

Digital Transformation in Education: Development of a Digital Marketing Website for a Small School

Darryll B. Babar

School of Information Technology, Mapua University, dbbabar@mymail.mapua.edu.ph

Leusor Ethan C. Dulzo

School of Information Technology, Mapua University, lecdulzo@mymail.mapua.edu.ph

Jan Edgar E. Tupas

School of Information Technology, Mapua University, jeetupas@mymail.mapua.edu.ph

Rafaello Jose M. Viera

School of Information Technology, Mapua University, rjmviera@mymail.mapua.edu.ph

Elcid A. Serrano

School of Information Technology, Mapua University, easerrano@mapua.edu.ph

Abstract - The rapid digitalization of the world calls for digital transformation in various fields, such as education. Institutions have to keep up with the growing trends brought about by technology to maintain a foothold among audiences in modern times. The study focuses on the development of a website application for a small school located in Roxas City, Philippines, connecting the school to the digital world and increasing the reach of the school. It addresses the digital marketing gaps and limited visibility manifested by the school due to the limited digital profile of the school. The website application provides a platform for showcasing relevant information about the school in the hopes of attracting prospective audiences. Additionally, a simple admission system is incorporated in the website to aid and improve the admission process of the school. The researchers assessed the usability of the developed website through the System Usability Scale (SUS). Obtaining an average SUS score of 81, the results indicate that the usability of the website is excellent and acceptable. The website was determined as successful in terms of usability and accepted for deployment and usage. The developed website ultimately contributes to the marketing efforts and educational experience of the school, solidifying the position of the school in the digital world. Improvements can still be made to the website, such as refining the user interface and adding additional information about the school, to improve its overall quality.

CCS CONCEPTS •Human-centered computing~Human computer interaction (HCI)•Information systems~World Wide Web~Web applications•Social and professional topics~Professional topics

Additional Keywords and Phrases: Digital Transformation, Website Development, Digital Marketing, System Usability Scale.

1 INTRODUCTION

Education is a vital and powerful tool in the world and is one of the foundations that lead to a better future. Education allows for the nurturing of individuals, aiding them in pursuing paths to success while embedding within them the necessary values and skills that result in a better version themselves. Over the past decade, the world has undergone rapid digitalization where various domains and fields have adopted and utilized emerging technologies to improve the quality of life. Such is the case in the Philippines where diverse sectors have opted to keep up with the continuously emerging digital trends. In the modern world, the focus of education is shifting to technological learning and usability, and the education sector has an opportunity to offer a more significant objective in communication conditions, appropriate knowledge, and understanding deployment [10].

Global marketing trends are moving away from traditional offline methods and toward online, digital ones. This is especially true for digital marketing, which offers a more promising approach by enabling prospective customers to conduct research on products and make purchases online [8]. From an educational standpoint, schools have recognized the advantages of extending their presence into the digital and online setting. Engaging in educational marketing is essential for preserving the viability of educational institutions, particularly those that are privately owned as it can highlight the accomplishments and benefits of the school, making them more appealing to the general public [5]. The educational landscape has been transformed by digital marketing, which has made it simpler for academic institutions all over the world to successfully market themselves to their target audiences in the community at large [12].

One small school located at Roxas City, Philippines, has over 30 years of experience as a progressive and play-based school that advocates for inclusive education for all children. Despite receiving recognition from international organizations, the school struggles in broadening its outreach to potential audiences which can be attributed to the lack of digital marketing. Currently, the school does not have an existing website and the digital presence of the school is limited to a single social media account. The lack of a larger and more robust digital profile limits the visibility of the school. It is necessary to keep up with the trends brought about by digitalization to ensure that small schools can continue to keep up with competitors. To address this problem, the researchers propose the development of a functioning website. The proposed website aims to bridge the digital marketing gaps of the school by providing features and essential information that showcase the uniqueness, capability, and reliability of the school. An online admission system is integrated with the website, streamlining and simplifying the admissions process of the school. Additionally, the usability of the website will be assessed and evaluated through the System Usability Scale (SUS). By developing a website, the study aims to enhance the digital presence of the school thereby raising awareness about the school and the advocacies of the school while inviting potential audiences to join the school.

2 REVIEW OF RELATED LITERATURE

2.1 Digital Marketing in the Educational Perspective

Over the past decade, the world has undergone immense digital transformation. According to Sunito et al., human-machine connectivity is facilitated by the use of digital technology which significantly impacts a range of human endeavors, including business, science, and technology [14]. Government, business, and societal digital transformation is a continuous effort aimed at improving process effectiveness, fostering transparency, utilizing new technologies, and maximizing customer value in response to shifting market demands [7]. The field of

education is no exception and the educational sector must also respond and adapt to the changes brought about by the worldwide digital transformation. Digital marketing is one specific area that showcase the adoption of digital technology by educational institutions. Puthussery states that digital marketing is the process of promoting and selling products or services through the use of digital technologies, such as the Internet, mobile devices, visual advertising, and other electronic media [9]. Digital marketing platforms include web-based systems that can develop, market, and provide high-quality brands to consumers through digital channels. Due to the recent pandemic, educational institutions are switching from traditional to digital marketing. Digital marketing also makes it easier for educational institutions to connect with parents and students, and to target potential students. Thus, digital marketing enables educational institutions to widen their reach to potential audiences. Additionally, digital marketing offers significant benefits, including lower costs and a larger customer base for reaching out to prospective and existing clients [3].

There are notable impacts of digital marketing to educational institutions and schools. According to Harbi and Ali, digital marketing helps educational institutions in attracting and engaging potential students, building credibility, and providing satisfaction, which translates to loyalty among the students and parents [4]. In addition, digital marketing builds student satisfaction as well as improves ranking, increases profit, grants easy access to millennial and parents, and allows for instant feedbacks. According to Rajkumar et al., higher education institutions need to use digital media to engage prospective students for enrollment and admission by regularly posting engaging user-generated content that includes text, images, videos, podcasts, and other information [11]. Meanwhile, Makrydakis acknowledged the effectiveness of digital marketing for schools and concluded that a public university can use digital marketing as a potent tool to advertise study programs, draw students, and compete more favorably with comparable domestic universities by drawing higher caliber of students [6].

A key channel used in implementing digital marketing is through a website which is an internet-accessible collection of linked web pages, usually with multimedia content. Websites are used by educational institutions to create engagements and to create a foundation for potential students on how they will see themselves if they are to be a part of that academic community [15]. In addition to being a hub for information, official websites also play a crucial role in facilitating interaction and communication between the institution and the community, namely the students, parents, and other related persons [1]. By offering features to promote ease of communication, the institution is able to establish the idea that it is fairly simple and hassle-free to reach out to the institution for any concerns and issues. Better interaction and communication with parents are then encouraged, which improves the educational process by overall promoting a sense of transparency and accessibility [2].

3 METHODOLOGY

The study centered on the development of an online website application for a small school located in Roxas City, Philippines, to expand the reach of the school to audiences through a technological-based landscape. The website application provides insightful and relevant details, media, and information about the school. The website application further incorporates an operational admission system that caters to both the needs of the user and the application reviewer or administrator. The website application utilizes a NoSQL database to store and manage information including school announcements and news for a streamlined method of updating users and audiences, and applicant requirement submissions subject to further management through the admission system. Figure 1 illustrates the different pages of the developed school website. The pages provide relevant information and media

about the school that showcase the various aspects of the school to attract prospective audiences. This serves as a manner to market the school to potential students and parents or guardians.

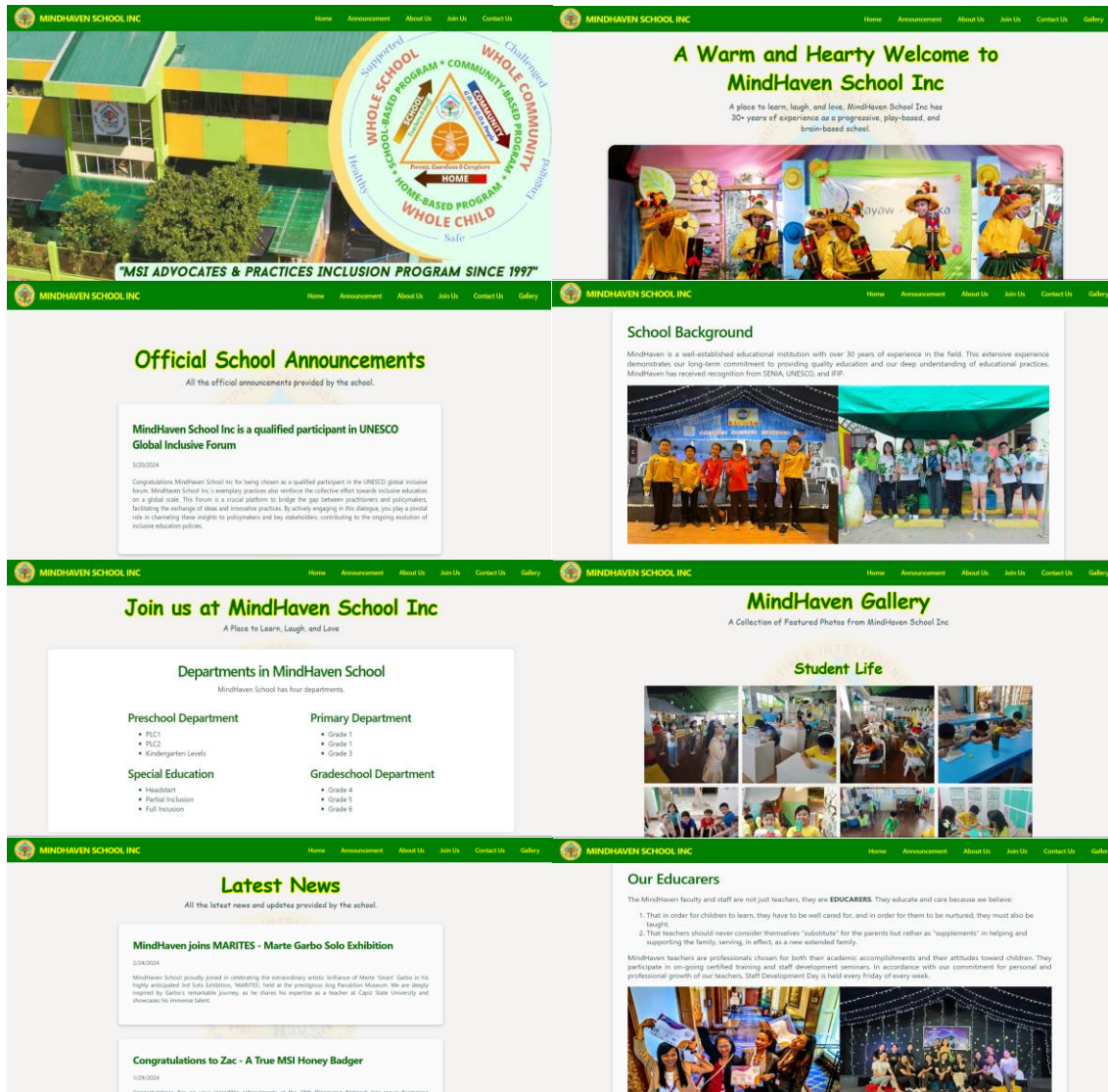


Figure 1. Overview of the Developed School Website

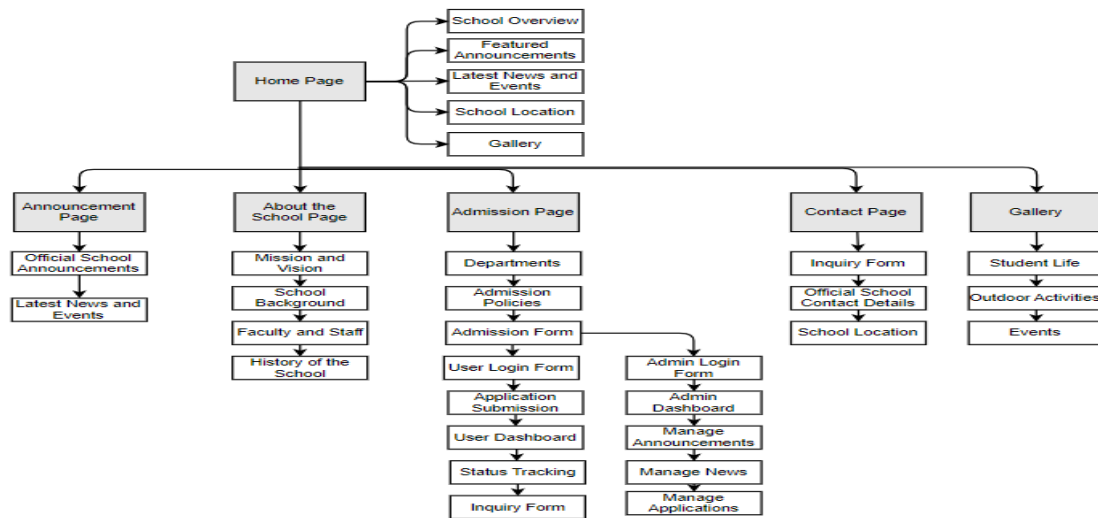


Figure 2. Sitemap of the Developed School Website

Figure 2 shows the sitemap of the developed school website. The graphic representation specifies and provides an overview in navigating the pages of the website and the features within each page. The primary pages of the website application include the home page, announcement page, about the school page, admission page, contact page, and gallery page. The admission page holds access to the User and Administrator dashboards where User and Administrator operations can be accessed after login verification. For the user dashboard, application status tracking and inquiry operations can be used. Meanwhile, for the admin dashboard, operations for managing announcements, news, and applications can be used.

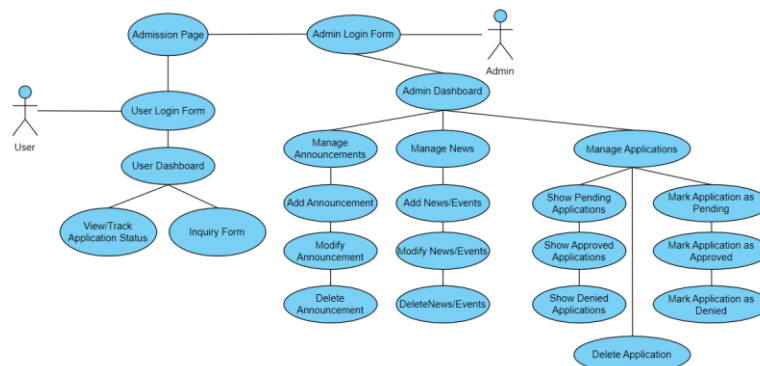


Figure 3. Use Case Diagram of Website Management and Admission System

Figure 3 shows the use case diagram for the admission system and website management. Administrator privileges grants access to managing the website. Upon login verification from the admin login form, the administrator is granted access to the admin dashboard that contains three management categories encompassing manage announcements, manage news, and manage applications. Each category allows for create, read, update, and

delete operations on the connected database. In the manage announcement option, the admin can create new announcements, modify existing announcements, or delete announcements. The changes are instantly reflected on the website. Similarly, in the manage news option, the admin can create news or new event articles, update existing news or event articles, or delete news or event articles. The changes are also instantly reflected on the website. In the manage application option, the admin is granted access to submitted student applications which are shown in a table. The admin can filter the applications displayed in the table according to status which are either pending, approved, or denied. Upon review of the submitted application, the admin can set the status of the application to either approved, denied, or retain it as pending for further processes. Meanwhile, tracking and inquiry operations can be carried out by the user. Upon login verification, the user is granted access to the user dashboard. The dashboard shows the application form and requirements submitted by the user and the status of the application whether it is pending, approved or denied. Additionally, if the user has concerns or inquiries regarding the application, the user can easily contact the school through an inquiry form provided. Figure 4 and Figure 5 shows the user interface of the user dashboard and admin dashboard respectively.

MINDHAVEN SCHOOL INC. Home Announcement About Us Join Us Contact Us

Greetings from MindHaven School Inc!

Applicant Information

First Name	Middle Name	Last Name	Date of Birth	Gender
Jan Edgar	Encriba	Tupas	1/21/2002	Male
Nationality	Email	Username	Number	Student Number
Filipino	janedgar@mindhaven.com	mariboutupas	09604261769	1104592976

Your Application Status is PENDING

Figure 4. User Interface of User Dashboard

MINDHAVEN SCHOOL INC. Home Announcement About Us Join Us Contact Us

MINDHAVEN SCHOOL INC. Home Announcement About Us Join Us Contact Us Gallery

Manage Announcements Manage News Manage Applications Log Out

MANAGE ANNOUNCEMENTS

TITLE	DATE	CONTENT	ACTIONS
MindHaven School Inc. is a qualified participant in UNESCO Global Inclusive Forum	3/20/2024	Congratulations MindHaven School Inc. for being chosen as a qualified participant in the UNESCO global inclusive forum. MindHaven School Inc.'s exemplary practice also reinforces the collective effort towards inclusive education on a global scale. This forum is a crucial platform to bridge the gaps between practitioners and policymakers, facilitating the exchange of ideas and innovative practices. By actively engaging in this dialogue, you play a pivotal role in championing these insights to policymakers and key stakeholders, contributing to the ongoing evolution of inclusive education practices.	Edit Delete
Teacher Nene! invited as Unesco speaker	2/27/2024	We are proud to announce another glowing glory for MindHaven School's advocacy for Inclusion in Education since 1993. Teacher Nene! has been invited by UNESCO to the March 14-15 Global Inclusive School Forum, as a speaker/panelist for the session on Family and Community Engagement.	Edit Delete
MindHaven School to receive RFP Global Inclusion Award	3/7/2024	In connection with our February 28 post, we would like to announce that MindHaven School is one of the 140 organizations and individuals from all over the world who will be recipients of the inaugural RFP International Forum of Inclusion Practitioners Global Inclusion Awards.	Edit Delete

MANAGE APPLICATIONS

Pending Approved Denied

First Name	Middle Name	Last Name	Date of Birth	Gender	Nationality	Email	Username	Number	Status	Reference Number	Actions
Jan Edgar	Encriba	Tupas	1/21/2002	Male	Filipino	janedgar@mindhaven.com	janedgar@mindhaven.com	09604261769	pending	4954240731	Edit Delete
Darryl	Ree	Balar	11/11/2002	Male	Filipino	darrylbalar@gmail.com	darrylbalar	09604261769	pending	5818514586	Edit Delete

MINDHAVEN SCHOOL INC. Home Announcement About Us Join Us Contact Us

MINDHAVEN SCHOOL INC. Home Announcement About Us Join Us Contact Us

Manage Announcements Manage News Manage Applications Log Out

MANAGE NEWS AND EVENTS

TITLE	DATE	CONTENT	ACTIONS
Honey Badger Champion in Asia	1/17/2024	Single Weapon Solo Category Congratulations on your outstanding performance and securing the top spot in the Asia Single Weapon Category! A huge shoutout for being the first Runner-up (2nd) in the Elementary Category! Your exceptional talent and perseverance have earned you this remarkable achievement.	Edit Delete
Congratulations to Zac - A True MHS Honey Badger	1/26/2024	Congratulations Zac on your incredible achievement at the 15th Disagang National Age-group Swimming Competition in Iloilo City! You have proven yourself to be a True MHS Honey Badger, fearlessly conquering the waves and leaving a trail of your success.	Edit Delete
MindHaven joins MARTITE! Marte Carlos Solo Exhibition	2/24/2024	MindHaven School proudly joined in celebrating the extraordinary artistic brilliance of Marte "Smart" Carlos in his highly anticipated 1st Solo Exhibition, MARTITE! held at the prestigious Ang Rendition Museum. We are deeply inspired by Carlos's remarkable journey, as he his expertise as a teacher at Capiz State University and showcases his immense talent.	Edit Delete

ADD NEW ANNOUNCEMENT

Title

Date

Content

Submit

Figure 5. User Interface of Admin Dashboard

The online admission system allows interested audiences to send admission requirements to the school which simplifies the overall process by eliminating the need to physically carry out the original procedures. The submitted requirements are easily managed by the school admins through the admin dashboard, streamlining and simplifying the review and acknowledgement processes. Users are also kept updated on the status of their application with the status tracking feature of the website. Additionally, the communication form features of the website directly link the audience to the school, negating the need to be physically present at the school to have inquiries or questions answered.

Requirements Gathering

The school website can be used on various devices as long as an internet connection is available and established. The website can be accessed on both a desktop device, such as personal computers and laptops, and smart mobile devices, such as android and IOS smartphones.

Design and Development

The school website caters to the following user profiles, each having specific roles and privileges when utilizing the website:

- Students, Parents, Teachers and Staff: Announcements, news, and events from the school are constantly and consistently published in the website. Current students and parents of the students of the school, as well as teachers and staff, can access the website to be informed and remain updated with the current happenings, updates, and state of the school.
- School Admins and Admission Reviewers: With the information management and admission system incorporated in the website, school admins can publish new announcements or news and modify or delete existing ones. Admission reviewers can access submitted applications, review them, and update their status as approved, denied, or still pending.
- Interested Parents and Students: The website provides insightful information about the school. Parents who are interested in enrolling their children to the school can use the website to gain more information about the school and can further communicate with the school if inquiries or concerns arise.

Application Development

With the accomplished requirements specifications, the developers utilized various tools for the development of the website application for the school. In developing the front-end of the website, the HTML and CSS scripting languages paired with the React framework was utilized. The React framework centers on the creation of components, which are independent bits of code that serve a specific purpose or task. The main benefit of the components is its reusability, allowing created components to be reused which saves time and effort in developing website segments with the same features. For the back-end development of the website, the Javascript programming language was used for implementing functions and features. Additionally, the NoSQL Firestore Database was used as the primary storage for information and data used in the website. The developers opted for a NoSQL database that uses key-value pairs due to the nature of information and data that were needed to be stored for the website. The website was deployed using the cloud hosting service of the online platform Vercel.

Testing

Testing cases were created that catered to each specific feature that the website provided. The developers used the created test cases as reference for evaluating and testing all intended functions and features of the website. This includes the create, read, update, and delete operations on the admin dashboard for both announcements and news management, application requirements management, status tracking of submitted applications, proper linking and navigation of pages, proper execution of communication forms, and database functionalities. Through this, the website was ensured to be running correctly and accordingly, free from errors and failures.

Data Gathering

A quantitative approach was used by the researchers for the data gathering methodology. This was achieved using the System Usability Scale (SUS), a well-established method for evaluating the usability of systems and services. The SUS is a questionnaire that encompasses ten survey questions as shown in Figure 6. The questions are answered using a Likert Scale encompassing Strongly Disagree (1), Disagree (2), Neutral (3), Agree (4), and Strongly Agree (5). The SUS was used by the researchers to gather data for evaluating the usability of the developed website.

System Usability Scale (SUS)

1. I think that I would like to use this system frequently.
2. I found the system unnecessarily complex.
3. I thought the system was easy to use.
4. I think that I would need the support of a technical person to be able to use this system.
5. I found the various functions in this system were well integrated.
6. I thought there was too much inconsistency in this system.
7. I would imagine that most people would learn to use this system very quickly.
8. I found the system very cumbersome to use.
9. I felt very confident using the system.
10. I needed to learn a lot of things before I could get going with this system.

Figure 6. SUS Survey Questions [13]

4 RESULTS AND DISCUSSION

The researchers used the SUS method for assessing the usability and effectiveness of the developed website. Data was gathered from 20 respondents which were either parents or guardians of children currently in pre-school or elementary. Computing the results from the SUS requires subtracting the sum of all points of odd-numbered questions by 5 and subtracting the sum of points from all even numbered questions from 25. The computed differences are added and multiplied by 2.5 to obtain a score out of 100. The average SUS score is 68 and any score below 68 indicates problems in website usability. Figure 7 illustrates how the raw SUS scores are interpreted. The result from the conducted SUS survey is presented in table 1. The equivalent SUS score per respondent was computed for and is shown in the table. The mean of the obtained SUS scores was computed for to achieve the

average SUS score of the developed website. An average SUS score of 81 was obtained and is interpreted as *Grade A* from figure 8. Additionally, the usability of the developed website is described as *Excellent* and *Acceptable*. On the net promoter score (NPS), the website attained *Promoter*. Thus, the website was determined to be successful in terms of usability and accepted for deployment and usage. Further improvements can be made specifically to the user interface of the website not only to improve the visual aspects of the website but to further ensure clarity in viewing the website contents. Additionally, further information regarding the school can be included in the website to further showcase the profile of the school and entice prospective audiences.

Grade	SUS	Percentile range	Adjective	Acceptable	NPS
A+	84.1-100	96-100	Best Imaginable	Acceptable	Promoter
A	80.8-84.0	90-95	Excellent	Acceptable	Promoter
A-	78.9-80.7	85-89		Acceptable	Promoter
B+	77.2-78.8	80-84		Acceptable	Passive
B	74.1 – 77.1	70 – 79		Acceptable	Passive
B-	72.6 – 74.0	65 – 69		Acceptable	Passive
C+	71.1 – 72.5	60 – 64	Good	Acceptable	Passive
C	65.0 – 71.0	41 – 59		Marginal	Passive
C-	62.7 – 64.9	35 – 40		Marginal	Passive
D	51.7 – 62.6	15 – 34	OK	Marginal	Detractor

Figure 7. Interpretation of Raw SUS Scores [13]

Respondent	SUS Score	Respondent	SUS Score
1	100	11	100
2	45	12	77.5
3	87.5	13	90
4	100	14	90
5	87.5	15	100
6	70	16	70
7	100	17	55
8	47.5	18	50
9	90	19	62.5
10	100	20	97.5
Average SUS Score		81	

5 CONCLUSION

The researchers developed an operational website application for a small school located in Roxas City, Philippines, to address the digital marketing gaps faced by the school while improving their overall digital profile. The development of the school website that provides informative content, interactive features, and the incorporation of an admission system showcases the potential and capacity for digital transformation to enhance communication, accessibility, and transparency within educational institutions. The researchers further evaluated and assessed the usability of the developed website through a conducted survey using the SUS. The results of the survey indicate an average SUS score of 81 which signifies excellent and acceptable usability. Improvements can still be incorporated in the website, such as by refining the user interface of the website and adding further information about the school, to further enhance the overall quality of the website. The developed website ultimately contributes to the marketing and advocacy efforts and educational experience of the school, cementing the place of the school within the digital world.

6 ACKNOWLEDGEMENTS

The authors would like to thank the clients representing the school for their guidance and insights with the development of the project design and requirements, their informative contributions, and for providing their full trust to the authors in accomplishing the project. The insights from the school were vital to the success of the research project. The authors would also like to thank Dr. Elcid Serrano for his assistance in writing this paper. His knowledge and support were crucial to the accomplishment of the research project.

REFERENCES

- [1] Ahmad Al-Halhouli. 2012. Design and Implementation of Portal System for Schools in Less-Developed Area. DOI https://meu.edu.jolibraryTheses58736980ea57f_1.pdf
- [2] Bhuvana Chandrasekar. 2022. The importance of a Perfect school website – Digital Evolution 2022. Retrieved from <https://gegok12.com/the-importance-of-a-perfect-school-website-digital-evolution-2022/>
- [3] Atuo Chinasa. 2022. Digital Marketing Strategies and Marketing Performance of Private Secondary Schools in Port Harcourt, Nigeria. *Asian Journal of Economics, Business and Accounting*. Volume 22, Issue 24, Page 241-253, 2022; Article no.AJEBA.94146 ISSN: 2456-639X
- [4] Ahmed Harbi and Mohammed Ali. 2022. Adoption of Digital Marketing in Educational Institutions: A Critical Literature Review. Retrieved from http://paper.ijcsns.org/07_book/202204/20220455.pdf
- [5] Hudi Hermawan et al. 2022. Development of Digital Marketing Management Through Websites and Social Media at Al-Furqon Vocational School. *Universitas Negeri Semarang*. EM 11 (1) (2022) 106-110
- [6] Nektarios Makrydakis. 2021. The Role of Digital Marketing in Public Higher Education Organizations in Attracting Younger Generations. *Expert Journal of Marketing*, 9(1), 28-38.
- [7] Marc Peter and Martina Vecchia. 2021. The Digital Marketing Toolkit: A Literature Review for the Identification of Digital Marketing Channels and Platforms. Retrieved from https://www.researchgate.net/publication/342784263_The_Digital_Marketing_Toolkit_A_Literature_Review_for_the_Identification_of_Digital_Marketing_Channels_and_Platforms
- [8] Yanti Purwanti et al. 2021. The Influence of Digital Marketing & Innovation On the School Performance. *Turkish Journal of Computer and Mathematics Education*. Vol.12 No.7 (2021), 118-127
- [9] Antony Puthussery. 2020. Digital Marketing: An Overview. Retrieved from https://books.google.com.ph/books?hl=en&lr=&id=wFjTDwAAQBAJ&oi=fnd&pg=PT3&dq=what+is+digital+marketing&ots=qRUqE-5-OR&sig=RoyNk0zxo4pr1PLdy2vkl1cFFU&redir_esc=y#v=onepage&q=what%20is%20digital%20marketing&f=false
- [10] Muhammad Qureshi et al. 2021. Digital Technologies in Education 4.0. Does it Enhance the Effectiveness of Learning? A Systematic Literature Review. *International Journal of Interactive Mobile Technologies (ijim)*, 15(04), pp. 31-47. <https://doi.org/10.3991/ijim.v15i04.20291>
- [11] Samuel Giftson Rajkumar, C. Samuel Joseph, J. Clement Sudhakar (2021). Digital Marketing Communication Strategies and Its Impact On Student Higher Education Decision Making Process - A Review Of Relevant Academic Literature, *Psychology And Education*, 58(2): 4267-4279
- [12] Rini Sari et al. 2021. Training in Adoption of Digital Marketing to Increase Branding and Intake of Lantera Bangsa School. Vol. 3, No. 1, Oktober 2021: 405 – 408
- [13] Jeff Sauro. 2018. 5 Ways to Interpret a SUS Score. Retrieved from <https://measuringu.com/interpret-sus-score/>

- [14] Sunito, Muhammad Saleh, and Rustam Effendi. 2021. Marketing Management in the Digital Era: A Study at State Vocational High School 1 and 2 Tamiang Layang. Vol. 4, No. 4, 457 – 464. <http://dx.doi.org/10.11594/jk6em.04.04.09>
- [15] Carmel Taddeo and Alan Barnes. 2014. The school website: Facilitating communication engagement and learning. Retrieved from <https://bera-journals.onlinelibrary.wiley.com/doi/abs/10.1111/bjet.12229>