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Design document for BTP Sarl Construction  
Management Web Application

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## Contents

<b>Context</b> .....	1
<b>Introduction</b> .....	1
<b>1. Methodology Used</b> .....	2
4+1 View Model .....	2
<b>2. Sequence Diagrams</b> .....	3
<b>3. Class diagram</b> .....	7
<b>4. Activity diagram</b> .....	8
<b>5. State Machine Diagram</b> .....	12
a. The whole system life cycle .....	12
b. Construction project life cycle .....	12
c. Material request life cycle .....	13
<b>Conclusion</b> .....	14

## Table of Figures

Figure 1: Admin's Sequence Diagram .....	3
Figure 2: Material Management Sequence Diagram .....	4
Figure 3: Cash Register Management Sequence Diagram .....	5
Figure 4: Progress Monitoring Sequence Diagram .....	6
Figure 5: Class Diagram.....	7
Figure 6: Admin's Activity Diagram.....	8
Figure 7: Material Management Activity Diagram .....	9
Figure 8: Cash Register Activity Diagram.....	10
Figure 9: Progress Monitoring Activity Diagram .....	11

Figure 10: Whole System State Diagram .....	12
Figure 11: Construction Project State Diagram .....	13
Figure 12: Material Request State Diagram .....	13

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## Context

BTP Sarl is a company that manages and monitors construction projects. One of its main concerns is tracking the input and output of construction materials. The goal is to develop a web application that enables real-time traceability of construction project management and monitoring from tablets or computers. This project can be used in the field of civil engineering.

## Introduction

This document provides the software design specifications for a **real-time construction work monitoring and project management system**. The system is intended to facilitate efficient tracking of construction activities, management of construction materials and financial transactions, and real-time documentation of project progress.

# 1. Methodology Used

## 4+1 View Model

For our design, we will use the **4+1 View Model**, a software architecture methodology that utilizes five complementary views to describe the system. Each view provides a different perspective, ensuring comprehensive coverage of both static and dynamic aspects.

### Description of the 4+1 Methodology

The **4+1 View Model** consists of:

VIEW	DIAGRAM	PURPOSE
LOGICAL VIEW	Class Diagram	Shows the static structure of classes and their relationships.
PROCESS VIEW	Sequence Diagram	Shows dynamic interactions between objects over time.
DEVELOPMENT VIEW	Activity Diagram	Represents workflows and processes in the system.
PHYSICAL VIEW	State Transition Diagram	Shows how system states transition over time (replacing Deployment Diagram).
SCENARIOS (+1)	Use Case/Sequence Diagram	Validates the architecture by showing how the system behaves in scenarios.

NB: In our case, the **Deployment Diagram** will be replaced by the **State Transition Diagram** due to project constraints.

## 2. Sequence Diagrams

### a) Admin sequence diagram

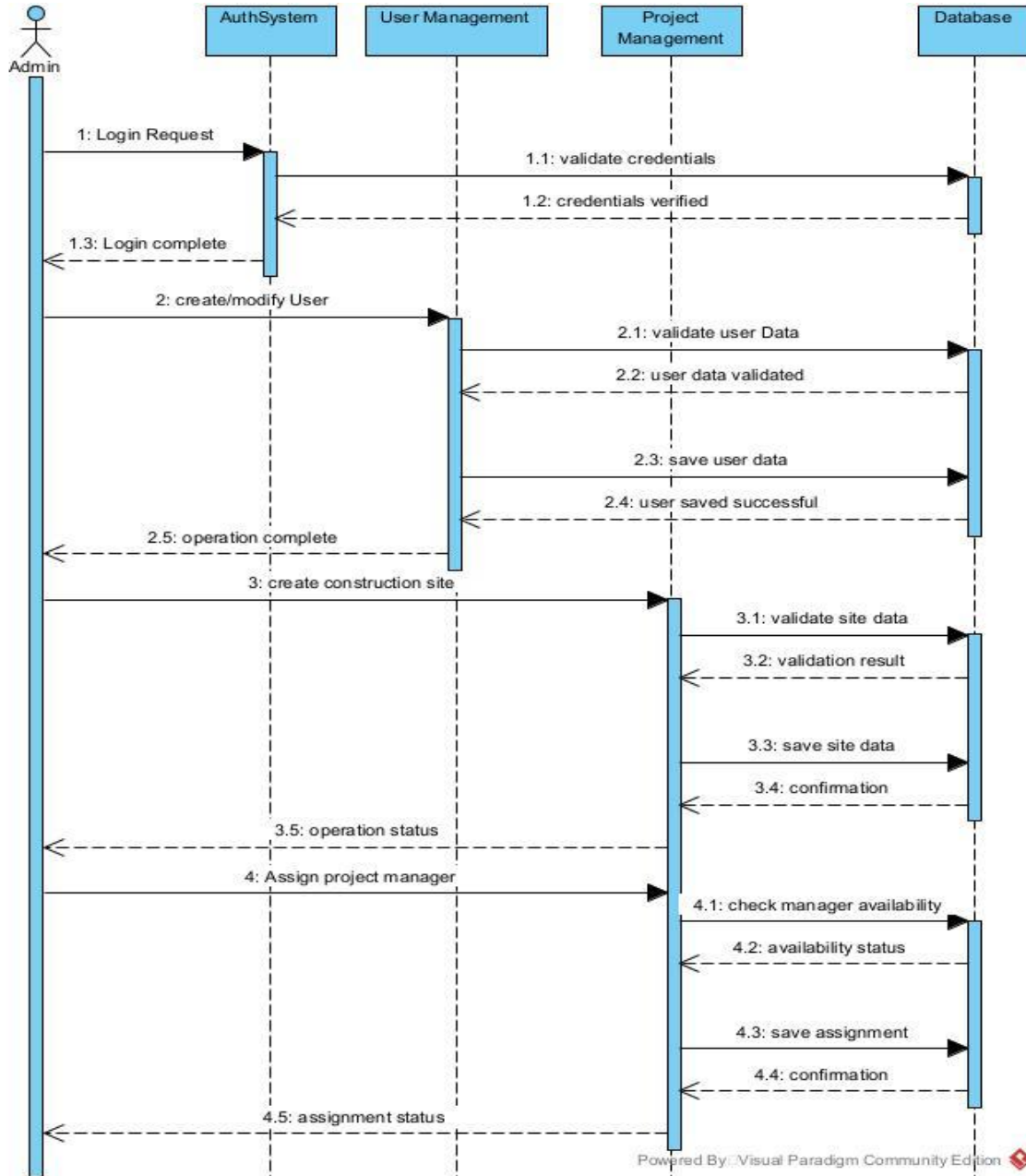


Figure 1: Admin's Sequence Diagram

## b) Material Management

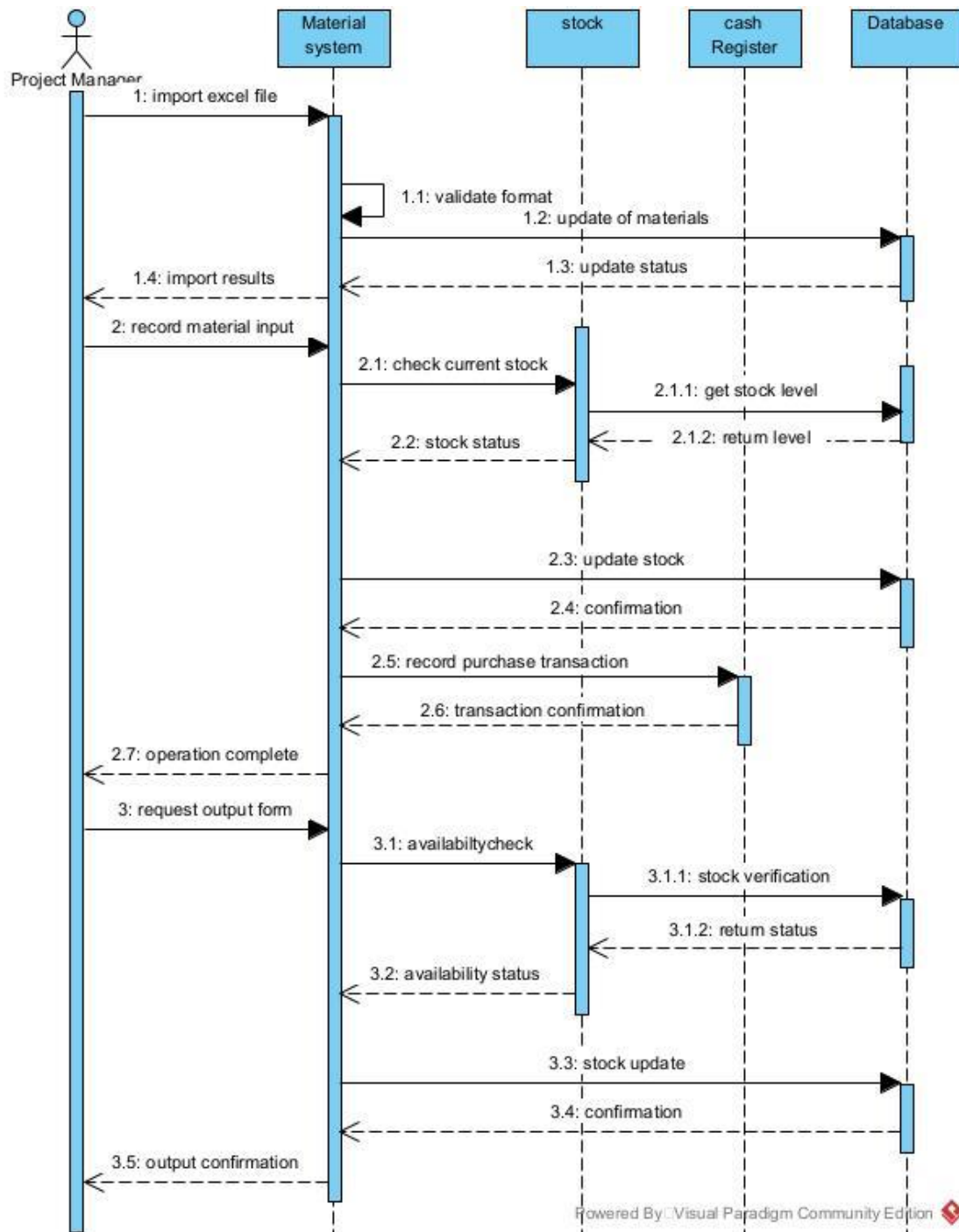


Figure 2: Material Management Sequence Diagram

### c) Cash Register Management

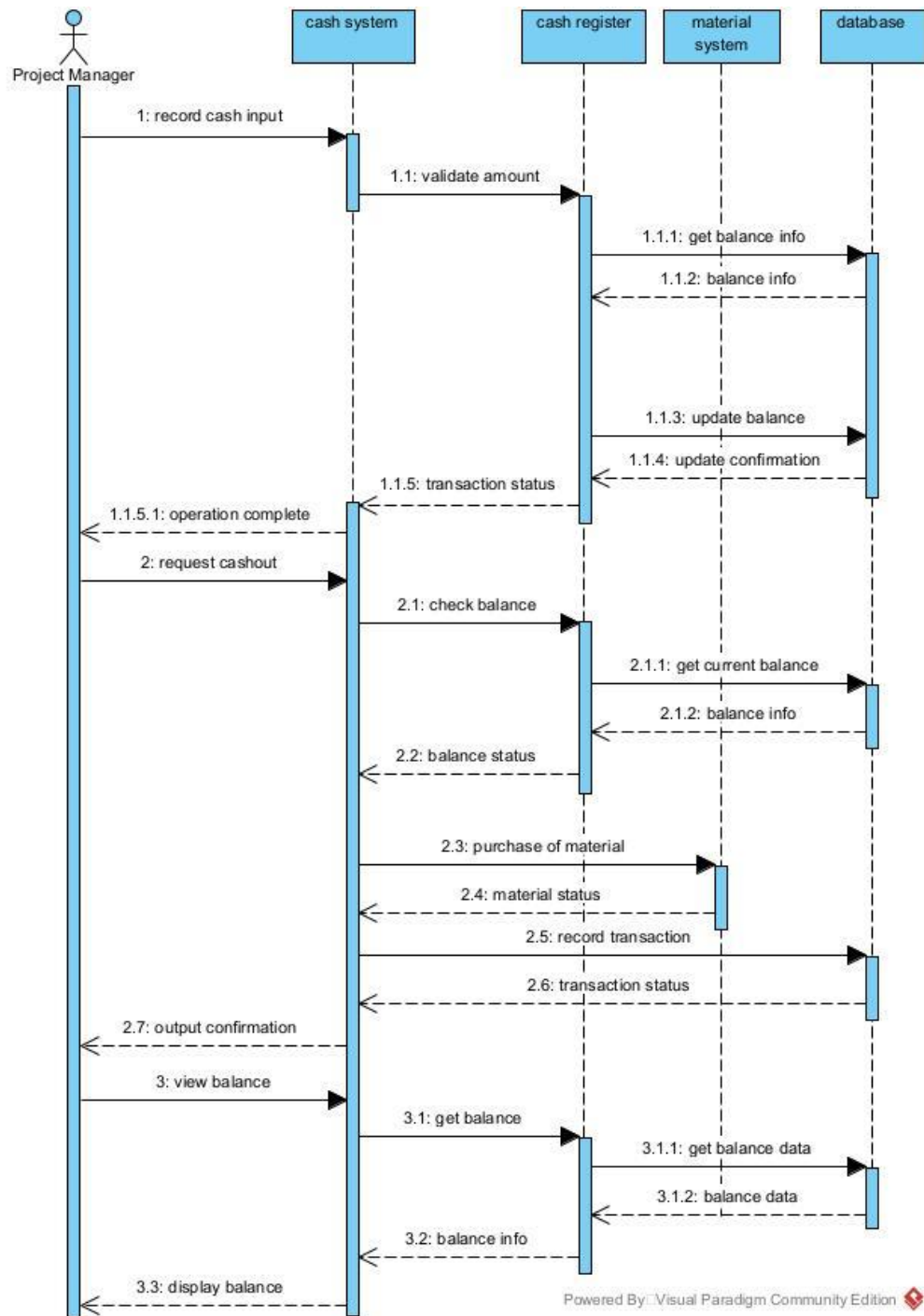


Figure 3: Cash Register Management Sequence Diagram



## d) Progress Monitoring

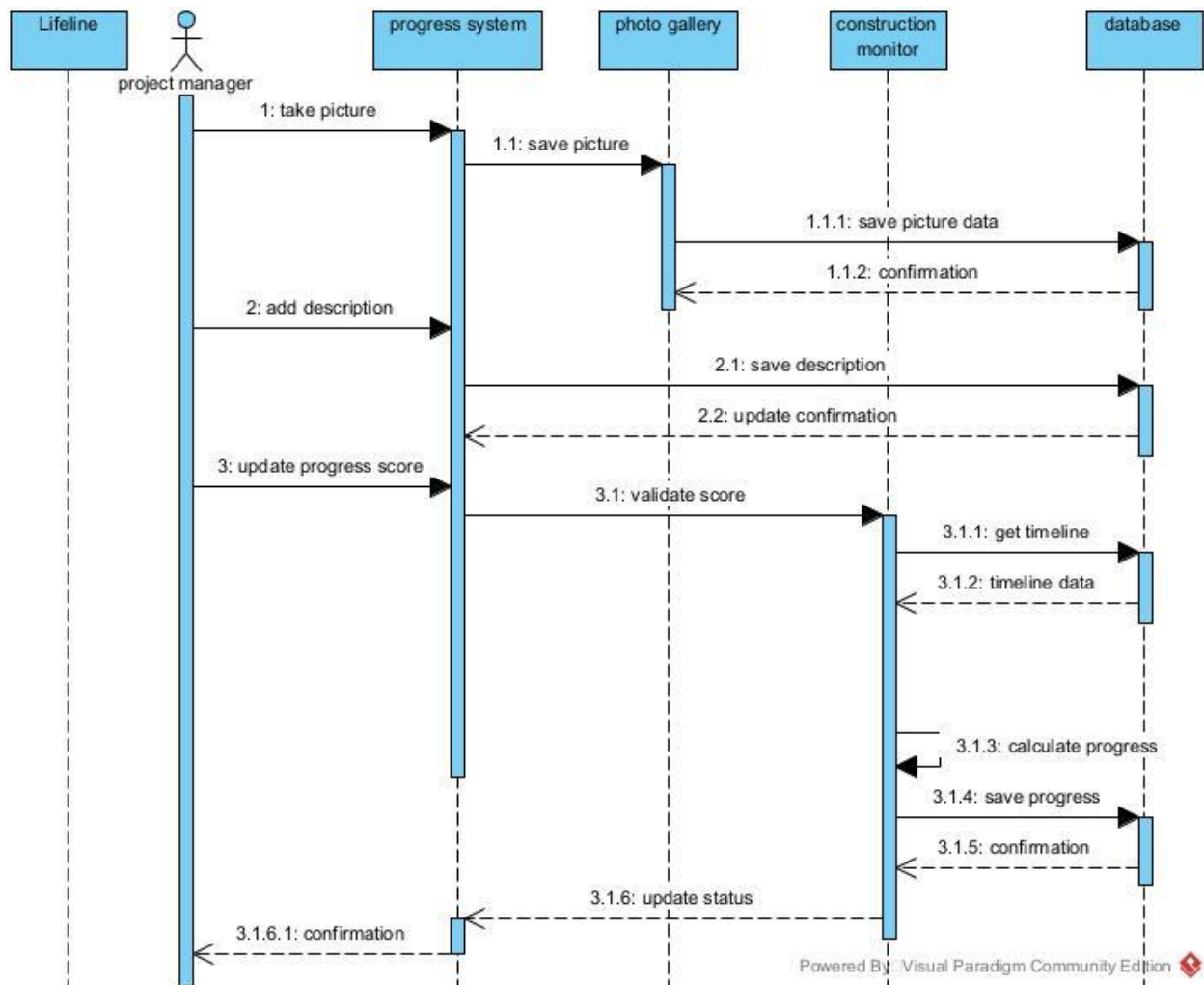
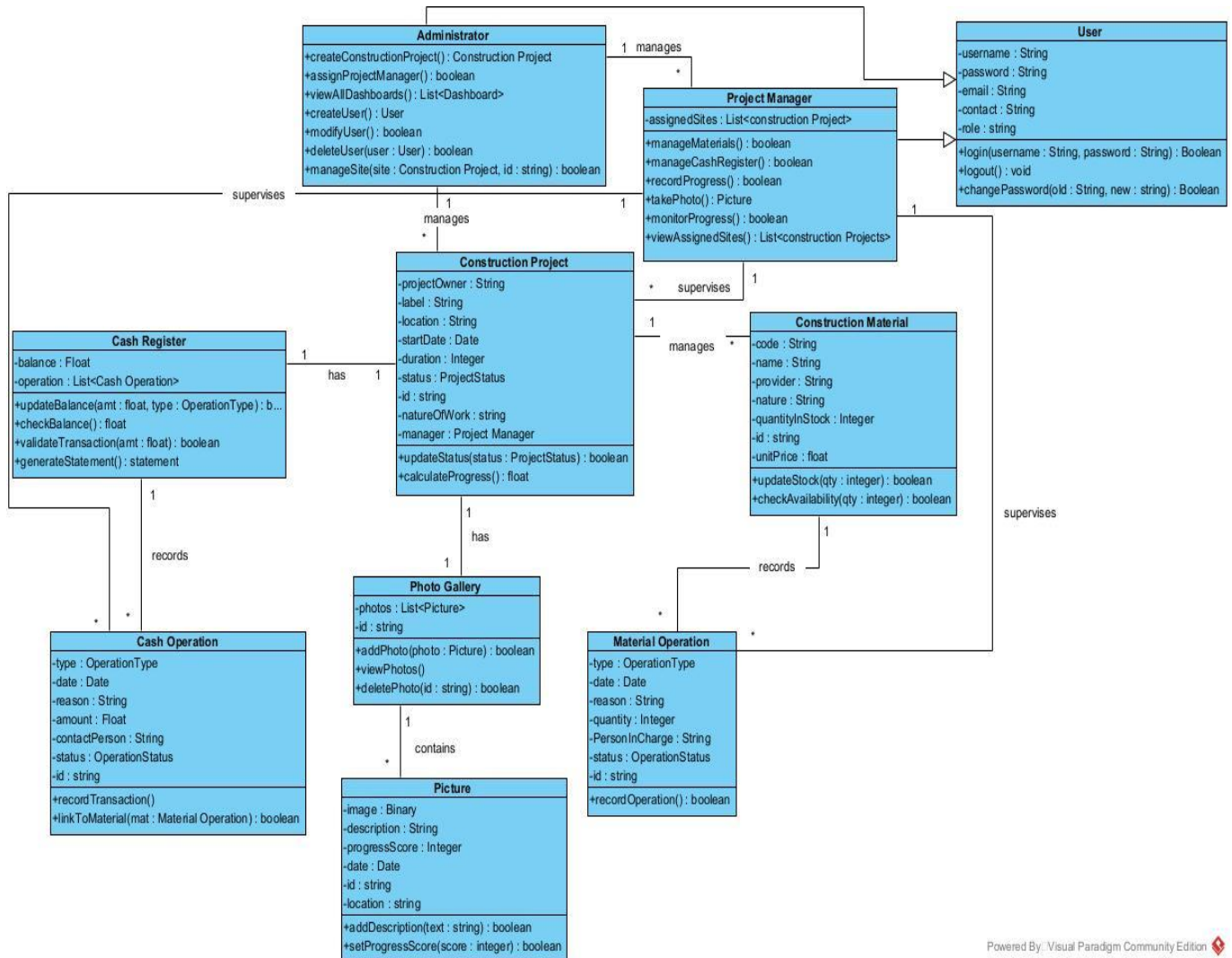


Figure 4: Progress Monitoring Sequence Diagram

### 3. Class diagram



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Figure 5: Class Diagram

## 4. Activity diagram

### a) Admin Activities

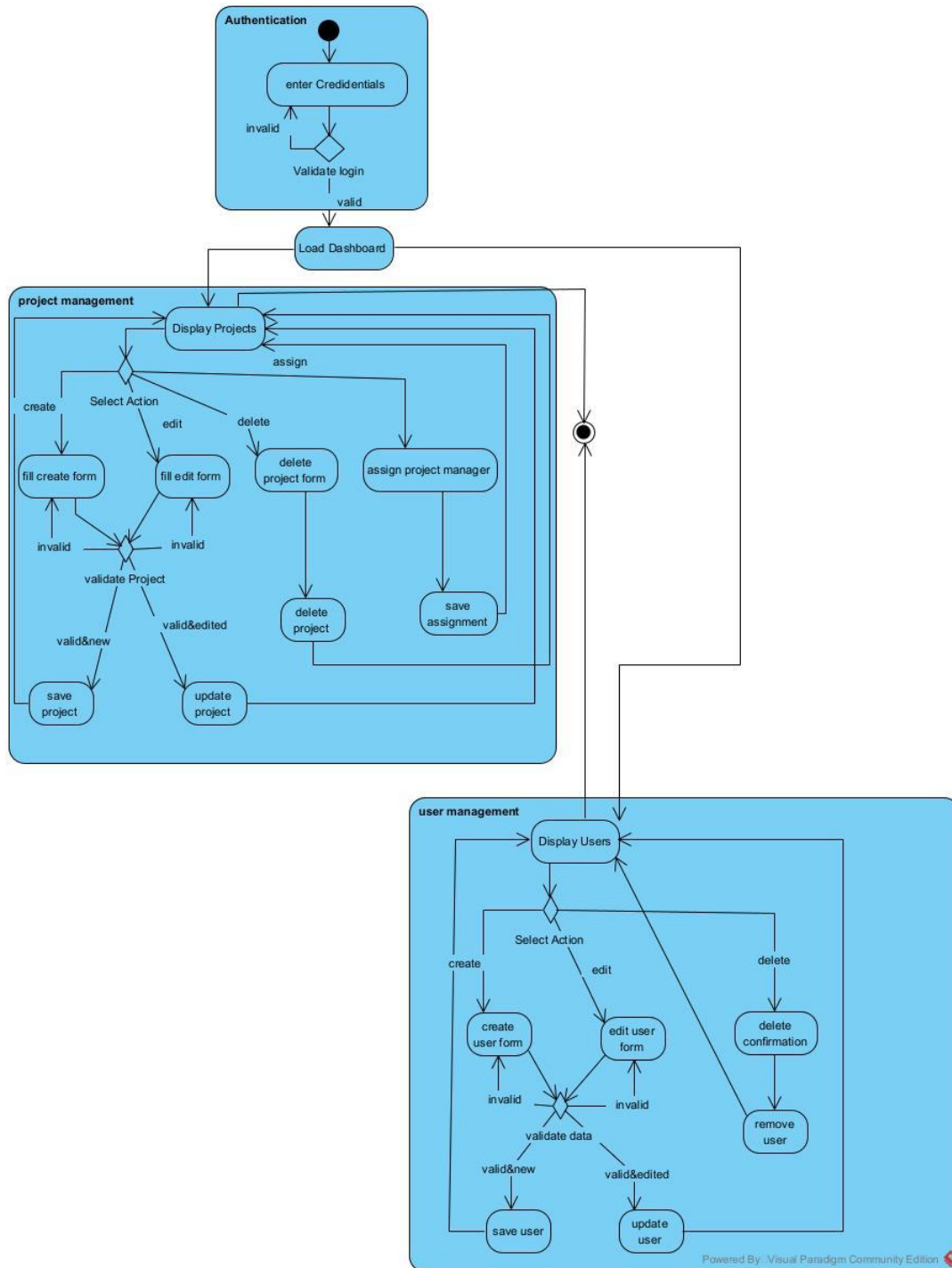


Figure 6: Admin's Activity Diagram

## b) Material Management

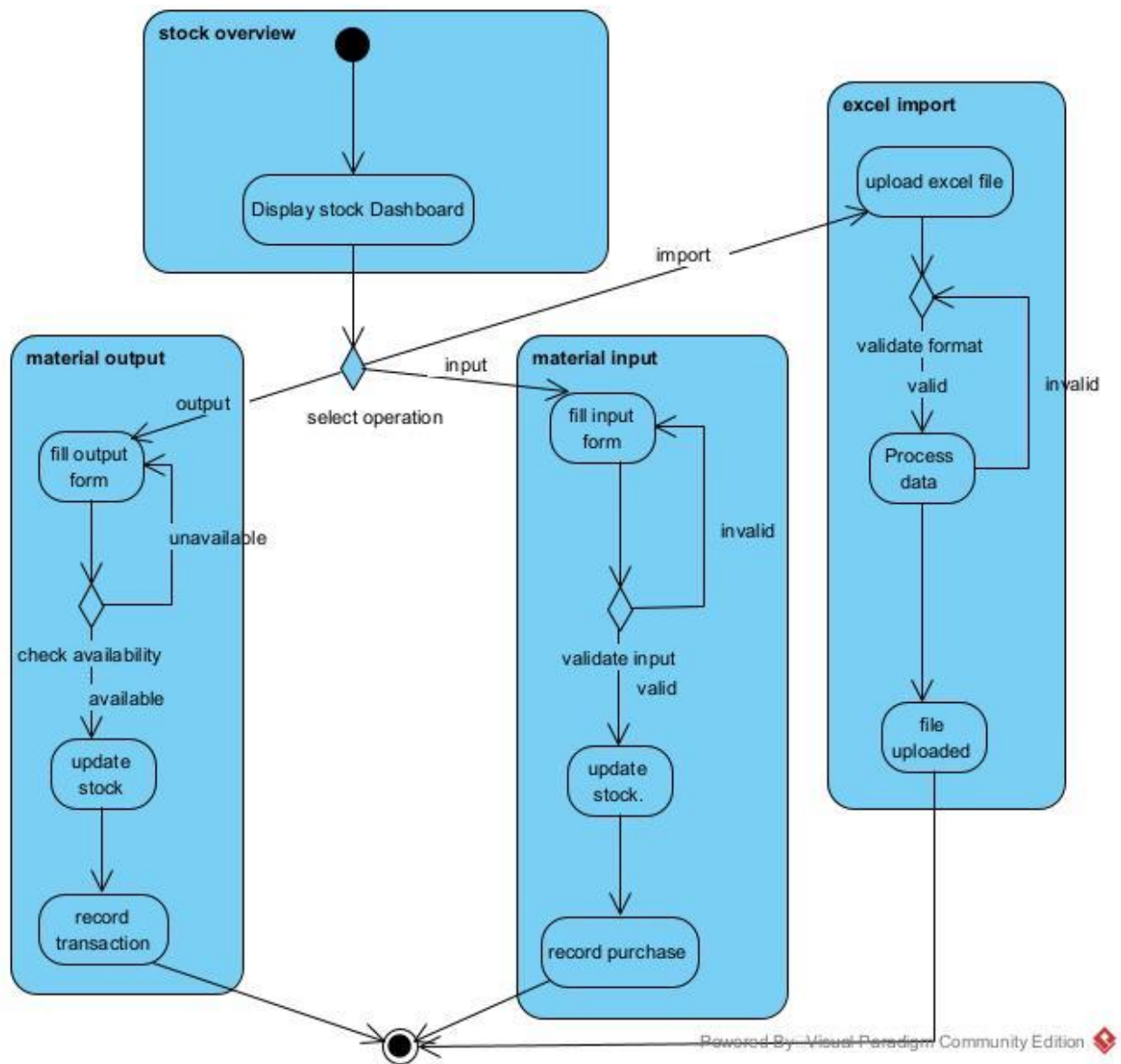


Figure 7: Material Management Activity Diagram

### c) Cash Register Activities

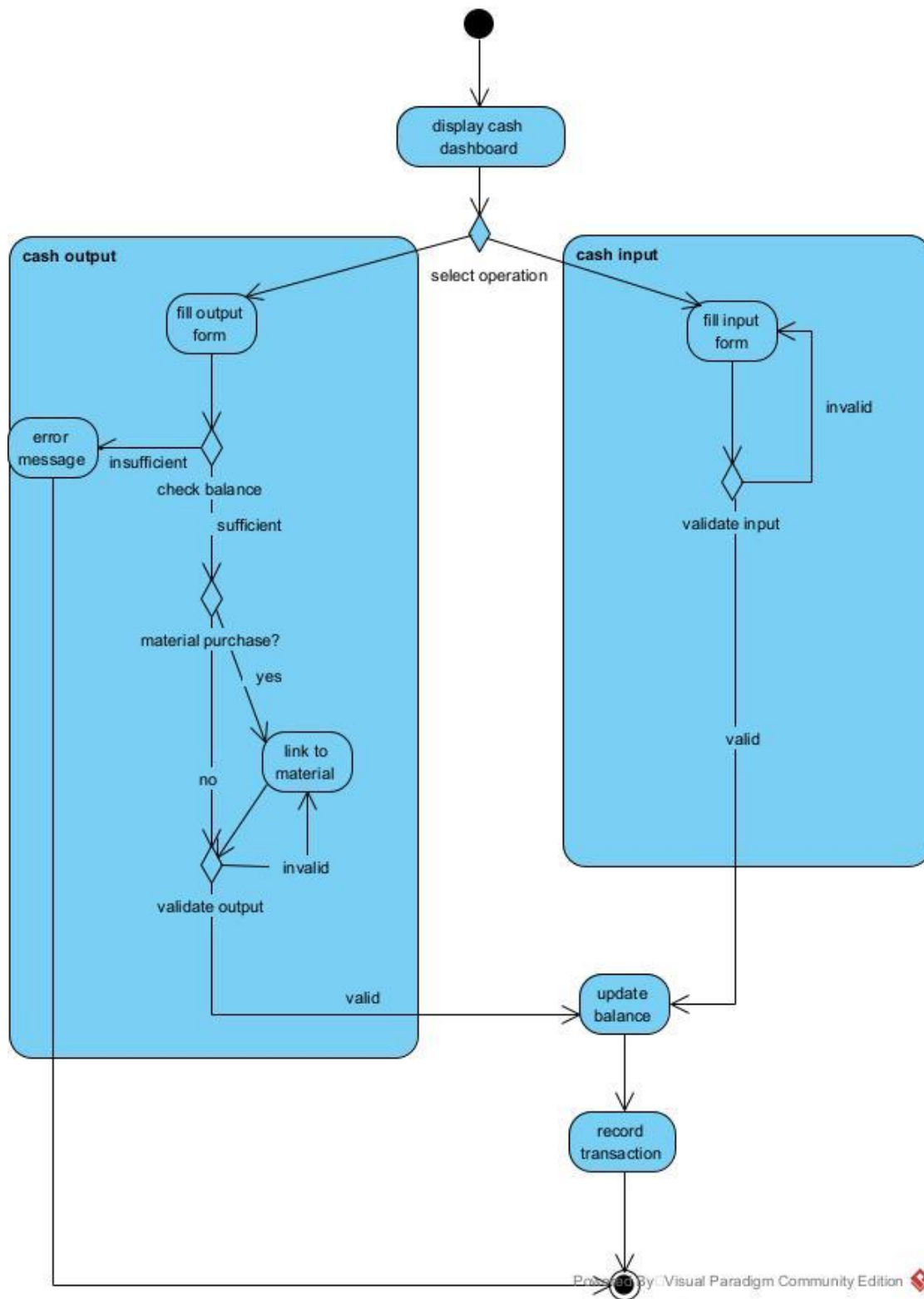


Figure 8: Cash Register Activity Diagram

#### d) Progress Monitoring

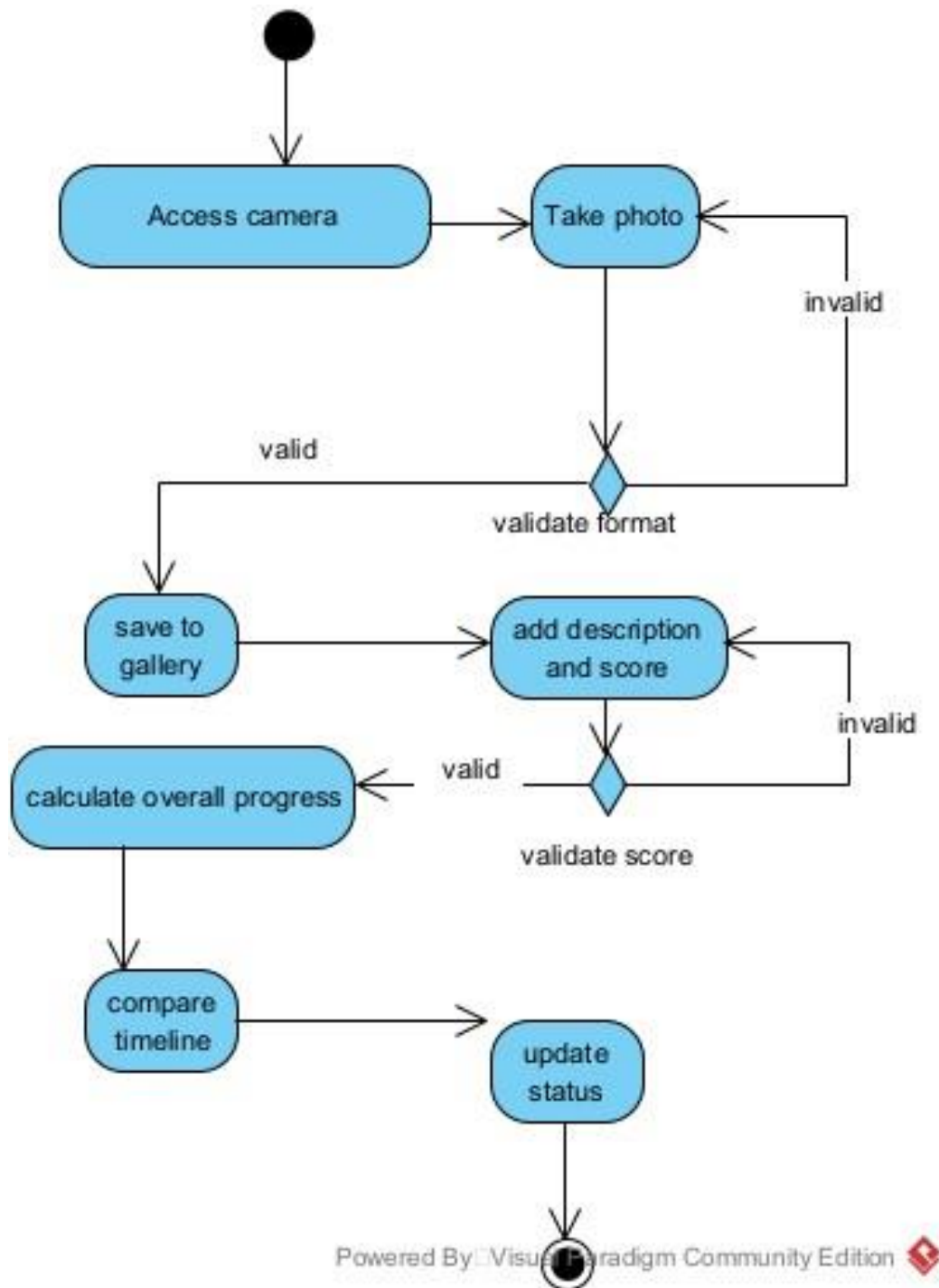


Figure 9: Progress Monitoring Activity Diagram

## 5. State Machine Diagram

### a. The whole system life cycle

#### States

- Development
- Testing
- Deployed

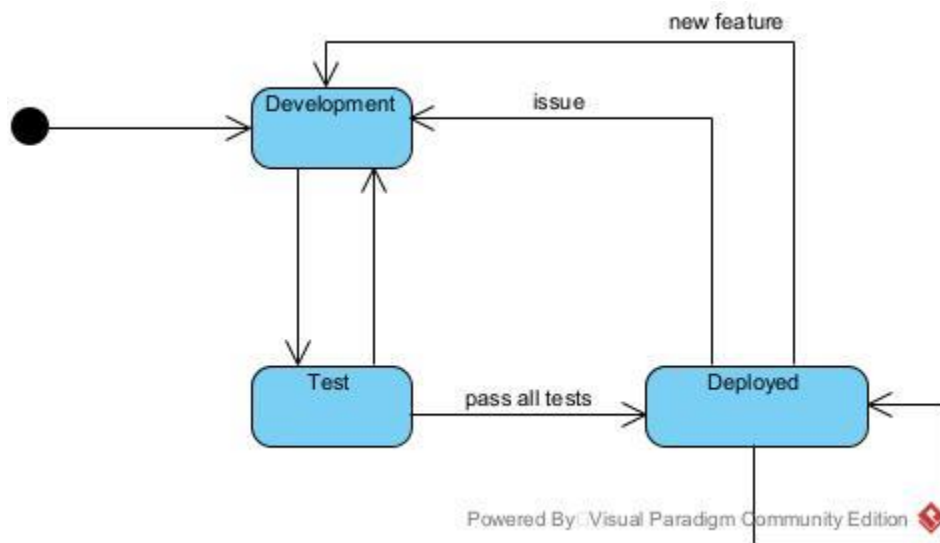


Figure 10: Whole System State Diagram

### b. Construction project life cycle

#### States

- Created
- Assigned to User
- Started
- Ongoing
- Cancelled
- Completed

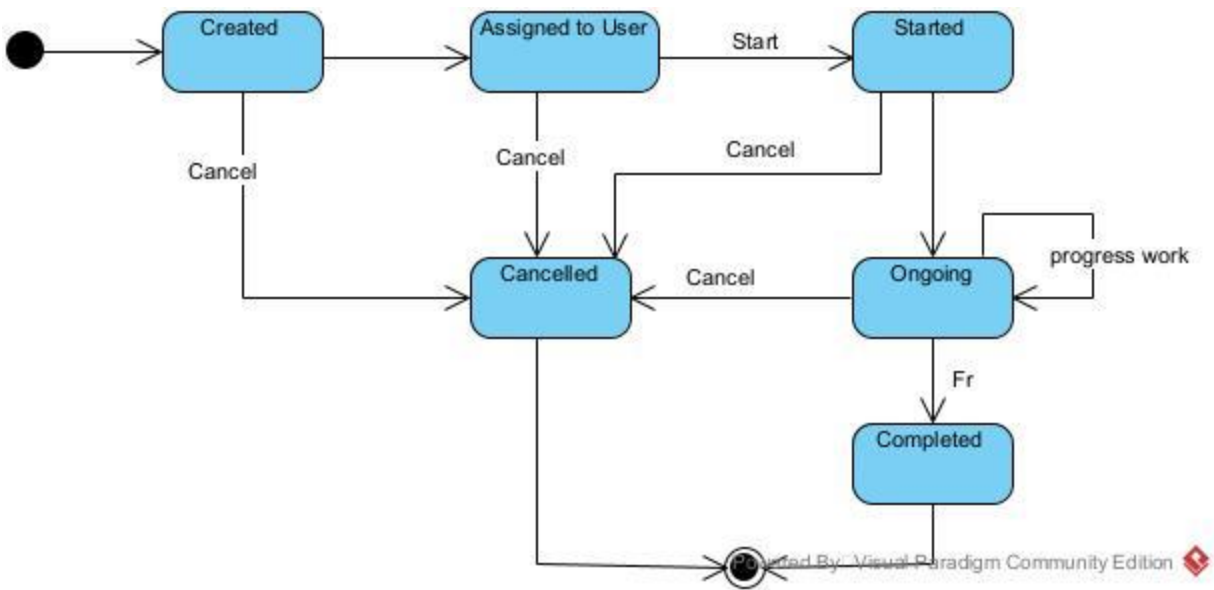


Figure 11: Construction Project State Diagram

### c. Material request life cycle

#### States

- Created
- Confirmed
- Rejected
- Recorded

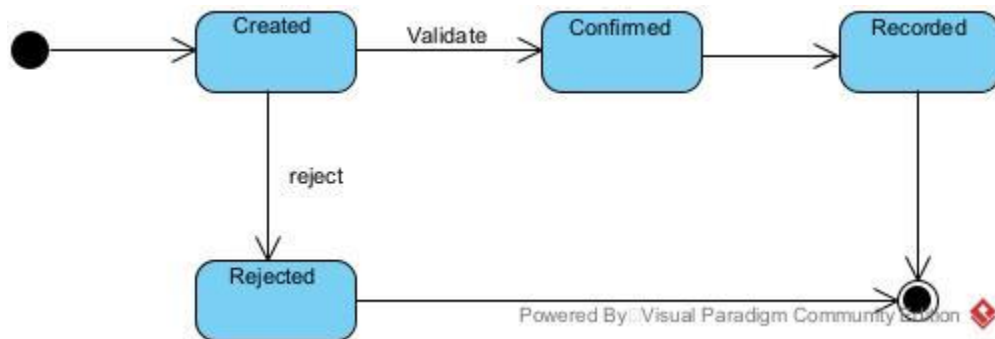


Figure 12: Material Request State Diagram



## Conclusion

This document presents the real-time construction monitoring and project management system using the 4+1 View Model. The design ensures efficient tracking of construction activities, materials, and financial transactions. By integrating user roles, workflows, and structured data management, the system will improve project oversight and decision-making.