

ICT HELPDESK TICKETING MANAGEMENT SYSTEM

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ABSTRACT

This study aimed to develop an ICT helpdesk ticketing management system for St. Paul University Philippines (SPUP). It also sought to provide a systematic helpdesk ticketing management system through which IT-related problems, issues, and concerns are reported, managed, and organized. The researchers used AGILE methodology in collecting and analyzing the data and in designing the developed system. Random sample of faculty and staff as representatives from each of the different offices/units in the University were the study participants. The interview guide was used for data gathering. The creation of web-based system was among the participants' suggestions to address the problems and challenges, and to improve the current manual helpdesk management system. With this, a web-application was developed to manage, report, track, and store reported data related to IT problems, issues, and concerns in the organization. The researchers concluded that the developed system can automate and keep track of the reported IT-related problems and issues, and print reports efficiently.

Keywords: *Helpdesk Management System, Web-Based system, Automate, Systematic, Ticketing Management System*

INTRODUCTION

Information Technology (IT) for end-users surfaced as one of the leading concerns of organizations. Technology has become so advanced that it is imperative to continuously adapt and update existing technologies for effective and efficient help desk services for organizations. Customer service representatives act as a liaison who provides product/services information, answer questions, and resolve any emerging problems to serve customers directly or via phone calls. When a problem has been reported, the customer service representatives must solve the problems quickly and find ways considered as the best solution. To satisfy the growing customer demands, organizations must actively search for a new way to provide a better help desk service.

Helpdesk is a customer support center in an organization that provides information, administrative and technical support to users, with the view to solving problems that users encounter using the organization resources or facilities. A helpdesk could comprise one person or group of persons that make use of telephone devices or software applications to keep track of problem(s) status and thus provide solutions that satisfy the users (Udoro, 2021).

Helpdesk is basically a center to which problems/ issues are reported and then managed and coordinated. From a general or wider perspective, it is an integral part of the service function, responsible for bringing resources together to address a problem or other issues. Helpdesk users can be internal or external, making the function potentially critical in terms of the quality of support offered to customers. (The Help Desk Software, 2002).

The study of Masongsong and Damian (2016) on Helpdesk Management System stated that the normal scenario in everyday work is related to technical concerns both in education and corporate. Thus, there is a need to monitor these concerns constantly and effectively that requires a system that can handle it. With this, an automated Help Desk: Customer Support for Information Technology Resource Center is a fit solution that can provide effective approach in handling all reported technical concerns with proper record keeping and monitoring to clients and technical personnel as well as systems administrators. Moreover, Helpdesk management system could be seen as an information and assistance

resource that supports the functionality of an organization by responding to users' requests in a timely manner. It is a core sector through which problems, complaints and requests are reported, managed, coordinated, and resolved.

Today Helpdesk systems take a large place along with developing Information Systems. These systems where internet users obtain information of the system's overall structure after entering the system and step by step solutions for frequently asked questions (Serbest et al., 2015).

Ismaili et al. (2018) stated in their study that as companies grow, so do the complex demands placed on the IT Department. Without a good Help Desk Software, IT departments can begin losing the ability to effectively provide employees with the technical support they need to do their jobs. Many enterprises rely on IT Ticketing Systems to deliver fast and reliable internal customer service, resulting in improved IT department operations and satisfied employees.

Another research from Wang et al. which developed *iHelp*: An Intelligent Online Helpdesk System gives importance to high-quality customer service, propelled many companies to use intelligent helpdesk systems (e.g., case-based systems) for improvement of customer service quality. *iHelp* is an intelligent online helpdesk system to automatically find problem–solution patterns from the past customer–representative interactions. When a new customer request arrives, *iHelp* searches and ranks the past cases based on their semantic relevance to the request, groups the relevant cases into different clusters using a mixture language model and symmetric matrix factorization and summarizes each case cluster to generate recommended solutions.

Cassandra et al. (2018) stated in their study that a service company, helpdesk or customer service is a very important part of a company. Good customer support and services will help companies to sustain and maintain the customer. Nowadays, customers are getting used to using applications during the development of technology and internet. It is very important for service company to also take part in developing a good helpdesk system for handling complaints and service. A good service will improve the service quality which are impacted to the loyalty of customers.

Ticketing is an interruption ticket (or also called a problem report) that is used in an organization to track detection, reporting and resolution of several types of problems. Trouble ticketing systems come from manufacturing a basic paper reporting system. Now it's mostly web based (Suryono and Saptono, 2017).

The Helpdesk is the IT part that the user first communicated when having questions or problems related to IT (Sipayung et al., 2017). The Helpdesk is a center point of an organization that helps deal with customer or user needs related to questions, services, technical support, or complaints about certain services by utilizing a numbering system (ticket request) to facilitate tracking of settlement actions coordinated by a team. A software must be able to categorize problems, keep knowledge of the solutions obtained and prioritize workmanship. This also helps IT staff when facing a problem in a company with many users. With the increasing number of complaints that occur every day, the use of e-mail and telephone is less efficient and effective in handling these complaints because it will be increasingly difficult to control the complaints made by the customers.

Wibowo and Metandi (n.d.) stated that Helpdesk Ticketing System application is an application that can facilitate users with technicians in resolving a problem quickly and accurately. The Ticketing System Helpdesk application itself has been used by many companies and agencies. This application is considered to facilitate the work of technicians technically because it can divide the work between technicians evenly, can facilitate users in reporting questions, services, technical support, or complaints about certain services so that the technicians can directly identify precisely.

At SPUP, the Information and Communications Technology (ICT) department is the central point where IT-related problems and issues are reported and coordinated. The faculty and staff have been doing manual communications in reporting IT-related issues and problems within the organization. The faculty and staff will make a request through internal local telephone calls by reporting and requesting for technical support in their respective offices and in the computer laboratories during class hours. IT technicians send them messages or reply to the queries, complaints, and issues manually. Some requests, problems, and issues were not able to resolve immediately due to lack of managing reported problems. It takes them a lot of time and labor to solve all the problems, queries,

and complaints. These problems have been encountered due to the manual way of informing and addressing concerns related to IT. Storing, monitoring, tracking resolved and unresolved issues, and handling complaints are also some of the problems encountered. Moreover, some reported IT-related problems were pending due to the manual way of notifying reported problems and issues.

On the other hand, transactions and processes done with the use of automated system are performed with ease, speed, and accuracy. All queries, complaints, and issues that will be posted in the system will be monitored by the technician for immediate solution. Hence, it is believed that the implementation of the helpdesk ticketing management system in the University will be essential in providing good services to the faculty, staff, and administrators. This system will meet customers' needs by providing them technical support for their relevant issues and the time-period for solving the problems will be much faster.

Conceptual Framework

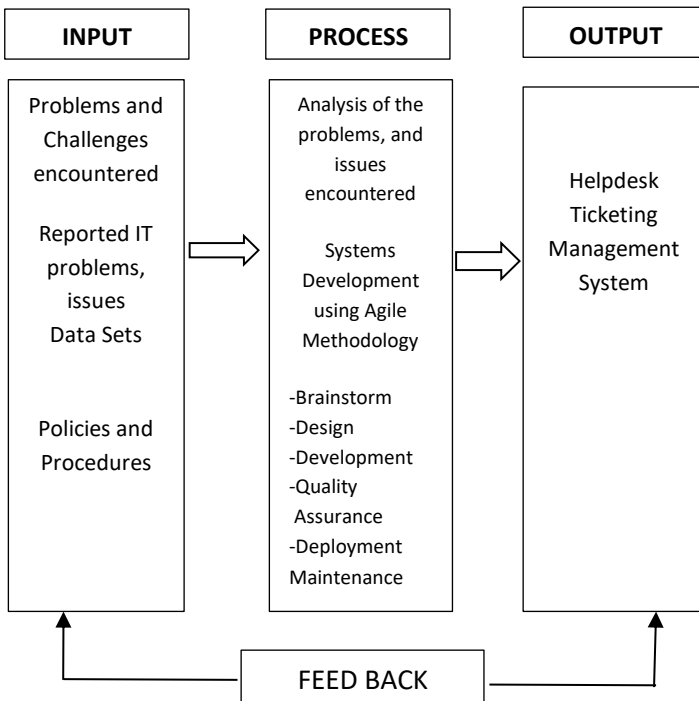


Figure 1

Paradigm of the Study

The researchers considered the input-process-output (IPO) model to present the framework on which the study was anchored. The input includes the participants' problems and challenges that they encountered based on their reported problems, issues, and data sets, including policies and procedures (inputs). The process is the analysis of the data gathered such as problems and issues encountered by the participants, systems development using AGILE Methodology, and brainstorming, design, development, quality assurance, and development maintenance. The output includes the Helpdesk Ticketing Management System.

Statement of the Problem

This study aimed to develop an ICT help desk support management system. Specifically, it sought to answer the following questions:

1. What are the problems and challenges encountered by the participants in terms of the following?
 - 1.1 reporting IT-related problems, issues, queries, and complaints
 - 1.2 managing, storing, and tracking reported IT-related problems, issues, queries, and complaints
2. What system can be developed to address the existing problems and challenges by the participants?
3. What system enhancement can be done to improve the developed system?

METHODOLOGY

Research Design

The researchers used systems development research guided by the AGILE Model. The descriptive design was used in obtaining data about the preferred inputs for the development of the proposed ICT helpdesk ticketing management system.

Participants of the Study

Information on the problems and challenges encountered in requesting support for IT-related problems, issues, queries, and complaints involved in help desk management were given by the faculty and staff of SPUP. The researchers used random sampling to select the participants. Table 1 presents a summary of the participants involved in the study.

Table 1

Participants of the Study

Participants	Frequency	Percentage
Faculty	10	38.46
Staff	16	61.54
Office Staff	(10)	(38.46)
IT Support staff	(6)	(23.08)
Total	26	100.00

The participants of the study are the faculty, office and IT support staff of SPUP. Only ten (10) faculty were included, and sixteen (16) staff were selected from the office and IT unit.

Instrumentation

The following instruments were used in data gathering:

Interview Guide. Through the interview guide, the researchers obtained information from the faculty and staff to gather details on the helpdesk management procedures done in their respective unit and to acquire relevant information for the development of the proposed system.

Interview was conducted to the selected faculty and staff of St. Paul University Philippines to determine the problems and challenges in requesting support related to IT- problems.

Data Gathering Procedure

The following procedure was undertaken by the system developers/researchers:

1. The researchers sought permission from the ICT director regarding the conduct of the study.
2. The researchers secured an Informed Consent Form (ICF) from the faculty and staff participants by giving them information about the study to ensure their willingness to participate.
3. Upon securing permission from administrators and consent from participants, the researchers conducted interviews with the faculty and staff as regards the processes involved in helpdesk management using online resources such as Google Form and MS Teams.
4. From the results of the interview on the participants' problems, and issues encountered in reporting on and requesting IT-related problems, the researchers developed support for the proposed ICT helpdesk ticketing management system.
5. As the development of the system was in progress, the researchers interviewed the staff and faculty of the units regarding their observations and comments on the system which served as data for the enhancement of the proposed system.

Data Analysis

The following statistical tool was used in the treatment of the data:

Content/Thematic Analysis. This tool was utilized to group the problems and suggestions of the participants in common themes.

RESULTS AND DISCUSSION

Problems and Challenges encountered by the participants

The common problems and challenges encountered by the participants in reporting IT-related problems are the following:

- Time spent resolving the problems and issues

- Contacting the IT technician through phone call
- Numerous reports of problems when the IT technician is not available
- Hard time in reaching out the IT technicians when not in the ICT office
- The far distance of the ICT office from the other offices if phone call is not available
- Insufficient management of reports on IT-related problems, issues and concerns some documents and records affect the performance of the university. This is when the records are not well stored and managed accordingly.

The common problems and challenges encountered by the IT technicians in managing IT-related reports are the following:

- Retrieval of accomplished request and report form
- Manually tracking of solved and unresolved reported problems
- Preparation of reports
- Using of manual logbook for reporting problems and issues
- No monitoring of reported issues, problems encountered related to IT.
- Manually writing of the ICT report
- Difficulty in generating reports

ICT helpdesk ticketing management system

The ICT helpdesk ticketing management system is a web based local system that can be accessed by two types of end-users: the customers and the ICT technical staff. The ICT technical staff can manage and provide helpdesk support to all IT-related problems, queries and services reported by the customers from the different units/offices of SPUP more efficiently. The system will generate a ticket number (*called problem report*) to the admin, as soon as the report is sent by the users (*faculty and staff*). The admin user can view customer report based from the active ticket. It has a feature to generate daily, weekly, and monthly reports with data analytics showing the percentage of accomplishment, with pending or closed/resolved cases, and summary display of resolved problems done by the assigned technicians. The ticket number system has also a feature of email notification for customers confirming that the reported problem has been resolved.

Below is the screen shot of the system.

Admin's View

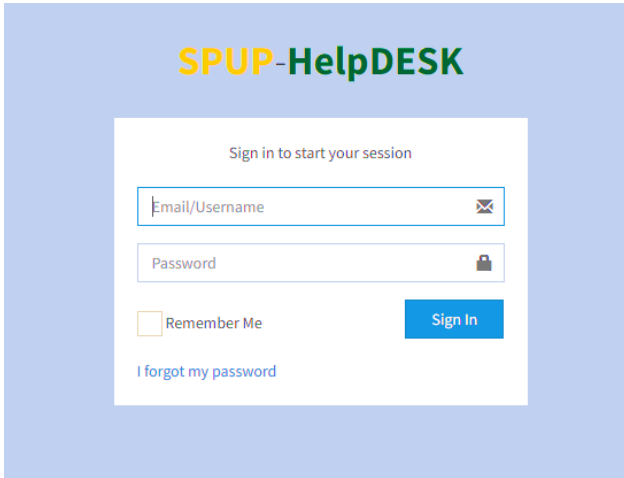


Figure 2
Log-in Screen

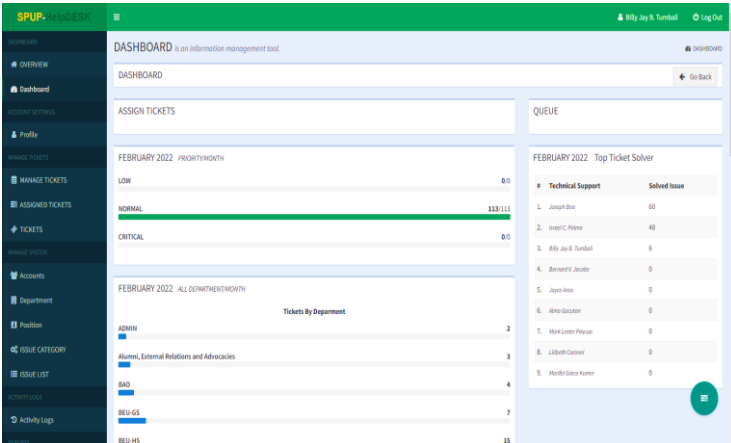


Figure 3
Dashboard

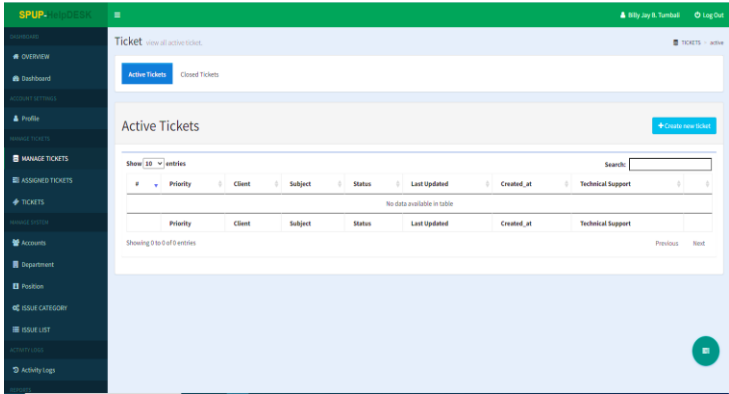


Figure 4
Active Ticket Views

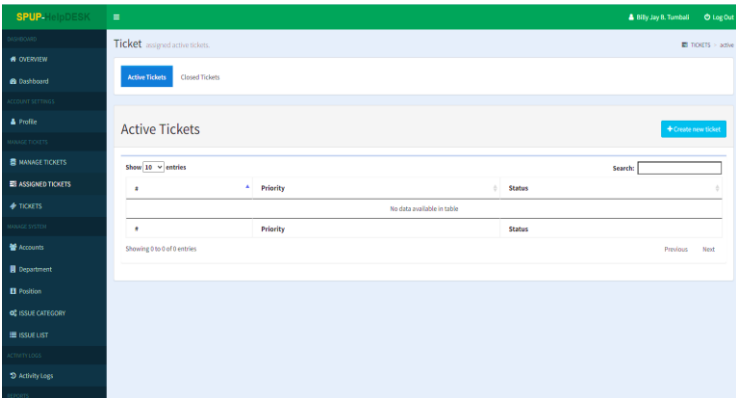


Figure 5
Create a New Active Ticket

St. Paul University Philippines
Tuguegarao City, Cagayan 3500.

Overall Report from 21/01/2022 12:00:00 AM to 22/02/2022 12:00:59 AM

Ticket #	Department	Category	Created At	Started	Ended	Status	Remarks
2623	Registrar Office	HARDWARE	21/02/2022 08:58 AM	21/02/2022 08:58 AM	21/02/2022 09:11 AM	closed	-Backup files of Man Jonalyn Completed
2622	SASTE	HARDWARE	21/02/2022 08:47 AM	21/02/2022 08:47 AM	21/02/2022 10:53 AM	closed	Done. Replaced the LCD panel and tested the all in one computer.
2621	SNAB	Wired and Wireless Internet Connection	19/02/2022 10:40 AM	19/02/2022 10:41 AM	19/02/2022 10:42 AM	closed	Done. Provided a Caritas WiFi voucher code and tested the internet connection.
2620	Graduate School	SOFTWARE	19/02/2022 10:38 AM	19/02/2022 10:38 AM	19/02/2022 10:44 AM	closed	Done. Created a MS-Teams account requested by Mr. Teshion B. Gueyay.
2619	ICT	OTHER SERVICES	19/02/2022 09:40 AM	19/02/2022 09:41 AM	19/02/2022 09:45 AM	closed	Done. Fixed the network cable at the Finoy Adobo.
2618	Registrar Office	HARDWARE	19/02/2022 08:29 AM	19/02/2022 08:29 AM	19/02/2022 09:18 AM	closed	Done. Reboot the memory module and tested the computer unit.
2617	Human Resource	BIOMETRIC	19/02/2022 08:19 AM	19/02/2022 08:25 AM	19/02/2022 10:21 AM	closed	-Reboot Bio metric Kiosk and tested
2616	SPB	HARDWARE	19/02/2022 02:00 PM	19/02/2022 02:01 PM	19/02/2022 02:02 PM	closed	-Scanned External Drive
2615	Graduate School	SOFTWARE	19/02/2022 09:46 AM	19/02/2022 09:46 AM	19/02/2022 09:47 AM	closed	-Reset the MS-Teams Password of Mr. Aaron V. Ancheta Graduate School Student
2614	Graduate School	SOFTWARE	19/02/2022 09:23 AM	19/02/2022 09:23 AM	19/02/2022 09:24 AM	closed	Done. Created the MS-Teams account for Mr. Jayson Guillermo Graduate School student.
2613	BEU-HE	HARDWARE	17/02/2022 04:37 PM	17/02/2022 04:37 PM	17/02/2022 04:48 PM	closed	-Replaced and tested Keyboard and Mouse
2612	BEU-GS	HARDWARE	17/02/2022 01:59 PM	17/02/2022 01:59 PM	17/02/2022 02:16 PM	closed	-Re installed LAN Card driver / Internet connection tested
2611	ICT	TELEPHONY	17/02/2022 12:04 PM	17/02/2022 12:04 PM	17/02/2022 12:06 PM	closed	-Re terminate LAN cable and Call Tested
2610	SNAB	TELEPHONY	17/02/2022 11:43 AM	17/02/2022 11:43 AM	17/02/2022 12:15 AM	closed	Done. Checked and tested the VOIP phone and removed the DNS configuration.
2609	Graduate School	PRINTER	17/02/2022 09:42 AM	17/02/2022 09:43 AM	17/02/2022 09:44 AM	closed	Done. Installed and tested the HP LaserJet Pro M122a. Empty cartridge
2608	Graduate School	PRINTER	17/02/2022 09:42 AM	17/02/2022 09:43 AM	17/02/2022 09:44 AM	closed	Done. Checked the Hp LaserJet printer P1102, Remarkal Empty cartridge
2607	BEU-HE	TELEPHONY	17/02/2022 09:31 AM	17/02/2022 09:31 AM	17/02/2022 09:45 AM	closed	-Tap the power adapter of the voip unit and call and received call tested
2606	Graduate School	HARDWARE	17/02/2022 09:17 AM	17/02/2022 09:17 AM	17/02/2022 09:18 AM	closed	Done. Checked the monitor and plug the monitor power cable.
2605	BEU-HE	Wired and Wireless Internet Connection	17/02/2022 09:02 AM	17/02/2022 09:02 AM	17/02/2022 09:04 AM	closed	-Renew Caritas voucher and tested internet access
2604	Registrar Office	HARDWARE	17/02/2022 08:18 AM	17/02/2022 08:18 AM	17/02/2022 08:57 AM	closed	-Backup files completed

Figure 6
Summary Report's view

User's View

The screenshot shows the SPUP HelpDesk interface. On the left is a dark sidebar with navigation links: Dashboard, Profile, My Tickets, TICKETS, Activity Logs, and CREATE REPORTS. The main area has a header with the user's name 'Genie M. Mallonga' and a 'Log Out' button. Below the header are tabs for 'Active Tickets' and 'Closed Tickets'. The 'CREATE NEW TICKET' section includes a 'Request' text input field, a 'Details' text input field, and a 'Location' dropdown menu. A blue 'Submit' button is located at the bottom of the form.

Figure 7
Create a New Ticket

The screenshot shows the 'Closed Tickets' section of the SPUP HelpDesk interface. It features a sidebar with navigation options like Dashboard, Profile, and Tickets. The main content area displays a table of closed tickets with columns for ID, Subject, Status, Last Updated, and Technical Support. A search bar and a 'Create new ticket' button are also visible.

#	Subject	Status	Last Updated	Technical Support	Action
1481	To reset the MS Teams account password	CLOSED	2 months ago	Israel C. Palma	Action
1480	Technical Assistance	CLOSED	2 months ago	Israel C. Palma	Action
1475	To check the VOP phone	CLOSED	2 months ago	Israel C. Palma	Action
1474	Request technical support, Printer not printing properly	OVERDUE/CLOSED	3 months ago	Billy Jay B. Sumbali	Action
1469	Request MS Teams Sharing files MACBOOK screen be Mirrored	CLOSED	3 months ago	Billy Jay B. Sumbali	Action
1417	Request to check MS Teams file sharing	CLOSED	3 months ago	Billy Jay B. Sumbali	Action
1408	Technical Assistance	CLOSED	6 months ago	Israel C. Palma	Action
1384	To create MS-Teams account of Mr. Subelo Phat Jr.	CLOSED	6 months ago	Israel C. Palma	Action
1380	Installation of 2 monitor user	CLOSED	7 months ago	Israel C. Palma	Action

Figure 8
Closed Ticket

The screenshot shows the 'Activity' section of the SPUP HelpDesk interface. It displays a table of user activities with columns for IP Address, Message, and Date/Time. The table lists various actions such as 'visited create report form', 'visited system activity logs', and 'login client account successful'. A search bar and pagination controls are also present.

Ip Address	Message	Date/Time
172.16.201.112	visited create report form	2022-05-17 11:12:54 AM
172.16.201.112	visited system activity logs!	2022-05-17 11:12:53 AM
172.16.201.112	login client account successful!	2022-05-17 11:12:50 AM
172.16.201.112	visited system activity logs!	2022-05-17 11:12:45 AM
172.16.201.112	visited user ticket closed list!	2022-05-17 11:11:29 AM
172.16.201.112	visited user ticket active list!	2022-05-17 11:11:24 AM
172.16.201.112	visited client create ticket form!	2022-05-17 11:06:48 AM
172.16.201.112	visited user ticket active list!	2022-05-17 11:06:43 AM
172.16.201.112	login client account successful!	2022-05-17 11:06:24 AM
172.16.201.112	login client account successful!	2022-05-17 11:06:20 AM

Figure 9
Activity Logs

Enhancement of the System

For future enhancement of the system, the following suggestions were made:

- Embedding of the booking system and borrowing for all the computer laboratories for easy tracking and requesting of the use of the laboratory;
- Embedding of the purchase and inventory system for all the ICT equipment within the university; and
- Inclusions of SMS for new task assigned to the technician.

CONCLUSION

Based on the findings of this study, the researchers conclude that the developed ICT helpdesk ticketing management system for the different offices of St. Paul University Philippines automates the reporting of IT-related problems and issues. This application is useful in monitoring and handling user concerns for action by the IT Department, particularly in handling data repairs and handling hardware damages. The system stores and records problems that are carried out systematically so the data will not get lost. Moreover, it can manage various transactions and processes including reports needed and tracking of actions being done that can be generated easily and efficiently.

RECOMMENDATIONS

From the obtained findings and conclusion, the researchers recommend the following:

1. The ICT Helpdesk Ticketing Management System should be adopted and implemented in the different offices of SPUP to manage reported IT-related problems queries and complaints and keep track of the ICT office documents;
2. The administration should consider the utilization of the proposed system to enhance the existing manual helpdesk management of the ICT department and offices;
3. The administration should support the implementation of the proposed system by providing hardware and software resources;
4. The researchers should provide an orientation on the use of the developed ICT helpdesk ticketing management system to all the users;

5. The researchers should be permitted by the ICT director to present the developed system to the academic council; and
6. Faculty, and staff of the different offices should be given training and immersion on the use of the ICT Helpdesk Ticketing Management System.

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