2nd Kelantan International Learning and Innovation Exhibition 2019
(KILIEx 2019)
Aug 19th-20th, 2019, UiTM Kelantan, Malaysia

Autonomous Attendance Monitoring System

Mohamad Iqmal Ussaiq Ismail
Faculty of Information Management
Universiti Teknologi MARA Cawangan Kelantan
Machang, Kelantan, Malaysia
iqmalussaiq@gmail.com

Mohamad Rahimi Mohamad Rosman
Faculty of Information Management
Universiti Teknologi MARA Cawangan Kelantan,
Machang, Kelantan, Malaysia
rahimimr@uitm.edu.my

Muhamad Hakim Ahmad Dzarawi
Faculty of Information Management
Universiti Teknologi MARA Cawangan Kelantan
Machang, Kelantan, Malaysia
muhamadhakimahmaddzarawi@gmail.com

Mohd Idzwan Mohd Salleh
Faculty of Information Management
Universiti Teknologi MARA Cawangan Kelantan,
Machang, Kelantan, Malaysia
idzwan201@uitm.edu.my

Muhamad Alif Zhafri Md Azman
Faculty of Information Management
Universiti Teknologi MARA Cawangan Kelantan
Machang, Kelantan, Malaysia
alifzhafri59@gmail.com

***Abstract*— Absenteeism is an act of habitual absence from work or schools. Absenteeism is considered as one of the worst social problem that may lead into another social problems, such as theft, drug, and bullying. Chronic absenteeism affects the performance of the individual; as well as those around them. In the context of Malaysian, Ministry of Education recorded that more than 37, 000 students were found absence from schools in the year 2017. Recent survey on the similar issue within the university context show that approximately 15 students were barred from examination due to poor attendance. Henceforth, there is a need for a new mechanism to replaced conventional attendance taking method. Therefore, Autonomous Attendance Monitoring System (AMoS) was developed in three stages. First, a qualitative study was conducted to investigate the problem with attendance monitoring. Then, the prototype of AMoS was developed based on PHP programming language, MySQL database, HTML5, CSS3, and jQuery. Lastly, a quantitative study was conducted to measure the extent of user satisfaction towards using AMoS. In term of novelty, AMoS improved the current absenteeism workflow implemented at UiTM, introduce new novel ideas of autonomous YY-ZZ monitoring, and a new absenteeism scale Ami-X. The system can be commercialized to any organization, such as academic institution; kindergarten, schools, universities, boarding schools, etc. The prototype of AMoS is protected by Copyright Act 1987, and available online at Google Play Store.**

Keywords*— *autonomous, attendance monitoring, information system, absenteeism, and social problem.

I. INTRODUCTION

Malaysia Higher Education level additionally been known as the post-secondary education, third-level or tertiary education. It is an optional final stage of formal learning that occurs after completion of secondary education. Usually delivered at universities, academies, colleges, seminaries, conservatories, and institutes of technology, education is additionally obtainable through sure college-level establishments, as well as job colleges, trade colleges, and different career schools that award educational degrees or skilled certifications. Absenteeism is one of the crucial problems faced by organization nowadays. Companies, schools, and universities are all facing the same problem when it comes to absenteeism. For example, universities undertook many approaches to prevent student absenteeism. One of the approaches is attendance taking. Attendance is a form of a basic tool and most important criteria needed in all the education system. In the context of Malaysian educational institution, many private and public universities are still practicing the conventional method of taking daily students‘ attendance. Academic staff usually needs to print out the printed attendance sheet and bring it with them to the class. However, sometimes using the conventional method can cause problem such as: (1) Forgetting to print out the attendance sheet, (2) missing or misplaced of the attendance sheet, (3) Did not bring the attendance sheet to the class, (4) miscalculate number of absenteeism, and (5) probability of student to cheat friend signature. Attendance Monitoring System is proposed to help or reduce lecturer‘s work. This system facility to access or manage the attendance information of all the classes. Student by default is assumed to be present as number of present will be higher than the absentees for most of the attendance report. After that, lecturer is allowed to change or modify absentee‘s attendance data. This system will automatically count the number of absents and the percentage of present for the entire student based on the subject classes. Once the number of absent exceed the attendance policy, appropriate warning letter will be generated automatically to be given to the absent. Hence, this system provides a tedious work in maintaining attendance records besides saving time to analyse every attendance list and assuring the calculation made was error-free.

II. LITERATURE REVIEW

According to Merriam Webster dictionary [1], absenteeism means chronic absence. If it is being talk in context of education, it‘s the habitual or intentional failure from going to school. This issue cannot be denied that no matter whether now or then, it is will continuously happen if there were not action taken. Student who absent to class will miss some education activity that may leads to many

problems that soon will gives bad impacts on their academic progress for their study. Besides that, in the context of higher education level like university itself faced many issues when were talk about the absenteeism. As an example for the attendance, lecturer got the responsibility to take the student‘s attendance before or after they start the teaching and learning process. Attendance is one of the most important things that needs to be taken as to know which students attend or absent to class. But, currently there are many problems that had faced by the lecturer especially in taking and managing the attendance.

According to Astrid Schmulian and Stephen Coetzee [2], there is a positive correlation between class attendance and academic performance. The study discovered that absenteeism leads to negatively impacts in education. Commonly issues that appear was lecturer (person in-charge) sometimes forget where they put the attendance, student cheats on helping their friend signed the attendance who absent to class, lecturer forget to bring the attendance to the class and so on. This problem will affect the validity and management of the attendance itself. Each of attendance consists of vital information that are very useful to determine and proof whether the student is guilty or not whenever they were called by the management when their attendance is lower from the percentage‘s attend to class that a student need to follow. As to mention more detail, student who less attend to class and got lower percentage will get a warning from the management before the next action be taken. The students need to take the warning as a serious matter because they could be dispelled from their study. Usage of manual methods in taking and handle the attendance leads to many bad factors. As to ensure the management could be parallel with the latest technology revolution nowadays, author proposed the action is taken attendance will be done in computerized or digitized so that it will be more smooth.

In another study, Raid [3] proposed the development and implementation of another medium or strategic that could be use in a long term as to manage the process of collecting student attendance to the class more effectively. Besides that, based on this article proposed methods, it‘s stated that the process of taking and managing the attendance will be easier to organize, monitor and evaluate if it is being use. So, its mean that by using more systematic methods in managing the attendance, it will be more precise and better. In a simple word, the author wants to make the improvement or revolution of the ways the attendance was managed right now change to be better into computerized.

Moreover, according to Patel, Patel, and Gajjar [4], student‘s attendance is one of the important part for any organizations or institutions. Recording and monitoring of class attendance is an area of administration that can require significant amounts of time and effort no matter whether in a school or university environment, largely due to the amount of time required in lectures to get the necessary information. Besides that, the authors also stated and proposed the usage of online student‘s attendance monitoring system in classroom using radio frequency identification technology may lead to better student‘s attendance management. RFID technology one of the powerful tool that are very useful in helping to manage student‘s attendance throughout the education process and also enhance classroom security. RFID technology already been applied to solve problems where it is necessary to take automatically record the movements and locations of students in a classroom of school or university environment. A real time intelligent system is implemented in conjunction with RFID hardware to record students‘ attendance at lectures and laboratories in a school/university environment. RFID is a technology that allows for a tag affixed on identity card to communicate wirelessly with a reader, in order for the tag‘s identifier to be retrieved.

Furthermore, according to Othman, Ismail and Raus [5], the development of an information system must follow a proper development methodology. The study is focussing on the development of a web-based attendance register system or also be called as ARS. The reason why this system was proposed and developed because the authors knew that the capability of web-based system that now become one of the important thing or preferable technologies as to ease the process of managing data and records resulted from the attendance taken. Besides that, the authors also stated in the article that, the efficiency and effectiveness of the web-based system in handling rapid access of documents and its ability in supporting multi-users simultaneously, thus saving a lot of time and hassle free.

III. METHODOLOGY

Autonomous Attendance Monitoring System (AMoS) was developed in three stages. First, a qualitative study was conducted to investigate the problem with attendance monitoring. Then, the prototype of AMoS was developed based on PHP programming language, MySQL database, HTML5, CSS3, and jQuery. Lastly, a quantitative study was conducted to measure the extent of user satisfaction towards using AMoS. However, due to the limitation of this research paper, this study will only discuss the quantitative methodology of AMoS. The previous stages have been submitted for a journal publication elsewhere.

A. Instrument Development

A quantitative approach was adopted for data collection. Items were adopted from similar previous study. The completed instrument was sent to the experts for pre-test. The instrument was modified based on the recommendation and suggestions from the expert review process. Then, the instrument was distributed for a pilot test; Cronbach alpha was used to determine the reliability of the instrument. Actual data collection takes place for 2 months. Respondents selected were students at the Faculty of Information Management, Universiti Teknologi MARA Kelantan Branch. The respondents were selected based on convenience sampling. The following table 1 shows the variables use in the study.

TABLE I. LIST OF VARIABLES

Variable	***Number of items***
System quality	4
Information quality	4
Service quality	4
Perceived usefulness	3
Perceived ease of use	3
User satisfaction towards AMoS	3

IV. RESULTS AND FINDINGS

The following section discuss the result of data collection. The findings will be discussed in term of descriptive analysis.

A. Demographic profile

The following table II shows the demographic profiles of respondents. A total of 44 respondents involved in the data collection process. Most respondents were female (65.9) while male was 31.1%. In term of study mode, the majority of student enrolled for fulltime course (95.5%), while part-time and SML made up the rest.

TABLE II. DEMOGRAPHIC PROFILES

Item	*Description*	*Frequency*	*Percentage (%)*
Gender	Male	15	34.1
	Female	29	65.9
Study Mode	Fulltime	42	95.5
	Part Time	1	2.3
	SML	1	2.3
Study Level	Diploma	14	31.8
	Degree	30	68.2

Table III shows the mean and standard deviation for system quality. From the table, it can be concluded that respondents agreed that system quality does contributing to the user satisfaction towards the use of AMoS. The highest mean is 6.1818 while the lowest mean is 5.9091.

TABLE III. SYSTEM QUALITY

Item	*Mean*	*Std Deviation*
AMoS has an easy navigation to information	6.1818	0.89632
AMoS has fast response and transaction processing	6.2500	0.75097
AMoS can be used anytime when I want to use it	6.0909	0.83019
AMoS keeps error free transaction	5.9091	1.00737

Table IV shows the mean and standard deviation for information quality. From the table, it can be concluded that respondents agreed that information quality does contributing to the user satisfaction towards the use of AMoS. The highest mean is 6.1364 while the lowest mean is 6.0455.

TABLE IV. INFORMATION QUALITY

Item	*Mean*	*Std Deviation*
AMoS provides complete information	6.0455	0.86144
AMoS provides accurate information	6.1364	0.82380
AMoS provides reliable information	6.1364	0.73424
AMoS provides information in appropriate format	6.0455	1.09872

Table V shows the mean and standard deviation for service quality. From the table, it can be concluded that respondents agreed that service quality does contributing to the user satisfaction towards the use of AMoS. The highest mean is 6.1591 while the lowest mean is 5.9773.

TABLE V. SERVICE QUALITY

Item	*Mean*	*Std Deviation*
AMoS anticipates and responds promptly to user request	5.9773	1.08881
AMoS instills confidence in users and reduces uncertainty	6.0000	0.94006
AMoS understands and adapts to the user specific needs	6.1591	0.93866
AMoS provides follow-up service to users	6.0000	0.86266

Table VI shows the mean and standard deviation for perceived usefulness. From the table, it can be concluded that respondents agreed that perceived usefulness does contributing to the user satisfaction towards the use of AMoS. The highest mean is 6.0909 while the lowest mean is 6.0455.

TABLE VI. PERCEIVED USEFULNESS

Item	*Mean*	*Std Deviation*
AMoS improves my learning performance	6.0909	0.88444
AMoS increases my learning effectiveness	6.0455	0.91384
AMoS enhances my learning experience	6.0909	0.88444

Table VII shows the mean and standard deviation for perceived ease of use. From the table, it can be concluded that respondents agreed that perceived ease of use does contributing to the user satisfaction towards the use of AMoS. The highest mean is 6.2955 while the lowest mean is 6.2045.

TABLE VII. PERCEIVED EASE OF USE

Item	*Mean*	*Std Deviation*
Learning to operate AMoS is very easy for me	6.2045	0.82348
It is easy for me to become skillful at using AMoS features.	6.2500	0.75097
My interaction with AMoS is clear and understandable	6.2955	0.73388

Table VIII shows the mean and standard deviation for user satisfaction. From the table, it can be concluded that respondents are satisfied with the use of AMoS. The highest mean is 6.3409 while the lowest mean is 6.2955.

TABLE VIII. USER SATISFACTION TOWARD AMOS

Item	*Mean*	*Std Deviation*
All things considered, I am very satisfied with the AMoS performance	6.3182	0.73998
All things considered, I am very pleased with the experience of using AMoS.	6.2955	0.70148
Overall, my interaction with the AMoS is very satisfying.	6.3409	0.71343

V. CONCLUSIONS

The study attempted to investigate the extent of user satisfaction with Attendance Monitoring System (AMoS). A quantitative study was conducted at the Faculty of Information Management, Univesiti Teknologi MARA Kelantan branch. A total of five determinants were identified; each was descriptively discussed in the findings section.

However, this study is not without limitation. First, we only use minimal number of variables for this study. Future study should include more variables to gain more insight from the data analysis, such as task complexity, task resources, and individual factors. Second, due to lack of respondents involves with the pilot run of the information system, this study can only rely on the small number of respondents. Future data collection should be conducted when the propose system have been fully implemented.

ACKNOWLEDGMENT

The researchers would like to thank the respondents at Faculty of Information Management, Universiti Teknologi MARA Kelantan Branch, Malaysia that contributed to the success of the research. The prototype of Attendance Monitoring System has won a Diamond and Gold medal award at 2019 Student Innovation, Invention, and Design Competition (SIIDCOM) organized by Universiti Teknologi MARA Kelantan, and also a Gold medal award at Bujang Valley International Innovation, Invention and Design Competition 2019 (BVIIEC) organised by Universiti Teknologi MARA Kedah.

REFERENCES

[1] Merriam-Webster Dictionary. Absenteeism. Retrieved from https://www.merriamwebster.com/dictionary/absenteeism?utm_camp aign=s d&utm_medium=serp&utm_source=jsonld

[2] Schmulian, A., & Coetzee, S. (2011). Class absenteeism: Reasons for non-attendance and the effect on academic performance. Accounting Research Journal, 24(2), 178-194.

[3] Reid, K. (2006). Raising school attendance: A case study of good practice in monitoring and raising standards. Quality Assurance in Education, 14(3), 199-216.

[4] Patel, R., Patel, N., & Gajjar, M. (2012). Online students‘ attendance monitoring system in classroom using radio frequency identification technology: a proposed system framework. International Journal of Emerging Technology and Advanced Engineering, 2(2), 61-66.

Othman, M., Ismail, S. N., & Raus, M. I. M. (2009). The development of the web-based Attendance Register System (ARS) for higher academic institution: From feasibility study to the design phase. International Journal of Computer Science and Network Security, 9(10), 203-208