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Snnhs E-Kart: Transforming School-Based Income Generation with: A Web-Mobile Online Marketplace

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ABSTRACT
This study examines the development and effectiveness of SNNHS e-Kart, a Web-Mobile Based Online Marketplace designed to enhance school-based entrepreneurial activities at Sto. Niño National High School. The platform facilitates organized transactions, financial tracking, and expanded market reach for the school's Income Generating Projects (IGPs). The study employed a validated questionnaire based on the Technology Acceptance Model (TAM) to assess the system's Perceived Ease of Use, Perceived Usefulness, and Overall Acceptability among students, teachers, IT professionals, and community members. Findings indicate that SNNHS e-Kart is user-friendly, efficient, and widely accepted across all respondent groups, proving its effectiveness as a school-based digital marketplace. The study recommends enhancing payment processes, improving hardware compatibility, and conducting user training to optimize the platform's long-term usability. The results suggest that SNNHS e-Kart can serve as a model for other schools aiming to integrate digital solutions into income-generating initiatives.

Keywords: school-based income generating project, web-mobile, online marketplace

I. INTRODUCTION

The rapid advancement of technology has transformed sectors like education, where digital solutions now enhance efficiency and service delivery. As institutions adapt to modern demands, innovative resource management becomes crucial.

Web-mobile solutions have gained popularity in today's digital landscape. According to Jafton (2022), mobile apps have become essential for tasks once performed in person or via computers. Nguyen et al. (2020) define web-mobile platforms as web-based systems optimized for mobile devices, offering convenient, on-the-go access through browsers or responsive interfaces. These platforms are widely used in e-commerce, education, and services, providing flexible and scalable solutions for diverse users.

As educational institutions adapt to changing dynamics, web-mobile platforms have become essential for providing accessible and efficient services. Moreover, online marketplaces for income-generating projects (IGPs) help optimize resources and enhance financial sustainability. StatAnalytica (2023) defines IGPs as initiatives aimed at generating revenue, including small businesses and service offerings, while Sellberry (2024) highlights how e-commerce enables schools to generate funds through product sales, services, and fundraising. Furthermore, successful implementations, such as the University of California, Berkeley's student-run marketplace (Stokes, 2019), demonstrate the potential of web-mobile technologies to improve

financial outcomes. Consequently, these platforms streamline resource management, expand market reach, and increase revenue, making them vital tools for modern educational institutions.

In the Philippines, the integration of web-mobile e-commerce platform into school-based income-generating projects has proven to be a transformative approach. Laguna State University (LSPU) (2023) and Don Manuel Rivera Memorial Integrated National High School (DMRMINHS)(2023) have pioneered initiatives that not only bolster financial stability but also offer students invaluable hands-on experience in entrepreneurship and project management. However, challenges persist in digital literacy, infrastructure, and security. This is supported by the study of Alampay (2020) that the digital divide limits access to reliable internet, while Pascual (2021) highlighted cybersecurity risks affecting user trust.

Sto. Niño National High School (SNNHS) recognized e-commerce's potential to support income-generating projects and enhance education. These projects, including food sales, crafts, and services, provide students with practical skills while generating revenue. However, challenges such as limited visibility, inefficient processes, and underutilized resources hinder their success. Traditional promotion methods, like Facebook posts and flyers, often fail to reach a broad audience, while manual processes cause delays and tracking issues, as noted by Gartner (2021).

Thus, the researcher developed SNNHS e-Kart, a web-mobile marketplace designed to expand audience reach, streamline processes, promote local products, foster entrepreneurship, and increase revenue within the school community.

II. METHODOLOGY

This chapter describes and discusses how the materials and methods were used by the researcher in the entire study.

"SNNHS-EKART: TRANSFORMING SCHOOL-BASED INCOME GENERATION WITH A WEB-MOBILE ONLINE MARKETPLACE" outlined the approach taken to develop, implement, and assess the effectiveness of the proposed platform. The study employed a combination of **system development methodology** and **evaluation research** to ensure a systematic and effective development process and to evaluate the platform's impact.

Materials:

Table 1. The following are the software specifications for Mobile

Item/s	Quantity	Description/Specification
1. Operating System	1 package	Android 10.0 and up
2. IDE	1 package	Visual Studio II
3. Design and UI Language	1 package	React JS, Jaava Script, Tailwind CSS
4. Programming Language	1 package	PHP, Laravel

Table 1 specifies the requirements for developing mobile applications it was anchored on several key software components. The utilized Operating System was an Android 10.0 and up, ensuring compatibility with modern applications and functionalities. To facilitate the coding and development process, Visual Studio II was employed as the Integrated Development Environment (IDE). The design and user interface were crafted using React JS, Java Script, and Tailwind CSS which provided a robust language for creating intuitive and visually appealing interfaces. Finally, Java served as the primary programming language, offering a stable and versatile foundation for the system's development.

Table 2. The following are the software specifications for Web Server

Item/s	Quantity	Description/Specification
1. Database Design	1 package	MySQL
2. Operating System	1 package	Windows 10 and up
3. Programming Language	1 package	PHP, Laravel
4. Browser Version	1 package	Google Chrome, Mozilla Firefox, Microsoft Edge
1. Hosting	1 subscription	Hostinger

Table 2 presents the items needed for the development of the web server, several key software components were employed to ensure robust functionality and compatibility. The database design handled using MySQL, chosen for its reliability and efficiency in managing and storing data. The server's operating system was Windows 10 and up, providing a stable platform compatible with a broad range of applications and functionalities. PHP and Laravel were utilized as the primary programming language for server-side scripting, offering a versatile and robust foundation. Finally, the system was supported various browser versions, including Google Chrome, Mozilla Firefox, and Microsoft Edge, ensuring broad compatibility and accessibility for users. These components worked together to create a seamless and efficient web server environment.

Table 3. The following are the Hardware Specifications

Item/s	Quantity	Description/Specification
1. Complete set of computer ○ HDD 1TB ○ SDRAM 8GB ○ Monitor ○ Mother Board ○ Mouse ○ Power Supply ○ Keyboard	1 unit	11th Gen Intel Core i5 Windows 10 Home 20” widescreen flat-panel display Built-in or external trackpad
2. Laptop	1 unit	Intel(R) Core (TM) i7-1065G7 CPU @1.30GHz 1.50 GHz, 8.00 GB (7.77 GB usable)
3. Printer	1 unit	Epson L360
4. Internet subscription	1 unit	PLDT Home

A complete set of computer with 11th Gen Intel Core i7 Windows 10 Home 20” widescreen flat-panel displayed built-in or external trackpad, and a laptop with Intel(R) Core (TM) i7-1065G7 CPU @1.30GHz 1.50 GHz, 8.00 GB (7.77 GB usable) were used for the execution, computation, and processing of the developed system.

Table 3 shows the minimum hardware requirements needed to run the system. A complete set of a computer such as a monitor, standard motherboard and graphics card, processor with the capacity of Intel Pentium G5400, Memory of 4gigabyte with storage of 500 gigabyte, a printer, mouse and keyboard. The hardware specification offered a thorough breakdown of the structural elements and technological

requirements of a specific item or system. It acted as a thorough reference for comprehending the hardware's capabilities, features, and performance traits. Therefore, it was recommended that the hardware components meet the minimum requirement for the software to function optimally. Higher hardware specifications typically resulted in faster performance.

Methods Development Process

The Agile Methodology was applied in the development of the system. "Agile Software Development with Scrum" by Schwaber and Beedle (2001) underscored the iterative planning process in Agile methodology, highlighting the value of incorporating user feedback in each iteration. The concept of this method was to deliver output incrementally by incorporating user requirements and feedbacks in each iteration.

The researcher utilized this method to reduce the overall risk associated with software development. In agile method, the software was developed incrementally. In this method, the researcher work iteratively; thus, it helped managed the work more efficiently and effectively within the time and budget constraints. Activities under this model included the following:

Plan- the project goals, scope, and requirements were clearly defined to ensure a structured approach to the development of the web-mobile platform. This phase involved identifying the specific needs of Sto. Niño National High School's income-generating projects and determining the key functionalities the platform should be offered. The timeline, resources, and budget were also established, along with risk assessments to anticipate potential challenges. Stakeholders engaged early on to gather their input, which will help guide the subsequent phases of design and development.

Design - the focus was on creating the overall structure and user interface of the web-mobile platform. This was included developing wireframes and prototypes to visualize how the system functioned and how users interacted with it. Key elements such as navigation flow, layout, and design aesthetics were carefully planned to ensure the platform was user-friendly and intuitive. Feedback from stakeholders were also be gathered during this phase to refine the design and to align it with user needs and expectations.

Build - the development team focused on coding and integrating the functionalities of the web-mobile platform. This involved translating the design specifications into actual software components, ensuring that each feature aligned with the requirements was outlined during the planning phase. The team utilized programming languages, frameworks, and tools to create the system’s architecture, including front-end and back-end development. Throughout this phase, continuous collaboration and communication with stakeholders were maintained to address any emerging issues and incorporate feedback. Regular updates and demonstrations were conducted to keep stakeholders informed of progress and to validate that the development was on track. Rigorous testing was also initiated concurrently to identify and to resolve any bugs or performance issues before moving to the next phase. This iterative approach ensured that the platform was built efficiently and effectively, meeting the project's objectives.

Testing- the focus shifted to evaluating the functionality, performance, and usability of the web-mobile platform. Each feature of the platform tested to ensure it works as intended and met the requirements specified in the planning phase. This included checking for errors in coding and validating that all functionalities, such as user registration, product listings, and payment processing, operated smoothly. Real users, including students, teachers, and other stakeholders, were invited to interact with the platform. Their feedback on navigation, interface design, and overall user experience were collected to identify any areas needing improvement. The platform was evaluated under various conditions to assess its speed,

responsiveness, and stability. This included testing how the system handled multiple users simultaneously and ensured it could manage the expected volume of transactions without performance degradation. Since the platform involved handling sensitive information, security measures were rigorously tested. This included checking for vulnerabilities that could expose user data or compromise the system. Any issues discovered during testing were documented and prioritized for resolution. The development team worked to fix bugs, enhanced performance, and make necessary adjustments based on user feedback.

Review - the focused on assessing the overall performance and effectiveness of the web-mobile platform prior to its final deployment. Internal stakeholders, including students, teachers, and external stakeholders such as parents, and community members, invited to provide feedback based on their experience with the platform during the testing phase. Their insights were crucial in identifying any remaining issues or areas for improvement. The team conducted a comprehensive evaluation of all platform features to ensure they aligned with the original requirements and objectives. This included verifying that all functionalities were working correctly and that the platform was user-friendly. The usability of the platform was critically examined, focusing on how intuitive and accessible the interface was for different users. This involved analyzing user navigation patterns and overall satisfaction levels. All documentation related to the development process, including user manuals and technical specifications reviewed to ensure accuracy and completeness. This was be vital for training users and maintaining the system in the future. Based on the feedback and evaluations, final adjustments and enhancements were made to the platform. This was included minor tweaks to the design, additional features, or bug fixed identified problems during the review process. A presentation was organized to showcase the platform to stakeholders, highlighting its features and benefits. This an opportunity to demonstrate how the platform would enhance the management of school-based income-generating projects. After ensuring that all feedback have been addressed and the platform met all requirements, the final approval for launch was obtained from key stakeholders, including school administrators. The review phase was crucial in ensuring that the web-mobile platform was fully prepared for deployment, with a focus on maximizing its effectiveness and user satisfaction, thus supporting the goals of Sto. Niño National High School's income-generating initiatives.

Figure 4. Agile Methodology

Sprint 1

Objective: Set-up the foundation for the system and implement e-commerce basic functionalities.

This initial phase focused on *planning* a solid foundation upon which further development can be built. In *designing*, overall system architecture was considered ensuring that the framework supports both web and mobile interfaces. The necessity of meticulous planning and architectural design was highlighted in numerous software engineering textbooks. For instance, Ian Sommerville's "Software Engineering" (2015) underscored the importance of defining project goals, scope, and requirements to create a solid foundation. Following the architectural design built the database, which served as the backbone of the system. This involved creating and configuring the database to securely store user information, product details, and transaction records. With the database in place, the next step tested user authentication, allowing users to register and log in securely. This initial interface provided a user-friendly experience, allowing users to interact with the platform. This was a critical functionality, ensured that only authorized users accessed and interacted with the platform. This was supported by the study of by Gamma et al. (1994) "Design Patterns: Elements of Reusable Object-Oriented Software" offered valuable insights into developing scalable and maintainable system architectures that effectively supported both web and mobile interfaces.

Project Schedule of the Study

Table 4 . Gantt Chart

	Activities	Sept	Oct	Nov		Dec	Jan	Feb	Mar	Apr	May	Jun
1.	Planning											
2.	Designing											
3.	Coding											
4.	Outline Defense											
5.	Testing											
6.	Final Defense											
7.	Final adjustment											

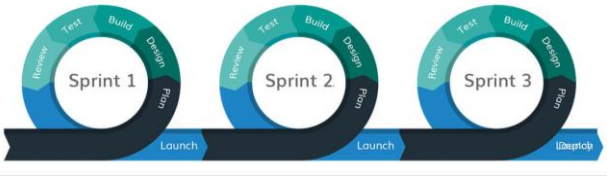

Table 3 presents the scheduled activities of the study, the tasks that were completed, and the corresponding months in which they were carried out.

Sprint 2:

Objective: Implement advanced features and workflows for efficient e-commerce transaction.

Sprint 2 focused on enhancing the platform with advanced functionalities and optimized workflows to ensure smooth and efficient e-commerce transactions. Karl E. played a significant role in the designing phase. The book *"Design Patterns: Elements of Reusable Object-Oriented Software"* by Gamma et al. (1994) provided insights into creating scalable and maintainable system architectures. Additionally, Norman's *"The Design of Everyday Things"* (2013) emphasized user-centered design and prototypes to ensure system intuitiveness and user expectations are met.

In the **planning phase**, specific requirements for advanced features, such as improved search functionalities, a streamlined checkout process, inventory management, and enhanced security measures, gathered and documented. During the **designing phase**, a detailed architecture was developed to outline the integration of new features and workflows into the existing platform. Prototypes focused on user experience and interface design enhancements, incorporating feedback from stakeholders. The **building phase** involved coding the new features and workflows, ensuring they aligned with the planned architecture. Martin's *"Clean Code: A Handbook of Agile Software Craftsmanship"* (2008) emphasized the importance of writing clean, maintainable code. In the **testing phase**, each feature was verified to ensure it operated as intended and met specified requirements. The platform's speed, responsiveness, and stability under various conditions were assessed, and security measures were checked for robustness. Real users were engaged to interact with the platform, providing feedback on navigation, interface design, and overall experience. During the **reviewing phase**, insights from users and stakeholders based on their experience during testing was gathered. Necessary tweaks and improvements were implemented based on collected feedback. This aligned with Paul Clements et al.'s *"Documenting Software Architectures: Views*

and Beyond" (2010), which underscored the importance of comprehensive documentation for system maintenance. Lastly, in the **launching phase**, the new features of the platform were demonstrated and made accessible to all users. Ries's *"The Lean Startup: How Today's Entrepreneurs Use Continuous Innovation to Create Radically Successful Businesses"* (2011) stressed the value of engaging real users for feedback in product development.

Sprint 3:

Objective: Enhance the system's performance on e-commerce, completing the final sprint of system development.

In planning phase, the researcher established specific targets like load times, transaction speeds, and system responsiveness is critical for performance optimization. According to Sommerville's "Software Engineering" (10th Edition, 2015), setting clear performance metrics is a fundamental aspect of project planning and helped in benchmarking and achieving desired performance outcomes. In designing, refining the system architecture to optimize performance and streamline user interaction was supported by Gamma et al.'s "Design Patterns: Elements of Reusable Object-Oriented Software" (1994), which emphasized creating scalable and maintainable architectures. Planning for system scalability was also crucial as noted by Bass, Clements, and Kazman in "Software Architecture in Practice" (3rd Edition, 2012), which discussed the importance of designing systems that can handle increased loads and evolving requirements. In building, refactor and optimize the codebase for enhanced speed and efficiency aligned with Martin's "Clean Code: A Handbook of Agile Software Craftsmanship" (2008), which advocated for writing clean, maintainable, and efficient code. This phase also improved caching mechanisms to reduce server load and improved response times, and optimized database queries and structures to enhance data retrieval speeds and to reduce latency. In reviewing, incorporate feedback from stakeholders and made necessary adjustments, ensured all changes aligned with performance goals and user requirements and update all documentation to reflect changes made during the sprint.

The Sprint 3 of system development ensured full integration and completion of e-commerce functionalities. This included implementing payment gateways, refining the user interface for ease of use, and ensuring smooth navigation for product management and transactions. Additionally, Sprint 3 focused on system testing to address any usability issues, confirming secure transactions, and enhancing the user experience. The sprint was designed to deliver a polished, fully functional platform that aligned with user expectations and met marketplace requirements comprehensively.

III. RESULTS AND DISCUSSION

This chapter presents the results, interpretation, and analysis of the data collected during the study. The findings were displayed in the following tables, accompanied by corresponding discussions and explanations. This chapter also addresses the specific research questions outlined in earlier chapters.

Results of Evaluation of e-Kart Special Features

System features are essential components that enhanced usability and functionality, offering tools like real-time collaboration and seamless integration. According to Borisyuk et al. (2025), creative feature design ensures practicality and transformative influence while improving system performance and user experience.

The results show in Table 6 that all 18 special features of the EKART System were visible and rated 100% in frequency and percentage by students, teachers, IT professionals, and community members. These

features included intuitive navigation, responsive design, convenient GCash payments, efficient inventory management, and secure checkout. Additionally, features like customizable profiles, wishlists, order tracking, and customer support chat were also highly valued, ensuring enhanced user experience and functionality.

Table 6. Results of the Evaluation of Special Features of SNNHS e-Kart by taking the Frequency and Percentage

Descriptive Statistics			
e-Kart Special Features	n	Frequency	Percentage
1.Intuitive design with easy-to-use navigation	120	120	100%
2.Responsive design adaptable to different devices and screen sizes	120	120	100%
3.Convenient online payment through Gcash	120	120	100%
4.Efficient product inventory system	120	120	100%
5.Ability to leave reviews and ratings for products and sellers	120	120	100%
6. Customizable user profiles	120	120	100%
7. Wishlist and save for later features	120	120	100%
8. Real-time order tracking	120	120	100%
9. Secure checkout process	120	120	100%
10. Detailed product information and reviews	120	120	100%
11. Advanced search functionality	120	120	100%
12. Bulk order management	120	120	100%
13. Detailed analytics and reporting for sellers	120	120	100%
14. Customer support chat feature	120	120	100%
15. Scheduled delivery options	120	120	100%
16. Order history and reorder features	120	120	100%
17. Product videos	120	120	100%
18. Flash sales and limited-time offers	120	120	100%

The evaluation results in Table 6 indicate that all respondents unanimously rated the special features of the SNNHS e-Kart as fully functional and beneficial, with each feature receiving a 100% positive response. This suggests that the system's Intuitive design with easy-to-use navigation, responsive design adaptable to different devices and screen sizes,convenient online payment through Gcash, .efficient product inventory system, .ability to leave reviews and ratings for products and sellers, customizable user profiles, wishlist and save for later features, real-time order tracking, Secure checkout process, detailed product information and reviews, advanced search functionality, bulk order management, detailed analytics and reporting for sellers, customer support chat feature, scheduled delivery options, order history and reorder features, product videos, and Flash sales and limited-time offers were accessible to students, teachers, and IT Professionals and external stakeholders including parents, alumni, and community members during the time they used the system. .

The evaluation results of the SNNHS e-Kart aligned with findings by PYMNTS (2024), Ghosh (2025),

and Smith (2024), which hig-hlight that platforms with intuitive, feature-rich designs effectively attract and retain users.

Results of Evaluation of SNNHS e-Kart's Interface, Accuracy, Navigation, and Design

Results of Evaluation of SNNHS e-Kart's Interface

A system interface is the point of interaction where users and the system communicate, enabling data exchange and functionality

Table 7. Results of Evaluation of e-Kart's Interface

Indicator	M	SD	Interpretation
1.The e-Kart System has an intuitive and easy to use interface.	4.7	0.45	Strongly Agree
2. The e-Kart System has an attractive and visually appealing design of interface	4.7	0.47	Strongly Agree
3. The e-Kart System has a consistent design and layout across the different sections and pages.	4.8	0.42	Strongly Agree
4.The e-Kart System has an interface that is easy to read and understand text, labels and instructions.	4.8	0.43	Strongly Agree
5.The e-Kart System has a responsive interface when interacting with different devices and screen sizes.	4.9	0.28	Strongly Agree

The evaluation findings for the interface of the EKART System were shown in the Table 7 above. The e-Kart System has an intuitive and easy to use interface, obtaining an average mean of 4.7 and a standard deviation of 0.45, which is interpreted as "Strongly Agree". Similarly, its **attractive and visually appealing design** achieved an average mean of **4.7** and a standard deviation of **0.47**, also rated as **"Strongly Agree"**. Moreover, the system maintained a **consistent design and layout** across different sections, scoring an average mean of **4.8 and a standard deviation of 0.42,** while the **clarity of text, labels, and instructions** received an average mean of **4.8** and a standard deviation of **0.43, both are interpreted as "Strongly Agree".** Lastly, the **system's responsiveness across different devices and screen sizes** earned the highest rating, with an average mean of **4.9** and a standard deviation of **0.28, interpreted as "Strongly Agree".**

The positive evaluation of the e-Kart system's interface aligns with Golden Flitch (2025), who emphasized that a well-designed UI enhances navigation and product browsing. Similarly, Nielsen (2020) highlighted that an effective interface bridges users and digital platforms, improving overall user experience.

Results of Evaluation of SNNHS e-Kart's Accuracy

Gupta and Sharma (2021) define system accuracy as a system's ability to perform tasks reliably with minimal errors, ensuring efficiency and user satisfaction. In e-commerce, accuracy is vital for inventory, orders, and transactions, directly impacting trust and performance.

Table 8 below presents the evaluation of SNNHS e-Kart's system accuracy. Product descriptions and price postings were rated highly, both achieving a mean of 4.9 with minimal standard deviations (0.24 and 0.25, respectively), both interpreted as "Strongly Agree". Inventory accuracy received a perfect mean score of 5.0 with zero deviation, interpreted as "Strongly Agree". Similarly, user reviews and ratings were deemed

accurate and reliable, scoring a mean of 4.9 with a 0.25 standard deviation and interpreted as "Strong Agree". Lastly, seller profiles and contact information also achieved a perfect 5.0 mean with a 0.13 standard deviation, interpreted as "Strong Agree".

The evaluation results highlight strong user approval of SNNHS e-Kart's system accuracy. All indicators received high ratings, with product descriptions, pricing, and user reviews achieving a mean score of 4.9, while inventory accuracy and seller profile details earned a perfect 5.0. The low standard deviations further confirm the system's reliability, reinforcing user confidence in its accuracy and transparency. These findings align with studies by Gupta et al. (2023), emphasizing that accurate information boosts consumer trust, enhances satisfaction, and improves purchasing decisions.

Table 8. Results of Evaluation of e-Kart's Accuracy

Indicator	M	SD	Interpretation
1.The EKART System has an accurate product descriptions that are provided by sellers.	4.9	0.24	Strongly Agree
2.The EKART System has an accurate prices posted.	4.9	0.25	Strongly Agree
3.The EKART System has an appropriate information regarding the availability of products on stock.	5.0	0.00	Strongly Agree
4.The EKART System has an accurate and reliable reviews and ratings provided by the users.	4.9	0.25	Strongly Agree
5.The EKART System display an accurate seller profiles and contact information.	5.0	0.13	Strongly Agree

Results of Evaluation of SNNHS e-Kart's Navigation

System navigation refers to the ease with which users move through a platform, access features, and complete tasks efficiently (Nielsen, 2020).

Table 9. Results of Evaluation of e-Kart's Navigation

Indicator	M	SD	Interpretation
1. I can navigate freely around the EKART system windows.	4.9	0.25	Strongly Agree
2.The EKART System has a well-organized and the menus and other categories are logically structured.	4.9	0.32	Strongly Agree
3.The EKART System has an effective search functions, thus, users can find every function/s quickly.	5.0	0.00	Strongly Agree
4.The EKART System has a useful filter and sorting options.	5.0	0.16	Strongly Agree
5.The EKART System has a responsive and functional interactive elements such as buttons, links, forms, etc.	4.9	0.26	Strongly Agree

Table 9 above presents about the evaluation results of e-Kart's Navigation. Freely navigation around the e-Kart system window gained an average mean of 4.9 and a standard deviation of 0.25, interpreted as "Strongly Agree". Likewise, logically organization of menus and other categories rated with mean average of 4.9 and a standard deviation of 0.32, interpreted as "Strongly Agree". e-Kart effective search functions obtained a perfect 5.0 mean average and zero standard deviation, interpreted as "Strongly Agree". Additionally, the filtering and sorting feature of e-Kart received an average mean of 5.0 and standard deviation of 0.16, interpreted as "Strongly Agree". Lastly, e-Kart responsive and functional interactive elements such as buttons, links, forms, etc. obtained an average mean of 4.9 and standard deviation of 0.26, interpreted as "Strongly Agree".

The e-Kart System achieved a perfect average mean of 5.0 for its effective search functions and useful filter and sort features, while other navigation indicators received a mean score of 4.9. This led to highly positive feedback, with users finding it easy to navigate. Nielsen (2020) supports this, stating that a well-designed navigation system enhances user experience.

Results of Evaluation of SNNHS e-Kart's Design

E-commerce design creates visually appealing, user-friendly, and functional digital storefronts to enhance the shopping experience.

Table 10 below presented the evaluation results of the e-Kart System's design. Users strongly agreed that e-Kart has a visually appealing interface, with an average mean of 4.9 and a standard deviation of 0.25. Its consistent layout, colors, and style across the platform also received a mean of 4.9 and a standard deviation of 0.3. Additionally, the system's minimalist design and consistency in features achieved perfect mean scores of 5.0, with standard deviations of 0 and 0.16, respectively. Lastly, e-Kart's user-friendly and intuitive arrangement of features received a mean of 4.9 and a standard deviation of 0.26.

The evaluation results of e-Kart system complement the findings of Chaffey and Ellis-Chadwick (2019), who emphasize that effective e-commerce design combines aesthetics, usability, and technology to enhance customer interaction and improve business performance.

Table 10. Results of Evaluation of e-Kart's Design

Indicator	M	SD	Interpretation
1. The EKART System has a visually appealing design that enhances my browsing experience.	4.9	0.25	Strongly Agree
2.The EKART System has a consistent design on layout, colors, and style across the whole website.	4.9	0.32	Strongly Agree
3.The EKART System has a minimalistic design that makes me navigate and find the button and functions easily.	5.0	0.00	Strongly Agree
4.The EKART System has a consistent features with no technical issues.	5.0	0.16	Strongly Agree
5.The EKART System has features that are well-arranged and the elements are user-friendly and intuitive.	4.9	0.26	Strongly Agree

Perceived Ease of Use of SNNHS e-Kart as Web-Mobile Online Marketplace

Perceived ease of use, according to Davis (1989), is the degree to which a user thinks a system or technology is simple to use and takes little effort to learn. Perceived convenience of use has a significant

impact on user engagement and platform usage in the context of e-commerce.

Table 11 below shows the results of the evaluation of perceived ease of use of e-Kart. The users found that navigating the e-Kart was easy to understand, with a perfect mean of 5.0 and a standard deviation of 0.16, interpreted as "Strongly Agree". Likewise, searching products, placing orders, and managing product listings easily and simply were rated a perfect mean score of 5.0 and 0 standard deviation, interpreted as "Strongly Agree". The clarity of information received a perfect **5.0** with standard deviation of 0.22, interpreted as "Strongly Agree", while instructions provided were rated **4.9 and** standard deviation of 0.24, also interpreted as "Strongly Agree". Additionally, users experienced seamless error recovery, scoring **5.0** and 0 standard deviation, interpreted as "Strongly Agree".

Table 11. Perceived Ease of Use of SNNHS e-Kart

Indicator	M	SD	Interpretation
1.I can navigate easily around the EKART System environment.	5.0	0.16	Strongly Agree
2.I can search products, place orders, and manage product listing easily and simply.	5.0	0.00	Strongly Agree
3.I can understand the information on the EKART System clearly and easily.	5.0	0.22	Strongly Agree
4.I can understand the instructions on the EKART System clearly.	4.9	0.24	Strongly Agree
5.I can easily recover from errors while using the EKART system.	5.0	0.00	Strongly Agree

The strong user approval of the e-Kart System's ease of use aligns with studies such as Cogent Business & Management (2024), which highlights that perceived ease of use influences technology acceptance. Similarly, the European Proceedings of Finance and Economics (2023) found a positive link between ease of use and online purchasing intentions.

Perceived Usefulness of SNNHS e-Kart as Web-Mobile Online Marketplace

Davis (1989) defined **Perceived Usefulness (PU)** as the extent to which a user believes a system enhances performance or delivers desired results.

Table 12. Perceived Usefulness of SNNHS e-Kart

Indicator	M	SD	Interpretation
1. The EKART System has the ability to reach a broader audience or clientele.	5.0	0.13	Strongly Agree
2. The EKART System can effectively help boost sales/revenue.	4.9	0.24	Strongly Agree
3. The EKART System can effectively helps users achieve its shopping and transaction goals.	5.0	0.22	Strongly Agree
4. The EKART System streamlines order management processes, allowing users to track and manage their orders seamlessly.	5.0	0.16	Strongly Agree

5. The EKART System is capable of generating report analysis to facilitate the easy understanding and interpretation of sales and transactions.	5.0	0.13	Strongly Agree

Table 12 presents the evaluation results of **perceived usefulness** for the e-Kart System. Users strongly agreed that e-Kart effectively reaches a wider audience, achieving a perfect mean score of **5.0** with a **0.13** standard deviation. It also helps boost sales and revenue for sellers, receiving a **4.9** mean and **0.24** standard deviation. Additionally, users found the system useful in achieving their shopping and transaction goals, managing and tracking orders, and generating reports for sellers, all earning **5.0** mean scores with standard deviations of **0.22, 0.16, and 0.13**, respectively.

Based on the evaluation results, **e-Kart** received strong user approval for **perceived usefulness**, with most indicators scoring **5.0, interpreted as "Strongly Agree"**. Users found it effective across all aspects, reinforcing its **positive impact on user experience and business growth**.

Overall Acceptability of SNNHS e-Kart as Web-Mobile Online Marketplace

Overall acceptability reflects users' confidence in a system's effectiveness, usability, and satisfaction. According to **Nielsen (1993)** and **Davis (1989)** that highly accepted systems build trust, enhance user adoption, and drive long-term success.

Table 13. Overall Acceptability of Use of SNNHS e-Kart

Indicator	M	SD	Interpretation
1. I can easily use the EKART system and answer all my needs.	5.0	0.00	Strongly Agree
2. I am satisfied with EKART's performance.	5.0	0.00	Strongly Agree
3. I am satisfied with EKART system performance.	5.0	0.09	Strongly Agree
4. I will recommend this EKART system to other organizations, institutions, etc.	4.9	0.24	Strongly Agree
5. I am satisfied with the customer support provided by the EKART system.	4.9	0.22	Strongly Agree

Table 13 presents the evaluation results of e-Kart's overall acceptability. Users found their shopping needs were available on the e-Kart and satisfied with the performance of the e-Kart rated as perfect mean score of 5.0 and 0 standard deviation, both interpreted as "Strongly Agree". Likewise, e-Kart system performance achieved a perfect mean score of 5.0 and standard deviation of 0.09, also interpreted as "Strongly Agree". Recommendation to use e-Kart to other organizations, institutions, etc., obtained an average mean score of 4.9, and standard deviation of 0.24, interpreted as "Strongly Agree". Finally, user satisfaction on the customer support by the e-Kart was rated an average mean of 4.9, and a standard deviation of 0.22, also interpreted as "Strongly Agree".

The strong user approval of e-Kart's overall acceptability aligns with Lemon et al. (2024) and Mamakou et al. (2024), who found that usability, service quality, and user experience significantly enhance customer satisfaction in digital platforms.

Results of the Difference Between Groups and Within Groups of Students, Teachers, IT Professionals and Community Members in terms of the Interface, Accuracy, Navigation, and Design of SNNHS e-Kart

One-way Analysis of Variance (ANOVA) is commonly used to compare the means of three or more independent groups to identify significant differences in their responses. If the p-value is less than the chosen significance level of 0.05, it indicates a statistically significant difference among the groups (Field, 2018).

Table 14. Results of the Difference Between Groups and Within Groups of Students, Teachers, IT Professionals and Community Members in terms of the Interface, Accuracy, Navigation, and Design of SNNHS e-Kart

Factors		Sum of Squares	df	Sum of Squares	F	p-val	Decision	Interpretation
Interface	Between Groups	0.995	3	0.332			Reject null hypothesis	There is a significant difference
	Within Groups	7.708	115	0.067	4.947	0.003		
	Total	8.703	118					
Accuracy	Between Groups	0.001	3	0.000			Do not reject null hypothesis.	There is no significant difference
	Within Groups	1.429	115	0.012	0.024	0.995		
	Total	1.430	118					
Navigation	Between Groups	0.046	3	0.015			Do not reject null hypothesis.	There is no significant difference
	Within Groups	2.525	115	0.022	0.703	0.552		
	Total	2.571	118					
Design	Between Groups	0.145	3	0.048			Do not reject null hypothesis.	There is no significant difference
	Within Groups	6.798	115	0.059	0.817	0.487		
	Total	6.943	118					

Table 14 presents the evaluation results of the Difference Between Groups and Within Groups of Students, Teachers, IT Professionals and Community Members in terms of the Interface, Accuracy, Navigation, and Design of SNNHS e-Kart. The results have shown a significant difference in perceptions of the system's interface among the groups ($F = 4.947$, $p = 0.003$). Since the p-value is less than 0.05, the null hypothesis is rejected. It can, therefore, be interpreted that "There is a significant difference" This indicated that the groups had varying experiences or opinions about the interface.

The analysis indicated no significant difference in perceptions of the system's accuracy ($F = 0.024$, $p = 0.995$). With a p-value greater than 0.05, the null hypothesis is not rejected. This suggested that respondents shared similar views regarding the system's ability to provide accurate information.

The results revealed no significant difference in navigation perceptions among the groups (F = 0.703, p = 0.552). The null hypothesis was not rejected, indicating that all groups found the navigation system consistent and effective.

The findings demonstrated no significant difference in design perceptions (F = 0.817, p = 0.487). As the p-value was above 0.05, the null hypothesis was not rejected. This suggests that the system's design was perceived similarly by all respondent groups.

One-way ANOVA was used to test the difference in ratings among students, teachers, IT professionals, and community members regarding the system's interface, accuracy, design, and navigation. The statistical analysis was conducted at a significance level of 0.05. Results showed that ratings for accuracy, navigation, and design were comparable across all groups, indicating no significant difference. However, for the system's interface, the test indicated a significant difference with F value (3,115) = 4.947, p value of .003 among students, teachers, IT professionals, and community members.

The **Games-Howell post-hoc test** identified that **IT Professionals** rated the interface significantly lower than both **Students** (mean difference = **-0.22000**, p = **0.006**) and **Teachers** (mean difference = **-0.17333**, p = **0.039**). No significant differences were observed between **Community Members** and other groups. These findings suggest that **IT Professionals** had distinct perceptions of the system's interface compared to Students and Teachers.

Results of the Difference Between Groups and Within Groups of Students, Teachers, IT Professionals and Community Members in terms of Perceived of Ease of Use, Perceived Usefulness, and Overall Acceptability of e-Kart

To determine if there is a significant difference among respondents—students, teachers, IT professionals, and external stakeholders (parents, alumni, and community members)—regarding their Perceived Ease of Use, Perceived Usefulness, and Overall Acceptability of e-Kart, a one-way ANOVA was conducted at a significance level of 0.05.

Table 15. Results of the Difference Between Groups and Within Groups of Students, Teachers, IT Professionals and Community Members in terms of Perceived of Ease of Use, Perceived Usefulness, and Overall Acceptability of e-Kart

Factors		Sum of Squares	df	Sum of Squares	F	p-val	Decision	Interpretation
Perceived Ease of Use	Between Groups	0.016	3	0.005			Do not reject null hypothesis	There is no significant difference
	Within Groups	0.698	115	0.006	0.862	0.463		
	Total	0.714	118					
Perceived Usefulness	Between Groups	0.031	3	0.010			Do not reject null hypothesis	There is no significant difference
	Within Groups	1.594	115	0.014	0.752	0.523		
	Total	1.626	118					
Overall Satisfaction	Between Groups	0.001	3	0.000			Do not reject null hypothesis	There is no significant difference
	Within Groups	0.733	115	0.006	0.0.63	0.979		
	Total	0.734	118					

Table 15 shows the results of evaluation on the difference between groups and within groups of students, teachers, IT professionals and community members in terms of Perceived of Ease of Use, Perceived Usefulness, and Overall Acceptability of e-Kart.

For Perceived Ease of Use, the computed F-value was 0.862 with a p-value of 0.463, exceeding the 0.05 significance level, so the null hypothesis was not rejected. This suggests that all groups had similar perceptions of e-Kart's ease of use.

Similarly, Perceived Usefulness had an F-value of 0.752 and a p-value of 0.523, also above 0.05, indicating no significant difference in how users viewed e-Kart's effectiveness.

Lastly, Overall Acceptability had an F-value of 0.063 and a p-value of 0.979, confirming no statistical difference in the general acceptance of e-Kart among the groups.

The evaluation results indicate no significant differences in perceptions of e-Kart's ease of use, usefulness, and overall acceptability among students, teachers, IT professionals, and community members. The statistical analysis using One-way ANOVA showed that all groups shared similar views. This suggests a consistent positive acceptance of e-Kart across diverse user groups

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