Designing and Developing an E-Outing System as a Web-Based Tracking Tool Application

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Abstract: The existing outing system still requires a lot of manual effort. Based on the current system, students are required to write down student details including name, matric number, time and date of outing. They then need to get the approval from the College Residents' Staff (CRS). The process is time consuming. As an initiative, an e-Outing system is suggested as it will help to digitalize the process. This E-Outing System is a web based tracking tool application that helps the administrative staff in organizing and managing the students' outing records. The aim of this project is to create a web-based system that can manage outing applications and provide an integrated view of the records which help to reduce the time spent in filling out the manual outing application forms. Besides, this system will also notify the parents once the outing application has been approved, ensuring awareness of their child's activities on that particular day. The other problem identified is the wastage of space storage to keep the data. Thus, this system will provide an online database to store the students' information. This system is developed following the five stages in System Development Life Cycle (SDLC) which include planning, analysis, design, implementation and maintenance.
Keywords: web-based application, e-outing system, SDLC

INTRODUCTION

In this Industrial Revolution 4.0 (IR 4.0), the application of automated system is widely used in the information management process. With the introduction of IR 4.0, the world is facing huge changes in cultural, communication, work processes as well as economical aspects. In this IR 4.0 era also, technologies play an important role. Park (2017) discussed that the introduction of IR 4.0 has changed the way people live, with the introduction of new concepts of the manufacturing processes, decentralization and adopting of systems based on the information and communications technologies. Inline with the IR 4.0, the ICT applications and databases present unparalleled opportunities in managing student records which can lead to the reduction of paper-based systems.

Computerized information systems have justified its benefits in helping organization reduce the space required to store the data and reduction of costs due to more efficient time management (Azza, 2017). Hence, it allows user capture, and manages, as well as provides access to reduce paperwork over time. Currently, the process of managing students' in and out information in all UiTM branch campuses is done manually through a paper based system. However, with the increasing number of students, the manual system could no longer handle student information effectively. Besides, the web-based application has been used in many areas including e-commerce, information publishing, records management as well as communication. These web-based applications have been used to improvise the information management process from a manual to a computerized system.

Asogwa et.al (2015) observed that in universities, paper work is still going on concurrently in their administrative or academic transaction services, and in maintaining student's academic history and profile, despite revolutionizing the student information systems. As an alternative, using E-Outing will give benefits in terms of recording students' in and out information which at the same time makes it easier in retrieving the students information. It is observed that the key benefits of the E-Outing System to students revolves around the fact that it is a 24/7 web-based system which is user friendly, easy and cheap to use. Therefore, with the introduction of this E-Outing System, the students' outing records management will be better facilitated.

BACKGROUND OF THE STUDY

The web-based application will help the information management in the fact that organization becomes easier and accessible. The proposed system, which is the Electronic Outing (E- Outing) System, will help the College management office, Hal Ehwal Akademik Pelajar (HEP) (Student Affairs) in UiTM to manage the students' outing records.

2.1 Problem Statement

The current practice uses the paper-based system where it is time consuming since the process of outing requires the students to fill up the paper based form and get approval from the management. The process circulates all the way around the management since the process is not digitalized. Apart from that, there are also the possibilities of missing records since the number of records are growing. The existing system is completely manual where students have to write the details of the outings on forms, and the hardcopy of the records require large spaces to store. Paperwork can take up a significant amount of space, and this requirement will only get bigger as the number of documents grows. At present, web-based information systems have been widely developed to overcome the constraints of place and time of operation (Hidayat, 2017). The storage in the office requires more space to store student files if the number of students increases in that semester. Computerizing a paper system can create additional space, as there is no longer a need to store large volumes of paper records or files. It also makes it easier for the management and staffs to track the students outing information.

Thus, in order to overcome these problems, the E-Outing System is proposed to assist the management of students' outing information. Through this system, students no longer need to fill up the hardcopy form. This system enables students to fill up the outing form online and the management can review and approve the outing request via online too. The system will facilitate both the students and management in handling the outing process, while at the same time reduce the time needed for managing students' outing information.

2.2 Objectives

The objectives of the system proposed are:

i. To develop a computerized system that will replace the manual system used by the college management in managing student outings.
ii. To keep track of students' outing information activities
iii. To facilitate administrative staff in organizing students' outing information

2.3 Scopes of the System

The targeted users for the proposed system include students, College Resident Staffs (CRS), Auxiliary Police and Parents. This study proposes the design and development of a system for a student outings that could be used by the College Management Unit at UiTM Machang branch. This system has the ability to monitor, track and collect data of the students who request for an outing.

With these features, the system will be useful and effective to the college management for the purpose of monitoring student outings. It would be easier for the authorized staff to approve or decline students' requests for outings through the online system. Therefore, developing this system will help increase the productivity and also improve some tasks. Transactions in the organization will also be systematically reliable. The proposed system consists of six (6) main modules.

The first module is the Registration Module. This module involves the process of new user registration. Users will fill up the form which will then be submitted for approval by the administrator. The second module is the Outing Application Module. In this module, the students can fill up the outing form to request for outing activities. The next module is the Approve and Decline Module. This module will be used by the management which is the College Resident Staffs (CRS) to approve or decline the students' outing request.

The next module involves the process of scanning the matric card. The auxiliary police will check the students' information regarding the

outing request status. This is then followed by the report generation module. The management can generate reports regarding students' outing activities by day, week, month or year. These reports can be printed to be presented to the top management. The last module is the SMS Notification Module. This module will be used by the parents. The proposed system will notify the parents regarding their children's outing activities. Once the outing request is approved, a notification by SMS will be sent to the parents. Hence, it will help parents to be aware of their children's activities in the college.

METHODOLOGY

Following Rosman et. al (2010), the E-Outing System is developed following several empirical stages. First, we conduct a review on the existing forms, procedures and reports. Second, interview sessions are conducted with the stakeholders which are College Resident Staffs (CRS) and students. Lastly, in order to have a structured process, the System development Life Cycle (SDLC) is used as a methodology in developing the E-Outing System. The SDLC comprises of five (5) stages which are planning, analysis, design, implementation and maintenance (Hoffer et al., 2017).

3.1 Review Existing Forms, Procedures and Reports

In developing the E-Outing System, the hardcopy forms currently used by the students to request for outings were analysed. Besides that, the current procedures and reports that are used by the management were also analysed, in order to understand the process of outing request activities. Previously, the students were required to fill up the outing request form which consists of information such as matric number, name, course, phone number, guardian's details, outing details and others. Every time the students need to go out, they need to fill up the hardcopy form which is time consuming and a waste of space since the number of forms keep growing.

3.2 Interview with stakeholders

Interview sessions were also conducted with the College Resident Staffs (CRS) and the students who are the residents of the college. The individual interview was conducted in order to identify the current process and issues of the existing system. It is also through these interview sessions that the stakeholders needs were identified.

3.3 System Development Life Cycle (SDLC)

The E-Outing System is developed following the SDLC Methodology. SDLC is a structured methodology that consists of five stages which are planning, analysis, design, implementation, and maintenance (Hoffer et. al., 2017).

3.3.1 Planning Phase

The planning phase involves aspects of project and product management that include the resource allocation, capacity planning, project scheduling, cost estimation and provisioning for the E-Outing System. In developing a system, planning is the key to its success. This phase includes the process of discovering the problems, collecting data from various sources and conducting research related to the system proposed. It also the part of the project that determines the project's overall direction through the creation of the project strategy.

3.3.2 Analysis Phase

The second phase is the analysis phase. The preliminary investigation was conducted in this phase in order to determine the nature of problems and the requirements needed for the new system. Hence, the interview session was conducted in order to understand the current process as well as to gather requirements. Besides that, it was in this phase that the existing forms, reports and procedures were reviewed.

3.3.3 Design Phase

Once the requirements were understood, the developers began to design the E-Outing System. In this stage, a detailed design was constructed and the hardware and software were identified. During this phase, a detailed diagram was drafted – the diagram includes Data Flow Diagram (DFD), Entity Relationship Diagram (ERD) and Contextual Diagram (CD). These diagrams will help to explain the data structure of E-Outing System. Apart from that, in the design phase, the user interface was designed. This was later used as a guideline in the development process. At the same time, the user interface helped to ensure that the system is user friendly and easy to use.

3.3.4 Implementation Phase

The implementation process is when a system's functions are implemented, and how it will be used by users. This phase is important as is ensures that the system will be implemented correctly and efficiently on the device involved. Coding from scratch is the main activity in this implementation process and the most important thing is that it fulfils the users expectations and avoids critical errors in the program to ensure that the system runs effectively. This stage involves the installation of the hardware and application like Adobe Dreamweaver and Wamp server. For hardware, the researchers used a barcode scanner to scan the students' matric cards. Furthermore, implementation phase is important to identify system function as well as to verify whether it works as expected and as documented in the requirements analysis phase. In this phase, the system was tested to detect, and subsequently eliminate, bugs or errors.

3.3.5 Maintenance Phase

Maintenance is the last phase in the SDLC. For maintenance of the E-Outing System, the researchers used corrective maintenance, adaptive maintenance and perfective maintenance. Once the system is implemented, the maintenance phase takes

place. In this phase, some updates were made and bug fixing was carried out.

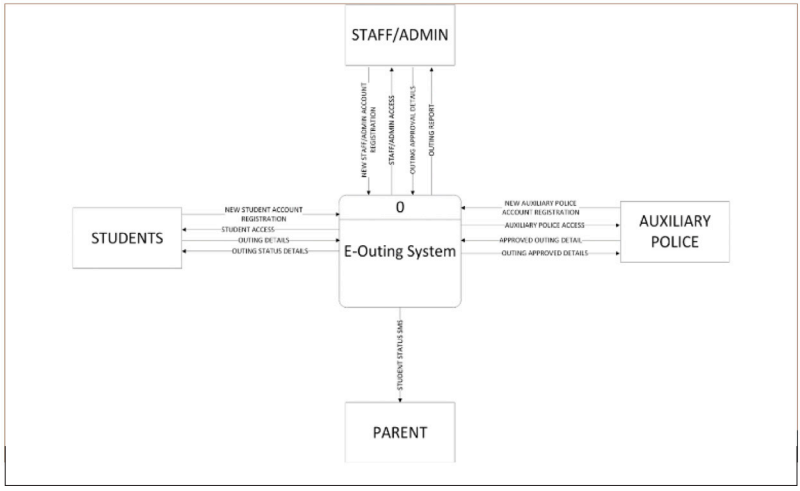

Fig. 1 Context Diagram for the E-Outing System

Figure 1, shows the context diagram of the E-Outing System where the flow of information between the system and entities which include Staff/ Administration, Students, Auxiliary Police and Parent can be seen.

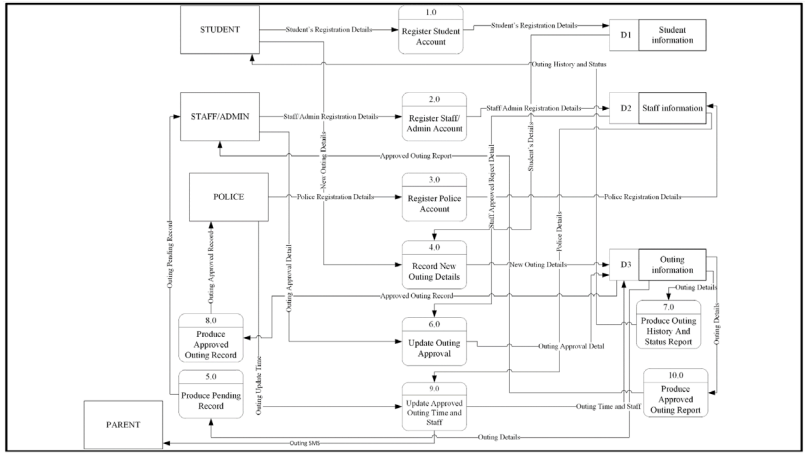

Fig. 2 Data Flow Diagram (DFD) for the E-Outing System

In Figure 2, the data flow diagram of the E-Outing System clearly identifies the flow of the information which consists of inputs, outputs, data stores and subprocesses.

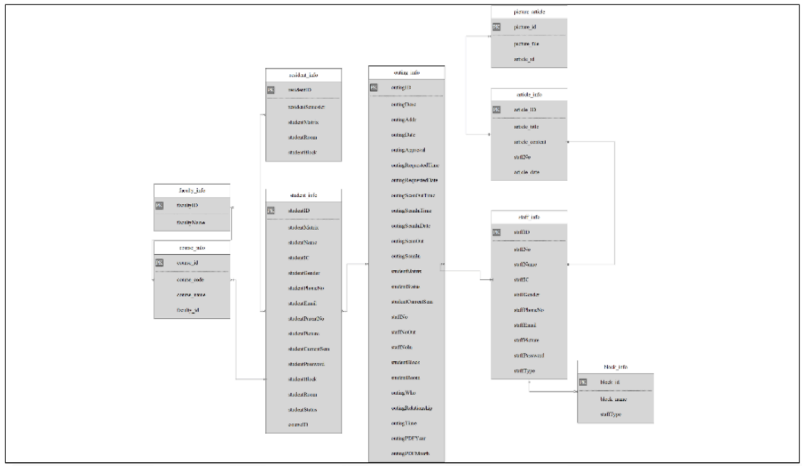

Fig. 3 Entity Relationship Diagram (ERD) for E-Outing System

Figure 3 illustrates the relationship between the tables. The figures represent the relationships among the entities within the E-Outing System.

INTERFACE FOR E-OUTING SYSTEM

The following figures show the print screen of the user interface for the E-Outing System which starts from the interface for outing request application, dashboard, outing approval or rejection, and reports.

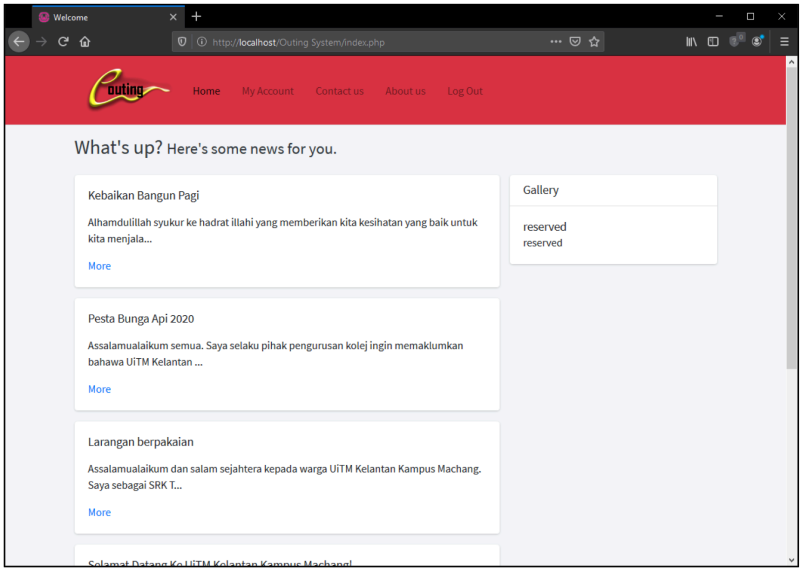

Fig. 4 Main Interface for E-Outing System

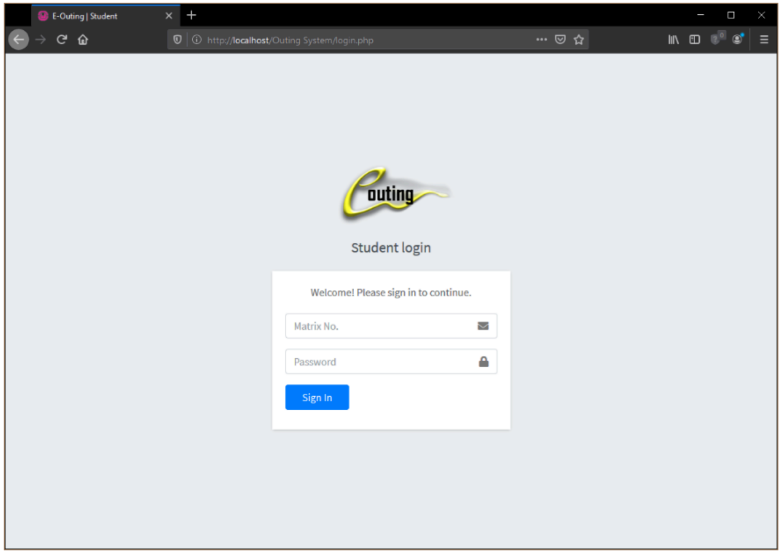

Fig. 5 Login Page for E-Outing System

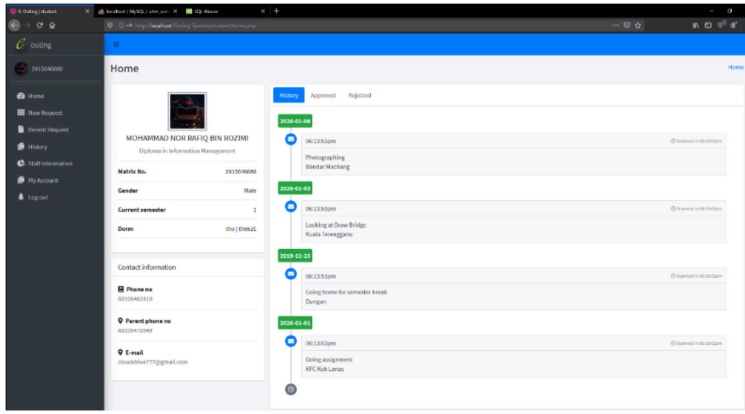

Fig. 6 Student's Information Page

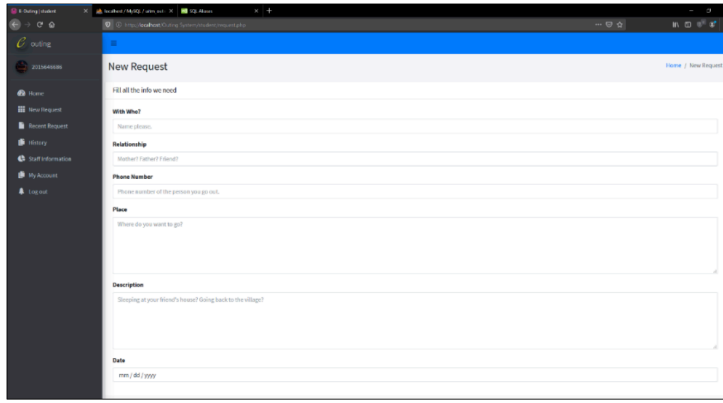

Fig. 7 Outing Request Application Form Page

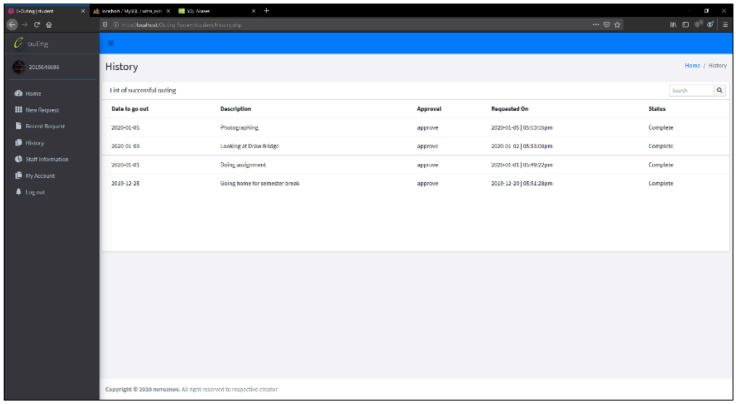

Fig. 8 Student's Outing History Page

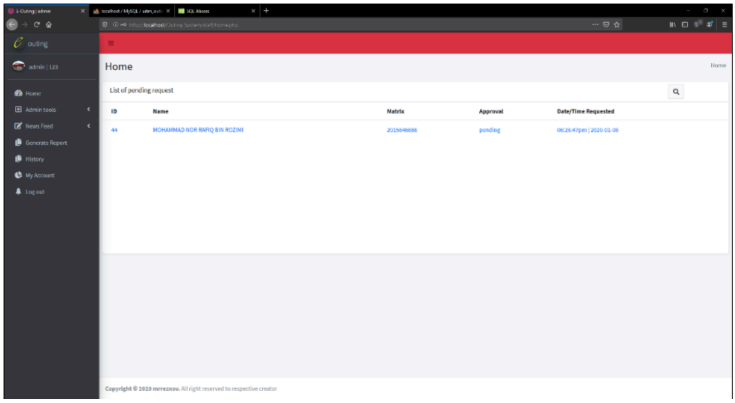

Fig. 9 Management Outing Approval Page

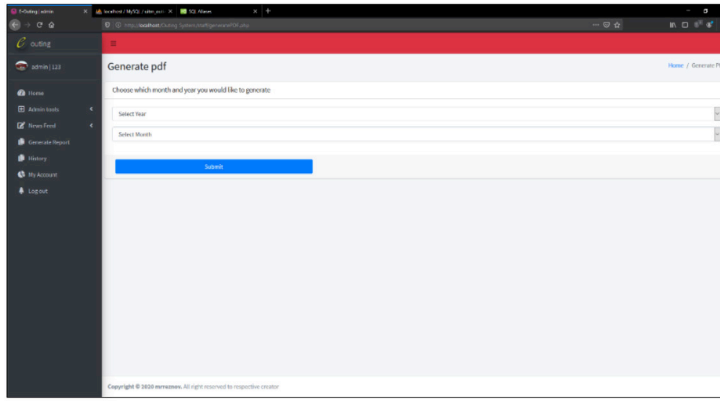

Fig. 10 Report Page

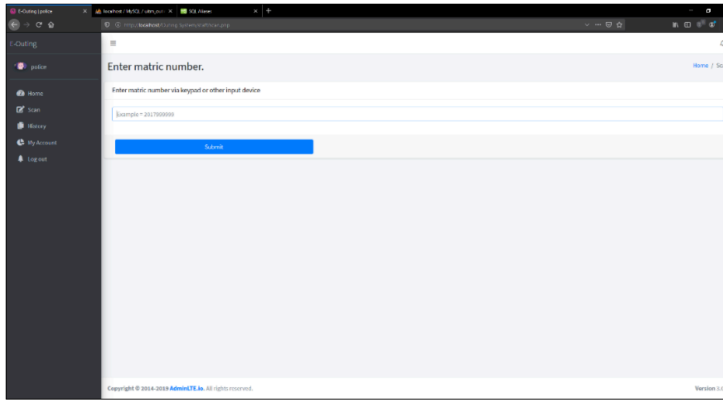

Fig. 11 Outing Application Evaluation Page for Auxiliary Police

CONCLUSION

In this paper, issues regarding record management were discussed. The E-Outing System is an information system that is developed with the aim to improve the procedures of student outing applications in UiTM Kelantan. However, the system could be implemented and commercialized to other campuses, universities and schools. The features of the system could be upgraded from time to time according the stakeholders' needs.

The people and departments that will mainly benefit from this E-Outing System are the College Management Unit, Auxiliary Police Unit and students of Universiti Teknologi Mara (UiTM) Cawangan Kelantan. The system provides a user-friendly interface to help the retrieval and management of the student outing information easily. This is achieved through the configuration of the system with a database that has allowed the system to be able to store a very large record efficiently and effectively. Besides that, using this new technology can enhance the systems and make them very robust. The implementation of an E-Outing System will solve all the problems that occurred in the previous manual system. The system ensures all the data are stored safely and ready to be displayed accordingly. Furthermore, the system eases and expedites the overall outing process as the total time consumed in managing student outings is significantly reduced. As a result, the user is able to save a lot of time and energy which can be spent on other matters.

Lastly, the E-Outing System assists the College Resident Staff (CRS) in assessing, reviewing, and approving or rejecting an outing request. The students outing information can be easily monitored by staff. The system also ensures all the documents will be generated such as outing student list and report. These could serve as evidence should anything untoward happen to the students.

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REFERENCES

Asogwa, D. U., Abdullahi, M., & Bello, A. (2015). The need for students information management system (SIMS) for Nigerian universities in a technological age: Challenges and strategies for proper integration. The International Journal of Social Sciences and Humanities Invention,2(12), 1765-1769.

Azza, A.M. (2017). An Empirical Study of MIS Impacts and Organizational Efforts on Improving Business Performance. London : Taylor & Francis Group

Hidayat, H., Hartono, H., & Sukiman, S. (2017). Pengembangan Learning Management System (LMS) untuk Bahasa Pemrograman PHP. Jurnal Ilmiah Core IT: Community Research Information Technology, 5(1).

Hoffer, J. A., George, J., & Valacich, J. S. (2017). Modern systems analysis and design (7th ed.). Boston: Pearson.

Park, S. C. (2018). The Fourth Industrial Revolution and implications for innovative cluster policies. AI & SOCIETY, 33(3), 433-445.

Rosman, M. R. M., Abdullah, R. Y. R., & Salleh, M. I. M. (2010, December). Development of Vehicle Observation System as security mechanism towards electronic records conversion. In 2010 International Conference on Science and Social Research (CSSR 2010) (pp. 699-704). IEEE.

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