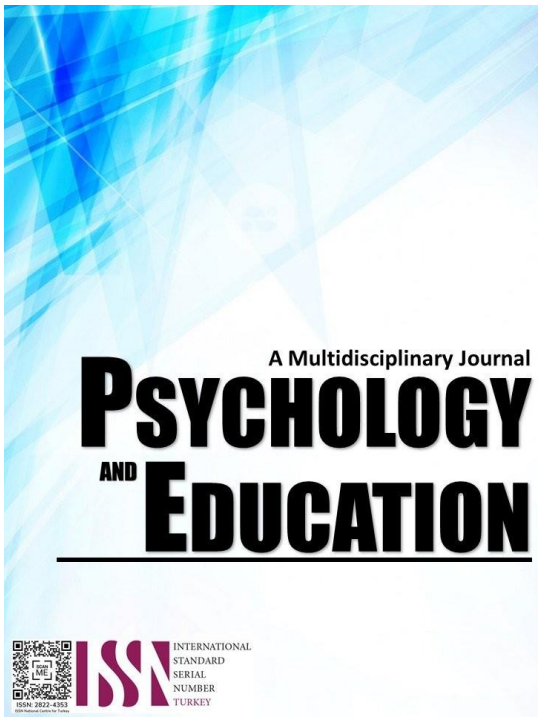
MANAGEMENT INFORMATION SYSTEM OF PUBLIC SECONDARY SCHOOLS IN SAGBAYAN DISTRICT: A PROPOSED IMPLEMENTATION



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Research Article

Management Information System of Public Secondary Schools in Sagbayan District: A Proposed Implementation

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Abstract

This research tackled the challenges public secondary schools in Sagbayan District, Bohol, faced regarding records management. The study employed a mixed research design, combining both descriptive-qualitative and descriptive- quantitative methods. The qualitative phase involved conducting in-depth interviews and focus group discussions with relevant stakeholders involved in records management. On the other hand, the quantitative phase utilized survey questionnaires to gather data from relevant stakeholders to determine the acceptability of the proposed MIS among end-users. The first phase findings revealed various challenges in records management faced by the schools, such as inefficient manual record-keeping systems, difficulties in data retrieval, and the risk of data loss due to inadequate backup procedures. These challenges highlighted the need for a comprehensive, technology-driven solution to streamline records management processes and ensure data security. The evaluation results in the second phase showed that the developed Management Information System (MIS) was well-accepted among the end users. The absence of any significant difference in the level of acceptability among the participants further validated the system's suitability for addressing their specific needs. The successful implementation of the MIS proved to be an effective solution to the records management challenges faced by the public secondary schools in Sagbayan District, Bohol.

Keywords: *management information system, sagbayan MIS*

Introduction

Today, computers and Information Systems (IS) have become essential for many organizations to provide timely, accurate, and updated information. Moreover, with every organization's need to collect, process, store, and retrieve these, the Management Information System (MIS) was conceptualized. The MIS arose from the critical element of assisting the management of an organization in collecting, processing, storing, and retrieving relevant and up-to-date information. In the field of education, where there are administrators, teachers, and students, this certainly demands the exchange and sharing of vital information among the many players in either the execution of duties or to furnish data and information to guide policy making and to yield valuable statistics on student enrollment, class schedules, and grades calling for a collaborative environment and the creation of either a local or an electronic network to facilitate the creation of joint databases, platforms, and information hubs that could easily feed and serve all the people involved.

In Sagbayan District, the School Principals, the School Registrars, and the teachers from the five public secondary schools, namely Clemente Borja Memorial High School, Eugenio V. Amores Memorial High School, JAPeR Memorial High School, San Agustin National High School and Ubojan Integrated School are still practicing the traditional and paper-based records management system. With the current system, when School Principals need to craft a school-level consolidated report such as the School Form 4 (Monthly Learner's Movement and Attendance) or the School Form 6 (Summarized Report on Promotion and Learning Progress & Achievement), they have to send out a letter to each of the advisers and in turn, advisers will transfer this information to paper templates. On the other hand, when quarter grades are required for reporting, advisers have to send out a paper grade sheet trail to each of the relieving teachers. The adviser, in turn, will transfer these to the paper master grading sheet to compute the general average. On the part of the School Registrars, when a parent or a previous student requests to issue a certification or Form 137 (Student's Permanent Record), the School Registrars have to flip through many sheets and folders to locate the specific student record. According to them, during an informal interview, there were also times when records were lost and misplaced. They added that students must write personal data on the enrollment form every time they enroll. These forms will then be given to the advisers, who will list the student enrollees in the School Form 1 (School Register).

The present processes that these schools are practicing have posed integrity and privacy issues to sensitive records of information, resulted in the redundancy of

tasks and delays in the accomplishment of school-level consolidated reports, and caused service dissatisfaction among their stakeholders. The researcher believes that these challenges and issues on records management will be addressed if they implement a system that features: (1) a collaborative system of collecting, processing, storing, and retrieving school records; (2) a centralized repository of data and information which can be easily accessible by any authorized personnel throughout the school; and (3) a faster and automated mechanism of retrieving records and generating reports to serve its stakeholders better.

These cases can only be achieved by deploying ICT technologies in their records management process. Moreover, with the present issues these schools have been pressed with and the benefits they can derive from the implementation of an ICT-based records management system, the researcher was motivated to develop a Management Information System for implementation in these schools to help them address their needs and challenges prompted by the practice of a manual records management system.

Research Questions

The central focus of this study is to unveil prevailing practices and challenges within records management, culminating in the conceptualization and construction of the Management Information System (MIS), followed by a meticulous evaluation of its user acceptability. This research embarks on a tripartite journey: identification, innovation, and assessment. The fundamental inquiries that propelled this study forward are as follows:

1. What are the problems encountered in the existing records management system?
2. What are the features of the proposed system based on the user requirements?
3. What is the acceptability level of the proposed system to the end users in terms of:
   3.1 Perceived Usefulness;
   3.2 Perceived Ease of Use;
   3.3 System Capability; and
   3.4 User Satisfaction?
4. Is there a significant difference in the acceptability level of the proposed system among the participants?

Literature Review

It is generally accepted that information is a vital commodity for the successful operation of today's organizations. Modern business organizations use computerized information systems to obtain such information. In fact, by the DepEd Orders No. 67, s. 2011 and No. 22, s. 2012, the Department of Education (DepEd) launched the Learner Information System (LIS), an online national registry of learners, in 2014. Moreover, Republic Act No. 10844, or the Department of Information and Communications Technology Act of 2015, stipulated the promotion of ICT to enhance critical public services, such as education, public health and safety, revenue generation, and socio-civic purposes, which outrightly clarifies that incorporating innovations, particularly in the records management aspect of the school, which is a government agency, is in line with the innovative goals of the national government, thus making it legal.

This study is also anchored on the Input-Process-Output (IPO) Model. In the IPO Model, a process is viewed as a series of boxes (processing elements) connected by inputs and outputs. Information or material objects flow through tasks or activities based on rules or decision points. The inputs represent the flow of data and materials into the process from the outside. The processing step includes all tasks required to transform the information. The outputs are the data and materials flowing out of the transformation process. Using the IPO Model in innovation can help focus on the process by making explicit, for each activity, what inputs are needed to get started, what to do to process those inputs most effectively, and what outputs need to be created. The structure and discipline this creates will make the innovation projects more effective and more productive (Reis, 2014).

The study also banked on the Waterfall Model. This model incorporates systematic development techniques into the project, and the correctness of the product is checked at each stage of the product building, ensuring that only the correct product that fulfills user requirements is built during development. Waterfall Model is a sequential model where the development process goes through several phases in a specific order, from the requirements phase to the implementation phase. Jonasson (2008) asserted that the Waterfall Model gained support from managers because everything flows logically from the beginning of a project through the end.

Moreover, the Technology Acceptance Model (Davis, 1989), an information systems theory that models how users come to accept and use technology, has also been anchored upon by this study. The model suggests that when users are presented with new technology, some factors influence their decision about how and when they will use it, notably: Perceived usefulness (the

degree to which a person believes that using a particular system would enhance his or her job performance) and Perceived ease-of-use (the degree to which a person believes that using a specific system would be free from effort) which is particularly significant during the acceptance testing. Acceptance testing (also known as user acceptance testing) is a type of testing carried out to verify if the product developed is within standards and criteria and meets all the requirements specified by the customer. This type of testing is generally carried out by a user or customer where another party develops the product externally. Acceptance testing is done to demonstrate the ability of the system or product to perform per the user's expectations and induce confidence in the newly developed system (Parekh, 2009).

Imperatively, the development of MIS in any institution of learning is essential for the modern management of the education systems (Karfaa et al., 2015). However, many schools still need to practice the former despite the benefits a school could enjoy in implementing Information Systems as a replacement for manual records management. In fact, according to Dayoc et al. (2001), the present system of City East Elementary School, Tagbilaran City, is still traditional and not systematic. They further found that processing the pupils' information is time-consuming and susceptible to many errors.

Moreover, Akil et al. (2005), in their study conducted at the Immaculata High School, Baclayon, Bohol, found that records were kept in no definite storage, and some records were even misplaced, resulting in difficulty in information retrieval. Furthermore, according to them, when a report must be furnished, the in charge must transfer them to templates. They found out that there were issues with spelling and inaccuracies in the report since it was done manually and redundantly.These issues can only be resolved by deploying ICT technologies in their records management process, corroborating Augustine's study (2012). He asserted that ICT could significantly contribute to the records management aspect of an educational institution. With the emergence of new technologies conceptualized for such purposes as the Management Information System model, it is imperative for a school to implement one for themselves, tailor-fitted to their needs.

Hammer (2003), as cited by Fajardo et al. (2015), said that computers could eliminate the need for copying and rearranging information entering the system, thus eliminating most of the paper works. According to him, the database stores data in a system because it saves time and increases productivity by making it easier to retrieve as needed. With its use, backing up vital information is much easier. Towsand (2005), as cited by Fajardo et al. (2015), backed up this premise by stating that a system needs a database to function, for without a database, a system would not be efficient or function. Using the proposed system as a web application has many advantages. According to Malviya (2015), with web-based applications, users access the system via a uniform environment—the web browser. While the user interaction with the application needs to be thoroughly tested on different web browsers, the application must only be developed for a single operating system. Developing and testing it on all possible operating system versions and configurations is unnecessary. He added that web applications are easier to develop, more beneficial to the users, install, maintain, keep secure, and grow when it needs to grow.

The Management Information System and the other related studies have similarities. The Management Information System's design is like the other studies regarding the system's processes, such as adding, updating, searching, viewing, and printing records. Though it is like the other studies, it will be much faster and more seamless because of its lightweight infrastructure with features that let the user process records easily and error-free. After citing the legal basis, the theories, and the related studies, the researcher could outline the Input-Process-Output Model of the study. Lastly, this study hypothesizes no significant difference in the proposed system's acceptability level among the five Sagbayan District secondary schools.

Methodology

A mixed research design, combining both descriptive-qualitative and descriptive-quantitative methods, was employed in this study. The qualitative phase involved conducting in-depth interviews and focus group discussions with relevant stakeholders involved in records management. On the other hand, the quantitative phase utilized survey questionnaires to gather data from relevant stakeholders to determine the acceptability of the proposed MIS among end-users. The qualitative phase involved conducting in-depth interviews and focus group discussions with school administrators, school registrars, and other relevant stakeholders involved in records management, allowing the researcher to gain valuable insights into the district's specific challenges and unique needs in managing records to design, develop, and implement

an MIS. On the other hand, the quantitative phase utilized survey questionnaires to gather data from School Principals, School Registrars, and teacher representatives. This phase aimed to determine the acceptability of the proposed MIS among end-users regarding the perceived usefulness, ease of use, system capability, and user satisfaction, providing measurable feedback on its potential effectiveness.

Participants

The participants of the study were the five (5) school principals, five (5) school registrars, and ninety-five (95) members of the faculty from the five (5) public secondary high schools in Sagbayan District making it a total of one-hundred five (105). From the sample size, only the School Principal, the School Registrar, and one (1) faculty representative from each of the schools were personally interviewed to give the researcher information on the flow of their enrollment and their practices and challenges in the records management aspect of the day to day school operations. The information gathered from the fifteen (15) respondents was the basis of the proposal for the Management Information System. Finally, to determine the acceptability of the proposed system, the researcher made use of all participants as they are the direct users of and are the ones who directly benefited from the proposed system.

Instruments of the Study

The researcher used the following data-gathering instruments to gather related information in developing the Management Information System.

In gathering important information that was needed in the study, the modified Interview Guide used by Lloren et al. (2014) in their study "The Automation Process of Student Records Management of Inabanga High School, Nabuad, Inabanga, Bohol" was utilized. The interview guide contained questions for the respondents to answer, which were about the current system processes and problems encountered by the respondents in creating processing, keeping, and retrieving student records.

Moreover, a questionnaire was distributed to the respondents to test the system's acceptability. The questionnaire has questions: Perceived Usefulness, Perceived Ease of Use, System Capability, and User Satisfaction. The questionnaire was constructed based on the User Interface Satisfaction Questionnaire (Chin et al., 1988) and the Usefulness, Satisfaction, and Ease of Use Questionnaire (Lund, 2001). Each question was answered using the Likert-Scale with 5-Very Much Acceptable, 4-Much Acceptable, 3-Acceptable, 2-Less Acceptable, and 1-Not Acceptable. A pilot testing of the survey questionnaire was conducted before the conduct of the survey proper.

Procedure

The researcher wrote a letter to the School Principals of the five (5) participant schools asking permission to conduct interview sessions related to the current records management practice and the problems they encountered. After the permissions were granted, the researcher conducted the one-on-one interview sessions with the School Principal, the School Registrar, and the faculty representative from each participant school. The system development process followed.

During the System Development phase of the Management Information System, the researcher used the "Waterfall Model." The first phase, the Requirements phase, involved gathering considerable information. Understanding the customer's requirements and expectations is essential so that the product meets the specifications. The researcher obtained the information from the interviews conducted with the study participants. With the information gathered, the developer carefully studied the existing process of the school.

The Design phase then followed the latter phase. This phase focused on the data requirements, the software construction, and the system interface. The researcher followed the requirements specified by the school and used different tools such as use case diagrams, use case narratives, relational database diagrams, and program hierarchies in developing the system's design. System Development came next. This phase involved converting design specifications into executable programs. After approving the design of the proposed system, the developer created the source code for the system wherein the researcher used HTML and CSS as the front-end and PHP Framework and MySQL as the back end in the development of the system.

The fourth stage then followed the System Testing phase. This phase required the schools to complete various tests to ensure the accuracy of the programmed code, the inclusion of expected functionality, and the interoperability of the application. Erroneous codes were rewritten and tested again until the desired output was achieved. During this phase, the developer conducted a system testing method, such as a user

acceptance or acceptability test, to ensure that all the system's features and reliability function as expected.Lastly, the System Implementation phase. The implementation phase involved installing the approved application in the schools. During this phase, the developer trained the end users, followed by the systems' deployment and implementation in the schools.

Ethical Considerations

In the pursuit of conducting an ethically sound research study, careful attention was paid to several essential ethical considerations. These considerations were integral to maintaining the rights, dignity, and well-being of the participants involved in the investigation. This narrative sheds light on two pivotal aspects of ethical conduct: informed consent and privacy and confidentiality.

The informed consent process marked the initial step in ensuring the ethical integrity of the study. Before embarking on the interview sessions, a deliberate and transparent effort was made to seek permission from the School Principals of the participant schools. This process underscored the researcher's dedication to upholding the principles of informed consent. Participants were provided a comprehensive understanding of the study's objectives, methodologies, and potential implications. Ethical considerations extended to elucidating the nature of the interview sessions and the voluntary nature of participation.

Privacy and confidentiality emerged as paramount concerns in one-on-one interviews with key stakeholders; stringent ethical measures were enacted to safeguard participants' privacy. The researcher ensured that all information divulged during the interviews remained strictly confidential and solely used for the research endeavor. To preserve anonymity, pseudonyms or identifiers might have been employed, thereby shielding participants from any potential breaches of confidentiality. Furthermore, meticulous protocols were implemented to guarantee the secure storage and handling of the collected data, aligning with the ethical mandate to protect participants' information.

Results and Discussion

The section encompasses distinct tables representing various study variables. Specifically, four tables (Tables 1 to 4) provide vital insights into the perceived issues within the current records management system, user requirements, and the degree of acceptability. These tables collectively offer comprehensive information to enhance understanding of the research outcomes.

The primary objective of this research is threefold: firstly, to ascertain the existing practices and challenges within records management; secondly, to conceive and create a Management Information System (MIS); and finally, to assess the level of acceptance and usability of the MIS among end-users within the public secondary schools situated in Sagbayan District.

Table 1 provides a comprehensive view of challenges within the current records management system, identified through stakeholder interviews. Challenges include difficulty in record retrieval, hindering efficient data access, delays in preparing consolidated reports impacting workflow, and task redundancies wasting resources. Additionally, limitations in physical storage emphasize the need for organized data retention, while lengthy enrollment wait times affect stakeholder experience. Data inaccuracies underscore data integrity's importance, while a decentralized system calls for centralization to simplify data management. Privacy issues require attention to maintain trust and comply with regulations. Although rare, difficulty in report generation highlights its significance. Distance from the office presents a unique logistical challenge. Addressing these intricacies will lead to a more efficient system, improving administrative effectiveness and stakeholder satisfaction.

Table 1. *Problems encountered in the existing records management system*

Problems Encountered	*Frequency*
1. Difficulty in record lookup	7
2. Delays in preparing consolidated reports	5
3. Redundancy of tasks	5
4. Not enough physical storage of paper records	2
5. Long wait times during enrollment	2
6. Data inaccuracies	2
7. Decentralized records system	2
8. Integrity and privacy issues	2
9. Difficulty in report generations	1
10. Distance from the office	1

Table 2 summarizes essential user requirements for the proposed Management Information System (MIS) based on the research study. The most prominent demand is for the "Automated generation of print-ready forms and reports," reflecting a strong preference for streamlined document creation. A desire for a "Centralized system for data accessibility" follows, indicating participants' interest in consolidated data access. Additionally, a call for a "Digitized or computerized" approach emphasizes modernization. Some participants expressed interest in an "Online" system, highlighting the importance of online accessibility. "Secured access" and an "Error-free" system are less frequently mentioned, signifying a focus on data security and accuracy. These requirements highlight the need for an efficient, technologically advanced MIS to address current records management challenges and improve operational efficiency.

Table 2. *User requirements of the proposed system*

User Requirements	*Frequency*
1. Automated generation of print-ready forms and reports	12
2. Centralized to allow data-accessibility	9
3. Digitized or computerized to make it paperless	6
4. Online	3
5. Secured access	1
6. Error-free	1

Table 3 presents a comprehensive evaluation of the Management Information System (MIS) based on critical criteria. Participants' perceptions and satisfaction levels are gauged across various aspects of the system. "Perceived Usefulness" receives a high mean score of 4.530, indicating strong acceptance of the system's practical value. "Perceived Ease of Use" attains a mean score of 4.480, suggesting participants find the system user-friendly. "System Capability" receives a mean score of 4.458, indicating participants believe the MIS adequately addresses their needs. "User Satisfaction" achieves a mean score of 4.517, signifying a high level of contentment. The cumulative "Overall" assessment is 4.496, reflecting participants' positive evaluation of the MIS. The consistently high scores across criteria demonstrate its practical design and implementation in addressing records management challenges. The table highlights participants' favorable perceptions and satisfaction with the MIS. The robust mean scores across criteria collectively affirm the system's success in overcoming records management obstacles within the participating institutions.

Table 3. *The overall level of acceptability of the proposed system*

Criteria	*Mean*	*Description*
1. Perceived Usefulness	4.530	Very Much Acceptable
2. Perceived Ease of Use	4.480	Very Much Acceptable
3. System Capability	4.458	Very Much Acceptable
4. User Satisfaction	4.517	Very Much Acceptable
Overall	4.496	Very Much Acceptable

Table 4. *A significant difference in the acceptability level of the proposed system among the respondents*

Source of Variation	*SS*	*df*	*MS*	*F*	*P-value*	*F critical*	*Result*
Between Groups	731.681	4	182.9201	0.961986	0.431875	2.462615	Not Significant
Within Groups	19014.853	100	190.1485				
Total	19746.533	104					

The results of the ANOVA analysis indicate that the observed differences between the groups are not statistically significant, suggesting no significant variation among the sources/groups being compared in the study context. The p-value above the standard alpha level of 0.05 further supports the conclusion that the observed differences are likely due to random chance.

Conclusion

This research endeavor has navigated a multifaceted expedition that bears profound implications for records management within public secondary schools in the Sagbayan District. The journey unfolded across three distinct yet interwoven phases, each bearing testament to its pivotal contributions. At its inception, this study embarked on a rigorous quest to dissect and comprehend the intricacies enshrouding the prevailing records management practices. A tapestry of operational inefficiencies, data intricacies, and logistical challenges was unveiled through meticulous inquiry. This illumination served as the clarion call for evolution, signaling the imperativeness of a novel paradigm.

The ensuing phase crystallized into the Management Information System (MIS) conception and actualization. The MIS fuses cutting-edge innovation with pragmatic stakeholder requisites. Its synthesis emerged as a veritable bridge spanning the chasm between technological sophistication and the practical needs of users. The robust scoring across pivotal criteria—perceived usefulness, ease of use, system capability, and user satisfaction—firmly attests to the MIS's triumphant debut. Its embodiment as a practical, user-centric tool offers a profound promise, poised to dispel the shadow cast by records management challenges. Even in statistical exploration, the ANOVA analysis, while veering away from conventional significance, subtly underscores a harmonious convergence among sources and groups. This unity, though not numerically asserted, symbolizes a collective aspiration for an elevated records management landscape, pulsating with efficiency and efficacy.

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