WI-FI CAPTIVE PORTLET IMPLEMENTING INTERNET OF EVERYTHING FOR TRIMEX COLLEGES INC.

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Abstract: The purpose of this study is to create a framework and test model that will provide an internet connection in Trimex Colleges, located in Biñan City, Laguna. The captive portal is a website or splash screen that will be shown until users can access the internet, applications or services using a desktop or mobile device. Often, captive portals display as login interfaces to guest Wi-Fi connections, like those you find in campus and nearby. Trimex Colleges focuses on all aspects of teaching, make teachings easier by providing a framework and set of tools for an additional tool such as the proposed Wi-Fi Portlet Implementing (IoE) for Trimex Colleges Inc. Biñan, Laguna. The Wi-Fi Portlet Implementing (IoE) is created to address the problem of expensive mobile data and internet connectivity. Since most students nowadays owns a smartphone with Wi-Fi capability, we can utilize the unlimited plans of our telecommunications/internet service provider by giving them privilege of internet usage using Wi-Fi Portlet system.

Keywords: Captive portal; Wi-Fi hotspot; Wi-Fi portlet system; Campus Wi-Fi

I. INTRODUCTION

A captive portal is a web page accessed with a web browser that is displayed to newly connected users of a Wi-Fi network before they are granted broader access to network resources. Captive portals are commonly used to present a landing or log-in page which may require authentication, acceptance of an end-user Wi-Fi notice agreement, acceptable use policy, survey completion, or other valid credentials that both the host and user agree to adhere by. Captive portals are used for a broad range of mobile and pedestrian broadband services - including cable and commercially provided Wi-Fi hotspots.

II. BACKGROUND

Trimex Colleges focuses on all teaching aspects, making teaching simpler by offering an additional tool system and collection of tools, such as the proposed Wi-Fi Portlet Implementation (IoE) for Trimex Colleges, Biñan, Laguna. As a student, we encountered the problem of school not having an internet access needed for the research.

The Wi-Fi Portlet Implementing (IoE) is planned to address the question of expensive mobile data and internet access. Because most students already own a Wi-Fi-capable smartphone, we can use our telecommunications/internet service provider's unlimited plans by granting them internet use privilege upon enrollment using the Wi-Fi Portlet system.

A. OBJECTIVE OF THE STUDY

The goal of the study is to give Trimex Colleges staff and students internet access to support the advertising school management as well as students and teachers for the research study. This study specifically aims to built and develop system that:

- To develop a module that will provide an accessible internet connection for students or school staff for online references
- To develop a module that will permit the administrator to view the devices within corresponding vouchers codes and allows the connection upon verification of the system
- To develop a module that can generate and validate vouchers for the client to use as access to the internet
- To develop a module that will inform students about school announcement and updates upon connecting on the portal
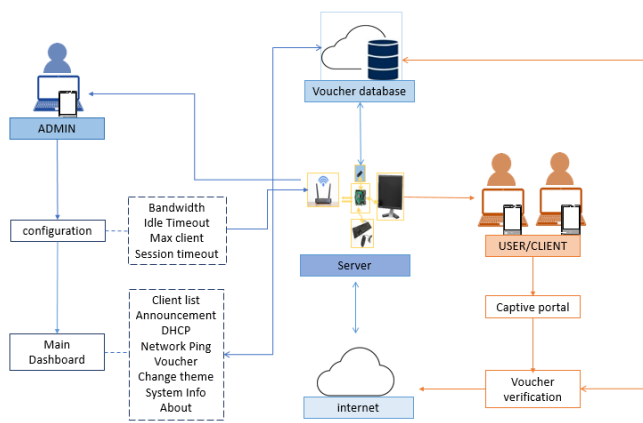
III. DESIGN OF THE STUDY

Figure 1: System Architecture

Figure 1 shows the system architecture of the system. The admin is connected to the server and then the system is configured. Once it is efficient, it will go to the Client List, Announcement, DHCP, Network Ping, Voucher, Change Theme, and Device Details and About tab of the Main Dashboard. The Voucher Database is linked to the main dashboard where the voucher code can be created by the admin. The client could go to the Trimex Captive Portal page and then needs to verify the Voucher Code, once verified, the client can use the internet.
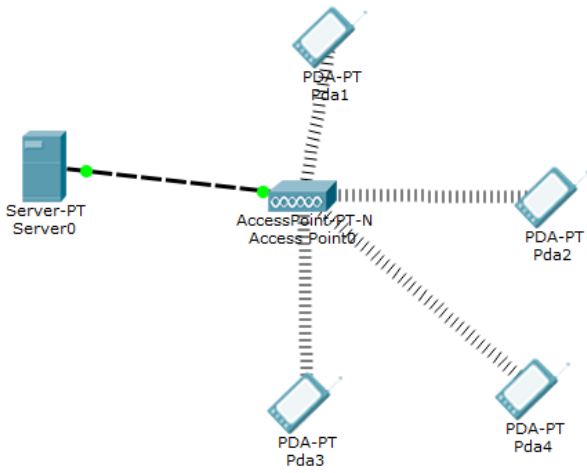

Figure 2: Hardware Interface

Figure 2 above shows the network connectivity of each devices. There is only one server that caters all the system such as voucher generator, uploading of updated school announcement, network configuration and testing. This server will also cater for access point setup, hardware and system control, as well as client devices. By entering the voucher generated by the system, they can easily access the captive portal and the internet will activate it and can be used in research using the updated browser.
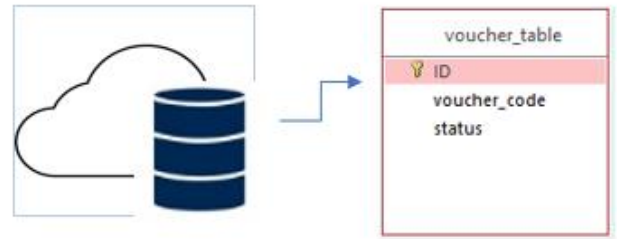

Figure 3: Database Schema

Figure 3 shows the database design of the proposed system. The researchers come up with a cloud based storage for the generation of voucher code for less cost with higher and enhanced storage functionality of the system
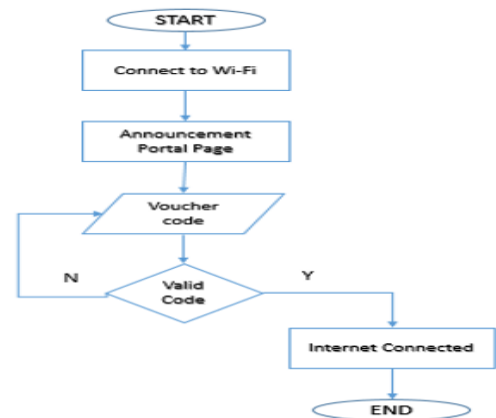
A. FLOWCHART

Figure 4: User/Client Captive Portal Module

Figure 4 shows the user go to the Wi-Fi setting and then connects to the Wi-Fi network of the device. After connecting to the Wi-Fi network, a captive portal webpage will open. The user will be directed to the announcement page then click proceed. The user will enter the voucher code then the user is now connected to the internet.
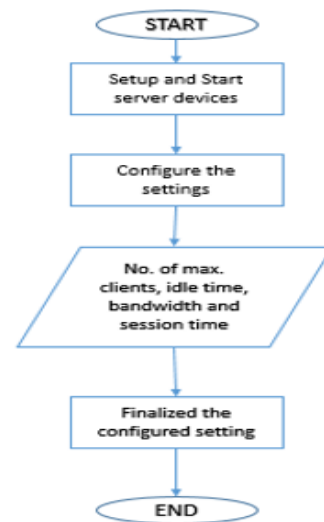

Figure 5: Administrator Configuration Module

Figure 5 shows how the administrator to manage and operate the system of the list of user to access the Wi-Fi, can set how many minutes will be credited of the user. This option can be empowered or disabled within the admin configuration setting. The framework features built - in transfer speed limiter per client. It guarantees that each client will get a break even with transfer speed allotment and web speed. This avoids from mishandling your web association.

Admin can operate the idle time out. The system has the feature of pre-authentication idle timeout and authentication idle timeout. Pre- authentication idle is when the user is still not yet verified or allowed to connect to the internet and not doing anything. Authentication idle is when the user is connected but not doing anything.

Once the client is idle for 2 minutes to save up data usage, client will be automatically kick out from the portal. Admin can set the default transfer speed assignment configured at 512 kbps transfer and 512 kbps download with the recommended data usage per client for a 250 users with ISP speed of 125 mbps. Although a 512 kbps is not very fast but still enough for surfing the net. Transmission capacity limiter (per client) depends upon the speed of the ISP. It guarantees that each client will get a break even with transmission capacity allotment and web speed. This avoid clients from mishandling your web association.
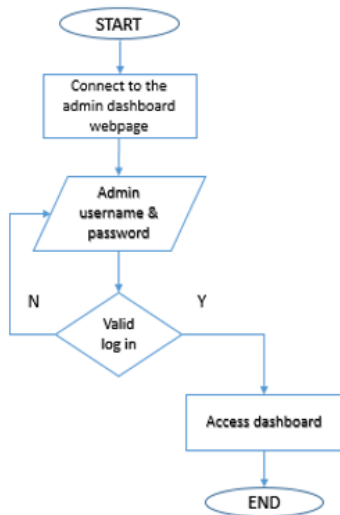

Figure 6: Administrator Main Dashboard Module Flowchart

Figure 6 shows that under the admin, is the DHCP, change theme, network ping and the Client list that can access the Wi-Fi network. The admin panel is exceptionally simple to utilize. Technical knowledge is not required to be able to manage and operate the system. Also, it extends to the feature of the system wherein the user can upload the updated photos for the announcement on the captive portal page. Under main dashboard, admin can also be directed to the voucher generation page.
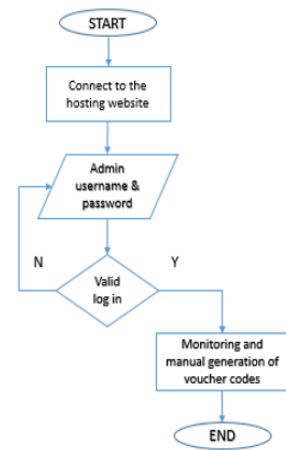

Figure 7: Administrator Database Module Flowchart

Figure 7 shows that the database of the system is hosted into a cloud storage. Admin can also monitor and generate the voucher codes.
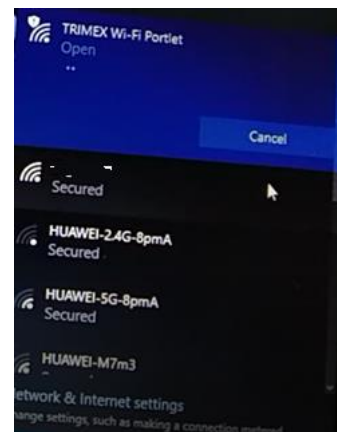
IV. RESULTS AND DISCUSSION

Figure 8: Laptop connecting on Trimex Wi-fi Portlet

Figure 8 shows actual screenshot of the system giving results in attaining the objectives of this system during deployment phase and how different devices can connect to the system.

Figure 9: Captive portal with announcement

Figure 9 shows has upon the development of module that connect the mobile phones and computer to the internet users will be directed on the web portal in which users will be updated with new announcements from the school after that users are required for voucher codes in order to access the internet.

Figure 10: Captive portal requiring voucher code for validation

Figure 10 shows developing a module that will permit the administrator to view the devices within corresponding vouchers codes and allows the connection upon verification of the system is meet by using the systems admin dashboard.
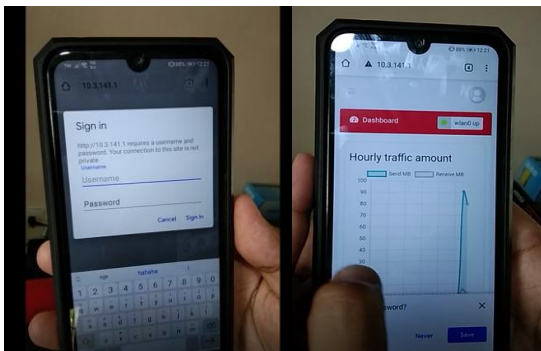

Figure 11: Admin dashboard accessible through mobile phone

Figure 11 shows has a web-based admin dashboard, which can be accessed by the admin via mobile phone if admin wants to go mobile while working. Ease of usability only with the admin.
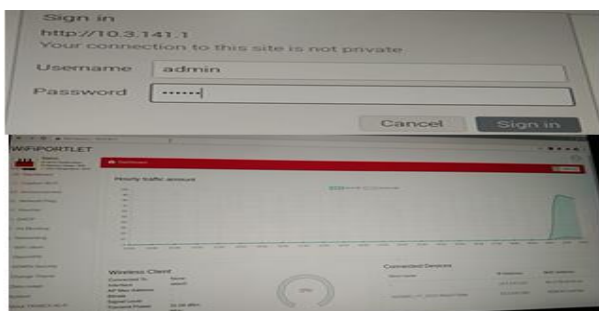

Figure 12: admin dashboard accessible through laptop computer

Figure 12 shows using either the server or another laptop, the device can also be accessed. Due to the username and

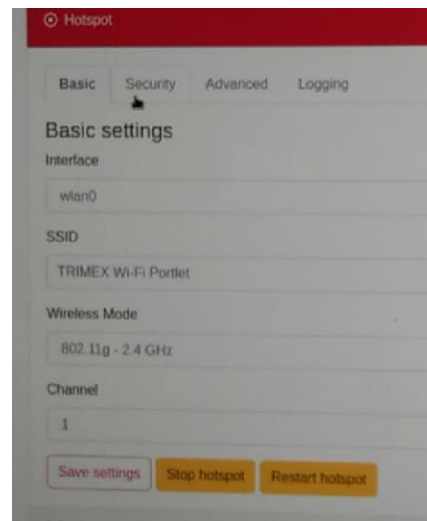password required by admin only, protection is not jeopardized.

Figure 13: Dashboard Captive Wi-Fi tab

Figure 13 shows Basic settings wherein the SSID is viewed. The system also has the feature that the admin can upload announcement or updates in jpeg format.
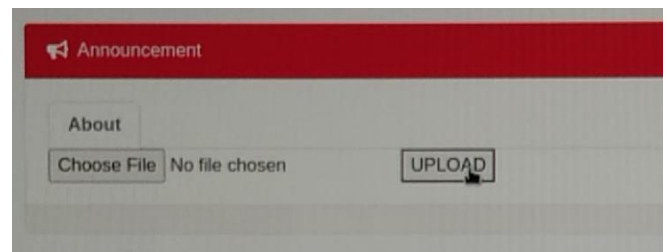

Figure 14: Admin dashboard announcement

Figure 14 shows the figure shows the tab where you can upload updates/announcement that appear on the captive portal.

A. SUMMARY OF SOFTWARE EVALUATION OVERALL MEAN SCORE

Table 1- Summary of Software Evaluation Overall Mean Score

Criterion	Mean	Interpretation
A. Functionality	4.64	Highly Acceptable
B. Reliability	4.36	Highly Acceptable
C. Usability	4.36	Highly Acceptable
D. Efficiency	4.08	Highly Acceptable
E. Maintainability	4.56	Highly Acceptable
F. Portability	4.92	Highly Acceptable
OVERALL MEAN	**4.49**	**Highly Acceptable**

Table 1 indicates that the outcome of the test points out that the highest average is that the system's parameters are versatile due to the fact that even the admin can access it anywhere, while the performance criteria have a drop off average. In general, the software yielded a total weighted mean of approximately 4.49 from the respondents. Among

25 respondents, more than 20 respondents strongly agreed about the system which fall on the highly acceptable in the Likert scale.

V. CONCLUSIONS

Based on the aims of the study and the results of the evaluation the following conclusions were drawn;

1. Students will be now more engage on their online references for study because of their privilege of connecting to the internet upon using voucher code

2. Students and employees will now be more aware of up to date school announcements

3. Administrator can now view and monitor all the connected clients and configure the setting of the system

4. Administrator can generate and validate the voucher of the user using the system

VI. ACKNOWLEDGMENT

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