

The Design and Development of the i-Jury Management System

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Abstract

Handling an event requires a repetitive and complex task, from initial preparation until its conclusion. One of the important elements in an innovation event is the jurying process. The jurying process usually involves tasks with higher priority and must be completed in a limited duration, usually within 4 to 5 days. The inexistence of inexpensive jurying information systems leads to the development of the i-Jury management system (i-Jury). The i-jury management system was developed based on PHP programming language, MySQL database, and jQuery. The development of the information system follows the System Development Lifecycle methodology. The findings show that the development of the information system speeds up the process of managing jury, project management, as well as speeding up the disbursement of results, comparing to previous traditional evaluation methods

Keywords: System development, jurying, innovation, exhibition, and event management.

1. Introduction

The sudden emergence of Novel Coronavirus 2019 or COVID-19 has transformed the whole world entirely. Education has now shifted entirely relying on online education through online distance learning (Sun, Tang, & Zuo, 2020; Doyumgaç, Tanhan, & Kiymaz, 2021; Paudel, 2021; Mohamad Rosman, S Baharuddin, Razlan, Ismail, Kamarudin, & Zawani, 2021). Similarly, COVID-19 also

turned business into two situations: first, liquidation due to restriction of control order (Malaysian Control Order - MCO), and second, digitalization of services to cater for restrictions and geographical barriers especially on the limitation of movement among customers.

The COVID-19 also has caused many events to be cancelled, reschedule, or completely abandoned. It caused a strategic and compounding loss totalling more than USD 1000 billion throughout the world (Madray, 2020). Events and Entertainment Management Association (EEMA) in their survey of 170 companies reported that over the last year since the start of the pandemic, 90% of scheduled events have been cancelled, the retrenchment percentage increase to between 25-50% while some companies have a higher value of between 50-80%, 63.1% suffered revenue loss and 97 companies require to raise capital to survive the pandemic.

In the academic context, one of the most affected events is the innovation event. For years, universities have organized international innovation events to (1) foster innovation among their academicians, (2) income generation, and (3) encourage national and international networking. However, the sudden impact of COVID-19 saw most of the innovation events in 2020 has been cancelled, only some of those were able to thrive the pandemics by moving into an online platform. Online platforms require a more diverse approach especially because most of the process will be performed from home to both organizer and the participants. Besides, one of the most challenging activities in the digital event is the judging process. Since this COVID-19 pandemic provides a different and new research paradigm on event management, thus researchers suggested that a special investigation should be conducted to view the multiple facets of COVID-19 impacts on the event management industry (Mohanty, Dhoundiyal, & Choudhury, 2020). Moreover, the researcher also stresses the importance of the study on how institutions manage social events in the post-COVID-19 pandemic (Simgé & Yaşar, 2021). Therefore, responding to the gaps in the event management post-COVID-19, this study was carried out to explain the development process of the jury management system or i-jury, an online jurying information system that was developed to ease the process of jurying and increase the efficiency of the result disbursement in the management of the event in the post-COVID-19 pandemic.

2. Literature Review

Several studies have been conducted to determine the impact of COVID-19 towards event management. Madray (2020) investigate the impact of COVID-19 on the event management industry from the context of India. The COVID-19 has completely transformed the event management industry particularly on related to live events. There was a huge cancellation of events throughout the pandemic, causing loss of revenue amounting to USD1000 billion. The author also argues to businesses are slow to regain their previous pace and now heavily relying on virtual events to survive the pandemic. The impact is severe, and government must take necessary action to restart the industry once again.

Miles and Shipway (2020) meanwhile investigate the need for disaster management and resilience studies in order to tackle future disasters in the context of international sports events, as well as traditional event management. The authors then highlighted 8 keys thematic areas that should be given consideration for future event management resilience. Besides, the article also introduces the new concept of sports events and venue resilience in order to cater for the future endeavour. The authors also suggested that there is a need to understand the synergy between sport

and event management studies with crisis and disaster management fields as a way to move forwards.

On the other hand, Jiang and Wen (2020) investigate the effects of COVID-19 on hotel marketing and management practices. The authors argue that the researcher should leave the focus of research on antecedents; instead, more focus should be given on customer's perception, surface cleanliness and evolving relationship between the hotel industry and healthcare industry. Moreover, adhering to healthcare support may influence travellers to attend the hosted event and reassure them of the cleanliness and safety of the premises. Similar to other industries, the hotel industry also suffered lost revenue and cancellation of booking throughout the pandemic.

Gajjar and Parmar (2020) argue that event management is a source of income generation companies and provides employment opportunities especially for the socio-economic development of a country. The authors categorize event management into several categories: social, corporate, entertainment, educational, exhibitions, and fair and special client events. Moreover, in order to tackle the current pandemic, the authors suggested that: (1) business particularly the staff must stay current, (2) Appropriate design and placement of space to cater for different participant's attitudes, (3) Have a clear communication plan to deal with the pandemic during the event, (4) develop a viable communication plan for the handling of the event, (5) Provides more accessible handwashing tools, and (6) focus on physical signages, staff awareness and communication with attendees on arrival.

Looking back into the current practices of the event management system, various application software has been developed to cater for the needs of the organization. For example, most organizations prefer to use free resources such as Google Form, Google Sheet, Survey Monkey, etc. (Laskowski, 2016; Mohamad Rosman, et al., 2021). On the other hand, big game players prefer to use established online software such as Judgify, JudgeFest, Award Force, etc. The importance of having an established information system for managing the event especially related to the jurying process contributed toward the success of the event as well as enhanced the reputation of the organization (Ahmadi, Mesgarianb, Bathaeib, & Haddadib, 2021).

3. Methodology

The development of the i-jury management system follows several empirical stages adopted from Rosman, Abdullah, and Salleh (2010). First, we conducted a content analysis by reviewing existing reports, forms, and procedures. Second, we conduct a joint application design (JAD) session to gain insight into the development and requirement analysis. Third, a short interview was conducted with end-users, and fourth, system development based on System Development Life Cycle (SDLC).

3.1 Review of existing reports, forms, and procedures

To gain an understanding of the overall process of the jurying system, we investigate existing reports, forms, and procedures from several innovation events, such as the Invention, Innovation and Design Exhibition (IIDEX), Kelantan International Learning and Innovation Exhibition 2019 (KILIEEX 2019), and Virtual Innovation Competition 2020 (VIC2020). The purpose of this stage is to identify the expected procedure, deliverable, and designing the business rules of the information system. The main source of information in this stage is the organiser website, previous

communication with the organiser, Internet searching, article from news hub, and management report. The expected output is business procedures and common standard operating procedures of managing the jurying process.

3.2 Conduct Joint Application Design (JAD)

The Joint Application Design (JAD) session was also conducted with the stakeholders. The purpose of the JAD session is to gain insight and obtain an in-depth analysis of the problem and potential solutions, as well as a good alternative to gain more details on the potential problem (Purvis & Sambamurthy, 1997). This JAD session was conducted through Google Meet with several respondents selected based on certain criteria: (1) have experience with jury management process, (2) involves as an organiser in at least one event, and (3) have a working experience of more than 3 years. The expected output is the system design and specification of the proposed information system. A total of 5 respondent was selected for the JAD session.

3.3 Perform interviews with end-users

Other than the JAD session, an individual interview was also performed with the selected respondents, selected from the list of judges from two events, Virtual innovation Competition (VIC) and International Information Management Online Showcase 2020 (IIMOS2020). The purpose of this stage is to understand the current process, requirement analysis and determining expected features of the information system. The expected output is to confirm the result from the JAD session from the previous stage.

3.4 System Development Lifecycle

The development of the information system follows the SDLC methodology. SDLC is considered as an appropriate methodology and consist of the following stages: planning, analysis, design, implementation, and maintenance (Hoffer, George, & Valacich, 2013). The initial preparation (planning and analysis) was assisted by the first three stages of this study. SDLC is a good alternative for a more popular agile development methodology (Kasauli et al., 2021). The expected output is information system planning that comprises planning, analysis, design, implementation, and maintenance. The purpose of this process is to determine the capability of the project team to conduct the project and to decide the resources necessary for making the development process a success.

4. Findings

The subsequent subsection will discuss the finding of the study.

4.1 Information system procedures

The following figure 1 shows the summary of the jurying process. The first process started with the call for jury, in which the organiser will have two options: first, open call for jury nomination through email and website. Second, a personalized invitation to the qualified

individual to be appointed as a jury. Next, the selection of the jury is usually based on several indicators: (1) number of working experiences, (2) years of experience with innovation, (3) the number of awards won throughout career, (4) level and type of expertise, (5) the number of projects submitted to the event, and (6) previous experience as a jury. In this stage, it is compulsory to do a background check to determine the reliability of the juries. Next, the jury will be assigned a task to be completed. The number of tasks depends on several criteria: (1) number of projects submitted, (2) expertise, (3) the number of juries available. However, it is advisable that the maximum number of assessments should not be more than 7 tasks to ensure the quality of assessment. The subsequent stage is assessment whereby the jury will perform the jurying task. This is the crucial stage whereby the organiser must: (1) Organize a jurying briefing session to ensure that the juries understand all the rubrics, thus ensure fair judging across the evaluation, (2) monitoring the percentage of assessment completion, (3) follow-up with each jury to ensure all juries complete their assessment within the stipulated timeframe. For the confirmation, it is advisable to establish a jury committee to go through all the evaluations and selected the best project out of mutual consensus among the selected juries. Finally, the result will be given to the other committee for other preparation such as certificate, medal, announcement, etc.

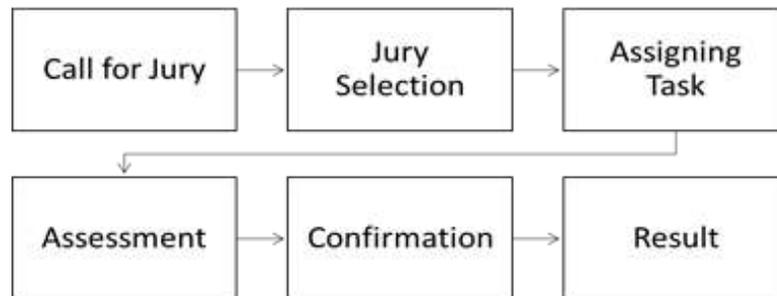


Fig. 1 Jurying Procedures

4.2 System Development: Conceptual Database Design

Results from the JAD session and user interview were transcribed into conceptual database design, as shown in the following figure 2. In this diagram, user, assessment, project, and a rubric are an object referred as the “entities”. An entity is the representation of a table that represents the main flow of the information system. In figure 2, the main table is the table USER. The table USER stores data related to three levels of users: administrator, staff, and jury. The second table is PROJECT. Table PROJECT stores information regarding the project registered for the event. The third table is ASSESSMENT. Table assessment contains the data regarding the projects and jury. Each project will be evaluated twice to ensure the reliability and accuracy of the assessment. The fourth table is RUBRIC. Table RUBRIC contains details regarding the evaluation criteria. In terms of relationship, a jury will be given at least 1 or more assessments (1:M), a project will have a minimum of two assessments (1:M), one rubric will be used by many assessments (1:M).

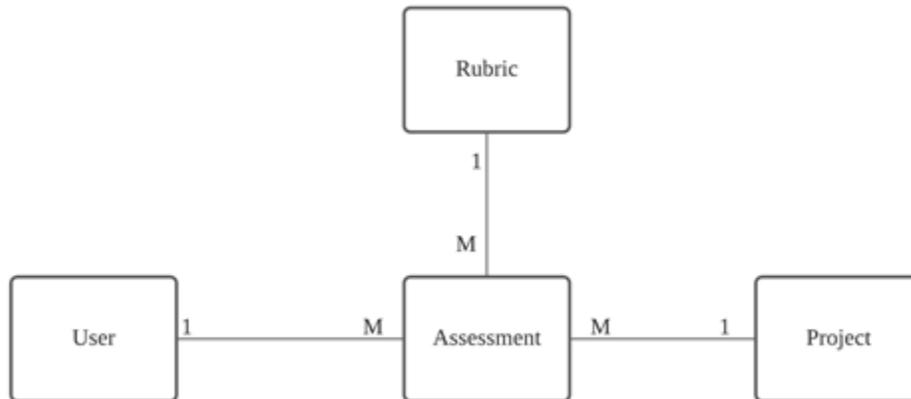


Fig. 2 Entity Relationship Diagram

4.3 System Development: Interface Design

The following figure 3 to figure 7 shows the print screen of the interface design for the i-jury information system. The dashboard in figure 3 shows the basic menu of the system. Figure 4 shows the capability of the system to automatically generate the results after an assessment has been completed. Figure 5 indicating the login screen whereby the jury can generate a jury code to continuing with their assessment. Figure 6 shows the appointment letter automatically generated and send through email to the appointed juries. Figure 7 meanwhile shows the “Jury Blaster” whereby the organiser can blast information to all juries.

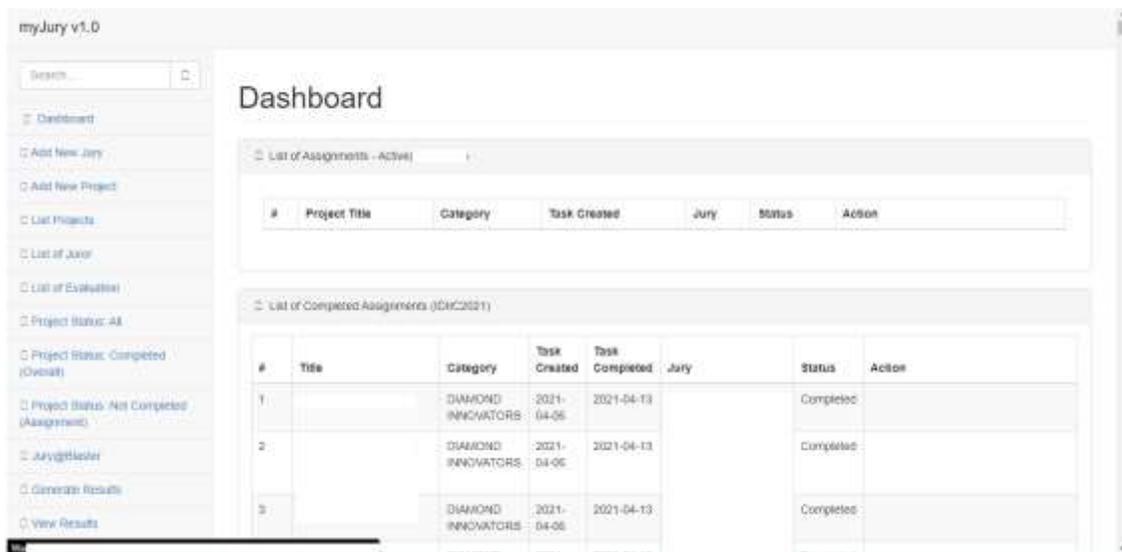


Fig. 3 Dashboard of i-Jury

Due to large number of records, generating results will took some times. Please be patient and wait until all process have been completed.

Generate Result

#	Total Project	Total Evaluation	Queries Run 1	Queries Run 2	Results Status
#	600	1200	600	1200	VALID

Fig. 4 Automatic Result Disbursement

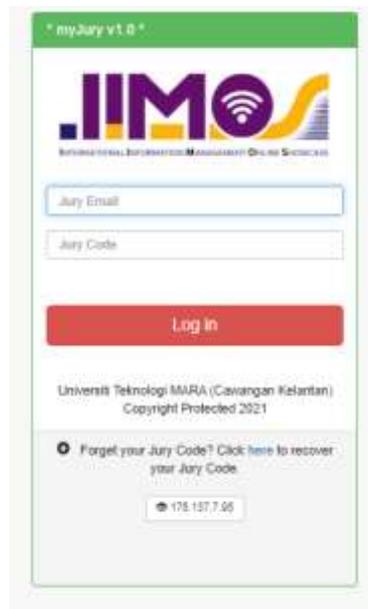


Fig. 5 Login Screen



Fig. 6 Jury Appointment Letter

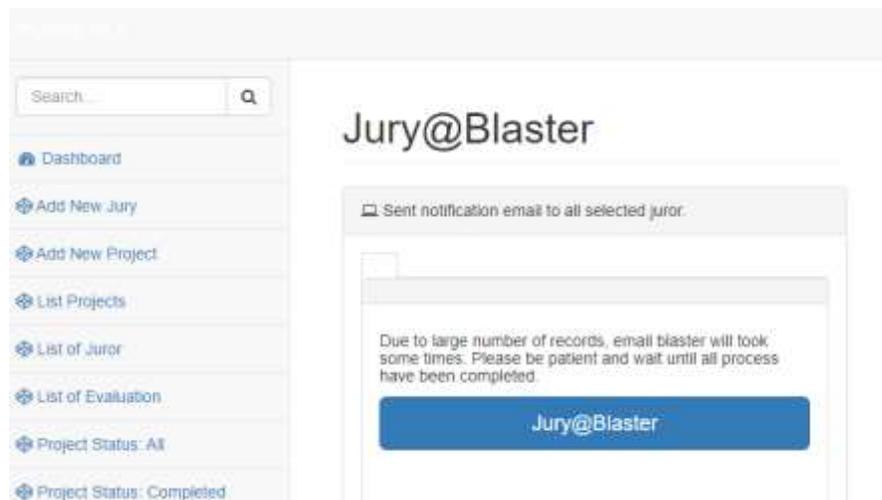


Fig. 7 Jury Blaster

4.4 System Development: Programing

The development of the application system utilizes an open-source programming language, which is PHP: Hypertext Preprocessor (PHP). PHP is one of the most popular programming languages and has been used for years by developers. The PHP version currently uses by the application is PHP 7.4 and is supported by the MySQL database. Similar to PHP, MySQL database is also free to use and has cross-platform compatibility – making it easy to be used on the different operating systems and are not confined to a single platform (i.e., Microsoft Windows). On top of that, jQuery was also utilized to simplify the PHP operation and adding an interactive feature to the information system.

4.5 System Development: Testing

In terms of software testing, a total of three tests have been performed; unit testing, integration testing, and system testing, as depicted in Table 1. Based on the result, the system passed all the tests and is ready for market distribution. The testing process was conducted by 10 selected respondents that have experience with information system development and meet the following criteria (1) a minimum qualification of degree level, (2) have more than 10 years experience with information system development, and (3) have an experience being a judge for any innovation

event. A Likert-Scale of 5 was given to the respondents during the User Acceptance Test (UAT) procedure. They also were allowed to give any additional comments that can help to improve the efficiency and effectiveness of the information system.

Table 1: Testing and Evaluation of the Information System

<i>Stage</i>	<i>Test</i>	<i>Source</i>	<i>Result</i>
Unit Testing	Black-Box	System Specification	Passed
	White-box		Passed
Integration Testing	User Interface	Menu and Interface Design	Passed
	Data Flow	Logical/relational ERD	Passed
	System Interface	System Flowchart	Passed
System Testing	Requirement	System functions and features	Passed
	Usability	Menu and interface	Passed
	Security	Login page and session	Passed
	Performance	System functions and features	Passed
	Documentation	User documentation/ manual	Passed

5. Discussion

The study identifies several interesting results. First, the development of the information system using System Development Lifecycle Methodology (SDLC) combined with the JAD session speed up the development of the information system, reduce non-compliant users, and increase user satisfaction. However, some respondents do raise an issue regarding their capabilities to handle the assessment using the information system. Thus, we suggested that the event organizer must always plan for a training or hands-on session for both juries and organizers before proceeding with the assessment process.

Second, thorough information system testing, and acceptance must be conducted before deciding on the full-scale implementation of the information system. Some respondents in the JAD sessions argue that the complexity of the information system may discourage users from continuous usage of the system, thus appropriate information system testing can help to improve the usability and user-friendliness of the information system.

Third, JAD sessions also reveal some of the functions seeks by the organizer and juries; (1) capability for multiple assessments, (2) automatic reminder of task(s) to be completed, and (3) capability to interact with the participants for further clarification of the innovation. Future system development should consider adopting these features to improve the efficiency and performance of the jurying process.

Fourth, there must be good communication between the organiser and the jury. Several respondents argue that managing juries require a systematic process from the appointment until the completion of the jurying process. Some respondents classified juries into three segments: excellent, moderate, and non-cooperative. Organisers must have the necessary skills and techniques to deal with different kinds of juries, thus help them to meet the objective of the event.

In relation to information system features, the development of the I-Jury management system has spearheaded the innovation event in UiTM Kelantan Branch has received numerous recognition and praise from the internal and external juries. The system offers several features such as (1) Automatic delegation of juries' task, (2) Automatic distribution of certificate and appointment letter, (3) Multiple judging process on the same task, (4) Automatic result generation, (5) Onsite and Offsite Backup, etc.

6. Conclusions

In this paper, the issues related to event management in the wake of COVID-19 was discussed, with the emphasis on the development of an i-jury management system to increase the efficiency and accuracy of the assessment. Subsequently, we discussed the development of the information system through the lens of content analysis, JAD, interviewing end-user, and follows SDLC methodology for the development of the information system.

The development of the information system speeds up the process of managing jury, project management, as well as speeding up the disbursement of results, comparing to previous traditional evaluation methods. Besides, the system also enables the pooling of expertise by storing information regarding the juries. On the other hand, the information system also stored information regarding the participant's project that can later be used as an innovative repository for references by future generations.

Concerning limitations and future work, the next step for this study is to investigate the perception of users towards the usage of the information system. In doing so, we will look upon the literature of information system adoption to determine and investigate the perception of users (i.e., jury) toward the information system, as well as potential impact particularly related to user satisfaction or perceived benefits. Moreover, there is also a need to conduct a usability assessment of the information system. We suggest future researchers look into Nielsen (1994) usability assessment methods for further clarification.

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