

Singkonet: Vending Machine for Internet Library Services

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Abstract:

Service automation is the process of integrating all domain and functionality tools into various automation layers in order to have unified interface for all workflows. It is then the primary aim of this study to develop a system automating the Internet Library services of San Mateo campus using the Agile Development Process that undergone to different phases; the Design, Build, Configure, Test and Release. Through this process, the development follows a continuous improvement of system life cycle which achieved the value faster as releases arrived at the customer. Through this, a "SingkoNet" was developed to automate the internet services of the library. As a result, "SingkoNet" generates transaction, monthly, quarterly and annual reports faster. It also provides accurate reports and even retrieve information for those students who failed to sign in the logbook, failed to pay the corresponding fee and most of all, it makes the work of the librarian easier, faster and economical because hiring a staff to man the Internet section will be minimized.

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INTRODUCTION

Automation of services in the Isabela State University is deemed necessary since human resources remains to be one of the barriers in giving quality service. The Library service is one of the frontline services of the University. It is then the aim of the librarian to give excellent service to its clients. Thus, one of the ways to give prompt and quality service to students is to design a system that will eventually make every student responsible in their transactions and deloading some duties and responsibilities of the librarian. Thus, the researcher developed a SingkoNet.

The main function of the SingkoNet is to control the computers in a network and manage the reports and billing system in the internet rentals. The development of this SingkoNet will be divided into two parts which are functionality and stability. The main market of this SingkoNet is for internet rentals in the library of ISU San Mateo. Basically, existing software such as "PisoNet" and other vendo machines is developed intended for internet rentals. Louren (2016), "PisoNet" business is simply an internet cafe business that instead of renting a computer with an hourly rate, usually PHP15-20 per hour, you're making the rate as cheap as PHP1 peso and that's about 4 minutes of renting time. But it doesn't generate any reports of transactions such as monthly income reports, number of users and statistics. It only focuses on the transactions of internet rentals. There are also other Internet Café softwares like Café Manila which is available in the market that

generate transaction reports like monthly income reports and number of users in a day, but it has to be manned. Thus, this SingkoNet enhance the weaknesses of VendoMachines (PisoNet) and Café Manila Software in which this SingkoNet doesn't need to be manned; can generate report of transactions and statistics; and the rate is cheaper amounting Five (5) Pesos in a span of thirty (30) minutes. Among the related software available, this version will provide better performance and reliability to the customer. The first part of the project is to test all the functionality available in the SingkoNet related to network maintenance. There are lot of functions to control the computers in network, but the most important is to fully automate without operating the software. Some of the functions can be performed in a network but in this case, it is not related to network system. The second part of the project is to test the stability. Nowadays, Vendo Machines (Coffee Dispenser, PisoNet, Soda Machine, Arcade Machine, etc.) become dominant and in-demand in the Philippines, therefore this is a need to ensure that SingkoNet will be for Internet Rental operations.

On the other hand, the library service of ISU San Mateo Campus is not automated since 2014. Students have to sign in the logbook and pay for their bills after the rent. Librarian encountered problems on the manual operations of internet rentals such as: students forgot to sign in the logbook; Students cheat on the time they consumed on the internet

section; additional work for the librarian to monitor the internet users; students escape and does not pay for the rent; and Librarian consumed too much time to do reports on the monthly income. Hence, the researcher developed a SingkoNet to address the following problems encountered by the librarian.

OBJECTIVES OF THE STUDY

This study aims to develop and validate the SingkoNet in the Library of ISU San Mateo for internet rentals.

METHODOLOGY

The Agile Development Process that was used by the researcher is adapted to Laurita Moore (2010).



Design

The **1st Phase** refers to the design of the SingkoNet such as designing the layout of the vending machine; list all the needed materials such as coin slot, timer, and desktop; designing the database and User Interface of the SingkoNet Software.

Build

The **2nd Phase** is building the vending machine base on the design created; connecting the coin slot and the desktop to the timer; coding and debugging the SingkoNet program using Visual Basic 6 as the Programming Tool and MS Access as the Database Storage.

Configure

The **3rd Phase** is configuring the desktop for every security needed such as installing the Deep Freeze software

Specifically, this study was conducted to determine the extent of compliance of the Singkonetto ISO 25010 Software Quality Standards in terms of Functional Suitability, Performance Efficiency, Compatibility, Usability, Reliability, Security, Maintainability and Portability; determine the significant difference between the manual operation profits and SingkoNet profits; and determine the feedback of the students on the Singkonetto.

and disabling the task manager to avoid reconfiguration of the desktop; and installing anti-virus for virus protections

Test

The **4th Phase** refers to the testing and maintenance of the SingkoNet. In this phase, the following steps were made: Three consecutive weeks of evaluation, reprogramming and debugging of the SingkoNet after errors were encountered; training for the librarian and library staff in using the SingkoNet.

Release

The **Last Phase** refers to the release of the SingkoNet to the Library for implementation. The SingkoNet release last 2016 and its almost 4 years that the library of ISU San Mateo using the SingkoNet for internet services.

May be used to achieve specific learning objectives in a specific context of use with adequacy, efficiency, risk-free and satisfaction	4.58	Strongly Agree
It is convenient to use and operate	4.38	Strongly Agree
Secures users from making mistakes	4.10	Agree
The design allows user to communicate easily and satisfactorily	4.33	Strongly Agree
May be utilized for wide scope of features and capabilities to accomplish a specified purpose in a specified usage setting	4.58	Strongly Agree
E. Reliability		
Meets the performance for reliability in normal operation	4.78	Strongly Agree
It is functional and accessible when needed	4.33	Strongly Agree
It works as expected despite the hardware or software deficiencies	4.23	Strongly Agree
Could recover the affected data and restore the desired state.	4.33	Strongly Agree
F. Security		
Ensures that the information can only be accessed by those authorized	4.48	Strongly Agree

Prevents unauthorized access to systems or data alteration	4.53	Strongly Agree
Can be proved to have existed so that it can't be repudiated later	4.40	Strongly Agree
An entity's behavior can be attributed directly to the object	4.25	Strongly Agree
A subject's identity can be proven the one claimed	4.30	Strongly Agree
G. Maintainability		
Composed of discrete components to minimize the impact of a modification to one component on other components	4.53	Strongly Agree
Resources can be used in more than one system or in creating other resources	4.25	Strongly Agree
It is possible to assess the impact of an intended change to one or more of its parts, or to diagnose deficiencies or cause of failures	4.30	Strongly Agree

The assessments of the Singkonet on ISO 25010 Software Quality Standards were answered by 30 students. Students used the Manual Operation and the SingkoNet Vending Machine in the internet section of the library.

Likewise, the researchers used checklist for Manual Operation, the SingkoNet Vending Machine and student feedback checklist as data gathering instrument.

Descriptive statistics was employed particularly mean and standard deviation in order to analyze the data with regards to validity of the SingkoNet and the students' feedback. The t-test for correlated samples was utilized to determine the significant difference between the Manual Operation and Singkonet Earnings.

RESULTS AND DISCUSSION

Table 1. Extent of Compliance of the SingkoNet to ISO 25010

ISO 25010 Software Quality Standards	MEAN	Descriptive Rating
A. Functional Suitability		
Covers all the activities and goals of the user	4.80	Strongly Agree
Provides the Correct outcome with the required level of accuracy	4.38	Strongly Agree
Facilitate the performance of specified activities and targets	4.28	Strongly Agree
B. Performance Efficiency		
Meet the requirements in the response and processing time when performing its functions	4.35	Strongly Agree
Meet the standards in the numbers and types of resources used in implementing the tasks	4.43	Strongly Agree
Meet the requirements in the maximum limits	4.38	Strongly Agree
C. Compatibility		
May perform accurately its necessary tasks while sharing a common setting and resources	4.30	Strongly Agree
Systems are able to exchange data and utilize the information that has been shared	4.58	Strongly Agree
D. Usability		
It is appropriate to the needs	4.40	Strongly Agree

Can be effectively and efficiently modified without introducing defects or degrading existing product quality	4.58	Strongly Agree
Test Criteria can be established and can be performed to determine whether those criteria have been met	4.48	Strongly Agree
H. Portability		
Effectively and efficiently be adapted for evolving hardware, software or other usage environments	4.45	Strongly Agree
Can be successfully installed and/or uninstalled in a specified environment	4.23	Strongly Agree
May replace any other software product in the environment for the same purpose.	4.55	Strongly Agree
OVERALL MEAN	4.41	Strongly Agree

Table 1 shows the extent of compliance of the SingkoNet to ISO 2510 Software Quality Standards has an over-all mean of 4.41.

With this result, the respondents strongly agree that there is a Functionality, Quality of Operations, Flexibility, Accessibility, Reliability, Safety, Sustainability and Portability in the SingkoNet Vending Machine. Therefore, it can be inferred that the students, librarian and the staff were

strongly agreed that the SingkoNet Vending Machine is an invention that meets the students, librarian, and staff's specified and implied needs in the Internet Section of the Library in ISU San Mateo Campus.

The result confirms the patent of Warner, Charles et al (1994) that the present invention describes a method and an apparatus which improves the efficiency of an agent by reducing or eliminating the "on-hold" time of the agent.

Effectiveness of the SingkoNet Vending Machine

Table 2. The t-test of difference between the Manual Operation and SingkoNet profits in the Internet Library Section

	N	Mean	Sd	T	Sig (2-tailed)	Remarks
Manual (2013-2015)	3	2271.67	1209394	-3.758	0.05	Significant
SingkoNet (2016-2018)	3	4775.333	11170.11			

Table 2 presents the t-test of difference between the Manual Operation and SingkoNet profits in the Internet Library Section. The computed t-value (-3.758) indicates that there is a significant difference between the mean of the Manual Operation during the year of 2013-2015 and mean of the SingkoNet profits during the year of 2016-2018 in the Internet Library Section at .05 level of significance of a two-tailed test. This means that the profits of the internet section

in the library of ISU San Mateo using the SingkoNet Vending Machine increases. This further means that the SingkoNet Vending Machine is more effective than the Manual Operation.

These findings agree to the study of (Gajjar & Sheth, 2014) that Automation replaces 5 workers at the workstation to 1 worker at the same station. This new design and automation increase productivity and reduce cost.

Table 3. Means and descriptive ratings of the students' feedbacks on the use of SingkoNet in the Internet Section

Feedbacks	Mean	Descriptive rating
1. Students will not forget to sign in the logbook.	4.83	Strongly Agree
2. Students will not be able to cheat on the time consumed in the internet section	4.55	Strongly Agree
3. Automates the transaction in the internet section	4.55	Strongly Agree
4. Eliminates the supervision of the librarian in the internet users	4.08	Agree
5. Students cannot escape without paying the bills in the internet section	4.45	Strongly Agree
6. Librarian will not consume too much time to do reports on the monthly income	4.43	Strongly Agree
7. Auto generated reports from monthly to annually that include statistics	4.60	Strongly Agree
Grand Mean	4.50	Strongly Agree

Table 3 reveals the students' feedback have a grand mean of 4.50 with a descriptive rating of Strongly Agree. This means that the students have positive feedback towards the SingkoNet Vending Machine. Likewise, it can be concluded that SingkoNet is an effective invention in automating the transaction in the internet section of the library.

The results showed that when SingkoNet is used by students in the internet section becomes more interesting because it enhances the weaknesses of Vendo Machines (PisoNet) and Café Manila Software in which this SingkoNet doesn't need to be manned; auto-generated report of transactions and statistics; and the rate is cheaper amounting Five (5) Pesos in a span of thirty (30) minutes. This means that the librarian is hassle free.

It is also evident that automation has a positive feedback as it is used in other systems as revealed in the study of (Gill, Khusvinder et al 2009), Yuksekkaya, B et al (2006). This also addressed the concern in the study of (Parasuraman & Riley, 1997) that Problems in human-automation interaction have included unbalanced workload, reduced system awareness, decision biases, mistrust, overreliance, and complacency

Conclusion

- SingkoNet automates the Internet Services in the Library of ISU San Mateo through vending machines and eliminates the supervision/assistance of the Librarian.
- It provides billing and utilization reports accurately.

- Reliable automation of SingkoNets significantly reduced decision times.
- The earnings in the internet section in the library of ISU San Mateo using the Singkonet Vending Machine increases.

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