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Sport Management System With Statistical Analysis

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Abstract
Sports activities are part of the lives of every student. The current process in the management of sports events at NISU Main Campus particularly in the recording and status monitoring, in terms of schedule and player information are done manually. As such, the main focused of this study was to design and developed a computer-based information system known as the "Sports Management System with Statistical Analysis" that provide real-time and accurate information to the players and participants of sports event at NISU Main Campus. Subsequently, the developed system was evaluated of its levels of quality and usability. Developmental-descriptive research designed were employed in this study. It also used Rapid Application Development as the SDLC Model. A researcher-made questionnaire was created to solicit feedbacks from respondents. Findings showed that the level of quality in terms of system quality, information quality and interface quality were described as very good while the level of usability in terms of completeness and correctness of information provided to users were also described as very good. This means that the developed system passed the implementation criteria and is ready for deployment and use.
Keywords: *Sports Management System, RAD, software development*

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I. INTRODUCTION

Sports are form of activities which improves mental and mental capabilities. It provides physical and mental ability and skills, and others aimed to use for healthy lifestyle and entertainment for those watchers and audience [1]. Sports are usually governed by a set of rules or customs, which serve to ensure fair competition, and allow consistent adjudication of the winner. Sports is very important part of our lives and is becoming more and more popular due to its health benefits. Doing sports keeps us relaxed as well as it maintains our figures and strengthens our patience and endurance.

In [2], they defined sports management is a field of education and vocation concerning the business aspect of sport. Sport management involves many aspects, such as the important data of athletes, sport equipment, and the records of games. They incorporated the used of information technology as a tool for the acquisition, processing, storage and dissemination of all kinds of digital information by combing computing and telecommunications technologies. They were able to developed a Sports Management System application focused in the school sports training process control, statistic, games of organization and management to speed up the information of the sports plays a role in promoting.

In [3], they designed and developed a management system for Reserve Talents of Competitive Sports in accordance with the software engineering requirements. The system integrates the basic information, evaluation, statistics and decision-making models, and various kinds of athletic competency models of elite athletes, realizes the scientization, automation and man-machine integration in the reserve talents management, and thus provide a powerful decision support for the scientific management and implementation of reserve talents for competitive sports. On the other hand, according to [4], he designed and developed a system to accelerate the modernization process of folk sports' reservation and ways and means of passing down to the next generation. Based on web system, his research uses advanced computer technology, information technology and database theory, to establish necessary database for folk sports. As a "living" historical carrier, the folk sport is significant for studying the changes of human history and culture. Since the folk sport has at present fallen into difficulties in its development for various reasons and is facing the danger of its "extinction", the reservation and passing down of it has become highly demanded.

According to [5], information technology applications in sports venues in an increasingly wide range of modern venues and facilities, including not only the intelligent application of office automation systems, intelligent systems and sports facilities, communication systems for event management, ticket access control system, contest information systems, television systems, Command and Control System, but also in action including the use of computer technology, image analysis, and computed tomography. This article employs the documentary data technique to investigate the implementation of information technology in sports stadiums and to speculate on future developments.

In [6], they argued that the student information management is not only the foundation for achieving effective education and teaching management in colleges and universities, but also a vital connection. However, in recent years, as higher education has grown in popularity, the number of students has increased dramatically, and the task of student information management has become increasingly difficult, posing new problems to student information management. Managers such as class instructors or class cadres must update the idea of student management, invent the student management mode, and handle class affairs and student information using contemporary information technology. They believed that is based on the standardization, digitization, and automation of student information management, which can help class teachers and class cadres save manpower, material resources, and financial resources, improve the efficiency and accuracy of class information management in sports colleges and universities, and provide a platform for students to broaden their horizons.

In this context, we planned to design and developed a web-based sports management information system that would improve efficient management of game sports in the university environment. Furthermore, this study aimed to determine the level quality of the system prototype in terms of system quality, information quality and interface quality and evaluate the level of usability of the developed system in terms of completeness and correctness of information provided to users.

II. METHODOLOGY

2.1 Research Design

In [7], the development-descriptive research design was used in this study. Development research is defined as the systematic study of designing, developing, and evaluating instructional programs, processes, and it must pass the internal consistency and effectiveness. The most common types of developmental research involve situations in which the product-development process is analyzed and describe, and the final product evaluated. In this study the systematic design and development of the system was concerned on developmental research. According to [8], descriptive survey research is characterized as simply the attempt to determine, describe or identify what is, while that way or how it came to be. In this study, the descriptive research was used to statistically compute feedbacks received from the respondents.

2.2 Software Development and Life Cycle

According to [9], A software process model is an overview process of system. In this study, the Rapid Application Development (RAD) model was s the SDLC. This model compresses the analysis, design, build and test phases into a series of short, iterative development cycles. Iteration allows for effectiveness and self-correction. An important fundamental principle of iterative development was that each iteration delivers a functional version of the final system.

The RAD model takes information gathered during workshops and other focus groups created tom identify what customers want from the product. There is also testing done on the initial product that helps in the creation of the final product and a continued use of the parts of the product that have been proven to be effective. The RAD model consisted of four phases namely requirements planning phase, user design phase, rapid construction phase and implementation phase.

At each phase, the researchers perform specific activities leading to the phase's deliverable. The RAD model heavily relies on the user; the deliverables are presented to them to further refine the final product. Figure 1 showed the RAD model as the software development life cycle used in this study.

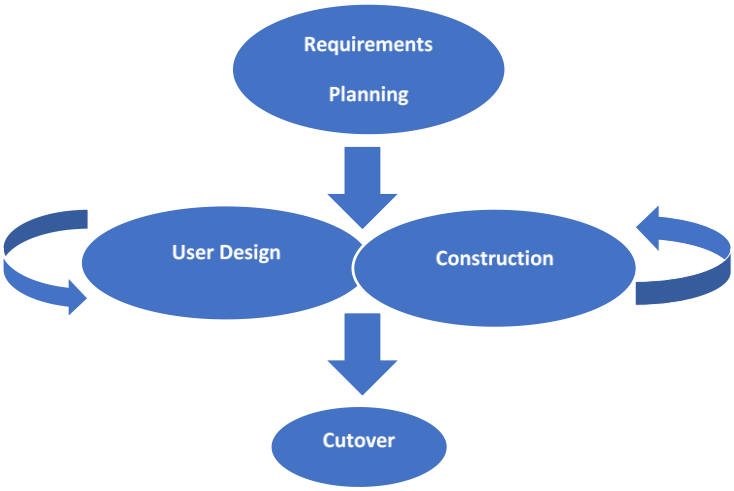

Figure 1: The Rapid Application Development Model

2.3 Preparation of the Rapid Construction

The first task in the rapid construction phase was the preparation of the necessary equipment and materials in the actual system development. It included identification of the programming language to be used as well as the database management system that addressed the database requirements. Since the construction of the developed system was web-based, we decided to make use of our laptop computer as the server-computer during the development. Additionally, the XAMPP application package was downloaded and installed in the server computer. The XAMP, which was comprised of Apache as the web server, my SQL for database and PHP as the server-side scripting language, is for Microsoft Windows operating system web development environment. Installing this package allowed the researchers to develop and test the system prototype in the local machine.

2.3.1 Construction of the System Prototype

Once the necessary preparations were done, the next task was the construction of the system prototype. The design of the system prototype was based on standards web development techniques for efficient user interface design. Font colors, styles and sized as well as background and even whitespaces had been configured while taking into considerations of the user's profiles. The system prototype consisted of multiple files was written in PHP.

2.3.2 Testing and Evaluation

The development of the system prototype would not be completed without testing the functionality of the various modules to meet user requirements. As such, it was important that testing was closed as possible to the real data. Prior to the finalization of the system product, a group of users was requested by the researchers to evaluate the system in terms of its and its levels of quality and usability over-all acceptability. A questionnaire was administered to the user after testing the product. A 5-points scale comprising of 1 as poor and 5 as Very Good was used. The questionnaire was based on the ISO IEC 25010 software characteristics standard which categorized software quality into six characteristics (factors) and whereas sub-divided into sub-characteristics (criteria). The group of experts was also given questionnaire based from McCall's software evaluation criteria to evaluate the system. To statistically compute whether the system passed the evaluation criteria, the Mean statistics was applied.

The obtained mean score was interpreted as 1.00 to 1.80 as "poor", 1.81 to 2.60 as "fair", 2.61 to 3.40 as "average", 3.41 to 4.20 as "good' and 4.21to 5.00 as "very good".

2.4 Software Evaluators

In this study, we identified 50 randomly-selected students from the Bachelor of Science in information technology first year to third year level as alpha-testers. They were requested to use the system prototype and further requested to evaluate using a researcher-made survey questionnaire. Table 1 shows the distribution of the software evaluators.

Table 1: Distribution of Respondents as Software Evaluators

Year Level	Number of Respondents	Percentage
All	50	100%
First Year	25	50%
Second Year	15	30%
Third Year	10	20%

III. RESULTS AND DISCUSSION

3.1 Level of Quality of Development system in terms of system Quality, Interface Quality

The results in Table 2 show the obtained mean scores of the Sport Management System with Statistical Analysis as to its level of quality. Using the researchers-made instrument, respondents provided feedbacks result for developed system. Thus, in terms of system quality, the developed system yielded a mean of 4.60 which is interpreted as Very Good. In terms Information Quality, the mean was computed at 4.50 and is interpreted as Very Good. The overall level of quality of the developed system was computed at a mean 4.56 and is interpreted as very good.

Table 1: Level of Quality of the Developed System in terms of System Quality, Information and Interface Quality

Implementation Indicators	Mean	Verbal Interpretation
Overall level of Quality	4.56	Very Good
System Quality	4.60	Very Good
Information Quality	4.50	Very Good
Interface Quality	4.60	Very Good

Legend: 1.00-80 (Poor); 1.81-2.60 (Average); 2.61-3.40 (Acceptable); 3.41-4.20 (Good); 4.21-4.99 (Very Good); and 5.00 (Excellent)

Level of Usability of the Developed System in terms of Completeness and Correctness

The result showed that the level of usability of sports records of the developed system was computed with a mean if 4.57 and is interpreted as very good. In terms of completeness it has a commuted mean of 4.55 which is interpreted as Very Good. While, in terms of correctness, the computed mean of the developed system was 4.59 which is describe as Very Good. Table 3 shows the details.

Table 2: Level of Usability of the Developed System in term of Completeness and Correctness of Information

Implementation Indicators	Mean	Verbal Interpretation
Level of Usability	4.57	Very Good
Completeness	4.55	Very Good
Correctness	4.59	Very Good

Legend: 1.00-80 (Poor); 1.81-2.60 (Average); 2.61-3.40 (Acceptable); 3.41-4.20 (Good); 4.21-4.99 (Very Good); and 5.00 (Excellent)

IV. CONCLUSION

The level of quality of the development system was perceived by the respondents as very good. Specifically, in terms of system quality, it yielded a description of very good. It means that in terms the of sports coordinators, sports instructor, and officers of recognized organization of Northern Iloilo State University had provided convenience in terms of sports recording and monitoring by the system.

The level of usability of the developed system was also generally described as very good. Specifically, in terms of completeness and correctness, it yielded a verbal descriptive of very good which meant that the features of the Sport Management System with Statistical Analysis were complete. It is ready for uploading of r

ecords correctly coming from the sports coordinator, team managers, coaches and students organizational officers.

V. REFERENCES

[1] Testing types.wordpress.com. (2013). Requirements Planning Phase? Retrieved on October 23, 2017 from https://testingtyps.wordpress.com/tag/requirements-planning-phase/

[2] Li, C. & Wang, Z. (2012). Research on the Applications of Information Technology in Sport Management Retrieved on September 9, 2017 from https://link.springer.com/chapter/10.1007/978-3-642-29087-9 37

[3] S. Qing and Y. Tianchao, "Design and Development of Management System for Reserve Talents of Competitive Sports," 2010 Second International Conference on Computer Modeling and Simulation, 2010, pp. 491-493, doi: 10.1109/ICCMS.2010.472.

[4] Liu, M. (2009). The Design and Development of Folk Sports Resource Management Information System Based on Web. In Proceedings to the 2009 International Symposium on Computer Network and Multimedia Technology. DOI: 10.1109/CNMT.2009.5374667.

[5] Han Can, Ma Lu, Luying Gan, The Research on Application of Information Technology in sports Stadiums, Physics Procedia,Volume 22, 2011, Pages 604-609, ISSN 1875-3892, https://doi.org/10.1016/j.phpro.2011.11.093.

[6] He, Q., Lu, L. and Xu, X. (2021). University Sports Information Management System Based on Big Data. In Proceedings to the 2nd International Conference on Computing and Data Science (CONF-CDS 2021). DOI:10.1088/1742-6596/1881/3/032058

[7] Richey, R. (1994). What is Research Design? Retrieved on January 14, 2018 from https://eric.ed.gov/?id=ED373753
English.stackexchange.com (2018). Game Sports. Retrieved on August 12, 2017 from http://english.stackexcahnge.com/question/139670/difference-between-game-and-sport

[8] Shuttleworth, M. (2008) Case Study Research Design. https://explorable.com/case-study-research-design

[9] Powell-Morse A. (2016). Rapid Application Development (Rad): What Is It And How Do You Use It? Retrieved on January 14, 2018 from https://airbrake.io/blog/sdlc/rapid-appliction-development