

# Paperless Digital Memorandum Distribution with Short Messaging Service (SMS) Notification

<sup>[1]</sup> Angie C. Almarza, <sup>[2]</sup> Kenth Joshua B. Espina, <sup>[3]</sup> John Rey A. Alipe

<sup>[1][2][3]</sup> Iloilo State University of Fisheries Science and Technology, Philippines

Corresponding Author Email: <sup>[1]</sup> einaalmarza@gmail.com, <sup>[2]</sup> kenthjoshuaespina@gmail.com,  
<sup>[3]</sup> jralipe@gmail.com

---

**Abstract**— *The study aimed to develop a Paperless Digital Memorandum Distribution with Short Messaging Service (SMS) Notification that can be beneficial to the faculty, staff, and administrators of the Iloilo State College of Fisheries. The system was developed to augment the work-from-home scheme during the pandemic specifically in the distribution of memorandum issued by the College President in a real-time and paperless way. The memorandum will be disseminated to the specific recipient using SMS notification and can be viewed online thru email. The additional feature of the system includes managing a user and memorandum as well as printing of reports. The researcher utilized the Agile Development Model in designing the system.*

*The evaluation of data was analyzed using the mean. The overall results of the evaluation based on product quality and quality in the use of the developed system for the Paperless Digital Memorandum Distribution with Short Messaging Service (SMS) Notification show that it has a grand mean of 4.5 which has a descriptive meaning of excellent.*

*The result likewise revealed that the product quality of the system was excellent as to its functional suitability, performance efficiency, compatibility, usability, reliability, security, maintainability, and portability. Finally, the system's quality in use evaluation result was excellent as to its effectiveness, efficiency, satisfaction, freedom from risk, and context coverage.*

**Keywords:** Digital memorandum, SMS Notification, Memorandum Distribution, Paperless.

---

## I. INTRODUCTION

During COVID-19 pandemic, almost all government offices transform their work to a work-from-home scheme. In this arrangement, government employees work in their own homes, rather than in an office. Incoming and outgoing communications are all done online. One of the means of communicating to employees is thru a memorandum. A memorandum is used primarily as a formal and physical means of efficient communication from the College President to the College Deans, Directors, administrative staff, and academic personnel of the system-- it is almost always for internal communication and only rarely sent to the public. The College Secretary usually drafts the memo which is essentially a short letter, typed in a word processing document, with Iloilo State College of Fisheries (ISCOF) official letterhead and either sent electronically as a file attachment or printed for hand delivery by the President's staff. A memorandum should be sent to a specific recipient, depending on their purpose.

Memorandums are used to keep employees informed on the most recent activities in the College, either College-wide or on a specific Campus. This scenario happens when the College President issues a change in academic policy; a memorandum is used to explain the change. Other news shared in a memorandum might include the new curricular offerings and inform personnel with updates on how project schedules are coming along. A memorandum includes an announcement to be posted in a conspicuous area of an office,

especially on the schedule of the current activities.

However, the issuance of the memorandum from the Office of the College President continues to evolve manually and needs extra time and effort to scan and send thru email. The President's office staff faces problems in finding people who are involved in the memorandum as well as indirect acknowledgement happens every time.

To add more, the COVID-19 pandemic had changed the way we work and communicate. The Work from Home scheme is expected to be a permanent feature in most government offices which official transactions can be done only online.

To directly address this problem, this research presents a design and prototype implementation of Paperless Digital Memorandum Distribution with Short Messaging Service (SMS) Notification at Iloilo State College of Fisheries.

## II. RELATED WORKS

Based on [www.gethppy.com](http://www.gethppy.com) [1], according to Ayers, a memorandum used to be the reigning champion when it came to workplace communications, but today, they have become much less common. Many companies are going paperless, and even those that don't tend to use digital tools that lead to fewer memos in the workplace overall.

In this study, a memorandum is part of communication across the College issued by the Office of the President for a record or written statement on current issues on the campus, usually a formal message sent between one or more employees. Also, this study aims to disseminate interoffice

---

memorandum in a paperless way and to notify the recipient in real-time.

Based on Tenhue [2] discuss in his article that a user is someone who interacts with a system. The primary user is in direct contact with the system interface and thus is usually most affected by it. When designing any system or interface, user experience professionals must keep in mind the needs and tasks of the primary user. The secondary user does not directly interact with the user interface of the system but is still affected by it.

In this study, the users are the persons that plays important role in the system such as Admin, President, secretary, and recipient. They all interact in the system by creating, distributing, and receiving memorandum.

The IBM Corporation [3] states that a user profile defines the portal tabs that the user can access and specifies user preferences, such as the product language, preferred output format of reports, and the style used in the user interface. A user profile is created when the user logs on to IBM® Cognos® software for the first time. It can also be created by an administrator. Initially, the profile is based on the default user profile. Users can view and change the preferences associated with their profile. To copy, edit, or delete user profiles, an administrator must have written permissions for the namespace that contains the applicable users.

In this study, a user's profile is created for users log ons into the system. These users were defined as Admin, President, Secretary, or recipient. Whenever the users use the system, its function depends on their profile.

In the article of Clarizen [4], a system administrator will typically assign a User Type to a user, which applies to system-wide predefined roles and permissions. Permissions let you manage users by their roles in the organization and the project, their group affiliation, and based on specific objects in the system. With permissions, you can expose only the relevant data to specific users, and restrict access to sensitive and financial data. For example, if the user type is Administrator (Admin), the user is authorized and will be able to access and adjust all system settings. Another example is when other users log in to the system they can access different restrictions.

A user type in this study is predefined and has specific roles in the system; the Administrator, President, Secretary, and recipient). The administrator (admin) has full access to all system settings and processes. The secretary is authorized only to manage the memorandum such as creating, editing, deleting, and printing memorandum. The President accesses the system whenever the memorandum has to be approved. The recipient of the memorandum has limited access to viewing only the memorandum received after a text notification from a mobile device. Each user of the system has set his/her username and password to access the system.

The journal of Olaleye, [5] states that the short message service (SMS) technology is one of the most stable and most

widely used mobile communication methods after phone calls. Most students of tertiary institutions carry mobile phones which are capable of receiving short messages as a means of event notification. In principle, the text message can be used either as a one-way communication to provide the user information such as reminders, alerts, etc, or as a two-way communication that enables the user to send and receive information (such as questions and answers). Event notification (through SMS) is a well-known way of notifying users about an event scheduled to take effect within a particular period in an institution.

In this study, sending notifications using SMS is the system's means of notifying the recipient (personnel) of the memorandum issued by the President. The personnel involved in the memorandum can receive a memorandum anywhere and anytime. The current system will save resources and time in notifying the memorandum.

### III. METHODOLOGY

The researcher used the five-point Likert Scale as the basis for evaluators in rating the system. The Likert Scale is an ordered, one-dimensional scale from which respondents choose one option that best aligns with their view. As in all scaling methods, the first step is to define what is to be measured. Because this is a one-dimensional scaling method, it is assumed that the concept you want to measure is one-dimensional.

The system was rated based on ISO/IEC 25010:2011, a standard evaluation of product quality and quality in use. The prototype was also evaluated in terms of the aforementioned criteria.

The researcher uses the SDLC method. The system was evaluated by thirty (30) respondents to verify its conformance with ISO/IEC 25010:2011 software quality model. This model was adopted for the evaluation of the potential user of the control system. The evaluation was done with the use of a questionnaire, anchored by the ISO 25010:2011 as to product quality and quality in use. In particular, it uses functional suitability, performance efficiency, compatibility, usability, reliability, security, maintainability, portability, effectiveness, efficiency, satisfaction, freedom from risk, and context coverage criteria.

#### Data analysis

The questionnaire was given during the demonstration of the current system where oral interview reinforced the printed instrument.

The responses of the respondents to the printed questionnaire were tallied and summed up and the mean was computed. The Likert Scale was used in giving the interpretation of the mean for each item.

**Data Gathering Instrument**

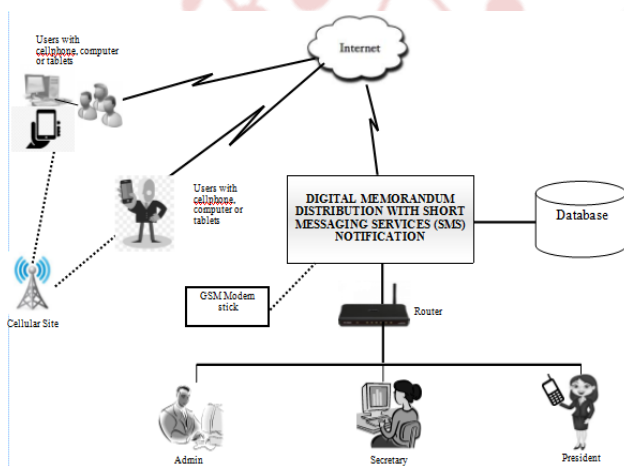
The evaluation criteria of the software for the proposed system will be rated based on ISO 25010:2011 product quality model, considering the criteria such as performance efficiency, compatibility, usability, reliability, security, maintainability, efficiency, portability, effectiveness, efficiency, satisfaction, freedom from risk, and context coverage.

Each criterion has to be evaluated as “excellent”, “very satisfactory”, “satisfactory”, “fair”, and “poor”. For statistical purposes, numerical weights are respectively assigned.

**Table 1.** The Rating Scale

Mean Value	Rating	Interpretation
4.2 – 5.0	Excellent	It has superior or extraordinary attributes.
3.4 - 4.1	Very Satisfactory	It is very satisfactory and shows above-average qualities or abilities.
2.6 - 3.3	Satisfactory	It meets the minimum required standards.
1.8 - 2.5	Fair	It is fairly suitable but lacks exceptional quality or ability.
1 - 1.7	Poor	It is deficient in quality and ability.

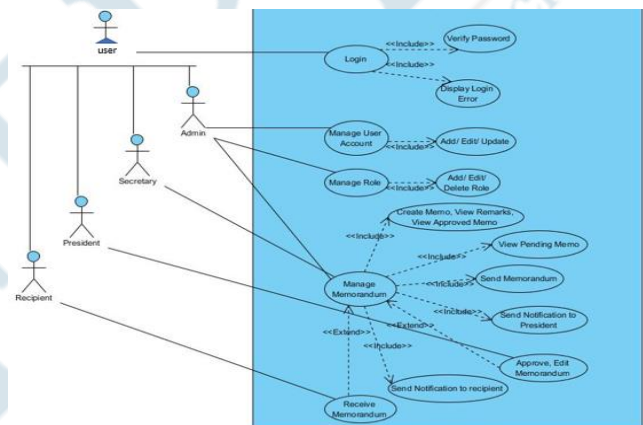
In the formulation of the scale of interpretation shown in Figure 1, the highest scale which is 5, is subtracted by the lowest scale of 1 to obtain a range of 4. However, there are 5 interpretations, thus, 4 is divided by 5, making an interval of 0.8.



**Figure 1.** The Deployment Diagram /Framework Model

Figure 1. The deployment diagram of the Digital Memorandum Distribution with SMS Notification. The system can be accessed using a Phone, Desktop Computer, or Laptop through a Local Area Network (LAN) or the Internet.

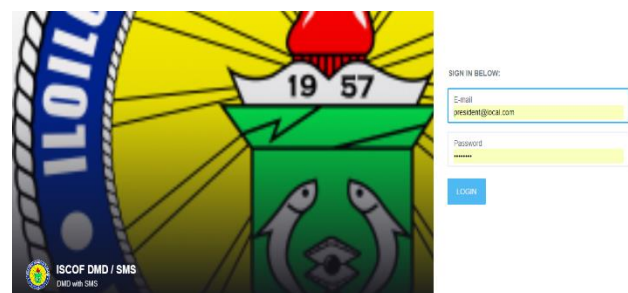
The function of the system starts with creating a memorandum by the Secretary. In the forms provided, the Secretary will enter the memorandum subject, series number, date issued, and memo contents. The secretary also selects the concerned recipient/s stored in the database and saves it as a draft memorandum for approval of the President. The President will receive a notification of the new memo. If there are no corrections or comments, the President published the memorandum and automatically sent it to the concerned recipients (faculty and staff) thru an SMS. If there are corrections, the President rejects the memo and sends back a notation for correction of the Secretary. The recipient receives a text notification from the Office of the President and automatically sends the memorandum thru email. The recipient can view the memorandum thru a smartphone, laptop, tablet, or any computer devices. All memorandum data sent will be automatically stored in the database.



**Figure 2.** The Use Case Diagram

The Use Case diagram as shown in Figure 2 was primarily designed to provide the conceptual model and architecture of the system being developed. Typically, a class diagram consists of more than one class or all the created classes for a system. This diagram defines and provides the overview and structure of a system in terms of classes, attributes and methods, and the relationships between different classes.

**IV. RESULTS AND DISCUSSIONS**

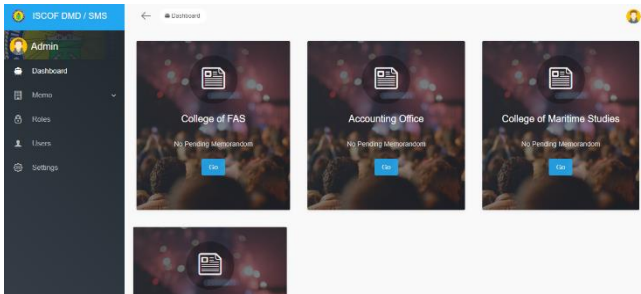


**Figure 3.** The Screen Shot of Login Page

Figure 3, the Login Page allows the users to enter their email and password, once it is correct, the system allows the

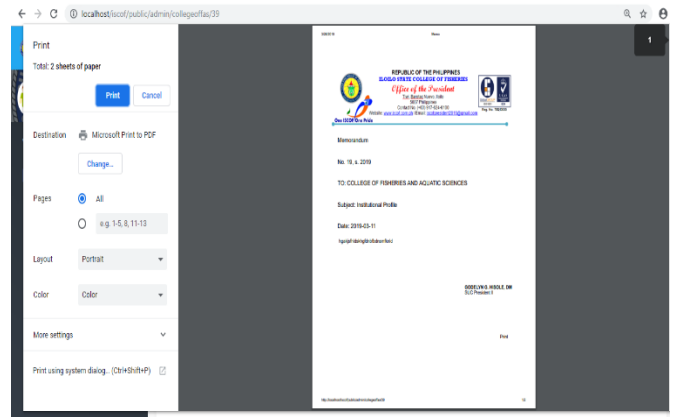


admin, secretary, President, and recipient to manage it depending on their role.



**Figure 4.** The Screenshot of the Admin Page

Figure 4 shows that the Admin has a total control of the system settings. The admin manages memorandum, roles, and users in the system. In managing a memorandum, the admin can select the department for creating a memo and search it first when editing, deleting, and viewing as shown in Figure 4.

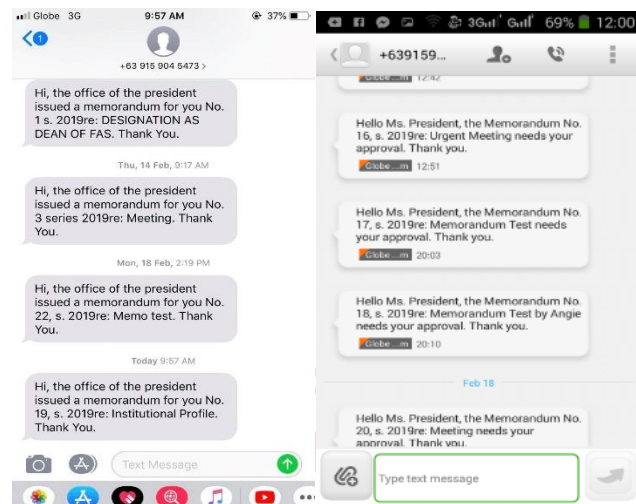


**Figure 7.** The Screenshot of the Memorandum when printed

Figure 7 shows that the system is capable of printing the memorandum. The print command button is provided to execute the printing.

**Table 2.**

Variables	Mean	Description
Functional Suitability	4.48	Excellent
Performance Efficiency	4.48	Excellent
Compatibility	4.47	Excellent
Usability	4.39	Excellent
Reliability	4.3	Excellent
Security	4.32	Excellent
Maintainability	4.3	Excellent
Portability	4.27	Excellent
Effectiveness	4.7	Excellent
Efficiency	4.6	Excellent
Satisfaction	4.75	Excellent
Freedom from Risk	4.7	Excellent
Context Coverage	4.31	Excellent
<b>Mean</b>	<b>4.5</b>	<b>Excellent</b>



**Figure 5 & 6.** The Screenshot of the SMS Notification to the President (for approval) and SMS Notification (for the recipient)

Figure 5 shows an SMS notification received by the College President notifying that a particular memorandum has to be approved. The notification text includes a memorandum number and subject matter.

Figure 6 shows an SMS notification received by the recipient notifying a particular memorandum. The notification text includes a memorandum number and subject matter. The text notification for the recipient was sent by the system as soon as the College President published the memorandum.

Table 2. Software's overall result of evaluation based on its Product Quality and Quality in Use of the Digital Memorandum Distribution with Short Messaging Service (SMS) Notification

The overall results of the evaluation based on product quality and quality in the use of the developed system for the Digital Memorandum Distribution with Short Messaging Services (SMS) Notification shown in the above table has a grand mean of 4.5 which is interpreted as an excellent. The developed system is excellent in its functional suitability, performance efficiency, compatibility, usability, reliability,

security, maintainability, effectiveness, efficiency, satisfaction, freedom from risk, and context coverage.

This result conforms with the study of Aricaya [6] which the main function of the system suits the needs of the user to create a Purchase Request (PR) through the Local Area Network (LAN), track the status of a document through SMS or Internet, generate items with memorandum receipt (MR) to employees through the internet, generate report of items with MR to specific employee/s, and can generate an inventory of MR Items and condemn items report.

The result of the study was the same idea presented in the study of Yi, et. al. [7] on mobile terminals and memo management methods thereof. The result of the system exhibited user-friendliness of the system.

Lastly, the current study and that of Ahn, J. E., [8] revealed that both systems' maintainability was proven to be effective and maintainable because it has undergone several testing procedures.

## V. CONCLUSIONS AND RECOMMENDATIONS

On the bases of the preceding findings, the following conclusions were drawn:

1. The system was able to manage its users and can manage the memorandum by creating, editing, removing, viewing, and printing;
2. The system can send memorandum notification to the recipient on a real-time basis;
3. The system can print reports such as records of the published memo, user data, and copies of the memorandum issued.
4. The developed system/software had complied with the requirements ISO/IEC 25010:2011 in terms of product quality and quality in use with a grand mean of 4.5 which is equivalent to excellent rating; and
5. Experts agreed that the system met the ISO/IEC 25010:2011 in terms of product quality and quality in use

Given the preceding results and conclusions, the following recommendations are hereby suggested:

1. The system, when adopted, the developer may find time to tutor/train the recipient of the program. The program can be of great help specifically in the ease, accessibility, and on-time utilization.
2. The system would be very beneficial to the ISCOF System. This is one of a kind system that would be of great help to the institution.
3. The system is effective, efficient, and user-friendly.

## Acknowledgment:

The researcher would like to express her deep and sincere gratitude to Prof. Aiwa Jane P. Rojo for providing invaluable guidance throughout this research. My profound thanks to Iloilo State College of Fisheries administration, deans and unit heads who patiently answers my questionnaires.

## REFERENCES

- [1] gethppy.com (2019), "Memos relevant anymore" Retrieved on February 22, 2019, at <https://gethppy.com/internal-communication/memos-relevant-anymore>
- [2] Tenhue, 2016. "User Experience: Primary and Secondary Users in Healthcare" Retrieved on January 14, 2019 at <https://medium.theuxblog.com/user-experience-primary-and-secondary-users-in-healthcare-8dd4c5c61490>
- [3] IBM (2015). "Managing User Profiles" Retrieved on February 22, 2019, at [https://www.ibm.com/support/knowledgecenter/no/SSEP7J\\_11.0.0/com.ibm.swg.ba.cognos.ug\\_cra.doc/c\\_use\\_rprofiles.html](https://www.ibm.com/support/knowledgecenter/no/SSEP7J_11.0.0/com.ibm.swg.ba.cognos.ug_cra.doc/c_use_rprofiles.html)
- [4] Clarizen, Inc. (2018). "Introduction to User Types, Roles and Permissions" Retrieved on January 14, 2019, at <https://success.clarizen.com/hc/en-us/articles/206448817-Introduction-to-User-Types-Roles-and-Permissions>
- [5] Olaleye, et al. (2013) Journal of Information Engineering and Applications [www.iiste.org](http://www.iiste.org) ISSN 2224-5782 (print) ISSN 2225-0506 (online) Vol.3, No.10, 2013" SMS-Based Event Notification System" Retrieved on January 15, 2019, at <https://www.iiste.org/Journals/index.php/JIEA/article/viewFile/7637/8056>
- [6] Aricaya (2013) "On-line Document Tracking and Inventory of Supplies and Equipment with Short Messaging Services" (printed)
- [7] Yi, et. al. (2017). U.S. "Mobile terminal and memo management method thereof" Patent No. 9,639,826. Washington, DC: U.S. Patent and Trademark Office. Retrieved on February 22, 2019 at <https://patents.google.com/patent/US9639826B2/en>
- [8] Ahn, J. E.,(2014). "Method for providing a memo function in electronic mail service" U.S. Patent No. 8,725,812. Washington, DC: U.S. Patent and Trademark Office. Retrieved on February 22, 2019, at <https://patents.google.com/patent/US8725812B2/en>.