# Development of the Creative Toba Marketplace Mobile Application using the Iterative Model

Riyanthi Angrainy Sianturi, Arnaldo Marulitua Sinaga, Ardiles Sinaga, Willy Susilo, Yohanssen Pratama, Indah Chris Sarah Sinurat, Nesty Gloria Tampubolon, Onra Immanuel Sihombing, Angela One Erika, Agnes Feni Rosalina Naibaho, and Jerico Geraldo Situmorang

***Abstract*— Marketplace is an application allowing sellers and buyers to transact online. Sellers market their products, while buyers search for and buy things. With an understanding of the marketplace and Micro, Small, and Medium Enterprises (MSMEs) in Toba Regency, the authors developed a mobile application for the Creative Toba Marketplace. In the previous development, we created the web-based application of Creative Toba Marketplace. However, based on the sellers' feedback, they mostly use smartphones to do their business. The development of the mobile application used the iterative model with agile methodology. Iterations were conducted three times with a focus on features for buyers and sellers. The results of the First Iteration include the functions of Account Registration, Account Login, Change Password, and Product Search. The results of Second Iteration are the functions of Add Product to Cart, Remove Product from Cart, Buy Now, Checkout, Cancel Order, Upload Proof of Payment, Add Buyer Address, Delete Buyer Address, Create Store, Add Product, Edit Product, Delete Product, Confirm Purchase, Add to Favorites, Delete from Favorites, View Account, Add Account, Delete Account, Manage User Data, Add Seller Address, and Delete Seller Address. In the Third Iteration, we built the payment feature. The result of the User Acceptance Test was acceptable.**

***Index Terms*—Agile development, Iterative model, Mobile application, MSMEs, Online marketplace, Toba.**

## I. INTRODUCTION

MSMEs play an essential role in a country's economy. MSMEs usually have a relatively small number of employees, limited business revenue, and limited access to capital [1]. Nonetheless, MSMEs significantly contribute to economic growth as they create jobs, support financial inclusion, and contribute to local incomes [2].

In the Toba region of North Sumatra, MSMEs perform a valuable role in supporting the local economy. In addition to supporting economic growth by producing goods and services, MSMEs can create jobs for residents. They make various products representing the region's rich culture and natural resources. Examples of MSME products in the Toba region include traditional handicrafts such as wood carvings with Bataknese patterns, bamboo weaving, ulos woven fabrics, local food and beverages such as Sambal Tuktuk, Toba Peanuts, Andaliman Cassava Chips, and agricultural products such as Toba coffee. The marketing of MSME products in the Toba region must implement intelligent strategies, especially in this digital era. One effective strategy is to utilize a marketplace for electronic transactions. The development of a mobile-based market contributes to the growing trend of using smartphones in the community [3][4][5].

The primary reason for developing a mobile-based application for Creative Toba Marketplace is that people mostly use smartphones in daily activities, including online shopping and interaction. A mobile application allows consumers to easily access and purchase MSME products online, increasing the accessibility and competitiveness of local products. The purpose of developing this application is to expand market reach, increase MSME sales, and support the economic growth of the Toba region in North Sumatra.

## II. STUDIED ITERATIVE MODEL

### A. Application

An application is a collection of software programs combining certain features so users can access them. The function of an application is closely related to the purpose of creating the application, which is to provide convenience and comfort in various fields of life. An application is a group of interconnected components that achieve a common goal by receiving input processes and producing outputs in an organized transformation process. Thus, the definition of the system is a set of interconnected procedures where, in a system, there are inputs, methods, and outputs to achieve the desired goals [6].

### B. Marketplace

The online marketplace allows sellers and buyers to meet and conduct various transactions. It has become a popular business model because it benefits both sellers and buyers.

R. A. Sianturi, A. M. Sinaga, and A. Sinaga are with the Faculty of Vocational Studies at Institut Teknologi Del, Indonesia (e-mails: riyanthi@del.ac.id, aldo@del.ac.id*, ardiles.sinaga@del.ac.id).

W. Susilo is with the Faculty of Engineering and Information Sciences at the University of Wollongong, Australia (email: willy_susilo@uow.edu.au).

Y. Pratama is with the Graduate School of Science and Technology at Nara Institute of Science and Technology, Japan (email: yohanssen.pratama.yl0@is.naist.jp).

I. C. S. Sinurat, N. G. Tampubolon, O. I. Sihombing, A. O. Erika, A. F. R. Naibaho. J. G. Situmorang are with the Software Engineering Technology at Institut Teknologi Del, Indonesia (e-mails: indah.sinurat@del.ac.id, nestytampubolon61@gmail.com, onraimanuel04@gmail.com, angelaoneerika@gmail.com, agnesfenirosalinanaibaho@gmail.com, jericogeraldo31@gmail.com).

Sellers can reach a wider audience and get better exposure for their products. Buyers can find a wide selection of products from different sellers in one place, making it easier for them to compare prices and quality [7][8][9].

### C. Creative Toba Marketplace

The name of the mobile application is Creative Toba Marketplace. Creative Toba Marketplace is a program of the Toba Regency government overseen by the Department of Communication and Information Technology of Toba Regency. As a center for creative and cultural activities, Creative Toba Marketplace aims to promote and support local creative industry entrepreneurs. The purpose of the development of Creative Toba Marketplace is to introduce products from the Toba region that can be sold to the broader community so that Toba products and culture can be more broadly recognizable. Creative Toba Marketplace can be a catalyst in strengthening the local creative economy ecosystem and supporting the development of the cultural industry in the region.

### D. Iterative Model

Agile methods, introduced in the 1990s, were designed to reduce process complexity by eliminating unnecessary steps and excessive documentation. The goal is to quickly deliver a software system to users, allowing them to suggest changes and add new business requirements. This approach is guided by the Agile Manifesto, which emphasizes valuing people and interactions, working software, customer collaboration, and adaptability to change. To achieve these principles, agile methods focus on small, dedicated, co-located teams that work closely together [10].

Agile methods follow an iterative and incremental development approach that supports the continuous delivery of product features. Features are delivered in multiple releases or iterations, with priorities set according to customer needs and changes. Continual prioritization of requirements is, therefore, a central aspect of agile methods [10].

A linear process flow carries out each of the five framework activities in order, starting with communication and ending with deployment. In contrast, an iterative process flow revisits one or more of the activities before moving on to the next step. This iterative approach allows the customer to regularly assess the software increment, offer feedback to the software team, and shape the adjustments made to the process in response to that feedback [11].

The method used in this research is the iterative approach, which involves iterative and incremental cycles. The iterative process makes it possible to identify and fix the problems at an early stage so that the issues will not continue to the next process [12]. In the first iteration, the development completely follows each step, from planning to analysis, design, implementation, and testing. The test and evaluation results from the first iteration become the basis for re-analyzing the next iteration [9][13][14].

This method helps estimate and define requirements in detail during the modeling process. By performing iterations, the development team can test the concepts, identify the problems early, and make the necessary changes quickly. This approach allows the final product to meet user needs and minimizes development risks [15][16][17].

### E. Mobile

Android is a mobile phone operating system based on Linux. It primarily provides a platform for developers to create applications for different types of devices. Google developed the Android operating system, which can be used on smartphones, tablets, smartwatches, and more. Android has an extensive ecosystem with thousands of apps on the Google Play Store. The operating system also supports many features and services, including internet connectivity, text messaging, media playback, GPS navigation, and more.

One of Android's advantages is its open-source characteristic, allowing developers to access and modify the code according to their needs. It has become a popular mobile operating system globally, used by millions of people for various purposes [18][19][20].

## III. System Design

A business process is a series of steps or activities performed to design, develop, and implement software applications that meet business and user needs. After a thorough analysis, it was found that the web-based Creative Toba Marketplace application was less practical because of the extended business process and was less compatible with smartphones. The study found that all MSME owners use smartphones instead of laptops or personal computers as working tools. This study is the basis for developing a mobile-based application that is more concise to use.

The mobile-based application of Creative Toba Marketplace was developed using an iterative model. The iterative model is a fundamental part of the Agile methodology. This method is used in an iterative work process with a structured and organized collaborative team. When designing an app using the iterative method, the team must first define the project plan and align the overall project goals. The next step is the analysis and design stage, followed by the implementation of the analysis results. Following this, we conducted testing, and the final step was to evaluate the product's overall performance. After analyzing the existing web application, the team will proceed to the design stage, starting with database design, UI style guide, and prototype.

A database is a systematically organized collection of data that is easy to access, manage, and update. Data is stored in tables, which consist of rows and columns. Each row in a table represents an entity, while each column represents an attribute or feature of that entity. Some tables commonly created include the user table, tenant table, product table, and transaction table, as shown in Table 1, Table 2, Table 3, and Table 4.

TABLE I
USER

| Id Field | Description | Type & length | Null | Remarks |
|---|---|---|---|---|
| id | Saving id | bigint (20) | NO | Primary key |
| username | Storing username | varchar (225) | NO | - |
| email | Storing email | varcar (225) | NO | - |

| | | | | |
|---|---|---|---|---|
| email_verified_at | Storing verifikasi email | timestamp | YES | - |
| password | Storing password | varcar (225) | NO | - |
| is_admin | Storing status admin | tinyint (1) | YES | - |
| is_banned | Storing status banned | tinyint (1) | YES | - |
| remember_token | Storing remember token | varchar (100) | YES | - |
| created_at | Storing the user's last creation time | timestamp | YES | - |
| updated_at | Storing the user's last update time | timestamp | YES | - |

TABLE
TENANT

| Id Field | Description | Type & length | Null | Remarks |
|---|---|---|---|---|
| merchant_id | Storing merchant id | bigint (20) | NO | Primary key |
| user_id | Storing user id | bigint (20) | NO | - |
| merchant_id | Storing merchant name | varcar (225) | NO | - |
| store_descrption | Storing store description | text | NO | - |
| store_contact | Storing store contact | varcar (225) | NO | - |
| merchant_photo | Storing merchant photo | varcar (225) | NO | - |
| is_verified | Storing verification status | tinyint (1) | YES | - |
| on_vacation | Storing active status | tinyint (1) | YES | - |
| created_at | Storing the user's last create time | timestamp | YES | - |
| updated_at | Storing the user's last update time | timestamp | YES | - |

TABLE II
PRODUCT

| Id Field | Description | Type & length | Null | Remarks |
|---|---|---|---|---|
| product_id | Storing product id | bigint (20) | NO | Primary key |
| marchant_id | Storing merchant id | bigint (20) | NO | - |
| category_id | Storing category id | bigint (20) | NO | - |
| product_name | Storing product nama | varcar (225) | NO | - |
| product_description | Storing product description | text | NO | - |
| price | Storing product price | bigint (20) | NO | - |
| heavy | Storing product weight | int (11) | NO | - |
| is_deleted | Storing the status of deleted user | tinyint (1) | NO | - |
| created_at | Storing the user's last create time | timestamp | YES | - |
| updated_at | Storing the user's last update time | timestamp | YES | - |

TABLE III
TRANSACTION

| Id Field | Description | Type & length | Null | Remarks |
|---|---|---|---|---|
| purchase_id | Storing user id | bigint (20) | NO | Primary key |
| purchase_id | Storing purchase code | varchar (255) | YES | - |
| user_id | Menyimpan id user | bigint (20) | NO | - |
| checkout_id | Storing checkout id | bigint (20) | NO | - |
| purchase_address | Storing purchase address | varchar (255) | YES | - |
| purchase_price | Storing purchase price | bigint (20) | YES | - |
| purchase_discount | Storing purchase discount | bigint (20) | YES | - |
| purchase_status | Storing purchase status | varchar (255) | NO | - |
| receipt_number | Storing receipt number | varchar (255) | YES | - |
| courier_code | Storing courir code | varchar (255) | YES | - |
| service | Storing service status | varchar (255) | YES | - |
| shipping_cost | Storing shipping cost | bigint (20) | NO | - |
| is_cancelled | Storing cancellation status | tinyint (1) | NO | - |
| created_at | Storing the user's last create time | timestamp | YES | - |
| updated_at | Storing the user's last update time | timestamp | YES | - |

A UI Style Guide is documentation that provides guidelines and rules about layout, design, color, and typography. It aims to ensure consistency and an exemplary user interface across a particular product or platform. The UI Style Guide for the Creative Toba Marketplace application is shown in Fig. 1.

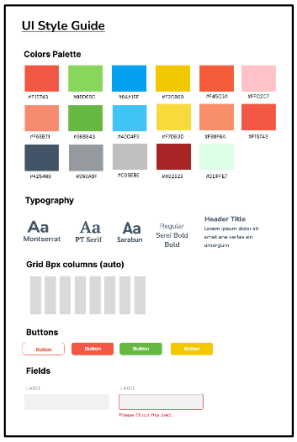


Fig. 1. UI Style Guide

After designing the database and UI Style Guide, the team will design the mobile application's user interface. The user interface design was developed using the Figma tool. From the results of the analysis stage, stakeholders who will use the application are divided into two roles: tenants and buyers. The admin can create, update, and delete data on the website. The pages that have been designed include the main page, log-in, products, shopping cart, and administrator. These pages can be seen in Fig 2, Fig 3, Fig 4, and Fig 5.


Fig. 2. Homepage

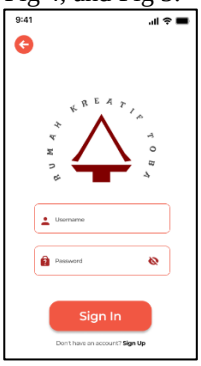


Fig. 3. Login

Fig. 4. Products

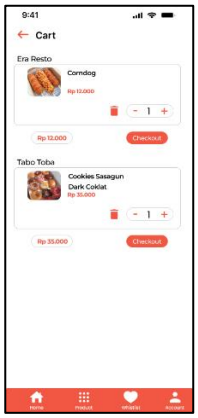


Fig. 5. The Cart

Furthermore, the results of this user interface design will be handed over to the development team for construction into a mobile application.

## IV. Result and Discussion

This section presents the results of the project implementation process. The project implementation follows an iterative model. A total of 3 iteration stages were involved in developing this project. Developing an application rarely or never involves a single development process that directly results in a perfect application that meets all needs and capabilities. Therefore, we used an iterative model to help enhance the application developed. Errors or inadequacies found in the first iteration will be resolved in the second iteration, and errors or inadequacies found in the second iteration will be resolved in the third iteration. In the implementation of the third iteration, finalization will also be conducted so that by the time this application is disseminated, it is targeted to reach 95% of the expected target users.

### *A. The Result of the First Iteration*

#### A.1. Planning

The activities undertaken during the planning stage include preparing documentation from the requirements gathering to understand the problem and objectives. During project execution, this documentation is the basis for developing work plans and implementation strategies. In addition, this stage also involves creating a Project Implementation Plan, which includes a comprehensive project implementation plan, including timelines, required resources, and specific steps to take during the project. The Project Implementation Plan serves as the main guideline in directing the course of the project and ensuring that the set objectives are being achieved.

#### A.2. Requirement Analysis

The current system is identified and evaluated at the Requirement Analysis stage to determine the causes of existing problems. The analysis is conducted through observations and interviews with sellers and buyers who have used the existing website-based application of Creative Toba Marketplace. In addition, ideas and solutions needed to improve the system following the objectives and requirements of the project are defined. From the analysis results, two actors were identified, namely buyers and tenants. Use Case Diagram describes the interaction between users and the system in terms of the functionality provided by the system. The Use Case Diagram can be seen in Fig 6.


Fig. 6. Use Case of the Application

A.3. Design

The design stage includes creating a Business Process Modeling Notation to represent the steps a user takes from initiation to completion of a task. This process business diagram can be seen in Fig. 7 below.

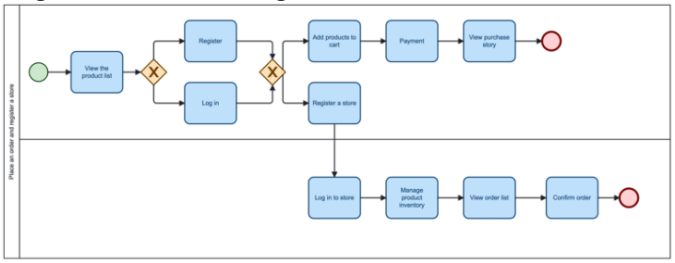


Fig. 7. Business Process of the Application

The target system of this research is a mobile application-based marketplace. The purpose of the application is to simplify the buying and selling process compared to a website that has been built previously because mobile applications are more effective than websites. This application will also help users obtain information more quickly through notifications provided by mobile devices.

The authentication process in the mobile application does not need to be repeated because the user account can be stored in the application every time it is opened. In Fig. 7, there is a Target Buyer System that will first open the application and then display the product list. A person must register an account to make a purchase or register a shop and sign in as a tenant. If a person already has an account and the admin has verified it, he can directly log in. Once the buyer selects a product, they will be directed to the payment page, and the admin will verify the payment. In addition, buyers can also view their purchase history. After that, several interfaces were created in the design stage, such as the home page, products, authentication, and product categories.

A.4. Implementation

In the first iteration, we focused on features such as displaying products by category, specifically best-selling food and beverages and new ones available for purchase. Also, authentication has the option to log in or register. If the user already has an account, they can log in. Otherwise, they will choose to register. The next feature is a keyword-based product search, which makes it easier for users to search for specific products.

A.5. Testing

Before the deployment, the prototype and the application are tested to ensure their quality. We conducted Black Box testing to assess functionality without considering the internal structure or logic of the code. Testing was conducted to ensure the application operated as expected and met predefined quality standards. This testing aims to identify and fix bugs or other issues.

A.6. Deployment

At the deployment stage, the system is launched and can be accessed by buyers and renters. If there are errors during system development, it can return to the analysis stage to fix and complete the missing program functions.

*B. The Result of the Second Iteration*

B.1. Planning

At the planning stage of the Second Iteration, we focused on developing functional features for both buyers and renters. For buyers, there are features such as Cart, Cancel Order, Order History, Manage Personal Data, and Payment. Seller features include Create New Store, Manage Store Data, Manage Products, and Manage Orders. The second iteration is planned to last five weeks.

B.2. Requirement Analysis

During this iteration, we focused on developing features that aim to improve the user experience from buyers' and sellers' perspectives. The requirements analysis section highlighted several features that need to be implemented. Buyers' features include adding items to the cart, canceling orders before they are processed, viewing order history, managing personal data such as shipping addresses, and making payments using various methods. As for sellers, the features to be implemented include creating a new store on the platform, managing store information such as description and contact details, managing the list of products offered, and viewing and managing orders received from buyers. Thus, implementing these features is expected to increase convenience and efficiency in the transaction process for both parties and enrich the online shopping experience.

B.3. Design

This design stage focuses on describing how the features identified in the requirements analysis stage will be implemented technically. The emphasis is on designing an intuitive and responsive user interface, including building drawings and prototypes to visualize user interactions. Next, the system architecture was designed to handle the features efficiently and with sufficient scalability, including careful database design to store information about users, stores, products, and orders. Each feature is then detailed in a technical design that includes business logic, algorithms, and integration with other system components. Security aspects are also considered, with the implementation of encryption for sensitive data and authentication and authorization features to protect user privacy. Finally, the design is tested through prototyping and user testing to ensure an optimal user experience before full implementation. This approach resulted in a robust technical plan to implement the desired features and ensure the system's design met the expected quality and security standards.

B.4. Implementation

In the implementation stage, the focus is on implementing the features analyzed in the second iteration. The second iteration mainly focused on ordering for buyers and features for sellers, specifically the Shop features that sellers have within the app. Some of the features that have been

implemented are the cart feature, order cancellation feature, order history feature, managing personal data, creating a new store feature, managing store data, managing products, and managing orders.

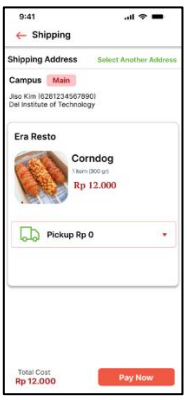


Fig. 8. Shopping Cart Page


Fig. 9. Profile Management Page

The cart page, shown in Fig. 8, stores the selected items before a purchase. Payment is made by placing an order for each store.

The Profile Management Page in Fig. 9 allows users to organize and manage personal information that has been saved.

B.5. Testing

Black Box Testing tested the application in the Second Iteration to verify its functionality. All features were tested and met the expected results.

B.6. Deployment

The application with the functions developed in the First and Second Iterations was released at this stage. The functions released in this iteration are Add Product to Cart, Remove Product from Cart, Buy Now, Checkout, Cancel Order, Upload Proof of Payment, Add Buyer Address, Remove Buyer Address, Create Store, Add Product, Edit Product, Remove Product, Confirm Purchase, Add to Favorites, Remove from Favorites, View Account, Add Account, Remove Account, Manage User Data, Add Seller Address, and Remove Seller Address.

### *C. The Result of the Third Iteration*

C.1. Planning

In the Third Iteration, we developed the buyer side by developing the payment features. This feature development process lasted for five weeks, with each step done cautiously and systematically to ensure the quality and success of the feature implementation.

C.2. Requirement Analysis

At this stage, we developed the payment feature. The requirements analysis for the payment feature involves understanding what is needed in the payment system, how users will use it, and how to keep the payment information secure and efficient. By involving these steps, we can design and develop payment features that meet user needs and ensure information security.

C.3. Design

The design stage for the payment feature involves visually and functionally representing how the payment process will happen within the app or system. It includes an intuitive and easy-to-use interface (UI) with precise payment totals, prominent payment buttons, and transparent transaction confirmations. Good design of payment features ensures a smooth, secure, and efficient user experience in payment transactions.

C.4. Implementation

The payment feature implementation stage is conducted according to the results of the Requirement Analysis that has been determined. Implementation of payment features as depicted in Fig. 10. Payment is processed when the buyer selects the items to be purchased and chooses the delivery system. There are two types of delivery: sent by courier or pick-up on the spot. The pick-up option means the buyer picks up the products at the store.

C.5. Testing

In the Testing stage, all functions built during the three iterations, including the payment feature developed in the Third Iteration, were tested using Black Box Testing. This feature has successfully met the expected results.

C.6. Deployment

All features have been released at the Deployment Stage, so they are available and can be used by buyers and tenants. After successful deployment, a User Acceptance Test is conducted. The result is that all features developed are acceptable and meet the requirements.

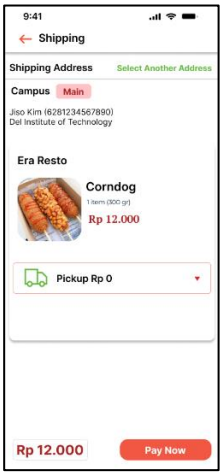


Fig. 10. Payment Page

## V. CONCLUSION

In this study, the Creative Toba Marketplace Mobile marketplace application was developed to improve the business process and create a more intuitive, responsive, and user-friendly user interface. Based on the analysis of

weaknesses in the previous web-based application, an innovation was made to present the mobile application of Creative Toba Marketplace. The methodology used in this research is the Iterative model using Agile Software Development. This method allows for repetition and improvement at each stage of development to ensure the quality and success of the resulting application. This research has three iterations, and each iteration produces a report as evidence of the work done and accountability for the application developed.

The result of this research is Creative Toba Marketplace's mobile application, which has an intuitive, responsive, and user-friendly interface. This application provides users with a convenient and easy shopping experience while improving business processes to be more effective, efficient, secure, and comfortable. It is hoped that this application will assist tenants and buyers in using it and become one of the e-marketplace applications capable of competing with other well-known and widely used marketplace applications in Indonesia.

In developing this application, the Android platform was chosen as the basis due to its high popularity in Indonesia, with approximately 94% of users being on Android. Android, a mobile operating system developed by Google, provides a comprehensive platform for developers to create various applications. The advantage of Android being an open-source operating system is that it allows developers to modify it according to their needs. Overall, developing this mobile application is expected to benefit tenants and customers conducting buying and selling activities and increase the competitiveness of marketplace applications in Indonesia.

## ACKNOWLEDGMENT

The Del Institute of Technology fully supports this research through the provision of funding and facilities**.**

## REFERENCES

[1] R. Sidahuruk and D. Sulistyono, "The Role of Micro, Small and Medium Enterprises (MSMEs) in the Lake Toba Region (*Peran Usaha Mikro, Kecil dan Menengah (UMKM) di Kawasan Danau Toba*)," *Jurnal Gerbang Riset Inovasi*, vol. 1, no. 1, pp. 19–29, Aug. 2022, doi: http://dx.doi.org/10.55932/grin.v1i1.12.

[2] A. T. Novitasari, "The Contribution of MSMEs towards Economic Growth in the Digitalization Era through the Role of Government (*Kontribusi UMKM Terhadap Pertumbuhan Ekonomi Era Digitalisasi Melalui Peran Pemerintah*)," vol. 9, no. 2, pp. 184–204, Dec. 2022.

[3] D. S. N. Marbun and M. Simanjuntak, "The Impact of Digital Marketing on Enhancing the Marketing Performance of Tourism MSMEs in Toba Regency Indonesia (*Pengaruh Digital Marketing terhadap Peningkatan Kinerja Pemasaran UMKM Pariwisata di Kabupaten Toba Indonesia*)," pp. 130–142, 2021.

[4] A. A. Dongoran, D. N. Hasibuan, Hendri, W. M. Dalimunthe, S. Wulandari, and W. D. Safina, "Improving Economic Growth in North Sumatra through MSME Development (*Peningkatan Pertumbuhan Ekonomi Sumatera Utara Melalui Pengembangan UMKM*)," vol. 5, no. 2, pp. 117–122, Dec. 2022.

[5] Aris, M. A. Fadillah, F. Z. Muttaqin, and A. M. V. B. Marbun, "Saving and Loan Information System Application at Syari'ah At Tahwil Joint Venture Cooperative in Tangerang City (*Aplikasi Sistem Informasi Simpan Pinjam pada Koperasi Usaha Bersama Syari'ah At Tahwil Kota Tangerang*)," *Seminar Nasional Teknologi Informasi dan Multimedia 2016*, pp. 7–12, Feb. 2016.

[6] S. R. Ajija, O. S. Hartadinata, and C. Sulistyowati, "Optimizing of Marketplace for Online Shopping and Selling among Housewives in Rural Areas (*Optimalisasi Pemanfaatan Marketplace sebagai Sarana Belanja dan Berjualan Online pada Kelompok Ibu Rumah Tangga di Perdesaan*)," *Jurnal Layanan Masyarakat (Journal of Public Services)*, vol. 5, no. 2, pp. 346–355, Nov. 2021, doi: 10.20473/jlm.v5i2.2021.346-355.

[7] I. Sofiani and A. I. Nurhidayat, "Design and Development of e-Marketplace Application for Agricultural Products Based on Website by Using Code Igniter Framework (*Rancang Bangun Aplikasi e-Marketplace Hasil Pertanian Berbasis Website dengan Menggunakan Framework Code Igniter*)," *Jurnal Manajemen Informatika*, vol. 1, no. 1, pp. 25–32, 2019.

[8] O. A. D. Wulandari, Ujiani, and N. R. Putri, "Analysis of Marketplace Utilization in Increasing Revenue for MSME Product Sales in Purbalingga (*Analisis Pemanfaatan Marketplace dalam Meningkatkan Pendapatan Bagi Penjualan Produk UMKM di Purbalingga*)," *Jurnal Ekonomi Manajemen*, vol. 6, no. 2, pp. 96–101, Dec. 2020.

[9] A. Hanif, M. Lilik Martanto, and H. Adianto, "Adaptation of Iterative SDLC Model to Mobile-first Approach of Responsive Web Interface Development (*Adaptasi Model SDLC Iteratif Terhadap Pendekatan Mobile-first Untuk Pengembangan Antarmuka Web Responsive*)," *Jurnal Ilmiah Teknik Informatika FORMAT*, vol. 10, no. 1, pp. 12–27, 2021.

[10] R. H. AL-Ta'ani and R. Razali, "Prioritizing Requirements in Agile Development: A Conceptual Framework," *Procedia Technology*, vol. 11, pp. 733–739, 2013, doi: https://doi.org/10.1016/j.protcy.2013.12.252.

[11] R. Pressman and B. Maxim, *Software Engineering: A Practitioner's Approach 9th Edition*. 2019.

[12] M. R. Gultom, R. A. Sianturi, R. S. Parhusip, O. F. Marbun, and Y. Pratama, "Development of Signer Portal for Digital Products by Using Iterative Model at PT RST," in *2022 Seventh International Conference on Informatics and Computing (ICIC)*, 2022, pp. 1–9. doi: 10.1109/ICIC56845.2022.10007002.

[13] D. C. Wynn and C. M. Eckert, "Perspectives on Iteration in Design and Development," *Res Eng Des*, vol. 28, no. 2, pp. 153–184, Apr. 2017, doi: 10.1007/s00163-016-0226-3.

[14] J. Frei, A. Ziltener, M. Wüst, A. Havelka, and K. Lohan, "Iterative Development of a Service Robot for Laundry Transport in Nursing Homes," in *Social Robotics*, F. Cavallo, J.-J. Cabibihan, L. Fiorini, A. Sorrentino, H. He, X. Liu, Y. Matsumoto, and S. S. Ge, Eds., Cham: Springer Nature Switzerland, 2022, pp. 359–370.

[15] R. Novriansyah, I. Aknuranda, and W. Purnomo, "Development of Information System for Deliberation with Iterative Method, Case Study: Ibnu Sina Mosque Jl. Veteran, Malang (*Pengembangan Sistem Informasi Musyawarah Dengan Metode Iteratif, Studi Kasus: Masjid Ibnu Sina Jl. Veteran, Malang*)," vol. 3, no. 6, pp. 6200–6209, 2019, [Online]. Available: http://j-ptiik.ub.ac.id

[16] N. D. Weinstein, P. M. Sandman, and S. J. Blalock, "The Precaution Adoption Process Model," in *The Wiley Encyclopedia of Health Psychology*, 2020, pp. 495–506. doi: https://doi.org/10.1002/9781119057840.ch100.

[17] E. M. Olson, K. M. Olson, A. J. Czaplewski, and T. M. Key, "Business strategy and the management of digital marketing," *Bus Horiz*, vol. 64, no. 2, pp. 285–293, 2021, doi: https://doi.org/10.1016/j.bushor.2020.12.004.

[18] C. A. Febrina, F. Ariany, and D. A. Megawaty, "Mobile-based e-Marketplace Application for Stainless Businesses in Bandar Lampung Region (Aplikasi e-Marketplace Bagi Pengusaha Stainless Berbasis Mobile di Wilayah Bandar Lampung)," *Jurnal Teknologi dan Sistem Informasi (JTSI)*, vol. 2, no. 1, pp. 15–22, 2021, [Online]. Available: http://jim.teknokrat.ac.id/index.php/JTSI

[19] A. Adekotujo, A. Odumabo, A. Adedokun, and O. Aiyeniko, "A Comparative Study of Operating Systems: Case of Windows, UNIX, Linux, Mac, Android and iOS," *Int J Comput Appl*, vol. 176, no. 39, pp. 71–24, 2020.

[20] A. Mos and M. M. Chowdhury, "Mobile Security: A Look into Android," in *2020 IEEE International Conference on Electro Information Technology (EIT)*, 2020, pp. 638–642. doi: 10.1109/EIT48999.2020.9208339.