CSLAB – First Delivery

1210804 – André Gonçalves

1201458 – Jorge Moreira

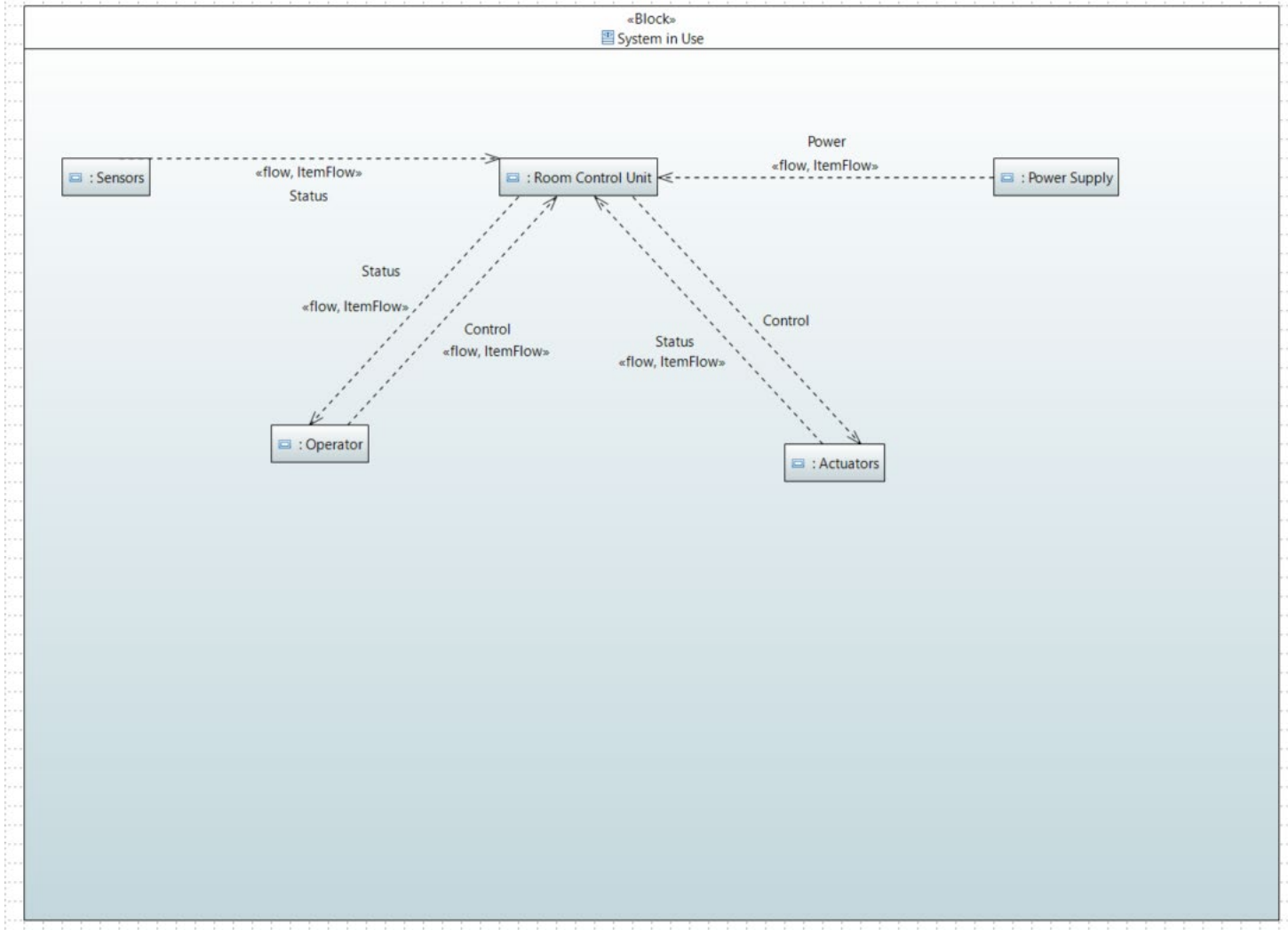
Problem Domain

Stakeholder Needs

	id	text
User Needs	SN-1	
Automated Lighting Control	SN-1.1	When natural sunlight is available, the system shall adjust blinds to allow the required amount of light. If natural sunlight is insufficient, the system shall activate artificial lighting to compensate.
Automated Heating Control	SN-1.2	The system shall control the heating in the office using smart heaters.
User Interface	SN-1.3	The system shall provide a user interface that allows office occupants to configure their preferences for lighting and temperature, and manually change the status of blinds, lights, and heaters.
Hazard Mitigation	SN-1.4	The system shall include measures to prevent or mitigate failures by identifying malfunctioning components, providing temporary fixes, and providing long-term fixes.
Notification System	SN-1.5	If the occupant's preferences are not being met, the system shall notify the occupant and indicate a potential problem with the system.
WSN Network	SN-1.6	Where possible, the system shall utilize Wireless Sensor Networks (WSNs) for communication and control.

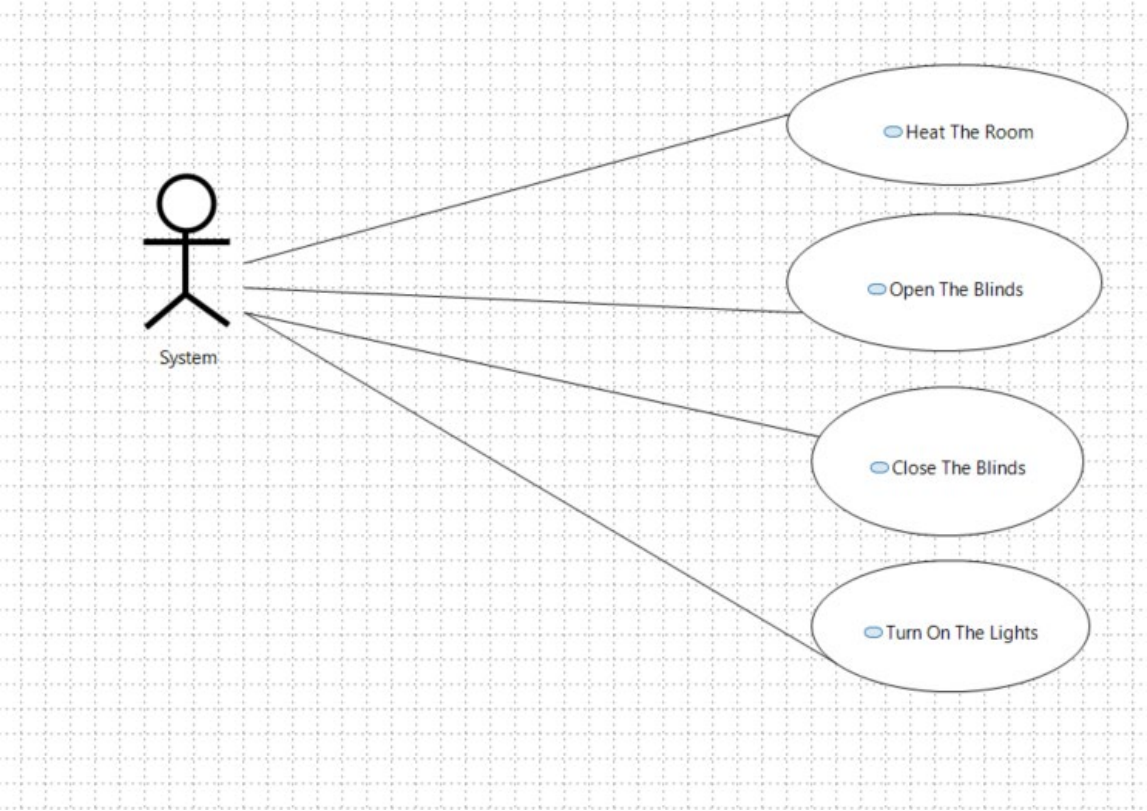
Problem Domain

System Context



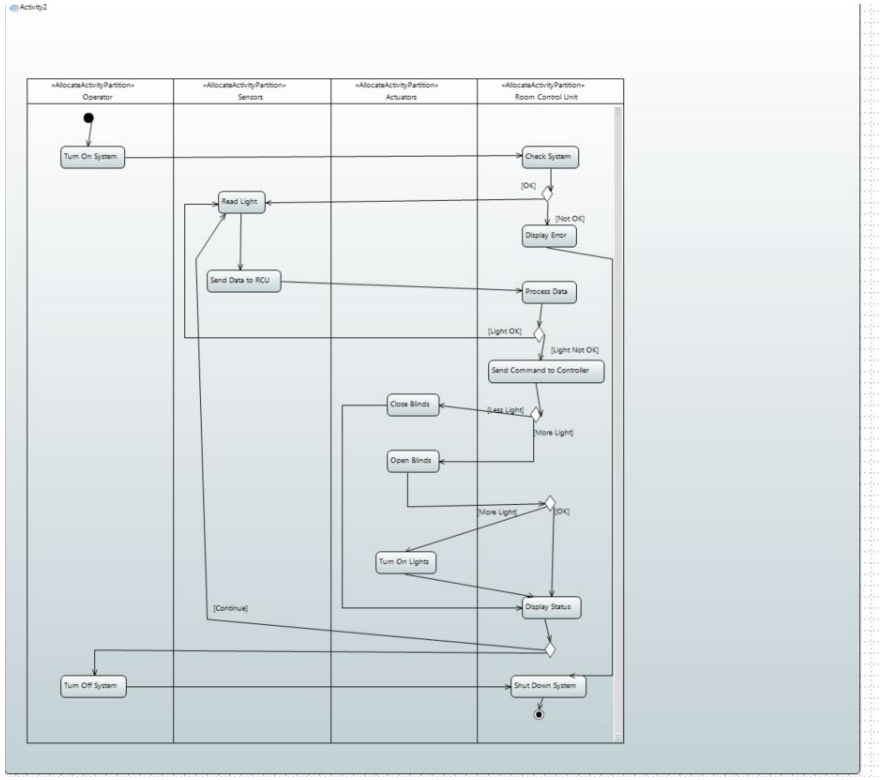
Problem Domain

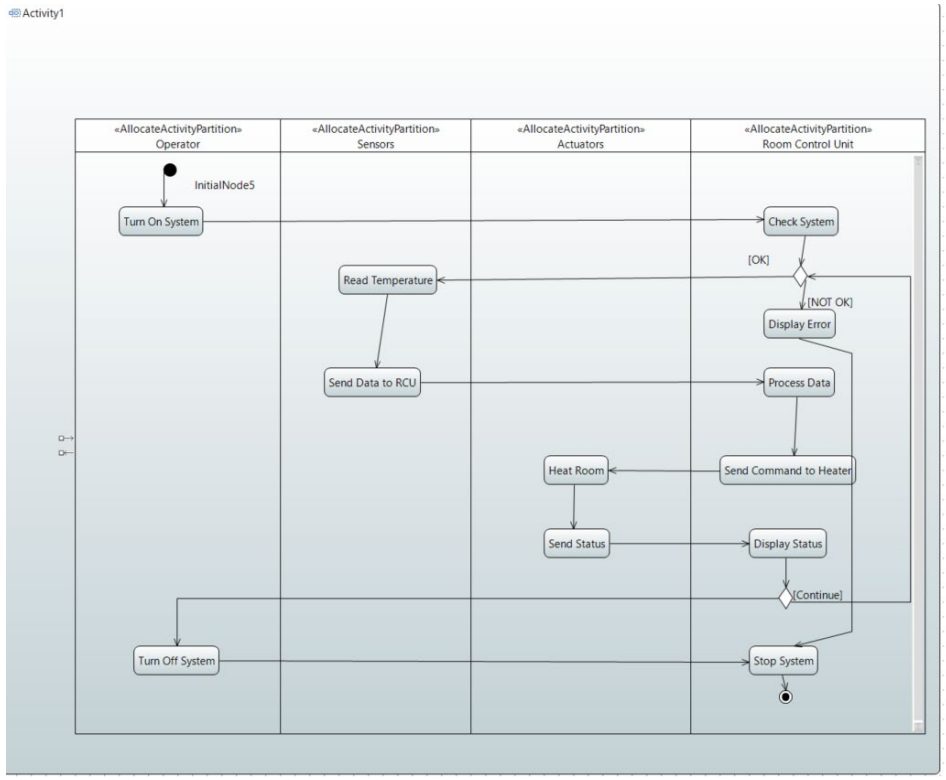
Use Case



Problem Domain

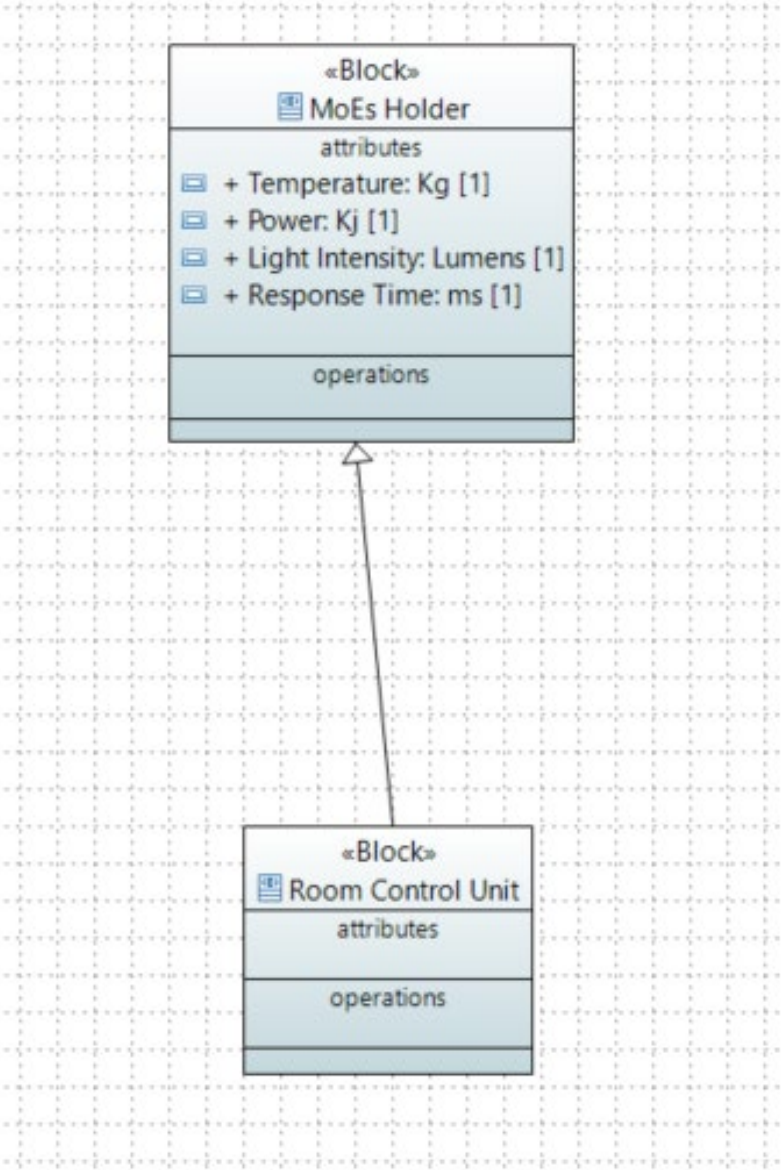
Activity Diagram





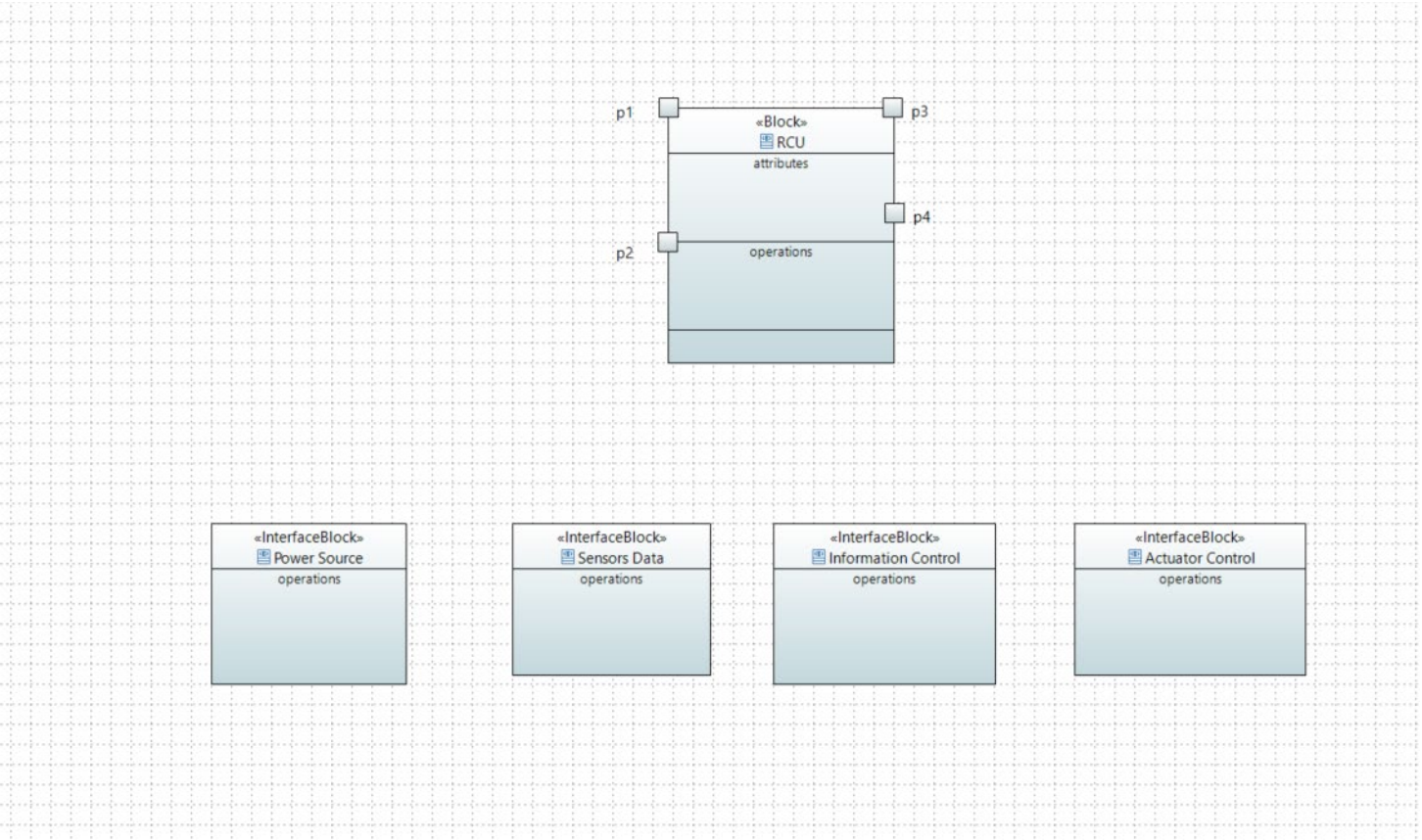
Problem Domain

Measures of Effectiveness



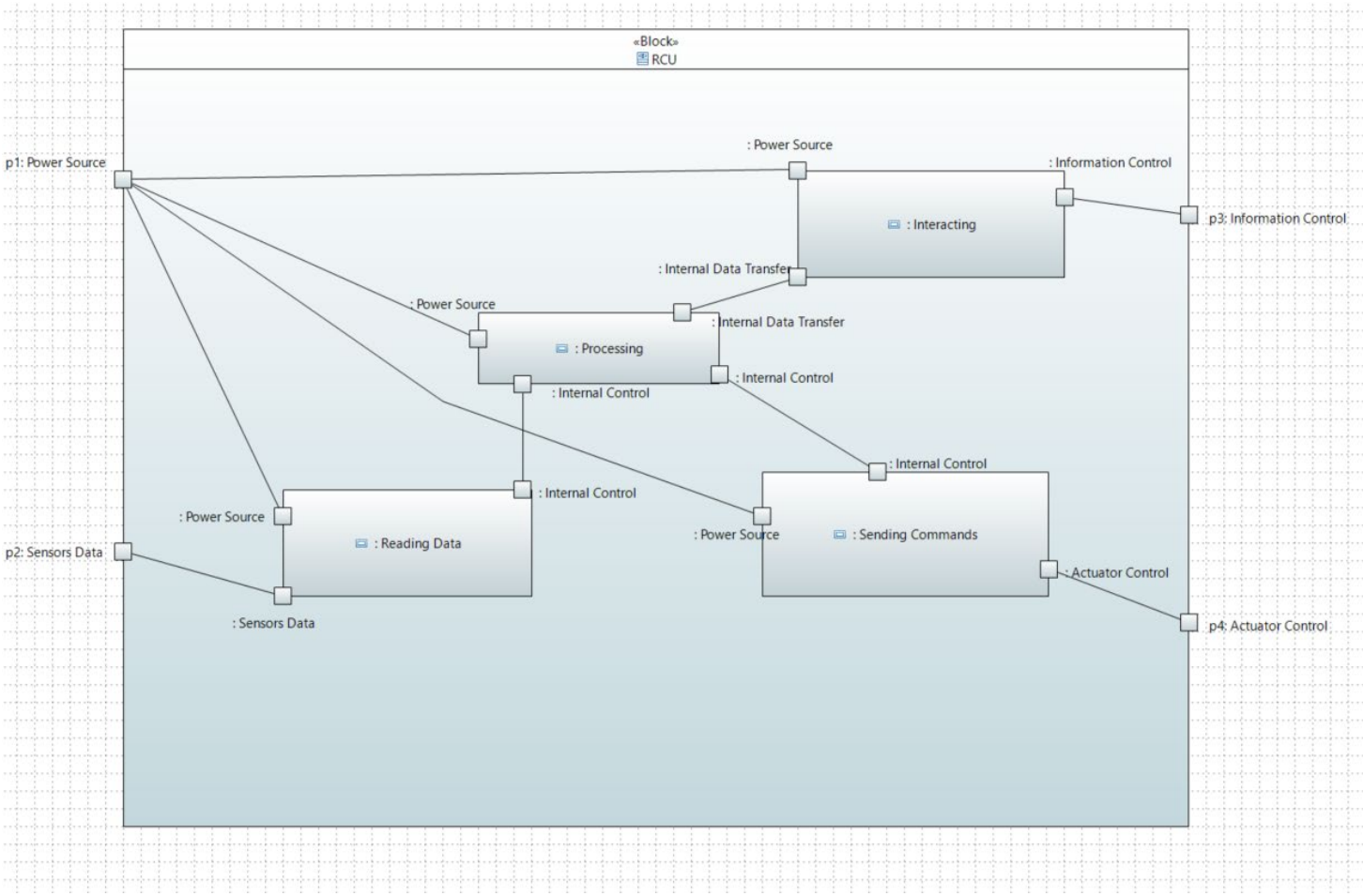
Problem Domain

Conceptual Systems



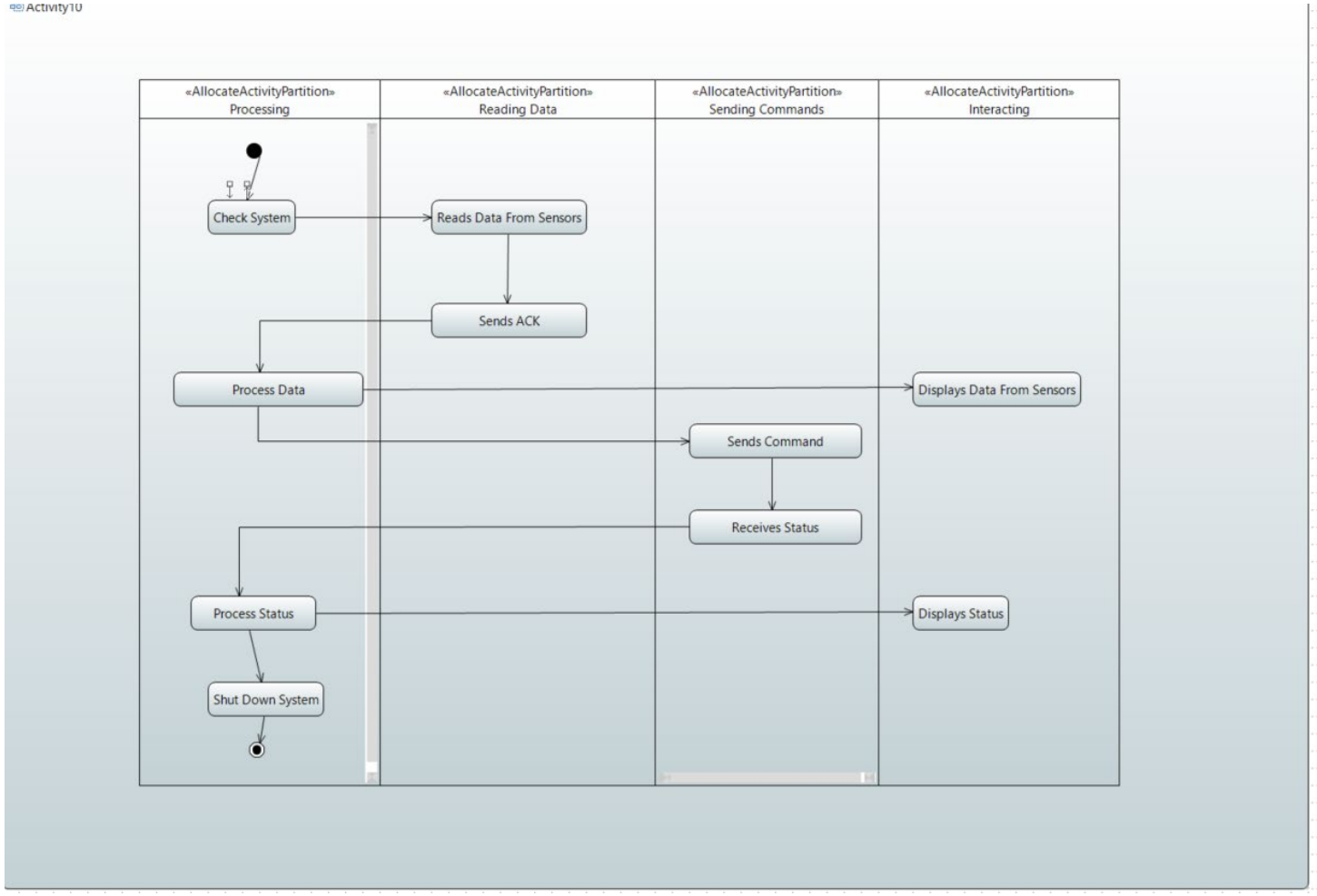
Problem Domain

Conceptual Sub Systems



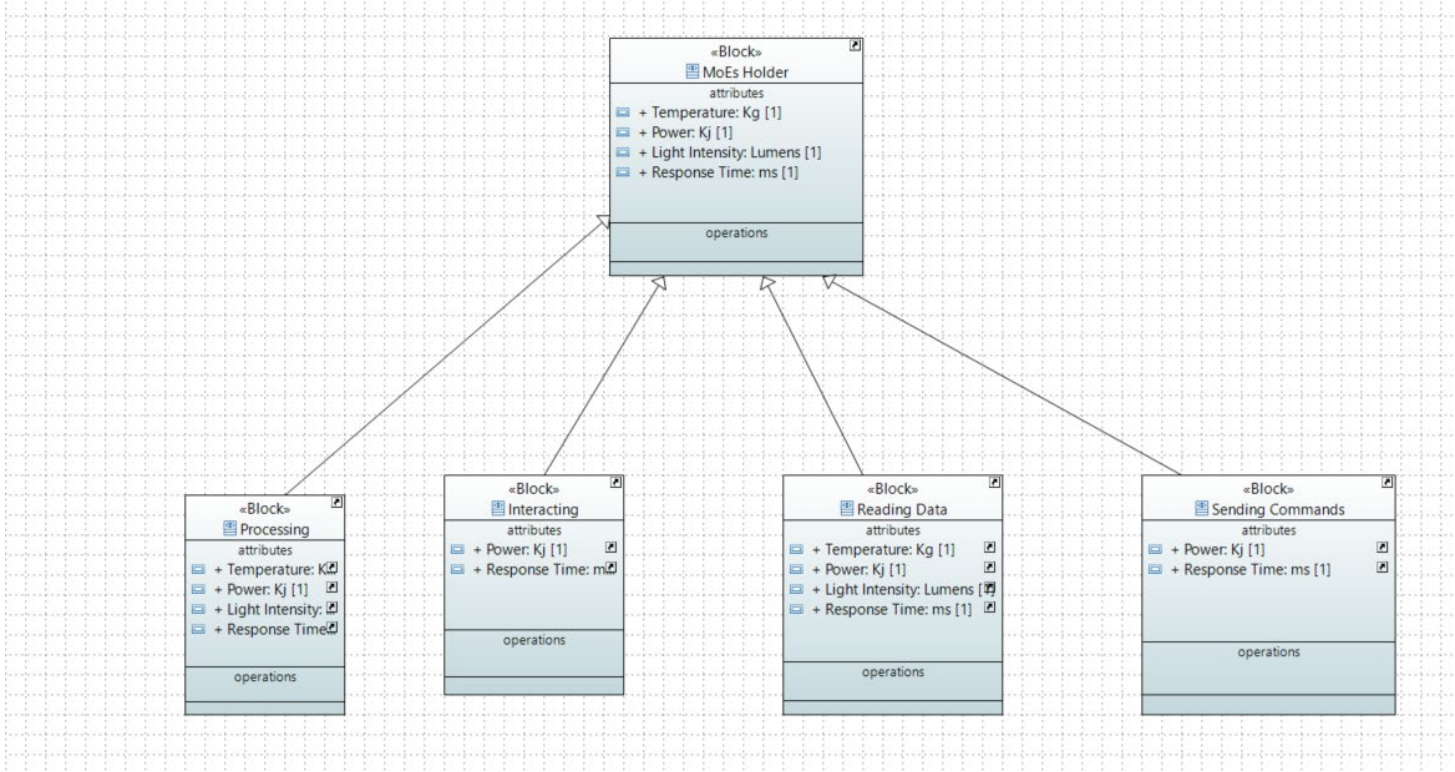
Problem Domain

Conceptual Sub systems (Activity Diagram)



Problem Domain

Measures of effectiveness for the conceptual subsystems



Problem Domain

Traceability

		A	B	C	D	E	F
		Automated Lighting Control	Automated Heating Control	User Interface	Hazard Mitigation	Notification System	WSN Network
0	System in Use	☐	☐	☐	☐	☐	☐
2	Property1 : Room Control Unit	☑	☑	☐	☐	☐	☑
3	Property2 : Sensors	☑	☑	☐	☐	☐	☐
4	Property3 : Actuators	☑	☑	☐	☐	☐	☐
5	Property4 : Power Supply	☑	☑	☑	☑	☑	☑
6	Property5 : Operator	☐	☐	☑	☐	☑	☐
7	Sending Commands	☑	☑	☐	☐	☐	☐
8	Reading Data	☑	☑	☐	☑	☐	☐
9	Interacting	☐	☐	☑	☐	☑	☐
10	Processing	☑	☑	☐	☑	☐	☑

Components

Component	What we would like to use	What we will be using
Temperature Sensor	DHT11	DHT11
Luminosity Sensor	TSL2561	LDR5539
Blinds Mechanism	SG90 LED 2x	SG90 LED 2x
Heater Mechanism	Heating Plate	LED
Smart Lights	LED	LED

Technologies

Technologies
MQTT
TCP/IP
NODE-RED