

Secured Cotabato City State Polytechnic College Web-Based Student Clearance System

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ABSTRACT

The study describes the Secured CCSPC Web-Based Student Clearance System's use and predicted effects. Hypertext Transfer Protocol (HTTP), Hypertext Preprocessor (PHP), Sublime editor, Bootstrap, and MySQL as the database tool were used to create the clearance system. This system includes two-factor authentication for students and designated offices. In the clearance system, a Secure Socket Layer (SSL) for data transit, as well as a software firewall and anti-SQL Injection attack, were offered and implemented. The CCSPC Portal was linked to the web-based student clearance system and Web API, with Web API acting as a bridge between SIMone and the clearance system. SIMone's role is to offer just a limited amount of information on the web-based clearing, such as designated office operations, account status from the Cashier, and student profiles from the Registrar. Students and the approved offices in charge of signing the student clearance include the Graduating Class Association (GCA) Treasurer, Laboratory Custodian, Cashier, Librarian, Academic Related Services (ARS), SPEED Director, Department Chairperson, College Dean, and the Registrar. The ISO 9126-1 International Standard Tool for Software Evaluation, on the other hand, was utilized in the CCSPC beneficiaries' surveys to test the system's effectiveness and reliability.

KEYWORDS

Secured; Web-based Student Clearance System

INTRODUCTION

Progressive development and advances in information and communications technology (ICT) have been rapidly materialized worldwide in this new era of modern technology when every transaction is at our fingertips. Due to the growing demand of people's demands, electronic applications in various transactions within the government and private educational institutions, international and even local small-scale firms and industries are progressively implemented. Web browsers like Firefox and Internet Explorer are used to transport information from a webpage, which is the foundation of a website with a structure (architecture) developed in web programming. In today's digital age, most organizations have a website offering information on their policies, artifacts, and services. It is possibly the most cost-effective and appropriate method of disseminating information and data over the world (Tupas, 2015).

Some of the Philippines' higher educational institutions (HEIs) have been competing on a global scale for years, building international links and adopting technologies from diverse institutions around the world. After that, the accepted technologies were used to speed up academic transactions. These technologies also necessitate a significant amount of revenue, so HEIs are keen to extract and slice budget from their school budgets to meet these demands. Many higher education institutions are now progressed or upgraded in terms of

computerized and web-based academic transactions. Some HEIs are still improving their computerization processes, while others still perform the tasks manually.

The Cotabato City State Polytechnic College is one of the HEIs in need of a computerized transaction (CCSPC). CCSPC is a member of the State Universities and Colleges (SUCs) and is located on Sinsuat Avenue in Cotabato City, in the heart of Central Mindanao. The university requires faster and more efficient electronic transactions to suit its rising student population; one of these activities is student clearing. A clearance is a document that grants authorization to leave an institution (Agbo-Ajala, Makinde, 2015).

The clearance is a mechanism or process used at CCSPC to check students' liabilities at several offices on campus before allowing them to graduate or enroll in the next year. The college still uses a manual student clearance system, in which each student must visit the designated offices listed on the clearance form to obtain signatures. The student is allowed to enroll for the next semester if all the required signatures have been completed. Due to its time, money, and energy requirements, the manual clearance system has been an issue and a nuisance for many students at the end of each semester. As a result, a Secured Web-based Student Clearance System for CCSPC was built to address the institution's long-term challenge.

The system will greatly help the institution's stakeholders, such as students, teachers, and administration, in addressing the problem; speeding up transactions efficiently and effectively; increasing knowledge, and positively exposing the stakeholders to current advanced technology. The study aimed to develop a secured web-based student clearance system for CCSPC. Specifically, develop an online clearance system for the CCSPC students and offices; implement two-factor authentication for users and encryption of web content; and evaluate the functionality, reliability, usability, and portability of the system.

RESEARCH METHODS

This study uses a checklist and a rating scale questionnaire to gather the needed data and responses. To evaluate the Functionality, Usability, Reliability, and Portability of the system, the participants should evaluate the system by rating each item in the questionnaire using the rating scale shown in **Table 1** the frequency of each rating is counted, and the weighted mean is computed and interpreted using the formula below.

$$WM = \frac{(1)f_{DNA} + (2)f_D + (3)f_A}{n}$$

Where:

WM = Weighted Mean

n = number of respondents (designated offices + students)

f_{DNA} = frequency of Does not apply response

f_D = frequency of Disagree response

f_A = frequency of Agree response

Table 1. Interpretative Scale used to interpret the Weighted Mean

Range of Mean	Interpretation
2.01 – 3.00	Agree
1.01 – 2.00	Disagree
0.01 - 1.00	Does not apply

RESULTS AND DISCUSSION

The System's Evaluation

The data gathered from the evaluation conducted on the participants who are the stakeholders/end-users of the system were tabulated and computed. The category and number of participants are shown in **Table 2** the categories of the participants are: the designated offices, graduating students (composed of 4th and 5th year students) and non-graduating students (1st, 2nd and 3rd year students).

Table 2. Category and Number of Participants Involved in the Evaluation

Category of Participants	Number of Participants (n)
Designated Offices	11
Graduating Students	17
3rd Year Students	10
2nd Year Students	10
1st Year Students	10
Total	58

Table 3 below illustrates the evaluation result on the functionality of the system. As to the weighted mean (WM), most of the values computed are within the range of **2.01** to **3.00** as shown in **Table 1** which falls on the interpretation **Agree (A)**. The highest WM are the items **1.3** and **1.4** while the lowest rating is the item **1.5**. The total WM is **2.95** which indicates that the participants “**Agree**” on the functionality of the system.

Table 3. Functionality of the system

I.	FUNCTIONALITY				WM	Interpretation
1.1	The software does what is appropriate (Adequacy)	56	2	0	2.97	Agree (A)
1.2	The software has available all the functions required for its Execution (Adequacy)	57	1	0	2.98	Agree (A)
1.3	The software does what was proposed correctly (Accuracy)	58	0	0	3.00	Agree (A)
1.4	The software interacts with the specified modules (Interoperability)	58	0	0	3.00	Agree (A)
1.5	The software has capacity for multiuser processing (Interoperability)	53	2	0	2.83	Agree (A)
1.6	The software has the capacity to operate with networks (Interoperability)	56	2	0	2.97	Agree (A)
1.7	The software has secure access through password (Secure access)	56	2	0	2.97	Agree (A)
1.8	The software has an internal back up routine (Secure access)	55	2	1	2.93	Agree (A)
	Total				2.95	Agree (A)

In terms of reliability, **Table 4** shows the result of the test on the reliability of the system with 2.64 weighted mean which implies that the participants “**Agree**” that the system has its ability to maintain a certain level of performance when used under definite conditions. On the other hand, the participants tend to answer “**Disagree**” on the possibility of system failures.

Table 4. Reliability of the system

II.	RELIABILITY				WM	Interpretation
2.1	The software has frequent failures (Maturity)	0	55	3	1.95	Disagree (D)

2.2	The software reacts appropriately when failures occur (Tolerance to failures)	57	0	1	2.97	Agree (A)
2.3	The software informs users concerning invalid data entry (Tolerance to failures)	58	0	0	3.00	Agree (A)
Total					2.64	Agree (A)

Table 5 describes the result on the usability of the system with 2.98 weighted mean. The WM denotes that the participants “Agree” that the system has its capability to be conveniently operated, learned, and utilized by the user when used under specified circumstances.

Table 5. Usability of the System

III.	USABILITY				WM	Interpretation
3.1	It is easy to understand the concept and application (Intelligibility)	58	0	0	3.00	Agree (A)
3.2	It is easy to perform its functions (Intelligibility)	56	2	0	2.97	Agree (A)
3.3	It is easy to learn how to use (Learnability)	57	1	0	2.98	Agree (A)
3.4	The software facilitates the user’s data entry (Learnability)	55	2	1	2.93	Agree (A)
3.5	It is easy to operate and control (Operability)	58	0	0	3.00	Agree (A)
3.6	The software provides help in a clear manner (operability)	58	0	0	3.00	Agree (A)
Total					2.98	Agree (A)

Table 6 presents the portability of the proposed project. With a total of 3.0 WM, respondents “Agree” that the system has the capacity to be adapted and installed.

Table 6. Portability of the system

IV	PORTABILITY				WM	Interpretation
4.1	It is easy to adapt to other environment (Adaptability)	58	0	0	3.00	Agree (A)
4.2	It is easy to install in other environment (Capacity to installed)	58	0	0	3.00	Agree (A)
Total					3.00	Agree (A)

Table 7 shows the over-all result of the system’s evaluation with an over all-mean of 2.89 which signifies that the participants “Agree” that the system is functional, reliable, usable and portable. This result proved that the system meets its requirement and is accepted by the stakeholders of the institution.

Table 7. Over-all Evaluation Result of the System

	Over-All Result	WM	Interpretation
1.	Functionality	2.95	Agree
2.	Reliability	2.64	Agree
3.	Usability	2.98	Agree
4.	Portability	3.00	Agree
	Over All Mean	2.89	Agree

CONCLUSION AND RECOMMENDATIONS

From the plotted results and observations of the proposed project, the researcher highly recommended that the proposed project is capable to be fully deployed and implemented due to the foreseen and timely solution on the current and long-time quandary of the CCSPC students in attending their clearance obligation every after-semester break or summer term.

Second, a Kiosk machine with a clearance system function is also recommended upon during its implementation. Next, the user interface of the clearance system website and its features inside can be enhanced, updated, and upgraded.

Additionally, the researcher recommended the web-based clearance system transaction for the faculty and staff at the end of every semester as a replacement to the manual one. For future researchers, it is recommended to conduct a further study about the clearance systems for the system to be more functional, efficient, and reliable.

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