Multiagent and Agent Systems

Project: KIVA Mobile-robotic Warehouse Automation System

Team members:

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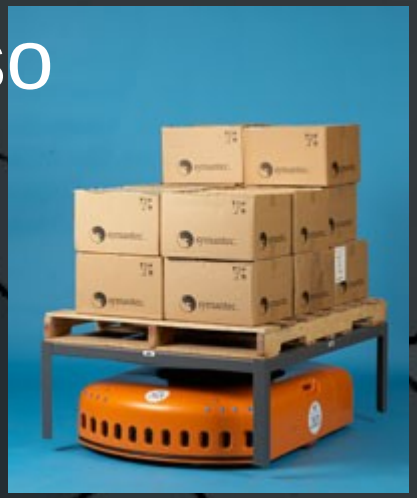


Objective

This project intends to model a Multi-Agent System based on the KIVA Mobile-robotic Warehouse Automation System. Such system uses mobile robots to enhance the efficiency in a warehouse, by attending to real-time orders and bringing the shelves that contain requested pieces or parts to a human employee. For more information about the project, please visit:

KIVA Systems

Software

- Programming Language: JAVA
- IDE: Eclipse
- Framework: JADE (Java Agent Development Framework)

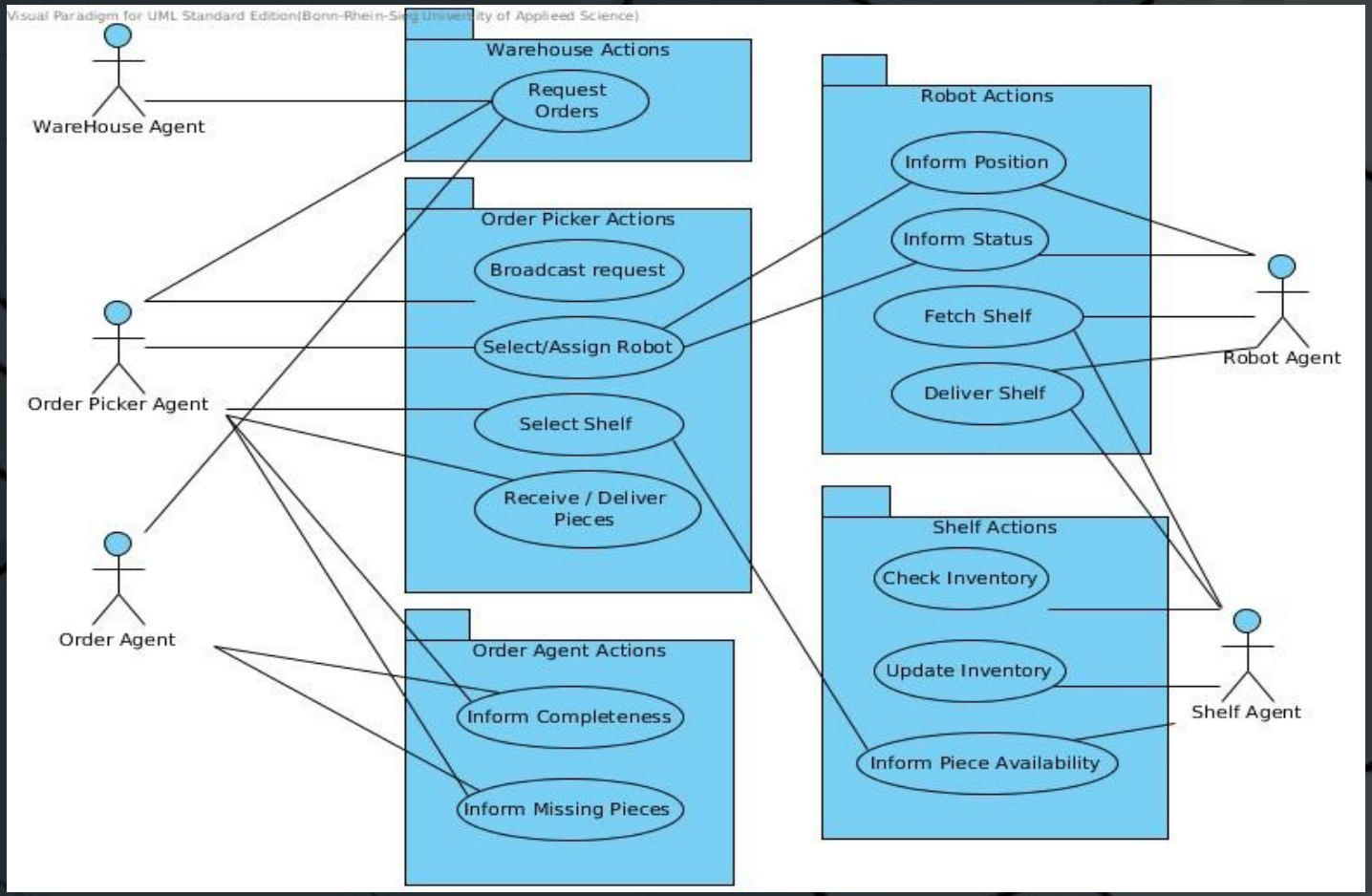
Agents Definition

- Warehouse (Single): Handles the orders and assigns them to order pickers.
- Order Picker Agent (Multiple): Assigns orders and shelves to robots.
- Order Agent (Multiple): Maintains its degree of completeness.
- Shelf Agent (Multiple): Provides the needed pieces according to the requested orders.
- Robot Agent (Multiple): Fetches corresponding shelves and brings them to the Order Pickers.

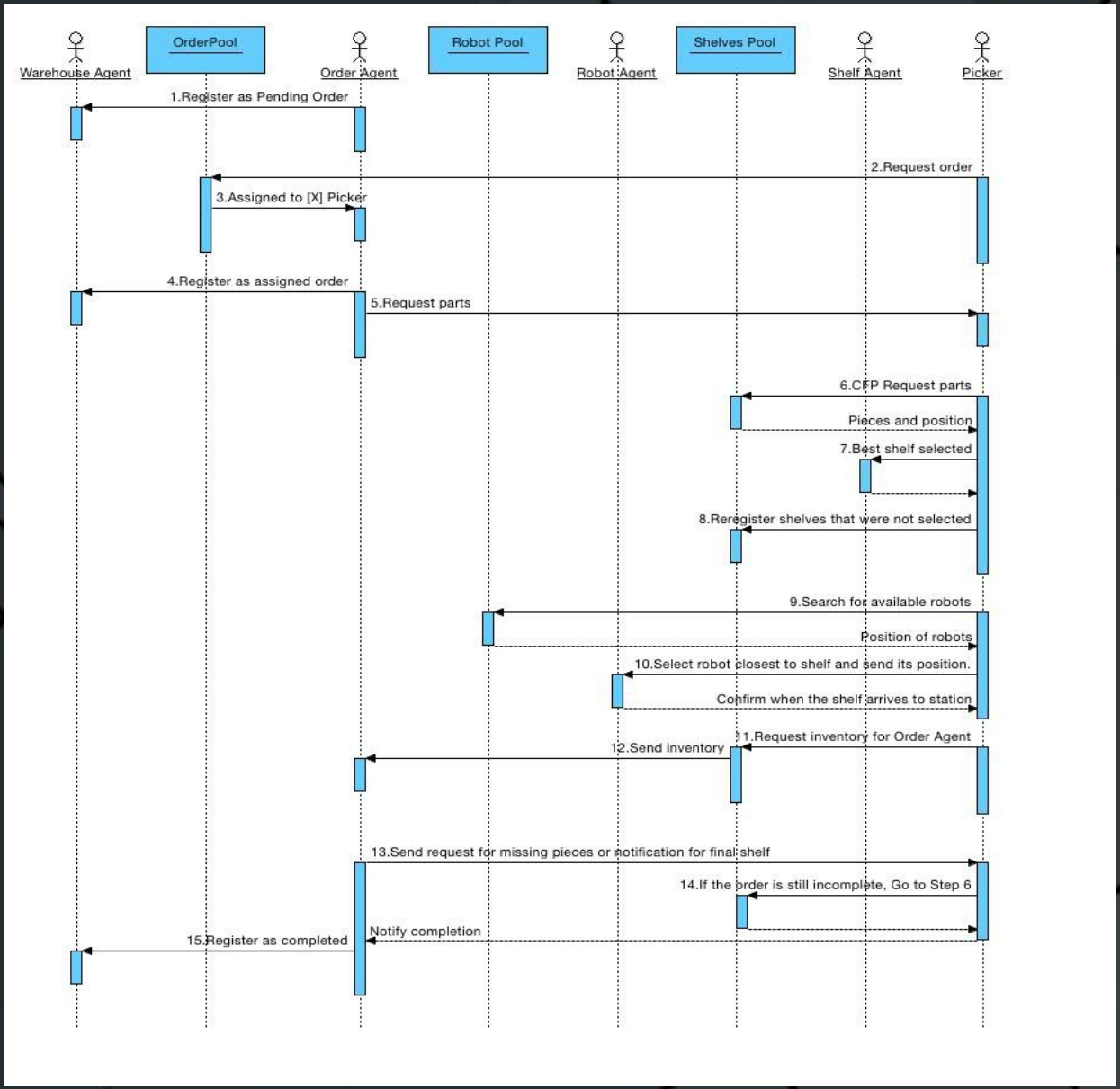
Progress

- Current Status: Finalized
- Possible Future Work: Graphical visualization of the system.

Use Case Diagram



Sequence Diagram



Other Features

- XML Writer: Multiple options to define the setup of the system (Number of agents, stock for inventories, etc.).
- If the orders can't be fulfilled:
  - Send messages from the GUI to restock a shelf.
  - Create new shelves dynamically.

The End

Thanks for your attention!