ISTANBUL TECHNICAL UNIVERSITY

SOFTWARE ENGINEERING

ASSIGNMENT 3

PROJECT TITLE	Package Deliverer Drones
REPORT NAME	Requirements Specification
TEAM NAME	Team Ratchet
GROUP NUMBER	**6**

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REQUIREMENTS SPECIFICATION

1. INTRODUCTION

This section introduces the requirement specification document for the Package Deliverer Drones. It provides the purpose of the system and the organization of contents in this document.

This requirements specification document describes the functions and requirements specified for this Package Deliverer Drones System. The drones take the package from the sender and bring it to the receiver. In addition, all the activity of the drones can be monitored from software that is used by the Control Operator and Drone Crew. This system helps greatly to the cargo companies, reduces the manpower needed to deliver packages and makes easier to send and receive packages.

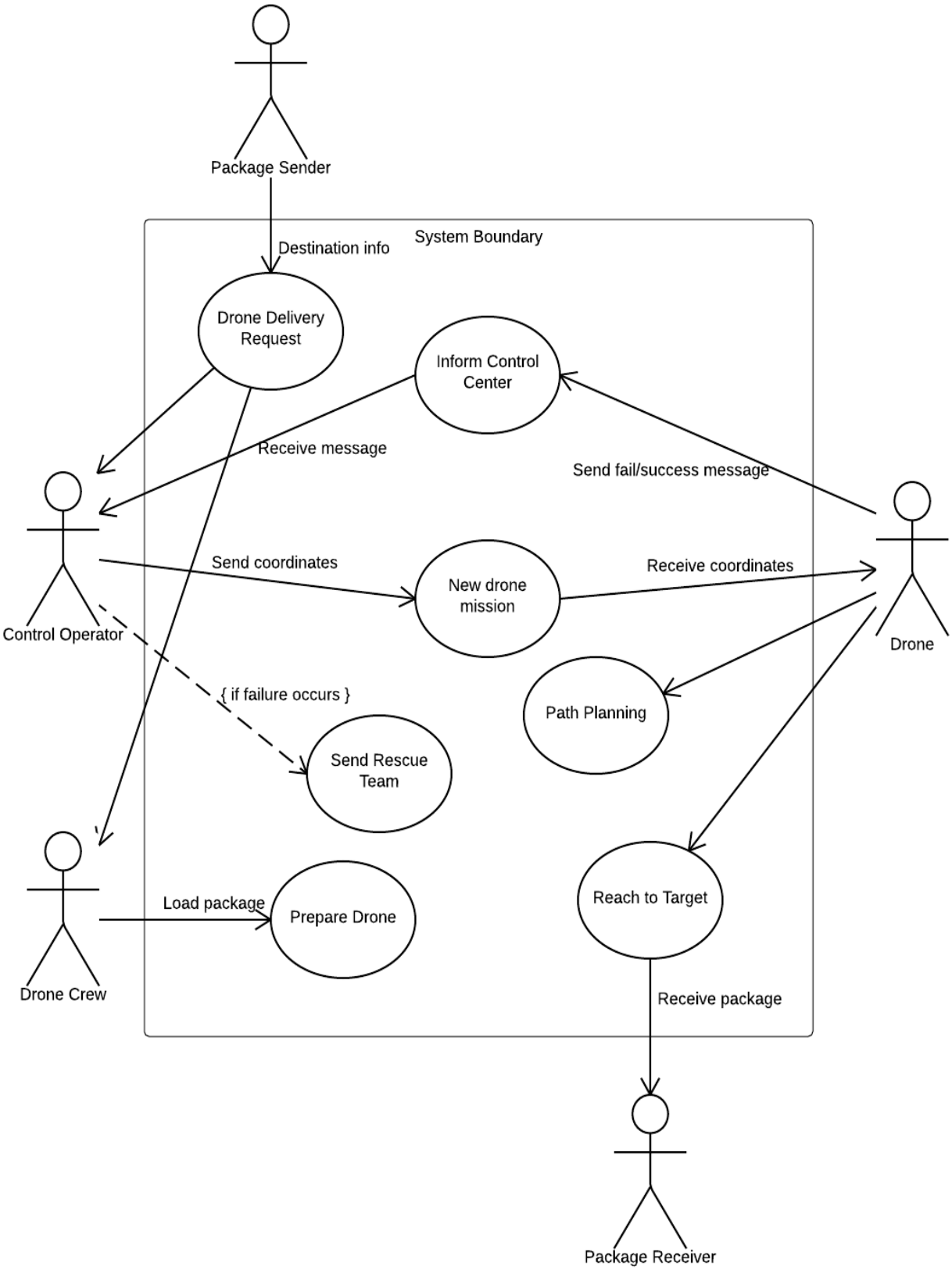
This document provides a high-level description of the Drone Deliverer Drones. It identifies the involved users and helps to explain their roles. The use cases of this system are also explained in this document.

2. PROJECT PLAN

2.1 User Types

User Type	Description
Package Sender	Provides the package and destination information
Package Receiver	Receiver of the package
Drone Crew	Responsible for general maintenance of the drone and loads package to drone
Control Operator	Responsible to provide location coordinates to drone and checks the delivery operation in real time

2.2 Use Case Diagram



2.3 Use Cases

Title	Drone Delivery Request
ID	UC-1
Version	1.0
Actors	Package Sender (primary) Drone Crew Control Operator
Level	Kite Level
Brief	Sender requests drone for his/her package delivery process
Preconditions	Drone delivery is avaible
Post conditions	A new drone mission emerges
Basic Flow	1. Sender fills delivery form 2. Sender specifies delivery with drone

Title	Prepare Drone
ID	UC-2
Version	1.0
Actors	Drone crew (primary)
Level	Fish Level
Brief	Drone crew prepares the drone
Preconditions	A drone mission
Post conditions	Drone is ready to flight
Basic Flow	1. Drone crew checks and prepares the drone for flight 2. Drone crew loads the package to the drone

Title	New Drone Mission
ID	UC-3
Version	1.0
Actors	Control Operator (primary) Drone
Level	Fish Level
Brief	Control operator sends required initial information to drone
Preconditions	A drone mission
Post conditions	Drone is ready to delivery
Basic Flow	1. Control operator establishes destination coordinates from package sender's information 2. Operator sends coordinates to the drone 3. Operator checks all required conditions and sends lift-off message to the drone

Title	Path Planning
ID	UC-4
Version	1.0
Actors	Drone
Level	Clam Level
Brief	Drone calculates path to the destination and moves according to that plan
Preconditions	Drone is ready to delivery
Post conditions	Drone moves to the target
Basic Flow	1. Drone automation system calculates the path 2. Automation system provides required speed data for the path 3. Drone lifts-off and starts to move to destination

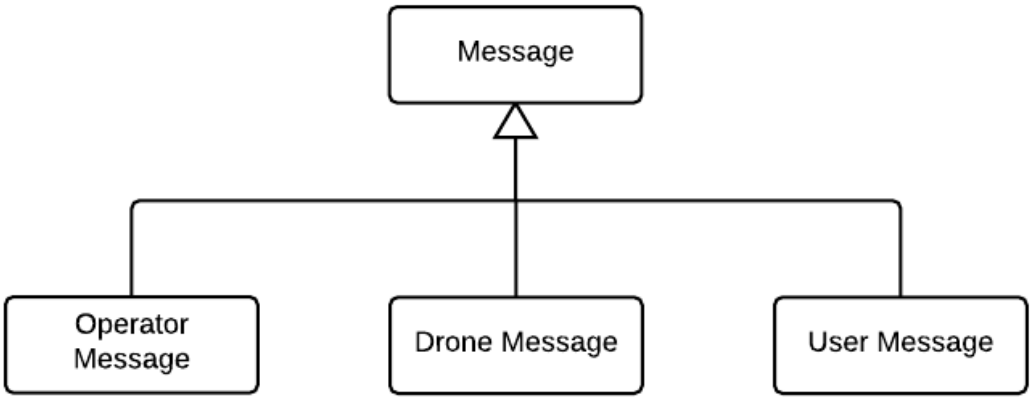
Title	Inform Control Center
ID	UC-5
Version	1.0
Actors	Drone (primary) Control Operator
Level	Fish Level
Brief	Drone informs the control center about delivery process periodically
Preconditions	Drone is airborne
Post conditions	Drone continues to move or waits for rescue
Basic Flow	1. While moving, drone regularly checks different sensor informations for failure detection 2. Drone sends success messages when it acquires a checkpoint 3. If drone detects a failure, it sends an appropriate failure message depending on the failure a. If the failure has low-priority(slight change in route etc..) drone logs the information about its current state and continues to move b. If the failure has high-priority(e.g. drone hits an object or detects system failure), drone tries to land safely, sends its location and waits for help

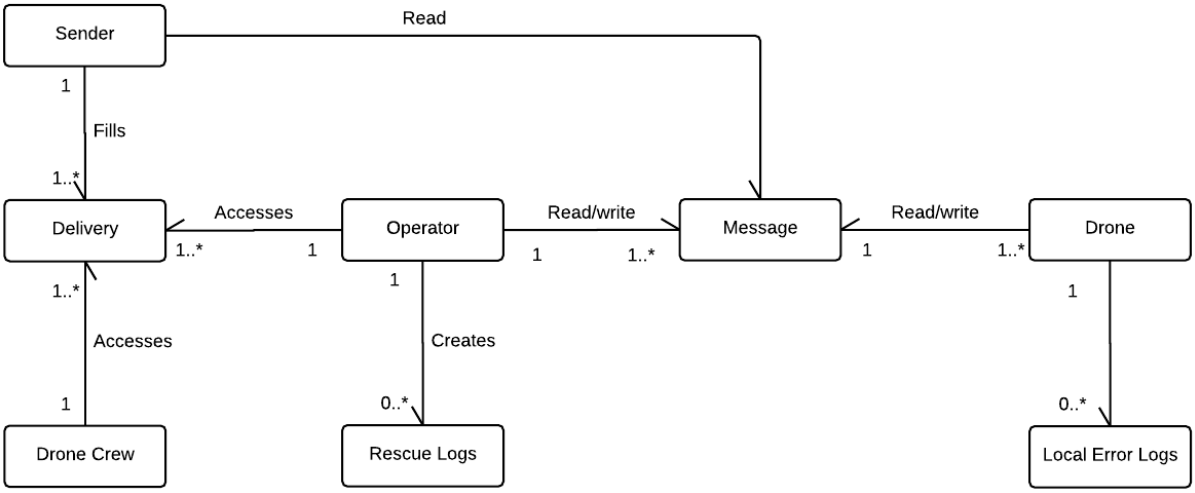
Title	Send Rescue Team
ID	UC-6
Version	1.0
Actors	Control Operator (primary) Drone
Level	Kite Level
Brief	Operator sends a team to rescue the drone and complete the delivery
Preconditions	Drone fails and requires help
Post conditions	Continue the delivery without drone
Basic Flow	1. Rescue team arrives to location of the drone 2. Team picks the drone 3. Team completes the delivery

Title	React to Target
ID	UC-7
Version	1.0
Actors	Drone Package Receive
Level	Kite Level
Brief	Drone arrives to target and delivers the package
Preconditions	Drone moves to target area without a fatal failure
Post conditions	Drone completes the delivery
Basic Flow	1. Drone arrives to target 2. It delivers the package 3. It returns to the base following same path backward

3. EARLY SYSTEM MODELS

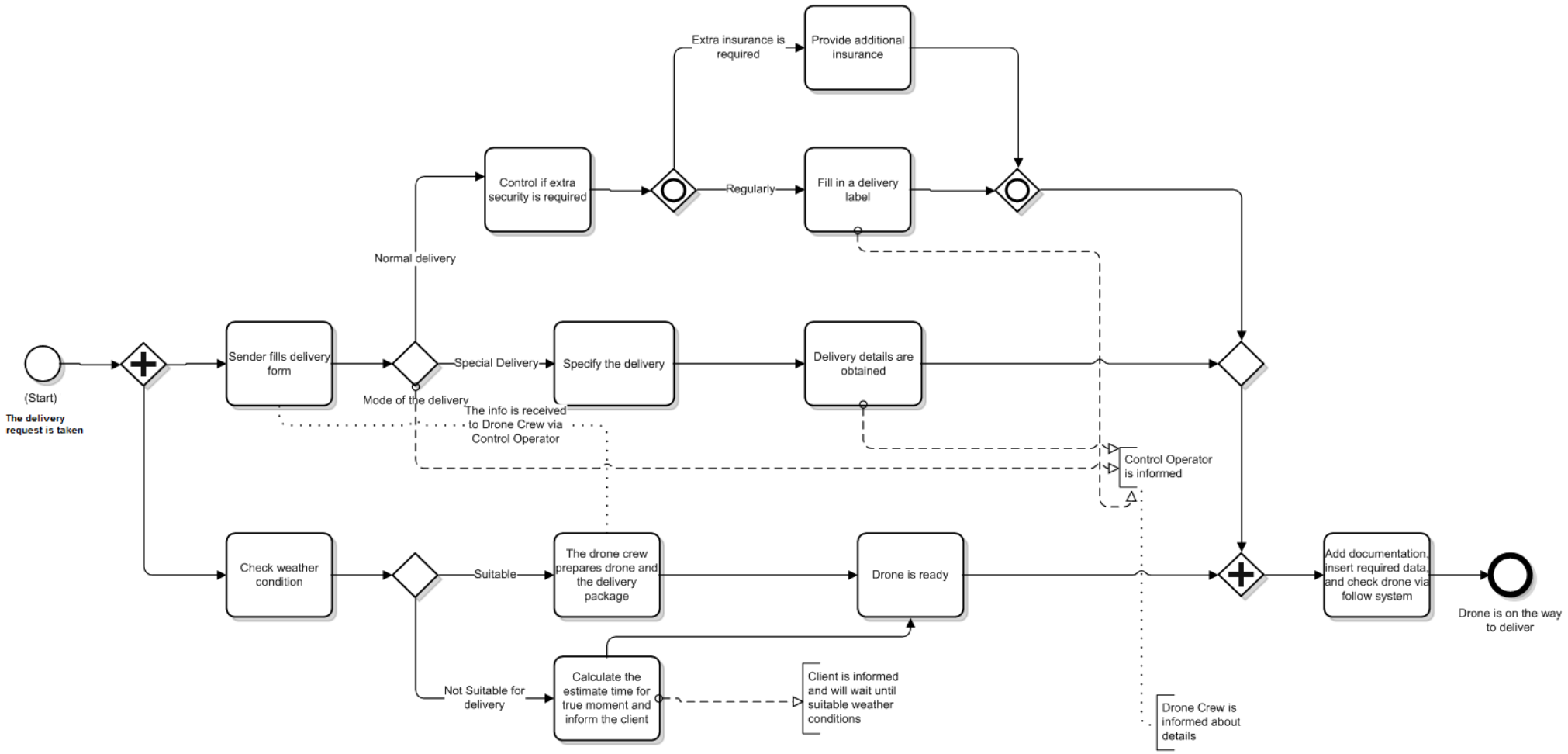
3.1 Conceptual Model



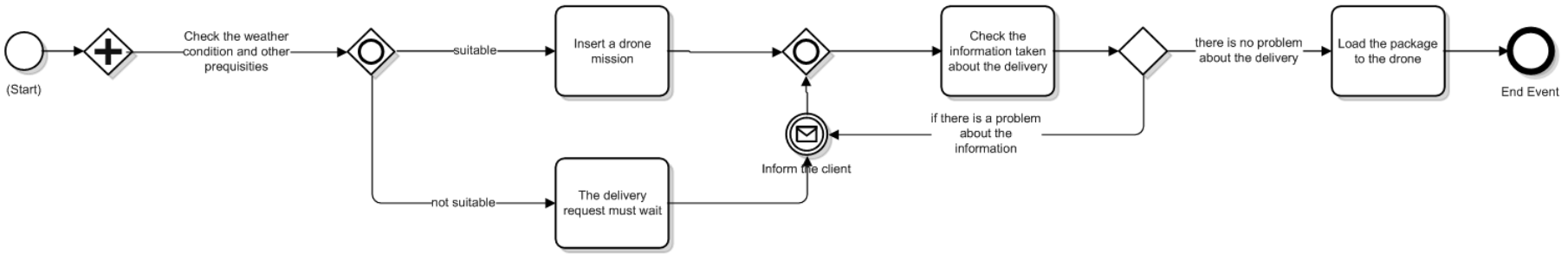


3.2 Flow Diagrams

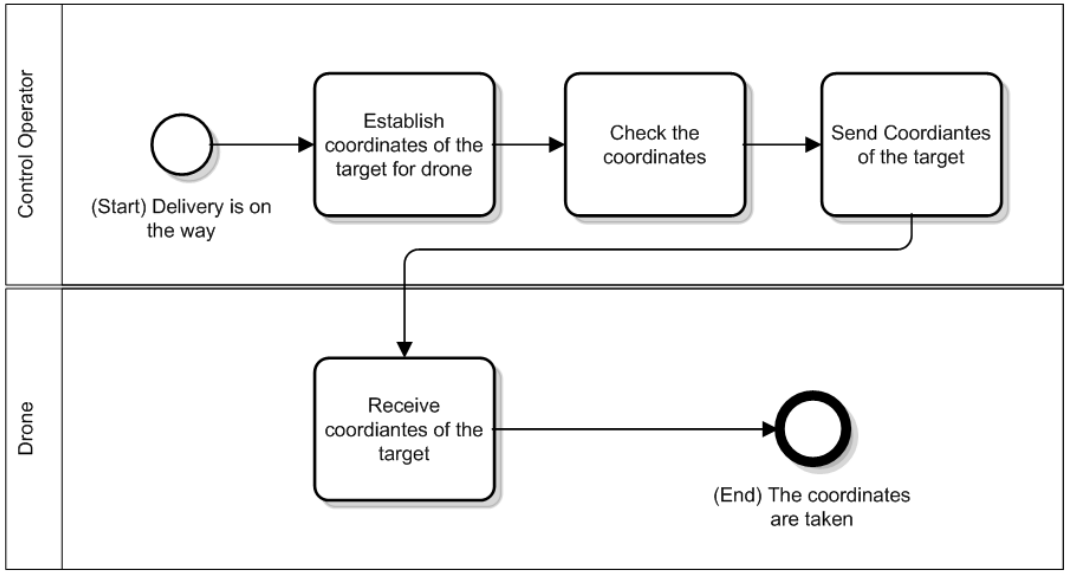
For Use Case – 1:



For Use Case – 2:



For Use Case – 3:



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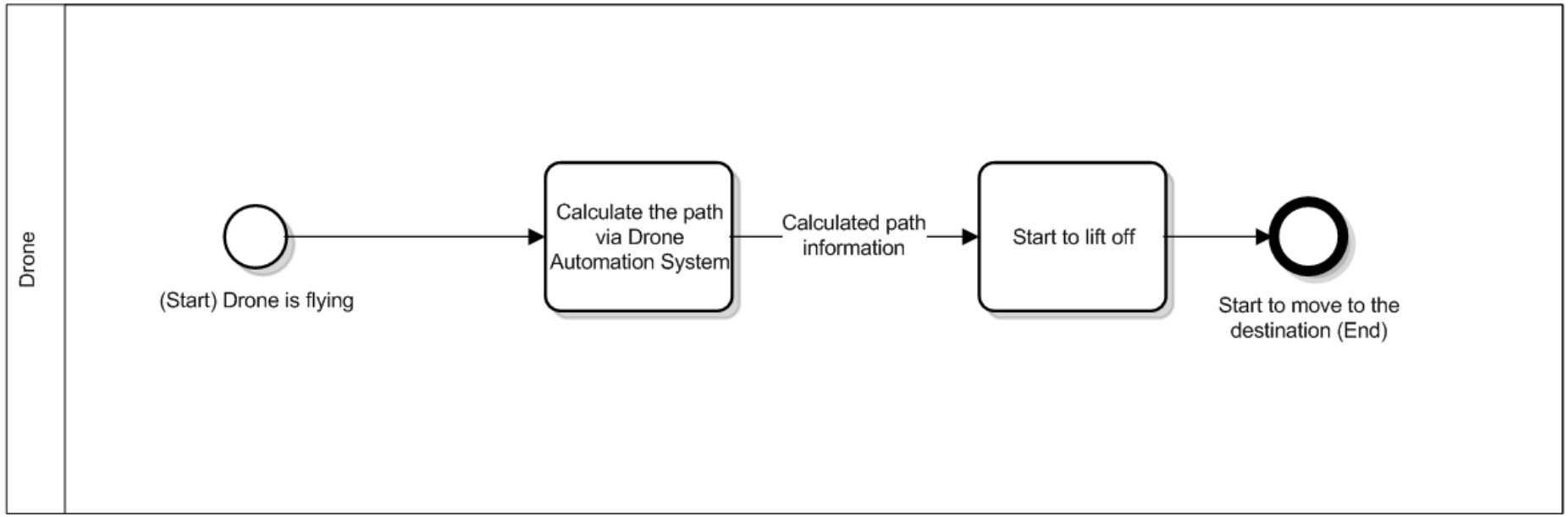
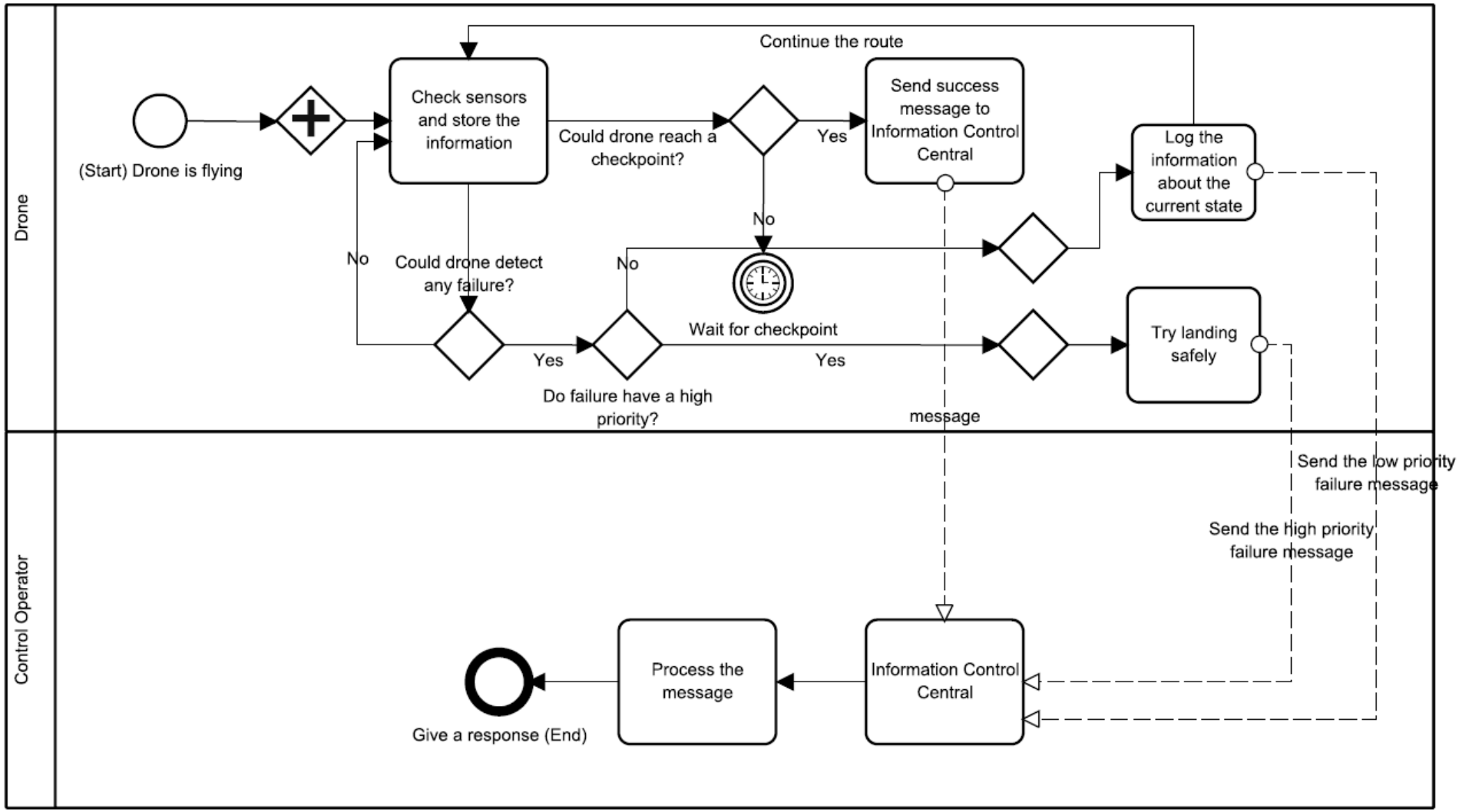
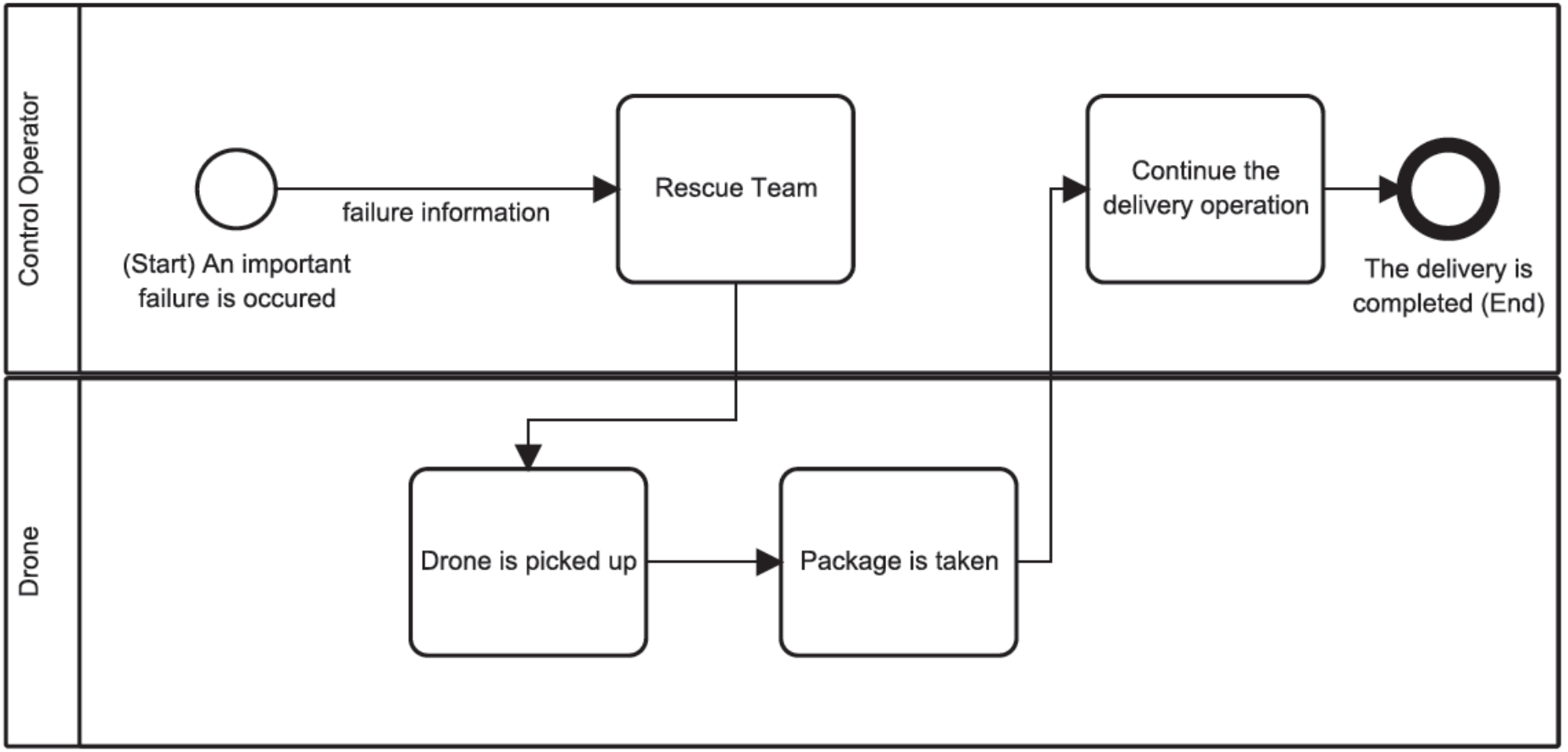


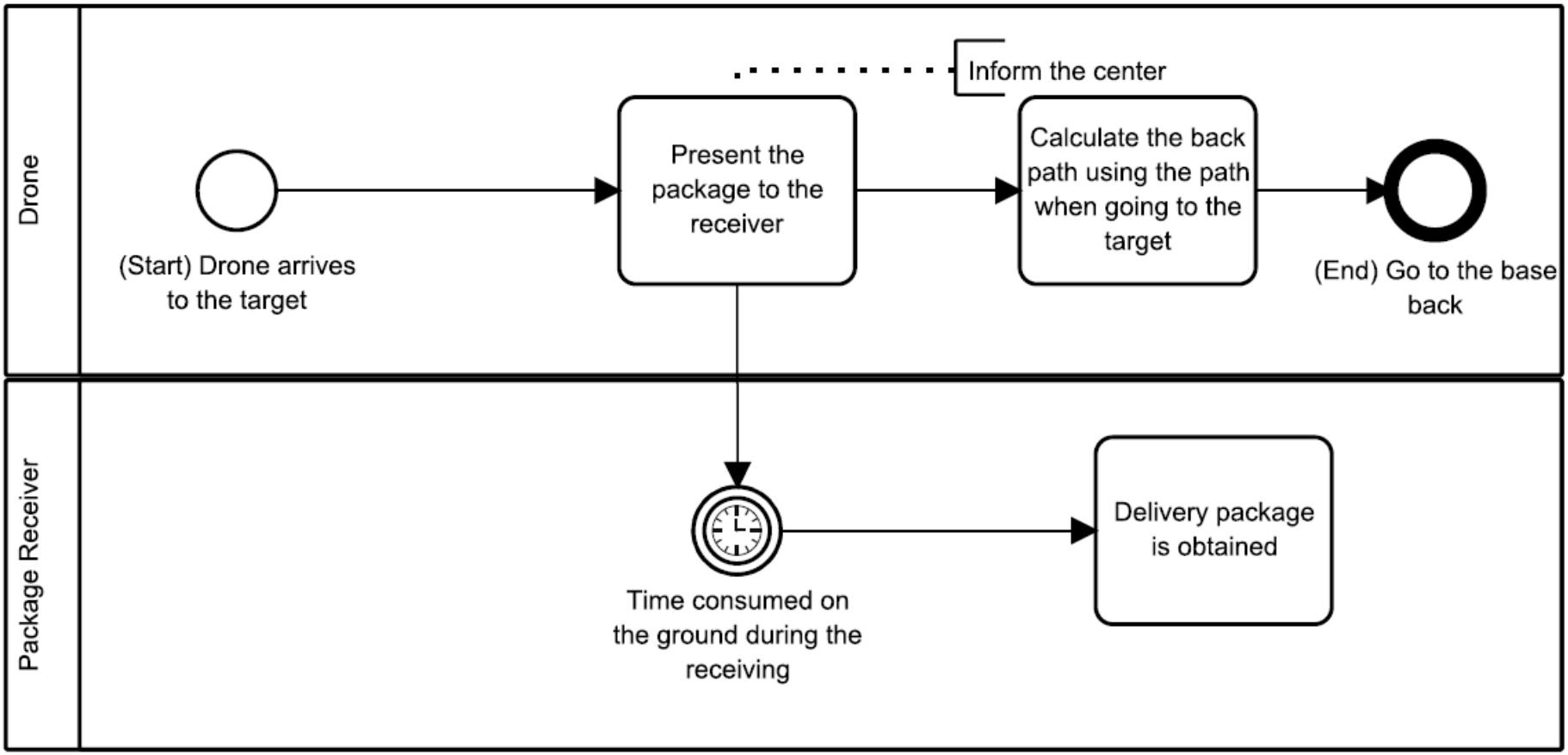
For Use Case – 5:



For Use Case – 6:



For Use Case – 7:



4. USER STORIES

Package Sender Log

User: Sender

A log created for the daily delivery information and sent to package sender via preferred way of communication

Variants Of Software

User : Control Operator

Variants of software created for different platforms.

Mobile App

User: Sender

A mobile app for monitoring package and drone status.

Package Return

User : Receiver

User make a request for package return and package returned to sender.

Mobile App

User: Receiver

A mobile app for monitoring package status.

Emergency Call Back

User: Control Operator

In a state of emergency drone called back for condition check.

Creating Alternative Routes

User: Sender

Alternative routes for drones created according to external conditions (weather etc.) and user is notified.

Control Checkpoints

User : Sender, User

Some checkpoints assigned by user and user infromed when drone arrived related checkpoints.

Drone Condition Control

User: Control Operator

Instant drone condition Information sent to the user.

Sound Notifications

User : Control Operator

User gets sound notifications for critical situations.

Failure Reporting

User: Control Operator

Drone informs the system about low and high priority failures and process failure protocol.

Template Messages

User : Control Operator

User uses template messages with few clicks to notify sender or receiver about delivery status.

Creating Template Messages

User: Control Operator

User may create new template messages in state of necessity.