# DESIGN AND IMPLEMENTATION OF TANGERANG REGENCY KORPRI AND COOPERATIVE E-COMMERCE SERVICE APPLICATIONS

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**Abstract** - Cooperatives and public services play an important role in supporting the local economy. The Tangerang Regency Korpri Cooperative faces challenges in providing efficient and effective service access for its members, especially due to geographical limitations. With the development of information technology, this project aims to design and implement a Korpri service application and e-commerce for the Tangerang Regency Cooperative, so that members can access services without physical location limitations. The methodology used is the Software Development Life Cycle (SDLC), including the planning, analysis, design, implementation, and maintenance stages. Each stage focuses on identifying needs, designing the user interface, developing the frontend and backend, testing the application, and maintaining it. Testing will be carried out both internally and with users to ensure the quality of the application. This project is expected to improve operational efficiency, transparency, and member trust through easily accessible transaction recording. Indicators of project success include increasing member access to cooperative services and increasing participation in cooperative activities. This application is expected to support local economic growth by increasing members' economic activities and improving their welfare. This project shows that digitalization can overcome geographical constraints and improve member efficiency and satisfaction.

**Keywords** - Korpri Service Application, Cooperative E-Commerce, Mobile Platform, Cooperative Member Welfare.

## I. INTRODUCTION

In the current digital era, public services and cooperatives play a crucial role in supporting the local economy, especially by providing services and facilities to members dispersed across various regions. The Koperasi Korpri in Tangerang Regency faces unique challenges in providing efficient and effective access to its members, as the cooperative's physical location is not always easily reachable. Additionally, with Korpri members spanning departments, agencies, districts, and retired officials across 29 districts, the cooperative encounters difficulties in ensuring equal and timely service. Advancements in information technology offer opportunities to modernize how cooperative services are delivered. Digital solutions, particularly mobile applications, can overcome geographical barriers and expedite transaction processes and services. This project aims to design and implement a Korpri service application and e-commerce platform for the Tangerang Regency Cooperative. The goal is to facilitate Korpri members' access to cooperative services without physical location constraints, increase transaction efficiency and transparency, and provide a mobile-accessible platform.

The proposed application is expected to integrate various cooperative services, such as savings and loan and online shopping, within a single, easy-to-use platform. Consequently, it

is anticipated that cooperative members can conduct transactions more quickly, transparently, and accurately, supporting local economic growth through increased cooperative activity.

The Korpri Cooperative in Tangerang Regency faces challenges in providing efficient services to its members due to limited physical access, especially for members spread across 29 sub-districts. Many members have difficulty visiting the cooperative office, which hinders them in conducting transactions and obtaining service information. To address this, this project designs a mobile-based e-commerce application that allows members to access cooperative services from anywhere, increasing efficiency, transparency, and member participation. With the SDLC methodology, this application is expected to support local economic growth by strengthening cooperative activities that are more easily accessible.

This project employs the Software Development Life Cycle (SDLC) methodology, encompassing the stages of planning, analysis, design, implementation, and maintenance to ensure effective and efficient application development. Comparison with Previous Research:

1. Researchers (Capra et al., n.d. 2021): This research focuses on a mobile application aimed at enhancing customer service in Malang's Waste Bank by providing information on account balances, waste prices, and waste collection schedules. Testing results indicate that the application functions well and improves service efficiency. The study uses a mobile-based software development approach to improve customer service, involving end-user testing to evaluate functionality and efficiency. The main focus of this research is on waste management services, not on e-commerce aspects, as in the Korpri research. The application is more specific to waste management needs, while the Korpri project encompasses the integration of e-commerce and broader cooperative services.

2. Researchers (Powon Achoke & Zachary Bolo Awino, n.d.): E-commerce solutions can boost sales and market access for cooperatives. This study demonstrates significant benefits from integrating e-commerce into cooperative operations. The Korpri project aligns with these findings but goes into greater detail with mobile application implementation and comprehensive integration of cooperative services, not just focusing on sales. Limitations: Focuses primarily on sales and market access without considering comprehensive integration with cooperative services.

3. Research by a team of researchers (Tidar National Seminar Proceedings, n.d.): Cooperatives play a vital role in community development by providing a platform for economic collaboration and improving members' welfare. This study focuses more on the general role of cooperatives in community development, whereas the Korpri project specifically aims to implement digital technology to enhance cooperative services and efficiency. Limitations: Does not cover digital technology implementation.

4. Research (Diajukan et al., n.d.): Sharing information among SACCO cooperatives can enhance operational efficiency and transparency. This study emphasizes the importance of collaboration and data sharing to improve cooperative services. The Korpri research also emphasizes transparency but is more focused on digital technology and e-commerce rather than information sharing among cooperatives.

5. Researchers (Zhong et al., 2019): An analysis of coordination in revenue sharing in the e-commerce logistics supply chain with cooperatives shows improved efficiency and cost

reduction. This study is more technical and focuses on logistics and supply chains, whereas the Korpri research has a broader scope, covering various cooperative services.

6. Research team (Mukenya, n.d.): Cooperatives can improve farmers' welfare by providing better access to markets and resources. This study focuses on the agricultural sector, while the Korpri project applies more broadly to general services for Korpri members and the integration of e-commerce.

7. (Hayatin et al., 2017): Researchers used a mobile application to improve customer service in Malang's Waste Bank by providing information on balances, waste prices, and collection schedules. The application functions well and enhances service efficiency. The main focus is on waste management services rather than e-commerce aspects, as in the Korpri research. The application is more specific to waste management needs, whereas the Korpri project includes e-commerce integration and broader cooperative services.

8. Researchers (Su et al., 2021): E-commerce adoption has a positive and significant impact on farmers' participation in digital financial markets, particularly in digital wealth management and payments. The focus is on farmers and digital financial markets, which differ from Korpri's broader approach to various cooperative services.

9. Research team (Kumar et al., 2015): Findings show that digital platforms improve public service efficiency, including member data management and transactions. The Korpri research is more specific to cooperatives and e-commerce aspects, while this journal covers public services in a more general context.

10. Researchers (Zhong et al., 2019): Findings indicate that adopting mobile technology for cooperative services faces technical challenges and training needs. The Korpri research offers practical solutions and direct integration with a broader e-commerce system.

The Korpri service application and e-commerce of the Tangerang Regency Cooperative are designed to provide a significant direct impact for users, especially Korpri members, in accessing cooperative services. With this application, Korpri members can access various cooperative services, such as savings and loans and online shopping, without having to come to the cooperative office. This eliminates geographical barriers and increases time and cost efficiency for members, who are spread across various agencies and regions in Tangerang Regency. In addition, this application significantly improves member welfare by providing easy access to financial services and e-commerce, allowing members to manage their finances and make transactions transparently and safely. With the integration of payment gateways such as Xendit, the application ensures that every transaction is clearly recorded and can be accessed at any time, which builds member trust in the cooperative system. These features encourage more dynamic economic activities, which ultimately support the overall economic welfare of members

Based on the comparison of various studies, it can be concluded that the research on the Koperasi Korpri e-commerce application takes a more comprehensive and integrated approach than previous studies, which were more specific and focused on certain aspects. Overall, the Koperasi Korpri e-commerce research demonstrates a more holistic and integrated approach, encompassing various aspects of cooperative services, improving

efficiency, transparency, and accessibility, and offering a broader solution compared to studies that focus on specific, targeted areas.

## II. METHOD

This project uses the Software Development Life Cycle (SDLC) methodology, which consists of five main stages to ensure effective and efficient application development and implementation. The stages in this project are as follows:

SDLC Scheme

This is the SDLC scheme used in this project:

A [Planning] ➡B[Analysis];
B ➡C [Design];
C ➡D [Implementation];
D ➡E [Maintenance];
E ➡F [User Feedback];

**Discussion**

1. **Planning:**
   - **Needs Identification:** Engages stakeholders and cooperative members to understand their needs and challenges. The results of this identification form the foundation for the entire development process.
   - **Resources and Timeline:** Determines the development team, tools, and software to be used, as well as sets a realistic project schedule covering all development stages.
2. **Analysis:**
   - **User Requirements:** An in-depth analysis of user needs ensures that the developed application truly meets the cooperative members' needs.
   - **Content Structure and Technology:** Selecting the right technology and planning the application content structure help ensure functionality and user-friendliness.
3. **Design:**
   - **Wireframes and Prototypes:** Help the development team and stakeholders visualize how the application will look and function.
   - **UI/UX Design:** Focusing on a positive user experience ensures that the application will be easy and enjoyable for cooperative members to use.
4. **Implementation:**
   - **Development and Testing:** Frontend and backend development are conducted in parallel, with continuous testing to ensure application quality. Testing covers various aspects, from functionality to performance.
   - **Optimization:** After testing, optimization is performed to ensure smooth application performance under various conditions.
5. **Maintenance:**
   - **Monitoring and Updates:** Continuous monitoring and periodic updates ensure the application remains relevant and secure. Regular backups protect data from loss, and technical support helps users resolve any issues they encounter.

The SDLC methodology used in this project ensures that each stage of application development is carried out in a structured and systematic manner, from planning to maintenance. This method enables the integration of e-commerce and broader cooperative services, thereby enhancing efficiency, transparency, and accessibility for Korpri members in Tangerang Regency. Through this approach, the project not only creates a functional application but also one that is easy to use and provides significant benefits for its users.

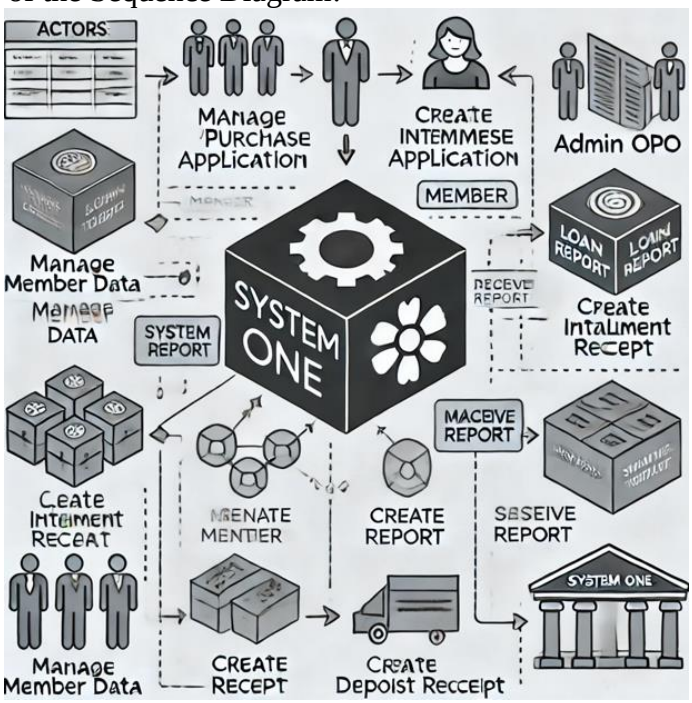
## III. RESULT AND DISCUSSION

The implementation of the Koperasi Korpri e-commerce service application is the process of deploying software designed to provide services related to transactions and cooperative management digitally. This application provides convenience for cooperative members in conducting transactions, accessing information, and managing finances. The system developed is a digital Koperasi Korpri system..

### System Design

#### 1. Sequence Diagram

A sequence diagram is used to explain and show interactions between objects within a system. It also illustrates the messages or commands sent, as well as their execution timing. The objects involved in the operational process are arranged from left to right. Below is the detail of the Sequence Diagram.




**Picture 1.** Sequence Diagram for the Digital Koperasi Korpri System Architecture

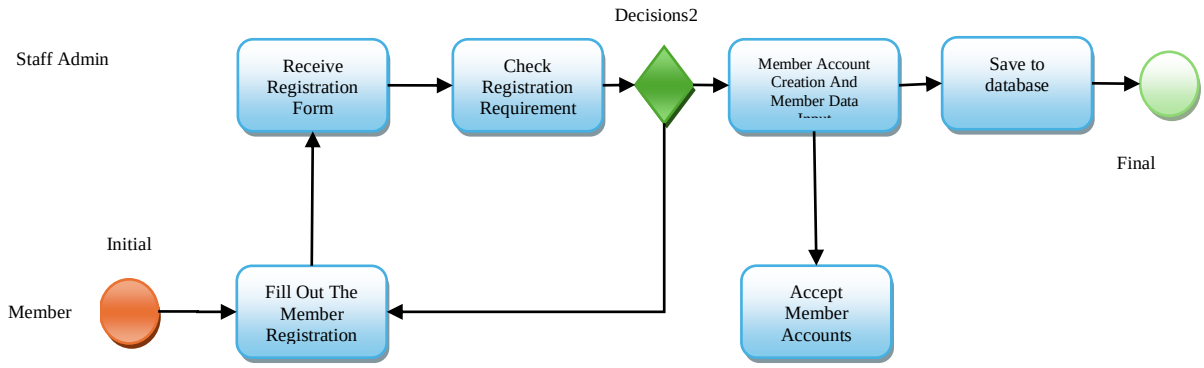
The cooperative system, represented by "System One" at the center of the diagram, is designed to streamline data management and operational processes. The system involves three main actors: Admin OPO, Member, and Main Admin. Admin OPO is primarily responsible for generating reports and managing member-related transactions, including savings, deposits, and withdrawals. Members are individuals who can register with the cooperative, apply for loans or make purchase requests, and receive receipts for their transactions. Main Admin oversees the maintenance of master data, approves reports, and manages various high-level system tasks.

Within "System One," several core processes ensure the cooperative functions smoothly. These include managing member data to keep track of each member's information and account details, and member registration, which enables new members to join the

cooperative. Members can also submit loan or purchase applications as part of their benefits. Manage Master Data is a key process handled by Main Admin, supporting the structure and data integrity of the system. For transaction tracking, the system provides functionalities to create installment receipts, manage installment data, receive and generate reports, manage savings and deposit data, and produce receipts for deposits and withdrawals. Dashed arrows labeled as "include" indicate dependencies between processes, showing where certain tasks rely on data or actions from others. For example, creating a receipt requires managing the underlying transaction data first. This organized structure promotes efficient data flow and clear responsibilities among all actors, facilitating transparency and ease of operations within the cooperative.

## 2. Activity Diagram

An activity diagram simulates the processes occurring within a system, represented in a vertical format that shows the sequence of processes in the system. The activity diagram is an extension of the use case diagram, which includes an activity flow. It can also be used to analyze use case diagrams by providing explanations about actors, actions that need to be taken, and when those actions should occur. Below is the activity diagram for the Koperasi Korpri Project*:*



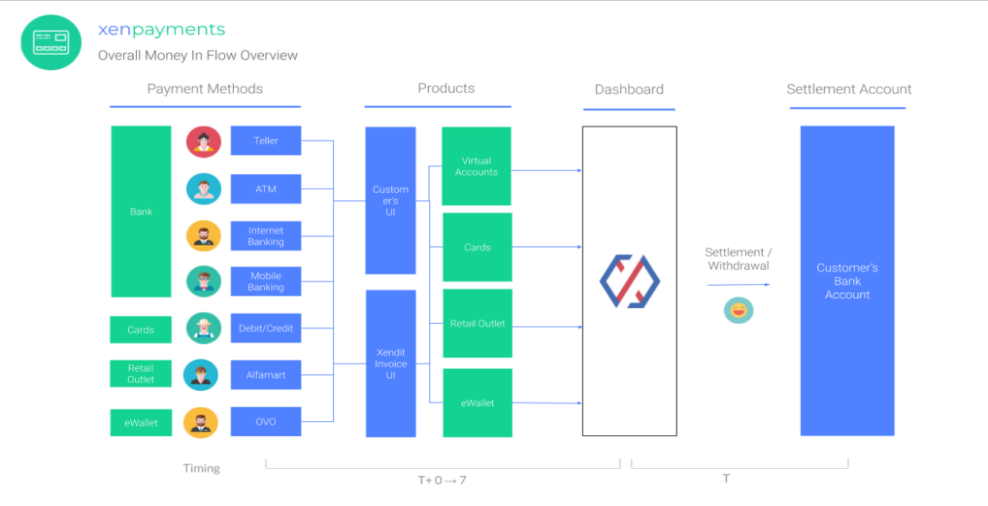

**Picture 2.** Activity Diagram

This diagram shows the member registration process flow involving members and admin staff. The process starts with members filling out the registration form. After the registration form is filled out, it is sent to the admin staff for further processing. The admin staff then checks whether the registration form meets the required requirements. If the requirements are met, the process continues to the next stage. However, if the requirements are not met, the form is returned to the member to be corrected or re-completed.

If the registration form meets the requirements, the admin staff creates a member account and enters the required data. After the member account is created, the account is officially accepted as a member. Then, the member data that has been accepted is stored in the database. This process ends at the data storage stage, ensuring that only members who meet the requirements are successfully registered and their data is stored properly.

## 3. Integration with Xendit Payment Gateway

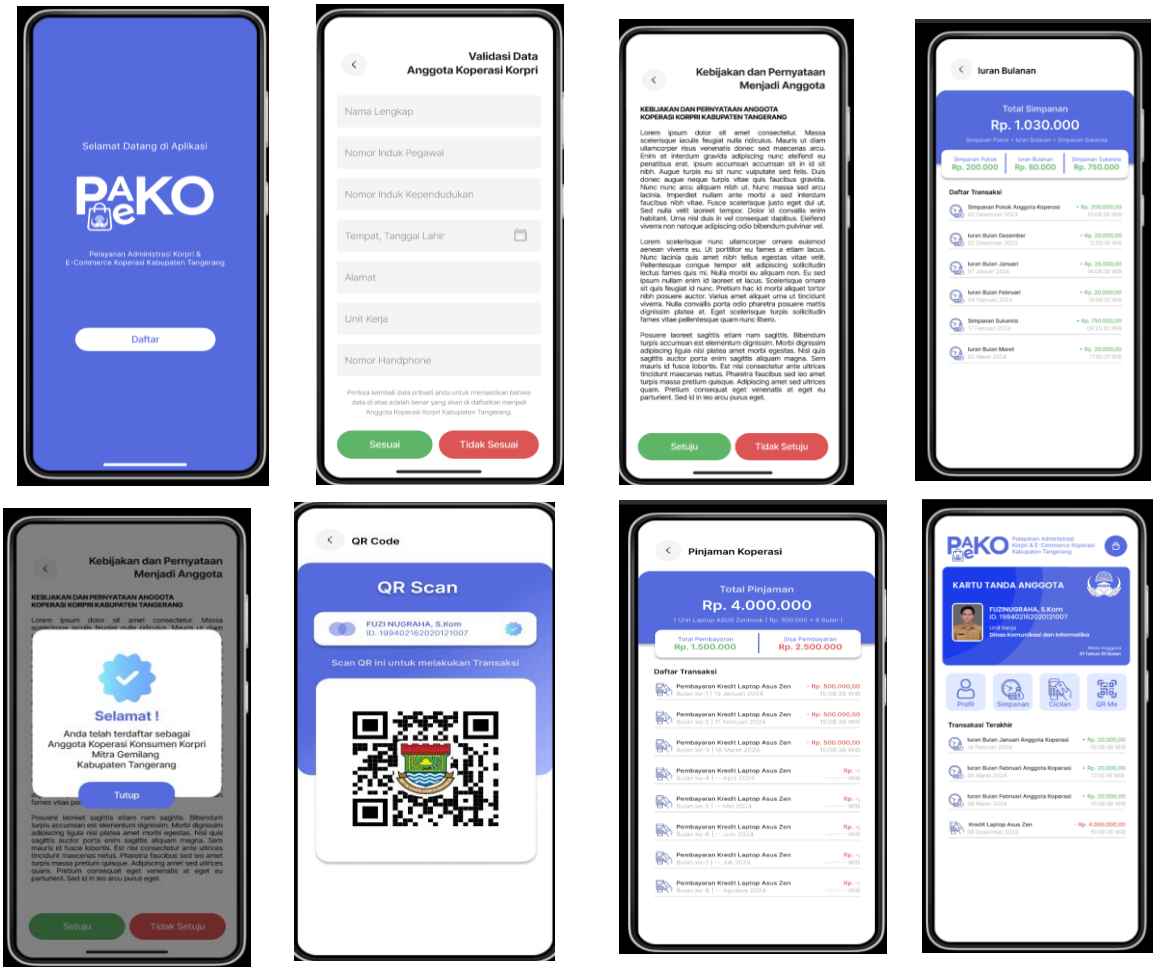
To enhance payment transparency, we will integrate the Xendit payment gateway, which enables secure online payments by transferring funds from the customer’s bank or e-wallet to the service provider.




**Picture 3.** Integration with payment gateway Xendit

## 4. User Interface Design (UI/UX)

UI/UX design focuses on creating user-friendly and visually appealing interfaces for software. Its goal is to enable enjoyable and easy interaction for users. Below is an overview of the UI/UX design for the Koperasi Korpri E-commerce application.

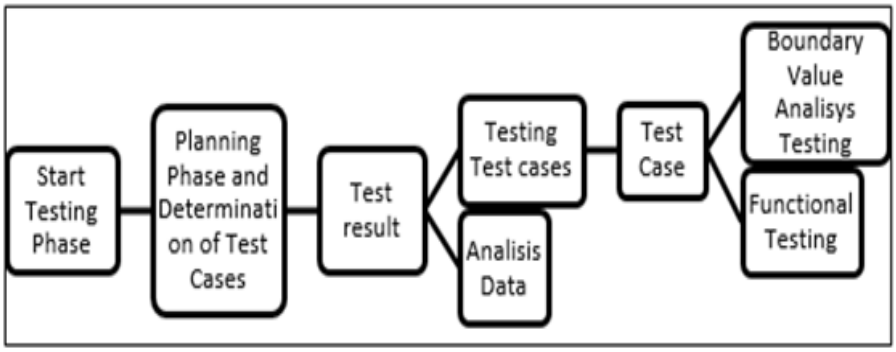



**Picture 4.** Applikasi E-commerce Koperasi Korpri Digital

## Testing and Validation

### 1. Black Box Testing

Testing the Koperasi Korpri Application involves completing an identity form and evaluating results through boundary value analysis. First, black box testing is chosen with boundary value analysis. The focus is the identity form for new members. Testing is then conducted, and results are measured and documented.

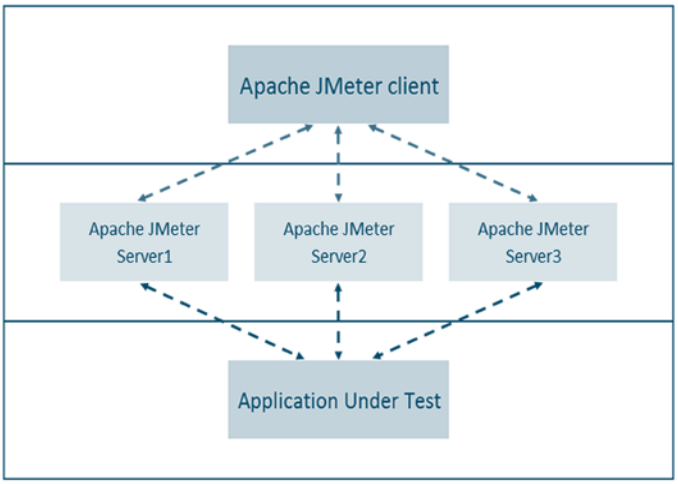



**Picture 5.** Test Flow

Boundary Value Analysis Testing Technique is an effective method for identifying functional errors in a system. The input scenarios used can be determined by examining the data format. Functional testing is conducted through several input scenarios that are tested to produce valid data for storage in the database. Based on the tests performed, it can be concluded that testing using Boundary Value Analysis focuses solely on input and flexibility, informing the conformity of the developed application with the specified requirements. The test results show that the application operates successfully at 100%. The system can validate the identity form entered by prospective participants. In future research, it is recommended to use more than one technique from the black box testing method and to test additional sections to ensure more valid results.

### 2. Real-Time Server Load Testing

In the development of a digital application, it is crucial to ensure that the server can handle user load efficiently without causing service disruptions. Apache JMeter, as one of the popular load testing tools, has been selected to test the real-time server load and assess its performance




**Picture 6.** Skenario Pengujian dengan Jmeter

**Testing Scenario:**

- Total virtual users: 5000 users
- Testing duration: 30 minutes

From the load testing performed using Apache JMeter, the following results were obtained:

**Test Results:**

- Average Response Time: 250 ms (This value indicates that the application responds quickly.)
- Error Rate: 0% (This means no errors were found during the testing, indicating that the application is stable.)
- Requests Per Second: 150 requests/second (This rate shows that the server can handle a high volume of requests in a short period of time.)
- Server Resource Usage:
  - CPU: 60% (Although there is load, the server has not yet reached its maximum capacity.)
  - Memory: 50% (There is still room for growth and additional load.)

  Bandwidth: 70% (Data communication between the client and the server is efficient.)

## IV. CONCLUSION

The conclusion of the implementation of the e-commerce service application of the Korpri Cooperative in Tangerang Regency shows that this application has significant advantages compared to conventional cooperative service methods. This application successfully overcomes geographical challenges by allowing cooperative members to access services from anywhere without having to visit a physical office. In addition, this application increases transparency and member trust through easily accessible transaction records and an intuitive and easy-to-use interface. This application also strengthens the cooperative's digital infrastructure, supports local economic development, and increases the economic activities of cooperative members through features such as safe and easily accessible online savings and loans and shopping. With this digital platform, cooperatives can provide more efficient, transparent services and improve the overall welfare of members.

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