MICHIGAN STATE
UNIVERSITY

Project Plan
Boeing Factory Simulator

The Capstone Experience

Team Boeing

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From Students…
…to Professionals

Project Overview

- Simulation of airplane construction processes
- No competing product has the required features
- Provides a cost effective way of trying different construction setups

Functional Specifications

- Accurate factory simulation game

- Construct paper airplanes

- With arrangement of different robots

- Player is the factory owner
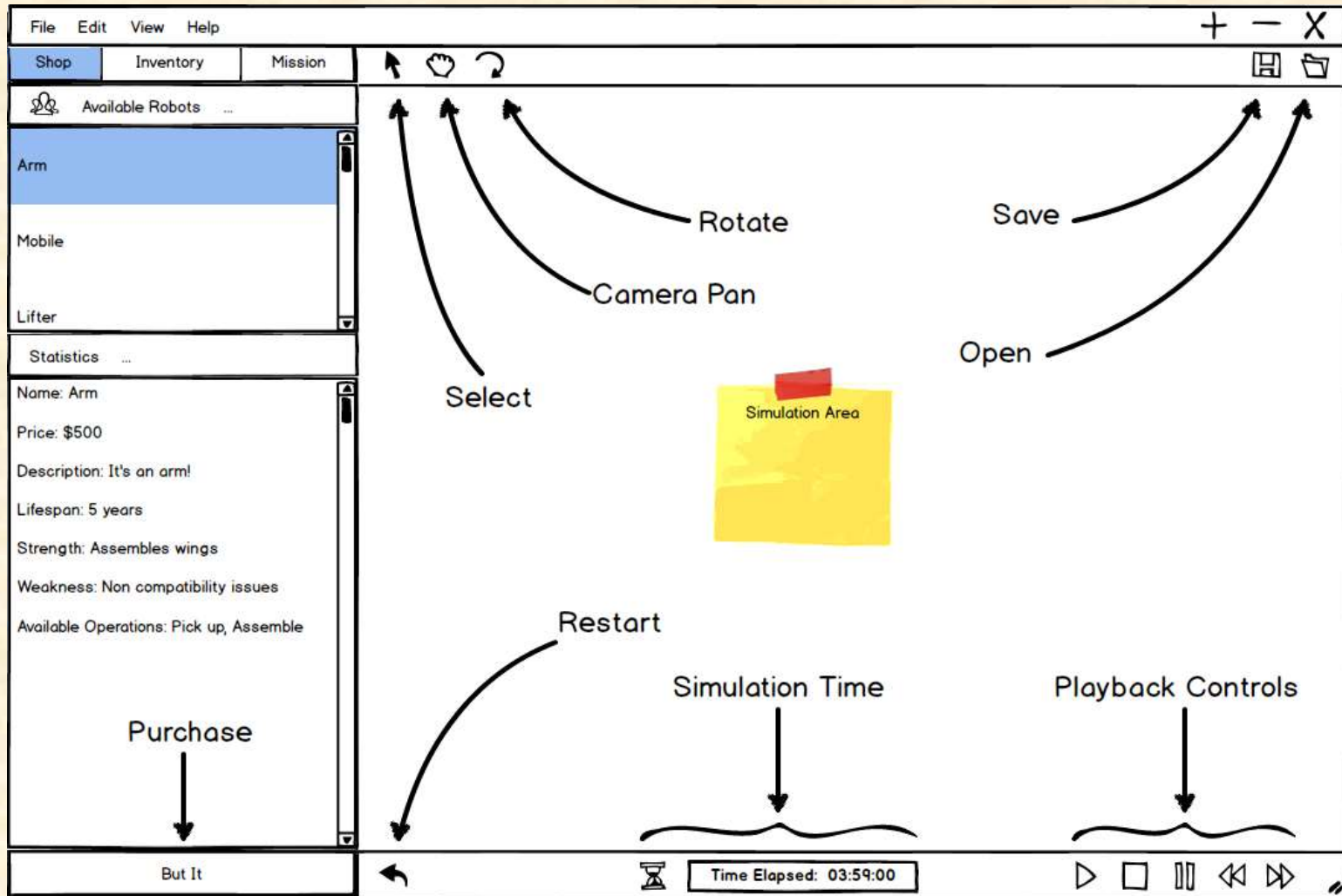
- Multiple scenarios

- Results recorded into files

Design Specifications

- Game is divided into different factory scenarios
- Players are able to place robots to construct paper airplanes
- Physics of the game world must match closely to real world
- Users are graded on safety, efficiency, and cost
- All results and actions logged into files

Screen Mockup: Main Scene

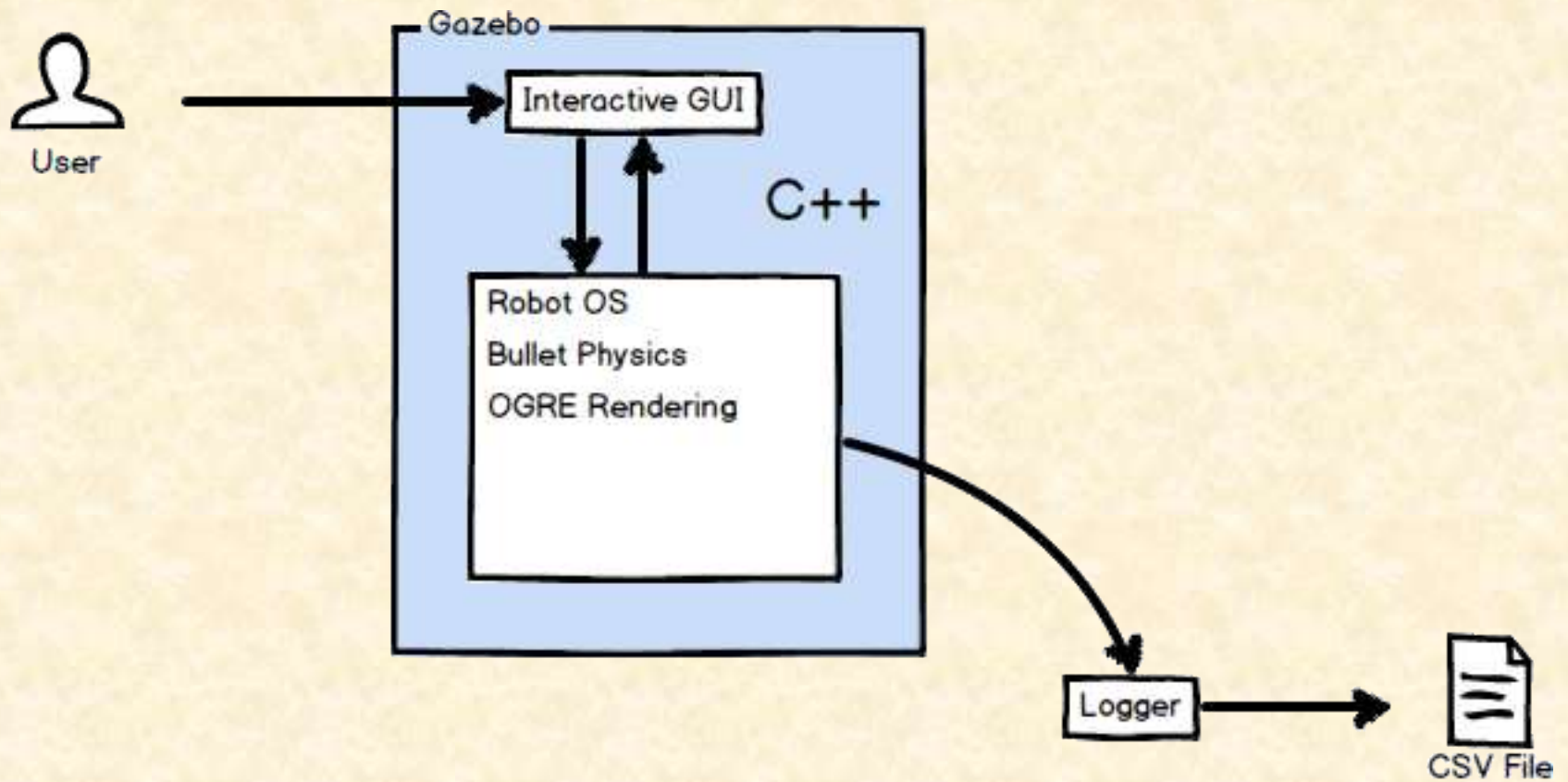# Screen Mockup: Inventory and Mission

Technical Specifications

- Program runs on top of Gazebo

- Uses C++ to customize the UI and simulation aspects

- Data is logged with custom application to CSV files

System Architecture

System Components

- Hardware Platforms
  - Ubuntu 12.04 Precise officially supported
  - Other platforms are use at own risk
  - No required server component
- Software Platforms / Technologies
  - Built using Gazebo Simulator
  - Relies upon ROS, Bullet Physics, and OGRE

Testing

- Weekly functional builds

- Constant play testing

- Unit tests were applicable

Risks

- Working with a lot of open source software

- Simulation must run at real time with logging

- Three different parts that need integrating

- Very expansive project vision