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American International University-Bangladesh (AIUB)

Department of Computer Science

Faculty of Science &Technology (FST)

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CSC 2210 Object Oriented Analysis and Design (OOAD)

Section: B

Group No: 2

The Waste management System

An Object-Oriented Analysis and Design (OOAD) project submitted
By

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CHAPTER 1: PROBLEM DOMAIN

1.1 Project Background Analysis

- **Write the background description that helps putting the project into the right context of a problem domain and gives everyone involved a common view of the project.**

The Waste management System is a way to recycle daily waste to our highest benefits, ensuring a healthy environment and a friendly eco-system. Through this system the public has to first login which requires verification. The objective is to buy and sell waste (inorganic or organic) which can be used to produce eco friendly products. By logging in, pubic can sell waste and buy eco friendly products and can check the product details and buyer can buy waste and sell eco friendly products which are recycled from waste. If the desired product is available public and buyer can buy products through preferred multiple transaction policy like Bkash, cash on delivery, credit or debit. Buyer delivers the cart to the precise location or collects waste and receives the money if cash on delivery. Also, people can review and write social awareness blog. This presentation is about the analysis of waste management system. Diagram's purpose is to present system clearly and completely as possible.

- **What is the root cause of this problem? why is this problem is so important to consider?**

Waste is a significant global issue. Increasing volumes of waste are being generated as the global population and living standards rise. Waste is generally defined as disposed or unwanted materials or by-products. Current waste generation in Bangladesh is around 22.4 million tonnes per year or 150 kg/cap/year. There is an increasing rate of waste generation in Bangladesh and it is projected to reach 47, 064 tonnes per day by 2025. The rate of waste generation is expected to increase to 220 kg/cap/year in 2025. So now is the right time to think about waste and how it can manage and turn it into useful products.
From the above discussion, We can say that the problem of waste management system is important to consider.

1.2 Project Solution and Feasibility Analysis

- **What are the solutions you are going to propose to deal with the problem? why is this solution is particularly appropriate to solve the problem? Is the solution feasible to the meet the business objective?**

Production of waste in our time is more than ever & slowing it's leading to global environmental change creating imbalances. There can be multiple solutions to deal with waste management. We

can replace plastic bags with tissue bags, bury the organic waste in the ground, avoid hazardous waste e.t.c. But nothing is as convenient as recycling the waste make them into usable products. This process will not only reduce waste but also make sure it's not harming the environment. It will also open a new income source for a lot of people. Even from the business prospective it's feasible for the new growing e-commerce market.

- **Provide a short description of the software being specified and its purpose, including relevant benefits, objectives, and goals?**

The general idea is to recycle waste & make them into new usable products. People can buy eco-friendly products from the online store. They can write blogs to raise social awareness addressing the problem. Also, they can even sell waste if they want to. However, waste is recyclable based on its' category. Chemical, medical waste are hazardous therefore they must be destroyed properly.

- **Existing studies presented in the problem area. What are the existing software solutions are available to solve the aforementioned problem?**

Existing solutions to this problems are BD clean & Garbage bin. But we believe our e-commerce idea is new, innovative & interesting & currently no one is implementing the idea of making "trash into cash." Existing studies on waste management system are given below:

- Economic assessment of municipal waste management systems—case studies using a combination of life cycle assessment (LCA) and life cycle costing (LCC)
- Evaluating the Effectiveness of Deliberative Processes: Waste Management Case-studies
- Review of LCA studies of solid waste management systems – Part I: Lessons learned and perspectives

- **What makes this project new, innovative, interesting, or otherwise distinct from other similar projects? Does the project duplicate functionality already available in the market?**

The waste management system is a digital and innovative project. This waste management project will help people to recycle the waste easily. For that nature will stay clean and we will be safe from germs. There are a few features that can help people to recycle their waste in a good way. They can easily replace their waste into organic fertilizer. They don't need to go outside and have to wait for a long time standing in a line. They can make the whole process sitting on sofa by online. Finally, we can say this project is totally new, innovative, interesting, and distinct from other similar projects in the market.

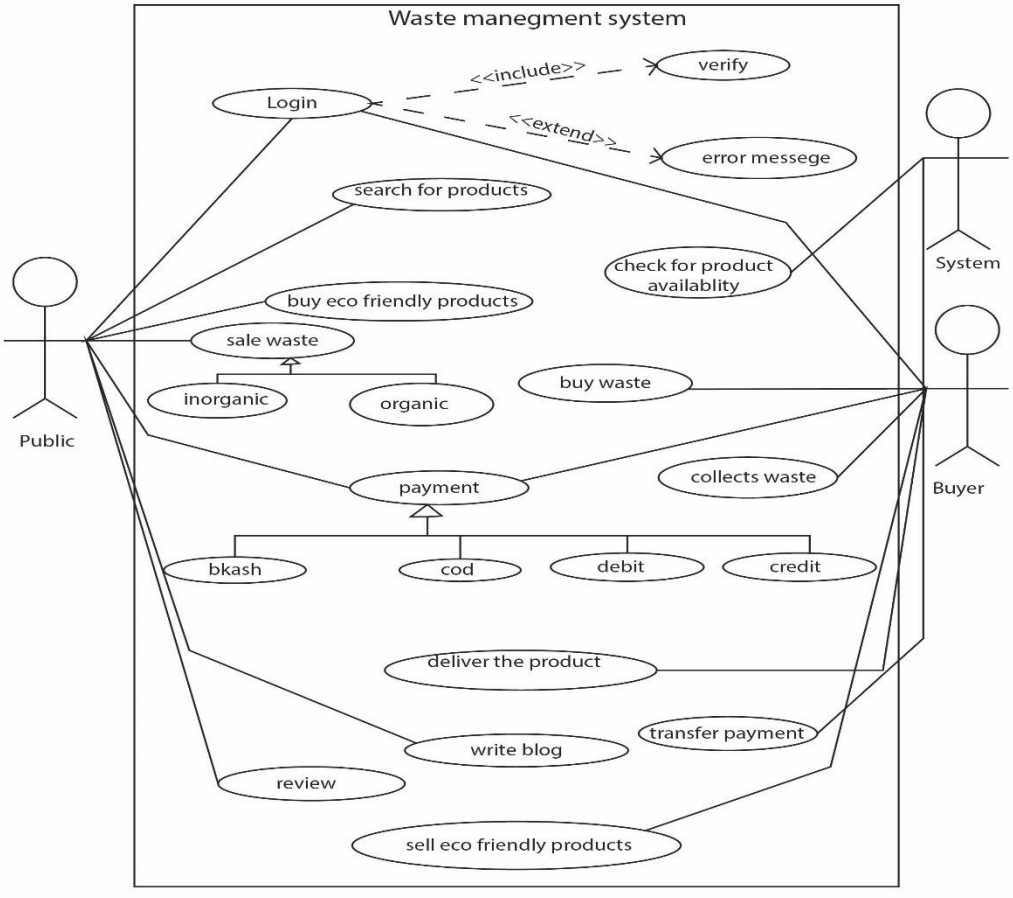
CHAPTER 2: UML DIAGRAM

2.1 Use Case Diagram

- **Does the use case narrative represent the Scenario of the use case diagram?**
  Yes, here the use case narrative represent the Scenario of the use case diagram

- **Does the Use Case diagram include the major use cases, actors who perform the use cases and the relationships among the use cases needed to deliver by the system?**
  Yes, the Use Case diagram include the major use cases, actors who perform the use cases and the relationships among the use cases needed to deliver by the system. Here we've three actors in our project: Public, Buyer and System. The relationship among the use cases is clearly shown by the features.

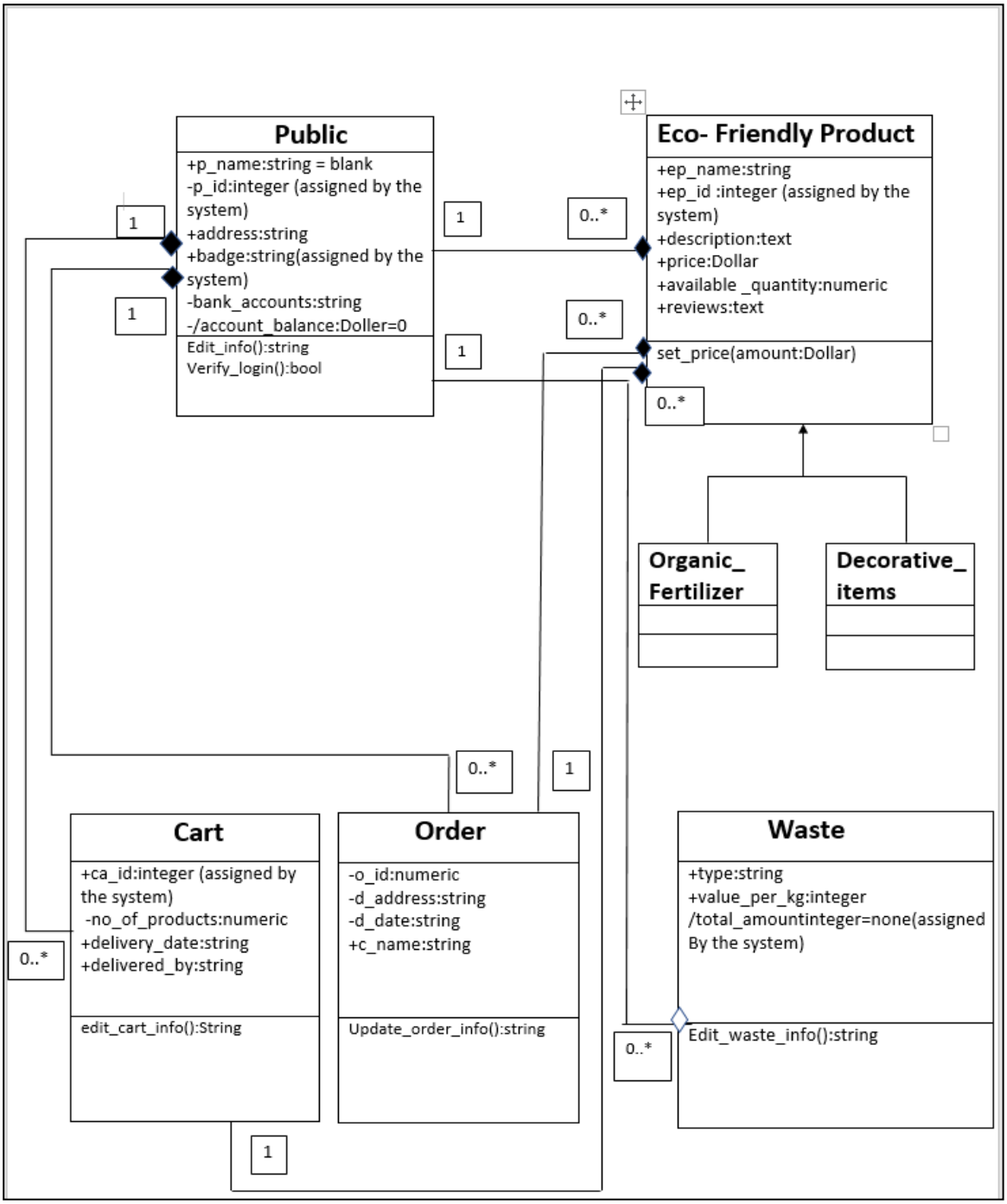
❖ **Case Study:** In the waste management system, the primary actor is public (general people) and the secondary actors are system and buyer. Public and buyer login to their accounts and verify their authenticity if fail then shows an error message. The public can search for items and system check product availability and can add waste for sale. There are two types of waste- organic and inorganic. Public can buy eco-friendly products. Buyer can buy waste and collect waste and sell eco-friendly products. If the desired product is available, both public and buyer can buy and sell products through preferred multiple transaction policy like Bkash, cash on delivery, credit or debit card. Also public can review products and write blogs for social awareness.



2.2 Class Diagram

- **Does the class narrative represent the Scenario of the class diagram?**
  Yes, the class narrative represent the Scenario of the class diagram.

- **Does the Class diagram include the major classes (attributes, operations) and the relationship among the classes needed to deliver by the system?**
  Yes, the Class diagram includes five major classes like waste, public, eco-friendly products, cart and order. Here the class diagram includes the relation among the classes needed to deliver by the system.



2.3 Sequence Diagram

- **Does the sequence narrative represent the Scenario of the sequence diagram?**

  Yes, the sequence narrative represents the Scenario of the sequence diagram.

- **Does the Sequence diagram include the sequence of the major activities needed to deliver by the system?**

  Yes, the sequence diagram includes the sequence of the major activities needed to deliver by the system

❖ **Case Study:** In the sequence diagram, public act like customer and have to request for login with their right information which is available in the database. Customer can search for items and system checks the products availability. After selecting product customer will be shown product price and delivery date. They can choose payment method and fill up required information. After verifying payment will be done, if not then a error message will be shown. As the same way both buying and selling waste and eco-friendly products will happen. For any inconvenience customer can call our helpline.

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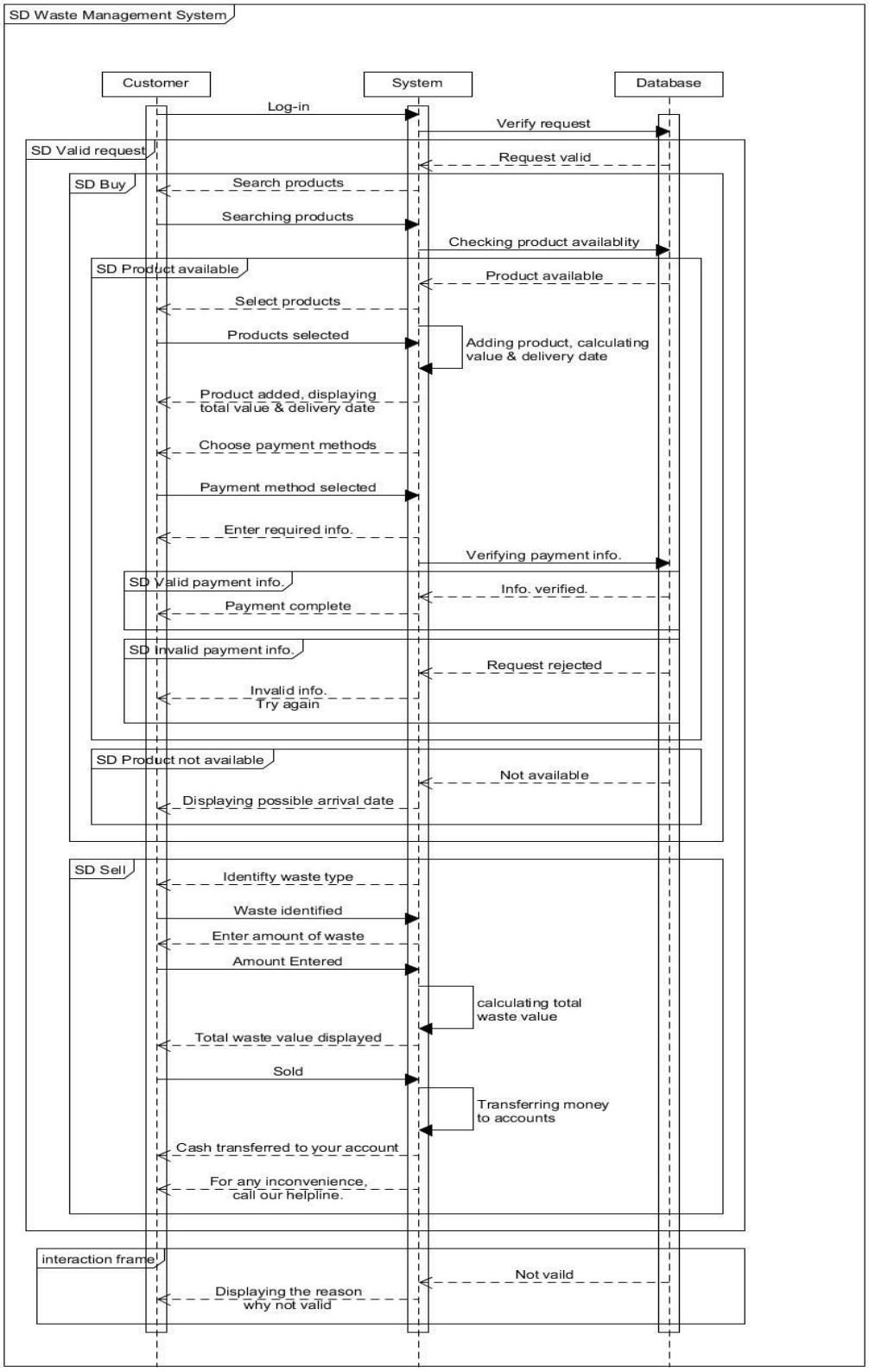
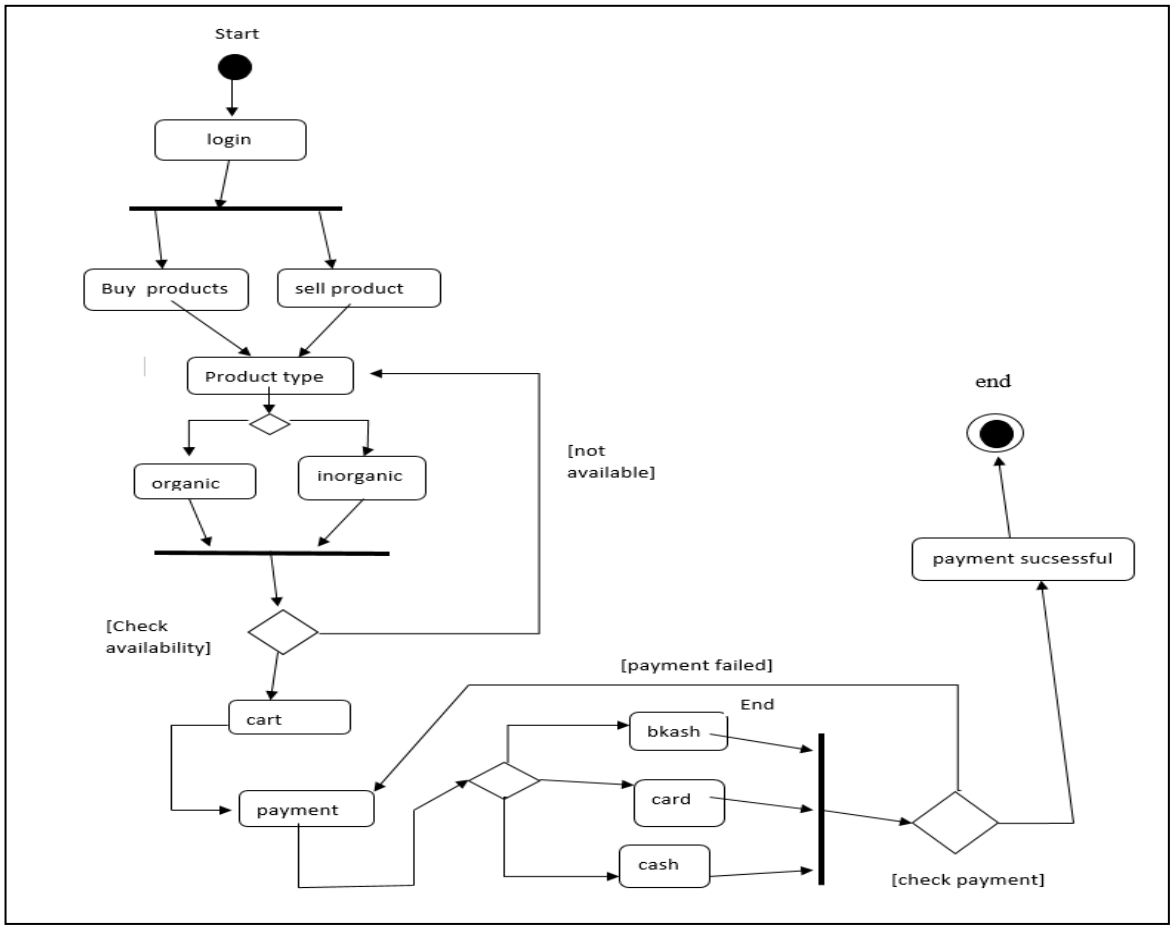

SD Waste Management System
Customer
System
Database
Log-in
Verify request
SD Valid request
Request valid
SD Buy
Search products
Searching products
Checking product availablity
SD Product available
Product available
Select products
Products selected
Adding product, calculating value & delivery date
Product added, displaying total value & delivery date
Choose payment methods
Payment method selected
Enter required info.
Verifying payment info.
SD Valid payment info.
Info. verified.
Payment complete
SD Invalid payment info.
Request rejected
Invalid info. Try again
SD Product not available
Not available
Displaying possible arrival date
SD Sell
Identifty waste type
Waste identified
Enter amount of waste
Amount Entered
calculating total waste value
Total waste value displayed
Sold
Transferring money to accounts
Cash transferred to your account
For any inconvenience, call our helpline.
interaction frame
Not vaild
Displaying the reason why not valid

2.4 Statechart Diagram

- **Does the stetechart narrative represent the Scenario of the statechart diagram?**
  Yes, the State chart narrative represents the scenario of the state chart diagram.

- **Does the Statechart diagram include the major states needed to deliver by the system?**
  Yes, the State chart diagram includes the major states needed to deliver by the system.

❖ **Case Study:** Using the Waste Management System, customer and buyer first login to the system and system verify that. After that public can sell waste and buy eco friendly products if available. Buyer can buy waste and sell eco friendly products. After buying waste, buyer collects the waste. If the desired product is available public and buyer can buy products through preferred multiple transaction policy like Bkash, cash on delivery, credit or debit. If any verification failed then system shows a error message.



2.5 Activity Diagram

- **Does the activity narrative represent the Scenario of the activity diagram?**

  Yes, the activity narrative represents the scenario of the activity diagram

- **Does the Activity diagram include the major activities needed to deliver by the system?**

  Yes, The Activity diagram includes the major activities needed to deliver by the system.

❖ **Case Study:** In our waste management system, at first customer has to log-in. Then they can either sell waste or buy eco-friendly products. For sale, first identify waste category then add amount and price and cash transfer to user account. For buying eco friendly products at first request for the products, check if it is available, if not go to the request page again otherwise display products details. After that select products then place order with ammount and delivery time and then select payment type among cash on delivery, debit, credit or Bkash. If submitted data are verified then payment will be confirmed and update product quantity in database other wise order will be cancelled.

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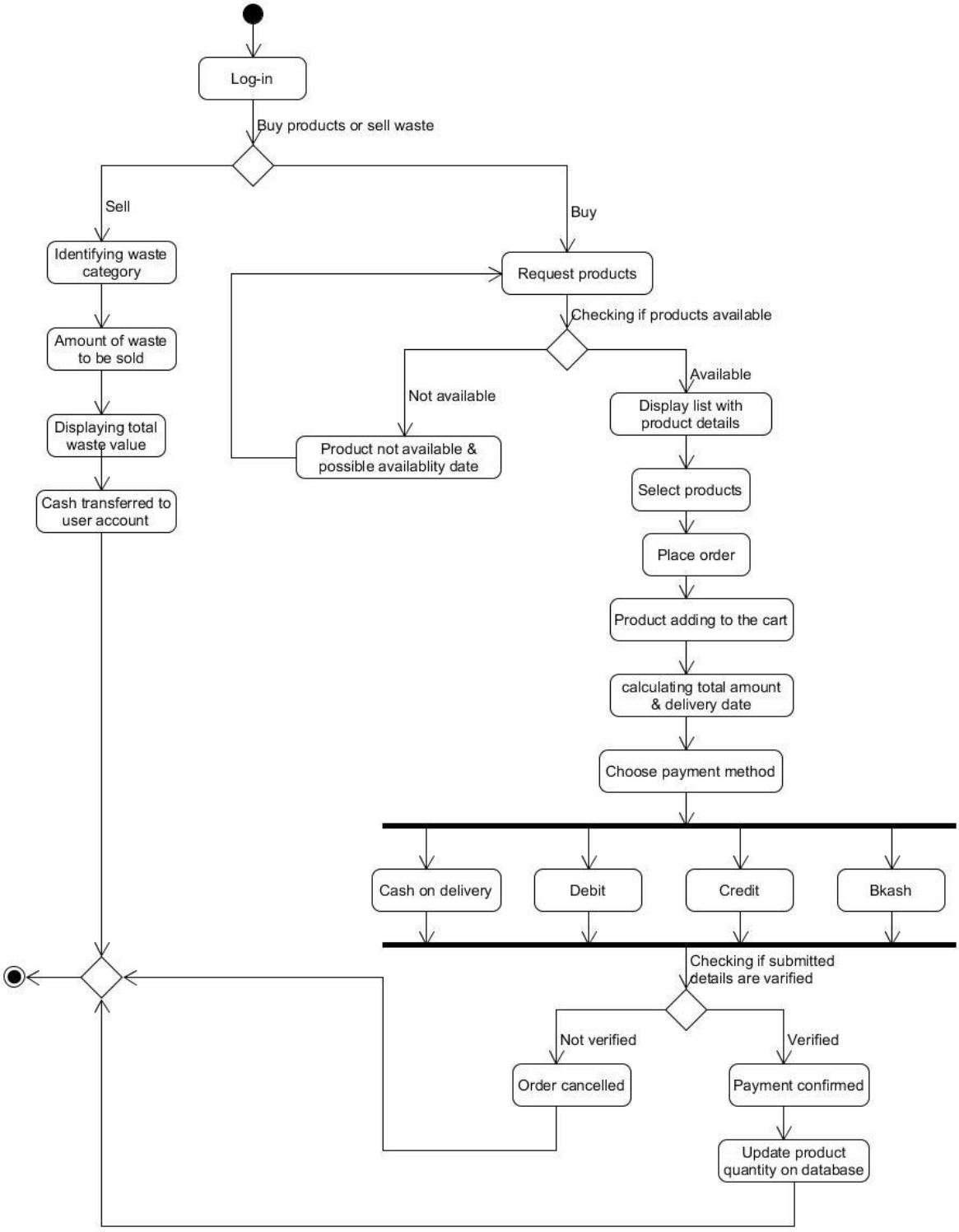
Log-in
Buy products or sell waste
Sell
Buy
Identifying waste category
Amount of waste to be sold
Displaying total waste value
Cash transferred to user account
Request products
Checking if products available
Not available
Available
Product not available & possible availablity date
Display list with product details
Select products
Place order
Product adding to the cart
calculating total amount & delivery date
Choose payment method
Cash on delivery
Debit
Credit
Bkash
Checking if submitted details are varified
Not verified
Verified
Order cancelled
Payment confirmed
Update product quantity on database