

Design and Develop Mobile Based Technical Activity Board System



Cherry R. Gumiran, Joel M. Gumiran

Abstract: *Technical Activity Board System was designed and developed for the benefit of the administration, tabulators, event managers, coaches and participants/players during school activities. The system worked as a tabulation system wherein it will provide substantial security of the data, recording, analysis and interpretation of data, tallying and efficiently producing an accurate result which outcome set of winners given on time. In developing the system, the researcher applied the Rapid Application Development (RAD) method using the development software such as, MySQL which serves as the database, PHP (Hypertext Pre-processor) Designer works as the programming editor, XAMP as windows apache, web browser for running the program and Static Internet Protocol as Internet Connection. Also, applied post questionnaires to determine the assessment and effectiveness of the system to the users and the technology acceptance of the user to the system. The system installed during the Socio-cultural activities and intramurals in the year 2014 for testing. Table 1 shows the significant difference in terms of time allotted to perform each activity comparing the manual method to the system. This indicates that the system requires less time in tabulating the activity in a very most convenient way. During the testing and implementation, it is found out that the developed software was considered useful regarding security, convenience, efficiency, usability, and functionality. Hence, it is recommended to implement the Technical Activity Board System to upcoming events of the school.*

Keywords : *Criteria, Event, Prototype, RAD, Xamp*

I. INTRODUCTION

Tabulation is the process of recording, tallying, computing of scores and arrange the data in a systematic form which primarily performed by the tabulators. Isabela State University administered numerous activities in a school year and occasionally happens concurrently in a day. Presently, the school is still using the manual process of tabulating the data through the use of paper, ball pen, calculator, folder and cabinet for storing the information.

During the operation of the manual tabulation, problems arise particularly on speed, suitability, correctness, security, and cost. A tabulator has to spend extra time and effort to perform his/her task effortlessly correctly on the part of pronouncing the winners.

A counting machine was invented by a former Census Office employee at Census Bureau in the United States of America, named Herman Hollerith in the year 1890 called

cents. His device was utilized to revolutionize census tabulation and was considered the most efficient method for processing the tabulation. Moreover, an article wrote about the called "Electric Tabulating System" developed by Herman Hollerith which describes the reason why the machine improved and that is to automate the 1890 US Census also, the basis for his 1890 Columbia PhD. The device scanned and converted the data to HTML which also developed by Frank Da Cruz of Columbia University in January 2004 for the Columbia University Computing History Project. Several years after, different technology arrived to do the tabulation process.

Some school and universities in the country applied the MS Excel to tabulate the data. MS Excel was owned by Microsoft, and it was developed for doing office work particularly in calculating process. Also, it records and interprets data. In this manner, tabulation requires recording, computing and understanding capability and that is why the aforementioned software is also capable of performing the tabulation. On the other hand, MS Excel is only capable of playing one task depending on the set criteria which means cannot be utilized for another event.

Another tabulation machine came out and studied by Kai Wang, Eric Kim, Nicholas Carlini, Ivan Motyashov, Daniel Nguyen and David Wagner a student came from the University of California, San Diego, and Berkely Campus. Their system called "Operator- Assisted Tabulation of Optical Scan Ballots". It was designed for counting the scanned images ballots and tabulates it. Based on their study, the machine produces correctness and competent. Different tabulation technology was developed and implemented in the community which followed the standard feature of tabulation which is tabulating one activity. In this manner, the Technical Activity Board System was designed and developed to classify any extracurricular activities of the school like sports fest and socio-cultural which also divided into numbers of an event. Entered scores will record, validate, evaluate and compute. Besides, the system can be utilizing multiple games simultaneously.

II. LITERATURE REVIEW

A Web-based Scoring System for Golf Tournaments, a patented project with a patent number US 9533213 B2 (2017) which utilized mobile devices for entering scores. The system able to store and secure the entered data to the memory, performed a request from the mobile device to the server, tabulate the score information and posting the result publicly.

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An accelerated computation of combustion with finite-rate chemistry using LES and an open source library for In-Situ Adaptive Tabulation (2017) studied by Ehsan Fooladgar,

C.K.Cha and Karl-JohanNogenmyr. Their study is the latest version of In-Situ-Adaptive –Tabulation algorithm, ISAT –CK7 which was introduced and linked to OpenFOAM for accelerating chemical computation in simulating combustion with the finite chemistry approach.

The study highlighted some findings of allowing the efficient coupling of detailed chemistry into combustion simulation without the use of commercial codes. In conclusion, LES results show good, excellent agreement with the measured data.

Performing cross-tabulation using a columnar database management system (2017) patented and invented by Carles Bayes Martin et.al. Cross-tabulation operation is performed within a columnar database management system. The columnar database management system worked as a receiver to a request and performs a cross tabulation operation on a set of the database. Also, capability in determining the values of cross-tabulation operation for each row of the result and the domain for each value of the row dimension corresponding to a row combination. Altogether, the result of tabulation based on the performance of the database management system.

Based on the book entitled “Classification and Tabulation of Data- New Age International” emphasized the objectives of the tabulation. Here are follows: first, carry out investigation; second, to make the comparison; third, to locate omissions and errors in the data; fourth, to use space economically; fifth, to study the trend; sixth, simplify the data; and seventh, to use it as a future reference. Moreover, sorting is a part of tabulation wherein, it was performed as the last process and the most time-consuming process especially if the data is too large. It had different method and divided into three which are a manual method, mechanical and electrical method and tabulation using an electronic computer. The Manual method is done hand in hand by giving tally marks for the number of times. While, mechanical and electrical method, applied mechanical devices and punched cards to tabulate the data. Punched cards are checked by a machine called the “verifier” and sorted into different groups by a machine called “sorter”. And utilizing the tabulation using electronic computer is the most convenient method for sorting data when large, data have to be classified for future use and the requirements of the table are changing. Such tabulation is less consuming and more accurate than the manual method.

III. PROJECT DESCRIPTION

The Technical Activity Board System has the following features:

1. Add, save, update and delete event and game category.
2. Set, update and eliminate criteria for a particular event.
3. Save, update and retrieve information from the participants, players, candidates, a panel of judges, event managers, and tournament managers.
4. Create and upgrade individual account for the panel of judges, tournament managers, event coordinator, and tabulator.
5. Automatic ranking of evaluated and computed.
6. Print and generate reports validated by the tabulator, panel of judges or tournament manager.

7. Search and print individual information of the participants, players or candidate.

IV. OBJECTIVES

This study aimed to design and develop a Technical Activity Board (TAB) System or tabulating system for the extracurricular activities of Isabela State University, Cauayan Campus. It also aims to:

- Identify the time difference using the manual method and the developed software in terms of convenience and efficiency during the search for Mr. and MS. PASUC.
- Compare the performance of the manual tabulation to the developed Technical Activity Board System during the Search for Mr. and Ms. PASUC in terms of convenience, functionality, efficiency and security.
- asses the technological acceptance of the system in terms of:
 - convenience;
 - efficiency;
 - usability;
 - functionality; and
 - Security

V. RESEARCH METHODOLOGY

Scientific Basis/Conceptual Framework

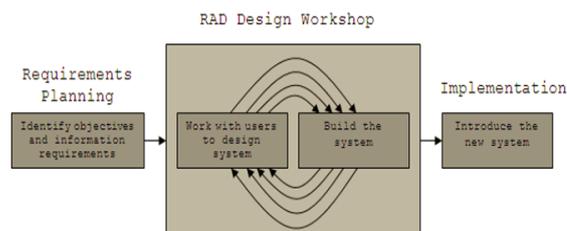


Fig 1: Rapid Application Development

A. Research design

The tabulating sheet used during the activity of the school was used in the development of Technical Activity Board System. Also, the formula for calculating the scores in designing the computation process.

The DTAB was designed based on the information needed from the tabulating sheet of the school and was developed using the following development platform:

1. MySQL – Database
2. PHP Designer – programming editor
3. Xamp – Windows Apache (Web Server)
4. Web Browser
5. Static IP-Internet Connection

B. Locale of the Study

The researcher conducted the study last Socio-Cultural Activities and Intramurals August 2014, held at Isabela State University-Cauayan City Campus.

C. Respondents

The respondents in this study are the pageant coordinators, judges and also the technical group.

D. Instrument

- **Pre-Test:** The researcher surveyed to be able to know the status of the event using the manual. To be able to see the problems encountered and solve that particular issue.

- **Post-Test:** The researcher surveyed to be able to know the status of the event using the TAB System. To understand how useful it is in terms addressing the problems encountered particularly in convenience, efficiency, functionality/usefulness and security.

D. Statistical Tool

Analysis of Data. A five point Likert scale will be used to interpret the data that will be gathered in the respondent:

Scale	Range	Descriptive Rating
1	0.00-0.99	Strongly Disagree
2	1.00-1.99	Disagree
3	2.00-2.99	Undecided
4	3.00-3.99	Agree
5	4.00-5.00	Strongly Agree

Weighted Mean. this method was used during the testing and after the implementation of the proposed system by means of using the post-test method tool.

$$\text{Formula: } WM = \frac{5(R)+4(R)+3(R)+2(R)+1(R)}{N}$$

Where:

- WM-Weighted Mean
- N-Sum of all respondents
- R-Number of Respondents per Rating

VI. TESTING AND SYSTEM OPERATION

1. Administrator registers the participants, users and tabulators to the system.
2. Assign unique username and password for the user.
3. Set criteria based on the criteria activity.
4. User/panel of judges enters their assigned username and password to every event to access the system.
5. Enter score and submit.

Note:

- Username and password should enter correctly; otherwise the user may not access the system.
- The System accepts score not higher than the set percentage.
- It automatically saved the entered data even without clicking the submit button.
- Allows the user to review their entered score until they click the submit button.

The System will accept request from the mobile devices of the user.

6. Provides automatic tally and compute.
7. Generate report which shows the list of winners.

Table 1: Shows the comparison of time consumed to each activity applying the Manual method and the TAB in a Search for Mr and Ms ISU PASUC.

Activities	Manual Method Time	TAB System Time	Significant Difference
Convenience			
1. Ranking of the evaluated score	5 to 7 minutes or up to 420 seconds	30 seconds	390 seconds
2. Sort the data based on the candidate or	30 to 35 minutes or up to 2,100	10 to 20 seconds	2,080 seconds

participant	seconds		
3. Collecting and Storing the scores	8 to 10 minutes or up to 600 seconds	5 seconds	595 seconds
Efficiency			
1. Providing the result	15 to 20 minutes or Up to 1,200 seconds	1 minute or 60 seconds	1,140 seconds
2. Computing and tallying of scores.	15 to 20 minutes or Up to 1,200 seconds	Up to 5 seconds	1,195 seconds
3. Proving the summary of results	20 to 25 minutes or up to 1,500 seconds	Up to 10 seconds	1,490 seconds

The significant difference shows the time consumed utilizing the manual method comparing to the TAB System. As observed, the data proves that applying the system is efficient and convenient especially that the activity contains a large number of data and requires less number of hours to process. With much time saved applying the TAB System, respondents have still different view about the convenience, efficiency, functionality and security.

VII. RESULTS AND DISCUSSION

Founded on the surveyed result, the respondents have their perspectives applying the Technical Activity Board System in addressing the problems in tallying and tabulating of the scores of a particular event conducted by the university.

Table 2: Shows the comparison of the two methods of tabulation in terms of convenience, efficiency, functionality and security.

Questions	Manual		TAB	
	Mean	Descriptive	Mean	Descriptive
Convenience				
1. Ranking of the evaluated score is automatic	0.83	Strongly Disagree	4.33	Strongly Agree
Efficiency				
1. Results are given on time.	0.92	Strongly Disagree	4	Strongly Agree
Functionality				
1. Tabulation is capable of computing and tallying of scores.	1.8	Disagree	3.13	Agree
2. Tabulation is capable of showing the summary of results	1	Disagree	3.67	Agree
Security				
1. Judges may see the score of their co-judges	3.75	Agree		
2. Judges cannot access the account of their co-judges			3.77	Agree



3. Results may possibly edit or change	3.75	Agree	2.13	Undecided
4. Scores may possibly lose or change	3.75	Agree	3	Undecided

Table 1 shows that 10 out of 12 respondents or 0.83 respondents responded strongly disagree which the manual process of tabulation provides an automatic ranking of the evaluated and computed scores. However, there are 0.25 respondents who are still undecided if it always convenient using the manual process of judging.

Whereas, 13 out 15 respondents or 4.33 responded strongly agree stated that the DTAB can provide an automatic ranking of the evaluated and computed the score. Nonetheless, most of the respondents believed DTAB is the most convenient tool for tabulation comparing to the existing process of tallying which is using the manual method.

Regarding efficiency 11 out of 12 respondents or 0.92 respondents responded strongly disagree pronouncing that the manual process of tabulation provides the result on time. On the other hand, there are 12 out of 15 respondents or mean of 4 responded strongly agree that the system produced the consequence ahead of time.

Concerning functionality, a mean of 1.8 respondents disagreed which the manual tabulation is still capable of computing and tallying of scores. However, a mean of 3.13 respondents agreed that utilizing the DTAB is more advantageous in computing and counting the scores. Comparing the manual and DTAB, 2.67 significant difference which implies that the system is more capable of showing the summary of result. On the other hand, there is a mean of 1 responded disagree that the manual is capable of displaying the summary of result.

Likewise, security, a mean of 3.75 respondents responded strongly agree that judges may see the score given by their co-judges, same as well in possibly edit and change the result and scores might get lost and change applying the manual process. Furthermore, there are 0.72 respondents disagreed that scores were stored correctly and the manual process does not contain accounts for judges to secure the entered score. 3.67 respondents responded strongly agreed that they cannot use multiple accounts.

VIII. CONCLUSION

Based on the aforementioned findings, the following conclusions were formulated. Overall, it was concluded that using the system is convenient to use especially in ranking and computing the evaluated scores. Also, the system provides an efficient and accurate report resulting in pronouncing the winners. Also, it is found out that the system can give the result on time, give the summary and capable of tallying data. Furthermore, it proves that the system has a stronger security compared to the manual system. Based on the findings, the manual operations are possibly edited or change the scores given by the judges but using the DTAB; users are confidently believed that the entered scores are well stored and cannot be manipulated or edited by anyone.

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Cherry R. Gumiran, A Master in Information Technology graduate in the year 2009. She presented and Published 2 papers in the year 2018 entitled “Applying Design Science Research in the Development of Human Resource Record Management System with Predictive Analysis through Pointing System” and “Using Hypertext Pre-processor Code in Converting .csv File into Civil Service Commission Daily Time Record Format Applying Agile Model” at ICSCA '19 Proceedings of the 2019 8th International Conference on Software and Computer Applications in Penang Malaysia. Furthermore, she was invited as technical committee and reviewer in numerous conferences like ICSCA 2019, 24th World Conference on Applied Science, Engineering and Technology and International Journal of Software Engineering and Computer System.



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