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RMS: E-Commerce Platform for Marble Industry in Romblon

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ABSTRACT

Innovative marketing strategies had made a lot of improvements in different business industries. Utilization of the internet through various social media platforms and development of software applications have brought ease in promoting and selling products all over the world. However, not all merchants are able to conduct similar practice on due to technological and knowledge gaps. In the province of Romblon, where marble is famous, only few merchants use technology to market since few have resources and knowledge to manage such advancement. To address this, the study aimed to develop an online platform based on the Business-to-Consumers (B2C) hybrid market. Through this, marble marketers could advertise, sell, offer services, and earn profit using basic technological resources, in addition to the earnings in their physical shop. The online market features performance efficiency, functional feasibility, reliability, compatibility, usability, and portability of the system that ensure excellent functional operation and hassle-free services for the users. The system was launched and tested using the ISO/IEC 25010 that the overall result gives a satisfactory rating. Romblon Marble Shopping (RMS) system has been accepted and recommended to be of use by the municipal business marble industry sector as a step through in marble marketing for the province of Romblon.

Keywords: *B2C, E-Commerce, Marble, Online Shopping, RMS*

INTRODUCTION

The Internet is an excellent medium for products or services exhibitions. In today's generation, many users go online either for leisure or for serious business (Bismo, 2019). By using digital marketing tools, companies have easy access to promote their product and build relationship with customers, suppress the expenditure, and increase sales volume. In terms of marketing, technology serves as an excellent opportunity for users to become more productive and competitive in the business field. Shifting to online marketing means that it could be accessed anytime and anywhere without tremendous difficulty.

For its effective convenience and utilization, the e-commerce concept delivered an exceptional growth over the digital platform. Fast internet connectivity has encouraged buyers to buy online. According to ACNielsen report, far more than 627 million consumers have shopped digitally in global scale. Germans and Britons are the world's leading online shoppers. The most common goods they bought on the Web are reading materials (printed and digital format), airplane ticket reservations, garments (shoes and clothes), movies, electronic games and other electronic devices (AcNielsen, 2005).

Of the seven Asia Pacific countries surveyed for cross-border sales using a smartphone, the Philippines is the third highest. Among the Filipino participants in the study, 58 percent used an application or website to participate in online shopping in the Philippines, while 13 percent did so outside the country through an application or website (De Leon, 2018). In 2017, a total of Php92.5 billion pesos was spent by Filipinos in online shopping alone and is expected to grow further to more than Php185 billion pesos in 2020 (De Leon, 2018).

Marble industry is one of the industries that is going online. The municipality of Romblon, Romblon is known for marble, the industry being established since late 19th century (MIMAROPA-NEDA; Guia, 2012). Marble deposits abound in the northern section of Romblon island, as well as on the Alad and Cobrador Islands, in a variety of hues and forms. Marble is carved and fashioned into a wide range of things. A booming industry produces novelty items like little souvenir eggs and animals, chess sets, nameplates, mortars and pestles, and religious icons. Marble slabs and blocks are also

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shipped to other parts of the Philippines for construction, monuments, and gravestones.

Considering this, the researchers designed and developed an online system e-commerce platform for marble industry in Romblon. This study emphasized the benefits of having a user-friendly open system, simple yet systematize, that could offer a practical approach for online business shopping. This e-commerce platform is a great way to expand the marble business and eventually increase profits.

METHODOLOGY

The system was developed using the Agile Model, as shown in Figure 1 which serves as a guide to ensure all requirements integration.

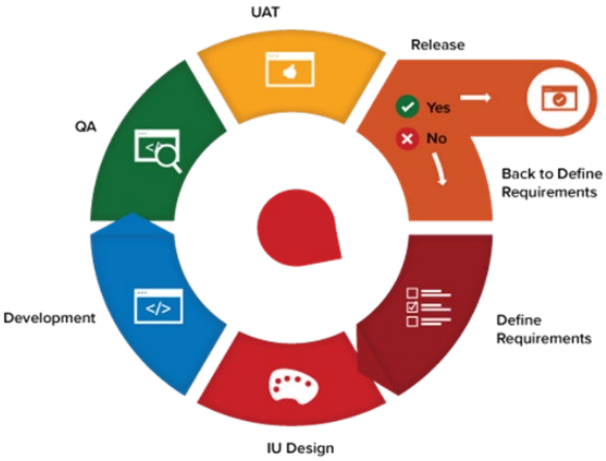

Figure 1. Design Process of the Proposed System

Figure 2. Flowchart of the Proposed System

The iterative process dominates the Agile software development life cycle. The next piece of the software creation puzzle results with each step before the finished output is completed and satisfied. With a purely fixed completion period, each iteration can typically take two to four weeks. It has a time-bound existence, thereby generating a mechanism of methodical repetition. As the allocated period permits, each iteration scope was specific.

During the Agile product development life cycle, multiple implementations have taken place, and each follows the workflow. The consumers and customers must have guidance during revisions to ensure that the requirements fulfill their needs. Business stakeholders must provide feedback to ensure that the features meet their needs.

The technology today made it possible for a faster and easier exchange of information. Every website has its unique designs that attract more visitors that make it possible to exchange information worldwide making online shopping nowadays, as one of the most popular online activities. The proposed system E-Commerce Platform gives a big help to the Marble Industry in Romblon in developing and improving the Municipality.

The diagram in Figure 2 explains the proposed system flowchart for RMS: E-Commerce Platform. It shows the graphical representation of the system's flow in the system and represents its work process.

Software Requirements

Programming Language

The developer used JavaScript in the implementation process, which has three main technologies: World Wide Web, HTML, and CSS. It requires websites to be interactive, thereby making it an integral part of web applications. Two JavaScript front-end frameworks Vue.js and React, are popular in the developers' world, and both tools have a productive approach in building various Web products. Both have the best usage cases of their own and respond to diverse market needs. PHP language was originally used for mobile application websites. It is used for command-line scripting and code applications in making websites, Android apps, and iOS apps since the system is viewable on a smartphone. It is used to create e-commerce websites, creating PDFs, and for building content management systems.

Database Management Software

The developer used MySQL, which enables relational databases to be managed, for its framework. It is an open-source, Oracle-supported application that can operate on several UNIX, Debian, Windows, and similar platforms. The researcher focuses on a software tool to

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develop a web-based application that is viewable on smartphones.

The researcher focuses on a software tool to be utilized in developing a web-based application that is viewable on smartphones. The researcher considers some programming languages and script languages to achieve and produce the desired features and functionalities. The proposed system be implemented using the minimum hardware requirements in Table 1.

Table 1. Hardware Requirements

Hardware Requirements (Minimum)		
Hardware	**Category**	**Specification**
Management Computer For system management (Customer, consumer, and Admin	Hardware	(*Admin*) Intel i3, 4gb RAM, 500gb HDD (*Customer, Consumer*) Non-specific
	OS	Windows 7
	Connectivity	Stable Internet Access
	Application	Google Chrome Browser, Microsoft Edge, Mozilla Firefox
Mobile (Customer, consumer)	Hardware	Non-specific
	Connectivity	Network Access
	Application	Google Chrome Browser, Microsoft Edge, Mozilla Firefox

System Design

Shown in Figure 3 is the system architecture of the proposed system for RMS. The proposed system has three primary users to have access to the system. The system is designed user-friendly and straightforward to address the variety of ages and literacy of the users. Users can access the system using a smartphone, laptop, or desktop. A user can be register, shop, and purchase orders anytime, anywhere in the Philippines.

Figure 3. System Architecture

Business owners need to register first online and validate their business store to have access to the system. They can add new products, edit and update the details, and manage the stocks' availability. The admin would validate this process before the business owner can post. They can make all inquiries regarding consumers' questions. Suggestions are entertained to have a good relationship with them.

The developer created a user-friendly home page for the consumers' convenience while browsing or making an online order and asking something about the company, products, and services that the marble store offered. Consumers are also required to fill-out personal data. After the registration, the consumers can now shop online marble products based on their desire, anytime, anywhere, using their mobile phones or laptop. The system requires the necessary consumers' information to validate delivery details.

The proposed system must have an administrator to manage and monitor the Romblon Marble Shopping, which the Municipal Business office manages. The admin is the one who validates the registration of businesses, manages and monitors the posting of a product by business owners.

System Development

In developing the website, the researcher focused on a software tool utilized as a web-based application that is viewable on smartphones. The developer considered some programming languages and script languages to achieve and produce the desired features and functionalities.

The PHP was initially used for creating websites for mobile app development, Android apps, and iOS apps since the system is viewable on a smartphone. It was used to create e-commerce websites and PDFs for creating content management systems.

To build the system, JavaScript was also used since it has three main technologies: the World Wide Web, HTML and CSS. It makes websites that are interactive, which is an integral aspect of web applications. It has the overwhelming majority of domains to use and a dedicated JavaScript engine is required for all major web browsers to operate.

For a database management system, MySQL helps relational databases to be managed. It is Oracle-backed open-source software that can operate on several UNIX, Debian, Windows, and similar platforms.

Test

Similar to how Agile approaches development, most of the best-known usability practitioners encouraged testing early and often. Thus, an iterative approach to testing was recommended (Coughlan, 2016).

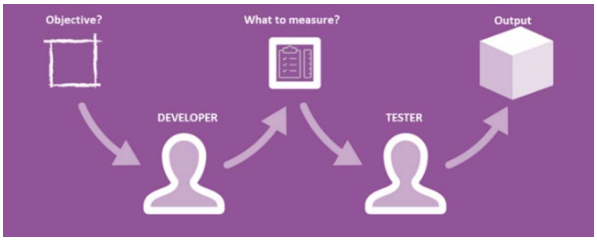

Figure 4. Iterative Test Model

As defined in Figure 4, the researcher needs to do some to conduct the usability test, as follows: (a) defining objective; (b) identifying the measurement needed; (c) creating tasks and questions which is best achieved when based on ISO/IEC 25010; and (d) recruiting testers.

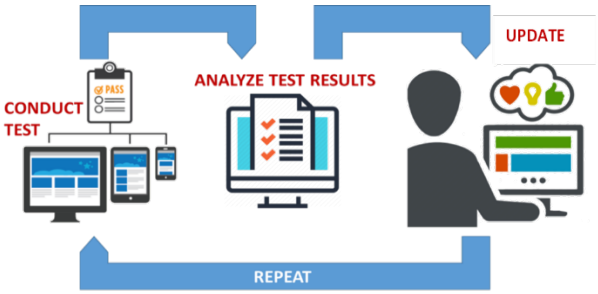

Figure 5. Iterative Test Cycle

The developer deploys the framework online to validate the website and to see how the system achieves the functionality of the system if the platform provides functions that when used under defined circumstances, fulfill mentioned and implied needs. It will share details and execute the required functions while testing the efficiency and compatibility of the device, thus sharing the same hardware and software environment. It will achieve the defined objectives with user-friendliness performance, efficacy, and satisfaction in order to verify the responsiveness of the process. Also, it will also check the reliability of the given rules set by the system. Considering the planning steps shown in Figure 5, the tested module before evaluation and user acceptance is shown in Table 2.

System Implementation and Evaluation

Implementation

The Municipality of Romblon, Romblon, and varied consumers, are the target users of the research project. The researcher requested to conduct a focus group orientation regarding the use of the online website and mobile application version. The target population sampling was randomly selected and for those who have marble business in Romblon, Romblon.

Evaluation

To determine system quality, the researcher used ISO/IEC 25010 standard. The quality of a system is linked to the degree to which the system satisfies the specified and implied demand for and from its interested parties, thereby providing value. The specifications of certain stakeholders (functionality, efficiency, protection, maintenance, and other related) are specifically represented by the quality model, categorizing product quality into features and sub-characteristics.

RESULTS AND DISCUSSION

The researcher provides a web-based ordering platform for the marble business owners to help their consumers who do not have access to their physical store (Tables 2, 3 & 4). The website lured consumers to visually observe the products before purchasing. In this way, the consumers can easily browse various displayed marble products with just a few clicks. Consumers may begin to buy conveniently from their internet-connected personal computers, tablets, and cell phones from shopping websites. Consumers will start waiting to collect their orders within a few days at the closest courier establishments within their neighborhood after paying their purchased items.

This system can help every consumer of every business store to have easy access to its management. They can have their inquiries online and have management feedback. All the information that the consumers want to know about the store is almost on

Table 2. Admin Test Procedure

Features	Test Objective	Test Procedure	Test Platform	Test Result
Log-in	The admin should be able to manage their account.	• Input username and password. • Change username and password.	Laptop or Desktop Computer Smart Phone	Successfully log-in and manage the username and password.
Manage Merchants	Able to validate the merchant's registration and verification.	• Test the validation of registration and verification.	Laptop or Desktop Computer Smart Phone	Successfully validate the merchant's registration and verification.
Manage Product Category and Validate	Set product categories and validate it.	• Set the product category. • Validate product.	Laptop or Desktop Computer	Successfully add, delete and validate product category.

Table 3. Merchant's Test Procedure

Features	Test Objective	Test Procedure	Test Platform	Test Result
Registration	• To register online using a different device and received SMS notification.	• Fill-up necessary information. • Set username and password. • Receive SMS notification (after the verification of the admin).	Laptop or Desktop Computer Smart Phone	• Successfully register and manage personal account. • Successfully received SMS notification.
Log-in	• To log-in with the registered username and password. • To be able to manage their account/s.	• Input username and password • Change username and password • Edit and update personal information	Laptop or Desktop Computer Smart Phone	• Successfully log-in using username and password. • Successfully edit and update information.
Manage Products	• To add, edit, and update products. • To monitor the products and stock	• Add products • Edit and update products details • Upload products design • Display the availability of the product and stock.	Laptop or Desktop Computer Smart Phone	• Successfully add, edit and update products. • Successfully monitor the products and stock.
Manage Purchased Order	• To monitor the product ordered by the customer. • To set the status of delivery and pick-up details of orders. • To monitor the payment transaction of the consumers.	• View customers order. • Set the status of ordered products. • Verify the consumer's information for the delivery and pick-up details. • Set the delivery and pick-up details of orders. • Verify the payment transaction made by the consumers.	Laptop or Desktop Computer	• Successfully monitor the product order. • Successfully set the status of delivery and pick-up details. • Successfully monitor payment transaction thru system notification.

Table 4. Consumers' Test Procedure

Features	Test Objective	Test Procedure	Test Platform	Test Result
Registration	To register online using different devices.	• Fill-up the required information • Edit and update personal information	Laptop or Desktop Computer Smart Phone	• Successfully register online. • Successfully edit and update information.
Log-in	The consumer should be able to log-in and manage their account.	• Input username and password. • Change username and password.	Laptop or Desktop Computer Smart Phone	• Successfully log-in in the website and easily manage account.
Shopping	• To be able to shop online and browse the desired products. • To be able to upload personalized design.	• Search and select products. • Show product and store details. • Add the product in the cart. • Remove or change product order in a cart. • Set the product order quantity. • Request personalized products. • View total purchase. • View the status of orders.	Laptop or Desktop Computer Smart Phone	• Successfully shop online and browse products. • Successfully upload image for personalized design. • Successfully edit and update order and view total purchase. • Successfully view the status of orders.
Online Payment	To be able to process online payment.	• Process online payment transaction.	Laptop or Desktop Computer Smart Phone	• Successfully process online payment using credit card.

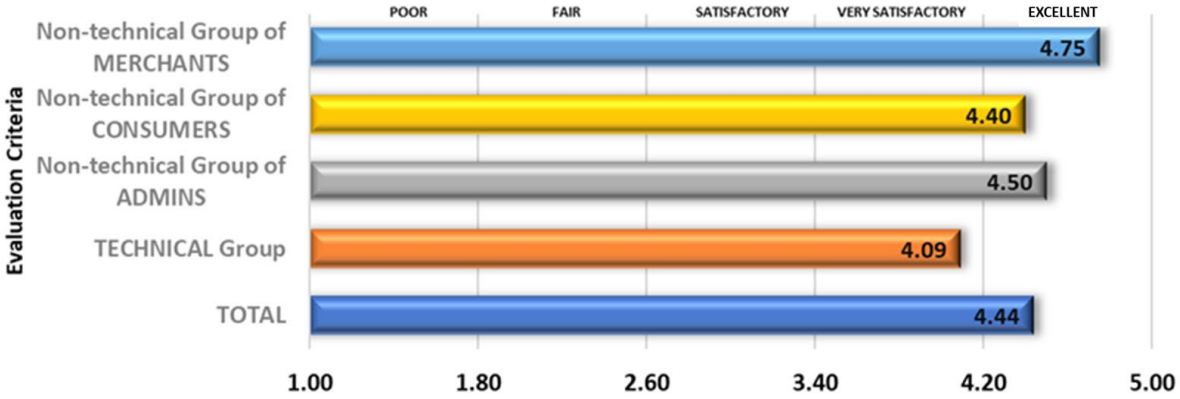

Figure 6. Overall System Evaluation Result

the products that they desire, add to their cart, and the system automatically computes the total amount purchased.

The prospect consumers can inquire online through the system. They can view the offered products, details, amounts purchased, and other services. The system also has a feature that enables consumers to view the availability of each product. The consumers can also request a personalized marble product from the business owner. The business process and procedures improvement could maximize the business income, facilitate and monitor all marble products and sales online. This website would give benefits to the marble business owners of Romblon, Romblon and consumers nationwide.

The research conducted to test the established framework came from four groups to ensured that the standards of the stakeholders were focused on the ISO/IEC 25010 specification to assess the consistency of the system. They are the non-technical admin, merchant, consumers, and the technical groups.

Shown in Figure 6 are the overall results of the system as evaluated by the admin group had a grand mean of 4.50 (excellent), the merchant's group was 4.75 (excellent) and the consumer's group was 4.40 (excellent). The system evaluation's overall mean for the technicality was 4.09 (very satisfactory).

The technical group shows the evaluated results means that the system was very satisfactory to meet the expected objective/output. In contrast, the admin group means that it did excellently meet its stakeholder's needs. The community of merchants and customers, on the other side, indicates that the measured outcomes indicate that the scheme meets the specified and implied needs of its different stakeholders excellently.

CONCLUSION

In general, the key objective of the study is to establish an E-Commerce Network for Marble Industry online platform in Romblon, which is excellently accomplished and fulfilled on the basis of the analysis and testing performed by the researcher.

It was shown that the developed system can check the legitimacy of the business. It is also viewable on a smartphone. It can provide feedback, confirmations, validations and status updates of online orders. It has a platform where customers can provide personalized design options for their orders, and it provides a convenient way of payment for consumers. Respondents benefit from knowledge in E-commerce from the system as it serves as an alternative expansion of the business. The evaluation and analysis of the data gathered proved that the majority favored and accepted the online shopping for the marble industry.

The study can help the industry keep and increase their patronage and transact untapped and new consumers. It provides much faster and better consumer services prompting the marble merchants to keep pace to remain competitive. The long-range approach would ensure the marble advertisement in the World Wide Web. The researcher concluded that as the users pilot tested the evaluated system, it helped them in the decision-making process.

CONFLICT OF INTEREST

The author declares that the project poses no conflict of interest in the process conceptualizing, designing, creating, testing, maintaining and publishing of this project from its software to hardware and unto this manuscript.

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