Usability Evaluation for a Convocation Management System: A Case Study in Politeknik Muadzam Shah

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ABSTRACT

A good convocation management system can benefit both the educational institution administration and graduates. In this research, perceived usability of a convocation management system developed for Politeknik Muadzam Shah was analysed and investigated using both quantitative and qualitative study. A modified Computer System Usability Questionnaire (CSUQ) was distributed to respondents via online. It was found that the respondents' perceived usability of the system is high but can be better improved to increase users' satisfaction regarding system performance especially the system using the Android and iOS platforms. Future study using different instrument may add further insight to design a more robust and highly usable system.

Key Words: Perceived usability, CSUQ, multiple platforms

1. INTRODUCTION

Convocation ceremony is the awaited day for most graduates of higher learning institution. It signifies their successful journey after years of struggle studying their chosen field. To ensure the smooth running of the ceremony, the convocation management must be implemented carefully and systematically so that no problems occur during the convocation ceremony. Every year, prospective graduates are found to be increasing and the management of student data done manually was no longer practical nowadays. Statistics of graduates attending the convocation ceremony were difficult to get and at the same time can caused problems to the committees involved.

A system was developed to overcome the management problem of Muadzam Shah Polytechnic (PMS) graduates during the convocation. The development of this system involved creating systems using multiple platforms to reach a wider range of users. This study aims to assess the usability of the convocation management system. The findings will help the developer in improving the system thus increasing users' satisfaction.

2. LITERATURE REVIEW

Various definitions of usability relating to specific standards have been published. Evaluation of usability has been proposed and well researched for the past decades ranging from instruments for generic use to instruments that targets a specific system (Assila, De Oliveira, and Ezzedine 2016). Several standardized questionnaires that are very popular to evaluate perceived usability are Computer System Usability Questionnaire (CSUQ), System Usability Scale (SUS), Website Analysis Measurement Inventory (WAMMI), Technology Acceptance (TAM) and Software Usability Measurement Inventory (SUMI) (Lewis 2018).

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Efficiency, effectiveness and satisfaction are the criteria covered by the CSUQ that consisted of 19 items categorized into 4 parts. (Tolle et al. 2020) used the CSUQ to discover the factors that affected perceived usability in an educational game. A study by (Oliha 2014) had benefited from the usability evaluation of a university's web portal that use adapted CSUQ with additional criteria known as ICT Competency Level as it had unveiled a low score on Information Quality criteria thus, affecting the overall score. Improvement to address the issues highlighted by these studies can be done to increase user satisfaction in the future.

3. METHODOLOGY

This study was undertaken to find out the usability of a convocation management system developed in Politeknik Muadzam Shah. The system aptly named as iConvo PMS Convocation Management System, aimed to provide better communication tool between administration and graduates, streamlining the procedure needed for their graduation ceremony. The system was created for three separate platforms to present several options to users, namely the Android, iOS, and web. The web platform was created using PHP and HTML and can be accessed using any browser, while the Android and iOS were natively designed using Java and Swift respectively and can be downloaded from Play Store and App Store. Figure 1 shows the platforms developed.

Graduates were given access to the system one month before the ceremony and were able to get the vital information such as location, tentative of the graduation ceremony, protocols, proper attire, payment procedure etc. The graduates also need to confirm their attendance for the ceremony allowing for accurate venue preparation by the administration. Any updates and announcements can be relayed to graduates instantly using the web platform but the native platform of Android and iOS need to be updated by users to get the newest information.

Figure 1: iConvo PMS on Android, iOS and web platform

A usability evaluation was then conducted to find out the shortcoming of the system and also users' perceived usability when using it. The graduates were then asked to participate in the survey distributed via Google Form during their rehearsal day. A modified Computer User Usability Questionnaires (CSUQ) was used as it is suitable to be administered using online format (Albert and Tullis 2013). Total of 392 graduates had responded to the survey. The questionnaire consists of 17 close-ended questions measured using a 5-point Likert scale ranging from '1=Strongly Disagree' to '5=Strongly Agree' forming 4 constructs and 1 open-ended question asking user's opinion on how the iConvo system can be improved.

As the instrument used was modified from the standardized CSUQ created by James Lewis (Journal, Interaction, and Ibm 1995), in order to adapt to the context of the evaluation, they were tested for reliability using coefficient alpha. There are several studies that had also modified the CSUQ (Johnson, Eagle, and Barnes 2013). The reliability recorded for the system usability (SYSUSE), information quality (INFOQUAL), interface quality (INTERQUAL) and overall (OVERALL) constructs were 0.833, 0.899, 0.888 and 0.763 respectively as shown in Table 1. These values exceeded 0.7, indicating that the constructs were highly reliable and the items has internal consistency (Nunnally and Bernstein 1994) even when it used a 5-point Likert scale as opposed to the original CSUQ that used a 7-point Likert

scale. This also corresponds with (Revilla, Saris, and Krosnick 2014) that suggested using a 5 answer categories for Agree-Disagree (AD) scales provided that it is fully labelled.

Table 1: Instrument Measurement Reliability

Constructs	Num. Of Items	Mean	Std Deviation	Cronbach's Alpha
SYSUSE	7	4.1633	.62257	.833
INFOQUAL	5	4.3393	.67448	.899
INTERQUAL	3	4.2270	.72372	.888
OVERALL	2	4.5077	.67467	.763

4. RESULTS AND DISCUSSION

The quantitative portion of this evaluation focused on the descriptive analysis using mean score and standard deviation of the construct items. According to (Nunnally and Bernstein 1994), mean score of 1.00 to 2.33 is rated as low, 2.34 to 3.66 as medium and 3.67 to 5.00 is considered high. Table 2 clearly shows that all items scored high above the mean level of 3.67 with the exception for item SYSUSE2 that rated as medium with only 3.51 mean score. This might be contributed by respondents' confusion to the negative worded question for the item. Furthermore, the overall mean for system usefulness were the lowest amongst the four constructs with only 4.1633 owing to that the items construct had 2 items, SYSUSE2 and SYSUSE7 with the lowest individual mean score of 3.51 and 3.75, respectively. SYSUSE7 is one of the additional items not included in the original CSUQ but is vital in examining the system performance and users' satisfaction.

The finding highlights that 11.2% or 44 respondents strongly disagree or disagree that the system rarely crashed while 98 respondents took a neutral stance. 27 of the 44 respondents used the Android platform and the other 17 use iOS platform. None of the 5 respondents using the web reported system crash. Among the plausible explanations for these findings is that the respondents need to update their apps from the corresponding stores to get the latest changes made for Android and iOS platform. Sometimes, this might lead to system instability due unsupported API version of the respondents' smartphone. In contrast, the web platform supported instant updates and respondents only need a browser to access the system.

Comparing the four constructs for different platforms used, Table 3 reveals that the majority of respondents or 223 respondents used the Android platform, while 164 respondents used iOS and only 5 respondents used the web. System usefulness is the lowest for Android with mean of 4.26 and standard deviation of 0.656 and highest for web with mean of 4.4 and standard deviation of 0.548. Android platform also recorded lowest mean score in the interface quality compared to others with mean of 4.17 and standard deviation of 0.738.

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Table 2: Evaluation Results

Construct	No	Items	Mean	Mode	Std. Deviation
System Usefulness (SYSUSE)	1	I think the system is easy and simple to use.	4.43	5	.664
	2	I need technical support to use this system.	3.51	4	1.162
	3	I feel confident while using this system.	4.29	5	.739
	4	It was easy to learn to use this system.	4.42	5	.681
	5	I think most people can learn this system quickly.	4.37	5	.685
	6	I find the system functioning smoothly and is well integrated.	4.30	4	.708
	7	The system rarely crashed.	3.75	4	1.055
Information Quality (INFOQUAL)	1	Whenever I make a mistake using the system, I recover easily and quickly.	4.11	4	.787
	2	The information provided with this system is easy to understand.	4.39	5	.692
	3	The organization of information on the system is clear.	4.32	4	.713
	4	I can easily find the information I needed quickly.	4.38	5	.693
	5	The information provided with this system is relevant.	4.32	5	.736
Interface Quality (INFOQUAL)	1	The interface of this system is pleasant.	4.21	4	.744
	2	I like using the interface of this system.	4.23	4	.773
	3	This system has all the functions and capabilities I expect it to have.	4.23	4	.721
Overall Usability (OVERALL)	1	Overall, I am satisfied with the system.	4.45	5	.673
	2	I would rate this system as excellent.	4.26	5	.810

Table 3: Descriptive Statistic

iConvo PMS system platform used		SYSUSE	INFOQUAL	INTERQUAL	OVERALL
Android	Mean	4.26	4.38	4.17	4.43
	N	223	223	223	223
	Std. Deviation	.656	.666	.738	.693
iOS	Mean	4.35	4.43	4.31	4.49
	N	164	164	164	164
	Std. Deviation	.549	.656	.706	.651
Web	Mean	4.40	4.40	4.20	4.20
	N	5	5	5	5
	Std. Deviation	.548	.548	.447	.447
Total	Mean	4.30	4.40	4.23	4.45
	N	392	392	392	392
	Std. Deviation	.612	.659	.724	.673

The qualitative portion of this study was done by asking the respondents of their opinion on how the system can be improved. While open-ended question may allow unbiased answer from respondents, it has certain disadvantage of having large non-response item (Reja et al. 2003; Zhou et al. 2017). This is proven in this study when only 36% of the respondent answered to give their opinion. Most of the respondents requested to minimize the updates needed for the Android and iOS platform. Another respondent would prefer if an English version is made available. A few complaints about the system lag although this might be attributed to their network connectivity. These suggestions will be taken into consideration for next upgrade of the system.

5. CONCLUSION AND RECOMMENDATION

The findings of this study suggest that the performance of the system using the Android and iOS platform needs to be improved further of minimize the chances of system crash. This can be achieved by redesigning the native application so that changes can be dynamically added without having to be updated via the stores. A future study using different usability measurement instrument such as Standardized Usability Questionnaire (SUS) may add further insight to design a more robust and highly usable system.

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