

E-Commerce Adoption Towards Sustainable Bamboo Industry in the City of Alaminos, Philippines

By

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Abstract

With the economic progress, Alaminos drives to another venture to make the city into the bamboo capital of Pangasinan through its Hundred Islands Engineered-Kawayan (E-Kawayan) Factory that produces bamboo products while encouraging massive cultivation of the plant. This study would present business model for an eCommerce platform that would transform the factory souvenir shop into digital store as any business needs to be competitive and cope up with the technology helping it to survive in the market and as part of the tourism program of Alaminos City. Literature reviews was used to support the development of digital store for Hundred Islands E-Kawayan Factory and aid the researcher in designing its business model. In addition, interviews and document analysis were conducted to understand the business process of the factory. As the tourism industry and business establishments embraces technology, digital platform that would reach wider target market will be highly beneficial to the city. Moreover, the development of the digital store will help support the project of the city in sustaining livelihood of the bamboo planter.

Index Terms - E-Commerce, sustainable, bamboo industry, bamboo products

I. Introduction

E-Commerce in the Philippines has significantly increased in demand when the covid 19 pandemic begun in early 2020. The government implemented strict limited movements and lockdown policies forcing buyers shifting from traditional buying of goods and services to online means using digital devices such as computers and mobile phones. In one of articles published by International Trade Administration (2022) it was stated that the Philippines E-Commerce market sales reached \$17 billion, largely contributed by 73 million online active users in 2021 [1]. E-Commerce or electronic commerce refers to the extensive use of digital technologies in facilitating online business processes such as sales and transactions [2]. Benefits of E-Commerce include its around-the-clock availability, the speed of access, the wide availability of goods and services, easy accessibility and international reach [3]. More Micro Small Medium Enterprises (MSMEs) are adopting digital platform to service their clients. The increased number of startups enabling digital transformation is driving the Philippine's economy to reach P5 trillion by 2030, or 27% of the country' GDP last year [4].

Most of the early E-Commerce marketplace adapter faced challenges like unfulfilled deliveries, unpaid purchases and even the selling of fake or damaged goods. In addition, mobile internet data and speed were also a problem in the early-to-mid 2010s. It cost around US\$2 per 1 gigabyte. Moreover, mobile signals were slow at around 2.8 megabits per second during the

same period [5]. But those hurdles gradually overcome, especially with tech companies joining E-Commerce bandwagon. Among the first issues resolved was payment with the entry of local telecom Globe releasing its GCash e-wallet service, followed by Smart with Maya. Apart from the payment facilities, new E-Commerce marketplaces started to pop up in the late 2010s starting with Zalora, followed by Lazada and Shopee. Facebook also entered the E-Commerce platform fray with its Marketplace. These companies helped provide Filipinos alternatives to purchase their items. E-Commerce changed in several factors. Other than the availability of e-wallet payment facilities and faster and more affordable mobile internet, Business-to-Consumer (B2C) platforms initiated more price-off and flash-sale offers. E-Commerce adapters also worked with several product forwarders and fulfillment companies and smaller courier service firms for direct-to-buyer deliveries.

With the evolvement of E-Commerce in the Philippines, this study will be focus on the E-Commerce adoption towards sustainable bamboo industry in the city of Alaminos. Hundred Islands E-Kawayan Factory is being promoted to the visitor and tourist of the city which introduces engineered bamboo product as part of the agritourism program of the city. The machines were making such a loud noise that the factory was built in a remote area far from homes. Situated away from the tourism area of the city where beach goer and visitor of Hundred Islands National Park, it is a challenge to the government of Alaminos to promote the engineered bamboo products. Consequently, it would affect the livelihood of farmers and cooperatives that provides bamboo raw materials of the factory. Hundred Islands E-Kawayan Factory also accommodates agencies that conducts benchmark activities.

The authors aim to address these issues through the design of an ecommerce platform that will provide and easy way of purchasing engineered bamboo products and online processing of onsite tour in the factory.

ii. Methodology

To have a clear view on the underlying problems that needs to be solved, design thinking was used as a preliminary research design in this study. Design thinking is a human-centered approach to innovation that draws from the designer’s toolkit to integrate needs of people, the possibilities of technology, and the requirements for business success [6]. Involving five phases - Empathize, Define, Ideate, Prototype, and Test – it is most useful to tackle problems that are ill-defined or unknown. Figure 1 shows the Design Thinking Model.

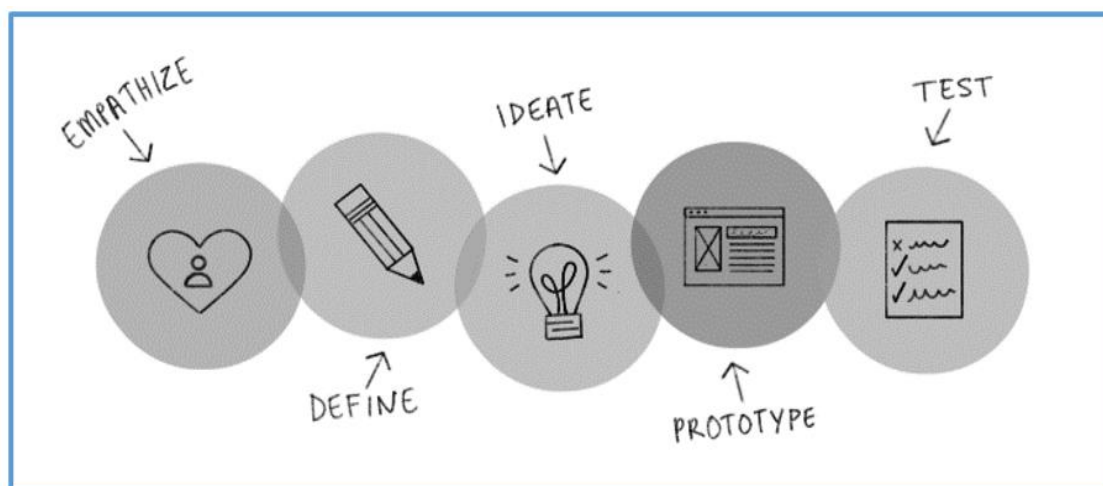


Figure 1. Design Thinking Model

The first phase involves a deep understanding of the user. Designing system framework and business model that will suit the needs of the factory is the primary concern of this study. Interviews with the factory administrator helps the researchers understand the business process done in the factory. Forms and other related documents such as job order receipt, logbook, sales report was collected to identify important data needed in the ecommerce platform.

From the data collected, the researcher begun to define the underlying problems of the user. Issues and challenges of the factory were listed and carefully analyzed. In addition, the researcher identified the target user of the ecommerce platform. Different products and services of the factory were also considered in this phase. Moreover, how customized products of the factory are ordered and produced.

The researcher begun finding solutions from the problems identified in early phase. The ideate phase allows the researcher to understand the business process from traditional marketing means of buying bamboo product to propose an online based solutions for purchasing items. Payment method that will be used by the buyer in processing the ordered product were also considered in this phase.

To conceptualized the business flow of proposed B2C model for Hundred Islands E-Kawayan Factory, different diagrams were utilized. In business model, the researcher identifies entities that are involve in the business process. Components of the ecommerce platform were listed its functions in the system. An architectural framework was used to depicts the internal structure of the system. The researcher used three tier architecture for this study. These are tools used for the prototype of the proposed ecommerce platform.

Interaction with the factory administrator is important in the test phase. As all identified solutions, design model and framework were created, the researcher presented to the factory administrator for review and test. The factory administrator carefully analyzed the solutions proposed by the researcher if it will address the needs and problems of the Hundred Islands E-Kawayan Factory.

Iii. Result And Discussion

E-commerce makes shopping easier for both customers and retailers. In a matter of days, a successful online store can be up and running, and customers value the convenience of making significant purchases from the comfort of their own homes. The following discussions were the proposed business model, system framework and architecture of the Hundred Islands E-Kawayan Factory.

Proposed B2C Business Model for Hundred Islands E-Kawayan Factory

As technology advances, businesses should cope with the demand of the market. The term “business model” refers to a business strategy for profit [7]. Creating a successful model is essential, whether you are starting a new venture, expanding into a new market, or changing your go-to-market strategy [8].

Integration of technology will help the Hundred Islands E-Kawayan Factory not only to promote bamboo products of the locality but to increase profit which will benefit the bamboo farmers and cooperatives. To reach wider market and help customer who has difficulty going to the factory because of its location, the development of ecommerce platform addresses most of the concern of the customer.

B2C is the process of selling products and services directly between a business and consumers who are the end-users of its product and services [9]. As shown in Figure 2, the business model of the factory comprises the customer/visitor, ecommerce platform/website and the e-kawayan factory. The ecommerce platform will serve bridge to the customer and visitor to the e-kawayan factory.

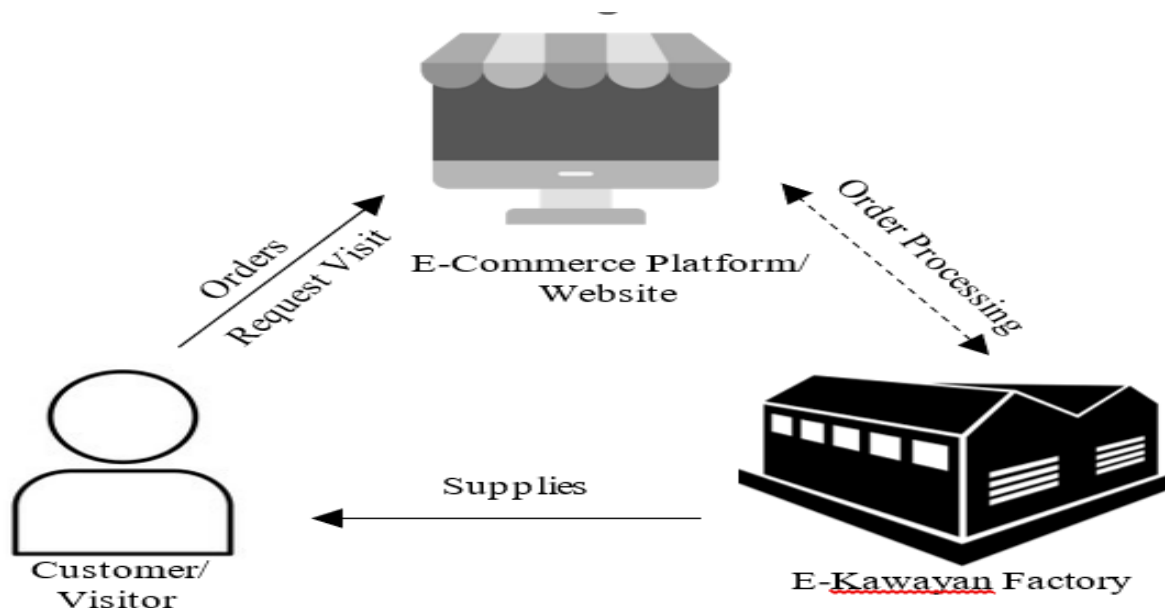


Figure 1. *B2C Business Model for E-Kawayan Factory*

The customer are the buyers of the engineered bamboo product while visitor is a person, entities or agencies who wishes to visit the factory for benchmarking activity in bamboo production; or tourist that visits the Hundred Islands National Park. These are end user of the system. They shall provide data such order and site details to the system.

An interface that acts bridge between end user and the factory will be website of the system. It is the storefront of the factory that displays different engineered bamboo products over the internet. The platform shall use to process customer order and visit request for onsite tour, benchmarking or data gathering.

When orders are received, factory will process the products ordered. Aside from processing customer order, the factory could also notifies other end user – the visitor for the status or approval of request for visits or onsite tour.

Proposed System Framework of the Hundred Islands E-Kawayan Online Shop

In general, a framework is a real or conceptual structure intended to serve as a support or guide for the building of something that expands the structure into something useful [10]. An ecommerce framework is made of underlying architecture needed to develop and maintain a system from selling products online. The new generation of shoppers and entrepreneurs prefer online shopping and business platforms more than the regular brick-and-mortar stores [11].

Typically, ecommerce platform has different components like user account, products, cart, payment, and shipping. In the development of ecommerce platform for Hundred Islands E-Kawayan Factory, tour module is included as part of the business process allowing an onsite visit in the factory. In the proposed system framework, customer has different roles from the visitor. Different modules therefore will be created for each user. A module that cater buyers' items purchased and a module that accepts tour request from the visitor.

The add to cart button function is to add an item to a customer's online shopping cart. The cart module allows the customers to choose items to purchase without completing the payment. All products that were add to the shopping cart will be shown when the customer will checkout for payment.

Processing of payment for the items ordered are done in the payment module. The payment module display the product details ordered and the amount for all the items purchased. The payment module allows the customer to select convenient way of paying the amount in different mode: Cash-on-Delivery, Credit Card or Cash deposit.

Delivery module handles the shipping of the product ordered. It handles the shipping details of the product and customer. This system framework for Hundred Islands E-Kawayan Factory Online Shop is shown in Figure 2.

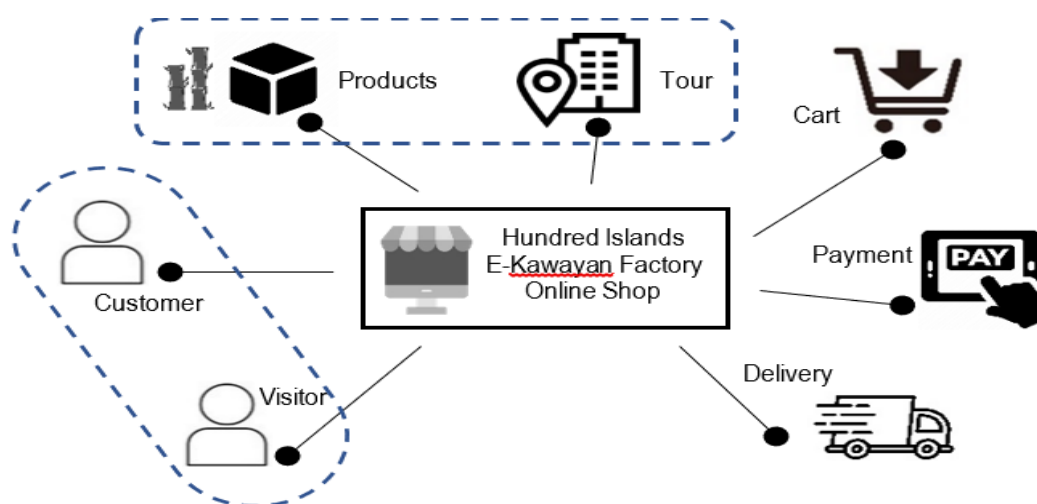


Figure 3. *Hundred Islands E-Kawayan Online Shop System Framework*

The product module holds and manages different product of the factory souvenir store. Management of product information like images, sizes and price are done in this module. It includes the processing of customized product order by the customer. The module allows the customer to add information and design of the product order such as engraved names, address or messages in the product. As shown in Figure 4, the factory offers to sell customized bamboo product.

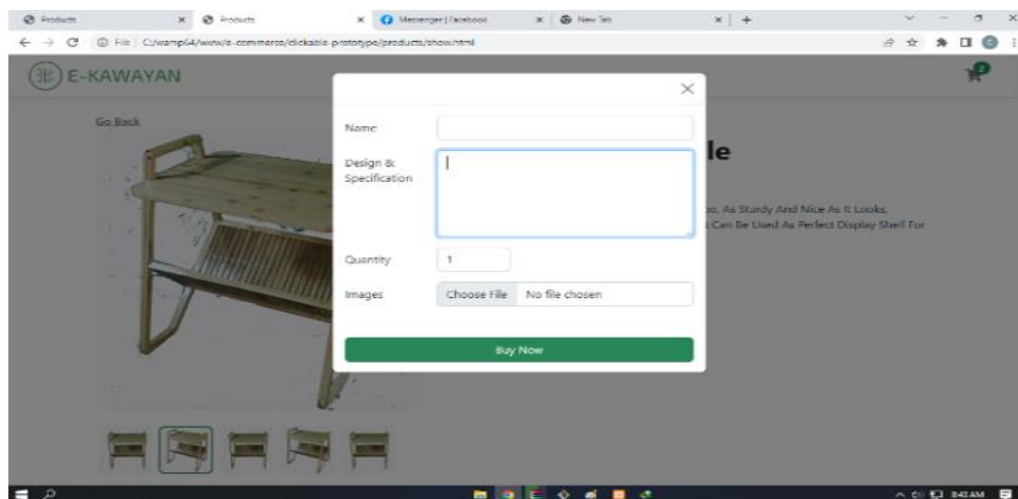


Figure 4. *Custom page for engineered bamboo product*

Proposed Hundred Islands E-Kawayan Factory Online Shop System Architecture

Three-tier architecture is a well-established software application architecture that organizes applications into three logical and physical computing tiers: the presentation tier, or user interface; the application tier, where data is processed; and the data tier, where the data associated with the application is stored and managed.

In the proposed Hundred Islands E-Kawayan Factory Online Shop system architecture as shown in Figure 4, the end user (customer and visitor) access the system over the internet. The web application interface request pages from the server side to accept and process user inputs such as product orders, payment and onsite tour request. These pages accepts user information, processes and saves in the shop database.

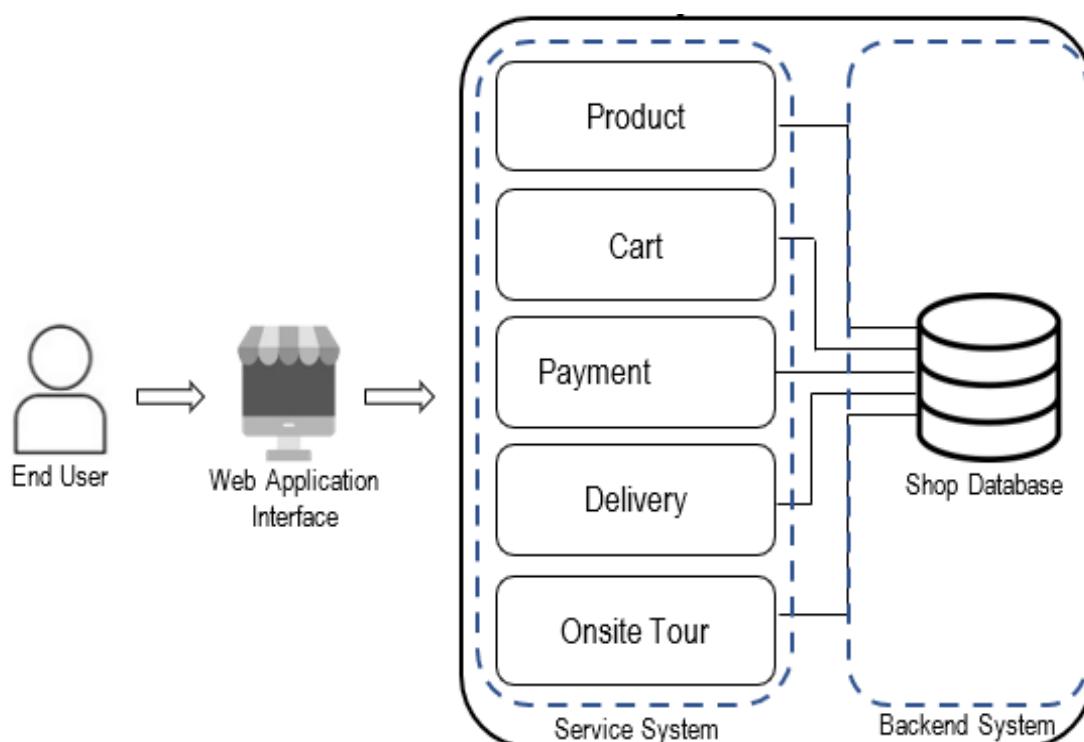


Figure 5. *Hundred Islands E-Kawayan Online Shop Three Tier Architecture*

When the end user search products, the service system used the keywords used to display different products associated to the keyword. The product service processes customized details provided by the end user for the product bought.

The cart service saves temporarily all items added by the end user. This holds all information of the product preparing for check out. The cart service displays all items and product details in the cart.

Payment service is called when end user checks out all the products added in the cart. This service will act to perform computation of the purchased product. This service will be saved and used for the monthly sales of the factory.

The delivery service takes charge on the pages used for processing shipping information of the end user. The customer enter shipping details in the database where the factory administrator retrieves and used to process the delivery of the product to the buyer.

Part of the business process of the factory is to cater visitor like tourist and other entities

that conducts benchmark activity. This service is design to display pages that process visit request to the factory.

Each layer in this architecture has its own infrastructure, can be simultaneously developed by a different development team, and can be upgraded or scaled as necessary without affecting the other tiers.

The system services for the Hundred Islands E-Kawayan Online Shop were identified and design based on the methodology used by the researcher.

v. conclusion

In order to sustain the stability of a business, innovation to its business model is essential to dealt with wider range of target market. Designing and creating framework is important to secure the customer information as well as the factory as an entity. The development of Hundred Islands E-Kawayan Factory Online Shop addresses the difficulty of the customer and visitor because it will provide an easy way of purchasing products whether it is customized and non-customized item over the internet. Moreover, the processing of request for visit shall be done electronically, giving a convenient way to the visitor of the factory. The ecommerce platform will introduce the engineered bamboo products to the global market reaching possible customer and buyer, a way to sustain the bamboo industry in Alaminos.

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