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## *Web-based Student Monitoring System with Short Message Service (SMS)*

**JOEY ALEDO DE LA CRUZ, MSIT**

Faculty Member, College of Information and  
Communication Technology (CICT)  
Nueva Ecija University of Science and Technology  
Atate Campus, Philippines

**ROWELL AGLIONES DIAZ, MBA, Ph.D(c)**

Faculty Member, College of Management  
and Business Technology (CMBT)  
Nueva Ecija University of Science and Technology  
San Isidro Campus, Philippines

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**Abstract:** *The trends in the mobile technology era offered a lot of convenience way in terms of communication to various users. In the past few years, the information spread thru various ways such as posting to the bulletin board, public places a the likes and specially to the students and parents, it is common to them to go the nearest bulletin of information for the update. The study was used the developmental method of research using SCRUM with the following stages: Requirements Gathering and Analysis, Backlog Construction, Sprint Planning, Development, Quality Testing, User Acceptance Testing and Deployment. The study used observation, interview and data gathering for the analysis. The system used RFID reader that will trigger the turnstile to open and send SMS to the parents toward the system unit with the use of GPRS Modem. The system used RFID TAG to trigger the turnstile device that will send SMS to the parents informing their time in and time out. The system runs on Windows 7 and 8 environments due to the drivers' compatibility issue, and was developed in Visual Studio C# programming language and SQL Server 2012.*

*The Web-Based Students' Monitoring System with Short Message Service (SMS) was developed using Scrum agile methodology assessed by the IT professionals, faculty and staff with the mean rating equivalent to "excellent". Having passed through the assessment of the respondents based on International Organization for Standardization (ISO) 9126, the Web-Based Students' Monitoring System with Short Message Service (SMS) proved acceptable and beneficial to the Midway Maritime Foundation, Inc. as the system will benefit the Foundation and the whole community as well, most specially the parents of the students' who are enrolled in the Foundation.*

**Keywords:** *web-based; monitoring system; SMS; RFID; ISO; Foundation.*

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### I. INTRODUCTION

One of the crucial moments of this era was the introduction of Information Communication Technologies (ICT) that made significant changes in our society. Information Communication Technologies (ICT) refers to all the knowledge used to handle telecommunications, broadcast media, intelligent building management systems, audio-visual processing and transmission systems, and network-based control and monitoring functions. Schools are one of those organizations that embraced the advantages as well as the challenges brought about by technology during this century.

School management acclimates computerized system to manage their records, employs databases and network infrastructure among others. Much effort had been devoted for putting technologies to cater information transfer which have shifted already from paper transactions to online, communication through the use of emails, social networking sites, private and public websites and others. Its administration, management and staff continuously tap opportunities on how it can improve its way of doing business, educating its students and connecting to its patrons, the parents.

Parents, who are most often than not are busy with work or business, have difficulty accessing their kids' information related to school. Though school management have made ways to make parents better informed, some relevant details about students do not come as early as needed especially with regard to problems in school. There are cases when their children deliberately hide information especially those that may put them in a bad light like failed subjects, unpaid dues because they have used the supposedly payments for such, hiding the actual school costs with an intention to pilfer.

In light of this observation, the researchers were prompted to develop a system that would help parents of Midway Maritime Foundation, student, faculty, staff and administration.

### ***Objectives of the Study***

This study developed a Web-Based Students' Monitoring System with Short Message Service (SMS). Specifically, it sought explanation to the following:

1. Development of the Web-Based Student Monitoring System with Short Message Services (SMS) according to the following stages of SCRUM: Requirements Gathering and Analysis, Backlog Construction, Sprint Planning, Development, Quality Testing, User Acceptance Testing and Deployment.
2. Assessment of IT professionals on the develop system based on the following criteria (ISO 9126): Functionality, Reliability, Usability, Efficiency, Maintainability and Portability.
3. Quality assessment of the end-users on the developed system based on the following criteria (ISO 9126): Functionality, Usability and Efficiency.

## **II. METHODOLOGY**

The study used the developmental method of research. Developmental research is a systematic study of designing, developing, and evaluating instructional programs, processes, and products that meet the criteria of internal consistency and effectiveness. The study was conducted in one of the well-known institution in the field of maritime industry in Central Luzon, the Midway Maritime Foundation. The respondents of the study were composed of five IT professionals, 20 faculty and staff, 50 students, and 20 parents of MMFI. The 5 IT professionals were selected in the basis of their educational attainment, present occupation and length of service in their profession.

The researcher used a questionnaire to assess the developed Web-Based Student Monitoring System with Short Message Service (SMS). An interview guide was also used to verify and confirm the responses in the questionnaire. All items in the questionnaires revolved around the International Standard for Evaluation Software (ISO 9126) criteria such us functionality, reliability, usability, efficiency, maintainability and portability.

The basic information on the records of the students was gathered from the office of the Registrar of Midway Maritime Foundation Inc. Likewise, the students' medical records were retrieved from the school clinic; their records concerning discipline guidance and counseling from the Office of Student Affairs; and their bills concerning tuition and other fees were taken from the Accounting office. The documents gathered were analyzed to have basis in the design and analysis of the System.

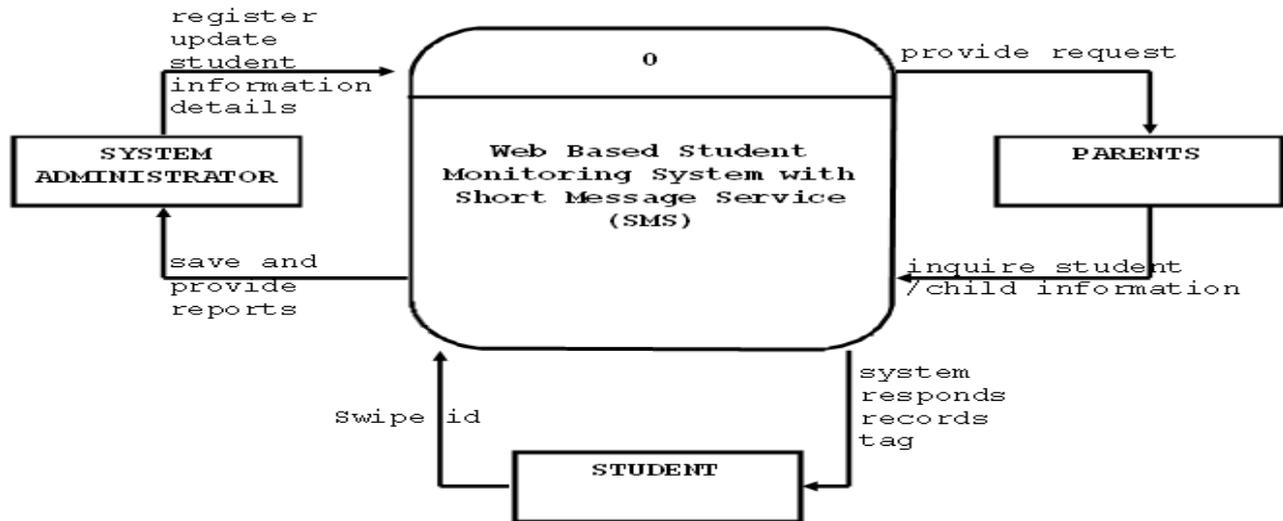


Figure 1. Context Diagram

The respondents were given five options to rate the items in the questionnaire, using the five-point scale with description as their guide: The scale used is described as follows 5-Excellent, 4-Very Good, 3-Good, 2-Fair and 1-Poor. To determine the instrument’s validity, the questionnaire was presented to the adviser, and other I.T. professionals. Their suggestions and comments were incorporated that enriched the contents of the instrument. To assure its reliability, the international standard for software evaluation was considered.

The mean ratings of the respondents were computed and interpreted using the scoring guide adapted from the study of Collado(2015).

Table 1. Numerical Table

Numerical Rating	Qualitative Rating	Verbal Description
4.20 – 5.00	Excellent	The developed system meets the quality standards of the software development. No or very minimal modification is needed.
3.40 – 4.19	Very Good	The developed system meets almost all the quality standards of the software development. Minimal modification is needed.
2.60 – 3.39	Good	The developed system meets the quality standards of the software development. Some revisions are needed.
1.80 – 2.59	Fair	The developed system failed to meet the quality standards of the software development. Major revisions are needed.
1.00 – 1.79	Poor	The developed system failed to meet the quality standards of the software development. Needs to be redone to serve its purpose.

### III. RESULTS AND DISCUSSION

This portion discusses the development and assessment of the Web-Based Student Monitoring System with Short Message Service (SMS).

1. Development of the Web-Based Student Monitoring System with Short Message Service (SMS). The development of the Web-based Student Monitoring System with SMS adopted the Scrum Agile Method. It involves seven steps.
  - 1.1 Requirements Gathering and Analysis. In this stage, the basic information on the records of the students was gathered from the office of the Registrar of Midway Maritime Foundation Inc. Likewise, the students’ medical records were retrieved from the school clinic; their records concerning discipline guidance and counseling from the Office of Student Affairs; and their bills concerning tuition and other fees were taken from the Accounting office. The documents gathered were analyzed to have basis in the design and analysis of the System.

- 1.2 Backlog Construction. The project backlog was constructed in order to present an ordered list of the different stages of development of the Web-Based Student Monitoring System with Short Message Service (SMS) that were needed in the project development.
- 1.3 Sprint Planning. The backlog construction was the Sprint Planning. Thru the use of Gantt chart, it was observed during development of the project into 8 sprints which were scheduled for completion every two weeks.
- 1.4 Development. The project was developed using the SCRUM Phases. The steps undertaken started with requirements gathering and analysis, then design, coding, integration, testing and deployment. The modules of the program were divided into 8 sprints attainable in iteration every two weeks of completion.
- 1.5 Quality Testing. The researcher himself conducted quality testing of the system to verify if all the requirements gathered were included in the program developed. When the required functions of the system already exist, it was then subjected to quality testing.
2. Assessment of the Web-based Students Monitoring System with SMS by IT Professionals. The technical quality of the System was assessed by IT professionals based on the ISO 9126 quality standards namely: Functionality, Reliability, Usability, Efficiency, Maintainability, and Portability.

**Table 2. Summary of assessment result of IT professionals based on ISO 9126 criteria**

ISO 9126 Criteria	Mean Rating	Qualitative Rating
Functionality	4.65	Excellent
Reliability	4.14	Excellent
Usability	4.67	Excellent
Efficiency	4.70	Excellent
Maintainability	4.60	Excellent
Portability	4.47	Excellent
<b>Grand Mean</b>	<b>4.50</b>	<b>Excellent</b>

The over-all assessment of Web-Based Students' Monitoring System with Short Message Service (SMS) IT professionals gave a grand mean of 4.50 with qualitative rating of Excellent. This means that the system meets all the quality standards of software development based on ISO 9126.

**Table 3. Summary of Assessment Result of Parents, Faculty and Staff of School and Students as of Functionality**

Respondents	Mean Rating	Qualitative Rating
Parents	4.49	Excellent
Students	4.57	Excellent
Faculty and Staff of MMFI	4.69	Excellent
<b>Grand Mean</b>	<b>4.58</b>	<b>Excellent</b>

The over-all assessment of Web-Based Students' Monitoring System with Short Message Service (SMS) in terms of Functionality. Parent's, Faculty and Staff of school and Students gave a grand mean of 4.57 with qualitative rating of Excellent. This means that the system is functional to the parents, faculty and staff of school and students. No modification needed.

**Table 4. Summary of Assessment Result of Parents, Faculty and Staff of School and Students as of Usability**

Respondents	Mean Rating	Qualitative Rating
Parents	4.44	Excellent
Students	4.60	Excellent
Faculty and Staff of MMFI	4.55	Excellent
<b>Grand Mean</b>	<b>4.53</b>	<b>Excellent</b>

The over-all assessment of Web-Based Students' Monitoring System with Short Message Service (SMS) in terms of Usability got a grand mean of 4.53 with qualitative rating of Excellent. This means that the system is useful and easy to learn by the parents, faculty and staff of school and students. No modification is needed.

**Table 5. Summary of Assessment Result of Parents, Faculty and Staff of School and Students as of Efficiency**

Respondents	Mean Rating	Qualitative Rating
Parents	4.13	Very Good
Students	4.43	Excellent
Faculty and Staff of MMFI	4.68	Excellent
<b>Grand Mean</b>	<b>4.41</b>	<b>Excellent</b>

The over-all assessment of Web-Based Students' Monitoring System with Short Message Service (SMS) in terms of Efficiency got a grand mean of 4.53 with qualitative rating of Excellent. This means that the system is efficient for the parents, faculty and staff of school and students. No modification is needed.

#### IV. CONCLUSION

Based on the findings, the following conclusions are drawn:

In overall, the factors for using the SMS was high regards of usefulness and ease of use to the end users. The Web-Based Students' Monitoring System with Short Message Service (SMS) was developed using SCRUM with following these stages: Requirements Gathering and Analysis, Backlog Construction, Sprint Planning, Development, Quality Testing, User Acceptance Testing and Deployment. The Web-Based Students' Monitoring System with Short Message Service (SMS) passed the evaluation criteria based on International Organization for Standardization (ISO) 9126.

Having passed through the assessment of the respondents, the Web-Based Students' Monitoring System with Short Message Service (SMS) proved acceptable and beneficial to the Midway Maritime Foundation, Inc. as the system will benefit the Foundation and the whole community as well, most specially the parents of the students who are enrolled in the Foundation. Using SMS, the faculty, administration, students and IT professionals actually motivated in the system applied in the dissemination of educational information among students in the said Maritime school. It can be explained that students' acceptance level towards use of SMS was very high based on the view that SMS was important in their learning environment at the respective maritime school and other college and that it should be maintained as a media for information dissemination. Findings of previous studies also established the same outcome. Among them was a study conducted by Kadirire, 2005 whereby use of SMS had been greatly accepted by users. As such the volume of SMS messages increased signaling the necessity for urgent and important information be disseminated using SMS service for ease of use and especially speed.

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#### Author(s) Profile



**JOEY ALEDO DE LA CRUZ, MSIT**, received the MS degree in Information Technology from Nueva Ecija University of Science and Technology and BS degree in Customs Administration at Midway Maritime Foundation and BS degree in Computer Science at Asian College of Science and Technology. During November 1997- May 2017, he worked at Midway Maritime Foundation as Assistant Head of Campus Management and DepEd Cabanatuan as Senior High school Teacher for information technology And now, he is currently working as Full time Faculty Member in the College of Information and Communication Technology at Nueva Ecija University of Science and Technology – Atate Campus.



**ROWELL AGLIONES DIAZ, MBA**, currently in the candidate status for the post graduate degree in Doctor of Philosophy with area of specialization in Business Administration. He received the Masters degree in Business Administration (MBA) from Nueva Ecija University of Science and Technology and BS degree in Accountancy at MV Gallego Foundation Colleges. He worked at FG Valino Accounting Firm as Head / Supervisor of Financial and Audit Department. He also worked in various private and public institutions as Auditor, Management Consultant, Researcher and Resource Speaker and now, he is currently working as Full time Faculty Member in the College of Management and Business Technology at Nueva Ecija University of Science and Technology – San Isidro Campus where he also serving as President of Faculty and Employees Club and Student Council Adviser.