Deliverable C: Design Criteria and Target Specification

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In this document, we will display our benchmarking, define a list of prioritized design needs, and reflect on how our project fits our client's needs. Based on our selected need, designing a motion sensor to inform the staff of when 3D prints are complete, we benchmarked some existing solutions to the project. Through our benchmarking, we were able to create criteria and design specifications as well as metrics. This will aid in finding potential solutions to problems we will face when creating the final design. Last, in this document we will reflect on the client and users needs to ensure that our criteria can successfully fulfill these needs. Throughout this document will have displayed our benchmarking, defined a list of prioritized design needs and reflected on how our project fulfills the client's needs.

Benchmarking Products:

Item	Product	Design Specifications
Camera	Go Pro Hero7 $199.00 https://gopro.com/en/us/shop/hero7-black/tech-specs?pid=CHDHX-701-master	**Max video resolution:** 3840 x2160 **Type**: 2'' LCD display, 4K action camera **Wireless interface**: Bluetooth, Wireless LAN **Width**: 2.5 in **Depth:** 1.3 in **Height**: 1.8 in **Weight:** 116 g
	Logitech C922x Pro Stream Webcam – Full 1080p HD Camera $99.99 https://www.bhphotovideo.com/c/product/1374480-REG/logitech_960_001087_c922_pro_stream_webcam.html/specs	**Video resolution:** 1080p at 30 fps 720p at 60 fps 720p at 30 fps **Wireless interface**: No- USB port required **Width**: 3.7 in **Depth:** 2.8 in **Height:** 1.7 in **Weight:** 161.6 g
Sensors	Arduino with PIR motion sensor Ardino - $17.00 PIR Motion Sensor - $6.87 https://makerstore.ca/shop?olsPage=products%2Farduino-uno-r3&page=2&sortO	**Arduino** **Weight:** 21.2g **Additional Information:** 14 Input/Output pins, 6 Analog outputs, usb connection, power jack and a

	ption=ascend_by_name https://www.robotshop.com/ca/en/gravity-pir-motion-sensor-arduino-compatible.html?gclid=EAIaIQobChMIzvz7uJX-5AIVPx6tBh1AggYZEAQYBCABEgKCjvD_BwE	reset button. **PIR Motion Sensor** **Input Voltage:** 3.3~5V, 6V maximum **Detection distance:** 7 m **Detection Angle:** 100°
	Samsung SmartThings Motion Sensor $34.99 https://www.amazon.ca/Samsung-SmartThings-Motion-Sensor-GP-U999SJVLBDA/dp/B07F8ZHBLS/ref=sr_1_1_sspa?gclid=EAIaIQobChMIkdPintj45AIVAeDICh2mXAZiEAAYASAAE	**Height:** 2.25 in **Width:** 2.25 in **Depth:** 2 in **Weight:** 0.2 lb **Additional Information:** Detects motion of up to 15 feet within 120 degree view. Battery operated.
Alarm	Digital Alarm clock $13.98 https://www.amazon.ca/AmazonBasics-Digital-Alarm-Clock-Nightlight/dp/B07DQWT15Y/ref=sr_1_6?crid=688GCF4UNZKK&keywords=alarm+clocks&qid=1569801671&sprefix=alarm+%2Caps%2C189&sr=8-6	**Height:** 3 in **Width:** 5 in **Depth:** 2.5 in **Weight:** 231 g **Additional Information:** 0.7 inch LED display. Has battery backup.
	Honeywell Home Security $206.34 https://www.amazon.ca/Honeywell-RCHS5230WF-Smart-Security-Starter/dp/B07GR541KN/ref=sr_1_3?hvadid=75247884566194&hvbmt=be&hvdev=c&hvqmt=e&keywords=honeywell+alarm&qid=1569546231&sr=8-3	**Height:** 18.5 cm **Width:** 9.1 cm **Depth:** 9.1 cm **Includes:** Camera base station, 2 sensors and remote control key fob **Additional Information:** Senses motion and sends HD Video. Smart home integration with Alexa built-in and 24-hour cloud storage
Flashing Lights	Budweiser Red Light $199.99 https://www.shopbeergear.ca/collections/budweiser-at-home/products/budweiser-red-light?ls=en	**Height:** 11.6 in **Weight:** 2.9 lb **Additional Information:** Battery operated (4 D batteries), pairs with ios or android app.
	Wake-up alarm clock $64.95 https://www.amazon.ca/Philips-HF3500-60-Wake-Up-Light/dp/B00F0W1RIW/ref=asc_df_B00F0W1RIW/?tag=googlesh	**Height:** 8 in **Weight:** 8 in **Depth:** 5 in **Weight:** 1.2 lb **Additional Information:** Must be

	opc0c-20&linkCode=df0&hvadid=292936769932&hvpos	plugged in with included cord.

Design Specification:

Constraints

#	Design Specification	Relation (=,<,>)	Value	Units	Verification Method
1	Cost	<	100	$	Estimate, check final
2	Dimensions	<	500x500x500	mm	Analysis
3	Weight	<	15	lb	Analysis

Functional Requirements

#	Design Specification	Relation (=,<,>)	Value	Units	Verification Method
1	Reliability: Alerts CEED employees when the 3D printer stops printing	=	yes	N/A	Test
2	Reliability: Tracks when there is no movement in the 3D printer	=	yes	N/A	Test

Non-Functional Requirements

#	Design Specification	Relation (=,<,>)	Value	Units	Verification Method
1	Easy to Use	=	yes	N/A	Test
2	Aesthetics	=	yes	N/A	Test
3	Product life	>	2	years	Test

Our project directly addresses our client's need for organization and spatial awareness. During the client meeting, the CEED and Brunsfield employees emphasized their need for better organization. When talking to additional employees from CEED, they agreed that organization

was a problem but also that the notification system for the 3D printers was a nuisance that they would like to be improved on. Our client is relying on us to make their alert system more efficient and because of this, we have decided that our functional requirements and usability are most important. Cost is equally important as usability because CEED has a limited budget to buy new technologies. Product life is less important than cost but should still be greatly considered. Our system should be reliable as we do not want the client to need to replace items every month. Our client mentioned in the meeting several weeks ago that they often like to reorganize the CEED space, because of this we have decided that the project's weight and dimension need to be thoroughly considered. Aesthetics is least important, as it does not affect the system's design. Our project is still in its initial stages and because of this some of our ideas and criteria may change. We still do not know if any of our suggested solutions to solving CEED's issue of organization and spatial awareness will work. The Benchmarked products that we have researched still to be tested and thoroughly reviewed before deciding to purchase it. As of right now, we are still learning about the challenges of our designs and new information regarding the project may come to light.

In this document, we displayed our benchmarking, defined our design needs and reflected on the prioritization of the design's needs. We have chosen to focus on our client's request for better organization, our system will alert employees of CEED when a 3D printer has finished printing or if the print has failed. As we continue on with our project we hope to create a multitude of design ideas and eventually decide on one that we believe suits our project best.