

Received: November 9, 2022

Revised: June 26, 2023

Accepted: June 27, 2023

Published: June 28, 2023

Develop a User-Friendly Stock Management Application for Small Businesses: A Case Study of Community Enterprises in Thailand

Nuttaya Iam-Khong

Faculty of Management of Science, Valaya Alongkorn Rajabhat University

Corresponding author e-mail: nuttaya.iam@vru.ac.th

Abstract

This research aimed to develop an information system that aids in the storage of product quantities inventories and product sales revenue. The application operates on the Android platform. This research used qualitative interviews with OTOP entrepreneur and community enterprises in Thailand to develop a user-friendly stock management application for small businesses. Results showed that the IOK Stock inventory application improved inventory tracking and sales revenue management, leading to increased efficiency and profitability.

Keywords: OTOP entrepreneur, Android application, Stock management, Digital business, Potential

Introduction

Today, the properties of good data must include accuracy, completeness, relevance to the user's needs, and verifiability, which is a characteristic of information that has become an important marketing tool to enhance performance and help adjust the products and services of businesses until they can compete with their competitors (Lotame, 2020). Vendors are currently adjusting their business platforms by communicating via social media. The products sold must have a product identity (Boberts, 2021). Customers can be attracted to a product's unique point of interest through visibility and trials, and build brand loyalty to create sales opportunities and quickly close deals. Therefore, information is essential for establishing a positive brand image. Easy-to-understand communication creates lasting impressions that encourage customers to make quick purchasing decisions. Relationship management facilitated by communication yields a competitive advantage, increased sales and a good long-term relationship (Knippe, 2021; Cognism, 2021). The current OTOP businesses, or community enterprises, have transformed their business model from selling products in storefronts or at trade shows to selling products on social media. Most of the products of community enterprises are unique and have

their own distinctive features, including story-telling (Lotame, 2020) about the history of the community that has already made an impression on the products. In addition, the quality standard of One Tambon One Product (OTOP product) is a local entrepreneurship stimulus program designed by Thailand's and aimed to support locally made and marketed products or a community enterprise (Business Development, 2021; Community Development Department, 2021; Ministry of Agriculture and Cooperatives, 2021). The problems that are often encountered by OTOP entrepreneurs, or community enterprises, involve a lack of knowledge in marketing analysis, Online communication skills, Photography skills, Only the knowledge of production has been inherited; they are unable to understand the use of technology for business management tools and have poor product information management, which greatly curtails their ability to reach their competitive potential in stock management e.g. manual recording or handwritten in transaction business processes and lack of use of application or online technology for stock management. It is difficult for today's OTOP entrepreneurs who are elderly. The researcher therefore conducted a study on the needs of OTOP operators, or community enterprises, through an analysis and design of business systems in order to use the information obtained to develop IOK stock inventory application for business information management system.

Research by Fenelli (2021) discusses the application of technology to small businesses. Research indicates that development must consider the availability of entrepreneurial resources and the investment of entrepreneurs in the business field. Due to the restricted funding of small businesses, it is difficult to expect public or private investment. Also, if there is new technology that can help small business owners reach their full potential, they will be willing to learn how to use it. The cost of managing a small business's resources should also be based on the owners' knowledge of the technology that will help them run their business. This will be part of the decision to develop technology for small business entrepreneurs (Akpan et al., 2021). Research by Mkansi et al. (2020) says small e-retailers can leverage their stock storage data to quickly close sales electronically. Then it is an important strategy for small e-retailers business. Interviews should be conducted to discuss a business's problems and requirements in order to study its business model for promoting products through social media, e-commerce or at the shop. The information acquired to develop information systems has the potential to help for entrepreneurs in the future (Iam-khong & Teerawut, 2021; Iam-khong, 2022a).

Through the development of IOK stock inventory application, this study sought to resolve the problem of product information management. The researcher thinks that community enterprise business owners will be able to use the information from the developed system to collect product details, remaining quantity, inventory, cost, and revenue information that can then be used to communicate with customers about product offerings and increase sales through social media, e-commerce or at the shop. The application should also improve their ability

to clear product inventory and issue reports quickly. As a result, the application will potentially help create more sales opportunities by using the data obtained from the application to forecast production planning, list of products to be produced, view popular product from application reports, and notification of product low stock. The information available in the application should be useful for deciding which product to promote in order to gain an advantage against similar business competitors.

Research Objectives

1. To identify common problems faced by OTOP entrepreneur in managing inventory using existing technology solutions.
2. Development a user-friendly stock management application for small business or community enterprises in Thailand.

Materials and Method

The samples used in the research

This research combined experimental and qualitative research methods, and the data were collected using formal interview forms. The sample group used in this research consisted of 5 specifically selected OTOP product operators, or community enterprises (A-E operators) located provinces of Pathumthani and Sa Kaeo in Thailand.

The tools used and research processes in the research consisted of:

The tools of this research consist of 3 items:

1. An open-ended interview question and need of OTOP product operators and community enterprises to be used in the development of IOK Stock inventory applications.
2. A tool by Google was used to develop the IOK stock inventory applications with Android Studio as an IDE tool. This tool is for developing applications running on the Android operating system and Android Virtual Devices. It is a product used to simulate a phone on a computer. The system development language is Dart, developed by Google as a structured programming language with capabilities in Object Oriented Programming. The framework used was Flutter. It is a framework used to create user interfaces for mobile applications and SQL language used to store databases.
3. A performance evaluation and user satisfaction form was used to assess with IOK Stock inventory management application for OTOP product operators or community enterprises. The assessment form used a rating scale, and was divided into 4 parts: (1) system functionality; (2) design and formatting; (3) data and content; and (4) utilization, through IOC testing with 3 experts.

The research process consists of two parts:

Part 1 Official interviews inquiring about the problems and needs of the product operators. (OTOP and community enterprises) and asking for information about the general status of the interviewees, problems they encounter with sales, inventory amounts and recording business sales revenue data. The information obtained is then used to develop the IOK Stock inventory application further.

Part 2 The process for developing the IOK Stock inventory application for OTOP product operators and community enterprises is shown in Figure 1.

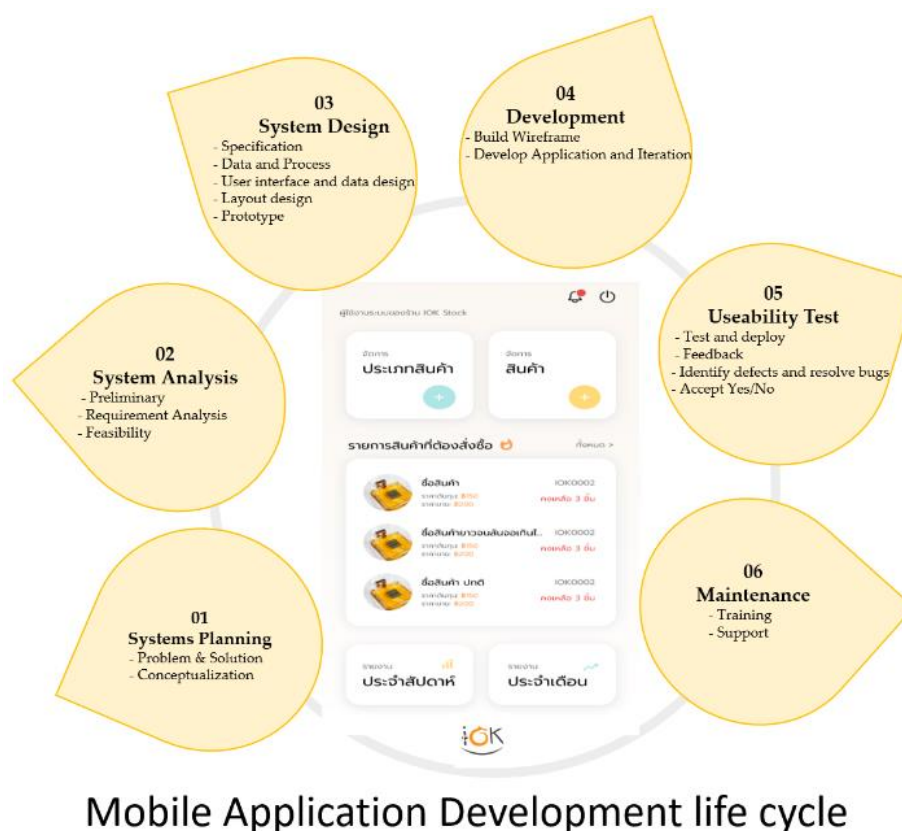


Figure 1 Mobile Application Development Life Cycle

Figure 1 shows that this research follows the guidelines for application development from Rosenblatt and Tilley (2016) which mentioned the adoption of System Design Life Cycles Methodology. It starts from design conceptualization created according to user requirements using the results of the data collected from the interviews. The design application is developed using a paper-based map Combe (2006) and then tested according to Hassan et al. (2021) research. In addition, the application development is done according to the process of The Software Development Life Cycle and the researcher has modified it to be more suitable for this research. Starting from Systems Planning: study the existing literature and conduct preliminary research according to the requirements and design. Analysis and Design: the concept was picked out and created to

produce a set of design guidelines which are utilized in the design and implementation phase. In the testing process, the system performs tests according to the established requirements. When problems are detected or the system crashes, or the defects are identified and resolved. The process then goes to evaluating the performance of the system from the user's perspective. Changes are made until an efficient system and a design that is suitable for the needs of users are achieved (Hassan et al., 2021).

There are 6 steps for system development as follows:

1. System Planning: starting with a study of the problems and identification of the solutions in order to come up with the idea of developing a system. Conceptualization: determining what the work process is by observing and visiting sites. It has similar characteristics to a feasibility study.

2. System Analysis conducted from observation and site visits to create an understanding of the work process and become familiar with the interviewees. Therefore, the information used to determine the scope of the interview objectives is summarized in order to create the official interview form. In this step, a preliminary investigation overview is conducted and data are collected from past community enterprise documents, along with relevant research studies to define the project scope and constraints, and fact-finding tools for the requirement analysis. Interviews are held with community enterprise entrepreneurs to summarize the results for the evaluation of the feasibility.

3. System Designs started when the conceptualization of the requirements has been analyzed and the evaluation feasibility has been done. Specifications are developed into the user interface and data design of the IOK Stock inventory application by considering the historical data of the OTOP product operators or community enterprises (business profiles) from the data collection and operational processes of the businesses (business process). A layout design is then drafted for the operators the OTOP products or community enterprises to consider. After being considered and approved by the operators, a prototype will be created for further testing. This section includes the design of the business report screen.

4. Development starts by building a wireframe before developing the actual application. The wireframe is then brought to the users, who are OTOP product operators or community enterprises, to consider the app's working process, applications and procedures. These will be the characteristics of the developed application and iteration. At this stage, community enterprise A is selected for consider action of the application trials are done involving community enterprises B to E.

Table 1 Information (Business Profile and Business Process) of Community Enterprise Operators: Problems and Needs of Community Enterprises and The Need for Information System Development to Promote Sales Potential

Enterprise Name	Products, Business Models, Problems and Needs for Information System Development to Promote Entrepreneurial Potential	Experience in a Community Enterprise Business / Year
A	<p>Products: Tableware sets, coffee sets and other kitchenware with Benjarong pattern.</p> <p>Business process: Make pottery and containers then add Benjarong patterns on it.</p> <p>Sales channels and Business profile: Sold through a middleman and a Facebook page and Shopee Market Place. Started an online sales 4 years ago. There are more than 20 types of products, with about 350 pieces in stock.</p> <p>Problems: Trouble finding the log entry document. Trouble finding the product, not sure if it exists or has been sold. Trouble remembering the cost of products. The sales revenue cannot be calculated precisely, only estimate.</p> <p>Needs: Need a system to record product costs, remaining balance, and sales revenue. In order to estimate production, it is necessary to have sales history information and market products based on when customers have ordered them.</p>	10
B	<p>Products: Artificial flowers made with from Thai clay. There are a variety of shapes of flowers, such as lotus flowers, orchids, jasmine, garlands, and Mon-saree.</p> <p>There are more than 20 shades of colors and more than 50 patterns of embroidery on the fabric. Each color used in embroidery had different patterns.</p> <p>Business process: The clay is shaped into lotus flowers for worshipping Buddha images or decorating homes and embroidered with Mon-saree.</p> <p>Sales channels and Business profile: Exhibitions and sales via Facebook pages.</p> <p>There are two types of products in stock; there is no more than 100 pieces of each type.</p> <p>Problems: There are many products, difficulty in finding the products. No products in stock, difficulty in finding pictures to send to customers. No exact product details, lack of product images for customers to purchase, handwritten cost and sales records.</p> <p>Needs: Need a system to help record product information, product prices and sales revenue that can be done on the phone easily.</p>	7

Table 1 (continued)

Enterprise Name	Products, Business Models, Problems and Needs for Information System Development to Promote Entrepreneurial Potential	Experience in a Community Enterprise Business / Year
C	<p>Products: Mon clothing, swan tail flags, centipede flags</p> <p>Business process: Craft products made from fabric embroidery, sewing, Mon clothes and Mon patterns that include Matat flowers, swans, ivy patterns, invented paper to make swan tails and centipede flags, all used to decorate Mon houses.</p> <p>Sales channels and Business profile: Selling through retail shops and online. There are five product categories. The quantity of products in stock exceeds 300 units.</p> <p>Problems: There are numerous products but the exact number, colors and patterns of products in stock are not known.</p> <p>The product information and details not recorded. Each time a customer contacts for information, fresh photographs and measurements must be taken.</p> <p>Needs: Need a mobile application that can store product information such as color, size, and length, as well as product costs and profit per unit, and provide the current number of items in stock, notify when a product is nearing depletion and display current sales revenue.</p>	5
D	<p>Products: Organic products, pickled fish and processed organic products</p> <p>Business process: Cultivate organic products and harvest agricultural products such as fish, fruits, and vegetables, and process organic agricultural products.</p> <p>Sales channels and Business profile: Retailing by means of a store and selling via the LINE mobile application. There are seven product categories. The number of products in stock does not exceed a weight of 50 kilograms.</p> <p>Problems: Lack of product information and illustrations when customers ask for product information. Unable to view customer order history and estimate revenue from sales of products.</p> <p>Needs: An application to work on a mobile phone that does not require the internet to work. It should help to take notes and keep detailed information and product images, and display sales items to estimate production needs.</p>	3

Table 1 (continued)

Enterprise Name	Products, Business Models, Problems and Needs for Information System Development to Promote Entrepreneurial Potential	Experience in a Community Enterprise Business / Year
E	<p>Products: Processed food products made from local ingredients such as cookies, compotes, and seasonal snacks.</p> <p>Business process: Bringing raw materials from the community to process them into preserved foods so that they can be kept for a longer time, packing and selling.</p> <p>Sales channels and Business profile: Selling through store exhibitions and Facebook pages. There are more than 10 product categories; the number of products in stock is not more than 50 pieces for each category.</p> <p>Problems: Product image information is hard to find because it is collected through Facebook. Lack of keeping product details, as well as income, sales history, and product origins. The number of stock products that are currently available is unknown.</p> <p>Needs: To help develop an application that can work offline and collect detailed information such as product illustrations. The data from the application should be easily sent to customers. An application that can keep the history of purchases and sales items to estimate production needs and post information to promote products.</p>	8

The reason for choosing Community Enterprise A stems from the nature of the product listing, recording product details, and the storage of documents that entrepreneurs have listed in detail and completed. Community Enterprise A thus serves as a model and co-developer that can offer advice that can be useful in the development of the application to reduce errors before testing the functionality with other community enterprises by Blackbox testing it to check for deficiencies in the use of various user functions. Community Enterprise A does a one-month trial system test by logging into the system and inputting product information, managing inventory, and generating a sales revenue summary report prepared to promote product information using information from the application's conversations, engagement, and information exchange with customers. When a problem is discovered during testing, the researcher is notified so that the program can be modified to fix the issue and meet the requirements of Community Enterprise A. The researcher makes the necessary adjustments based on the gathered information then retests the application to make it more useful and easier to access.

5. Usability Test is done using feedback from the test and the deployment section to see if defects and bugs it can be identified and resolved. The researcher tests the application with the OTOP operators and Community Enterprises B to E for a period of 3 months (beta testing). At the end of the test period, problems encountered during use are identified and a questionnaire is answered to assess the performance of the system and the satisfaction obtained from using the IOK Stock inventory application. This is a test to see the level of acceptance of the IOK Stock inventory application.

6. Maintenance is done once the application passes the test and receives user approval. To increase the benefits, the researcher will share the training with other community enterprise users. If users discover issues or have questions, they can provide feedback.

Results

The results of this research consist of two parts:

Part 1: Problems and needs of OTOP product operators and community enterprises to be used in the development of the IOK Stock inventory application. This was the first step in the development using interviews with five community enterprise operators in Pathumthani Province and Sa Kaeo Province. The preliminary data are summarized and shown in Table 1, and consist of information on the general status of the interviewees, problems encountered in data recording inventory and sales revenue, as well as the need to develop information systems to boost sales potential.

As can be seen from Table 1, the problems encountered by OTOP product operators and community enterprises can be summarized as being the overall data storage that is currently done by taking notes on notebook paper. In each note, there is a lack of consistency and granularity because there is no standardized form as shown in Figure 2,

Date	Product	Cost	Income	Profit
11/01
11/02
11/03
11/04
11/05
11/06
11/07
11/08
11/09
11/10
11/11
11/12
11/13
11/14
11/15
11/16
11/17
11/18
11/19
11/20
11/21
11/22
11/23
11/24
11/25
11/26
11/27
11/28
11/29
11/30

Figure 2 Example of Recording Product Cost, Income and Profit Data

This leads to problems such as not remembering a product's cost or revenue, not being able to locate a product, not knowing the cause of its disappearance, or simply misplacing the logbook altogether. The quantity of items might not match the actual count. These issues impact trade opportunities that are missed as a result of stockpiles. It also impacts the ability to build consumer connection by providing buyers with product-specific information such as color, size, and shape. The data might be still lacking when communicating with clients, either through messages or speaking, without the needed attachments. This leads to a lack of corporate image standardization for communication, thus impacting the ability of OTOP product operators' and community businesses to build strength and confidence.

The researcher can conclude from the analysis of the needs of the OTOP product operators or community enterprises that they require a system that can work on a phone without relying on the internet because some locations do not have internet access. The developed information system should help them record product details, collect information and product images, and provide sources and sales history. It should provide inventory sales revenue and a notify the user when a product is about to run out of stock in order to help with decision making so that products can be produced on time to meet customer demands. The information that is gathered could then be used to decide how to manage marketing, product, product's cost, revenue and estimate how many produce the product were made correct the problem in the past.

Part 2: IOK Stock inventory application development for OTOP product operators and community enterprises has the following process.

After having defined the steps, this will be the second step: observations and site visits.

The analysis of the data obtained from the OTOP product operators and community enterprises can be used to create a conceptualization that will be developed as a tool to help manage the information systems for OTOP product operators and community enterprises. A context diagram of the application IOK stock inventory is shown in Figure 3 and a function decomposition diagram of the application IOK stock inventory is shown in Figure 4.

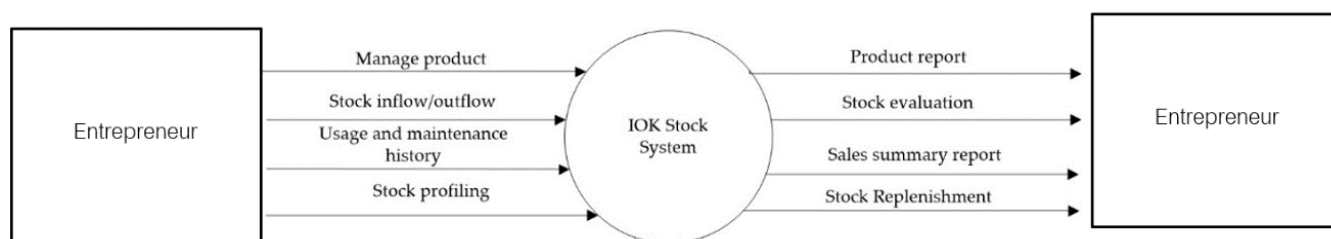


Figure 3 Context Diagram of Application IOK Stock inventory

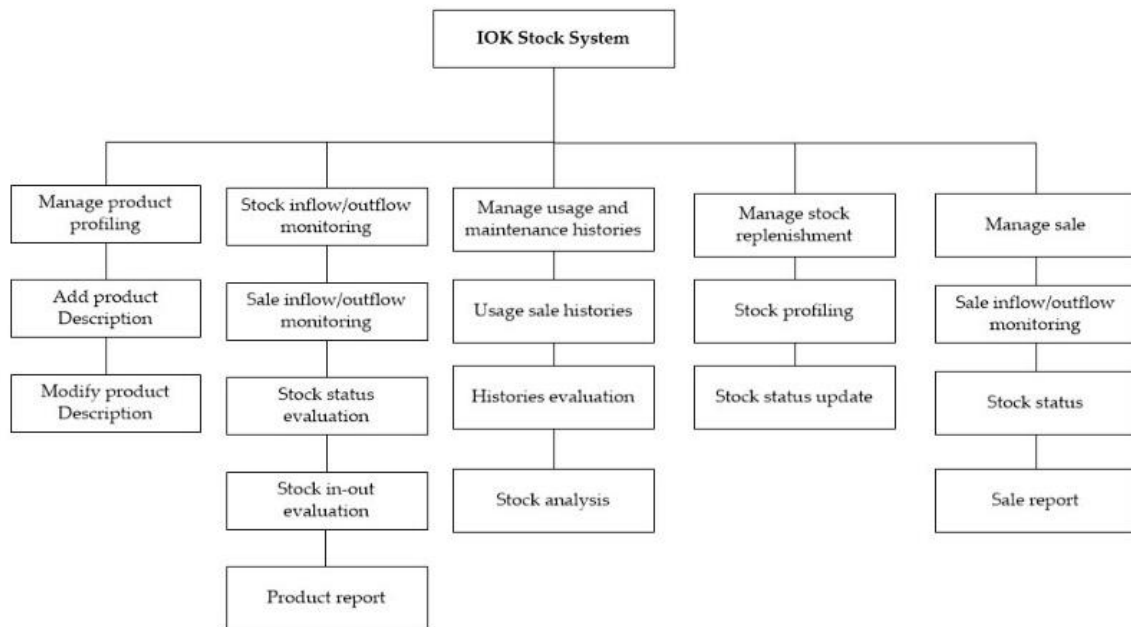
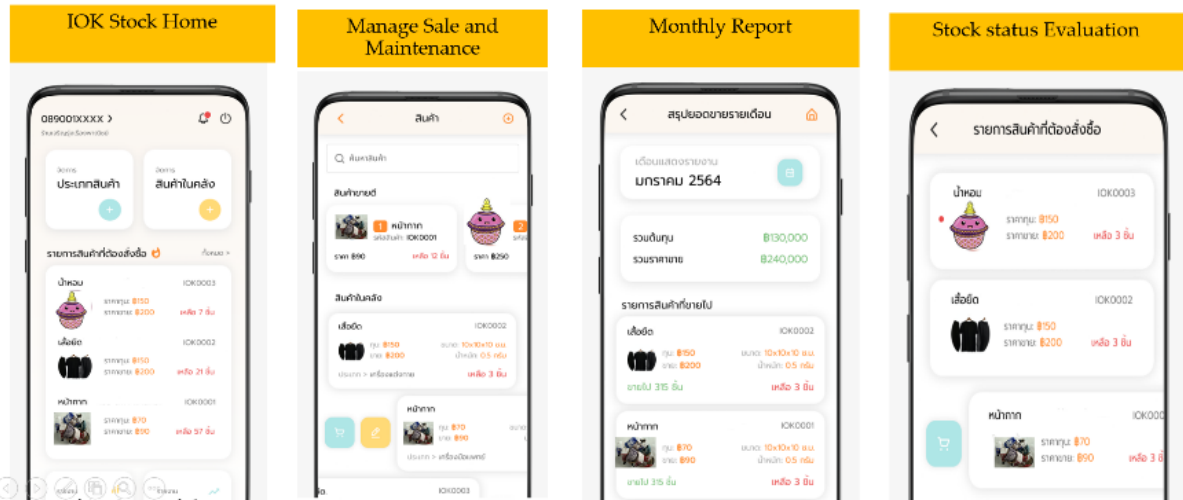


Figure 4 Function Decomposition Diagram

Figure 3, the context diagram should contain external entity to interact IOK Stock System. Figure 4, the function decomposition diagram, is divided into the main functions as follows: Manage product profiling for management and modify products in detail; monitor stock inflow and outflow for stock monitoring and evaluation; manage usage and maintenance histories, manage stock replenishment, and manage sales.

Step 3: System Design from Conceptualization. The system was created as a user interface and data design of the IOK stock inventory application. It was then brought to community enterprise entrepreneur A for their consideration. Adjustments were made according to the recommendations, resulting in a work structure as shown in Figure 5, the main screen layout, and Figure 6, the sub screen layout.



The flowchart illustrates the user journey for the iOK mobile application, starting from the login/register screen and moving through various app features like browsing products, viewing item details, and the checkout process.

Key Screens and Features:

- Home Screen:** Displays a search bar, a list of featured products (e.g., "หมวกสีฟ้า", "หมวกสีน้ำเงิน"), and a calendar view for selecting a date.
- Product Listing:** Shows a grid of products with images, names, prices, and ratings.
- Item Detail View:** Provides a close-up of a selected item, including its name, price, and a description.
- Checkout Process:** Guides the user through selecting items, reviewing the cart, and completing the purchase.

Flow Summary:

- User logs in or registers.
- User browses the home screen or searches for products.
- User selects a product to view details.
- User adds items to the cart.
- User proceeds to the checkout screen.
- User completes the purchase.

CONNEXION Journal of Humanities and Social Sciences, 12(1), Article ID: 262074 doi: 10.14456/connexion.2023.5

Steps 4, Development, and 5, Usability Test, are combined for the development. The screen layout is user-considered, and a wireframe was created. The system development was done together with the test and its deployment. Therefore, the tested application was brought to community enterprise A for a trial period of 1 month in order to identify and fix bugs and defects.

The results of the test run helped determine the unit of measure, the number of pieces, and the weight of the product. Each type of product has a different measurement resolution. Users recommended that the system should not be specific to the units used and should be flexible for ease of use in the future. The quantity of goods at the point of purchase should allow the user to customize it. The writing-off of products in stock and addition of products to the system stock should be automatically calculated according to the inventory. The report summary format should be weekly and monthly, and the user should be able to choose to display them at the desired time interval. The system should display the best-selling products and notify the user when inventory is almost depleted, allowing the user to estimate future production. After adapting it to customer needs, it was launched for a new two-month trial. There were no new recommendations for any changes. As a result, the IOK Stock inventory application was made available to community enterprise operators B to E for a three-month beta testing period. Users were able to report any problems so that further adjustment could be made in accordance with their recommendations.

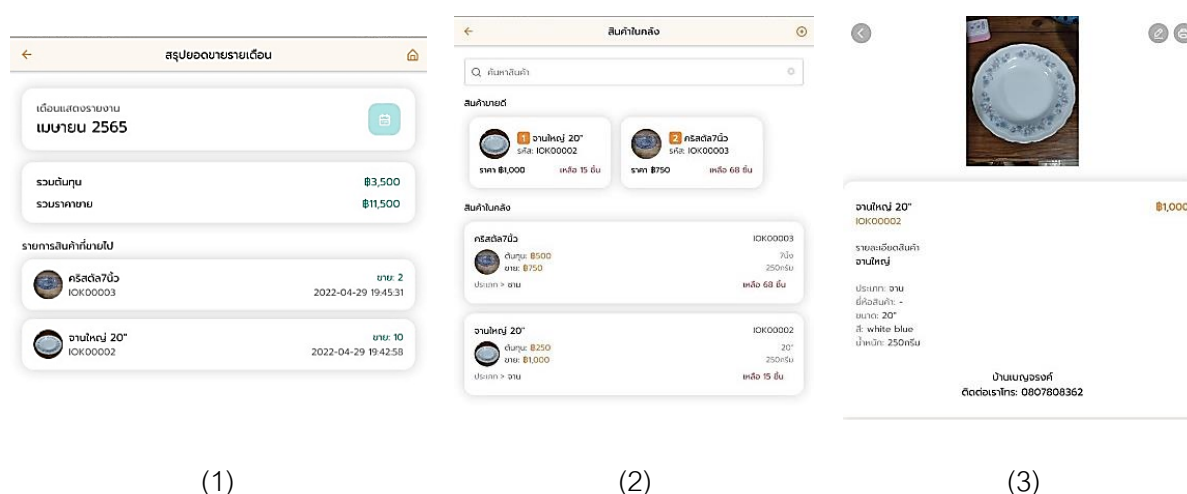


Figure 7 List of Products; Bestsellers and Inventory; Product Detail Information

The results of the trial, as shown in figure 7, (1) show the list of products, (2) the list of best-selling items, and (3) the amount of inventory and product detail information. The community enterprise operators B to E conducted the beta testing. They used the system and found that it had the ability to help them decide which items in the shop should be advertised by analyzing the stock quantity. The application also helped them to answer customer questions about product information, which was provided in an easier to read format with

illustrations. OTOP entrepreneur or community enterprises B to E then evaluated their level of satisfaction with the IOK stock inventory application and incorporated their feedback was incorporated into the IOK stock inventory application. The satisfaction evaluation of the IOK stock inventory application on the Android operating system revealed that the users were satisfied with the system operation design and its performance, with an average satisfaction rating of 4.90 (\bar{X} = 4.90). The reasons given were that the application was simple to use, it managed of product information and inventories, as well as provided a compilation of sales reports with a profit and loss summary. Users were quickly able to find information, answer customer questions, and give customers information and pictures about their products.

Step 6, Maintenance When users use the system and need advice, they can inquire or report back to the researcher. In addition, the researcher also made the application widely available and provided training to OTOP operators or other community enterprises who wish to use the application as shown in Figure 8.



Figure 8 Application Publication and Training to OTOP Operators or Other Community Enterprises

Discussion

The potential for development of OTOP entrepreneurs or community businesses begins with the provision of information based on the entrepreneurs' demands. Therefore, the researcher created the IOK stock inventory application. The procedure began by examining the demands of the entrepreneurs by questioning them about their difficulties and the need for information technology solutions to handle product information. Similar to the research of Islind and Lundh Snis (2017), the interviewing process for software development began with the generation of conceptualization and a working process based on the interview data, and the building of comprehension by explaining to the interviewees the research tools employed. Consequently, the interviewee procedure involves three components for the researcher: (1) introduction talks to create familiarity with the interview in order to reduce or eliminate negative bias; (2) interview chats regarding the ability to use information technology to make a transition to the business process; and (3) discussion/questions concerning the issue of data storage requirements and expectations as a result of information technology use; the data entry procedure; data display; report and screen layout production; and system evaluation (Islind & Lundh Snis, 2017). In the

process of collecting data, the researcher remained consistent with the theory of Rosenblatt and Tilley (2016) and used the fact-finding tool as an important tool for interviewing. This consisted of 7 steps: determine the people to interview, establish objectives for the interview, develop interview questions, prepare for the interview, conduct the interview, document the interview and evaluate the interview.

The interviews were done with entrepreneurs who chose to use applications on the Android operating system, and they described the business process that corresponded to their choice of using the Android operating system. The researcher used this data to develop the IOK stock inventory application to store product data instead of the original data storage model, which is consistent with the research of Emmanuel et al. (2020) that stated that business processes developed into applications should be designed with a user-centric approach so that the applications are ultimately designed to solve problems and increase work efficiency. Research by Vandana et al. (2020) states that application development requires user feasibility studies to meet their needs and purposes. Most users choose applications that run on the Android operating system because it is versatile enough to be used according to the needs, the structure is easy to modify and the cost of use is minimal. It's easy to update versions in the future without any additional cost for using the application. Research by Holzer and Ondrus (2011) provides the point of view that developers who use the open technology parts of the SDK and OS source code and make use of open technology offered by platform providers encourages the gathering of a community of developers. In the current market, Linux and Google have chosen to provide open platforms. The user interface and application design were then created by the researcher using the conceptualization information gathered from the interviews. The process of developing user flow diagrams and wireframes, using requirements as screen layouts, using wireframes in design implementations, using visual layouts to communicate with the users, and creating a consistent understanding of the layout implementation were all used in the development of the design applications. The layout screen is used to test the screen's design and adjust an object's size on the screen. As for the reporting system, the researchers developed it in accordance with the research of Muhamat et al. (2021) that states that feasibility studies should be conducted to formulate reporting strategies to avoid the risk of loss, to make planning easier, to make it easier to implement, to simplify supervision, and to make it easier to control, depending on the suitability of the business model used. If there is an unsuitable aspect, suggestions for improvements should be given, so that the proper criteria are met. As for the design of business reports, studies include legal aspects, marketing aspects, financial aspects, technical and operational aspects, management and organizational aspects, economic and social aspects, and environmental impact aspects (Pathak, 2016). They can also be used for income benefits as well (Vandana et al., 2020). The development and usability test that was co-developed with community enterprises involved black box testing techniques to

evaluate usability. This was done from the user test and deployment development using a prototype model in conjunction with an iterative model. This can be modified using user feedback, shortening the development time and leading to the best solution in less time and with lower costs. The advantages of an iterative model are that it allows the step-by-step building and improving of applications, and the ability to track defects at early stages. It also allows participation in the development and commenting on the application throughout the development period. Users get real access to productivity and so users can imagine how the application will work. Iterative models reduce design and documentation time (Pathak, 2016; Kirmani, 2017). Application satisfaction and acceptance assessments were conducted to test the performance and functionality of the software. Users can contact the application developer should they experience any issues or have any questions about how the system works. Future application developments should heed to user feedback by incorporation innovations that bring together fresh concepts to help increase the commercial potential of information technology. It should develop ties with customers to boost business performance (Kruachottikul et al., 2021; lam-khong, 2022b) and make business operations more competitive than those of other companies. As the business model is being modified (Kotler & Keller, 2021), it should encourage the use of marketing strategies that will help products be sold and promoted using digital systems. Service improvements are necessary (Deloitte, 2020; Kotarba, 2018) for transforming business processes into potential digital business operations. They should have the capacity to compete with businesses elsewhere. Additionally, developing long lasting relationships with customers is crucial to operating a digital business (Gumasing et al., 2022). The IOK stock inventory application provides operators with ways to satisfy the needs of their customers, including raising awareness of the added value of the product by providing information about the product's components. Every time information is provided to customers online, the same standards should be met in order to earn their trust and confidence. This includes inventories and shipping estimates that correspond to reality (Seitz et al., 2017).

Conclusion

To increase the potential development of OTOP entrepreneurs or community enterprises, the researcher has developed an information system in the form of an application by collecting data concerning their problems and needs. Community enterprise operators and OTOP entrepreneurs want applications that can run on the Android operating system, that can run offline and be used to record information and product images, inventory costs of goods, and income from sales of goods. The researcher has developed the IOK stock inventory application according to the needs of entrepreneurs by applying the application development process of Rosenblatt and Tilley (2016) which suggests the application of the System Design Life Cycles Methodology in the development stage along black box testing and user testing. Users have expressed satisfaction with the

application system. The developed application system has been made available on google play store for the benefit of OTOP entrepreneurs and other community enterprises.

A follow up on the research findings of the application development should be done in the future. The use of information communication, the use of information derived from the application, and the outcomes of its implementation should be discussed. The transfer of knowledge from successful OTOP entrepreneurs or community enterprises to serve as guidelines for transforming business models into digital business enhancing capabilities, it encourages the use of information technology applications by upcoming small business owners.

A guideline for developers of mobile applications for small businesses must be simple and relevant, like using apps that serve a purpose. With a lot of options available, users and entrepreneurs tend to prefer apps whose designers managed to avoid overcomplication while keeping the interface minimalistic and close to universally accepted standards.

References

- Akpan, I, J., Soopramanien, D., & Kwak, D. (2021) Cutting-edge technologies for small business and innovation in the era of COVID-19 global health pandemic, *Journal of Small Business and Entrepreneurship*, vol. 33, no. 6, pp. 607-617. <https://doi.org/10.1080/08276331.2020.1799294>
- Roberts, J. (2021) *The four key types of customer data for marketing or...how valuable is knowing my customer's pet's name?*, Available: <https://www.smartinsights.com/customer-relationship-management/customer-privacy/types-customer-data/> [9 August 2022]
- Business Development. (2021) *The project to enhance the potential of Thai community shops budget of 2017*, Available: https://www.dbd.go.th/ewt_news.php?nid=469405537&filename=index [9 August 2022]
- Cognism. (2021) *What is marketing data?*, Available: <https://www.cognism.com/what-is-marketing-data> [14 August 2022]
- Combe, C. (2006) *Introduction to e-business management and strategy*, 5th edition, Oxford: Elsevier.
- Community Development Department. (2021) *Download/community development announcement*, Available: <https://cdd.go.th/content/download> [20 May 2022]

-
- Deloitte. (2020) *Digital disruption in retail*, Available: https://www2.deloitte.com/content/dam/Deloitte/in/Documents/consumer-business/in-consumer-Digital%20Disruption%20in%20Retail_Retail%20Leadership%20Summit%202020%20Report.pdf [24 June 2022]
- Emmanuel, G., Emanuel, A. W. R., & Setyohadi, D. B. (2020) Design of mobile application for community health workers: A case study in Rwanda, *International Journal of Interactive Mobile Technologies*, vol. 14, no. 11, pp. 271-280. <https://doi.org/10.3991/ijim.v14i11.13307>
- Fenelli, R. M. (2021) Barriers to adopting new technologies within rural Small and Medium Enterprises (SMEs), *Social Sciences*, vol. 10, no. 11, pp. 430-445. <https://doi.org/10.3390/socsci10110430>
- Gumasing, J. J., Prasetyo, Y. T., Persada, S. F., Ong, A. K. S., . . . Redi, A. A. N. P. (2022) Using online grocery applications during the Covid-19 pandemic: Their relationship with open innovation, *J. Open Innov. Technol. Mark. Complex*, vol. 8, no. 2, pp. 93-119. <https://doi.org/10.3390/joitmc8020093>
- Hassan, N. A. M., Baharum, A., Sani, Z. H. A., Chau, K., & Noor, N. A. M. (2021) Reducing cognitive impairment among dementia users through mobile application, *Pertanika J. Sci & Technol*, vol. 29, no. 2, pp. 863-883. <https://doi.org/10.47836/pjst.29.2.09>
- Holzer, A., & Ondrus, J. (2011) Mobile application market: A developer's perspective, *Telematics and Informatics*, vol. 28, no. 1, pp. 22-31. <https://doi.org/10.1016/j.tele.2010.05.006>
- Iam-khong, N. (2022a) Marketing mix factors affecting consumers' decision to buy community enterprise products through e-commerce system (ปัจจัยส่วนผสมทางการตลาดที่มีผลต่อการตัดสินใจเลือกซื้อสินค้าวิสาหกิจชุมชนผ่านระบบพาณิชย์อิเล็กทรอนิกส์), *Journal of Mass Communication Technology*, vol. 7, no. 1, pp. 9-20. (in Thai)
- Iam-khong, N. (2022b) The development of digital transformation for improving business potential: A case study of Banbenjarong Bommunity Enterprise in Pathumthani Province (การพัฒนาความสามารถด้านการเปลี่ยนผ่านทางดิจิทัลในการเพิ่มศักยภาพทางการแข่งขันของธุรกิจ: กรณีศึกษา วิสาหกิจชุมชนบ้านเบญจรงค์ จังหวัดปทุมธานี), *Sripatum Review of Humanities and Social Sciences*, vol. 22, no. 11, pp. 35-48. (in Thai)

-
- Iam-khong, N., & Teerawut, T. (2021) The development of stickers for line application: The pink mushroom family set for promotion OTOP products of Klang Baan Mushroom Farm, Pathumthani Province (การพัฒนาสติกเกอร์บนแอปพลิเคชันไลน์ชุดครอบครัวเห็ดสีชมพูเพื่อส่งเสริมการขายสินค้าโอท็อปฟาร์มเห็ดกลางบ้าน จังหวัดปทุมธานี), *Management Sciences Valaya Alongkorn Review*, vol. 2, no. 2, pp. 27-35. (in Thai)
- Islind, A. S., & Lundh Snis, U. (2017) Learning in home care: A digital artifact as a designated boundary object-in-use, *Journal of Workplace Learning*, vol. 29, no. 7-8, pp. 577-587. <https://doi.org/10.1108/JWL-04-2016-0027>
- Kirmani, M. M. (2017) Agile development method for mobile application: A study, *International Journal of Advanced Research in Computer Science*, vol. 8, no. 5, pp. 1421-1425. <https://doi.org/10.26483/ijarcs.v8i5.3370>
- Knippe, E. (2021) *What is data-driven marketing? How to use smart data to deliver a higher marketing ROI*, Available: <https://www.adverity.com/data-driven-marketing> [16 May 2022]
- Kotarba, M. (2018) Digital transformation of business models, *Foundations of Management*, vol. 10, no. 1, pp. 123-142. <https://doi.org/10.2478/fman-2018-0011>
- Kotler, P., & Keller, K. (2021) *Marketing management*, 16th edition, New Jersey: Pearson Education.
- Kruachottikul, P., Cooharajanane, N., Phanomchoeng, G., & Kovitangoon, K. (2021) Development of a user-centric bridge visual defect quality control assisted mobile application: A case of Thailand's department of highways, *Applied Sciences*, vol. 11, no. 1, pp. 9555-9568. <https://doi.org/10.3390/app11209555>
- Lotame. (2020) *How brands can use data to improve customer relationships*, Available: <https://www.lotame.com/use-data-to-improve-customer-relationships/> [22 July 2022]
- Ministry of Agriculture and Cooperatives. (2021) *Community enterprise information system about the department of enterprise promotion community*, Available: <https://smce.doae.go.th/aboutus.php> [10 march 2022]
- Mkansi, M., Leeuw, S., & Amosun, O. (2020) Mobile application supported urban township e-grocery distribution, *International Journal of Physical Distribution & Logistics Management*, vol. 50, no. 1, pp. 26-53. <https://doi.org/10.1108/IJPDLM-10-2018-0358>

-
- Muhamat, N. A., Hasan, R., Saddki, N., Arshad, M. R. M., & Ahmad, M. (2021) Development and usability testing of mobile application on diet and oral health, *PLOS One*, vol. 16, no. 9.
<https://doi.org/10.1371/journal.pone.0257035>
- Pathak S. V. (2016) Acceptance testing technique: A survey along with its operating frameworks, *International Journal on Recent and Innovative Trends in Computing and Communication*, vol. 4, no. 4, pp. 772-775.
https://ijritcc.org/download/conferences/ICMTEST_2016/ICMTEST_2016_Track/1463810661_21-05-2016.pdf
- Rosenblatt, H. J., & Tilley, S. (2016) *System analysis and design*, 11th edition, Boston, MA: Cengage Learning.
- Seitz, C., Pokrivcak, J., Toth, M., & Plevny, M. (2017) Online grocery retailing in Germany: An explorative analysis, *Journal of Business Economics and Management*, vol. 18, no. 6, pp. 1243-1263.
<https://doi.org/10.3846/16111699.2017.1410218>
- Vandana, Gupta, P., Kumar, A., & Verma, C. (2020) Feasibility study of android application in architectural education, *International Journal of Scientific & Technology Research*, vol. 9, no. 2, pp. 2682-2686.
<https://www.ijstr.org/final-print/feb2020/Feasibility-Study-Of-Android-Application-In-Architectural-Education.pdf>