



**Department of Electronic and Telecommunication Engineering**

**Faculty of Engineering**

**University of Moratuwa**

**EN 2160 Electronic Design Realization**

**Conceptual Design Report**

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## Introduction

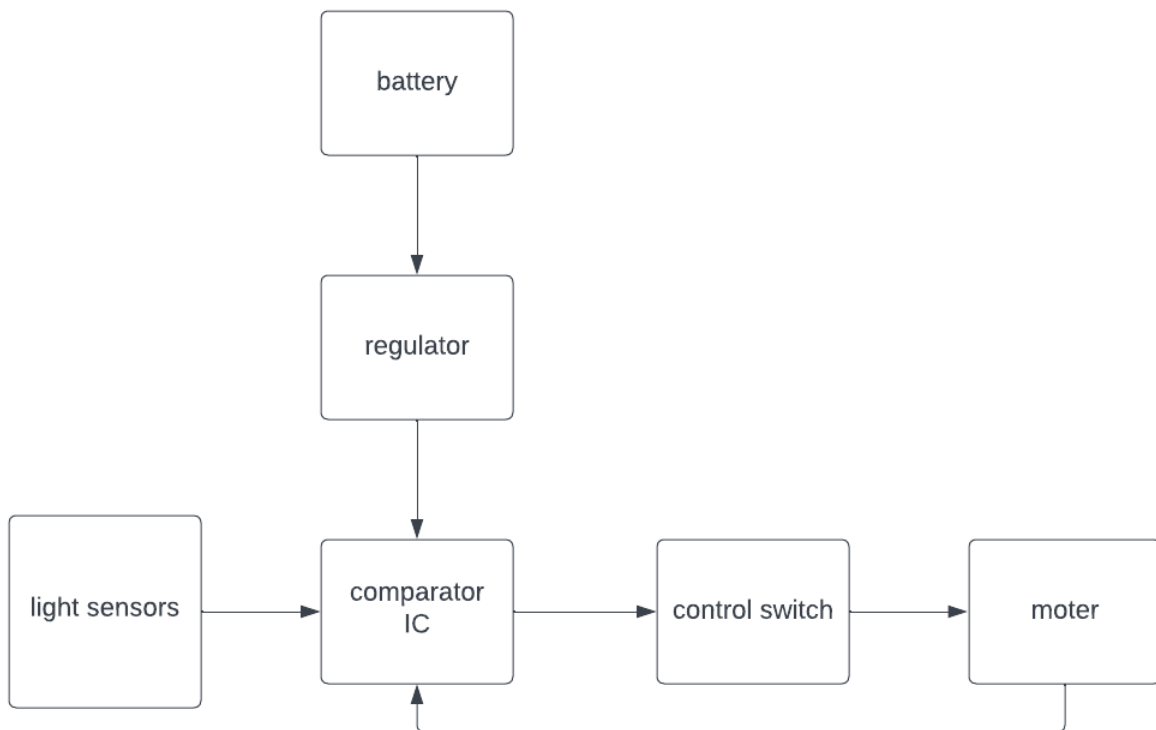
The initial phase of the design process, known as Conceptual Design, plays a crucial role in exploring ideas, generating concepts, and creating preliminary design solutions. This phase is instrumental in setting the foundation for the entire design process. In this report, we will delve into how the Conceptual Design cycle was effectively executed for the development of the "Light Sensitive Door Closer" product, employing two prominent design approaches: Design-Driven Innovation and User-Centered Design.

## Design Driven Innovation Approach

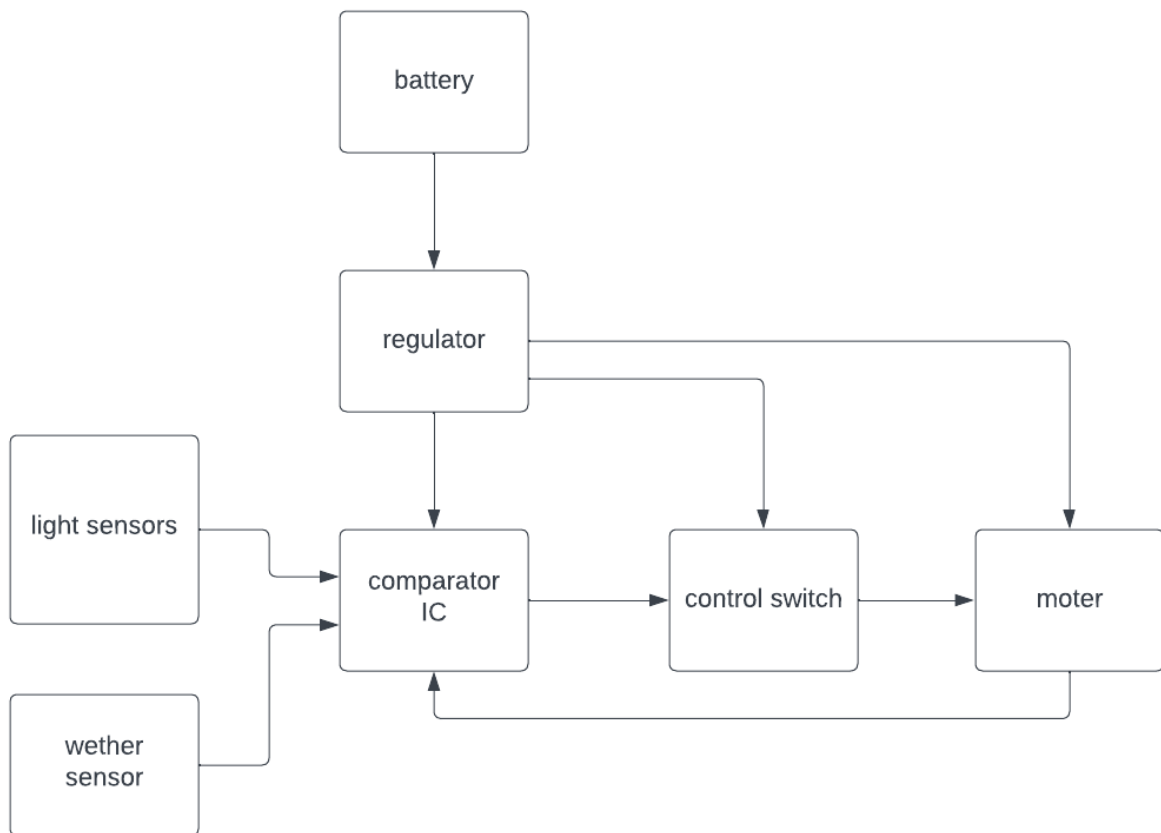
In Design Driven Innovation, conceptual design process involved in developing new designs according to the ideas came through some brainstorming sessions. We came up with 3 alternative designs in terms of block diagrams and enclosure designs.

### Block Diagrams

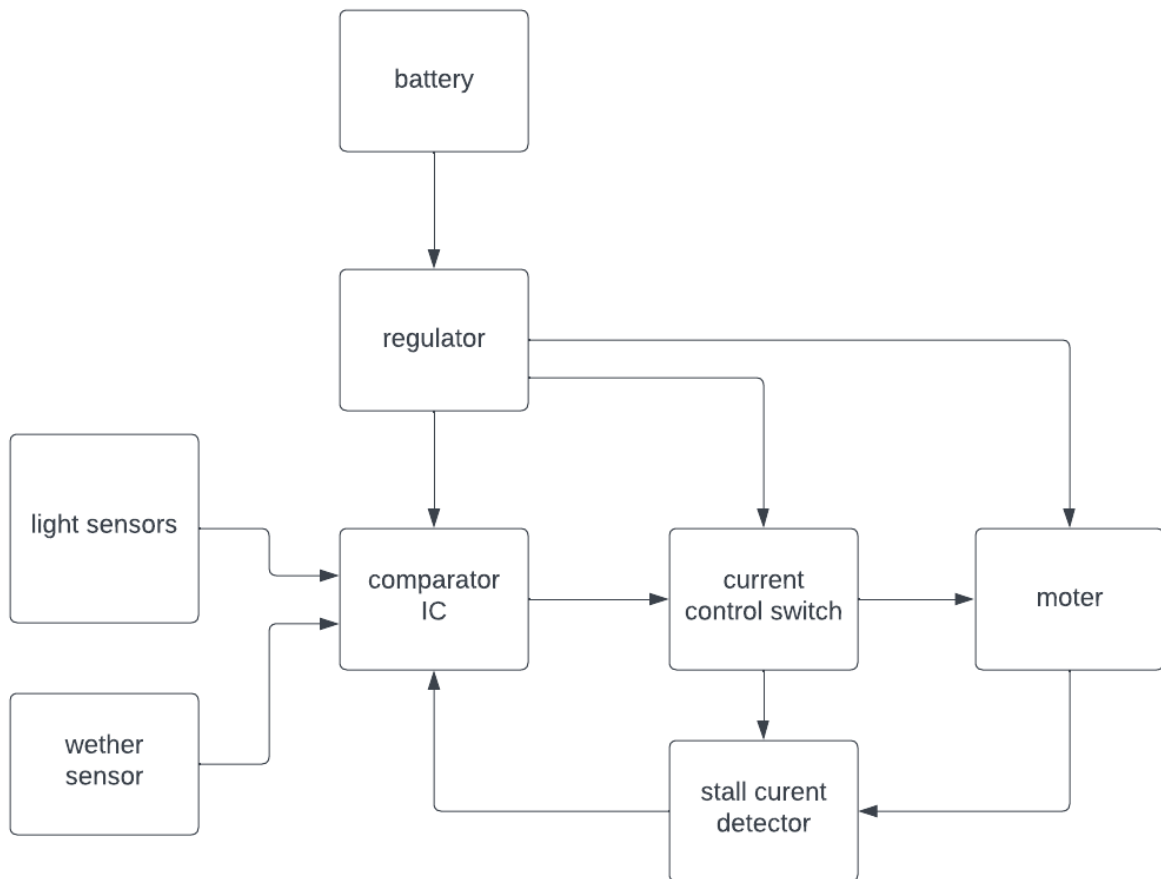
#### Block Diagram 1



**Block Diagram 2**

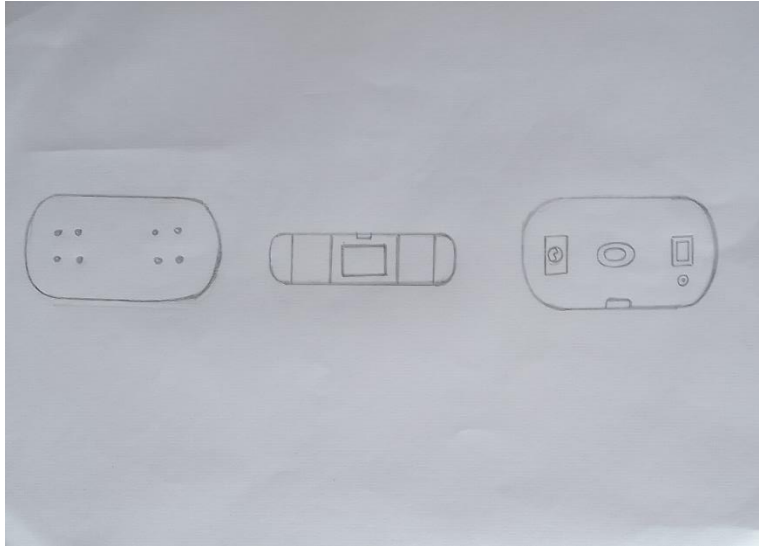


**Block Diagram 3**

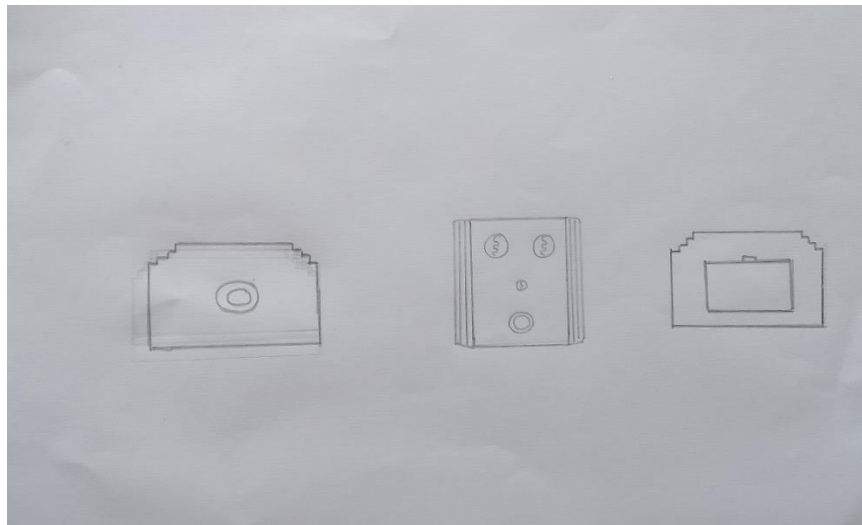


## Enclosure Designs

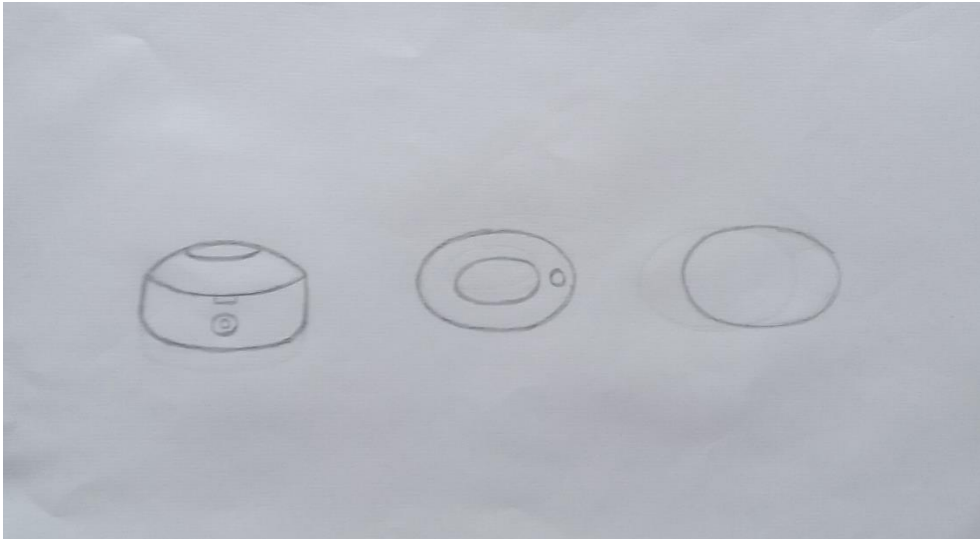
### Enclosure 1



### Enclosure 2



## Enclosure 3



## User Centered Design

User-Centered Design places a strong emphasis on incorporating user feedback throughout the conceptual design process to enhance the design. In this iterative approach, users are actively engaged by providing an overview of our initial design and soliciting their preferences and suggestions. If the users express approval and genuine interest in our design concept, we proceed to implement their valuable suggestions to further refine the product. However, if the users do not demonstrate a genuine need or enthusiasm for the product, it becomes imperative for us to explore alternative options.

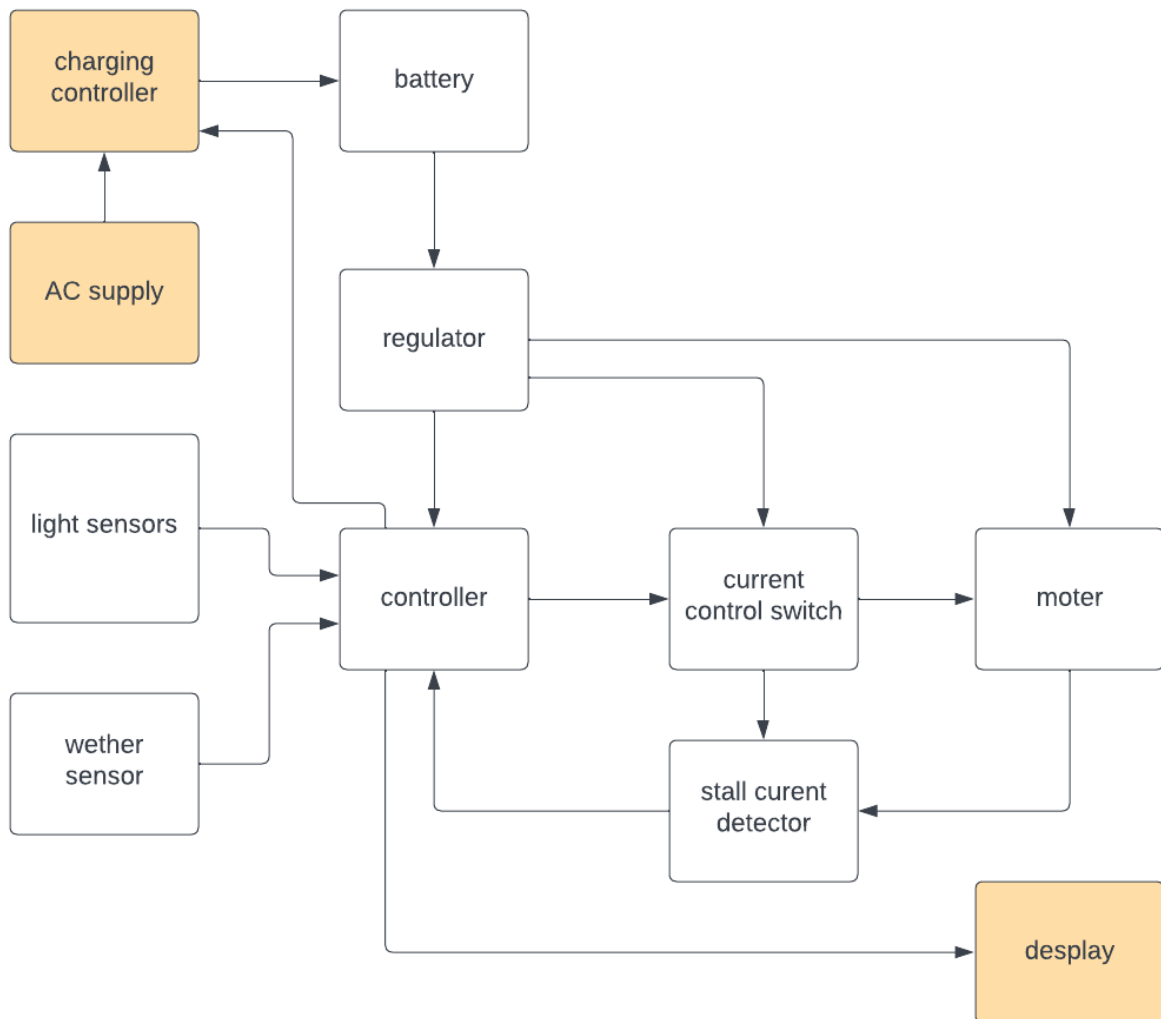
During the user feedback sessions for the "Light Sensitive Door Closer," several suggestions were received, which led to notable improvements in the design. By actively listening to users' perspectives and incorporating their valuable insights, we were able to enhance the product's functionality, usability, and overall user experience.

### Suggestions from the public survey

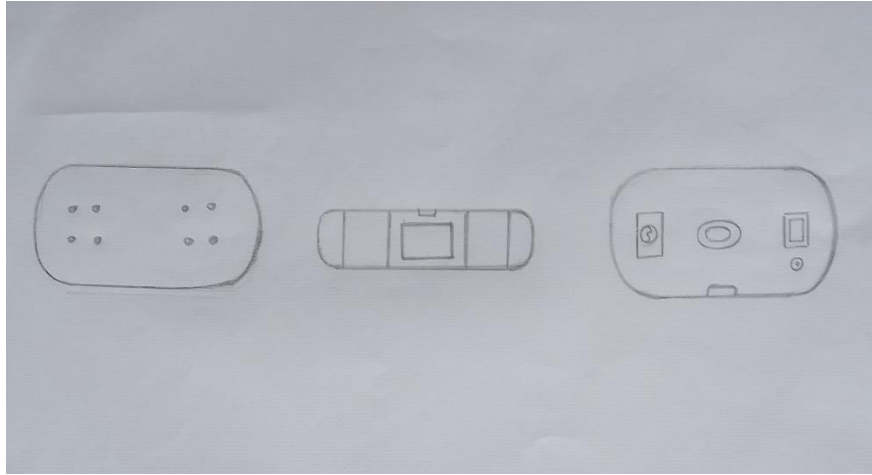
- Use a display to give feedback to the user.
- Reduce the power consumption.
- Give method to charge the batteries without replacing them.
- Increase the pulling force.

## Block Diagram according to the user feedback.

Block Diagram 4



## Enclosure 4



## Evaluation

### Evaluation of Block Diagram

#### Criteria

- Functionality – (To what extent the design meets the intended needs)
- Accuracy
- User Friendliness
- Cost
- Power Consumption
- Reliability
- Compatibility – (capability of replacing devices or systems that perform the same process or part of the process)

	Block Diagram 1	Block Diagram 2	Block Diagram 3	Block Diagram 4
Functionality	5	5	10	10
Accuracy	8	5	10	10
User Friendliness	5	7	7	9
Cost Effectiveness	5	9	8	3
Power Efficiency	5	8	8	5
Reliability	1	2	7	8
Compatibility	2	2	5	7
Total	31	38	55	47

### Enclosure Evaluation

#### Criteria



- Durability
- Attractiveness
- Cost Effectiveness
- User Safety – Prevention from electric leakage
- Compatibility – Capability of attaching the device to a certain place
- Repairability
- Weight and Hardness

	Enclosure 1	Enclosure 2	Enclosure 3	Enclosure 4
Durability	8	8	10	10
Attractiveness	8	5	10	10
Cost Effectiveness	10	7	7	7
User Safety	5	5	8	8
Compatibility	5	8	8	8
Repairability	1	2	7	7
Weight and Hardness	2	2	5	5
Total	44	37	55	55

#### Team Contribution

Name	Index
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