SUPERMARKET MANAGEMENT SYSTEM
MILESTONE 2: Mid-term Report

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1. Stock Service:

1.1. Function

Central services to deal with the business logic of product management. Using H2 in memory database to store the product information.

1.2. Communication

- Synchronous communication using rest and JSON with barcode reader service.
- Asynchronous communication using message queue and JSON with discounted good reservation service.

2. Discount Good Reservation Service:

2.1. Function

Asynchronous communication with stock service. After the reservation, the stock service will update the stocks for the product.

2.2. Communication

The discounted good reservation services mainly use asynchronous communication with other services. The communication model is one-to-many messages with message queue. The advantage for using asynchronous communication is that:

    a. It helps decoupling the services. A message queue decouples the sender and receiver, allowing them to evolve independently without affecting each other. Synchronous service establish connection for every requests. Two services are highly related to each other. We need to write specific code to satisfy the certain need of other service.

    b. The communication is Asynchronous, we do not need to wait for the response to deal with the following code.

    c. Moreover, it helps reducing the workload for reservation services. With message queue it only needs to communicate with broker. It also reduces the workload for consumer, it has a queue to deal with all the requests.

    d. The reservation service does not need synchronize between other services. The communication with other services is isolated. For example, the user service will listen to the message to update the user information for recommendation, and the stock service will listen to the user service to update the stock. Two database's business logic are isolated with each other and do not need to synchronize, which would not add more latency to the system for synchronization.

3. Barcode Reader Service

3.1. Function

    3.1.1. **Intended function:** The barcode reading service would be able to scan, segment barcode number from a product's barcode and retrieve that product from the database.

    3.1.2. **Current implementation:** For now, the scan section is not yet implemented. However, the synchronous communication between the barcode reading service

and the Stock service is completed. User can now input an ID of the product on the website, and product detail will be retrieved.

3.2. Communication

The barcode reader service using the synchronous communication with product service. The advantage is that:

a. It requires immediate feedback from other services. With synchronous communication, the sender of the message receives an immediate response from the receiver. The barcode reader needs the product information immediately to continue the business logic.

b. It is easier to handle error. The barcode reader services would also have the case that the product cannot be found or wrong input. With synchronous communication, it is easier to handle these errors.