Detailed drawing ,assembly drawing & assembling mechanism

Group 05
Vilan Jayawardene EN21466830
Vinal Gamage EN21481130
Kasuni Dissanayake EN21485640
Dulanthi Perera EN21482120
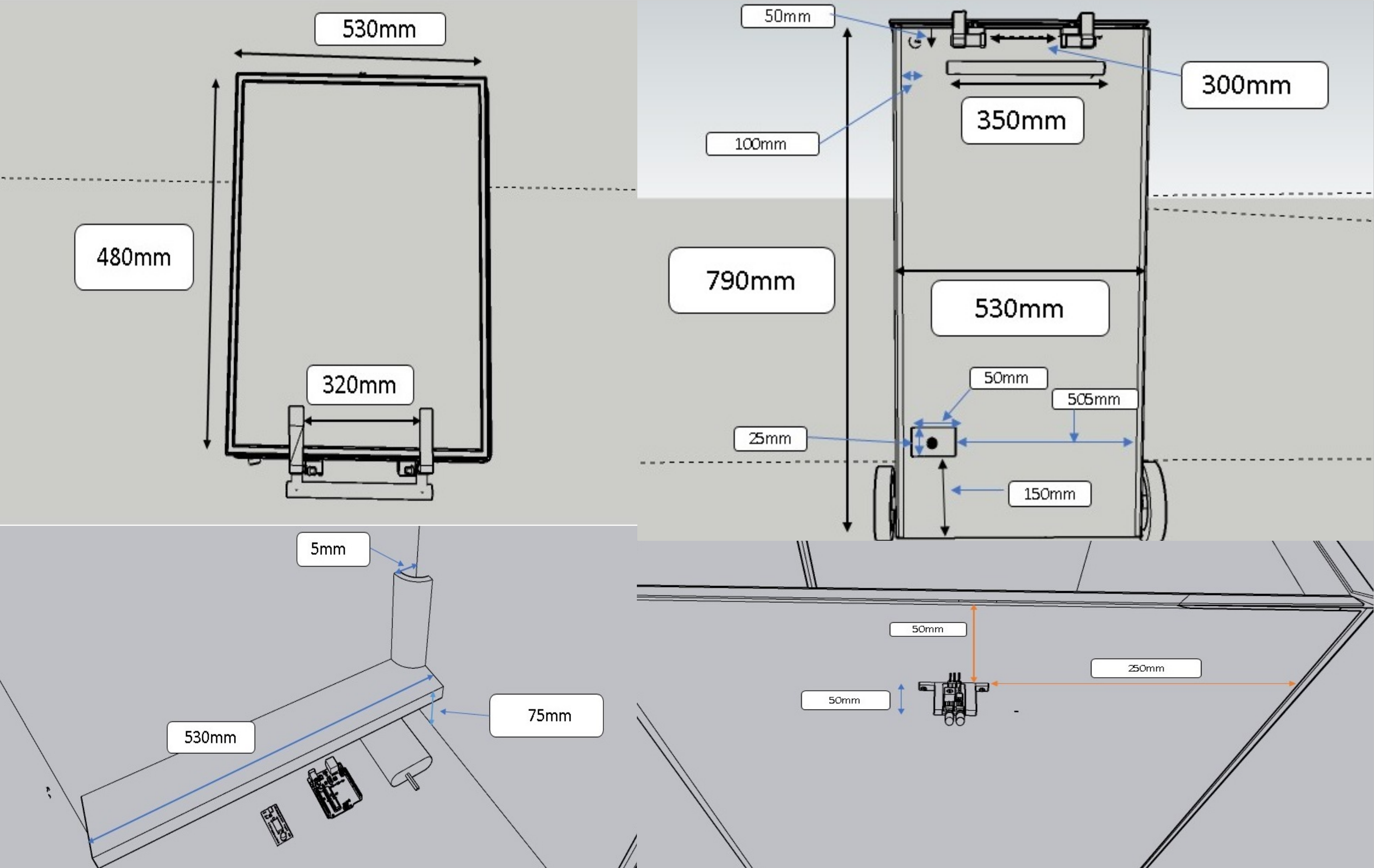N.A. Thinuri Isaka EN21492716

Bill of material

	Item number	Quantity	Item name	Item description
Components used for detecting a person and opening of the lid	1	1	IR Infrared Obstacle Avoidance Sensor Module Adjustable (YL-63)	infrared sensor emits and/or detects infrared radiation to sense its surroundings
	2	2	Servo Motor SG90 9G Micro Servo Motor	servos can lift about 3.75lbs that is positioned on an arm 1cm out from the shaft Servo can rotate approximately 180 degrees (90 in each direction)
Components used to detect garbage level and sealing trash bag	3	1	Zip Ties Heavy Duty 18 Inch	Sealing the trash bag is done from the zip tie
	4	1	Ultrasonic sensor HY-SRF05	An ultrasonic sensor is an instrument that measures the distance to an object using ultrasonic sound waves
	5	1	NEMA 17 17HS4023 Stepper Motor 42x42x2mm D Shaft 5mm	The gear rod is connected to the gear rod which pulls the zip tie sealing the trash bag
	6	1	EasyDriver A3967 V44 Stepper Motor Driver Board	It provides much more flexibility and control over your stepper motor
	7	1	Differential Main Gear 64t Motor Gear 21	Pulling the zip tie from its groves

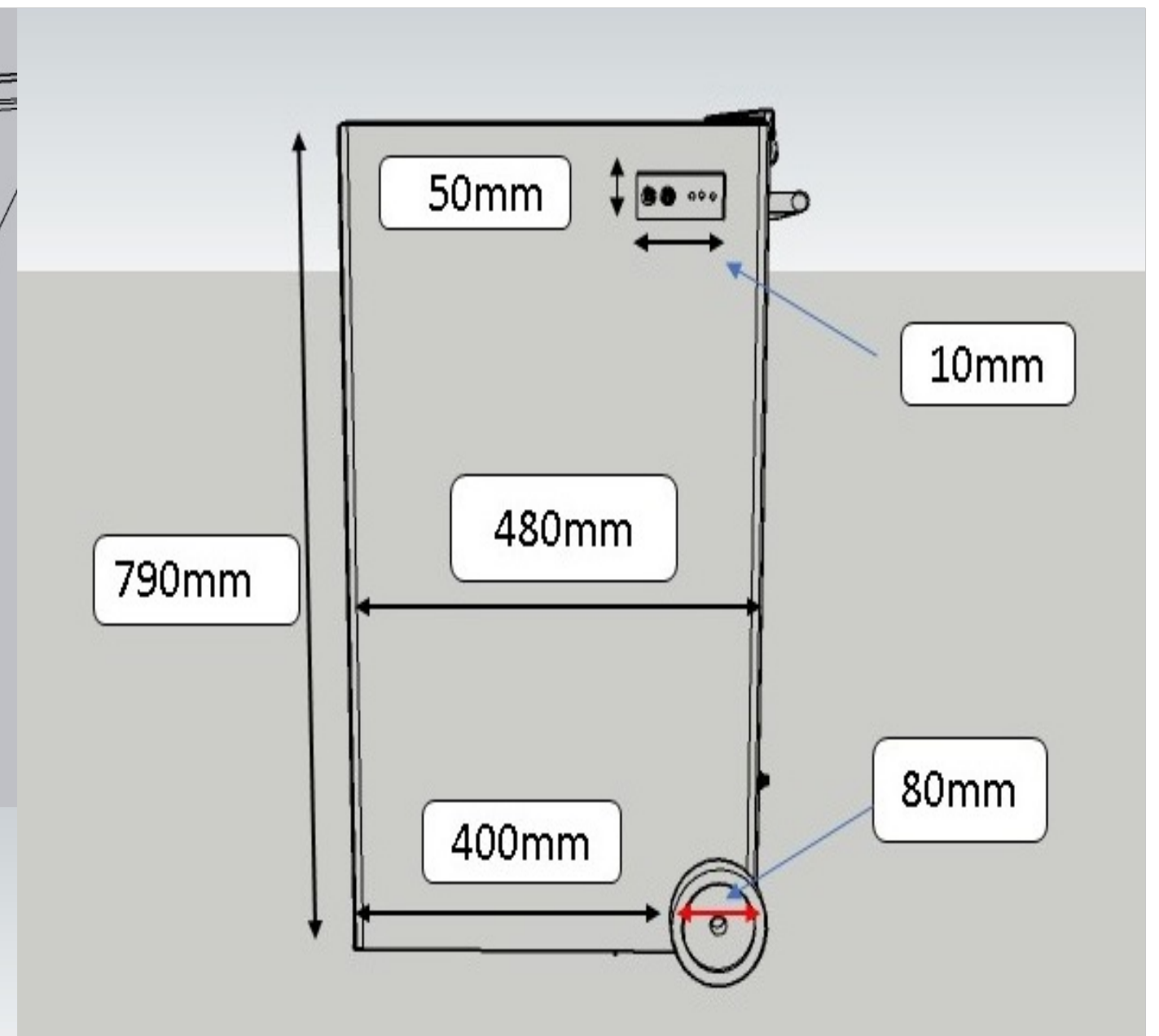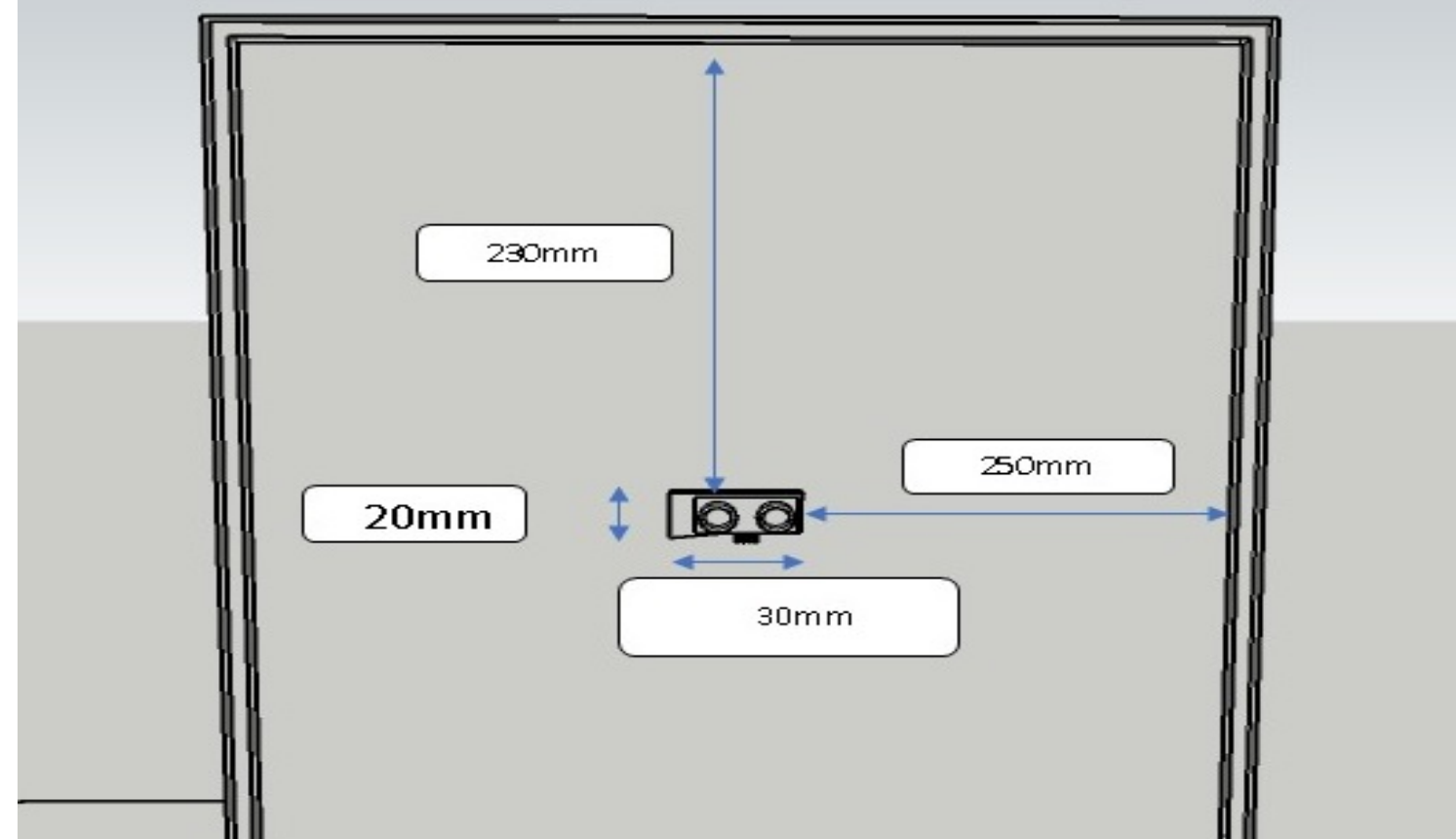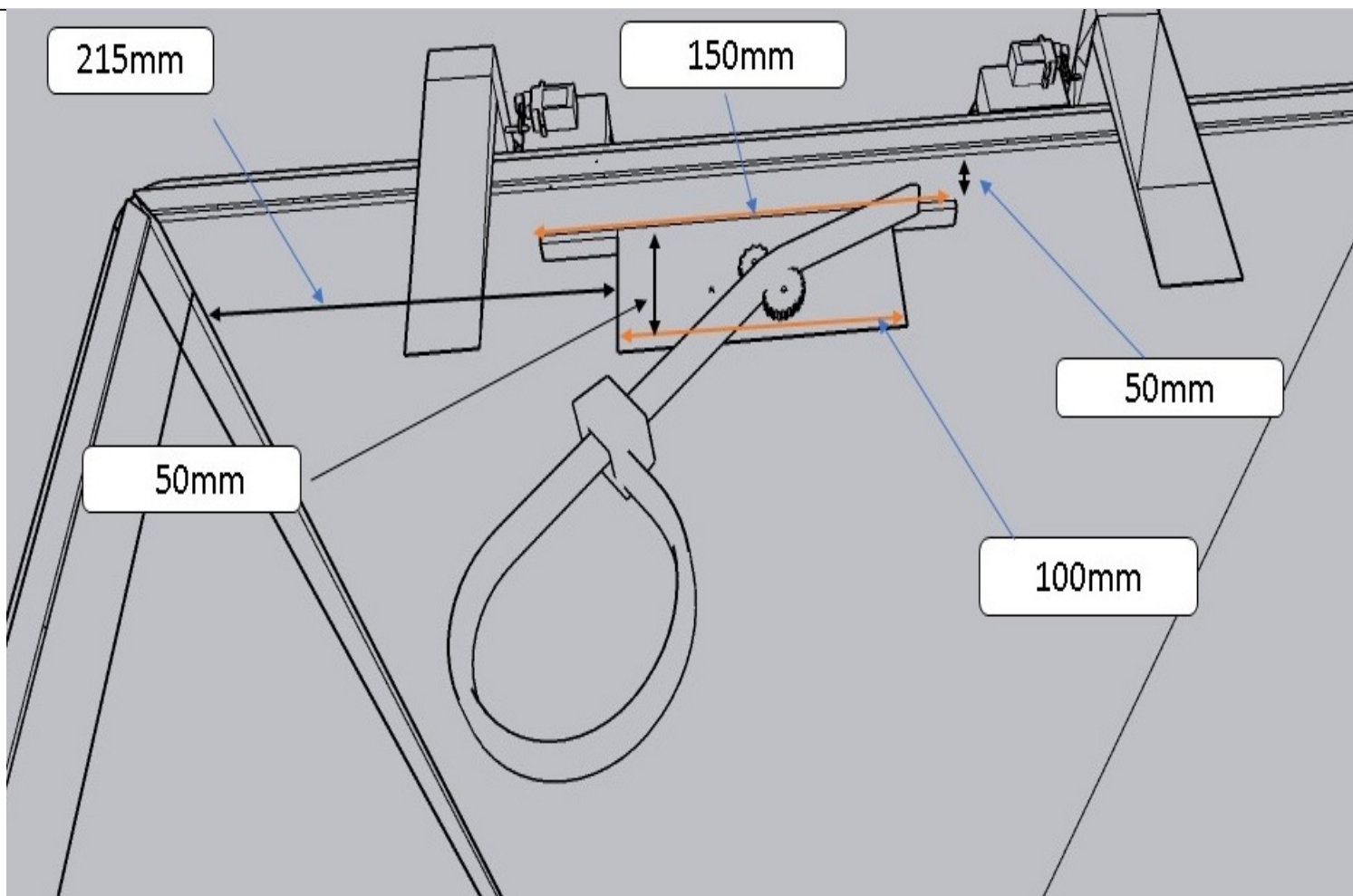|				
Components used for charging device	8	1	12V 3000ma Battery	Rechargeable Li-ion battery that can be used multiple times
	9	1	12.6V 1.3A SMPS Charger	Connects mains power with on board battery system
Other components	10	1	Garbage Bin 100 LTR	
	11	1	LED 3mm Water Clear 20mA	LEDS that will allow displaying information battery level.
	12	2	Push Button Micro Switch 6x6x4mm	for making and breaking of electric current in a circuit
	13	1	Jumper Wire	Wires to connect microcontroller with each electronic component
	14	1	Rubber seal	serve as a static seal between flat surfaces
	15	1	Passive Buzzer Electromagnetic 3V 16Ohm 2KHZ	The buzzer is a sounding device that can convert audio signals into sound signals
	16	1	Arduino Uno R3 Atmega328P Atmega16U2	The board has 14 digital I/O pins, 6 analogue I/O pins
	17	8	M3 Iron Phillips Head Screws + Nuts Fastener 30mm	Attaching components to the metal L bracket.
	18	2	Metal L bracket	Allowing components to be screwed and attached

Cost estimate (Bottom-up approach)

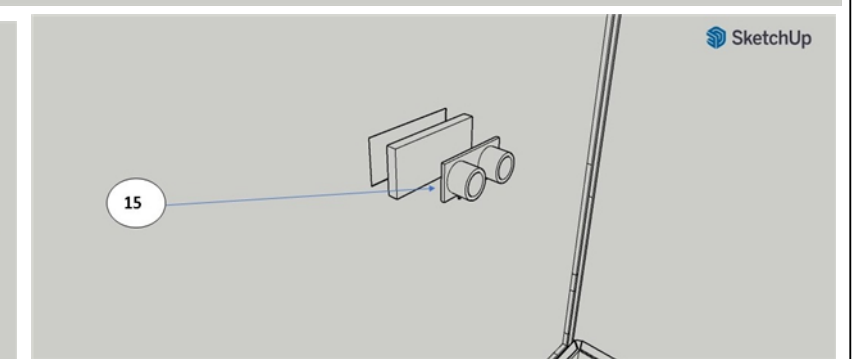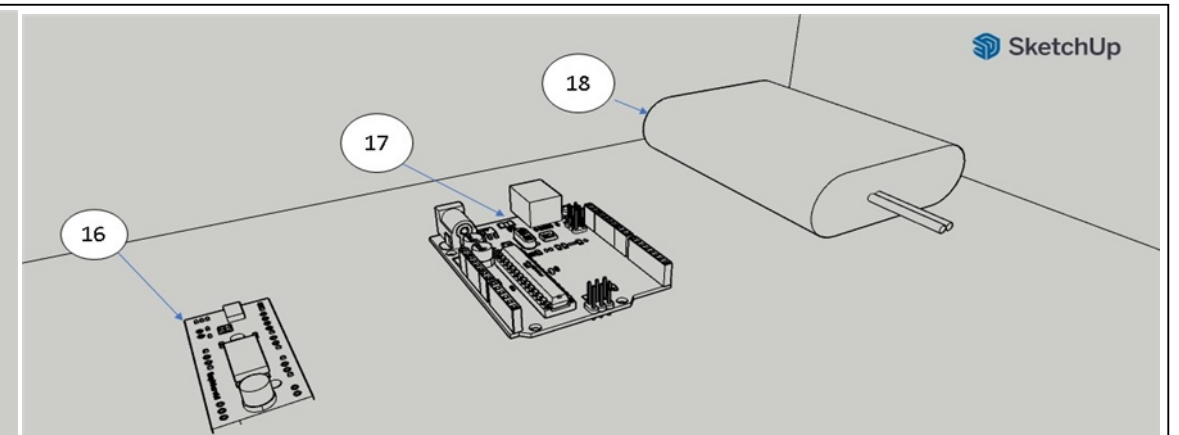| Item name		Cost per 1 (LKR)	Quantity	Total (LKR)
for detecting a person and opening of the lid	IR Infrared Obstacle Avoidance Sensor Module Adjustable (YL-63	Rs.130.00	1	Rs.130.00
	Servo Motor SG90 9G Micro Servo Motor	Rs.330.00	2	Rs.660.00
detect garbage level and sealing trash bag	Zip Ties Heavy Duty 18 Inch	Rs.22.00	2	Rs.44.00
	Ultrasonic sensor HY-SRF05	Rs.225.00	1	Rs.225.00
	NEMA 17 17HS4023 Stepper Motor 42x42x2mm D Shaft 5mm	Rs.1,250.00	1	Rs.1,250.00
	EasyDriver A3967 V44 Stepper Motor Driver Board	Rs.380.00	1	Rs.380.00
	Differential Main Gear 64t Motor Gear 21	Rs.50.00	1	Rs.50.00

charging device	12V 3000ma Battery	Rs.2,290.00	1	Rs.2,290.00
	12.6V 1.3A SMPS Charger			
Other components	Garbage Bin 100 LTR	Rs.6,975	1	Rs.6,975
	LED Defused 5mm 3V 20m	Rs.2.5.00	3	Rs.7.5.00
	Push Button Micro Switch 6x6x4mm	Rs.6.00	2	Rs.12.00
	Jumper Wire	Rs.180.00	1	Rs.180.00
	Rubber seal	Rs.200.00	1	Rs.200.00
	Passive Buzzer Electromagnetic 3V 16Ohm 2KHZ	Rs.50.00	1	Rs.50.00
	Arduino Uno R3 Atmega328P Atmega16U2	Rs.1,571.00	1	Rs.1,571.00
	M3 Iron Phillips Head Screws + Nuts Fastener 30mm	Rs.7.5.00	8	Rs.60.00
	Metal L bracket	Rs.20.00	2	Rs.40.00
Total cost				**Rs. 14124.5.00**

530mm

480mm

320mm

50mm

100mm

300mm

350mm

790mm

530mm

50mm

505mm

25mm

150mm

5mm

75mm

530mm

50mm

50mm

250mm

			Group 05		
Smart dustbin	Detailed drawing				01
			EN21466830	Vilan Jayawardene	
			EN21485640	Vinal Gamage	
	09/04/2021		EN21492716	Kasuni Dissanayake	A
			EN21482120	Dulanthi Perera	
			EN21492716	Thinuri isaka	

215mm

150mm

50mm

50mm

100mm

50mm

10mm

480mm

790mm

400mm

80mm

230mm

250mm

20mm

30mm

	Group 05			02
Smart dustbin	Detailed drawing	EN21466830	Vilan Jayawardene	
		EN21485640	Vinal Gamage	
	09/04/2021	EN21492716	Kasuni Dissanayake	A
		EN21482120	Dulanthi Perera	
		EN21492716	Thinuri isaka	

Item no	Part no	Description	Quantity
01	17	M3 Iron Phillips Head Screws + Nuts Fastener 30mm	8
02	1	IR Infrared Obstacle Avoidance Sensor Module Adjustable(YL-63)	1
03 , 11	19	Metal L bracket	2
04	12	Push Button Micro Switch 6x6x4mm	2
05	11	LED Defused 5mm 3V 20m	3
06	15	Passive Buzzer Electromagnetic 3V 16Ohm 2KHZ	1
07 , 08 , 09	2	Servo Motor SG90 9G Micro Servo Motor	2
10	10	Garbage Bin 100 LTR	1
12	5	NEMA 17 17HS4023 Stepper Motor 42x42x2mm D Shaft 5mm	1
13	7	Differential Main Gear 64t Motor Gear 21	1
14	3	Zip Ties Heavy Duty 18 Inch	2
15	4	Ultrasonic sensor HY-SRF05	1
16	6	EasyDriver A3967 V44 Stepper Motor Driver Board	1
17	16	Arduino Uno R3 Atmega328P Atmega16U2	1
18	8	12V 3000ma Battery	1
19	14	Rubber seal	1
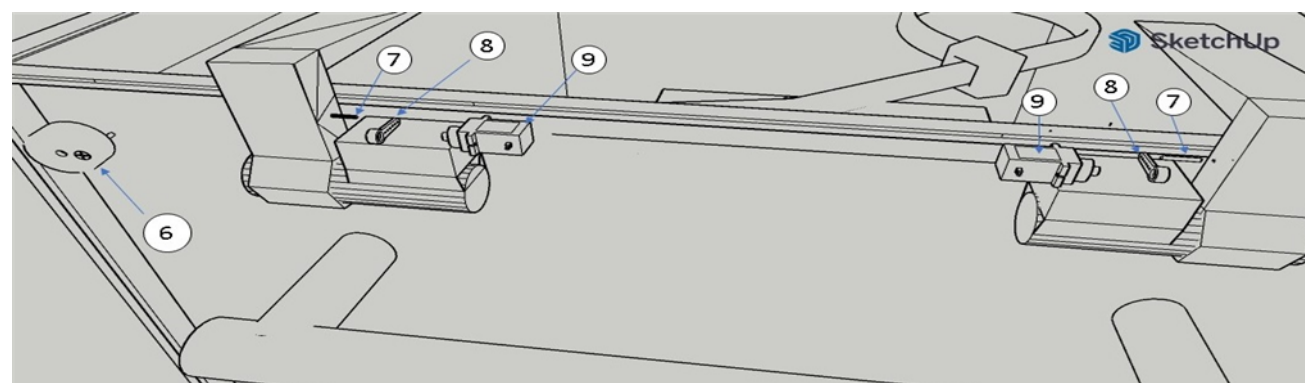
Smart dustbin	Assembly drawing	Group 05	03
		EN21466830 Vilan Jayawardene	
	09/04/2021	EN21485640 Vinal Gamage	A
		EN21492716 Kasuni Dissanayake	
		EN21482120 Dulanthi Perera	
		EN21492716 Thinuri isaka	

03 .assembling mechanism