ILOCOS SUR POLYTECHNIC STATE COLLEGE
Sta. Maria Campus, Sta. Maria, Ilocos Sur

E-PRODUKTO WEB APPLICATION FOR ILOCOS SUR POLYTECHNIC STATE COLLEGE

ADRIEL JOE N. CABO

ANNA MAE T. CAMBE

APPLE MAE T. CAMBE

LAURENCE F. CAMBE

CLIDE JAN C. CAMERO

ILOCOS SUR POLYTECHNIC STATE COLLEGE

COLLEGE OF COMPUTING STUDIES

SANTA MARIA, ILOCOS SUR

BACHELOR OF SCIENCE IN INFORMATION TECHNOLOGY

FEBRUARY 2023

TABLE OF CONTENTS

LIST OF APPENDICES

LIST OF TABLES

LIST OF FIGURES

LIST OF PLATES

Chapter I

INTRODUCTION

Background of the Study

The internet's explosive growth has caused a fundamental change in entrepreneurship, making it possible for it to thrive, either fully or partially, in the virtual world. With the rise of social media platforms and mobile devices, online shopping has become a convenient and widespread activity for people around the world. The ability to purchase goods and services from anywhere at any time has transformed the way we shop and has created a new level of accessibility and convenience (Chandna & Salimath, 2018). The rapid development of electronic commerce (e-commerce) has shown a significant impact on the economy, as it has created new business opportunities in different regions around the globe (Zhang et al., 2019).

Indonesia, Thailand, Singapore, Malaysia, Vietnam, and the Philippines are the six (6) biggest markets located in Southeast Asia—made up the majority of the region's e-commerce sales income, which was over $25 billion in 2019 and was expected to reach over $88.1 billion by 2025 (Hanjaya et al., 2019). The internet has evolved into a platform that marketing companies can use to increase the value of their products and services. The internet and the World Wide Web's spectacular development and diversifying popularity have emerged as a key to encouraging more customers and businesses to make use of the advantages of e-commerce, UNESCAP, and UNCTAD (2021).

The web application design and services offered an upper hand on the e-commerce website which is primarily responsible from the end-perspectives users for the performance of the e-commerce application as stated by (Sreedhar, 2018). In addition

to its economic impact, e-commerce has also changed the way we work and interact with others. Many jobs that were once performed in physical locations are now being done remotely, and the rise of entrepreneurial ventures and online marketplaces has created new opportunities for people to earn income from the comfort of their own homes. E-commerce benefitted both developed and underdeveloped countries (Biagi & Falk, 2017; Lee et al., 2019).

The Philippines, classified as a developing nation, is currently undergoing significant changes in its technological infrastructure, presenting numerous opportunities for Filipinos to enter the exciting realm of technology. (Tudy, 2021). The need for online services is growing steadily, particularly in light of the COVID-19 pandemic. During the lockdown, people learned how to survive because the pandemic altered the way people live. E-commerce websites were launched so that purchasing goods and essential items would be manageable and convenient. Since then, there has been an increase in demand for anyone looking for a means to make the most of e-commerce facilities on the internet (Pastor, 2022).

In 2021, the e-commerce market in the Philippines generated $17 billion in sales, as reported by the International Trade Administration (2022), with 73 million of those customers being engaged online. E-commerce is the widespread application of digital technologies to support various aspects of online business, including sales and transactions. The availability of goods and services around-the-clock, access speed, variety of available goods and services, and ease of accessibility, particularly for business initiatives, are all advantages of e-commerce in entrepreneurial ventures.

Digital platforms are being adopted by more Micro Small Medium Enterprises (MSMEs) to serve their customers. The rise in startups that are facilitating the digital

revolution is causing the growth of the Philippine economy to reach P5 trillion by the year 2030, equivalent to 27% of the country's GDP in 2017. In 2018, micro, small, and medium enterprises (MSMEs) comprised 99.5% of businesses in the Philippines and provided employment to 62% of the labor force, establishing their significance as employers. Moreover, over half of their transactions and commerce were conducted through online platforms. The crucial role of MSMEs in supporting the Philippines' economic growth cannot be understated. Prior to the outbreak of the COVID-19 pandemic, the Southeast Asian region boasted over 70 million MSMEs, which accounted for 99 percent of all enterprises and provided employment to more than 140 million people. Collectively, MSMEs constituted the bulk of economic activity and played a crucial role in promoting entrepreneurship, innovation, and commerce in the larger global society and even local regions. (UNESCAP and UNCTAD 2021).

In the local setting, the city of Alaminos, in the province of Pangasinan, is driving a new enterprise, aimed at establishing the city as the bamboo capital of Pangasinan, is the Hundred Islands Engineered-Kawayan (E-Kawayan) Factory, which produces bamboo items while simultaneously promoting the cultivation of bamboo on a large scale. Their business model involved establishing an e-commerce platform that would convert the factory souvenir shop into a digital store. This was deemed necessary for the enterprise to remain competitive, adapt to technology, and thrive in the market. Additionally, the digitization of the store was a key element of Alaminos City's tourism program. Furthermore, the creation of the digital store aided the city's project to maintain the livelihood of bamboo planters and support the agricultural sector.

In relation to this, the Ilocos Sur Polytechnic State College (ISPSC), a provincial institute of agriculture, has its own goods to market in public, such as eggs, rice,

livestock animals, fruits, and vegetables. These goods are processed manually and as a result, it increases the risk of human error when it comes to product updates and services between admin and customer transactions. The ISPSC, on the other hand, uses the manual procedure of commercial business transactions to promote and distribute agricultural-related products through social media, particularly Facebook under the name "Produkto ti ISPSC," where users could use private messaging to provide comments and inquire about the availability of goods and products, as well as commenting on the administrator's uploaded photos to request the products. The objective of the authors is to tackle these concerns by creating an e-commerce web application that simplifies the process of selling products. However, there is little information available on how e-commerce web applications might help an institution's income generating project. To fill a such gap in the literature and to further understand the concept of the involvement of an e-commerce platform within the institution, this study was conducted to focus on the adoption of e-commerce web applications toward the automated, sustainable, and smooth operation of the Income Generating Project office of Ilocos Sur Polytechnic State College, Santa Maria, Ilocos Sur in marketing different products of the institution, hence the reason for its implementation. To be more precise, it was developed to achieve the following goals: a.) to lessen the workload of the IGP administrator in manual product promotion and to reduce manual errors by automating the order reports of every transaction, and b.) to enable customers to receive better services and shop whenever it is convenient for them because services can be used through online platforms. Additionally, the study can serve as a reference point for MSMEs and IGP offices of other institutions in the consumer-based goods retailing Sector when deciding whether to adopt the E-commerce web platform, particularly for

those who are already preparing to engage in online selling.

Conceptual Framework of the Study

A conceptual framework was a versatile analytical tool with several usages. It was used to arrange concepts and draw mental distinctions. Hence, it served as the visual representation for the study and can be significantly more systematic and logical. It could be utilized to show the relationship between the various variables in the developed E-Produkto Web Application for Ilocos Sur Polytechnic State College.

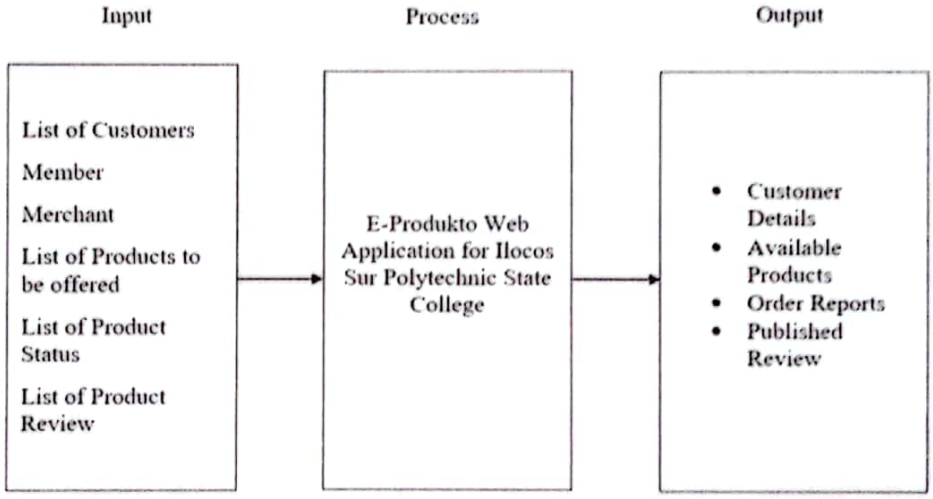

Figure 1. Conceptual Framework of the Study

In the Conceptual Framework, the input was used by identifying the customers on the list as either merchants or members of the E-Produkto store. The product status, reviews, and list of available items served as a means of enhancing the web application's interactive and comprehensive usefulness. Therefore, the process carried out throughout the developed web application's accessibility resulted in being adequately relevant in the context of real-time data processing. The web application comprises a visualization of customer details, available products, order status, and published reviews from the customer's satisfaction rating in order to ensure appealing user

interaction. Generally, the developed web application's concept entails how the workflow should be done properly from the outset to the end output which can be useful for having functionalities that perform well.

Objectives of the Study

This study aimed to develop an e-commerce application for the Ilocos Sur Polytechnic State College that would gather pertinent data regarding the flexibility and productivity of the Income Generating Project Office (IGP).

Especially, this study aimed to achieve the following:

1. To determine the current transaction process of the Income Generating Project Office in terms of:
   a) Product Inventory
   b) Customer Information Sheet
   c) Generated Reports
   d) Payment Methods
2. To identify the feature integrated into the develop system entitled E-Produkto Web Application for Ilocos Sur Polytechnic State College.
3. To evaluate the acceptability of the developed system.

Scope and Limitation of the Study

The developed web application highlighted the features that are intended for customer online purchasing. The application could allow the customers to create accounts and add products to their cart while the administrator can post, see products, and affix prices. Products were categorized to minimize the use of the search button.

The system does not provide online payment options and limits the file size of the uploaded photos by the customer to a 2 MB jpeg file size.

Importance of the Study

The E-Produkto Web Application for Ilocos Sur Polytechnic State College (ISPSC) could be beneficial to the following:

The **Income Generating Program Product Owner** could find it advantageous to utilized the web application as it will facilitate seamless and dependable virtual transactions of the products being advertised and sold. Furthermore, the application's capabilities extend beyond promotion, increasing the profitability of the good and services being offered.

The **Staff** could be administer the web application, to be able to easily monitor, update, and fulfill product requests from customers. The continuous operation of product distribution and order validation facilitated by the application will make the staff's tasks more manageable and less complex.

The **Customer** could utilize the web application to purchase products without any interruption during the ongoing development and enhancement process. In addition, the application could offer a responsive and user-friendly interface design, resulting in an efficient and enjoyable shopping experience.

The **Researchers** could used this as an instrument to broaden their understanding and improve their programming skills, especially in creating new systems using similar development approaches.

The **Future Researchers** could utilized this as a foundation for further research in developing a new system that includes additional features or improvements to the current system.

Chapter 2

METHODOLOGY

This chapter outlines the process followed in gathering the data and doing the analysis that was important to the study. The study research design, software model, population and locale, research instrument, and data analysis tools are all discussed. It also provides information about who the respondents are, and how they were sampled for the research.

Research Design

The researchers used a descriptive-developmental and experimental design to provide and collect the required data upon conducting the study. Which sought to learn more about the status of a phenomenon at a given time. This form of study aimed to produce an accurate profile of circumstances, individuals, or events (Rahi, 2017). The developmental study design could provide a comparison of two separate but related randomized experiments and repeated observations of the same occurrences over time. (Mehran, 2017). In addition to using an experimental study approach, the researchers also used a purposive sample technique where customers can allow to operate and test the developed system and operate to ensure its smooth performance. By all means, the data were unbiasedly collected from the respondents that simply express their experience and ratings throughout the acceptability of the E-Produkto web application for ISPSC through having a complete and deep observation in terms of the security of the customer's account and way of checking out the products within the proposed web application. Hence, this approach served as the way for the analysis, interpretation, and integration of the data within the E-Produkto Web Application for ISPSC. This method benefited the developers of the web application wherein different programming

languages and software packages were applied. Generally, the data flow efficiently works to the point that the optimum user interface was built and incorporated into the web application.

Software Model

The study used Scrum, an iterative procedure that systematically elicits moments of feedback. The scrum methodology aimed to take into consideration that the inherent entire process of developing software would seem to be unpredictable. By approaching development incrementally, reducing overhead for planning, estimating, executing tasks, and establishing continuous communication with the customer (Hron & Obwegeser, 2018). The researchers adopted the Scrum model to develop E-Produkto Web Application for ISPSC. The software and product development process could be managed and controlled using Scrum, an agile and simple framework. The quality of the outcome depends more on people's implicit knowledge than it does on their explicit knowledge of the technology and methods used. In addition, the group served as the aspect of the scrum process to create collaborative ideas from the project team. An iterative and incremental development approach (Sprint) was used to segment the product into individual sections to perform multiple tests that help the project team to apply new design flows, and features, and improve overall functional capabilities. Furthermore, it concentrated on taking small actions sequentially until the product's ultimate aim was attained. As a result, it is advised that the researchers pursue their specific needs within the product development due to the point that scrum development was eventually utilized as the main tool for software development in the industry to have a well-performed process ahead of time. As depicted in Fig. 2. The Scrum process scheme was created, and according to its working methods, research, and development

could carried out through daily scrums, retrospectives, sprint reviews, and consideration of the development of the product backlog and sprint backlog before a release.

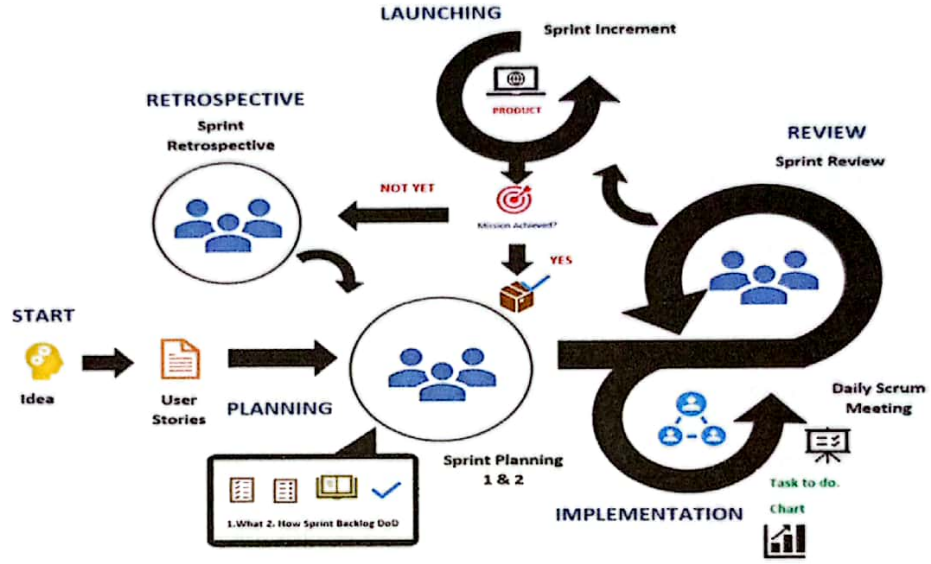

Figure 2. The Scrum Application Development Model

Figure 2 presents the Scrum Application Development Model for managing the development of incremental deliverables. The complicated inadequate processes involved in the development of specific types of technology are managed by the team using this model. It is intended for project teams that divide their work into tasks that may be finished in time-limited iterations known as sprints. Each sprint lasted no more than one month and is often four weeks long that includes five phases to be performed such as start, planning, implementation, review and retrospective, and launching. However, the team sets common goals instead of concentrating on individual tasks that adhere to a set of principles and ideas including teamwork, continuous improvement, high-quality outcomes, and adaptability of the desired project. Generally, scrum represented a collection of gatherings, resources, and classifications that coordinate to support the team in organizing and managing overall work.

This section described the research study was created using the methodology methods and how the development of the prototype was completed by carrying out the stages.

The five phases utilized to implement SCRUM Application Development Model are as follows:

Start. Initiation process was to gather requirements upon conducting the study. The researchers organized a letter with the approval of the campus administrator, and the College of Computing Studies (CCS) Dean to seek permission upon gathering needed data for the study. An interview was conducted with Income Generating Project Office (IGP) director to acquire the necessary information for the proposed web application and to know the current transaction process of the IGP office. Moreover, group discussion was initiated to identify the problems that the office encountered while using its current process. This provided an additional idea for transforming the way of goods and services promotion. Hence, the product requirements serve as part of the specifications that are set by the product owner.

Planning. Under Sprint's specifications, the necessary tasks were identified to create a new version of the product (Increment) of the functional type. During this phase, the researchers utilized the Sprint (Deliverables) to prepare tactical planning of the task. Meetings were held to decide and discuss sets of tasks that the development team is responsible for carrying out. In this stage, approved estimated and user requirements were broken down and compiles into a task list. For this work, sprint counted on the interview of customers who had been fully identified in advance. In line with this, the software's flow has been identified as formulizing the web application's main component using the modern Javascript framework which is React.js for frontend

development while Express.js, Node.js, and MongoDB for the development and Amazon Web Services has been utilized for its cloud hosting.

Implementation. The details of the project plan were executed during the development of the product that is relevant to the produced deliverables and measured performance. The researchers ensure and maintain keep things organized. The tasks were developed according to a sprint chronogram, in which the due dates for each deliverable were established. In addition, the development of the product depends on being well-organized which ensures the project team is in accordance with the consecutive sprints and user history as per suggested by the Income Generating Project Office Director. The team assessed what they had achieved with regards to their sprint goal; identify what they haven't achieved yet; lastly, the hindrances that keep them from achieving their sprint goal.

Review and Retrospective. The testing and analysis of the integrated features were routinely carried out to ensure that the product functioned well. The researchers gathered daily to assess the sprint and identify any issues that could be resolved or improved. To ensure that the goal was achieved and developed normally without issues, the participants in the sessions alternated every day and also examined what went wrong, what went correctly, and what challenges arose that prevented the project from moving forward as intended. Researchers also provided an outlook on what the product owner can expect to come up next.

Launch. The release of the final product through being visualized at a high level of monitoring and controlling process that reflects the aim of the project team. The researchers delivered the integrated features of the web application to identify the accomplished requirements performance of each sprint in terms of overall usability and

acceptability. Followed by being assessed to ensure that all of the operative occurrences within the web application are well-worked and interactive which will be beneficial for the customer's experience. The researchers conducted a dry run using the AWS cloud services to test the proposed system on its cloud environment to anticipate any issues and bugs that may arise.

Project Plan

Table 1 presented the methods and procedures that were used to collect information required to clearly illustrate the status of the development of the E-Produkto Web Application for the Ilocos Sur Polytechnic State College, which could lessen the burden on the managers. It also shows the pattern and time frame for each of the five phases of the Scrum Development Application Model.

	Q3-Q4 (2022) – Q1 (2023)																	
	SEPTEMBER				OCTOBER				NOVEMBER				DECEMBER				JANUARY	
E-PRODUKTO APP.	W 1	W 2	W 3	W 4	W 1	W 2	W 3	W 4	W 1	W 2	W 3	W 4	W 1	W 2	W 3	W 4	W 1	W 2
Start																		
Sprint Planning																		
Implementation																		
Review																		
Retrospective																		
Launching																		

Table 1. The Project Schedule Gantt Chart

Project Assignments

The roles and responsibilities of the project team members within the proposed web application, entitled E-Produkto Web Application for Ilocos Sur Polytechnic State College.

Table 2 shows the role requirements and responsibilities of the members of the team. It was show that each member had different tasks and responsibilities assigned. The project manager was the one who provided the assignments to the member according to their skills and was responsible for the overall management of the project and building cooperative teamwork in the group. The developer was responsible for the analysis and design, the rest of the members are documenters or planners of the team who provides teamwork in the overall development and status of the project and lastly, the testers are responsible for the performance test of the development of the technology that was done in this project.

Roles	Name	Functions
Project Manager	Adriel Joe N. Cabo	Lead Team, report status review of deliverables and assure quality
System Analyst and Designer	Apple Mae T. Cambe Anna Mae T. Cambe	Coordinates the technical team's efforts in resolving challenges and ensuring that solutions are practical and consistent.
Programmer and Developer	Laurence F. Cambe Adriel Joe N. Cabo	Framework Content
QA / Tester	Clide Jan C. Camero Adriel Joe N. Cabo Laurence F. Cambe Apple Mae T. Cambe Anna Mae T. Cambe	Responsible for checking the debugging queries of the project. Test the performance of the project.
Documenter/Technical Writer	Apple Mae T. Cambe Anna Mae T. Cambe Laurence F. Cambe	Design the project performance management

Table 2. The Role Requirements and Responsibility of the Team

Population and Locale of the Study

The researchers utilized purposive sampling that helped them determine the distribution of respondents, which included students, teaching staff, non-teaching staff from the different colleges of Ilocos Sur Polytechnic State College, and customers outside the institution was within the municipality of Santa Maria, Ilocos Sur.

Table 3 presented the distribution of the respondents selected to participate to measure the Level of Acceptability of the proposed Web Application which is composed of 43 respondents, namely 16 students, 12 teaching staff, and 10 non-teaching staff of Ilocos Sur Polytechnic State College Sta. Maria Campus, also coming from 5 outside of the institution.

Respondents	N
Student	16
Faculty Staff	12
Non-Faculty Staff	10
Outside of the Institution	5
TOTAL	43

Table 3. Distribution of Respondents

Research Instruments

The researchers used interviews, documentary analysis, internet and library research, and survey questionnaire to get and analyze pertinent documents as a piece of evidence to support and validate facts presented in this research study. It involves the participation of the students, faculty staff, and non-faculty staff of Ilocos Sur Polytechnic State College Sta. Maria Campus, also coming from outside of the institution.

The WAMMI questionnaire was used as the main evaluation tool. WAMMI uses surveys to assess usability and experience using 20 criteria. By comparing the choices

made when answering the questions to the expectations, WAMMI records and analyzes the satisfaction of respondents (Ismail et. al, 2021). Furthermore, the WAMMI questionnaire was the main data-gathering instrument in conducting the study to determine the acceptability of the prototype within the testing stage of the developed web application regarding the user experience (Hussain, 2022). This also consisted of four factors upon assessing the acceptability of the web application such as ease to use, satisfaction, usefulness, and ease of learning which depend on the interaction of the customers within the web application's interface and functionalities.

Data Analysis

Questionnaires were used as tools for gathering the data. Point value, mean range, descriptive rating, and descriptive interpretation were used to describe the data to assess the acceptability of the proposed E-Produkto Web Application for Ilocos Sur Polytechnic State College.

The descriptive interpretation scale for the developed E-Produkto Web Application for Ilocos Sur Polytechnic State College level of acceptability is shown in Table 8, where the term is frequently used interchangeably with the rating scale. The proponents utilized this scale to categorize the results of the web application acceptability survey.

Point Value	Mean Range	Descriptive Rating	Descriptive Interpretation
5	4.21-5.00	Strongly Agree	Very Highly Acceptable
4	3.41-4.20	Agree	Highly Acceptable
3	2.61-3.40	Neither Agree	Moderately Acceptable
2	1.81-2.60	Disagree	Slightly Acceptable
1	1.00-1.80	Strongly Disagree	Not Acceptable

Table 8. Descriptive Interpretation on the Level of Acceptability of E-Produkto Web Application for Ilocos Sur Polytechnic State College.

A scale from Not Acceptable to Very Highly Acceptable was used to rate the information that was gathered. In terms of interpretation, a mean score of 1.00-1.80 indicates a Strong Disagreement and is interpreted as Not Acceptable, 1.81-2.60 indicates a Disagreement and is interpreted as Slightly Acceptable, 2.61-3.40 indicates a lack of Agreement and is interpreted as Moderately Acceptable, 3.41-4.20 indicates Agreement and is interpreted as Highly Acceptable, and 4.21-5.00 indicates a Strong Agreement and is interpreted as Very Highly Acceptable.

REFERENCES

Journal Article

Ahmad, A., Hussain, A., Flayyih, O. H., Abdulwahab, W., & Sabri, M. I. (2017). Utilizing WAMMI Components to Evaluate the Usability of E-commerce Website. *Journal of Telecommunication, Electronic and Computer Engineering,* 9, 2-11.

Biagi, F., & Falk, M. (2017). The impact of ICT and e-Commerce on employment in Europe. *Journal of Policy Modeling,* 39(1), 1-18.

Chandna, V., & Salimath, M. S. (2018). Peer-to-peer selling in online platforms: A salient business model for virtual entrepreneurship. *Journal of Business Research,* 84, 162-174.

Hanjaya, S. M., Kenny, S. K., & Gunawan, S. S. (2019). Understanding factors influencing consumers online purchase intention via mobile app: Perceived ease of use, perceived usefulness, system quality, information quality, and service quality. *Marketing of Scientific and Research Organizations,* 32(2), 175-205.

Ismail, N. A., Jamaluddin, F. I., Hamidan, A. H., Ali, A. F., Mohamed, S. E., & Said, C. S. (2021). Usability Evaluation of Encyclopedia Websites. *International Journal of Innovative Computing, 11(1)21-25.*

Pastor, C.K.L. (2022). Sentiment analysis on synchronous online delivery of instruction due to extreme community quarantine in the Philippines caused by COVID-19 pandemic. *Asian Journal of Multidisciplinary Studies,* 3(1), pp.1-6, 2020.

Rahi, S., 2017. Research design and methods: A systematic review of research paradigms, sampling issues and instruments development. *International Journal of Economics & Management Sciences,* 6(2), pp.1-5.

Sreedhar, G. (2018). A study on performance of e-Commerce web applications. *Journal of Exploring the Convergence of Big Data and the Internet of Things,* 192-199.

Zhang, S., Pauwels, K., & Peng, C. (2019). The impact of adding online-to-Offline service platform channels on firms' offline and total sales and profits. *Journal of Interactive Marketing,* 47, 115-128.

Journal Article, Internet-only Journal

Camposagrado, C. P., & Palaoag, T. D. (2022). View of e-Commerce adoption towards sustainable bamboo industry in the city of Alaminos, Philippines. *Res Militaris – An Official Journal.* Retrieved February 7, 2023, from https://resmilitaris.net/menu-script/index.php/resmilitaris/article/view/2205/1836

Hron, M., & Obwegeser, N. (2018). *Scrum in practice: An overview of Scrum adaptations.* Proceedings of the 51st Hawaii International Conference on System Sciences. Retrieved October 26, 2022, from https://www.researchgate.net/publication/323379652_Scrum_in_Practice_an_Overview_of_Scrum_Adaptations

Mashalah, H. A., Hassini, E., Gunasekaran, A., & Bhatt M, D. (2022). The impact of digital transformation on supply chains through e-Commerce: Literature review and a conceptual framework. *Transportation Research Part E: Logistics and Transportation Review,* 165, 102837. Retrieved October 27,

2022, from ResearchGate https://www.researchgate.net/publication/362455960_The_impact_of_digital_transformation_on_supply_chains_through_e-commerce_Literature_review_and_a_conceptual_framework

Tudy, R. A. (2021). From the corporate world to freelancing: The phenomenon of working from home in the Philippines. *Community, Work & Family,* 24(1), 77-92. Retrieved February 15, 2023, from Taylor & Francis Online https://www.tandfonline.com/doi/full/10.1080/13668803.2020.1809994

UNESCAP and UNCTAD (2021). *The Role of Competition Policy in Strengthening the Business Environment for MSMEs in the ASEAN Region.* Retrieved February 10, 2023, from Think-Asia https://think-asia.org/handle/11540/14769?fbclid=IwAR2jlVPalf1trxXiovzB5XptdaL6-qlbtnLt10iCo8sROnNJhpg3t9QFtJA

Velasco, D. (2022). *Latest eCommerce Trends in the Philippines*. Retrieved February 9, 2023, from Online Business https://prosperna.com/ecommerce-trends-philippines/

Web Document

Aleksandar, P., Goran, H., Petar, J., & Viktor, S. (2020). *1st international scientific conference "Economic and Business Trends Shaping the Future".* Retrieved February 7, 2023, from Faculty of Economics - Skopje, Ss Cyril and Methodius University. https://repository.ukim.mk/handle/20.500.12188/9682

International Trade Administration, (2022). *Philippines - ecommerce.* Retrieved February 7, 2023, from Trade.gov. https://www.trade.gov/country-commercial-guides/philippines-ecommerce

Lutkevich, B., Chai, W., & Holak, B. (2022). *e-commerce*. Retrieved February 8, 2023, from The evolving CIO role: From IT operator to business strategist. https://www.techtarget.com/searchcio/definition/e-commerce

Mehran, P. (2017). *Development Research.* Retrieved November 25, 2022 from SlideShare. https://www.slideshare.net/parisamehran/developmental-research