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Designing Startup Application "LaKu" for MSME in Riau Based on Android

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Abstract

Department of Industry, Trade, Cooperatives and SMEs (DITCS) of Riau has an important role in supporting 631,347 groups of Micro, Small and Medium Enterprises (MSMEs) engaged in various fields such as handicrafts, batik, songket, and food and beverages. Many MSME merchants still market their products traditionally through the neighborhood and word of mouth, while online marketing faces a big challenge because they have to compete with well-known brands, making them difficult to develop and grow their business. To overcome these problems, an Android-based application "LaKu" was developed that aims to help MSME merchants expanding their marketing reach and increasing their competitiveness in Riau. The development of this application uses the Extreme Programming (XP) method which consists of four main steps: Planning, Design, Code, and Testing. The development results show that the "LaKu" application can be an effective digital marketing platform, helping MSMEs in promoting products more widely without having to compete directly with big brands. With this application, MSMEs are able to increase competitiveness and contribute to local economic growth in Riau Province.

Keywords: Application; Startup; MSME; Riau; Android; Extreme Programming
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SDGs: No Poverty (1); Decent Work and Economic Growth (8); Industry, Innovation and Infrastructure (9); Reduced Inequalities (10); Partnerships for the Goals (17)

1.0 INTRODUCTION

Riau is one of the wealthiest provinces in Indonesia, experiencing continuous population growth and infrastructure development. Alongside this growth, the number of Micro, Small, and Medium Enterprises (MSMEs) is also increasing. The Department of Industry, Trade, Cooperatives, and MSMEs of Riau Province plays a strategic role in fostering and developing MSMEs to be competitive and adaptable in the digital era (Junaedi et al., 2024). According to data obtained from the official website of the Information and Documentation Management Officer (PPID) of Riau in 2023, MSMEs play a significant role in Indonesia's economic growth, accounting for 99% of all business units. Their contribution to the Gross Domestic Product (GDP) reaches 60.5%, while they also account for 96.9% of total national employment. In Riau alone, the number of MSMEs has reached 631,347. This is a substantial number and needs continuous support in terms of financing, product quality, human resources, and marketing. In efforts to market MSME products in Riau Province, various methods are used by entrepreneurs. These include selling in traditional markets, conducting face-to-face transactions, relying on word-of-mouth marketing, and utilizing digital e-commerce platforms.

Electronic Commerce, also known as E-Commerce, is a process of buying and selling transactions between sellers and buyers to provide goods and services or acquire rights through electronic media. These transactions take place regardless of geographical boundaries and national regulations, affecting the buying and selling process. (Achyar & Pratama, 2021)

To support the marketing of MSME products in Riau Province, the Department of Industry, Trade, Cooperatives, and MSMEs has undertaken various initiatives, including encouraging entrepreneurs to adopt Electronic Commerce (E-Commerce). However, data from the Antara News Riau website indicates that only about 6% of MSME merchants have passed digital literacy "Onboarding E-Commerce." Meanwhile, according to an initial

survey conducted by the Department of Cooperatives and MSMEs of Indragiri Hilir Regency in 2021, only around 15% of MSMEs in the regency have utilized digital platforms for marketing their products (Susanto et al., 2024).

Based on the above data, only around 6-15% of MSME merchants in Riau use E-Commerce for product marketing. The low level of digital adoption indicates that many MSME merchants still face challenges in marketing their products through digital platforms, whether due to limited access, lack of digital literacy, or competition with large brands. Despite this, MSMEs on E-Commerce platforms face several challenges, such as intense competition with established brands, high administrative costs, and low visibility, which hinder sales. Traditionally, MSME merchants have struggled to reach wider markets due to limited resources, lack of marketing knowledge, and difficulties in innovating, making them less efficient and effective.

A startup is a group of individuals or organizations formed as a single entity to create, sell, and market products or services, often technology-based (Renaldo et al., 2022), in a market full of uncertainty with an imperfectly established business model. Product development is a critical stage that determines a startup's ability to survive and compete in the industry. A startup capable of producing products that solve societal problems and meet public needs has a much greater chance of competing, especially if the developed product has higher value than its competitors (R. Setiawan & Yuana, 2022).

To create a startup application, researchers utilize the Android operating system as the platform for the application. Android is a Linux-based operating system for mobile devices that includes an operating system, middleware, and applications. Android provides an open platform for developers to create their applications. It is an OS used on smartphones and tablets, allowing users to run various applications such as messaging, internet browsing, and gaming (Chan et al., 2022).

Therefore, the Department of Industry, Trade, Cooperatives, and MSMEs of Riau Province encourages the development of the "LaKu" startup application based on Android as a digitalization solution for MSMEs in Riau. The "LaKu" startup application aims to facilitate MSME merchants in Riau in entering E-Commerce platforms by understanding local consumer preferences and incorporating local wisdom to present more relevant products and services. "LaKu" has several interesting features, such as displaying new stores on the main page to help them reach potential customers more easily, allowing orders with various payment methods and delivery or pick-up options, enabling users to review products and stores, and allowing users to manage multiple stores. The "LaKu" startup application helps users compete healthily with other MSME merchants in Riau, enabling them to grow and expand their business reach to national or even international levels.

One study by (Akbar, Usman, & Budiman, 2023) designed the UI/UX of a self-care startup application website using the Design Thinking method (Effendy & Gusrianty, 2024). The objective was to create a self-care website with an attractive UI/UX. Another study by (Nisa, 2024) developed the "Otocity" startup application to facilitate vehicle maintenance for users and workshop owners through a mobile-based platform. Meanwhile, a study by (Riyanto Pratama, 2023) focused on the "rekomendasiin.com" startup application, which featured a recommendation system based on a Decision Support System (DSS) using the Simple Additive Weighting (SAW) method (Andra & Hajjah, 2020). The objective of this research was to develop an online store startup, "rekomendasiin.com," with a recommendation system tailored to user needs. Another study by (Hermanto & Nora, 2023) addressed challenges in maritime transport at PT. Mitra Tujuh Samudra, where ship tracking was done via phone, often leading to inaccurate reports. To solve this, a website was developed using the Waterfall method, featuring a simple UI and integration with Vessel Finder for accurate ship tracking. Access is limited to registered customers, helping reduce report discrepancies and improving service accuracy.

Based on reviews of previous research and analysis of MSME issues in Riau, the development of the "LaKu" startup application is expected to be a solution that enhances MSME competitiveness and accelerates economic digitalization in Riau. With support from the Department of Industry, Trade, Cooperatives, and MSMEs of Riau Province, this application can be implemented on a larger scale and become part of the regional government's strategy to drive MSME sector growth in the digital era.

2.0 LITERATURE REVIEW

Application

An application is the implementation, storage of certain matters, data, problems, or tasks into a medium that can be used to create a new form. In general, an application is a tool designed for specific and integrated functions according to its capabilities. An application is a computer software that is ready to be used by users. (Amdi Rizal et al., 2022) In general, an application serves as a user-oriented interface that allows individuals or organizations to interact with data, automate tasks, enhance productivity, and facilitate decision-making. Applications are built with specific, integrated functions tailored to user needs and are typically developed using programming languages and frameworks suitable for their platform—whether desktop, mobile, web-based, or cloud-based.

Startup

According to Ries, as cited in Ramdhan, a startup is defined as follows: *"A human institution designed to deliver a new product or service under conditions of extreme uncertainty."* From this definition, a startup can be divided into three key aspects. First, *a human institution*, which means that a startup is a human-based institution, either an individual or a company. Second, *to deliver a new product or service*, meaning that a startup is established by an

individual or company to sell new products or services. Third, *under conditions of extreme uncertainty*, referring to the fact that startups are newly established businesses that face a high level of uncertainty regarding their success or failure. A startup refers to a company that has recently begun operations. (Pricillia & Ramadhan, 2024)

Micro, Small, and Medium Enterprises (MSMEs)

MSMEs are business activities carried out by individuals, households, or small-scale business entities. Typically, MSMEs are classified based on annual income, number of employees, and owned assets. The government has regulated MSME management under Law No. 20 of 2008 on Micro, Small, and Medium Enterprises. (Marlim et al., 2024) MSMEs contribute significantly to the Gross Domestic Product (GDP) each year. Additionally, they provide employment opportunities for the community. MSMEs have also proven resilient during economic crises, such as in 1998 when many businesses collapsed due to an economic downturn, but MSME activities remained operational. Therefore, MSMEs are often referred to as the saviors of the nation in times of crisis. (Sudrartono et al., 2022)

Android Operating System

Android is a Linux-based operating system used for mobile devices or tablets (PDA). Android provides an open platform for developers to create their own applications, making it one of the most popular mobile operating systems today.

Android was founded in 2003 by Andy Rubin, Nick Sears, Rich Miner, and Chris White. It was later acquired by Google in July 2005. Initially developed by a startup company named Android Inc., the operating system gained significant momentum after being acquired by Google. Today, Android has become one of the most influential operating systems for mobile phones and gadgets worldwide. (Hanif & Sinambela, 2020)

Dart

Dart is an open-source, structured programming language for building complex web-based browser applications. Users can run Dart applications directly in a browser that supports Dart code or compile Dart code into JavaScript. Dart features familiar syntax, is class-based, optionally typed, and single-threaded. It has a concurrency model called *Isolates*, which enables parallel execution. In addition to running Dart code in a web browser or converting it to JavaScript, users can execute Dart code in a command-line environment hosted in the Dart Virtual Machine. This allows both the client-side and server-side components of an application to be coded in the same language. Dart's syntax is similar to Java, C#, and JavaScript, making it easy to learn. (Sofi & Dharmawan, 2022)

Android Studio

Android Studio is an Integrated Development Environment (IDE) for Android application development, based on IntelliJ IDEA. In addition to the powerful IntelliJ code editor and development tools, Android Studio offers numerous additional features. (Pratama et al., 2023) It is an IDE that is widely used by developers of all skill levels to create excellent Android apps. Additionally, as a tech enthusiast, you have to be familiar with the fundamentals of this instrument. We will thus walk you through the process of installing Android Studio on your PC in this post(Dinata & Marlim, 2020).

Supabase

Supabase is a Backend as a Service (BaaS) and an open-source alternative to Firebase for backend developers. Instead of relying on a NoSQL database, Supabase provides a relational database—PostgreSQL.
Supabase offers storage, database, authentication, and real-time services, simplifying backend functionality for front-end developers. As a BaaS, Supabase combines various scalable open-source technologies, including PostgreSQL as the database, GoTrue for authentication, PostgREST for providing REST APIs, and Kong as the API Gateway (Valerian Romero et al., 2023).

3.0 METHODOLOGY

Extreme Programming

In this research, the Extreme Programming (XP) method is used to design and develop the "LaKu" application. Extreme Programming is chosen because it emphasizes flexibility, collaboration, and rapid iterations, making it highly suitable for designing and developing a startup application (Zuhairra & Putri, 2020). With XP, the development team can quickly respond to changing user requirements through short and repetitive development cycles, ensuring that essential features such as ordering, product management, and transactions function optimally (Sinaga & Hajjah, 2020).
The following are the stages of the system development process using the Extreme Programming method:

1. **Planning**
   In this stage, the researcher conducts planning for developing the "LaKu" application based on collected data. Using data from interviews and field observations, the researcher plans the development process,

dividing it into several stages necessary to fulfil the application's functionality and features (L. R. Setiawan & Nasien, 2020).

2. **Design**
   In this stage, the researcher designs the "LaKu" e-commerce platform application. The design includes system architecture, user interface design, and other technical specifications required for system implementation (Jollyta et al., 2025).
3. **Coding**
   In this stage, the researcher performs programming using the Android Studio code editor, the Dart programming language, and the MEmu Android Emulator to ensure the application functions according to the promised features.
4. **Testing**
   In this stage, the researcher conducts unit testing (automated testing to determine whether the developed features work correctly) and acceptance testing (user testing to verify that the entire system has been developed according to the promised features) (Suharti & Shinta, 2021).

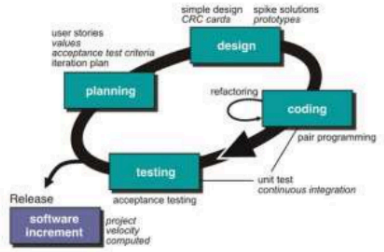

Figure 1. Extreme Programming method

Data Collection

In this research, the researcher conducted data collection using the following methods:

1. Observation
   Observation was carried out by examining market competition on major e-commerce platforms and in traditional markets, as well as observing MSMEs merchants in Pekanbaru.
2. Interview
   Interviews were conducted with MSME actors in Pekanbaru to understand the obstacles and challenges they face in marketing their products.
3. Literature Study
   The researcher conducted a literature study by exploring and studying articles related to the Extreme Programming system development method, programming languages for Android application development, and how to connect a database to the system (Nasien et al., 2025).

4.0 RESULTS AND DISCUSSION

The following are some system designs such as system architecture design, Use Case Diagram, Activity Diagram, Sequence Diagram, and Class Diagram.

1. Use Case Diagram
   As shown in **Figure 2**, The "LaKu" application supports four roles: Admin, User, Buyer, and Seller. Admins manage the app, reviewing products and stores added by sellers. Users can view stores and products but must log in for full access. After logging in, Buyers can manage their cart, check out, make payments, view transactions, and adjust account settings. Sellers have all Buyer privileges plus access to store settings and sales status.

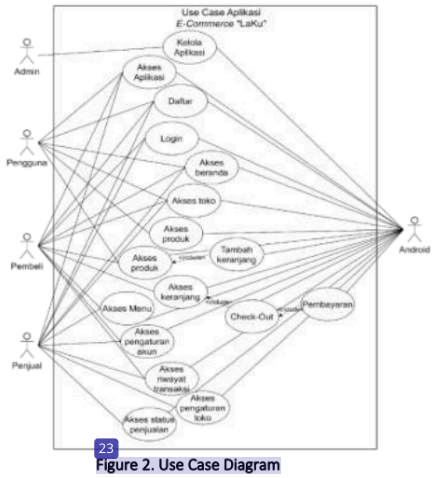

Figure 2. Use Case Diagram

2. Activity Diagram

The new activity diagram will describe the flow of activities in the system being designed, how each flow starts, decisions that may occur, and how they end.

A. Buyer Activity Diagram

The buyer activity diagram shows the process of accessing and making transactions in the "LaKu" app. Buyers must log in first; if the password is incorrect, they return to the login page. If they don't have an account, they must register before logging in. Once logged in, buyers can access the homepage, store, cart, menu, account settings, and order history. From the store, they can view products and add them to the cart. After accessing the cart, they can check out, make payments, and finally log out.

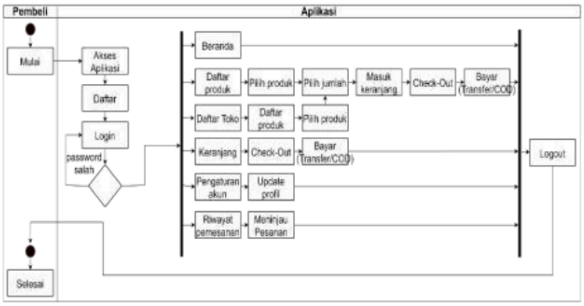

Figure 3. Buyer Activity Diagram

B. Seller Activity Diagram

The seller activity diagram outlines how sellers access and manage transactions in the "LaKu" app. Sellers must log in first; if the password is incorrect, they return to the login page. If they don't have an account, they must register before logging in. Once logged in, sellers can manage store details (name, address, hours, etc.), review sales status, accept or reject orders, send orders, view payment receipts, and complete orders. Finally, sellers can log out.

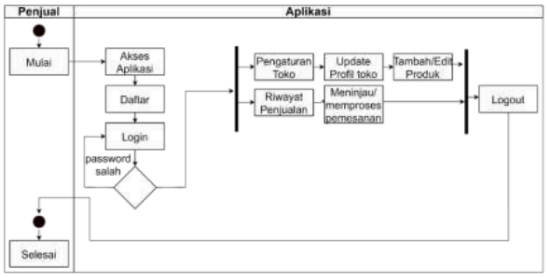

Figure 4. Seller Activity Diagram

3. Sequence Diagram

Sequence diagram describes the sequence of a process carried out to the desired goal starting from the program login to produce a report or the required output.

A. Buyer Sequence Diagram

The buyer's sequence diagram shows the steps a buyer follows in the Android-based "LaKu" app. Buyers must log in first; if the password is incorrect, they return to the login page. If unregistered, they must sign up before logging in. Once logged in, buyers can access the homepage, store, cart, menu, account settings, and order history. They can browse products, add items to the cart, check out, make payments, and log out.

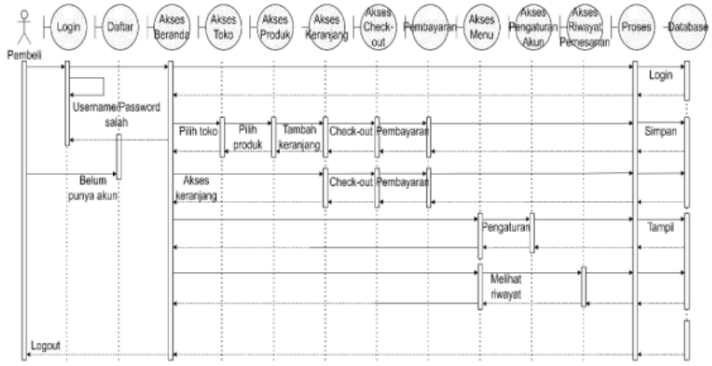

Figure 5. Buyer Sequence Diagram

B. Seller Sequence Diagram

The seller's sequence diagram illustrates the seller's activities in the Android-based "LaKu" app. Sellers must log in first; if the password is incorrect or they don't have an account, they must return to the login page or register. Once logged in, sellers can manage store details (name, address, hours, etc.), review sales status, accept or reject orders, send orders, view payment receipts, complete orders, and log out.

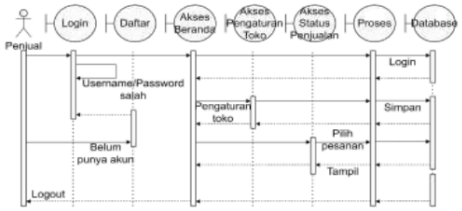

Figure 6. Seller Sequence Diagram

4. Class Diagram
   The class diagram shows the relationships between key entities in the "LaKu" application, including User, Toko, Produk, Pemesanan, and Detail_Pemesanan. The User table stores data for admins and shop owners, linked to Toko via id_user. Produk contains items sold by each store. Orders are handled in Pemesanan, with product details stored in Detail_Pemesanan. Each class supports CRUD operations for managing data. These relationships ensure seamless integration and efficient store operations.

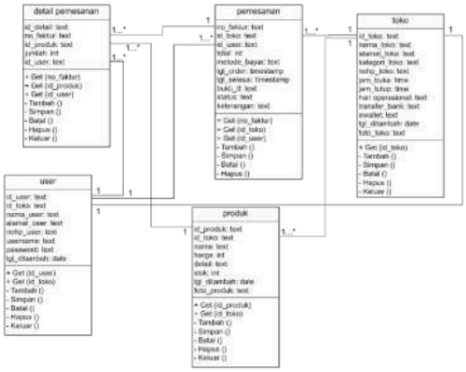

Figure 7. Class Diagram

The following is the logo for "LaKu" app.

Figure 8. "LaKu" App Logo

In the logo from Figure 8 there is a Selembayung which is the most commonly used and most prominent ornament in the design of buildings in Pekanbaru city. The umbrella is red which means "Brotherhood and Courage" and yellow which means 'Power' and green which means "Fertility and Prosperity". Below the umbrella is the name "LaKu" which stands for "Lancang Kuning" which is under the name "LaKu".

5. User Interface Design

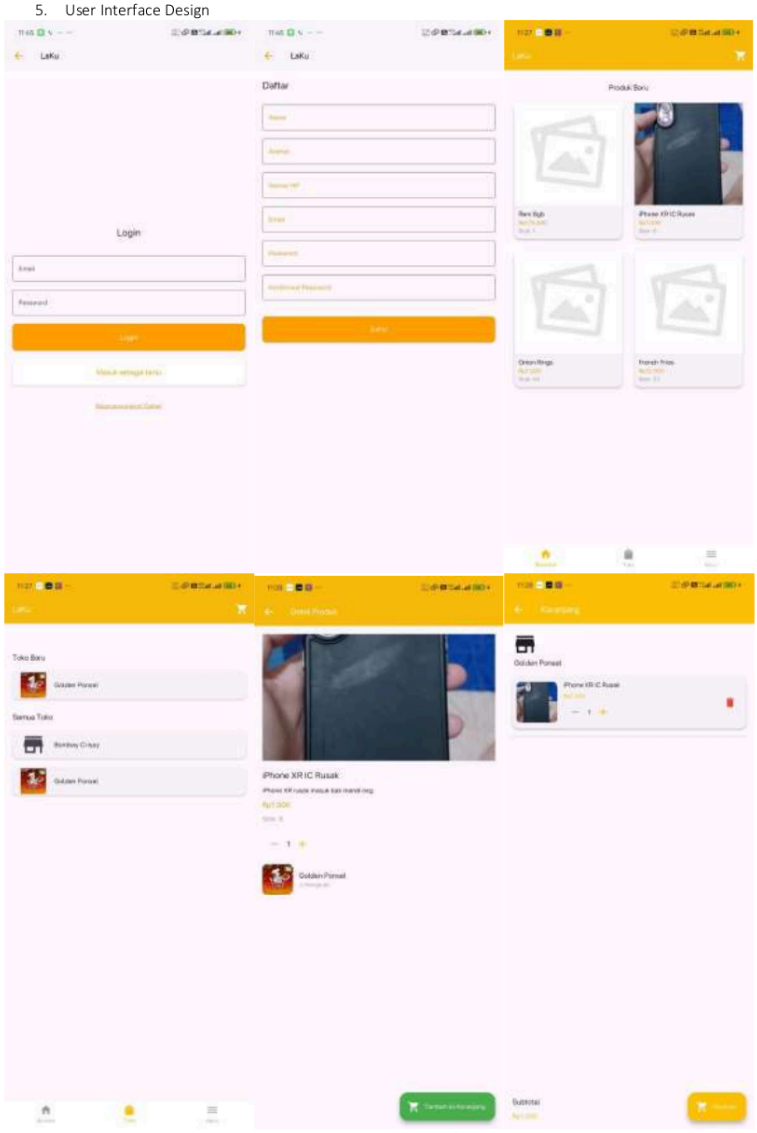

Figure 10. LaKu Final UI Design

Figure 10 shows some of the final design of "LaKu" app's user interface.

5.0 CONCLUSION

In conclusion, The "LaKu" application helps MSMEs in Riau reach a wider market and grow their businesses more efficiently. Its user-friendly features, low fees, and simple registration process support both new and existing MSMEs in managing transactions. This application not only increases MSMEs' competitiveness against larger brands but also aligns with the regional government's efforts to promote digital transformation in the business sector. The user-friendly interface, simple registration process, and support for various payment methods make "LaKu" accessible to a wide range of users, especially those with limited digital experience.

The "LaKu" application significantly expands the marketing reach for MSMEs in Riau Province who previously only relied on traditional methods such as word of mouth and local markets. This opens up opportunities for MSMEs to penetrate regional, national, and even international markets.

As for suggestions, this study is limited to Android users in Riau. Future research should expand the scope and add features like integrated bank/e-wallet payments, location tracking with interactive maps, and dynamic shipping cost calculations based on weather and distance.

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