



## **System Modeling and Software Requirement Documentation for a Multilevel Marketing Dropship Platform at CMA Solutions**

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Received: 3/2/2025

Revised: 11/3/2025

Accepted: 31/3/2025

Published: 8/4/2025

### **ABSTRACT**

This technical report details a business analysis and system modeling study conducted within the Information Technology department at CMA Solutions Sdn Bhd. The primary objective of this study was to design and document the system architecture for the "Eden Network," a newly developed multilevel marketing dropship platform aimed at assisting sellers in Indonesia. The methodology encompassed the creation of context diagrams, use case diagrams, and detailed process maps utilizing Draw.io to visualize the interactions between the system and its external entities. Subsequently, these visual models were translated into a comprehensive Software Requirements Document (SRD), which systematically captured the process rules, inputs, and outputs for seven core modules. The results yielded clear, unambiguous process maps and SRD tables for modules such as Fulfillment, Shopping Cart Management, and Stock Disposal. These documentations successfully bridged the gap between business requirements and technical development, preventing operational misunderstandings and guiding the software engineering team. Ultimately, applying logical and mathematical precision to IT system requirements ensures robust, transparent, and scalable software solutions.

**Keywords:** Business analysis, Context diagram, Process map, Software Requirements Document (SRD), Use case.

### **INTRODUCTION**

CMA Solutions Sdn Bhd is a Bumiputera-owned Information Technology company established in September 2014, currently operating in One City, Subang Jaya. As a subsidiary of Coshare Holdings Berhad, CMA Solutions specializes in web development, software integration, consultation, and IT maintenance. The company aims to pioneer IT solutions and transform technology into a strategic business advantage for its clients, having collaborated with notable entities such as Al-Rajhi Bank, Hong Leong Islamic Bank, and PTPTN.

The Information Technology department is the core of CMA Solutions, dedicated to software management, technology infrastructure, data analytics, and strategic IT planning. A major ongoing initiative within this department is the Eden Network project. Eden Network is a multilevel marketing dropship system designed to serve as a robust platform for promoting and selling products to assist sellers in Indonesia.

Developing a comprehensive dropship platform requires meticulous translation of business logic into technical specifications. Therefore, analytical tasks were executed to bridge the gap between user requirements and system development. The first task involved constructing a Context Diagram, Use Cases, and Process Maps for the Eden Network. The second task translated these visual workflows into a formal Software Requirements Document (SRD). These foundational engineering steps are critical for minimizing development errors, identifying stakeholders, and ensuring the software functions exactly as intended.

## THE PROPOSED METHOD

### System Modeling: Context Diagrams, Use Cases, and Process Maps

To visually structure the Eden Network, the Draw.io application was utilized to draft three critical architectural models:

- **Context Diagram:** Designed to provide a high-level view of the system's scope. The Eden Network system was placed centrally, and arrows were used to denote data movement (inflows and outflows) between the system and external actors.
- **Use Case Diagram:** Constructed to describe user-system interactions across seven core modules: Registration/Recruitment, Sales/Order, Fulfillment, Product Management, Network Management, Commission Management, and Sales Program Management. Dotted arrows were applied to represent extended and included functionalities.
- **Process Maps:** Created to chart the user's experience from the entry point to the final outcome for each module. Swimlanes were utilized to differentiate processes executed by specific entities. Standard flowchart shapes—ellipses for start/end points, rectangles for processes, and diamonds for decisions—were rigorously applied.
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### Documenting Software Requirements (SRD)

The finalized process maps were systematically translated into a Software Requirements Document (SRD). The SRD acts as a blueprint detailing the intended features and functionality of the software. For each module, a tabular format was constructed containing four primary columns: Process Number (corresponding to the labels on the process flow), Process Rules (guidelines and conditions the system must follow), Input (information or user actions triggering the process), and Output (the resulting state or data generated).

## EVALUATION AND RESULTS

### Architectural Visualization

The system modeling phase successfully mapped the complex interactions of the dropship platform (See Figure 1). The context diagram clearly identified that the Eden Network interacts with eight distinct

human entities (Public, Member, Affiliate, Business Admin, Distribution Centre, Payment Gateway Provider, Logistic Provider, and Institutional Sales Admin) and one hardware device (Printer).

Furthermore, the high-level use case diagram effectively consolidated the system's modules into a single readable interface (See Figure 2). This visualization demonstrated how certain modules interconnect; for instance, Network Management acts as an extension of the Registration/Recruitment module, while Fulfillment is directly included within the Sales/Order module.

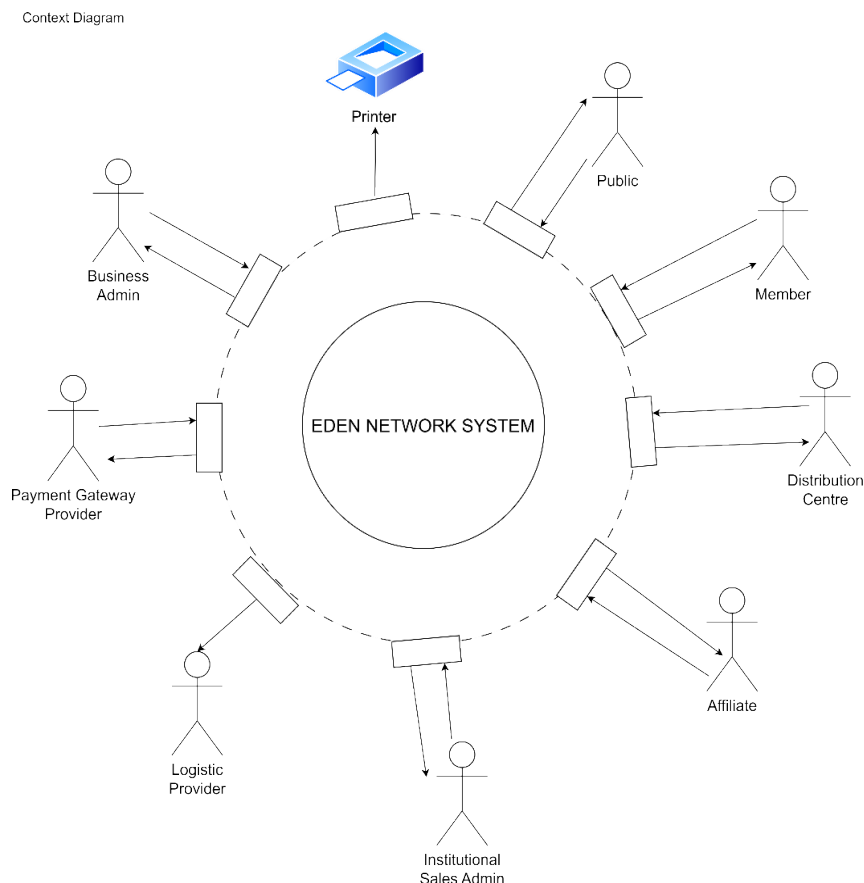
### Software Requirement Specifications

The translation of process flows into SRD tables provided clear, mathematical-like logical rules for the developers to follow, effectively mitigating cross-departmental misunderstandings (See Table 1 and Table 2).

For example, the SRD for Shopping Cart Management logically defined that the "Lanjut Belanja" (Checkout) button must remain hidden (non-visible) if the cart's input condition equates to zero items, replacing it dynamically with an "Empty Cart" label. Similarly, the Stock Disposal SRD established strict compliance rules, mandating that disposal execution (Output) can only trigger if formal approval (Input) is logged by the business owner.

**Figure 1**

*Context Diagram of Eden Network*



**Figure 2**

*Use Case of Eden Network*

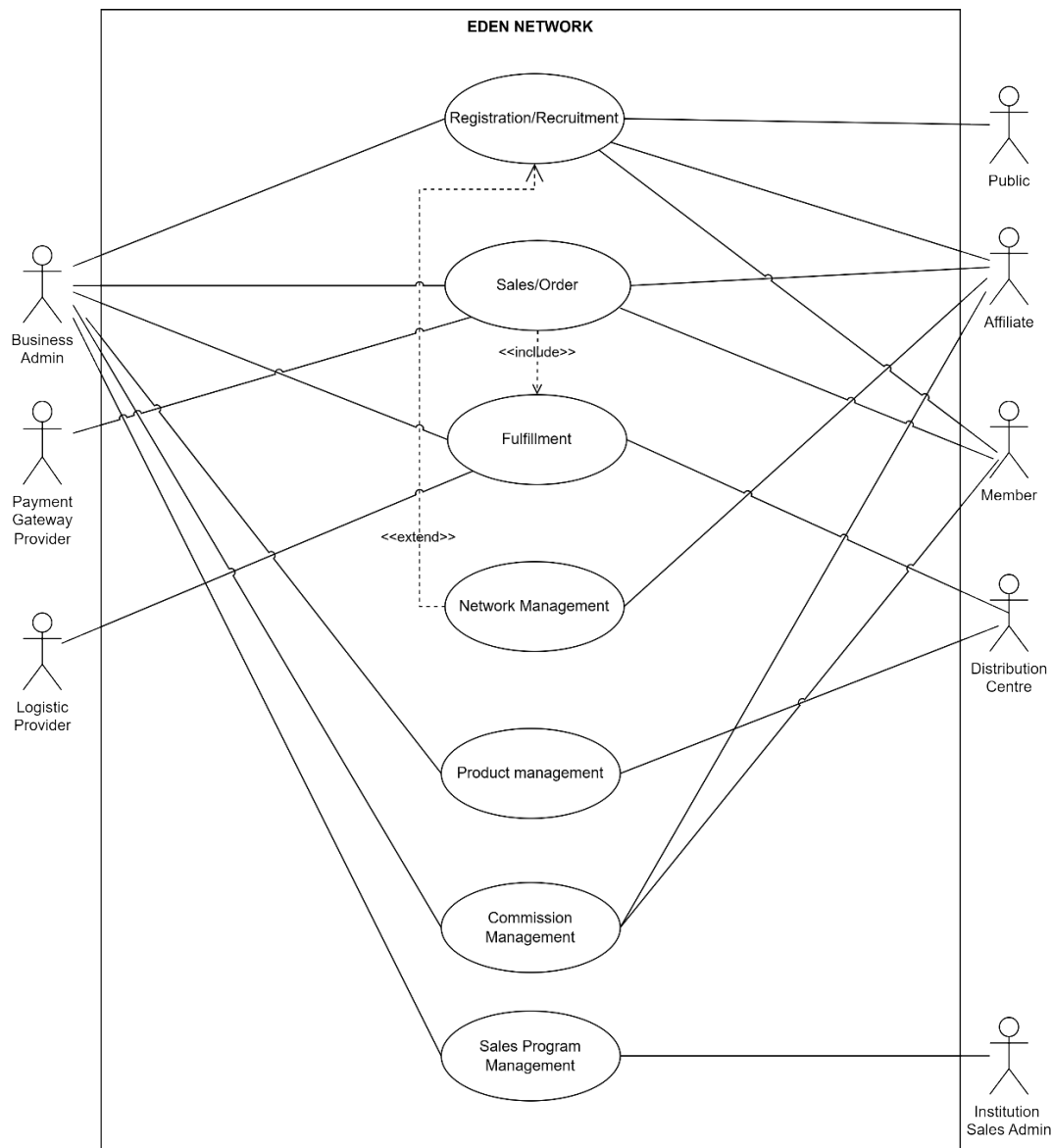
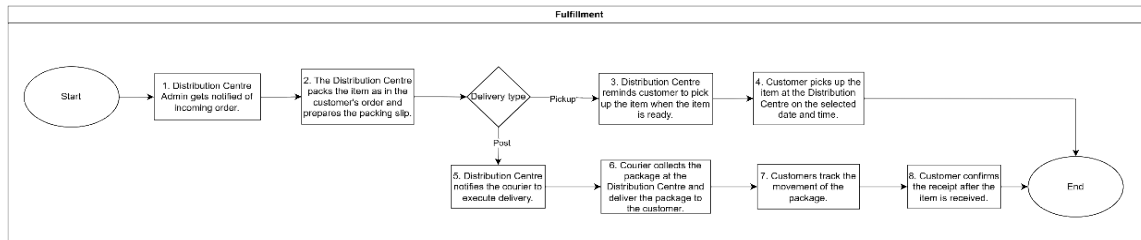
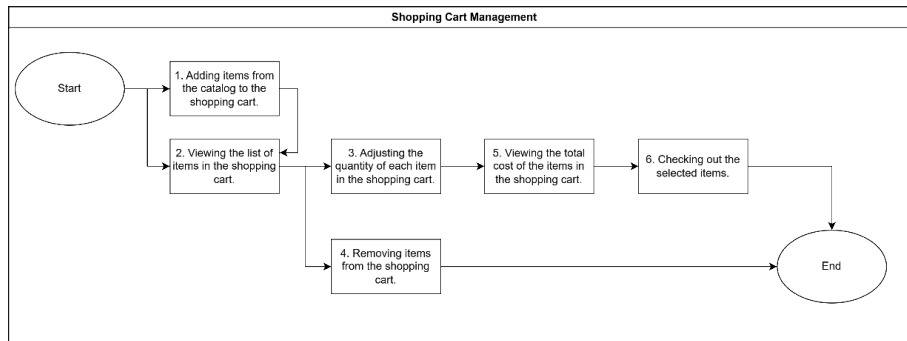


Table 1

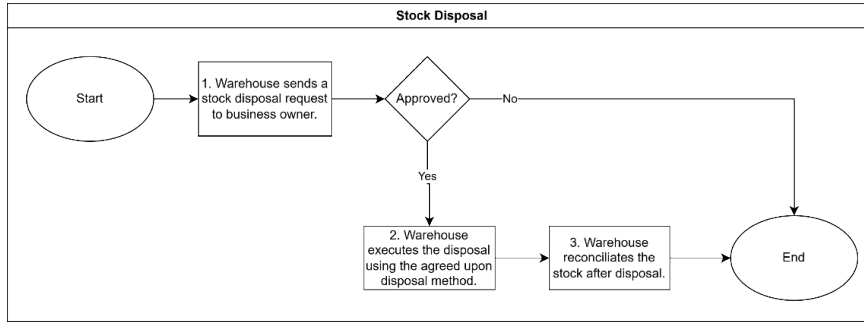
## SRD of Fulfillment



| Process | Process Rule                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     | Input                                                                                                                                                                                                                                                                                                                                                                                               | Output                                                                                                                                                                                                                                                                                                                                                                                                                                                      |
|---------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 1.      | <ol style="list-style-type: none"> <li>When an order is placed by a customer, Distribution Centre Admin shall get notified of the new order through the system.</li> <li>DC Admin can view the list of new orders and the details.</li> <li>The order information must include the order ID, customer's name, the total amount paid, the delivery type, order status, order date, and the details that include the list of items and the quantity of each item.</li> <li>DC Admin shall be able to update the status of order.</li> <li>Every status update made by DC Admin is visible to customers.</li> </ol> | <ol style="list-style-type: none"> <li>Customer's order, including details of the items, quantities, and any special instructions.</li> <li>A system-generated notification that informs the Distribution Centre Admin about the new order.</li> </ol>                                                                                                                                              | <ol style="list-style-type: none"> <li>DC Admin updates the status of the order in the system.</li> <li>Any status update made by DC Admin is visible to the customer.</li> </ol>                                                                                                                                                                                                                                                                           |
| 2.      | <ol style="list-style-type: none"> <li>Item is packed by the Distribution Centre.</li> <li>DC will prepare a packing slip and place it in the parcel with the items.</li> <li>If the delivery method is post, DC will weigh the package and prepare the shipment details.</li> <li>Shipment details include sender's and recipient's information and address, package weight and dimension, the content of the package and special handling request.</li> </ol>                                                                                                                                                  | <ol style="list-style-type: none"> <li>The products that need to be prepared to fulfill the customer's order.</li> <li>Details of the customer's order, including the items, quantities, and any special requests.</li> <li>Information on the chosen delivery method for the package.</li> </ol>                                                                                                   | <ol style="list-style-type: none"> <li>The parcel containing the customer's ordered items, properly packed and sealed.</li> <li>A packing slip placed inside the parcel, listing the details of the packed items for reference.</li> <li>Shipment details that include sender and recipient details, address, weight, dimensions, contents, and special handling requests.</li> </ol>                                                                       |
| 3.      | <ol style="list-style-type: none"> <li>DC Admin must update the status of the order to "Ready for pick-up".</li> <li>Customer shall be notified of the item that is ready to be picked up through email.</li> <li>The notification includes pick-up location, the selected pick-up date and time, and the specific pick-up instructions.</li> </ol>                                                                                                                                                                                                                                                              | <ol style="list-style-type: none"> <li>DC Admin initiates an update to change the status of the order to "Ready for pick-up."</li> </ol>                                                                                                                                                                                                                                                            | <ol style="list-style-type: none"> <li>The customer is notified via email that the order is ready for pickup.</li> <li>The notification content includes the pickup location, pickup date and time, and pickup instructions.</li> </ol>                                                                                                                                                                                                                     |
| 4.      | <ol style="list-style-type: none"> <li>Customer must show the order confirmation to pick up the item.</li> <li>Customer will have to confirm the pickup through the system.</li> <li>After the pick-up is confirmed by the customer, the system will update the order status to "completed".</li> </ol>                                                                                                                                                                                                                                                                                                          | <ol style="list-style-type: none"> <li>The document or confirmation provided to the customer during the order placement process.</li> </ol>                                                                                                                                                                                                                                                         | <ol style="list-style-type: none"> <li>DC updates the order status to "Completed" after the customer confirms the pickup.</li> </ol>                                                                                                                                                                                                                                                                                                                        |
| 5.      | <ol style="list-style-type: none"> <li>DC will notify the courier to execute delivery.</li> <li>DC send the shipment details to the courier.</li> <li>The courier will send a shipping label based on the shipment details.</li> <li>The shipping label shall be placed on the package.</li> <li>DC Admin will update the tracking number in the shipping label to the customer in the system.</li> </ol>                                                                                                                                                                                                        | <ol style="list-style-type: none"> <li>Shipment details that include sender and recipient details, address, package weight and dimensions, package contents, and special handling requests.</li> <li>DC initiates a notification to the courier to execute the delivery.</li> </ol>                                                                                                                 | <ol style="list-style-type: none"> <li>Confirmation from the courier that they have received the notification and shipment details.</li> <li>Shipping label is generated by the courier.</li> <li>The tracking number updated by DC Admin in the system for customer tracking.</li> </ol>                                                                                                                                                                   |
| 6.      | <ol style="list-style-type: none"> <li>The package is picked up by the courier at the Distribution Centre for delivery.</li> <li>Every movement of the package will be updated by the courier through the tracking number provided.</li> </ol>                                                                                                                                                                                                                                                                                                                                                                   | <ol style="list-style-type: none"> <li>The package prepared by the DC for delivery.</li> <li>The courier is notified by the DC about the package's readiness for pickup.</li> </ol>                                                                                                                                                                                                                 | <ol style="list-style-type: none"> <li>Confirmation that the courier has successfully picked up the package.</li> <li>The courier updates the package's movement through various stages of the delivery process using the tracking number.</li> </ol>                                                                                                                                                                                                       |
| 7.      | <ol style="list-style-type: none"> <li>The tracking number of the order can be retrieved by the customer from "Order History" menu in My Office.</li> <li>There is a list of orders in "Order History" with the details that shall include the order ID, customer's name, total amount paid, delivery method, order status, order date, tracking number, and receipt.</li> <li>Clicking on a specific order in the list will expand the view of the order history of that specific order.</li> </ol>                                                                                                             | <ol style="list-style-type: none"> <li>Customer's account information (login credentials).</li> <li>Order details that include order ID, customer's name, total amount paid, delivery method, order status, order date, tracking number, and receipt.</li> </ol>                                                                                                                                    | <ol style="list-style-type: none"> <li>The system displays a list of the customer's orders in the "Order History" menu, showing summarized details for each order, including order ID, customer's name, total amount paid, delivery method, order status, order date, tracking number, and receipt.</li> <li>Clicking on a specific order in the list expands the view, providing additional details and history related to that specific order.</li> </ol> |
| 8.      | <ol style="list-style-type: none"> <li>There is a button "Delivered" in the expanded view of order history to confirm the receipt.</li> <li>The button "Delivered" will become active after the first tracking entry is made by the courier.</li> <li>After receiving the package, the customer must confirm the receipt by clicking the button "Delivered".</li> <li>There is a support email provided at the bottom of the "Order History" page.</li> <li>If the item is not received, or the wrong item is received, the customer can report through the support email provided.</li> </ol>                   | <ol style="list-style-type: none"> <li>The customer accesses the expanded view of their order history, displaying detailed information about a specific order.</li> <li>Information about the tracking entries made by the courier, indicating the package's status and movement.</li> <li>The customer's interaction with the "Delivered" button to confirm the receipt of the package.</li> </ol> | <ol style="list-style-type: none"> <li>The system records the customer's confirmation status, indicating that the package has been received.</li> <li>A support email address is provided at the bottom of the "Order History" page.</li> </ol>                                                                                                                                                                                                             |

**Table 2***SRD of Shopping Cart Management, and SRD of Stock Disposal*

| Process | Process Rules                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          | Input                                                                                                                                                                                                                | Output                                                                                                                                                                                                 |
|---------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 1.      | 1. The items in the catalog could be added to the shopping cart by clicking the button "Pilih" on the product in the catalog.<br>2. Clicking the button "Pilih" will also show the shopping cart and the list of items in it.                                                                                                                                                                                                                                                                                                                                                                                                                                                          | 1. Users click "Pilih" on the product in the catalog.                                                                                                                                                                | 1. Clicking the button "Pilih" adds the product to the shopping cart and shows the shopping cart with the list of items in it.                                                                         |
| 2.      | 1. The shopping cart could be viewed by clicking the button "View Cart" in the catalog.<br>2. The shopping cart could also be viewed by adding an item to the cart.<br>3. The shopping cart shall contain:<br>1. A progress tracker that displays the user's progress through a sequence of pages.<br>2. The list of items in the cart in "Periksa Barang Section".<br>3. A box labeled as "Barang di Keranjang".<br>4. The box "Barang di Keranjang" must contain:<br>1. The total cost of items in the cart.<br>2. The commission e-wallet balance.<br>3. A button "Kembali Pilih Barang" to return to the cart.<br>4. A button "Lanjut Belanja" to check out the items in the cart. | 1. Users click "View Cart" in the catalog.                                                                                                                                                                           | 1. Clicking the button "View Cart" shows the shopping cart.                                                                                                                                            |
| 3.      | 1. There shall be an increment and a decrement icon on the product in the catalog.<br>2. Clicking the increment icon will increase the quantity of the product in the shopping cart by one.<br>3. Clicking the decrement icon will decrease the quantity of the product in the shopping cart by one.<br>4. The quantity of the product could be reduced to at least one.<br>5. The system will update the total cost of items in the shopping cart after the quantity of item is adjusted.                                                                                                                                                                                             | 1. Users click the increment icon.<br>2. Users click the decrement icon.                                                                                                                                             | 1. Clicking the increment icon increases the quantity of the product in the shopping cart by one.<br>2. Clicking the decrement icon decreases the quantity of the product in the shopping cart by one. |
| 4.      | 1. There must be a bin icon on the product in the shopping cart to allow removing the product from the shopping cart.<br>2. The system will update the total cost of items in the shopping cart after the item is removed from the shopping cart.                                                                                                                                                                                                                                                                                                                                                                                                                                      | 1. Users click the bin icon on the product in the shopping cart.                                                                                                                                                     | 1. The item will be removed from the shopping cart.                                                                                                                                                    |
| 5.      | 1. The total cost of the item in the shopping cart shall be visible in a small section labeled as "Barang di Keranjang".<br>2. The total cost of the items in the cart shall be updated after the quantity is adjusted or the item is removed from the shopping cart.<br>3. The user's commission e-wallet balance must be displayed within this section.                                                                                                                                                                                                                                                                                                                              | 1. The system needs information about the items currently added to the shopping cart.<br>2. The system needs the information about any changes in quantity (adjustments) or removal of items from the shopping cart. | 1. A visual section in the shopping cart interface labeled "Barang di Keranjang" (Items in the Cart).                                                                                                  |
| 6.      | 1. The button "Lanjut Belanja" will be non-visible if there is no item in the cart.<br>2. A label "Empty Cart" shall take the place of the "Lanjut Belanja" button.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    | 1. The system needs information about whether there are items currently added to the shopping cart.                                                                                                                  | 1. If the cart is empty, the "Lanjut Belanja" button is non-visible.<br>2. If the cart is empty, a label "Empty Cart" takes the place of the "Lanjut Belanja" button.                                  |



| Process | Process Rules                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             | Input                                                                                                                                                                                                                                                                                                         | Output                                                                                                                                                                                                                                                                                        |
|---------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 1.      | <ol style="list-style-type: none"> <li>Disposal can be made if the items meet the criteria for disposal, such as being damaged, expired, or obsolete.</li> <li>Warehouse has to generate a stock disposal request, including details such as the list of items, quantities, and reasons for disposal.</li> <li>The disposal request must be transmitted to the business owner for review and approval.</li> <li>The business owner reviews the request and provides approval or rejection.</li> </ol>                                                                                                                                                                                                     | <ol style="list-style-type: none"> <li>The products or items that are identified for disposal due to reasons such as damage, expiration, or obsolescence.</li> </ol>                                                                                                                                          | <ol style="list-style-type: none"> <li>The inventory is updated to reflect the removal of items disposed of after receiving the business owner's approval.</li> <li>A notification indicating whether the business owner has approved or rejected the stock disposal request.</li> </ol>      |
| 2.      | <ol style="list-style-type: none"> <li>If the stock disposal request is approved, the warehouse must confirm that there is an agreed-upon method for disposing of items.</li> <li>The warehouse will be granted the authorization to execute the disposal.</li> <li>Safety and compliance checks will be conducted to ensure that the chosen disposal method adheres to environmental regulations and workplace safety standards.</li> <li>The disposal will be carried out according to the agreed-upon method.</li> <li>The warehouse must keep records or documentation confirming that the disposal has been completed, including any relevant details such as disposal dates and methods.</li> </ol> | <ol style="list-style-type: none"> <li>The formal approval obtained from the business owner for the disposal of specific items.</li> <li>The agreed-upon method for disposing of the items.</li> <li>Products or items identified for disposal, based on the approved request.</li> </ol>                     | <ol style="list-style-type: none"> <li>The disposal is executed according to the agreed-upon method.</li> <li>The warehouse must keep records or documentation confirming that the disposal has been completed, including any relevant details such as disposal dates and methods.</li> </ol> |
| 3.      | <ol style="list-style-type: none"> <li>The warehouse must confirm that the disposal process has been successfully completed and documented.</li> <li>The inventory records shall be updated to reflect the removal of the disposed items.</li> <li>The warehouse has to make adjustments to the inventory records to reconcile the quantity after disposal.</li> <li>The initial physical counts of items in the warehouse will be recorded.</li> <li>The results of the physical count will be compared with the recorded inventory levels in the system.</li> </ol>                                                                                                                                     | <ol style="list-style-type: none"> <li>Records or documentation confirming the completion of the disposal process, including details of disposed items.</li> <li>Records reflecting the inventory status before the disposal.</li> <li>Records reflecting the inventory status after the disposal.</li> </ol> | <ol style="list-style-type: none"> <li>Records reflecting the inventory status after the disposal.</li> <li>Records documenting the reconciliation process, including any adjustments made to the inventory.</li> </ol>                                                                       |

## CONCLUSION

The analytical and documentation tasks executed at CMA Solutions Sdn Bhd were highly successful in bridging the gap between business logic and technical software development. By mapping the Eden Network through Context Diagrams, Use Cases, and Process Maps, the organization gained a transparent overview of the platform's architectural scope and actor interactions. Transitioning these visualizations into a strict Software Requirements Document (SRD) ensured that ambiguous business needs were converted into precise, logical system rules. This methodical approach proves that applying structured, mathematical precision to IT documentation is essential for optimizing workflows and minimizing downstream coding errors. Moving forward, it is recommended that the organization continuously updates the SRD alongside any agile software iterations to maintain a perfectly synchronized Traceability Matrix.

## ACKNOWLEDGEMENT

The author extends profound gratitude to Universiti Teknologi MARA for supporting this work. The author expresses sincere gratitude to CMA Solutions Sdn Bhd for providing a collaborative work

environment and the opportunity to contribute to the Eden Network project. This research received no specific grant from any funding agency in the public, commercial, or not-for-profit sectors.

#### **Conflict of Interest**

The authors have no conflicts of interest to declare.

#### **Non-funded**

This research received no specific grant from any funding agency in the public, commercial, or not-for-profit sectors.

### **REFERENCES**

- CMA Solutions Sdn Bhd. (n.d.). *CMA SOLUTIONS SDN BHD - Software Company in Malaysia*. Retrieved October 11, 2023, from <https://www.cmasolutions.my/>
- Frevvoblog. (2021, November 2). *What Are Business Rules (and How to Implement Them)*. Frevvo Blog. Retrieved November 2, 2023, from <https://www.frevvo.com/blog/business-rules/>
- Pedriquez, D. (2023, September 7). *What is a Context Diagram (and How Can You Create One)?* Venngage. Retrieved October 18, 2023, from <https://venngage.com/blog/context-diagram/>
- Schwartz, B. (2022, September 29). *How to make a Requirements Traceability Matrix (RTM)*. ProjectManager. Retrieved October 24, 2023, from <https://www.projectmanager.com/blog/requirements-traceability-matrix>
- Vpadmin. (2023, September 12). *A comprehensive guide to use case modeling*. Visual Paradigm Guides. Retrieved October 18, 2023, from <https://guides.visual-paradigm.com/a-comprehensive-guide-to-use-case-modeling/>



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