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User-Centered UiTM e-Event using Predictive Software Development Life Cycle (SDLC)

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ABSTRACT

University students are having challenges in catching various events and programs which are being organized and held at their university. Currently, traditional methods of event notification, including posters and social media messages are weak in ensuring student awareness about various university's events. Many activities are held in low attendance which leads to missing opportunities for students' engagements and eventually the students may lose track of any events or programmes that have taken place on campus. This research aims to develop an event management system, UiTM e-Event, based on the predictive Software Development Life Cycle (SDLC). The predictive SDLC methodology was chosen for the structured approach to cater well-defined requirements. This research conducts a systematic process from planning and analysis to design, implementation, testing, and maintenance. The centralized platform known as UiTM e-Event can minimize the gap of communication, maximize the number of participants in an event and bring vibrancy to the campus life. This research also aims at addressing practical issues and able to add a value to the body of knowledge in the field of event management and information systems. UiTM e-Event integrates information pertaining to events, enhancing student involvement in such events, and improving event management at UiTM Machang. The system gives advantages such as assisting students to discover and engage with upcoming events, help to promote events organized by students or staff, facilitate the attraction of a larger audience and encourage greater participation among UiTM Machang users. This research also highlights the users' feedback by performing UiTM e-Event usability testing and the feedback generally has resulted positive feedback from the students.

1. INTRODUCTION

Event management in a university involves the process of planning, organizing, and executing various types of events within the academic setting. Universities organize numerous events throughout the year, including seminars, workshops, and festivals (Dolasinski et al., 2021). These events can range from academic conferences, seminars, and workshops to cultural festivals, sports competitions, and social gatherings.

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Centralizing event management is important to the university since events can be consolidated into a unified system and it can be utilized by students to get updated information regarding related events. Therefore, it is important to provide an effective event management to ensure smooth operation which can then meet event objectives and provide a positive experience for all the university students. However, there is a challenge in keeping up with university events since numerous events are not centralized in one platform in the campus (Hadiwiyanti et al., 2022; Schreyer & Ansari, 2022). This is mainly because there is not a single, easily accessible platform for keeping track of upcoming events. Due to this limitation, student involvement is severely hampered because events frequently go unreported, receive little feedback and have low attendance rates (Schreyer & Ansari, 2022). Even though students can be notified via messaging services like WhatsApp and Telegram, there is a tendency where students will miss out the event notifications. This paper discusses on a development of web-based system known as Campus Event Management Information System, which is developed to enhance the management of events for the university. The proposed User-Centered UiTM e-Event is developed by using predictive System Development Life Cycle (SDLC) since the requirements from the users are not volatile and the requirements are clear to be implemented. This proposed system also aims to give staff and students a solution to browse and stay informed about events on the campus and improving information sharing.

The paper is hereby organized as follows: Section 2 reviews the related literature on event management systems and predictive SDLC. Section 3 elaborates the software development methodology of UiTM e-Event. Section 4 provides an account of results obtained from this study with regard to usability testing and user feedback. Finally, Section 5 offers conclusions and suggestions on the implications of the findings.

2. LITERATURE REVIEW

This section discusses related literature on existing event management system and overview of predictive SDLC.

2.1 Comparison of Existing Event Management System

This section elaborates existing event management systems that are used to handle events for selected groups. The three examples known as Eventbrite, Meetup and CampusGroups below are managed via an online system.

2.1.1. Eventbrite

Eventbrite is a leading event management and ticketing platform that serves a wide range of users, including educational institutions, by facilitating the creation, management, and promotion of events of all sizes (Jibran & Ismail, 2018). It allows organizers to set up customizable event pages, complete with detailed descriptions, images, and ticketing options that range from free registrations to multi-tiered pricing. The platform's integrated payment processing offers a secure way for attendees to purchase tickets, simplifying the transaction process.

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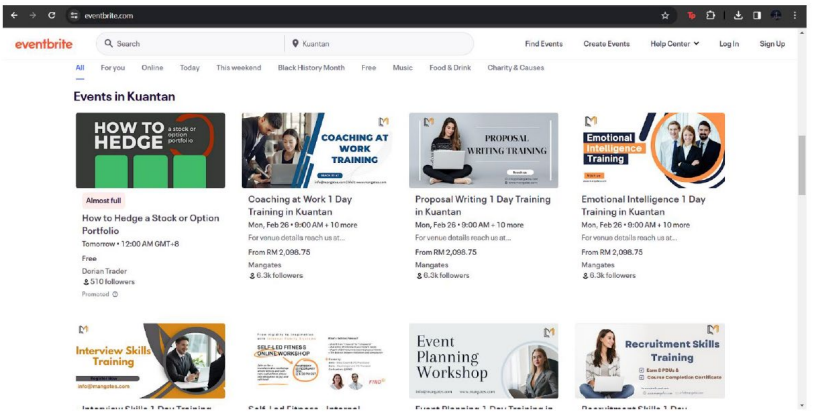

Fig. 1. Eventbrite Homepage

Moreover, Eventbrite equips organizers with powerful promotional and analytics tools, such as email marketing and social media integration, helping them to reach a broader audience and gain insights into event performance. Attendees benefit from a user-friendly interface for discovering events and a mobile app for ticket management on the go. This suite of features, combined with its ease of use, makes Eventbrite a popular choice among event organizers worldwide, particularly in the educational sector, for enhancing event visibility and improving attendee experience.

2.1.2. Meetup

Meetup is a versatile platform designed to bring people together for events and activities aligned with their interests, offering a unique space for community building and engagement (Thakar, 2018). While it's not tailored specifically for educational settings, its features make it an excellent tool for university clubs, groups, or departments looking to organize events that cater to specific academic, cultural, or recreational interests. Users can create or join groups based on these interests, and organizers can schedule events, manage memberships, and promote gatherings to group members or the broader Meetup community.

The platform's intuitive interface simplifies the process of discovering events and connecting with like-minded individuals or groups. For universities, this means the ability to foster a more engaged and interconnected campus community by facilitating easier access to a wide range of events. Meetup's emphasis on creating a network based on shared interests makes it a valuable resource for enhancing student engagement, encouraging participation in extracurricular activities, and supporting the growth of specialized clubs and organizations within the educational ecosystem.

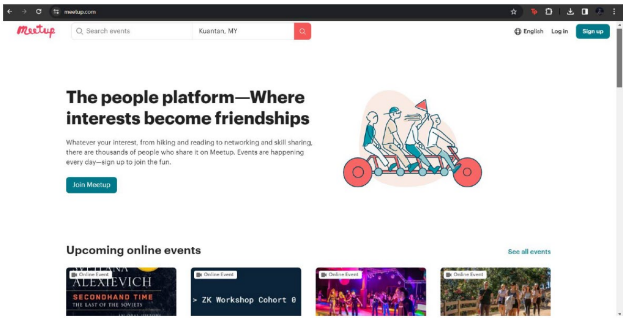

Fig. 2. Meetup Homepage

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2.1.3. CampusGroups

The third example of event management system is known as CampusGroups (Education, 2024). It is a comprehensive platform tailored to meet the unique needs of higher education institutions, facilitating effective event management, student engagement, and community building. It specialized suite of tools allows university clubs, groups, and departments to easily organize events, communicate with members, and foster a vibrant campus community. From scheduling events and managing RSVPs to distributing surveys and polls, CampusGroups streamlines the entire process, making it more efficient for both organizers and participants.

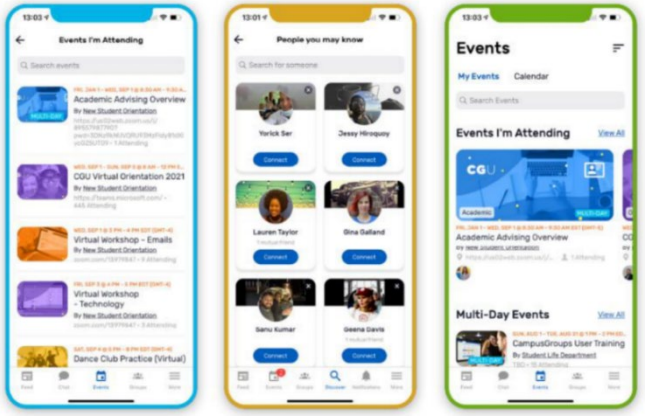

Fig. 3. CampusGroups Homepage

Additionally, the platform enhances student engagement by providing a centralized hub for all campus activities, enabling students to discover and participate in events that align with their interests. With features like personalized event recommendations and a mobile app for on-the-go access, CampusGroups ensures that students stay connected with their campus community, contributing to a more engaging and inclusive university experience.

2.1.4. Comparison of Features between Eventbrite, Meetup and CampusGroups

Section 2.1.4 compares features of existing event management system elaborated in 2.1.1 to 2.1.3.

Table 1. Comparison of Features of Existing Event Management System

Feature	Eventbrite	Meetup	CampusGroups
Focus	Event management and ticketing for a broad audience	Community building around specific interests	Event management, student engagement and community building within universities
Learning Style	User-friendly for organizers and attendees	Community-driven learning through group activities	Tailored to educational environments, promoting interactive learning and engagement
Pricing	Free for free events, charges a fee for ticketed events	Subscription-based for organizers; free for participants	Custom pricing based on the institution's size and needs
Strengths	Wide range of tools for event promotion and management, integrated payment processing	Fosters social interaction and community building, diverse interest groups	Comprehensive suite of tools specifically designed for educational institutions, enhances campus engagement

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Weaknesses	Can be cost-prohibitive for small events due to fees	May not be directly tailored for educational events	May require institutional commitment and investment, potentially limiting individual initiative

2.2 An Overview of Predictive SDLC

Predictive SDLC, is a structured and sequential approach for producing high quality software product (Yang et al., 2022). It emphasizes planning and scheduling, with each phase of the development process being completed before the next one begins. This model is best suited for projects with well-defined requirements with minimum changes. The phases of predictive SDLC are planning and analysis, design, implementation, testing and maintenance. Predictive SDLC ensures thorough documentation and able to produce systematic project progress However, it is less suited for projects that require flexibility and adaptability due to evolving requirements (Alazzawi & Rahmatullah, 2023).

3. METHODOLOGY

When it comes to developing a system, methodology provides a framework for effectively managing the development process, ensuring that it is well-planned, executed for quality information system. In system development processes, planning and analysis is considered as an initial stage for obtaining initial idea on requirements for developing UiTM e-Event. This section elaborates processes involve in producing UiTM e-Event for improving event coordination and communication in UiTM Machang.

3.1 Planning and Analysis

The Planning and analysis phase is an initial process in predictive SDLC for establishing the project's scope and detailed plan for the entire event management system (Sakul-Ung & Chutimaskul, 2017). Software development in this research employs the predictive Software Development Life Cycle (SDLC) to produce high-quality software products. It offers a sequence of stages and tasks that direct the creation process from the first concept through the release and maintenance of the finished product. The predictive SDLC technique aids in making sure that software projects are well-planned, well-executed and satisfy the stakeholders' expectations. Fig. 4 visualizes predictive SDLC phases that are used in this study.

Fig. 4. Software Development Life Cycle Methodology Phases

Source: Pinheiro (2018)

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The main objective of this phase is to provide a strong framework for the project, making sure that it is realistic, well defined and capable of being effectively carried out. This phase has established the framework for the entire software development project and provides guidance for the next stages which include analysis, design, implementation, testing and maintenance. There was a brainstorming session among students for producing UiTM e-Event and they have given a clear process for the proposed system. During the requirements gathering process, the key points has been as below: -

- Description of existing methods to announce events happening at UiTM Kelantan Branch.
- Challenges in organizing events of UiTM Kelantan Branch.
- Issues with event attendance or engagement using existing methods of announcement.

Fig. 5 below reveals a use case diagram for UiTM e-Event system based on the brainstorming session and Fig. 6 describes the flow chart of UiTM e-Event.

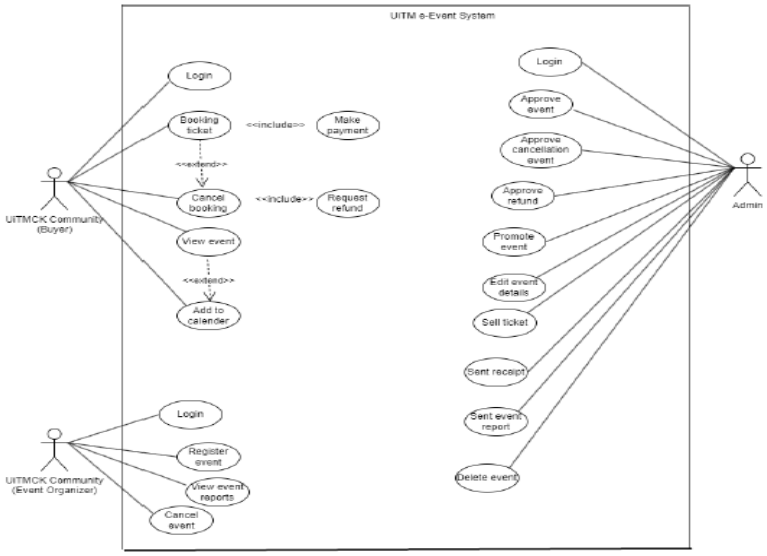

Fig. 5. Use Case Diagram of UiTM e-Event

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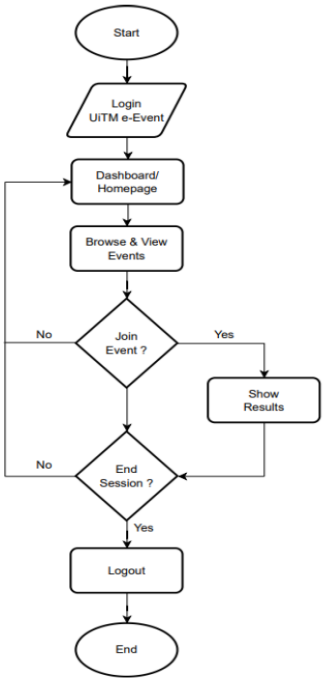

Fig. 6. Flow chart of UiTM e-Event

Fig. 6 outlines the process for navigating the UiTM e-Event platform. The users start by logging in and is directed to the dashboard. From there, the users can browse and view events, and choose to join an event or log out. If they choose to join an event, they are prompted to confirm their selection before being directed to the event page. The flowchart also includes options for showing results and ending sessions, with the users being prompted to confirm their choice before the session is ended.

3.2 Design

During design phase, activities such as creating Entity Relationship Diagram (ERD) and user interface are important to transform the requirements into a blueprint of system development (Maulana et al., 2023). ERD and user interface design are designed for UiTM e-Event system to ensure data regarding UiTM events are successfully integrated for users.

3.3 Implementation

Next, implementation phase took place to allow coding and testing activities for UiTM e-Event system development. The proposed system has been tested to ensure the database and user interface can be implemented for running UiTM Machang's event management system. The output of the implementation phase has considered all requirements from the users during initial activity which is Planning and Analysis phase (Moparthi & Geethanjali, 2016). The implementation phase's activities are briefly described in the Table 2. For usability, purpose, the user evaluation using System Usability Scale (SUS) has been performed by using selected 26 users which were among UiTM Machang citizens.

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Table 2. Summary of implementation phase

Phase	Activities	Tools/Method	Deliverables
Implementation - To develop User-Centered UiTM e-Event using SDLC	Develop the database	PhpMyAdmin	A configured database in phpMyAdmin with schemas for users, events, registrations and feedback for the event management system
	Develop UI and functions of User- Centered UiTM e-Event using SDLC	Visual Studio Code / Laravel	The instructions that specify how the system behaves are contained in the source code, which forms the basis of the system

Prior to being released to users, the software is thoroughly examined during the testing process, which is an important stage in the Software Development Life Cycle (SDLC). Next phase will elaborate about the testing activities of UiTM e-Event system. Generally, the testing is divided into functional testing, performance testing, usability testing and compatibility testing (us Saqib & Shahzad, 2018). This paper highlights on the usability testing to see responses on the user's feedback regarding the system usability.

3.4 Testing

During testing phase, UiTM e-Event system was thoroughly examined during the testing process, which is an important stage in the predictive SDLC. The main objective of testing is to make sure that the software complies with the requirements and operates in a consistent manner (Kamal et al., 2020). The system is tested as part of system testing after it has been completed in its entirety. Usability testing is conducted to see whether the system can assist the users efficiently to perform each task. Usability testing is a critical process in user-centered design since it can be used to evaluate a product or service by testing it with real users (Rembulan et al., 2023). By utilizing existing System Usability Scale (SUS) (Sujito et al., 2019), the development of the User-Centered UiTM e-Event project focuses on securing essential user feedback on the system's usability. This effort is pivotal for pinpointing areas that require enhancement and confirming that the system aligns with the needs and expectations of UiTM Machang users. By incorporating SUS into the testing phase of the predictive SDLC, it allows informed decision-making for a more user-centric and efficient platform for managing and participating in events.

3.5 Maintenance

The software development life cycle (SDLC) concludes with the maintenance phase, which happens after the software has been deployed and is being used by users. In this stage, the emphasis switches from software development to continuing software support, improvement and maintenance. During this stage, UiTM e-Event system is initially used by the users and any changes or improvement is recorded if there is any or related with the quality of the system.

4. RESULTS

4.1 Students' Perception on UiTM Event News

The result begins by finding types of resources that students usually use for obtaining UiTM event information. The questionnaires have been distributed to 26 UiTM Machang students were generated by using a pie chart as depicted in Fig. 7. Online questionnaires were selected due to their ease of use and capacity to quickly and effectively communicate with the respondents at once.

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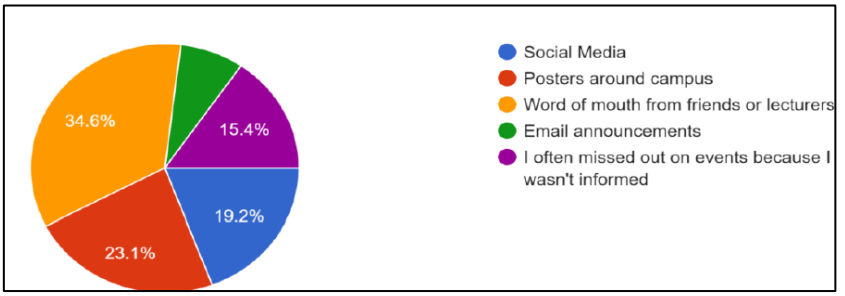

Fig. 7. How respondents find out about UiTM events

According to the selected 26 respondents of UiTM students, most of the respondents from the UiTM Machang community (34.6%) find out about events by word of mouth from their friends or lecturers while 23.1% are aware about the events through posters around campus. Meanwhile, email announcement is the least preferred way for obtaining any event information by the students. This has shown that there is still lack of awareness among students in updating information using email service. Most of them were comfortable with word of mouth and posters around the campus for updating themselves for any events. Whereas based on Fig. 8, 53.8% of the respondents often missed out interesting events or too late to know about it. This shows that many events should have more participants if they did not miss out about the event and if there was a more suitable platform that can be referred to address the issue.

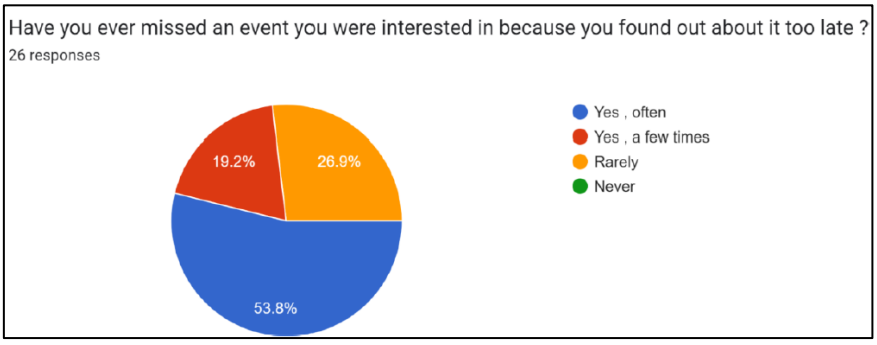

Fig. 8. Students' reaction on missed UiTM events

4.2 UiTM e-Event Admin Page

This section reports selected pages for UiTM e-Event which portrays how the system can be used by the users. Fig. 9. Displays the 'Upcoming Events' in the UiTM E-event system along with the event name and price for admission per unit.

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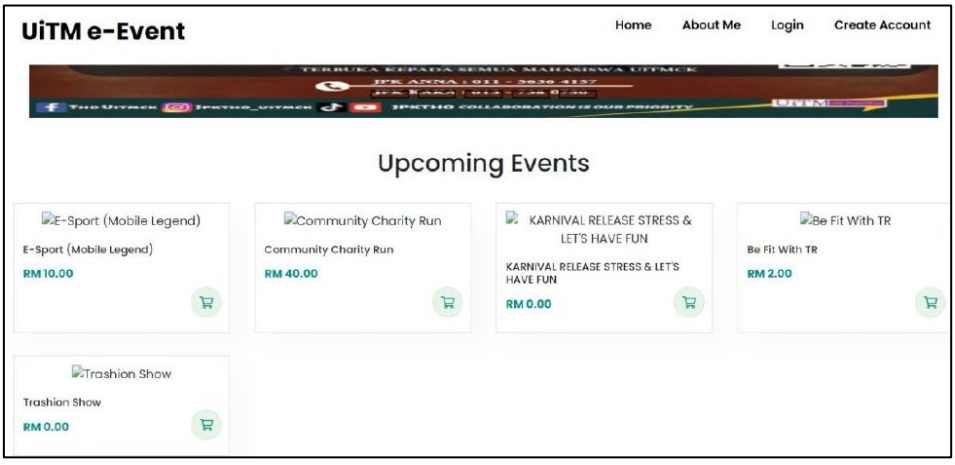

Fig. 9. UiTM Events Homepage

From this homepage in Fig. 9, the user can also navigate the system by using a navigation bar above the page. It has the elements such as Home, About Me, Login and Create Account. Then, user can view all the upcoming events that are going to be held in UiTM Machang. User can choose which events that they want to view more about the information and join it by clicking on the trolley button.

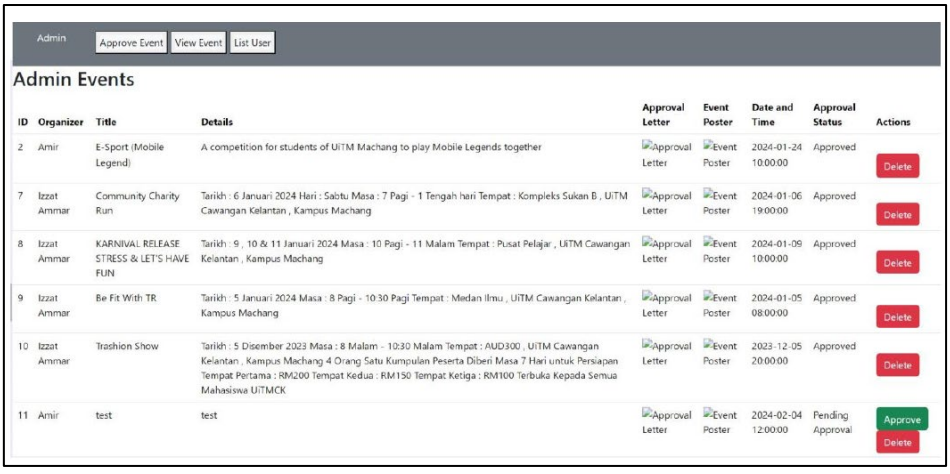

Fig. 10. UiTM e-Event for Admin Page

Fig. 10 displays an administrator page for UiTM e-Event. This page lists down all event application list that need to have approvals for legalized the events. If the administrator wants to approve the application, he or she just need to click the ‘Approve’ button and if the event needs to be rejected, the admin needs to click the ‘Delete’ button and the application will be deleted from the list.

4.3 System Usability Scale (SUS) Evaluation

SUS has selected 6 respondents in order to produce usability result for UiTM e-Event. Following completion of the system, SUS was performed to determine its effectiveness and usability. 6 respondents were sufficient to find out if there is any usability problem regarding the design of the software product

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(Nielsen, 2000). According to Fig. 11, 66.7% respondents were “Agree” or “Strongly Agree” to use UiTM e-Event website frequently.

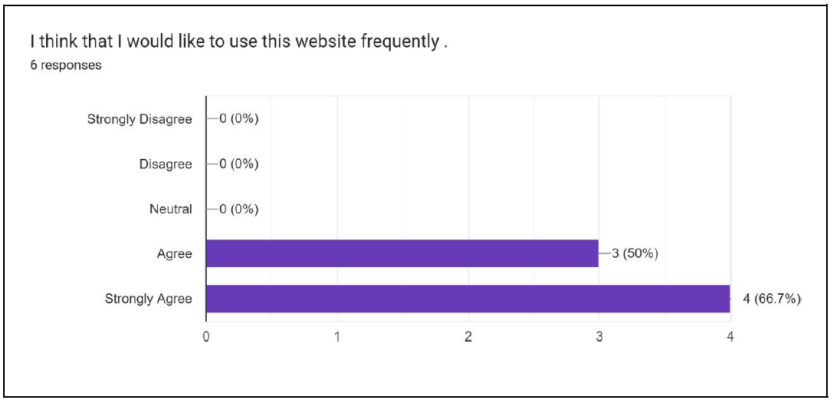

Fig. 11. Result of using UiTM e-Event on frequently basis

Whereas Fig. 12 reveals about their opinion whether UiTM e-Event is an easy-to-use website. From the survey result, 66.7% of the respondents were “Strongly Agree” that this website was a very easy to use website. Meanwhile, another 33.3% agreed with the statement. The result in Fig. 12 also indicates that the respondents acknowledged UiTM e-Event website as a user-friendly website.

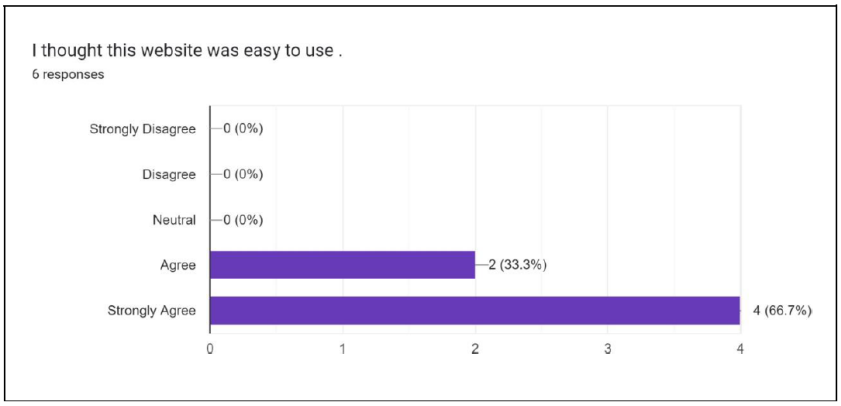

Fig. 12. Result on feeling easy to use in using UiTM e-Event

This paper also reveals their opinion whether the information on UiTM events is integrated on the website. From Fig. 13, 83.3% respondents agreed that UiTM e-Event has various functions and the information were integrated online.

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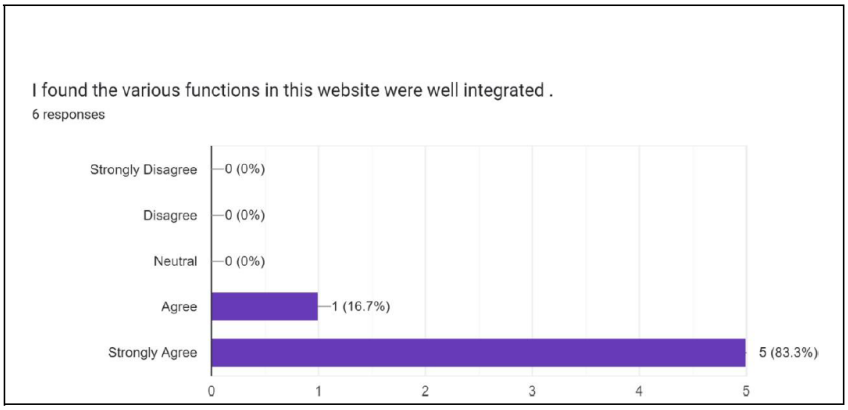

Fig. 13. Result on data integration using UiTM e-Event

In summary, by having UiTM E-event system as an online event platform, the students of UiTM Machang may find it easier to respond with events that catch their interest since the events will be centralized, thus enable the system as the alternative for event communication channel.

5. CONFLICT OF INTEREST STATEMENT

The authors agree that this research was conducted in the absence of any self-benefits, commercial or financial conflicts and declare the absence of conflicting interests with the funders.

6. AUTHORS' CONTRIBUTIONS

Noorihan Abdul Rahman: Introduction, methodoloy and writing-original draft; **Muhammad Izzat Ammar Ghaffa**: UiTM E-event system development and testing; **Nor Asma Mohd Zin**: User interface design checking for UiTM e-Event; **Zuriani Ahmad Zukarnain**: Investigation on event management in UiTM existing event management system; **Yeffry Handoko Putra**: Review and paragraphs and figures editing.

7. REFERENCES

Alazzawi, A., & Rahmatullah, B. (2023). A comprehensive review of software development life cycle methodologies: Pros, cons, and future directions. *Iraqi Journal For Computer Science and Mathematics*, *4*(4), 173–190. https://www.iasj.net/iasj/download/7e28313890452e4f

Dolasinski, M. J., Roberts, C., Reynolds, J., & Johanson, M. (2021). Defining the field of events. *Journal of Hospitality & Tourism Research*, *45*(3), 553–572.

Education, R. (2024). *CampusGroups*. https://www.campusgroups.com/product/home/

Hadiwiyanti, R., Suryanto, T. L. M., & Safitri, E. M. (2022). Evaluation of campus event management information system using system usability scale method. In *2022 IEEE 8th Information Technology International Seminar (ITIS)* (pp. 350–353). IEEE Xplore. https://doi.org/10.1109/ITIS57155.2022.10009978

Jibran, S., & Ismail, S. (2018). A study of commercial extended social media events applications. *Journal of Economics, Business and Management*, *6*(2), 62–65. https://www.joebm.com/vol6/551-SE006.pdf

Kamal, A. H. A., Yen, C. C. Y., Hui, G. J., & Ling, P. S. (2020). Risk assessment, threat modeling and

security testing in SDLC. *ArXiv Preprint ArXiv:2012.07226*.

Maulana, B., Siregar, R., Hutahaean, H. D., & Sinaga, T. (2023). Design of alumni and career development center web based application using agile SDLC methodology. *Instal: Jurnal Komputer*, *15*(02), 134–143. https://doi.org/10.54209/jurnalkomputer.v15i02.125

Moparthi, A. N. R., & Geethanjali, B. D. N. (2016). Design and implementation of hybrid phase based ensemble technique for defect discovery using SDLC software metrics. In *2016 2nd International Conference on Advances in Electrical, Electronics, Information, Communication and Bio-Informatics (AEEICB)* (pp. 268–274). IEEE Xplore. https://doi.org/10.1109/AEEICB.2016.7538287

Nielsen, J. (2000). *Why you only need to test with 5 users*. Nielsen Norman Group. https://www.nngroup.com/articles/why-you-only-need-to-test-with-5-users/

Pinheiro, J. (2018). *Software development life cycle (sdlc) phases.* Medium. https://medium.com/@jilvanpinheiro/software-development-life-cycle-sdlc-phases-40d46afbe384

Rembulan, G. D., Akhirianto, P. M., Priyono, D., Pramudito, D. K., & Irwan, D. (2023). Evaluation and improvement of e-grocery mobile application user interface design using usability testing and human centered design approach. *Jurnal Sistim Informasi Dan Teknologi*, 41–45. https://doi.org/10.60083/jsisfotek.v5i3.282

Sakul-Ung, P., & Chutimaskul, W. (2017). A predictive model for successful software development projects with information technology strategic alignment. In *Proceedings of the 6th International Conference on Software and Computer Applications*, 39–45. ACM Digital Library. https://doi.org/10.1145/3056662.3056700

Schreyer, D., & Ansari, P. (2022). Stadium attendance demand research: A scoping review. *Journal of Sports Economics*, *23*(6), 749–788. https://doi.org/10.1177/15270025211000040

Sujito, F., Arifudin, R., & Arini, F. Y. (2019). An analysis of user interface and user experience using system usability scale and GOMS method. *Journal of Advances in Information Systems and Technology*, *1*(1), 65–73. https://doi.org/10.15294/jaist.v1i1.36503

Thakar, V. (2018). *Platform for Event based Social Networking*. https://scholarworks.calstate.edu/downloads/4q77ft552

us Saqib, N., & Shahzad, S. (2018). Functionality, performance, and compatibility testing: a model based approach. In *2018 International Conference on Frontiers of Information Technology (FIT)* (pp. 170-175). IEEE Xplore. https://doi.org/10.1109/FIT.2018.00037

Yang, Y., Xia, X., Lo, D., Bi, T., Grundy, J., & Yang, X. (2022). Predictive models in software engineering: Challenges and opportunities. *ACM Transactions on Software Engineering and Methodology (TOSEM)*, *31*(3), 1–72. https://doi.org/10.1145/3503509

https://doi.org/10.24191/jcrinn.v9i2.468