation. In the Design phase, wireframes, flowcharts, and user interface elements were developed to visualize the system structure. The Development phase involved installing osTicket on the Windows Server, configuring its features, and setting up user roles to ensure seamless integration. Following this, the Testing phase was conducted to evaluate the system's functionality, performance, and security through rigorous testing procedures. After successful testing, the system moved to the Implementation phase, where it was deployed, and user training sessions were conducted to familiarize end-users with the new platform. Finally, in the Maintenance & Updates phase, continuous monitoring and system updates were performed to enhance performance and address potential issues, ensuring long-term efficiency and usability.

Conceptual Framework

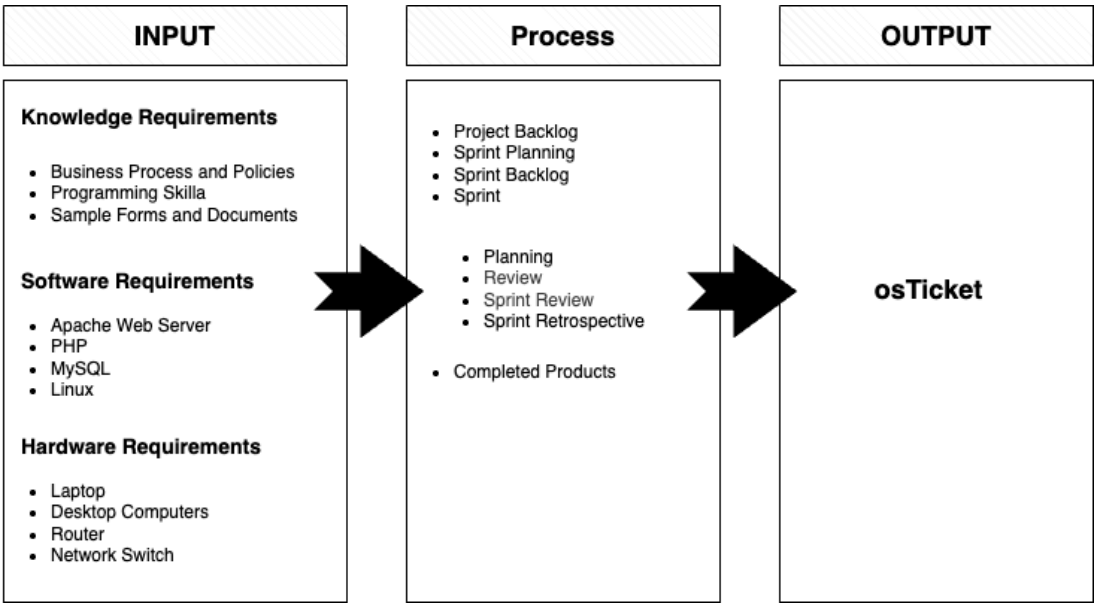

Figure 3. Conceptual Framework of the Study

The conceptual framework illustrates how the development of the osTicket system is guided by essential inputs, a structured process, and a clear output. The input stage identifies all foundational requirements needed for the system's development—this includes knowledge of business processes and programming, the necessary software tools such as Apache, PHP, and MySQL, and the required hardware like laptops, desktops, and

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network devices. These inputs ensure that the team has the skills, tools, and environment needed to build the project.

The process stage represents the Agile workflow used in the study. It begins with creating a project backlog, followed by sprint planning, development cycles or sprints, and continuous reviews and retrospectives. This iterative process allows the team to gradually refine the system, address issues early, and continuously improve each sprint until the desired output is achieved.

Finally, the output of the framework is the developed osTicket system, representing the completed product that meets the project's requirements. Overall, the framework shows how structured inputs and disciplined processes work together to produce a functional and effective ticketing system.

System Flow

Figure 4 below, presents the program flow of the osTicket system. The process begins when a user logs into the system to report a concern or request assistance. After logging in, the user submits a ticket describing the issue they are experiencing. The system then records the ticket and officially logs it for tracking. Once the ticket is logged, the IT staff are immediately notified that a new request has been submitted. The IT team reviews the ticket details and begins attending to the issue. They assess the problem, perform troubleshooting, and take the necessary steps to resolve it. After working on the ticket, they evaluate whether the issue has been completely resolved. If the ticket is successfully resolved, the IT team marks it as closed. The system then notifies the user that their issue has been addressed. The closed ticket is archived and stored for reporting, documentation, and future reference.

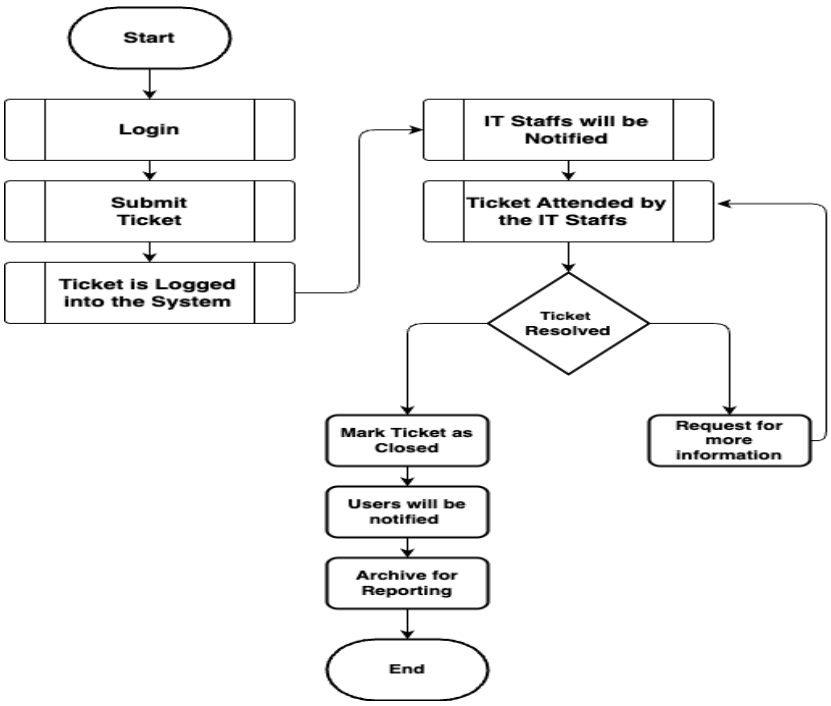

Figure 4. osTicket Program Flow

However, if the IT staff determine that more information is needed to properly resolve the issue, they send a request back to the user for clarification or additional details. The process continues until the necessary information is provided and the problem is fully addressed.

RESULT AND DISCUSSIONS

The Developed System

Figure 5 below, shows the main landing page of the FCPC Ticketing System, where respondents are greeted with options to open a new ticket or check the status of an existing one. The interface is designed with

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simplicity and clarity, offering direct navigation through buttons on the right-hand side. Without logging in, users can access basic functions, while signed-in users with department-specific accounts can proceed to ticket creation and tracking. The home page emphasizes ease of access and efficiency, aligning with the system's goal of providing quick and reliable support.

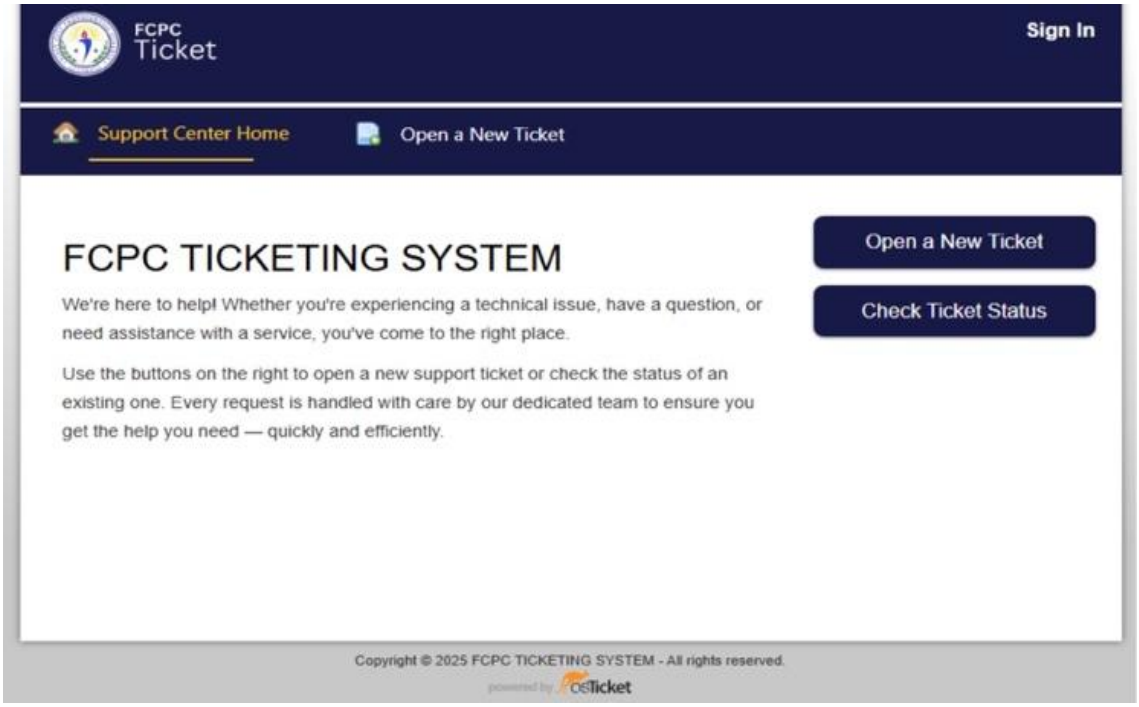

Figure 5. osTicket Support Center Home Page

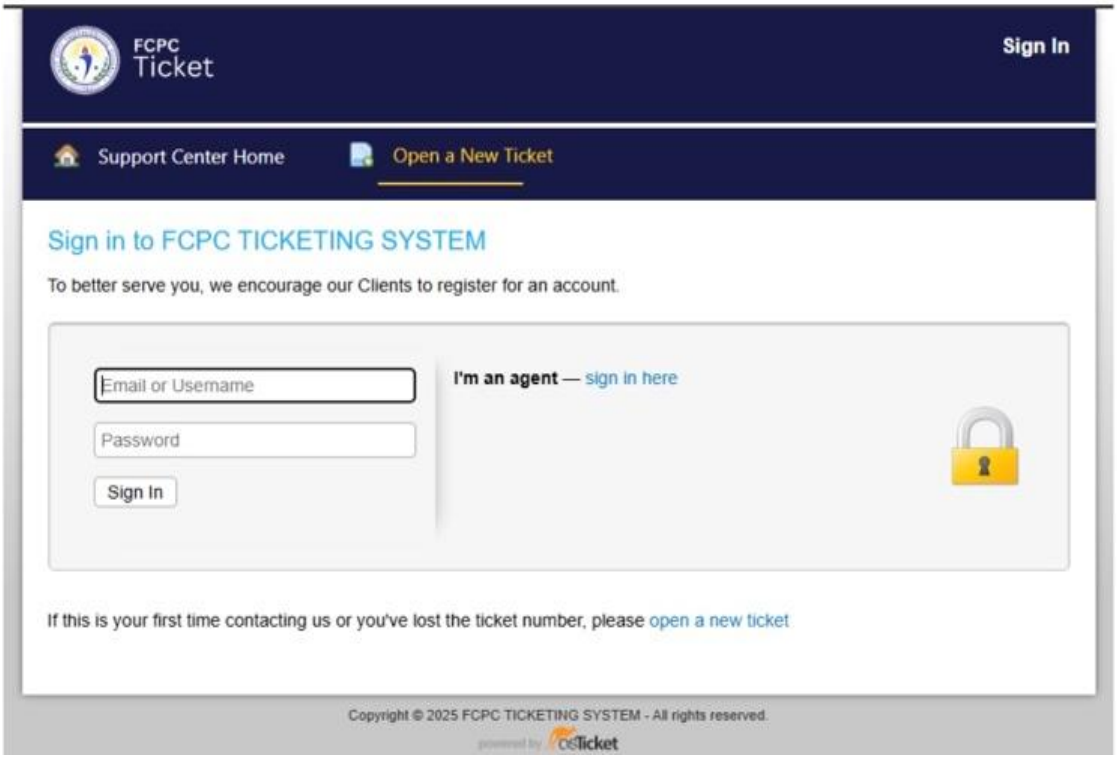

Figure 6. osTicket Login Screen

Figure 6 presents the login screen of the FCPC Ticketing System, where respondents use the credentials issued by the IT department for their assigned office or unit. This process ensures secure access to the system and allows users to submit and monitor their support tickets. The interface also includes a separate sign-in option for agents and provides first-time users with the ability to open a new ticket directly.

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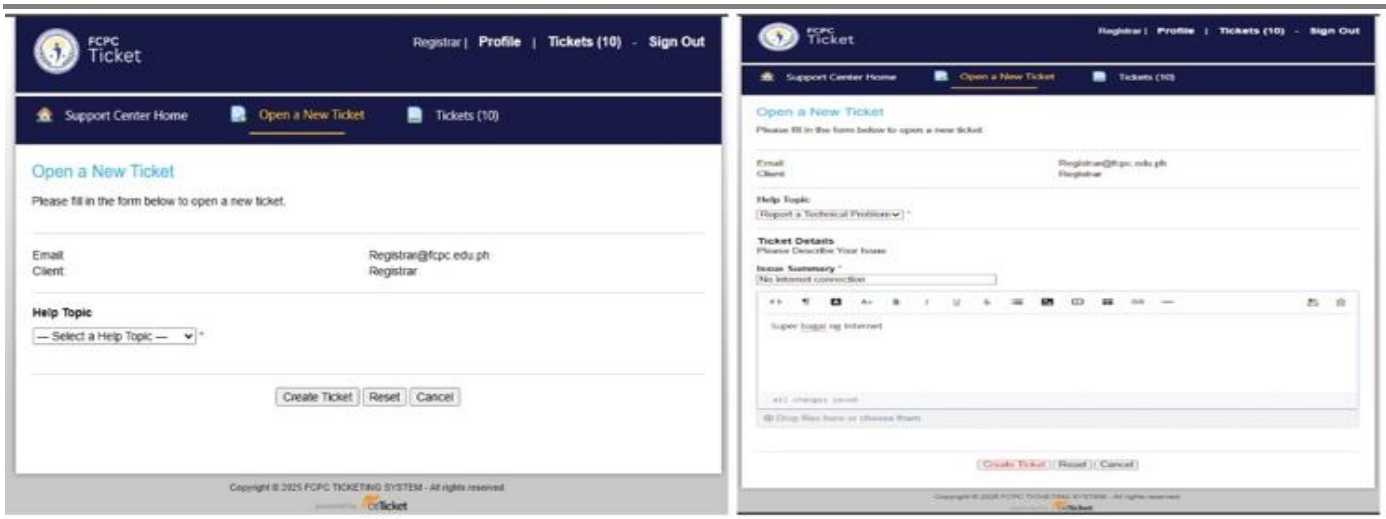

Figure 7. osTicket Ticket Submission Module

Figure 7 illustrates the "Open a New Ticket" interface of the FCPC Ticketing System, where users can submit support requests based on predefined help topics. The form automatically fills in essential information such as the user's email address and client identity, based on their login credentials. The Help Topic dropdown menu organizes concerns into four categories: Account Access Issues, Equipment Request, Internet/Wi-Fi Issues, and Reporting a Technical Problem. This categorization helps ensure that each ticket is properly routed to the correct department. By providing a structured submission process, the system supports faster and more accurate issue resolution from the very beginning.

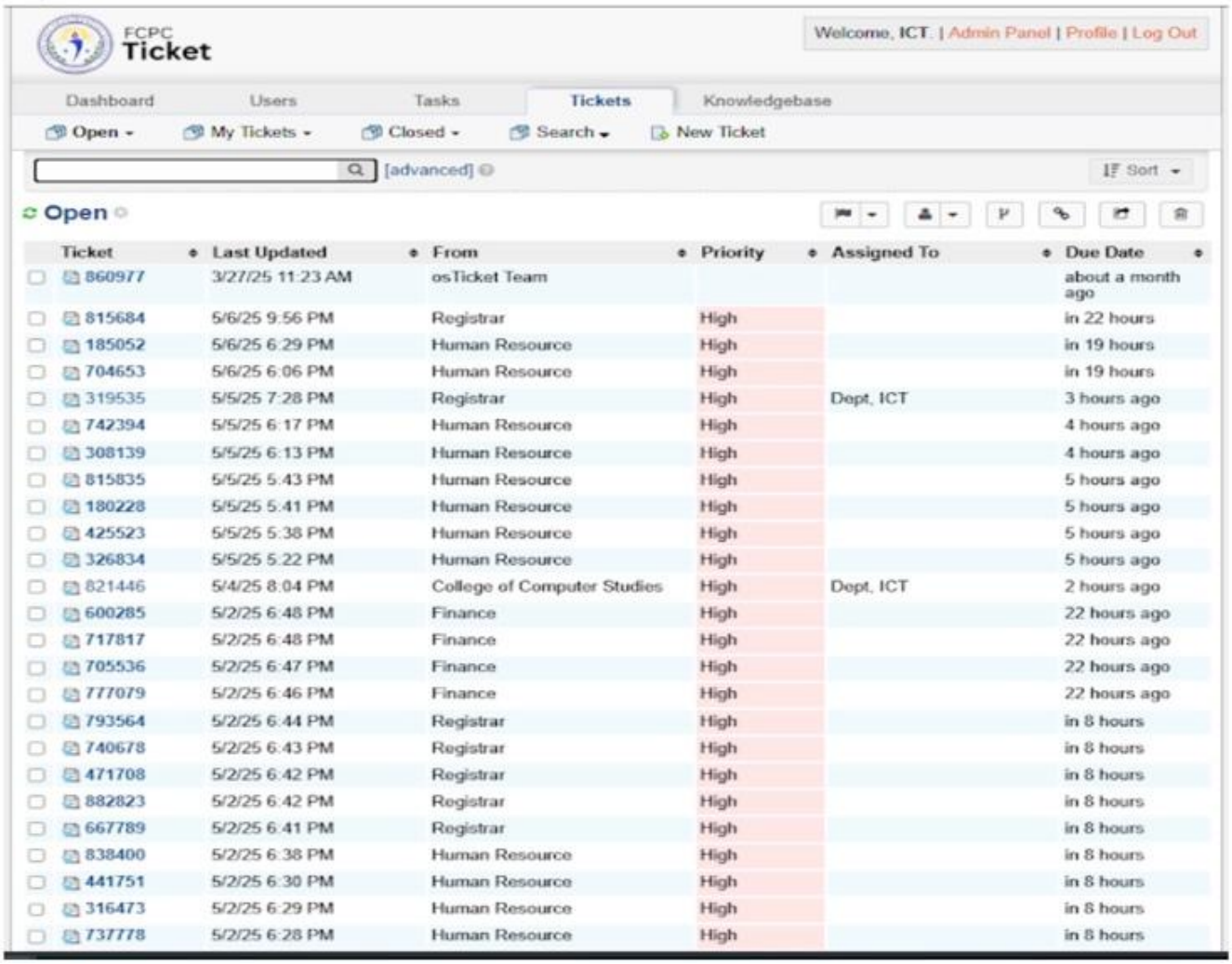

Figure 8. osTicket Ticket Management Module

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Figure 8 demonstrates the ticket management dashboard of the FCPC Ticketing System from the admin or agent perspective. This interface presents a real-time list of open tickets, showing key details such as the ticket number, last update, originating department, priority level, assigned personnel, and due dates. The color-coded priority indicator helps highlight urgent concerns, enabling faster and more efficient prioritization. Through this centralized dashboard, admins and agents can filter, search, and manage tickets with ease, supporting organized workflow distribution and improving response times across college departments.

User Evaluation and Statistical Analysis

The user evaluation measured the usability, functionality, and overall effectiveness of the osTicket system among faculty, staff, and ICT personnel of FCPC. Respondents assessed the system based on clarity of interface, ease of submitting and tracking tickets, responsiveness of support staff, and improvement in communication and workflow. A standardized Likert-scale questionnaire was administered to end-users and ICT personnel to capture their experience with the deployed system.

Results indicate that users found the ticketing system intuitive and efficient. Most respondents agreed that osTicket simplified the reporting of technical issues, provided clearer updates on the progress of their concerns, and reduced delays caused by manual reporting. ICT staff likewise noted improvements in organizing support requests, identifying priorities, and maintaining documentation for future reference.

Figure 9 below, shows the distribution of points across departments. The Finance Department scored the highest at 20.0%, followed by the Registrar and IT Department with 16.7% each. All other departments—CAS, CCS, COBM, COED, HR, Library, and Marketing—shared an equal score of 6.7%. This suggests strong participation from key departments, particularly those with higher support or service demands. The uniform scores among the remaining departments indicate generally balanced involvement, possibly reflecting similar usage levels or standardized reporting patterns.

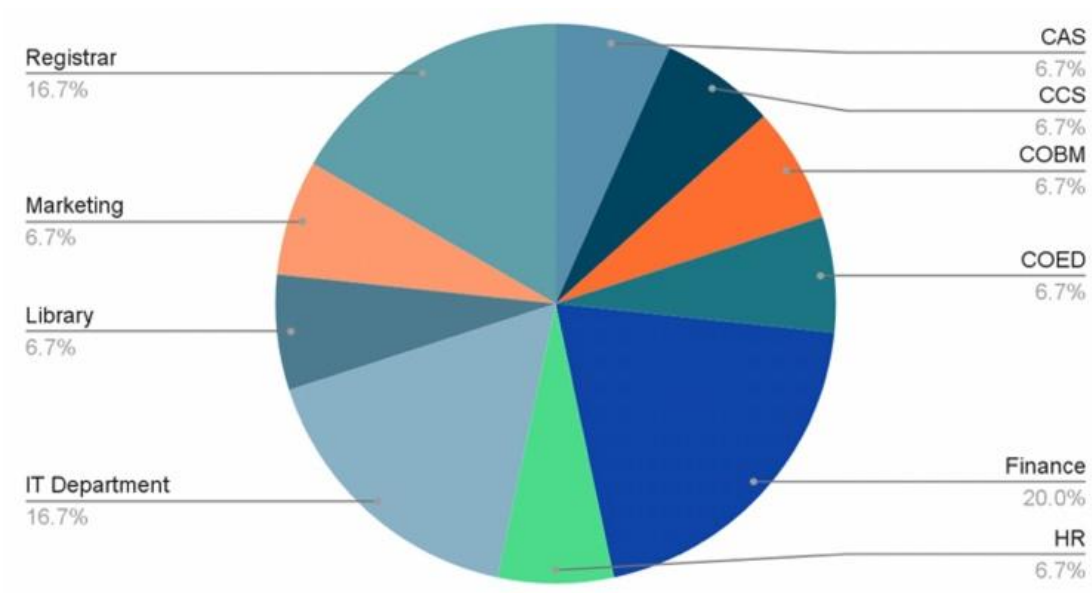

Figure 9. Distribution of User Satisfaction Across Departments in Using The osTicket System

Table I User Perception on the Ease of Submitting Requests Using osTicket

Indicator	Frequency	Mean	Equivalent
Ease of Submitting Request Using osTickets			
Always	8	4.00	Often
Often	15		
Sometimes	6		
Rarely	1		
Never	0		

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Table I presents the respondents' perception of the ease of submitting requests using the osTicket system. The data shows that most users find the system easy to use. A total of 15 respondents answered "Often," while 8 respondents answered "Always," indicating that the majority consistently experience ease when submitting their requests. Meanwhile, 6 respondents selected "Sometimes," suggesting that a smaller portion of users encounter occasional difficulty. Only 1 respondent answered "Rarely," and none reported "Never," showing that very few users struggle with the process.

Based on the computed mean of 4.00, the overall equivalent rating is "Often," which signifies that users generally perceive osTicket as an accessible and user-friendly platform for submitting support requests.

Table II User Perception on the Tracking the Progress of Tickets

Indicator	**Frequency**	**Mean**	**Equivalent**
Tracking the Progress of Tickets			
Always	14	4.23	Often
Often	11		
Sometimes	3		
Rarely	2		
Never	0		

The table shows the respondents' perception of how easy it is to track the progress of their tickets in the osTicket system. The results indicate that a majority of users find the tracking features convenient and accessible. Fourteen respondents selected "Always," while 11 respondents answered "Often," showing that most users consistently experience ease in monitoring their ticket status.

A smaller portion of respondents reported occasional difficulty, with 3 selecting "Sometimes" and 2 selecting "Rarely." Notably, no respondents chose "Never," indicating that all users are able to track their tickets to some extent.

The computed mean score of 4.23, equivalent to "Often," reflects a generally positive perception, suggesting that the osTicket system provides effective and user-friendly tools for tracking request progress.

Table III Timeliness of System Responses to User Concerns

Indicator	**Frequency**	**Mean**	**Equivalent**
Timely Response to User Concerns			
Always	8	4.00	Often
Often	11		
Sometimes	10		
Rarely	1		
Never	0		

Table III shows that the majority of respondents (n=30) perceive the system as timely in addressing user concerns, with a mean score of 3.86, interpreted as "Agree." Most responses fall under "Agree" (11) and "Strongly Agree" (8), while 10 respondents selected "Neutral." Only 1 respondent chose "Disagree," and none selected "Strongly Disagree." This indicates that users generally view the system as responsive, although the number of neutral responses suggests that some users may not consistently experience timely feedback.

These findings are consistent with prior studies on helpdesk and ticketing system usability. For example, Afandi and Santoso (2025) reported that usability enhancements in a public-sector helpdesk system improved

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user satisfaction and streamlined service request handling. Their results support the idea that well-designed ticketing systems lead to better user experiences, similar to the positive perceptions reported by respondents in this study regarding the osTicket system.

Table IV User Perception on the Clarity and User-Friendliness of the Interface and Layout

Indicator	**Frequency**	**Mean**	**Equivalent**
Interface Clarity and Visibility			
Strongly Agree	11	3.96	Agree
Agree	10		
Neutral	6		
Disagree	3		
Strongly Disagree	0		

As shown in Table IV, the majority of respondents (n=30) find the system's interface and layout clear and user-friendly, with a mean score of 3.96, interpreted as "Agree." Most responses fall under "Strongly Agree" (11) and "Agree" (10), while 6 respondents selected "Neutral." Only 3 respondents answered "Disagree," and none chose "Strongly Disagree." This indicates that users generally view the interface as easy to navigate and visually clear, although a few users may have mixed or less favorable experiences.

This finding aligns with the case study by Afandi and Santoso (2025), which showed that enhancements in usability and interface clarity significantly improved user experience in the ESDM 136 Contact Center's ticketing system. Similarly, Tsai et al. (2023) conducted a usability evaluation of self-service ticketing kiosks in cinemas and found that clear interface presentation and strong visual cues were essential in boosting operational efficiency and user satisfaction. These studies support the positive perceptions observed in this research, highlighting that a well-designed, intuitive interface plays a crucial role in ensuring a smooth and efficient ticketing experience.

Table V Time Saving Benefits of osTicket over Manual Request System

Indicator	**Frequency**	**Mean**	**Equivalent**
osTicket Saves Time			
Very Beneficial	11	4.10	Beneficial
Beneficial	13		
Neutral	4		
Not Beneficial	2		
Not at All Beneficial	0		

Table V shows that the majority of respondents (n = 30) perceive osTicket as time-saving compared to manual request systems, with a mean score of 4.1, interpreted as "Beneficial." Most responses were categorized as "Very Beneficial" (11) and "Beneficial" (10), while 6 respondents remained "Neutral." Only 3 respondents selected "Not Beneficial," and none chose "Not at All Beneficial." These results suggest that users generally view osTicket as an effective tool for saving time, although a few respondents expressed neutrality or mixed experiences regarding its usefulness.

This finding aligns with Hidayah and Salsabilla (2023), who reported that users of the M.TIX ticket purchasing app felt confident and independent when interacting with the system, noting that a clear and user-friendly interface significantly enhanced user autonomy. Similarly, Putri and Liu (2024) found that users of the

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Ticket.com app appreciated its ease of navigation, which increased their sense of control and reduced reliance on external assistance. Both studies underscore the importance of designing systems with usability in mind to foster user confidence and independence.

Table VI Respondent's Self-Sufficiency in Using osTicket

Indicator	**Frequency**	**Mean**	**Equivalent**
Confidence in Using osTicket			
Very Confident	18	3.46	Confident
Confident	5		
Neutral	8		
Not Confident	3		
Not at All Confident	4		

Table VI illustrates that the majority of respondents (n = 30) feel confident using osTicket, with a mean score of 3.46, interpreted as "Confident." Most responses were categorized as "Confident" (10) and "Very Confident" (11), while 6 respondents remained "Neutral." Only 3 respondents selected "Not Confident," and none chose "Not at All Confident." These results suggest that most users are comfortable using osTicket independently, although the presence of neutral responses indicates that some users may still have reservations about their level of confidence with the system.

This finding is supported by Purba et al. (2024), who evaluated a ticket ordering application using the System Usability Scale (SUS) and the D&M IS Success Model. Their study found that systems with high usability and user satisfaction significantly enhance user confidence and reduce reliance on external support. Similarly, Ferreira et al. (2018) conducted a usability evaluation of a public transport mobile ticketing solution and concluded that well-designed interfaces improve user understanding and efficiency, emphasizing the importance of intuitive design in fostering confidence and minimizing support needs.

Table VII Respondent's Satisfaction with Their Experience Using osTicket

Indicator	**Frequency**	**Mean**	**Equivalent**
Satisfied with the Overall Experience Using osTicket			
Very Satisfied	10	4.16	Satisfied
Satisfied	17		
Neutral	**1**		
Not Satisfied	2		
Not at All Satisfied	0		

Table VIII shows that the majority of respondents (n=30) are satisfied with their overall experience using OsTicket, with a mean score of 4.16, interpreted as "Satisfied." Most responses fall under "Satisfied" (17) and "Very Satisfied" (10), while 1 respondent remained "Neutral." Only 2 respondents selected "Dissatisfied," and none chose "Very Dissatisfied." This suggests that users generally have a positive experience with OsTicket, although a small number of users may have specific concerns or areas for improvement.

This finding is further supported by Fina and Santoso (2024), who showed that the design of the interface and self-service features in e-commerce help center applications play a key role in overall user satisfaction. Their study highlighted that improving the ease of use and clarity of the interface can lead to higher satisfaction. Similarly, Attamimi and Tileng (2021) conducted research on Shopee's mobile application and found that

making usability improvements through cognitive walkthroughs significantly boosted user satisfaction and confidence. These studies emphasize the importance of good design in creating a positive user experience.

Summary of Findings

This study focused on evaluating the effectiveness and usability of the osTicket system, specifically its impact on administrative operations, communication, and user satisfaction at First City Providential College (FCPC). Through a comprehensive analysis of various performance indicators, the findings provide an insight into how osTicket has influenced ticket management, response time, and communication efficiency.

Key findings from the research include:

Ease of Submitting Requests: The majority of respondents found it manageable to submit requests through osTicket, with most indicating that it was "Often" easy to do so. The system was perceived as user-friendly, but some users reported occasional difficulty in submission.

Tracking Ticket Progress: Respondents found it convenient to track the progress of their tickets, though some still encountered challenges with the tracking feature.

System Response Time: The system was generally regarded as timely in addressing user concerns, with the majority agreeing that osTicket improved response times.

Interface Usability: The system's interface was evaluated as clear and easy to navigate by most respondents, though some users indicated that improvements could be made.

Time-Saving Benefits: OsTicket was widely seen as a time-saving solution compared to manual request systems, indicating positive impacts on operational efficiency.

Overall Satisfaction: A large number of respondents were satisfied with their experience using osTicket, affirming the system's utility in enhancing support service delivery.

CONCLUSIONS AND RECOMMENDATIONS

The implementation of the osTicket system at FCPC has noticeably improved administrative workflows and the overall management of support requests. Its user-friendly interface and structured ticketing process have strengthened communication between users and ICT personnel, resulting in faster response times and more organized handling of technical concerns. The system has successfully streamlined internal communication, reduced staff workload through automation, and increased user satisfaction due to its clarity and ease of use. Despite these strengths, some areas still require enhancement. A number of users reported challenges with ticket tracking, particularly in identifying repeated issues, and occasional difficulties navigating specific interface elements. These concerns highlight opportunities for continued system refinement and user support.

Based on the findings, the following recommendations are proposed to further optimize the osTicket implementation at FCPC:

Enhance Training and Support

Provide regular training sessions, especially for users who experienced difficulty navigating the system. This will help increase user confidence and ensure consistent use of the platform's features.

Improve Interface Usability

Conduct periodic usability evaluations to identify interface elements that can be made more intuitive. Implementing user feedback will help create a smoother experience for all staff.

Refine Tracking and Reporting Features

Improve the detection and monitoring of recurring issues and enhance reporting functions to support better analysis of service performance.

Integrate Automated Response Features

Consider adding chatbots or automated replies to reduce response time for common inquiries, especially during off-hours or peak demand.

Perform Regular System Updates

Ensure osTicket remains stable, secure, and compatible with new technologies by applying routine updates and addressing any emerging technical issues.

In summary, the study demonstrates that osTicket is an effective tool for improving FCPC's support service operations. It enhances communication, reduces response time, and provides users with a reliable platform for submitting and tracking concerns. While the system performs well overall, targeted improvements in usability, tracking, and automation—paired with ongoing user training—will help maximize its potential and ensure sustained service excellence across the institution.

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