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iShopLycean: An Ecommerce Book Store Application for the Students of Lyceum of the Philippines University Cavite

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Abstract: **This research project, entitled "iShopLycean: AN E-COMMERCE BOOK STORE APPLICATION FOR THE STUDENTS OF LYCEUM OF THE PHILIPPINES UNIVERSITY CAVITE" aimed to establish an e-commerce system connecting the LPU bookstore with the students of LPU Cavite. To achieve this, a web admin system was developed to serve as an inventory and customer transaction management system for the bookstore, enabling a digital e-commerce solution. Moreover, a mobile application named iShopLycean was created for students to browse and order products using their mobile devices. The development of the project utilized Microsoft Visual Code, MySQL, and XAMPP, with HTML5, CSS, and Laravel as the primary framework. Rigorous testing by IT experts resulted in a 100% score for functionality and compatibility of both the web admin system and mobile application. Evaluations, based on ISO 25010 and MARS, yielded highly acceptable ratings of 3.90 and 3.93, respectively. The project successfully provided an effective e-commerce solution, enhancing the LPU bookstore's business processes and services. The students of LPU Cavite also gained an efficient way to order products through the iShopLycean mobile application. Lastly, the project's implementation demonstrated its ability to facilitate seamless online transactions, implementing an ecommerce experience for both the bookstore and students of LPU Cavite.**

Keywords: **iShopLycean, LPU Bookstore, E-Commerce, web admin system, mobile application.**

I. INTRODUCTION

The LPU bookstore is a place where students can go and buy their textbooks, uniforms, and any LPU merchandise. Traditionally, students will have to go to the LPU bookstore personally to browse all the available products and buy what they need over the counter. However, this limits the LPU bookstore to serve the students effectively like the limitations of physical stores. Limitations like limited information about the products, long queue lines, and restricted store hours. Therefore, many businesses are starting to sell their products online because of its many benefits compared to traditional selling, especially during the COVID-19 pandemic stated by Kelly, (2020). According to Khrais and Alghamdi, (2021), to improve the efficiency of their operations, most retailers are integrating their practices with modern technologies. The adoption of technology aims to enable businesses to accurately meet the needs and expectations of their customers. Thus, the proposed project entitled "iShopLycean: An ECommerce Bookstore Application for the Students of Lyceum of the Philippines University - Cavite'', delivers a system both for the LPU bookstore and for the students to establish an e-commerce system. The research project will supplement the LPU bookstore with a web-based Content Management for Inventory Management and to keep on track of orders and transactions of the students registered in the system. The students will have access to the iShopLycean mobile application to browse products in the LPU bookstore, add items to their carts, order them, and get their item based on the scheduled pickup date. This is due to the research survey conducted by the developers to the students of LPU Cavite resulting in a 100% yes 2 for the LPU bookstore to have an E-Commerce Platform that both the students and the bookstore could benefit from.

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II. METHODOLOGY

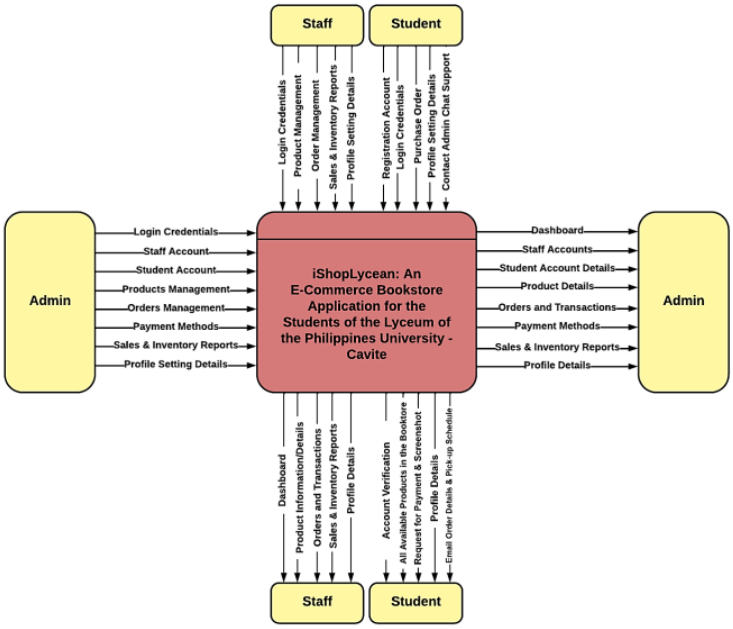

Fig 1. Context Diagram Level 0 of iShopLycean: An E-Commerce Bookstore Application for the Students of Lyceum of the Philippines University – Cavite

Shown in Figure 1, the iShopLycean system enables Bookstore Admins to manage products, inventory, sales, and payments, while Staff have limited access. Students register, browse products, place orders, and upload payment receipts. Verified transactions lead to scheduled pick-ups, with students notified via email once confirmed.

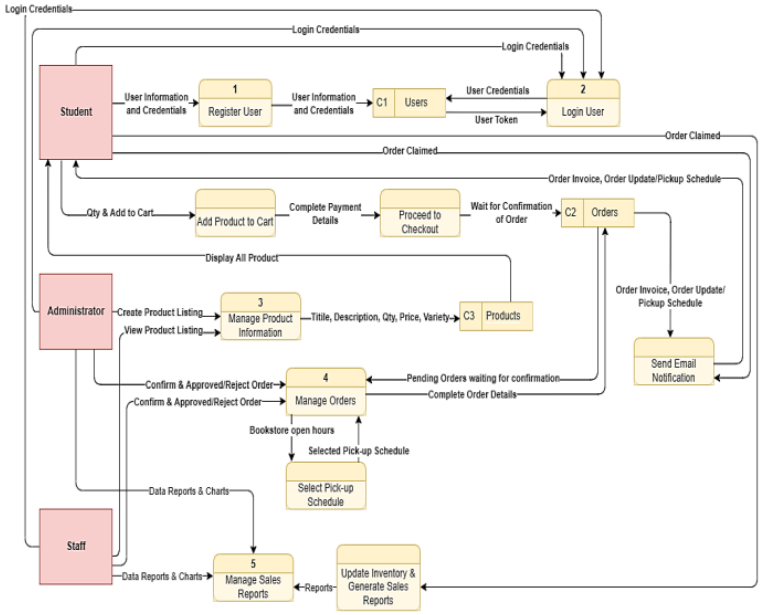

Fig 2. Data Flow Diagram Level 1 of iShopLycean: An E-Commerce Bookstore Application for the Students of Lyceum of the Philippines University – Cavite

Shown in Figure 2 is the Level 1 Data Flow Diagram, where students log in using registered credentials validated by the system. Admins manage product data, which is then displayed for student purchase. After checkout and payment upload, admins or staff confirm transactions and schedule order pickups, updating sales and inventory accordingly.

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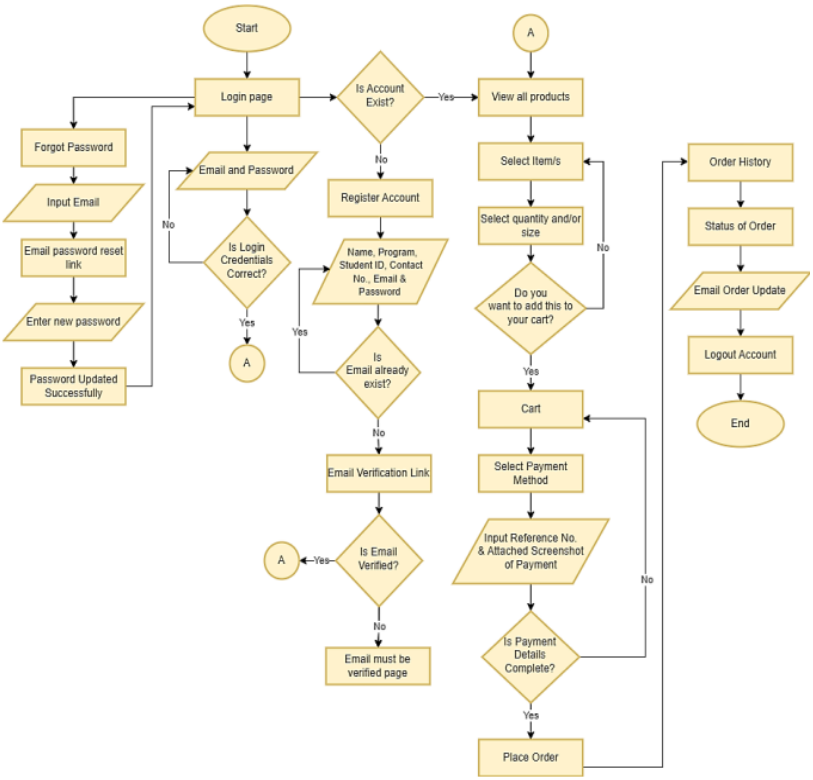

Fig 3. Student - System Flow Diagram of iShopLycean: An E-Commerce Bookstore Application for the Students of Lyceum of the Philippines University – Cavite

Shown in Figure 3 is the system flow of the student application, where students browse and order products added by the admin. After adding items to the cart, students upload payment proof and a reference number. Once validated by the admin or staff, a pickup schedule is sent via email, and the transaction is updated in both the admin and student records.

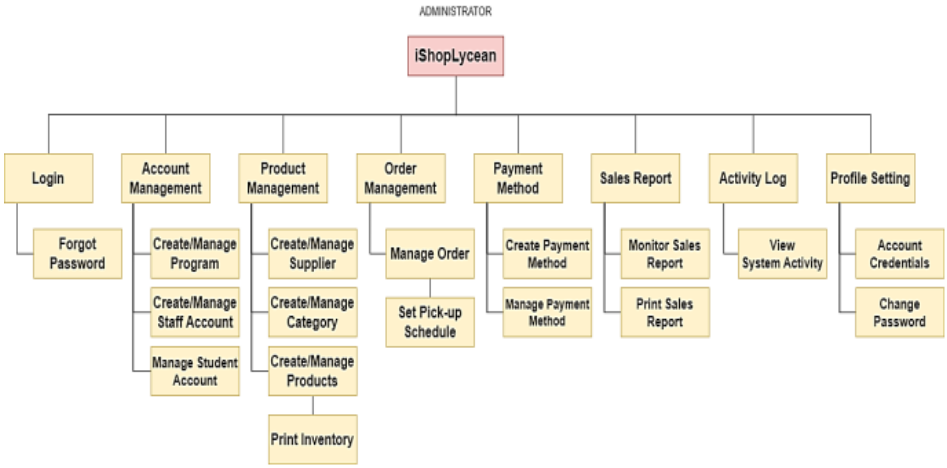

Fig 4. Administrator – Functional Decomposition Diagram of iShopLycean: An E-Commerce Bookstore Application for the Students of Lyceum of the Philippines University – Cavite

Shown in Figure 4 is the Functional Decomposition Diagram of Administrator Web Content Management. The LPU Bookstore Admin oversees full system access, managing student and staff accounts, inputting programs, handling products, generating reports, and verifying payments. Approved orders are scheduled for pickup and students are notified via email.

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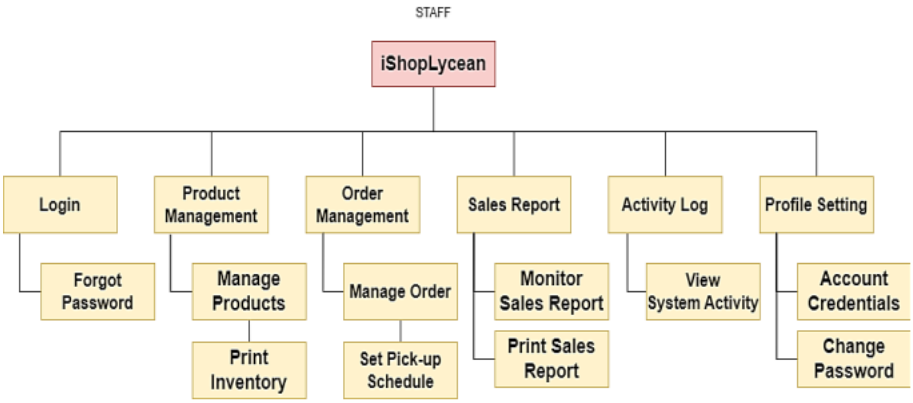

Fig 5. Staff - Functional Decomposition Diagram of iShopLycean: An E-Commerce Bookstore Application for the Students of Lyceum of the Philippines University – Cavite

Shown in Figure 5 is the Functional Decomposition Diagram of the Staff Web Content Management, which has fewer functions than the LPU Bookstore Admin. Staff can manage inventory, view product scarcity, print sales and inventory reports, and handle order management. Upon verifying payment, staff approve orders and set pickup schedules, notifying students via email.

Evaluation

Numerical Rating	Equivalent
3.26 - 4.00	Highly Acceptable
2.51 - 3.25	Acceptable
1.76 - 2.50	Fairly Acceptable
1.00 - 1.75	Unacceptable

Fig 6. Likert Scale

Numerical Rating	Equivalent
4	Highly Acceptable
3	Acceptable
2	Fairly Acceptable
1	Unacceptable

Fig 7. Scoring System

Shown in this figure 7 is the Numerical Rating Scale used for system evaluation. It presents four levels of acceptability: a rating of 4 corresponds to "Highly Acceptable," 3 to "Acceptable," 2 to "Fairly Acceptable," and 1 to "Unacceptable." This scale helps assess user feedback based on system performance or usability.

Evaluation Procedure.

The evaluation phase was successfully done with the following steps.

1. The developers will explain all the features of both the admin system and the mobile application of the iShopLycean project.

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2. The evaluators are then free to explore the system and test all the functions of the iShopLycean system.

3. After testing, the developers gave the evaluators the evaluation form to evaluate the system's function and usefulness using google forms through the given links: https://docs.google.com/forms/d/e/1FAIpQLSft0SARn9d0CsJ3G4jahXy3wWeouBA_1tS uQBh7kWsYWL_ltg/viewform?usp=sf_link https://docs.google.com/forms/d/e/1FAIpQLSdfMknOxAF-jvVWRPeV1Pqb87gFnUP3ikN-AMF7KBKHe1yZA/viewform?usp=sf_link.

4. The developers gave the admin the ISO 25010 evaluation for evaluating the database system for the LPU bookstore, and the students get the MARS evaluation to evaluate the mobile application. While the IT Specialist get both evaluation form for both the admin system and the mobile application

5. The evaluation result was then collected for tabulation and interpretation. Statistical Treatment of Data. Developers collected information from 41 evaluation respondents. The obtained data were calculated, interpreted, and validated based on the weighted mean and standard deviation

III. RESULTS AND DISCUSSION

Fig 8. Application Loading Page of iShopLycean: An E-Commerce Book Store Application for the Students of Lyceum of the Philippines University Cavite

As presented in figure 8, it displays the loading screen of the application that the user will encounter upon opening iShopLycean. In the middle section, the logo of the application is displayed for the users to understand its own brand. The color scheme of the loading page is inspired from the official color of the school which is yellow and red.

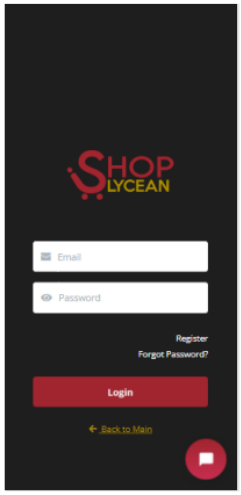

Fig 9. Application Login Page of iShopLycean: An E-Commerce Book Store Application for the Students of Lyceum of the Philippines University Cavite

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Presented in Figure 9 is the login page of the bookstore application iShopLycean. The two text fields will ask the user to input their email and password. If the user doesn't have an iShopLycean account yet they can press the "Register" Button to create an account. If the users fail to remember their password, they can tap "Forget Password" and the system will then send a reset email so they can create a new password. After getting the credentials of the user, they can now proceed to logging in by tapping the Login button that is located at the bottom of the text fields. The Back to Main text allows the users to return to the home page of the official website.

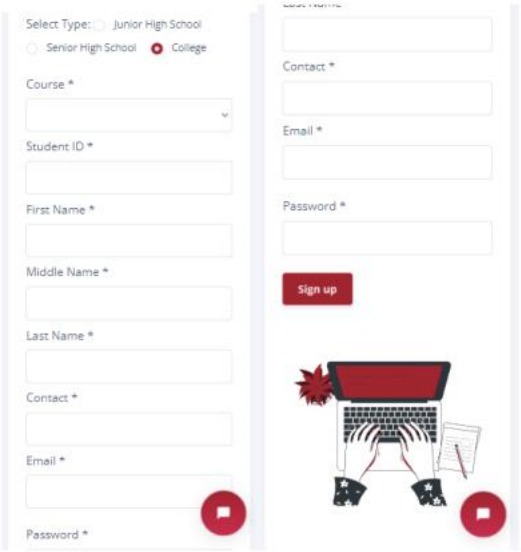

Fig 10. Student Application Registration Page of iShopLycean: An E-Commerce Book Store Application for the Students of Lyceum of the Philippines University Cavite

Figure 10 shows the registration page for the student to sign up for an account to access the iShopLycean application. Fields like student type, student ID number, name, contact number, school email address, and password must be filled in before signing up. LYCEUM OF THE PHILIPPINES UNIVERSITY CAVITE COLLEGE OF ENGINEERING, COMPUTER STUDIES, AND ARCHITECTURE 73 Once done, the system will generate a verification link sent through their school email and can now access the application using the credentials inputted by the student.

Fig 11. Student Application Registration Page of iShopLycean: An E-Commerce Book Store Application for the Students of Lyceum of the Philippines University Cavite

As shown in figure 11, it displays the home page of iShopLycean after the user logs in. The navigation bar consists of two elements that allow the user to view the settings and navigation menu The search bar is in the upper part of the page just below the navigation bar, this allows the users to search for the items that they are looking for and they can also filter the

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items that are shown below by clicking the filter icon beside the search icon. A carousel banner is also displayed, this is where the users will be able to see the announcements of the bookstore whether an item is back in stock, new items, etc. Below the banner are the items that are available in the bookstore, images of the items will be displayed together with their name/label and price.

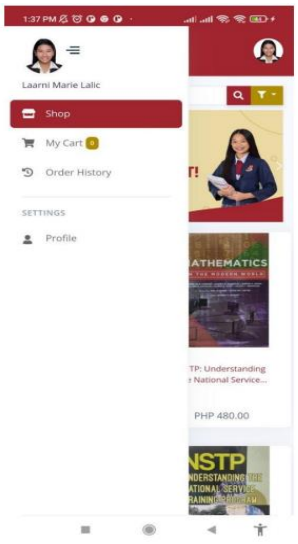

Fig 12. Student Application Registration Page of iShopLycean: An E-Commerce Book Store Application for the Students of Lyceum of the Philippines University Cavite

Figure 12 shows the content in the navigation Window of iShopLycean. This section is where the user will be able to change the displayed page according to their desired section: Shop being the default page, My Cart, Order History, and settings that include the profile.

TABLE 1. TEST RESULT USING COMPATIBILITY TEST

Test Respondents	Pass	Fail	Test Criteria	Percent
Developers	8	0	8	100%
Tech Adviser	8	0	8	100%

In table 1 shows the compatibility testing of the iShopLycean mobile application the tested by themselves. The test result shows that the application is compatible on recent android versions and screen sizes. All the features are running, and the application is running smoothly tested on recent android versions.

TABLE 2. TEST RESULT USING THE FUNCTINALITY TEST

Test Respondents	Pass	Fail	Test Criteria	Percent
(10) IT Expert	62	0	51	100%
Tech Adviser	62	0	51	100%

As shown in table 2, the developers tech adviser and IT experts test the functionality of the iShopLycean mobile application. The functionality test result shows that all the features and functions of the mobile application are working as intended and getting a hundred percent rating.

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TABLE 3. EVALUATION RESULT USING MARS CRITERIA FROM TEN (10) IT EXPERTS

System Characteristics	Mean	Standard Deviation	Interpretation	Rank
Engagement	4	0	Highly Acceptable	1
Functionality	3.95	0.16	Highly Acceptable	3
Aesthetics	3.97	0.11	Highly Acceptable	2
Information	4	0	Highly Acceptable	1
Total mean & SD	3.98	0.07	Highly Acceptable	

In table 3 the evaluation by the ten (10) IT specialists shows that the engagement and information characteristic of the system ranked first with a weighted mean of 4 and standard deviation of 0 getting a perfect rating. This shows that the functions and features of the application are engaging and easy to use by the student and shows all the necessary information about the products of the LPU bookstore. The aesthetic aspect of the system ranked second followed by the system's functionality, both of which getting high ratings.

TABLE 4. EVALUATION RESULT USING MARS CRITERIA FROM THIRTY (30) STUDENTS

System Characteristics	Weighted Mean	Standard Deviation	Interpretation	Rankings
Engagement	3.88	0.31	Highly Acceptable	4
Functionality	3.95	0.19	Highly Acceptable	1
Aesthetics	3.92	0.23	Highly Acceptable	2
Information	3.91	0.28	Highly Acceptable	3
Total mean & SD	3.91	0.25	Highly Acceptable	

Based on table 4, the evaluation result of thirty (30) students, on which the functionality of the system ranks first having a weighted mean of 9.95 and standard deviation of 0.19, this signifies for them having a good experience using all the functions and recognizing the components of the system. Aesthetics ranked second which shows that the students like the design of the application. Information comes in third on which it supplements the minimum information of all the products on the system. The last is the engagement part of the system also getting high ratings.

TABLE 5. OVERALL EVALUATION USING MARS CRITERIA

System Characteristics	Mean	Standard Deviation	Interpretation	Rank
Engagement	3.91	0.28	Highly Acceptable	4
Functionality	3.95	0.18	Highly Acceptable	1
Aesthetics	3.93	0.20	Highly Acceptable	2
Information	3.93	0.24	Highly Acceptable	3
Total mean & SD	3.93	0.22	Highly Acceptable	

Table 5 revealed the overall result of the MARS evaluation resulting in functionality ranking first with a total weighted mean of 3.95 and a standard deviation of 0.18 having all its functions working as intended and being easy to use according to the students and IT experts. Followed by aesthetics and information both having high ratings, showing that the respondents like the design of the application and the information it gives are necessary to the application. Last is the engagement part of the application also getting a high rating among the respondents.

IV. CONCLUSION

The iShopLycean system is an e-commerce solution designed for the LPU Bookstore, offering both a web-based admin system and a mobile application for students. Its main objective is to streamline the bookstore's business processes by enabling students to browse and order products online while allowing admins to manage inventory, orders, payments, and pickup schedules. The system bridges the gap between the CMS admin panel and the student mobile app, ensuring smooth interaction between both platforms.

Key features include student account management, sales and order reporting, and multiple payment options. A major challenge in development was aligning system processes with the bookstore's services without redundancy, as well as ensuring full functionality and compatibility across devices and platforms.

Compatibility and functionality tests showed 100% success across various browsers and Android versions. The mobile application was evaluated using the MARS criteria by ten IT experts and thirty students, resulting in a “Highly Acceptable” mean score of 3.93. The admin system, assessed using the ISO 25010 standard by ten IT experts, admins, and staff, received a 3.90 mean rating, also “Highly Acceptable.” Overall, iShopLycean enhances convenience, reduces in-store congestion, and supports efficient bookstore operations, proving its effectiveness and value in addressing business needs.

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