Web-based School Information and Publication System:
A Developmental Study

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Abstract

The study aimed to promote the school online, provide timely, engaging, and current information of the school to employees, learners, parents, and community, share updates of school activities online, supply downloadable instructional materials and resources for both employees and students. Also, it evaluated the assessment of teaching and non-teaching staff, learners, parents and IT specialists to the ISO 25010:2011 software quality standards of the developed Web-based School Information and Publication System along functional and suitability, maintainability, usability, security, reliability, performance efficiency, compatibility, and portability. This study was descriptive and developmental research. The researcher used the iterative waterfall software methodology. The overall assessment on the Web-Based School Information and Publication System in its quality and standard was "Excellent". Furthermore, based on the findings, the system was beneficial and informative for the school, especially for learners. It was determined that the system was generally acceptable and conformed to the quality software characteristics needed by ISO 25010:2011 standards.

Keywords: school information, publication system, ISO 25010:2011

Introduction

Technology had played a critical role in the improvement and expansion of education throughout the world. A website is one of the technological instruments that institutions and businesses can use to share their academic and corporate profiles with the global community, and it is becoming increasingly popular.

These days, practically every school must have its web-based school information and publication system. The school's administrators put vital information about the student and its various activities and programs. A school website serves as a virtual gathering place for members of the school community to exchange information. Also, data about the school's history, principles, mission, vision, teaching and non-teaching employees, certificates, honors, other recognitions, and any other information pertinent to the institution are included.

Doctor (2017), in his study, "Integrated educational management tool for Adamson University", reported that the system might be used by academic institutions such as colleges and universities to keep student and staff records easily.

Additional benefits include the ability to save money, time, and effort by using a web-based information and publication system for schools. If an institution has a well-designed website, it will be possible to create online portal brochures. The school's management will not have to worry about running print or television advertisements to promote the institution. Additionally, the necessity that parents and other members of the school community receive printed documents and announcements is gone.

Also, graduates of a specific school can be kept updated on the school's achievements and improvements. A school should develop a website to showcase its accomplishments, challenges, and objectives. It can welcome alumni to visit the school's website, leave comments, read its articles and reports, and rekindle student-teacher relationships. The web-based school information and publication system might use Facebook, Twitter, and other social media platforms to facilitate speedy communication.

Regarding learning and teaching, web-based school information and publication systems can be used as a teaching tool that is not limited to the confines of a traditional school setting. Teachers can share relevant links and other educational materials on this page. Teachers can also use forums or chat rooms to further the debates that take place in class.

The web-based school information and publication system could potentially be used as a database. It could also be utilized as a backup storage location for information on the school, its staff, and its learners. The "Downloadable Page" has a collection of frequently used documents in school and are available for download.

 Koomsin (2018) stated that another benefit of a school website is that parents get more connected. Parents may readily learn about forthcoming events, like activities, tests, and tips, by going to the website. School websites help to facilitate communication between parents and the school. According to Swain (2012), students, future students, and their families must have easy access to the school's information and publications using a web-based school information and publication system. The website should serve as a continual representation, where students who are curious about the school's work can find first-hand information about how it operates. Therefore, a web-based school information and publication system must be both exciting and straightforward to use.

Teachers could share their opinions and thoughts with staff members and their students and parents through websites. The system makes it easy for parents to provide valuable feedback to the school and the teachers. Efficacious website activities, recognitions, and announcements make it possible for parents to find out what they need to know. As a result, many people view the web-based school information and publication system as replacing in-person contacts. The website should only be an additional resource benefit supplied by schools to the world.

The researcher conducted this study to establish a web-based information and publication system for Lal-lo National High School to serve as a more dependable source for all school-related information.

Research Questions. This research study aimed to develop a Web-based School Information and Publication System. Specifically, it sought to answer the following:

1. What are the system features that can be considered in the Web-based School Information and Publication System in the areas of: (1.1) Promoting the school online; (1.2) Providing timely, engaging, and current information of the school to employees, learners, parents, and community; (1.3) Sharing updates of school activities online; and (1.4) Supplying downloadable instructional materials and resources for both employees and students?

2. What is the evaluation of the assessment of teaching and non-teaching staff, learners, parents, and IT specialists to the ISO 25010:2011 software quality standards of the developed Web-based School Information and Publication System in terms of: (2.1) Functional Suitability; (2.2) Reliability; (2.3) Performance Efficiency; (2.4) Usability; (2.5) Security; (2.6) Compatibility; (2.7) Maintainability; and (2.8) Portability?

Methods

This study was conducted at Lal-lo National High School located at Centro, Lal-lo, Cagayan, one of the performing schools in SDO Cagayan. The respondents of this study were 126 teaching and non-teaching staff, 350 learners of the said school. Also, 70 parents were participants in this study and 12 IT Specialists. The researcher surveyed to evaluate the developed study based on ISO 25010:2011 software quality standards. Mean and standard deviation was used to analyze the data gathered.

The researcher employed the iterative waterfall software methodology. This technique consists of several processes that must be completed, including gathering of requirements, design, implementation, verification, as well as maintenance.

Phase 1 Requirements. The iterative waterfall paradigm begins with all requirements that apply to the system development as defined in a requirement specification document. The researcher obtained relevant data at this time. The data analysis will follow afterward. The researcher explored what may be needed to design and analyze the system. The researcher also specified the aims and objectives to figure out the scope and constraints of the investigation.

Phase 2 Design. During this phase, the needed specifications and system design were created. Hardware needs and overall system architecture were identified with the help of system design. This phase involved identifying design needs from project documentation and adapting the project accordingly. The requirement specification was being studied in this phase, and that assists in the design process.

Phase 3 Implementation. In this phase, actual coding takes place. The system was being written based upon the algorithm design period. The system was first developed in small programs called units integrated into the next phase with inputs from the system model. Each unit was created and tested for its functionality which was referred to as Unit Testing.

The researcher also produced the planned design from the current iterations, including coding and testing the software developments using an appropriate programming language. Lastly, the customer's environment is used to deploy the software.

Phase 4 Verification. During the implementation phase, all modules were built and integrated into a system. The complete system's integration was tested for any problems and malfunctions. During this stage, the researcher begins developing the project and testing the overall system for its user-friendliness.

Phase 5 Maintenance.   In this phase, when issues come up, patches were published to correct such difficulties. Additionally, an enhanced product model was introduced to affect these modifications in the user ecosystem.

Results and Discussion

Functional Suitability

Table 1 shows the evaluators' assessment of the web-based school information and publication system in its functional suitability. The data show the evaluation in terms of "The information is effective and helpful to complete what is needed" has an overall weighted mean of 4.39 with a descriptive value of "Excellent". The data also reveal that "The system has all the functions and capabilities needed" assessed by the evaluators is having an overall weighted mean of 4.29 with a descriptive value of "Excellent".

Moreover, the overall weighted mean assessed by the evaluators was 4.29 with a descriptive value of "Excellent". This means that the system performs complete, correct, and suitable functionalities when used under the defined conditions and that the system meets stated and implied demands when used under the provided settings.

Table 1. Evaluation of the web-based school information and publication system of the school in its functionality and suitability

Indicators (Functionality and Suitability)	Sch. Staff		Students		Parents		IT Specialists		Overall	
	WM	DV	WM	DV	WM	DV	WM	DV	WM	DV
1. The information is effective and helpful to complete what is needed.	4.80	E	4.34	E	4.20	E	4.92	E	4.39	E
2. The system has all the functions and capabilities needed.	4.65	E	4.24	E	4.18	VG	4.69	E	4.29	E
3. The system provides error messages/ notifications that are clearly understandable.	4.48	E	4.15	VG	4.04	VG	4.62	E	4.18	VG
Composite Mean	4.64	E	4.24	E	4.14	VG	4.74	E	4.29	E

Legend: *WM – Weighted Mean; DV – Descriptive Value*
4.20-5.00 - Excellent (E); 3.40-4.19 - Very good (VG); 2.60-3.39 - Good (G); 1.80-2.59 - Fair (F); 1.00-1.79>> Poor (P)

Reliability

Table 2 presents the evaluators' assessment of the web-based school information and publication system in its reliability. The data show that evaluators' assessment in terms of "Information provided/posted on the system is current and reliable" has an overall weighted mean of 4.28 with a descriptive value of "Excellent". The data also reveal that "The information provided by the system is easy to understand" has an overall weighted mean of 4.30 with a descriptive value of "Excellent".

Closely, "Clear information (such as help, on-screen messages, and other documentation) are present and provided with the system" is also having an overall weighted mean of 4.30 with a descriptive value of "Excellent".

The overall weighted mean assessed by the evaluators was 4.29 with a descriptive value of "Excellent". In other words, it means that the system performs particular functions in the given conditions for a specified amount of time and has the characteristics of maturity, ease of use, fault tolerance, and recoverability that are expected.

Table 2. Evaluation on the web-based school information and publication system of the school in its reliability

Indicators (Reliability)	Sch. Staff		Students		Parents		IT Specialists		Overall	
	WM	DV	WM	DV	WM	DV	WM	DV	WM	DV
1. Information provided / posted on the system are current and reliable.	4.71	E	4.20	E	4.15	VG	4.92	E	4.28	E
2. The information provided by the system is easy to understand.	4.74	E	4.22	E	4.17	VG	5.00	E	4.30	E
3. Clear information (such as help, on-screen messages, and other documentation) are present and provided with the system.	4.65	E	4.24	E	4.14	VG	5.00	E	4.30	E
Composite Mean	4.70	E	4.22	E	4.15	VG	4.97	E	4.29	E

Legend: *WM – Weighted Mean; DV – Descriptive Value*
4.20-5.00 - Excellent (E); 3.40-4.19 - Very good (VG); 2.60-3.39 - Good (G); 1.80-2.59 - Fair (F); 1.00-1.79>> Poor (P)

Performance Efficiency

Table 3 shows the evaluators' assessment of the web-based school information and publication system in its performance efficiency. The data show the evaluation in terms of " The same function (e.g. adding, viewing, editing, uploading, printing, posting, and many more) be used by more than one person at the same time with efficiency" has an overall weighted mean of 4.26 with a descriptive value of "Excellent".

Meanwhile, the data also reveal that "The software support group's devices with application upgrades or browser updates" assessed by the evaluators have an overall weighted mean of 4.25 with a descriptive value of "Excellent".

The overall weighted mean assessed by the evaluators was 4.24 with a descriptive value of "Excellent". This signifies that the productivity relative to the number of resources utilized under the specified conditions, such as system reliability, resource consumption, and capacity, are fulfilled under the specified criteria.

Table 3. Evaluation of the web-based school information and publication system of the school in its performance efficiency

Indicators (Performance Efficiency)	Sch. Staff		Students		Parents		IT Specialists		Overall	
	WM	DV	WM	DV	WM	DV	WM	DV	WM	DV

	WM	DV	WM	DV	WM	DV	WM	DV	WM	DV
1. The same function (e.g. adding, viewing, editing, uploading, printing, posting, and many more) be used by more than one person at the same time with efficiency.	4.62	E	4.21	E	4.14	VG	4.85	E	4.26	E
2. The software support group's devices with application upgrades or browser updates.	4.65	E	4.19	VG	4.10	VG	4.92	E	4.25	E
3. The software or project forms, tables data grids or contents are being displayed and viewed real-time without carrying runtime errors.	4.64	E	4.12	VG	4.08	VG	4.77	E	4.19	VG
Composite Mean	4.64	E	4.17	VG	4.11	VG	4.85	E	4.24	E

Legend: WM – Weighted Mean; DV – Descriptive Value
4.20-5.00 - Excellent (E); 3.40-4.19 - Very good (VG); 2.60-3.39 - Good (G); 1.80-2.59 - Fair (F); 1.00-1.79>> Poor (P)

Usability

Table 4 presents the evaluators' assessment of the web-based school information and publication system in its operability. The data show the evaluation in terms of "The system can operate even outside human interaction" has an overall weighted mean of 4.24 with a descriptive value of "Excellent". Meanwhile, the data also reveal that "The system menus, dropdown button, check box, select button, links, sub-links, forms, and buttons are working properly on a specified use" have an overall weighted mean of 4.29 with a descriptive value of "Excellent".

Table 4. Evaluation of the web-based school information and publication system of the school in its usability

Indicators (Usability)	Sch. Staff		Students		Parents		IT Specialists		Overall	
	WM	DV	WM	DV	WM	DV	WM	DV	WM	DV
1. The system can operate even outside human interaction.	4.62	E	4.21	E	4.14	VG	4.85	E	4.26	E
2. The system menus, dropdown button, check box, select button, links, sub-links, forms, and buttons are working properly on a specified use.	4.65	E	4.19	VG	4.10	VG	4.92	E	4.25	E
3. The system allows me to efficiently complete any process or transaction with faster turn-around.	4.64	E	4.12	VG	4.08	VG	4.77	E	4.19	VG
Composite Mean	4.63	E	4.20	E	4.19	VG	4.85	E	4.27	E

Legend: WM – Weighted Mean; DV – Descriptive Value
4.20-5.00 - Excellent (E); 3.40-4.19 - Very good (VG); 2.60-3.39 - Good (G); 1.80-2.59 - Fair (F); 1.00-1.79>> Poor (P)

Furthermore, "The system allows me to efficiently complete any process or transaction with faster turn-around" also has an overall weighted mean of 4.27 with a descriptive value of "Excellent".

The overall weighted mean assessed by the evaluators was 4.27 with a descriptive value of "Excellent". As a result, defined users will be able to use the system effectively, efficiently, and satisfactorily within a stated context of usages, such as sufficiency recognition, learnability, usability, error protection, user interface aesthetics, and accessibility.

Security

Table 5 shows the evaluators' assessment of the web-based school information and publication system in its security. The data show in terms of "The system security features cover Admin System access, Features access, Database field access, Reports, Master file changes and Standing data" has an overall weighted mean of 4.28 with a descriptive value of "Excellent".

Also, the data reveal that "The reports produce by the system are detailed and protected by access levels" have an overall weighted mean of 4.29 with a descriptive value of "Excellent". Thus, "Each user has a personal password, users have different permission levels and security management systems logs, data and security of the database including archiving" has an overall weighted mean of 4.35 with a descriptive value of "Excellent".

Table 5. Evaluation of the web-based school information and publication system of the school in its security

Indicators (Security)	Sch. Staff		Students		Parents		IT Specialists		Overall	
	WM	DV	WM	DV	WM	DV	WM	DV	WM	DV
1. The system security features covers Admin System access, Features access, Database field access, Reports, Master file changes and Standing data.	4.65	E	4.23	E	4.15	VG	4.69	E	4.28	E
2. The reports produce by the system are detailed and protected by access levels.	4.65	E	4.25	E	4.10	VG	4.92	E	4.29	E
3. Each user have a personal password, users have different permission levels and security management systems logs, data and security of the database including archiving.	4.77	E	4.33	E	4.05	VG	4.85	E	4.35	E
Composite Mean	4.69	E	4.27	E	4.10	VG	4.82	E	4.31	E

Legend: *WM – Weighted Mean; DV – Descriptive Value*
4.20-5.00 - Excellent (E); 3.40-4.19 - Very good (VG); 2.60-3.39 - Good (G); 1.80-2.59 - Fair (F); 1.00-1.79>> Poor (P)

The overall weighted mean assessed by the evaluators was 4.31 with a descriptive value of "Excellent". In other words, the system safeguards data and information to ensure

that individuals or different systems have access to the level of granularity required by their types and levels of permission, such as confidentiality, truthfulness, non-repudiation, accountability, and authenticity, among other characteristics.

Compatibility

Table 6 presents the evaluators' assessment of the web-based school information and publication system in its compatibility. The data show in terms of "The software is compatible with input/ output standards, computer system interface and Database standards" has an overall weighted mean of 4.33 with a descriptive value of "Excellent". The data also reveal that "The system is compatible or responsive to any type of display resolution" has an overall weighted mean of 4.32 with a descriptive value of "Excellent".

In like manner, "The system is accessible and compatible on the platform it is designed without run-time errors and system crash" have an overall weighted mean of 4.23 with a descriptive value of "Excellent".

The overall weighted mean assessed by the evaluators was 4.29 with a descriptive value of "Excellent". While having the same hardware and software environment, this indicates that the system or unit can share information with other factors, procedures, or components as well as fulfill its needed activities.

Table 6. Evaluation of the web-based school information and publication system of the school in its compatibility

Indicators (Compatibility)	Sch. Staff		Students		Parents		IT Specialists		Overall	
	WM	DV	WM	DV	WM	DV	WM	DV	WM	DV
1. The software is compatible with input/ output standards, computer system interface and Database standards.	4.64	E	4.29	E	4.15	VG	4.92	E	4.33	E
2. The system is compatible or responsive to in any type of display resolution.	4.68	E	4.26	E	4.19	VG	4.92	E	4.32	E
3. The system is accessible and compatible on the platform it is designed without run-time errors and system crash.	4.64	E	4.18	VG	4.02	VG	4.92	E	4.23	E
Composite Mean	4.69	E	4.27	E	4.10	VG	4.82	E	4.31	E

Legend: WM – Weighted Mean; DV – Descriptive Value
4.20-5.00 - Excellent (E); 3.40-4.19 - Very good (VG); 2.60-3.39 - Good (G); 1.80-2.59 - Fair (F); 1.00-1.79>> Poor (P)

Maintainability

Table 7 shows the evaluators' assessment of the web-based school information and publication system in its maintainability. The data show in terms of "The system is easy to maintain even without technical support and maintenance procedures" have an overall weighted mean of 4.28 with a descriptive value of "Excellent". The data also reveal that "The system provides an administrative control panel that allows information to be updated real-time in its windows forms" has an overall weighted mean of 4.30 with a

descriptive value of "Excellent". Likewise, "The system has a comprehensive & user-friendly function and interface that includes help & support and user's guide" have an overall weighted mean of 4.35 with a descriptive value of "Excellent".

The overall weighted mean assessed by the evaluators was 4.31 with a descriptive value of "Excellent". As a result, the effectiveness and efficiency of a system can be modified to improve it, correct it, or make adjustments to changes in the environment, along with other requisites such as modularity, reusability, and analyzability, modifiability, and testability, become important considerations.

Table 7. Evaluation of the web-based school information and publication system the school in its maintainability

Indicators (Maintainability)	Sch. Staff		Students		Parents		IT Specialists		Overall	
	WM	DV	WM	DV	WM	DV	WM	DV	WM	DV
1. The system is easy to maintain even without technical support and maintenance procedures.	4.57	E	4.24	E	4.12	VG	5.00	E	4.28	E
2. The system provides administrative control panel that allows information to be updated real-time in its windows forms.	4.64	E	4.24	E	4.17	VG	5.00	E	4.30	E
3. The system has a comprehensive & user-friendly functions and interface that includes help & support and user's guide.	4.70	E	4.29	E	4.19	VG	4.92	E	4.35	E
Composite Mean	4.63	E	4.26	E	4.16	VG	4.97	E	4.31	E

Legend: WM – Weighted Mean; DV – Descriptive Value
4.20-5.00 - Excellent (E); 3.40-4.19 - Very good (VG); 2.60-3.39 - Good (G); 1.80-2.59 - Fair (F); 1.00-1.79>> Poor (P)

Portability

Table 8 presents the evaluators' assessment of the web-based school information and publication system in its transferability. The data show evaluators' assessment in terms of " The system can be transferred to or any platform and accessible via local area network" has an overall weighted mean of 4.29 with a descriptive value of "Excellent". The data also reveal that "The system is accessible at all types of devices or workstation" have an overall weighted mean of 4.29 with a descriptive value of "Excellent".

Furthermore, "The system can be easily transferred without fear of system failure and/or data loss" have an overall weighted mean of 4.28 with a descriptive value of "Excellent".

The overall weighted mean assessed by the evaluators was 4.29 with a descriptive value of "Excellent". A system's or component's efficacy and efficiency can be transferred from one operational or consumption environment to another through the use of adaptability, installability, and replaceability, among other attributes.

Table 8. Evaluation of the web-based school information and publication system of the school in its portability

Indicators (Portability)	Sch. Staff		Students		Parents		IT Specialists		Overall	
	WM	DV	WM	DV	WM	DV	WM	DV	WM	DV
1. The system can be transferred to or any platform and accessible via local area network..	4.67	E	4.23	E	4.12	VG	4.92	E	4.29	E
2. The system is accessible at all types of devices or workstation.	4.64	E	4.24	E	4.11	VG	5.00	E	4.29	E
3. The system can be easily transferred without fear of system failure and / or data loss.	4.64	E	4.21	E	4.21	E	4.92	E	4.28	E
Composite Mean	4.65	E	4.23	E	4.15	VG	4.95	E	4.29	E

Legend: *WM – Weighted Mean; DV – Descriptive Value*
4.20-5.00 - Excellent (E); 3.40-4.19 - Very good (VG); 2.60-3.39 - Good (G); 1.80-2.59 - Fair (F); 1.00-1.79>> Poor (P)

Conclusion and Recommendations

Based on the researcher's findings, the system was both valuable and effective. Functionality-wise, it can be used by multiple people concurrently with effectiveness. Everything was working as it should. Security management systems logs, data, and the security of the database are all part of the database's security. Also compatible with input/output standards, computer system interface, and database standards. The system is comprehensive and user-friendly, with detailed guides and assistance. Additionally, the system is transferable to and can be used from a local area network. It is accessible on any device or workstation.

After the researcher finished the study's findings, the researcher would like to recommend the following: (1) There should be an ICT teacher representative permanently assigned to guide teachers and staff in manipulating the proposed system. The ICT teacher will also oversee the sustainability and maintenance of the system. (2) The school should use, maintain, and sustain the proposed Web-based School Information and Publication System to improve the information and publication system of the school. (3) The school must renew and upgrade its web hosting plan for better features and system performance. (4) The said school must create a quality assurance team to prevent mistakes and ensure the school information's quality to be posted on the website.

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