

Group 10 - Deliverable #3

SFWRENG 3A04: Software Design III - Large System Design
Tutorial 1

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1 Introduction

1.1 Purpose

The purpose of this document is to demonstrate HackerSim through various Unified Modelling Language (UML) diagrams. Utilizing the use-case diagrams and business events from Deliverable 1, as well as the analysis class diagram, architectural diagram and class responsibility collaboration (CRC) cards from Deliverable 2, we can create effective and detailed state diagrams, sequence diagrams and a class diagram. These UML diagrams will outline the states, sequence of interactions and core data structures that HackerSim is compiled of. This document is intended for the project manager, current members of the project team, future developers and stakeholders for the HackerSim project.

1.2 System Description

The HackerSim system is an interactive game that will allow the user to raise a Software Engineer (SE) in their room. The user will have various control options over their SE to assist them in their growth as well as the ability to customize their Software Engineer to their liking. These control options include choosing when the SE will work, play games, exercise, sleep and eat. Working will increase the SE's currency and provide them with the ability to purchase various items for their room or food for when they're hungry. Each of these activities will also directly affect the SE's attributes in some manner and may extend or reduce its lifespan. Users will also have the ability to add friends and converse with them.

HackerSim utilizes a Presentation-Abstraction-Control (PAC) architecture that partitions the system into agents (triads) each containing a controller, entity object, and various presentation views. The system is broken down into the following agents: General (Room), User Attributes, SE Attributes, Shop, SE Inventory, Projects, Time-Step, and Friends & Chat. These agents communicate with one another to control the data flow through the entire system that is HackerSim.

1.3 Overview

The document is organized by the following sections: State Charts for Controller Classes, Sequence Diagrams and Detailed Class Diagram.

Section 2 contains State Chart Diagrams, built from the controllers from the Analysis Class Diagram from Deliverable 2, that depicts the system's states and the events required for transitions

Section 3 - contains Sequence Diagrams, built from the Use Case Diagrams and Business Events from Deliverable 1, that visually explain the flow of interactions between the user and the system

Section 4 contains a Class Diagram, built from the CRC cards from Deliverable 2, that defines the core data structures of the system

2 State Charts for Controller Classes

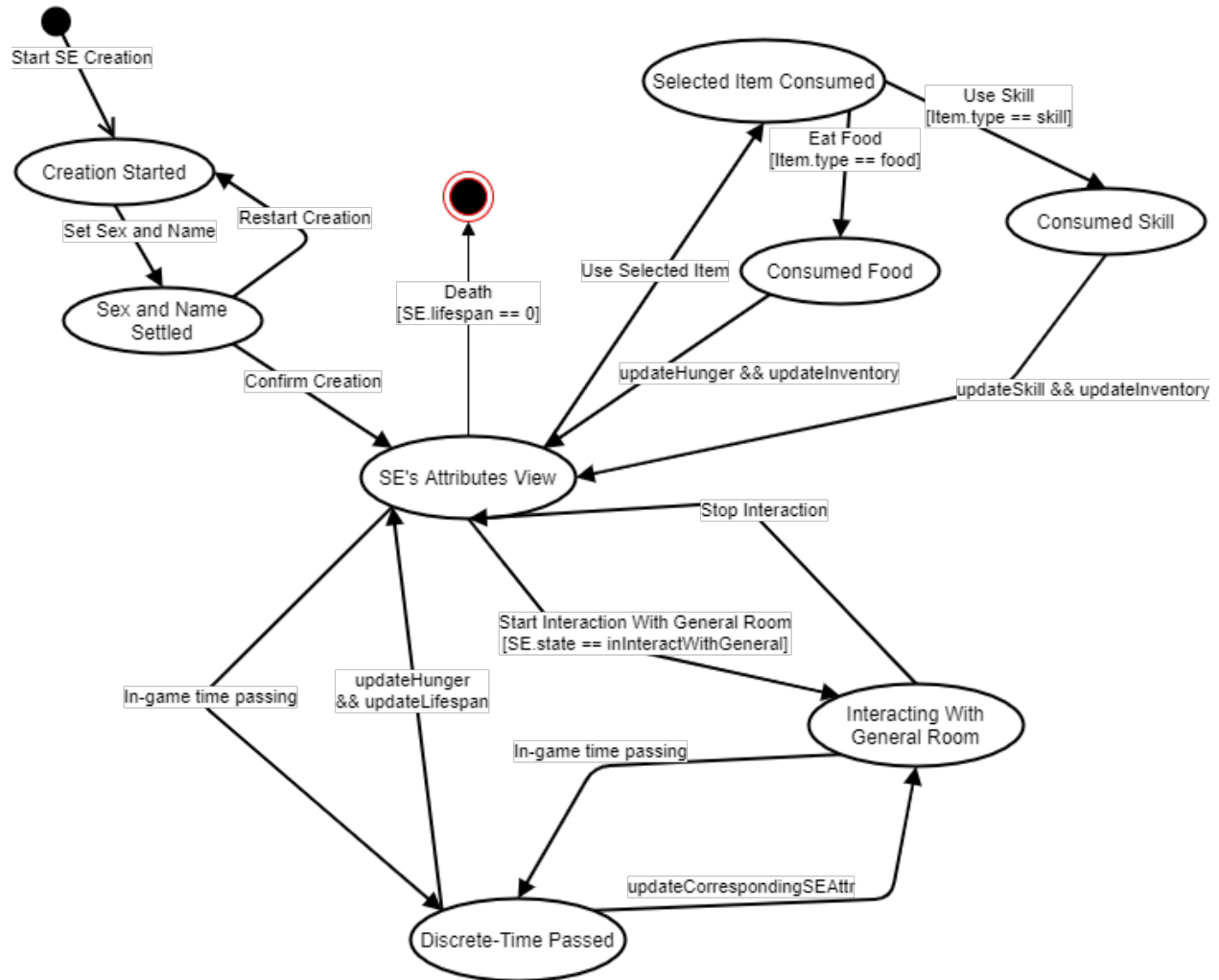


Figure 1: State Chart - SE's Attributes

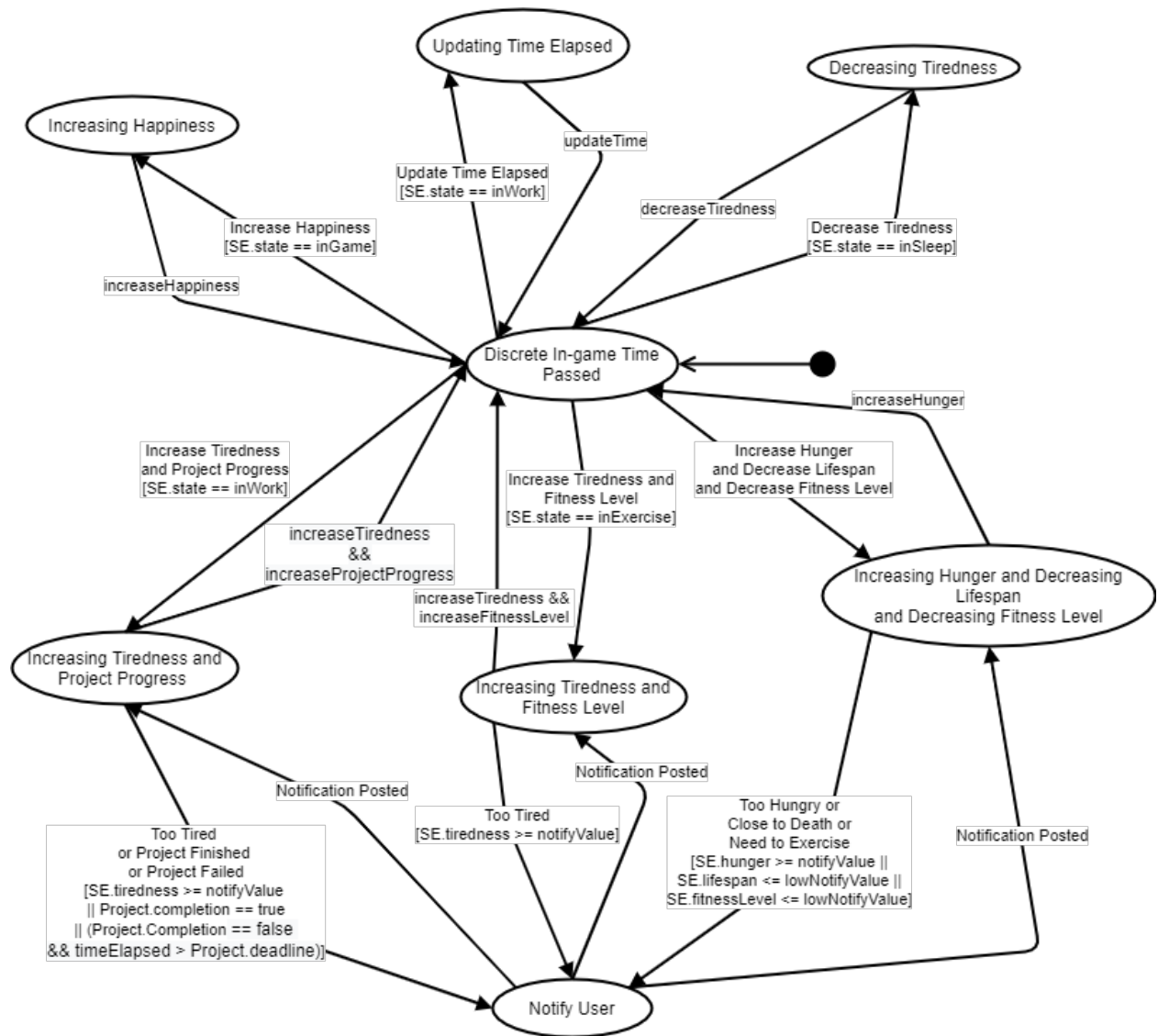


Figure 2: State Chart - Time-Step Controller

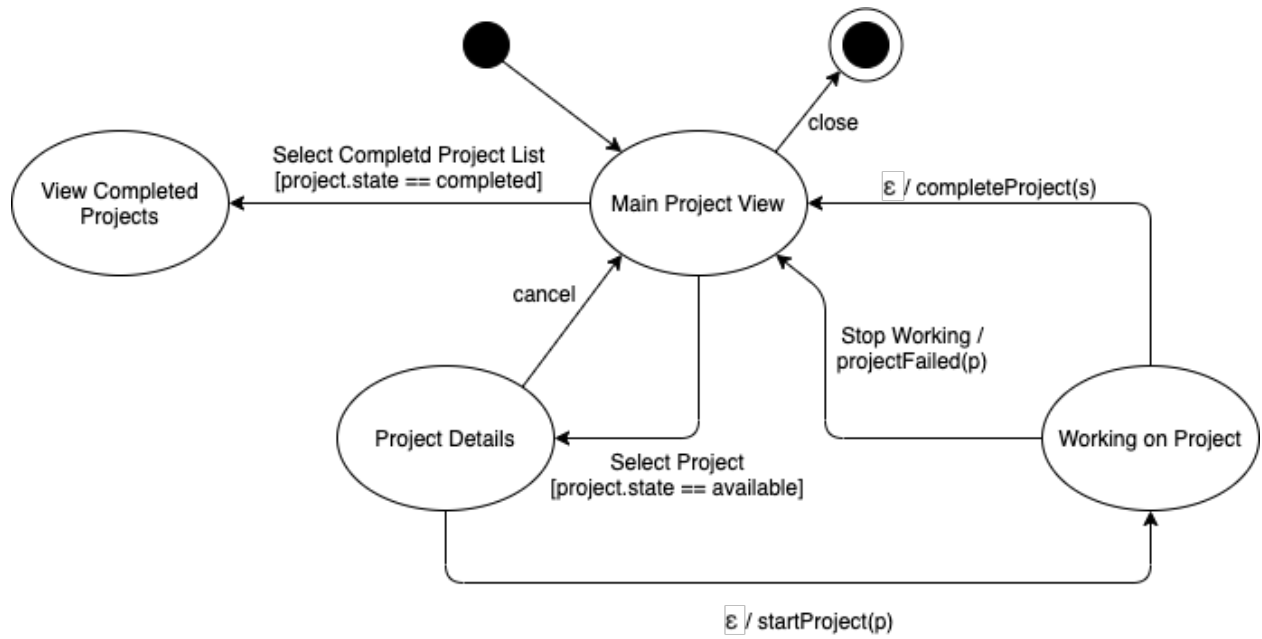


Figure 3: State Chart - Projects

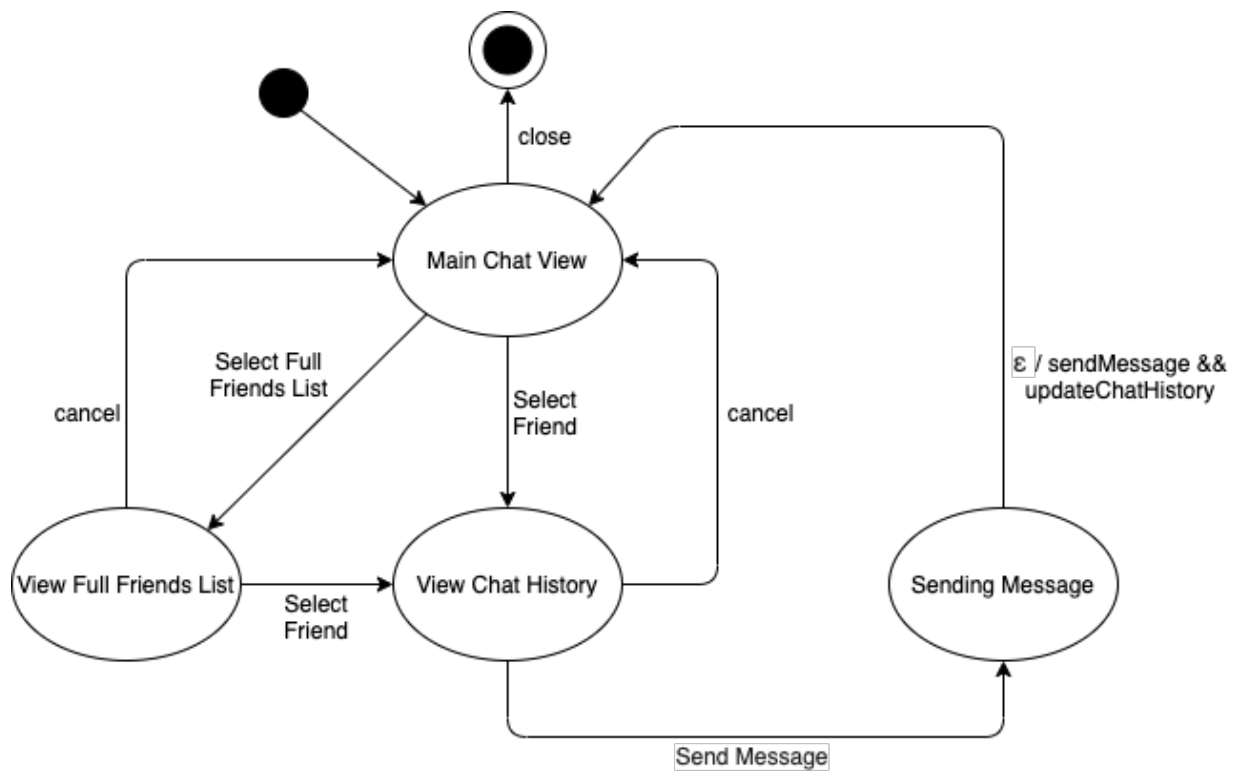


Figure 4: State Chart - Friends and Chat

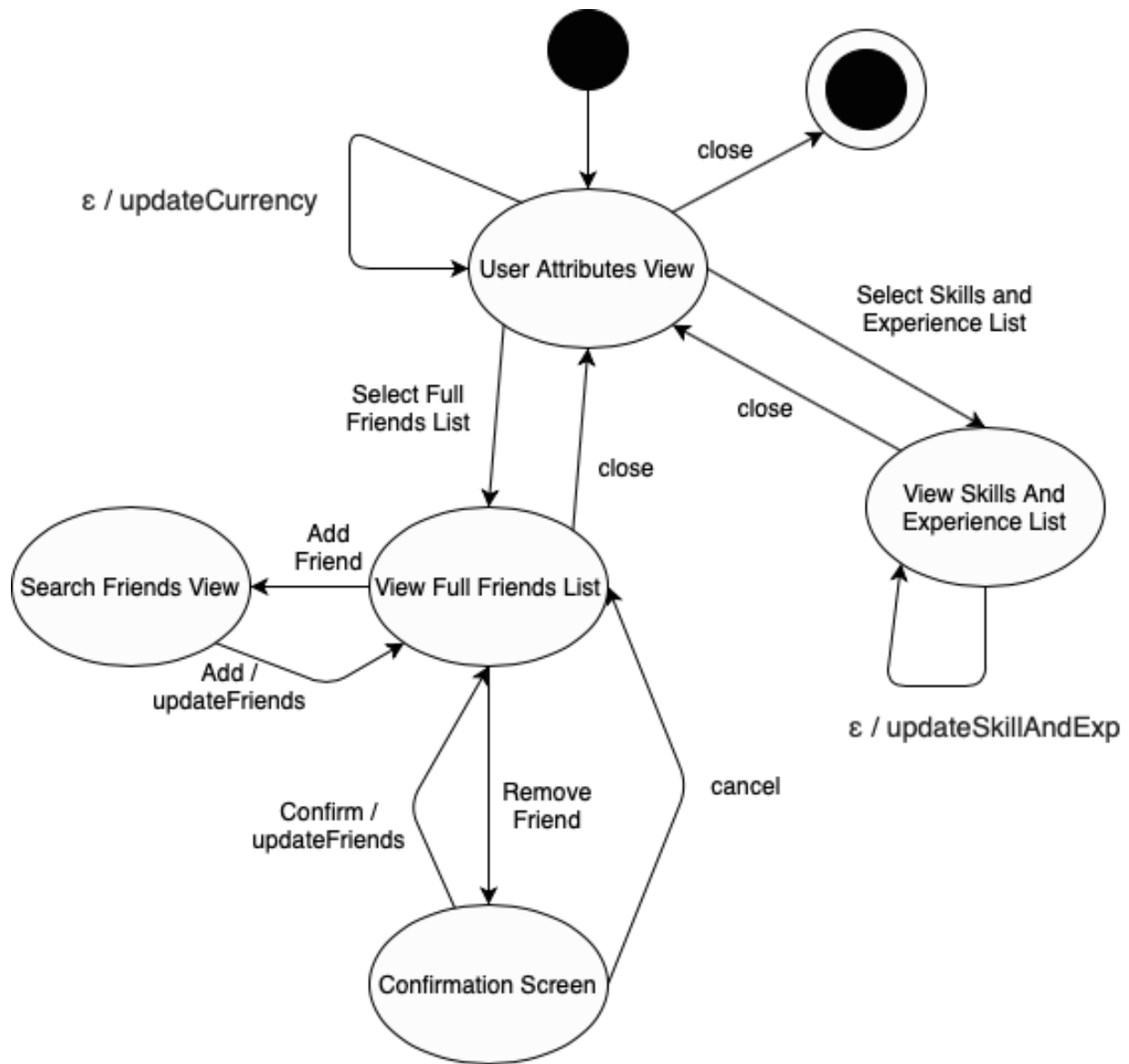


Figure 5: State Chart - User Attributes

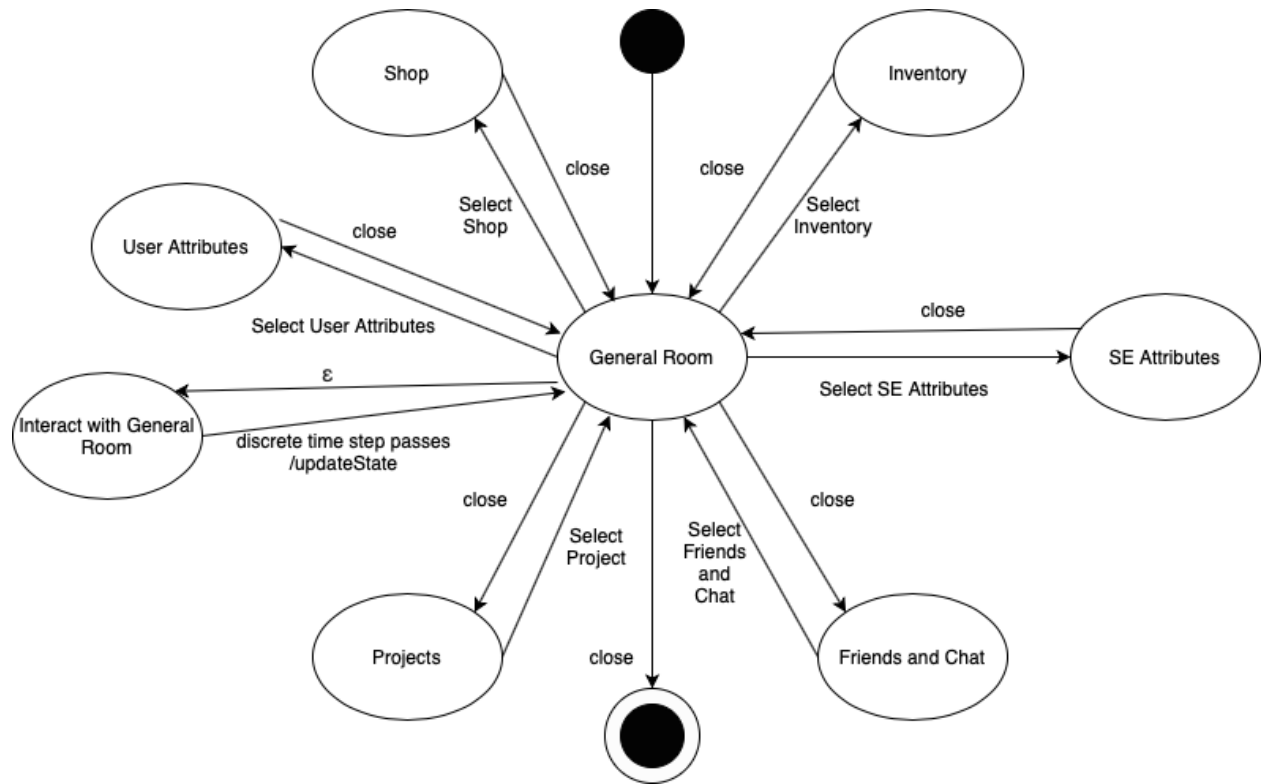


Figure 6: State Chart - General Room

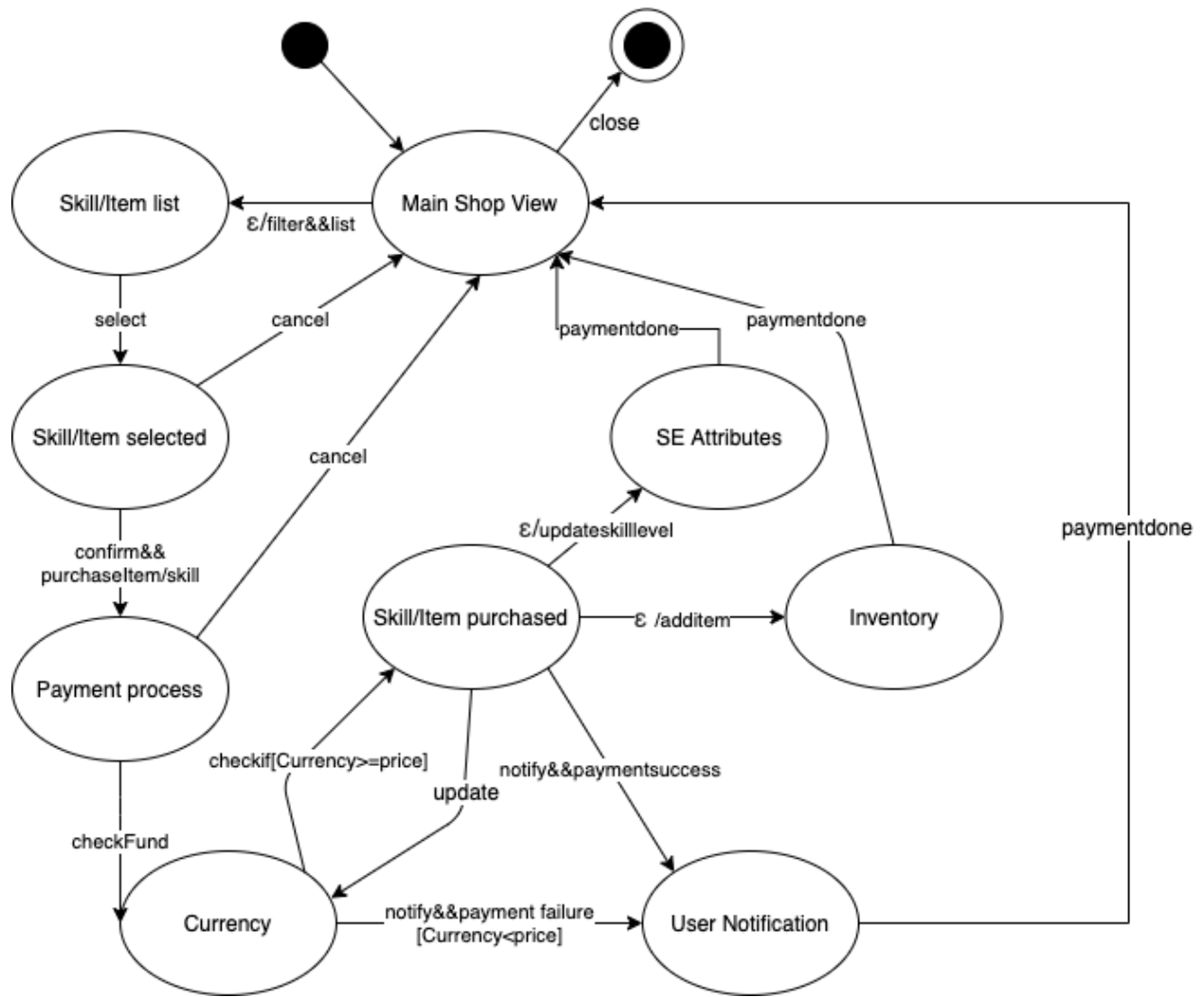


Figure 7: State Chart - Shop

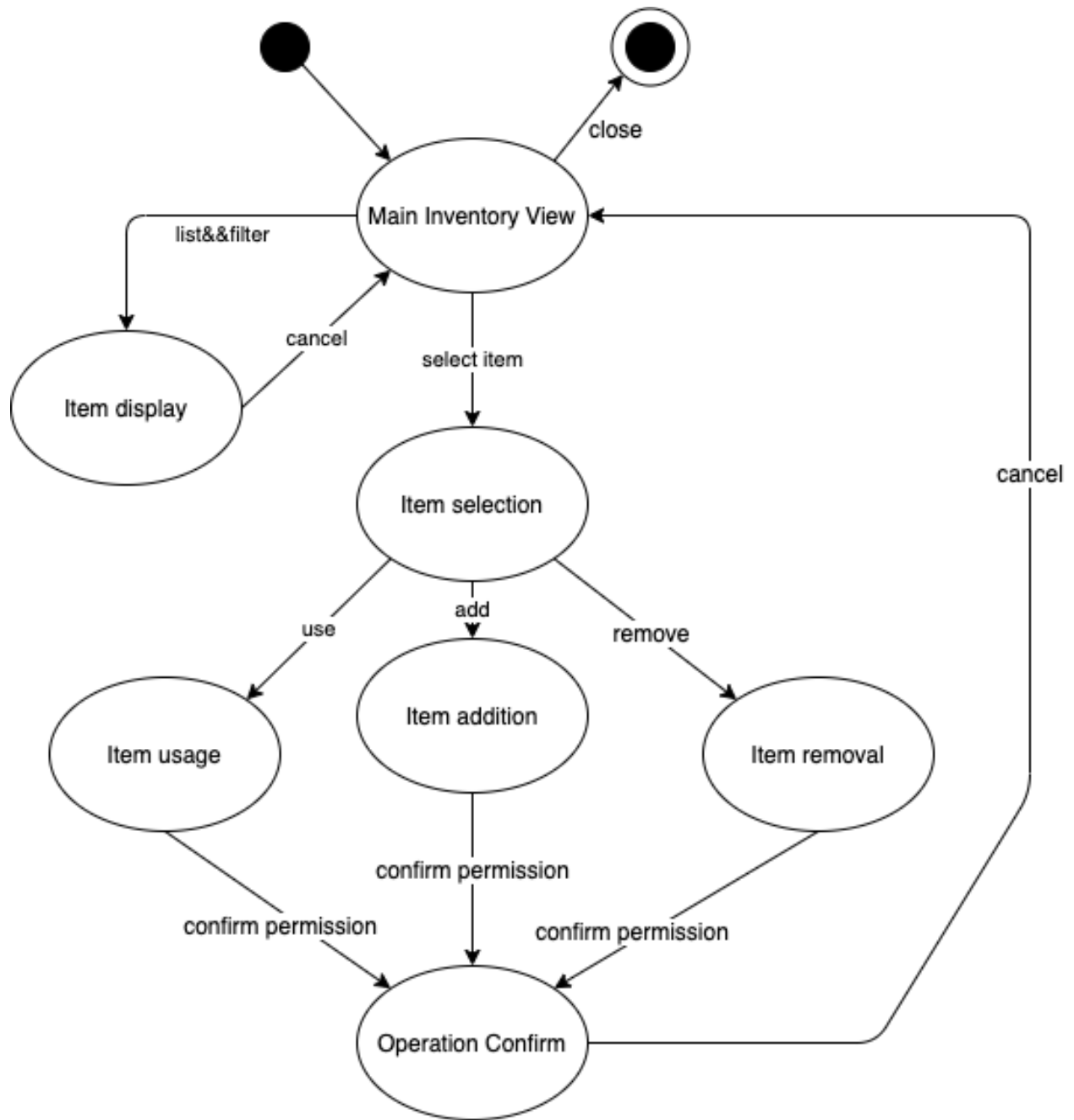


Figure 8: State Chart - Inventory

3 Sequence Diagrams

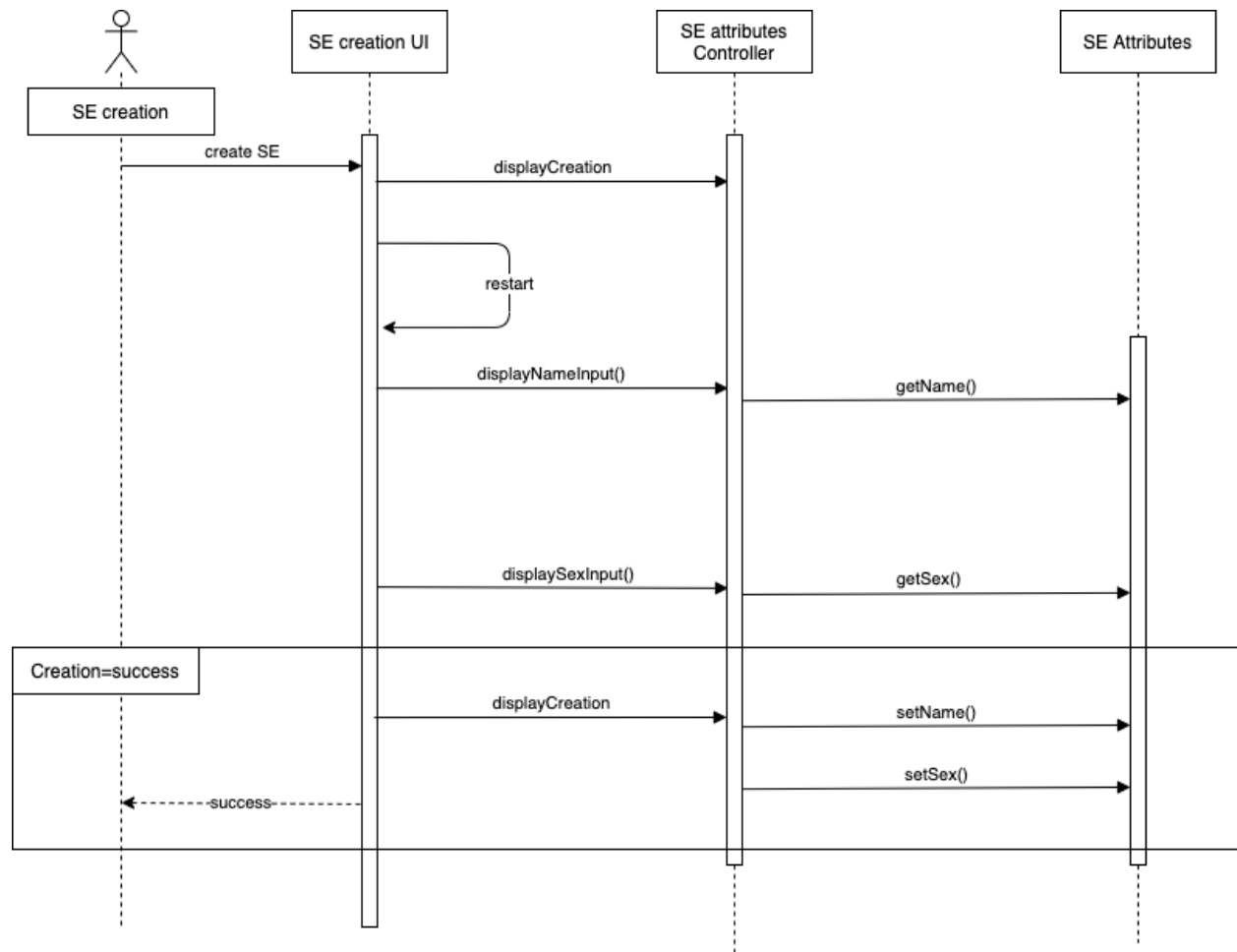


Figure 9: Sequence Diagram - User creates SE

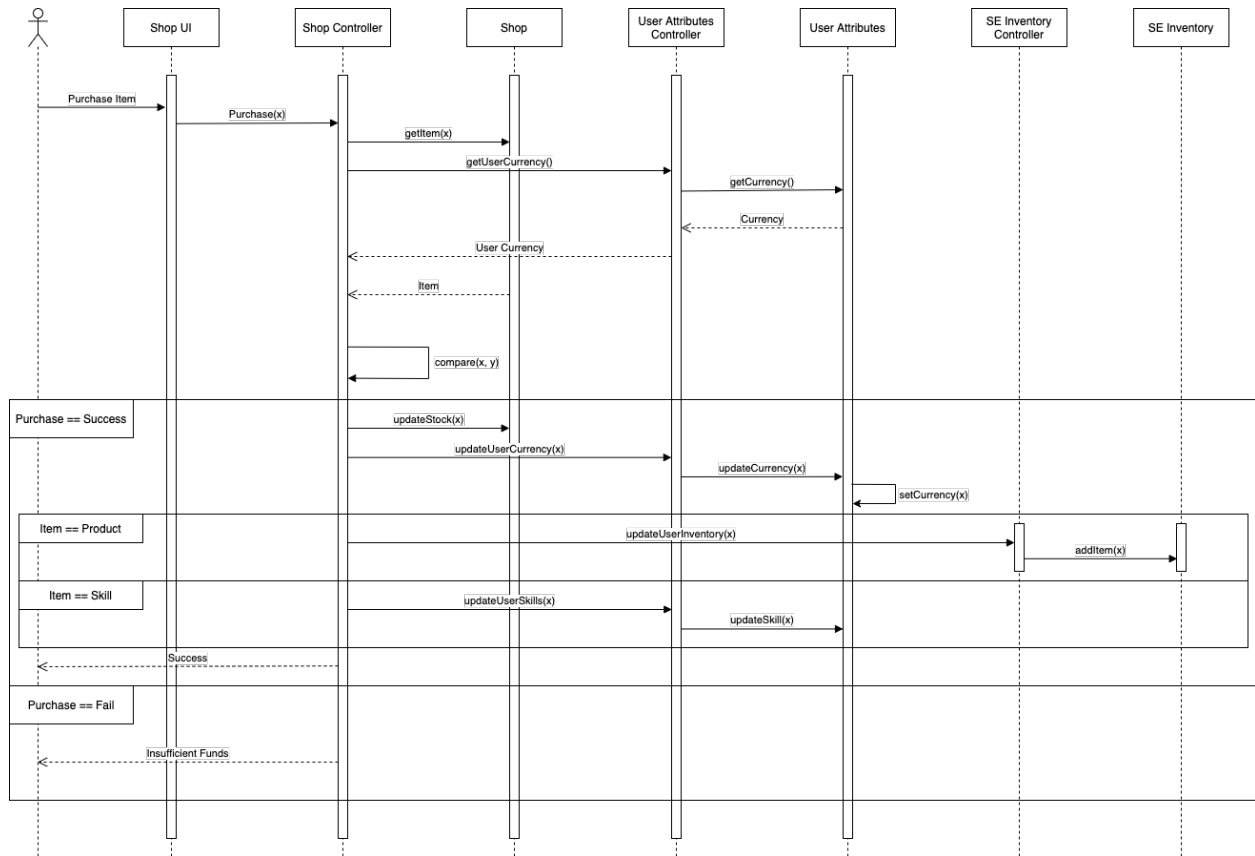


Figure 10: Sequence Diagram - SE Purchases Items and Skills

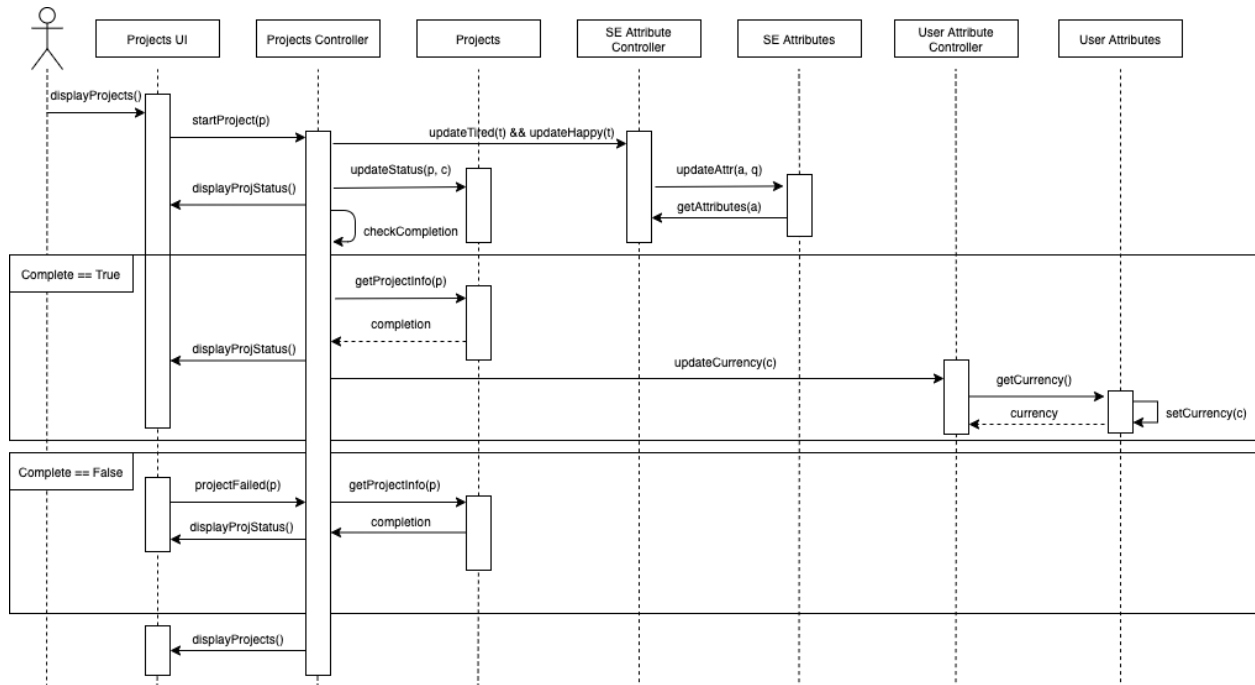


Figure 11: Sequence Diagram - SE Works on Projects

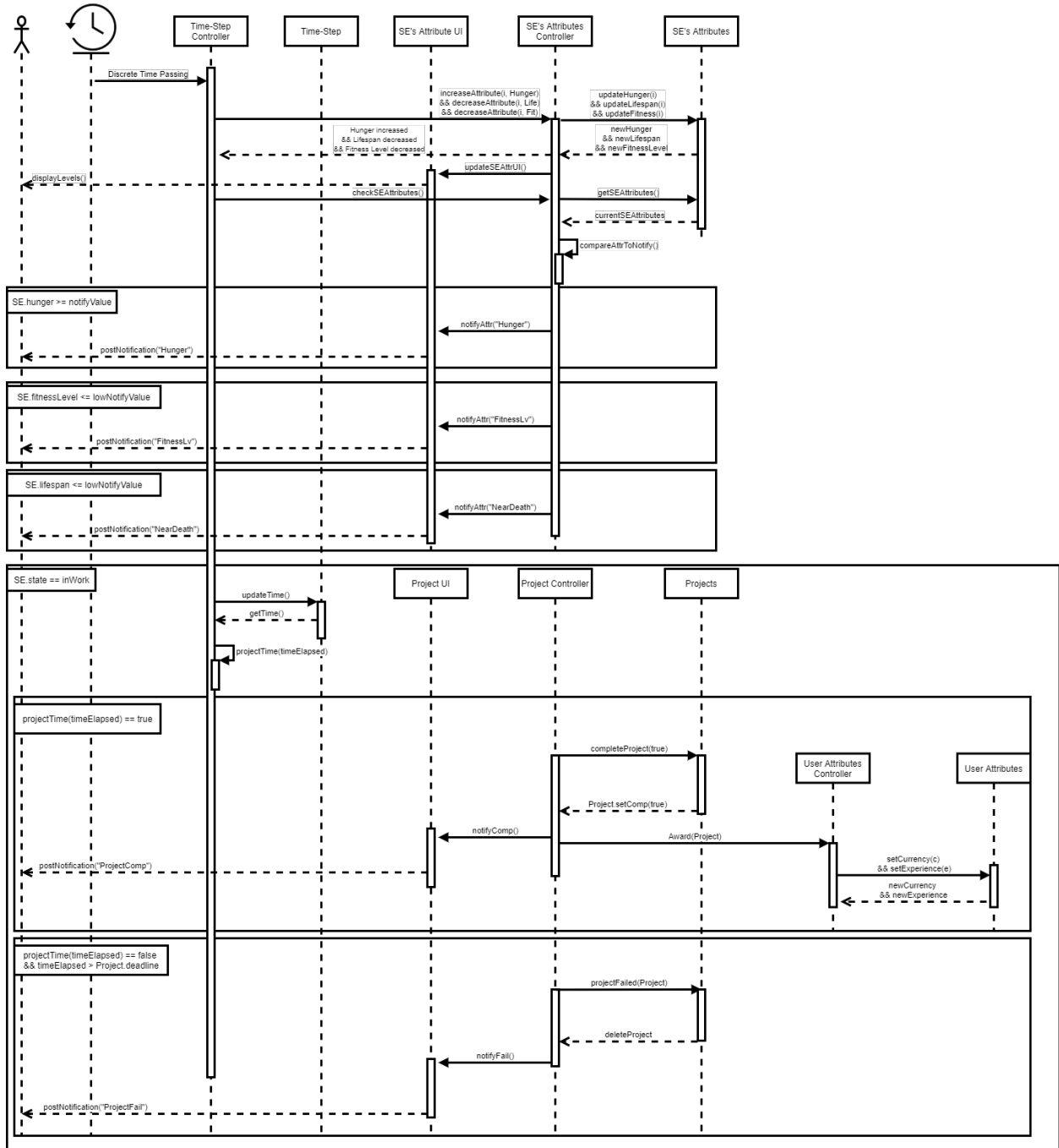


Figure 12: Sequence Diagram - Discrete-Time Pass

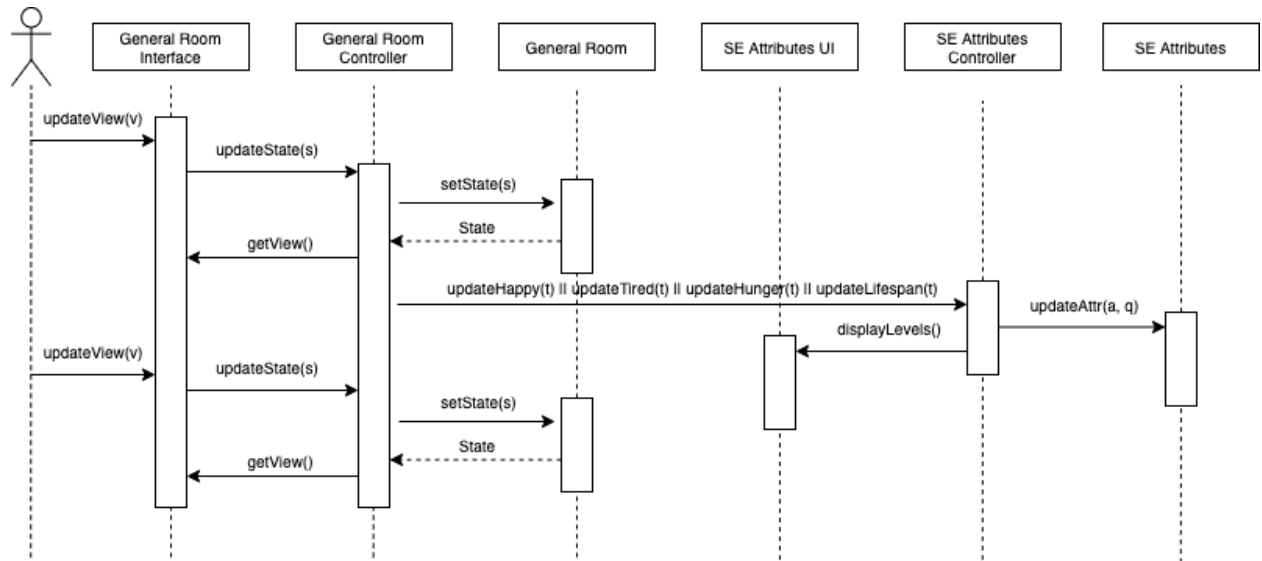


Figure 13: Sequence Diagram - User Interaction with Room Objects

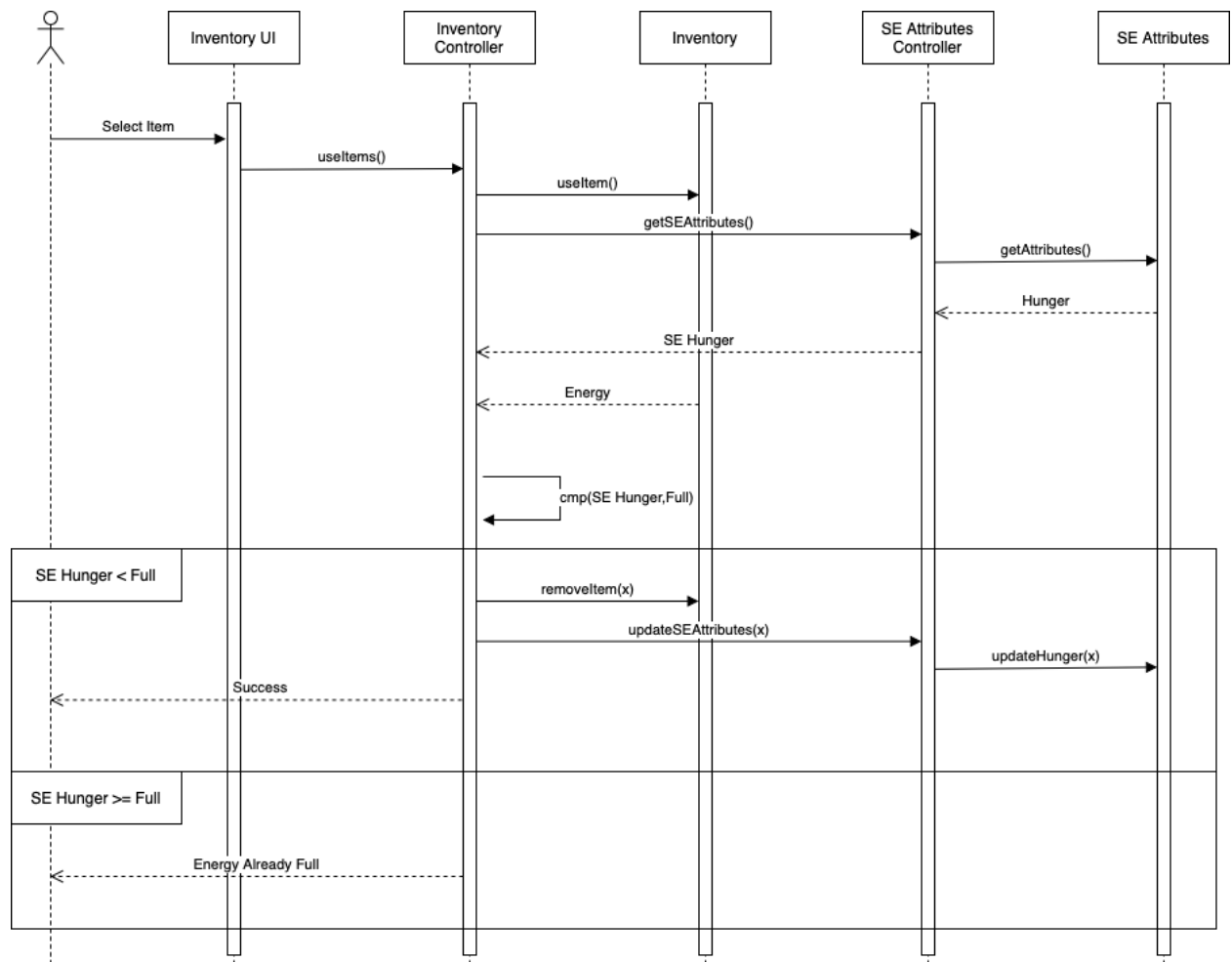


Figure 14: Sequence Diagram - Access Inventory and Use Items

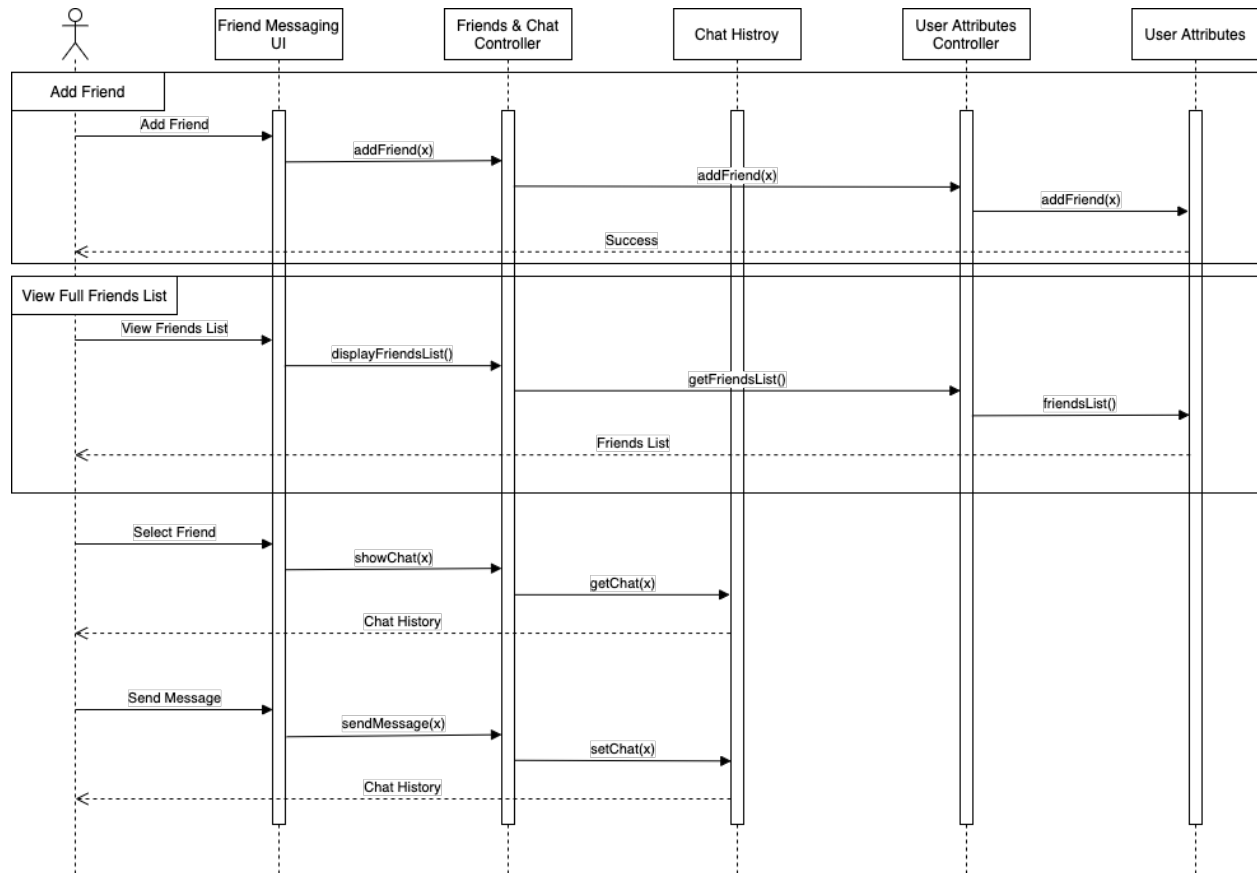


Figure 15: Sequence Diagram - Communication with Friends via Chat

4 Detailed Class Diagram

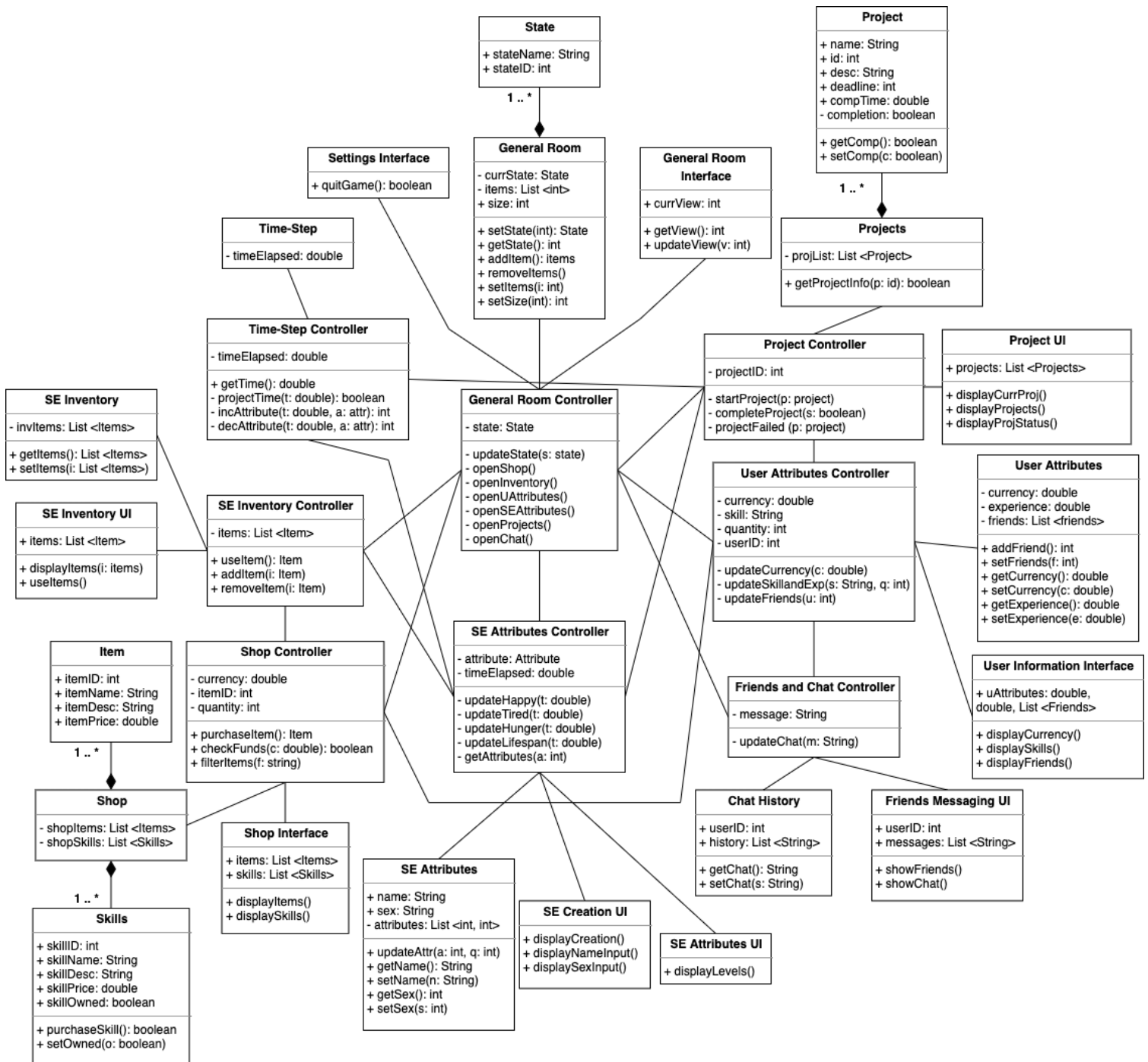


Figure 16: Detailed Class Diagram - HackerSim

A Division of Labour

Table 1: Division of Labour

Section	Contributor(s)	Description
Introduction	Andrew Hum	Completed section and revision
State Charts	Arkin Modi, Christopher Vishnu, Hongzhao Tan, Shengchen Zhou	Arkin: Projects, Friends & Chat Chris: User Attributes, General (Room) Hongzhao: SE Attributes, Time-Step Shengchen: Shop, SE Inventory
Sequence Diagrams	Andrew Hum, Arkin Modi, Christopher Vishnu, Hongzhao Tan, Shengchen Zhao	Andrew: Figure 11 & 13 Arkin: Figure 10 & 15 Chris: Figure 14 Hongzhao: Figure 12 Shengchen: Figure 9
Detailed Class Diagram	Andrew Hum	Completed section and revision

Andrew Hum

Arkin Modi

Hongzhao Tan

Christopher Vishnu

Shengchen Zhou