Department of Electronic and Telecommunication Engineering
University of Moratuwa

EN2160 – Conceptual Design Report

Morse Code Encoder Decoder

THILAKARATHNE D.L.J. 200650U

This report is submitted as partial fulfilment of the module EN2160 - Electronic Design Realization

6 June 2023

Content

1. Introduction

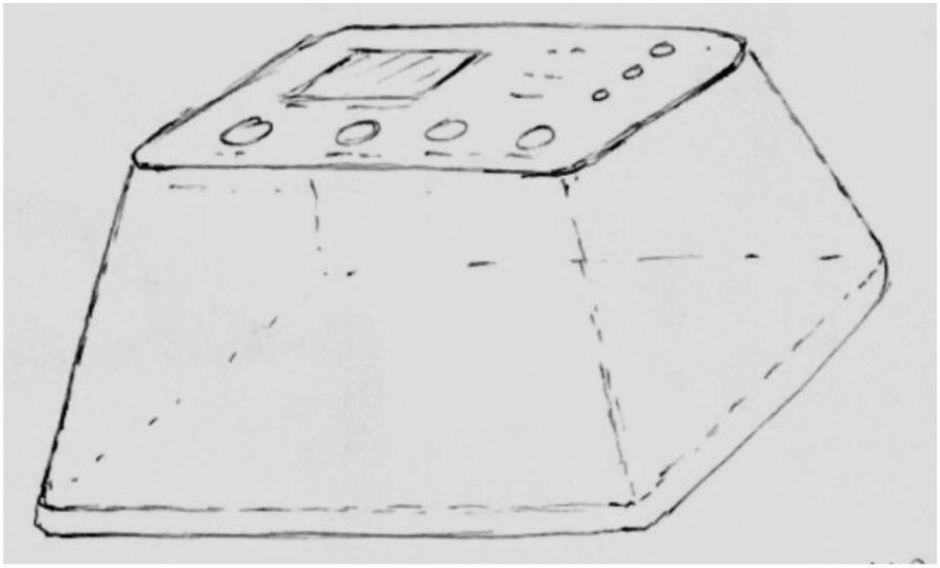
The conceptual design phase is a critical stage in the product development cycle, where the design team explores various ideas and prototypes to address specific challenges. During this phase, the team considers different circuits, enclosures, and functional parts, leveraging collective brainstorming sessions to generate innovative concepts. These ideas are then linked to form a comprehensive solution that effectively tackles the identified problem. Through hand sketches, the underlying concepts are organized and presented, aiming to arrive at an optimal solution that fulfils the project objectives. This report outlines the key findings and outcomes of the conceptual design process, highlighting the journey towards the development of an innovative and practical product.

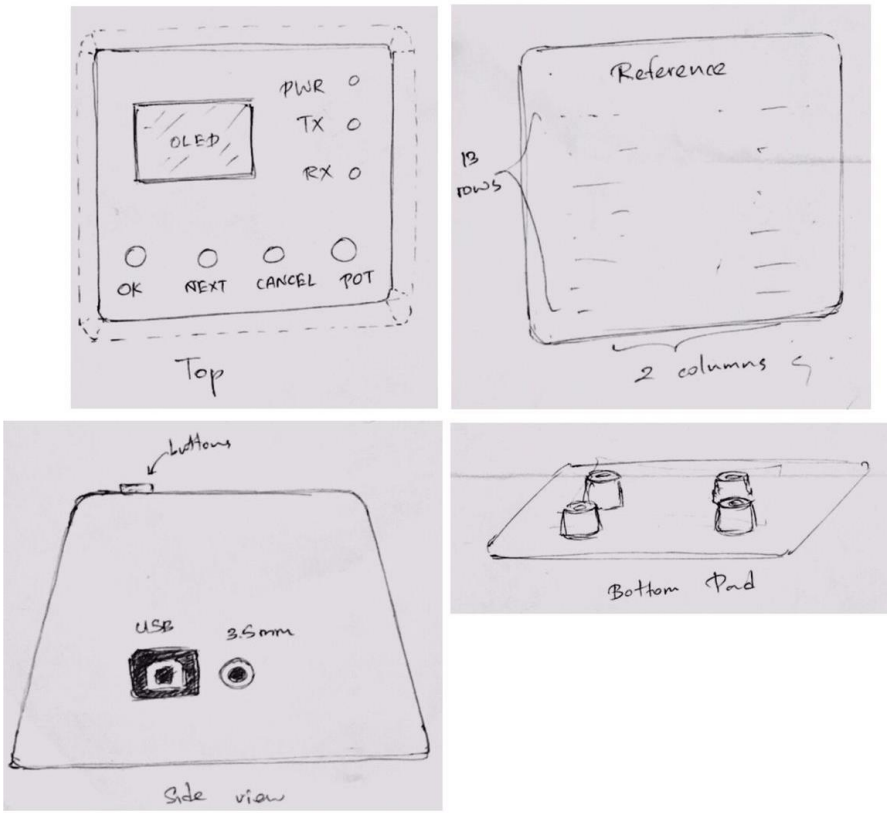
2. Design Driven Innovation

Design-driven innovation is an approach that places design at the forefront of the innovation process, using it as a driving force to generate new and meaningful solutions. It emphasizes the importance of understanding user needs, desires, and behaviours to create products or services that resonate with them. By combining creativity, empathy, and problem-solving, design-driven innovation aims to deliver unique and disruptive outcomes that meet both user expectations and business objectives.

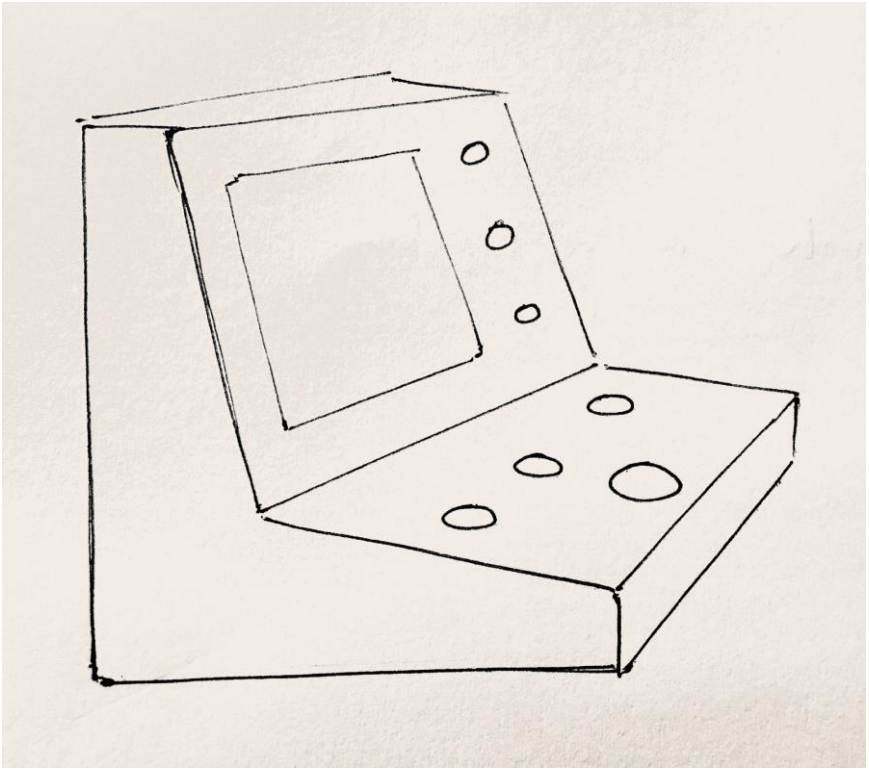
2.a. Conceptual Designs

i. As a cute, fun cube

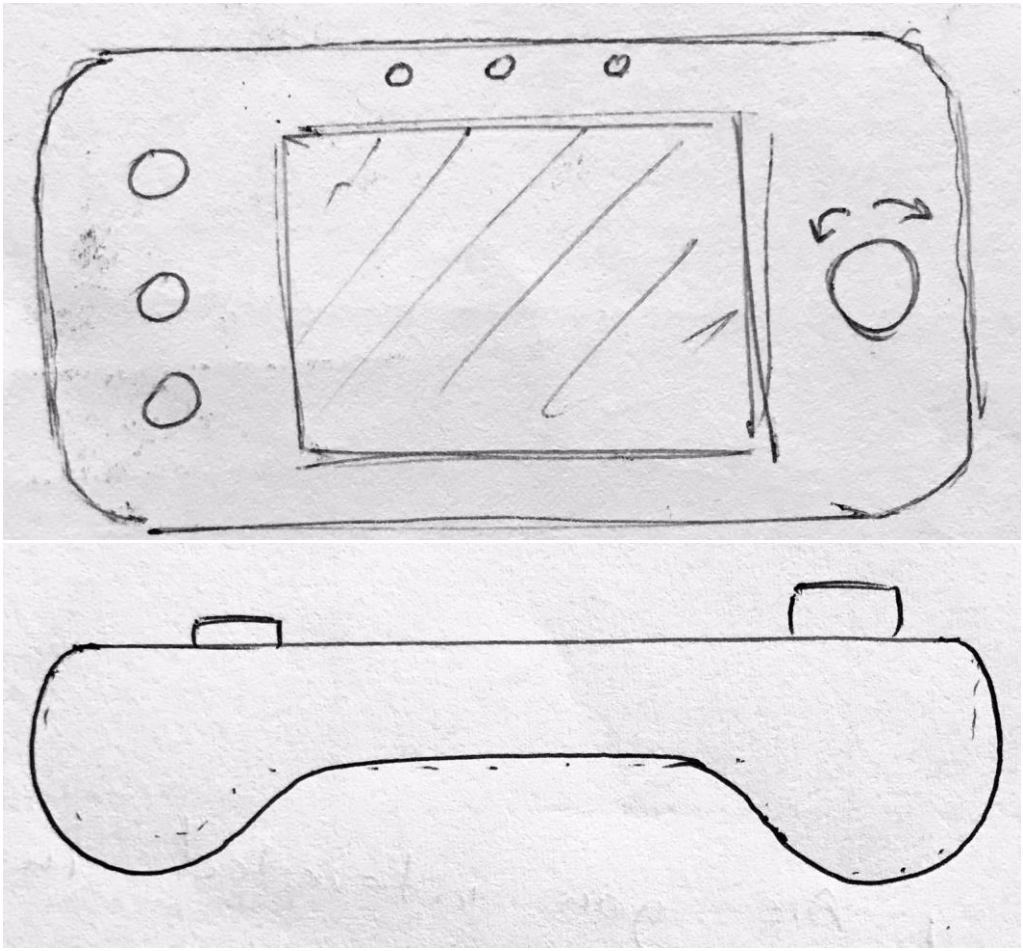




ii. As a small gaming station

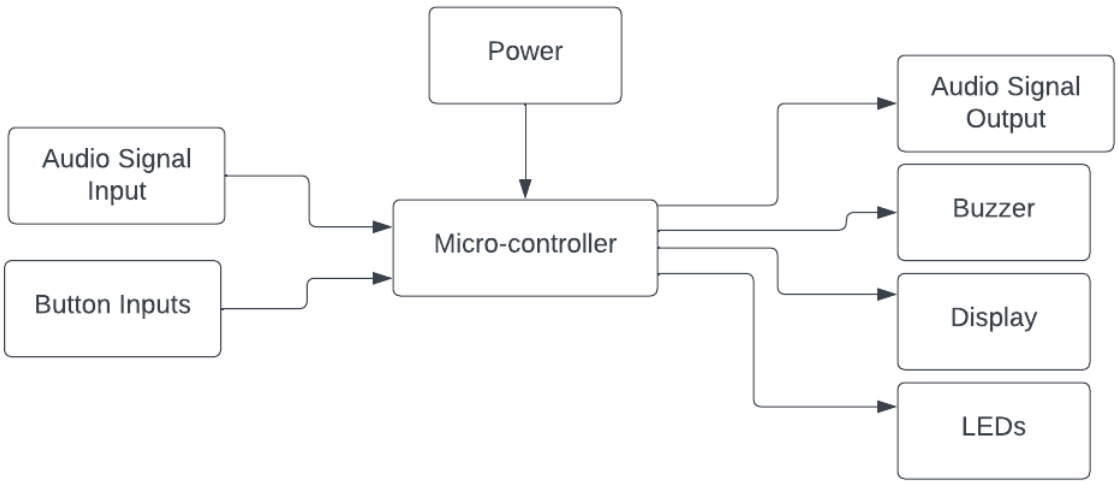


iii. As a Gameboy device (Handheld)

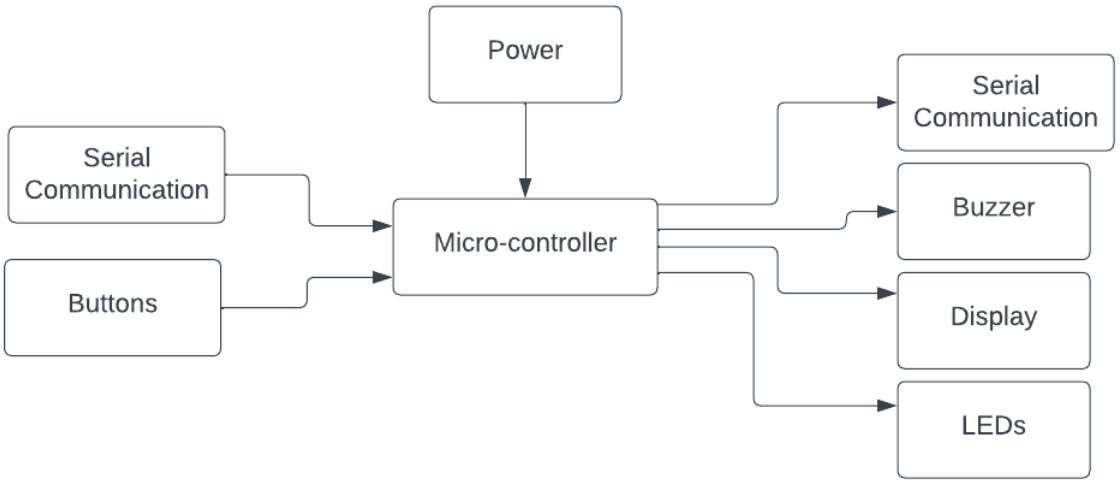


2.b. Block Diagrams

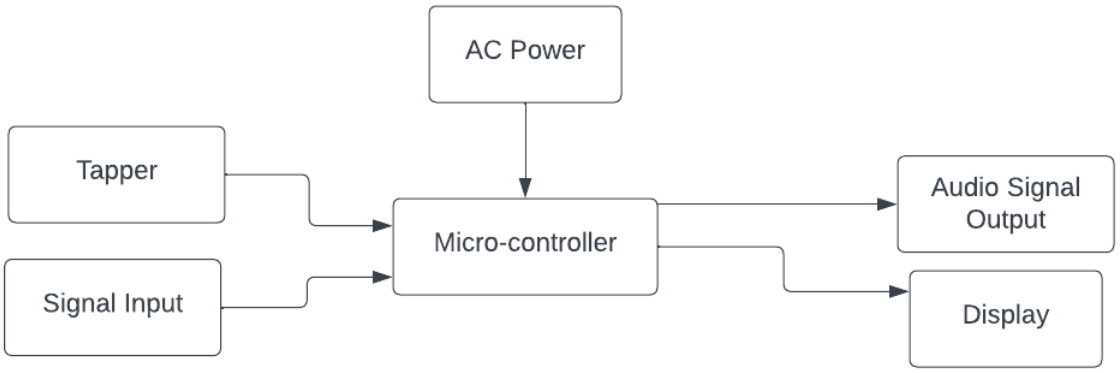
1. Diagram 1



2. Diagram 2

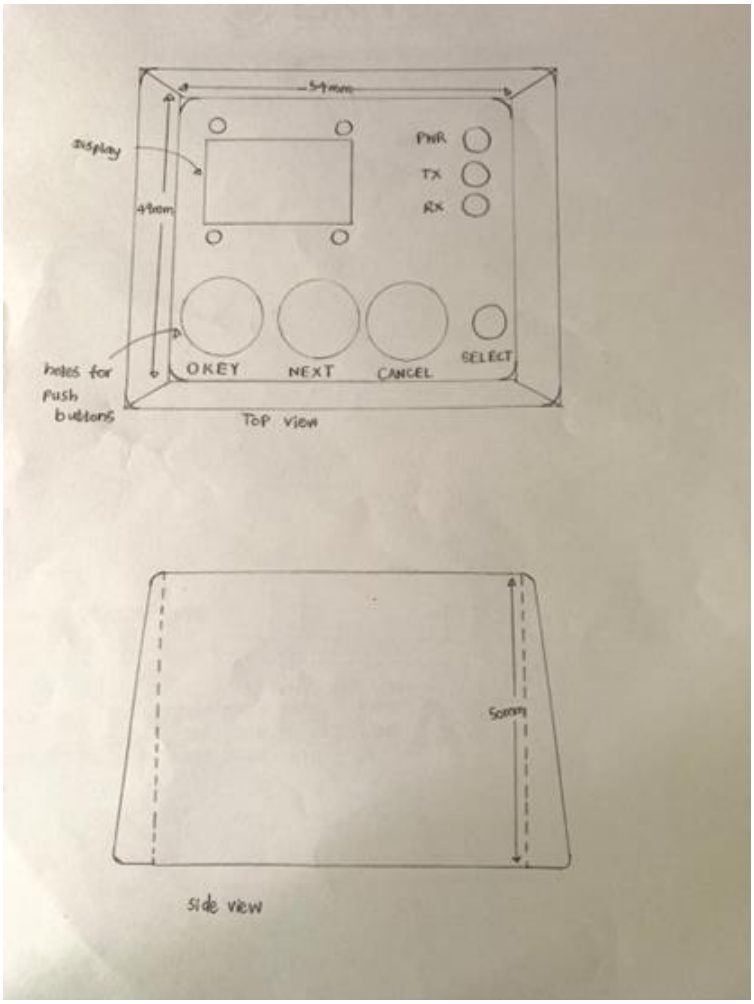


3. Diagram 3

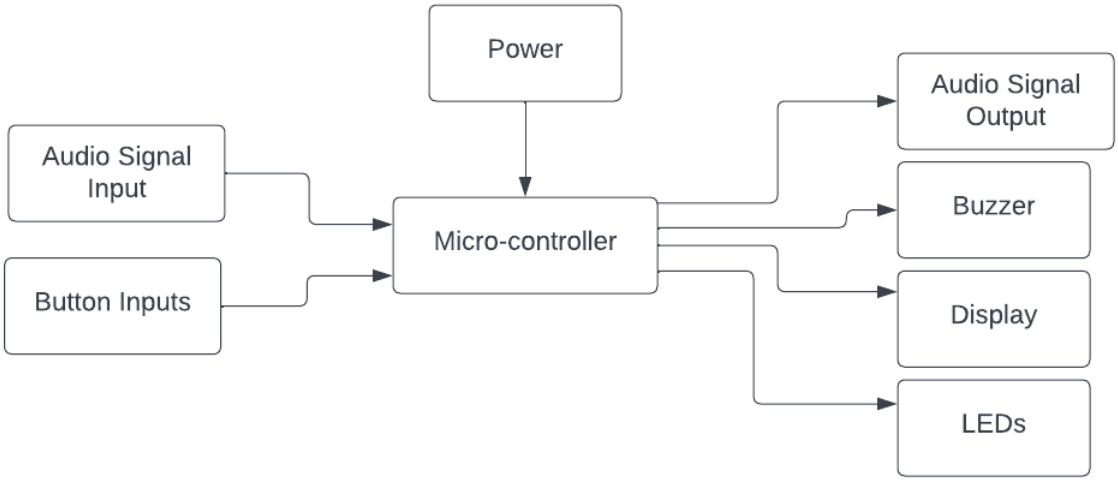


3. User Centred Design

3.a. Sketch



3.b. Block Diagram



4. Evaluation Matrices

4.a. Conceptual Designs

Criterion	Design 1 (Fun Cube)	Design 1 (Gaming Station)	Design 1 (Gameboy)	User Centred Design
Aesthetics	8	7	8	9
Ergonomics	7	5	9	8
Safety	8	7	8	8
Durability	8	6	5	7
Repairability	7	8	5	6
Simplicity	8	6	4	8
Portability	5	4	6	7
Competitiveness	7	8	8	8
Total	58	51	53	61

4.b. Features Update

Features	Design 1 (Fun Cube)	Design 1 (Gaming Station)	Design 1 (Gameboy)	User Centred Design
Added	Simple Aesthetic	Repairability	Ergonomic Aesthetic	Simple Aesthetic
Removed	Portability	Aesthetic	Simplicity	Portability

4.c. Block Diagrams

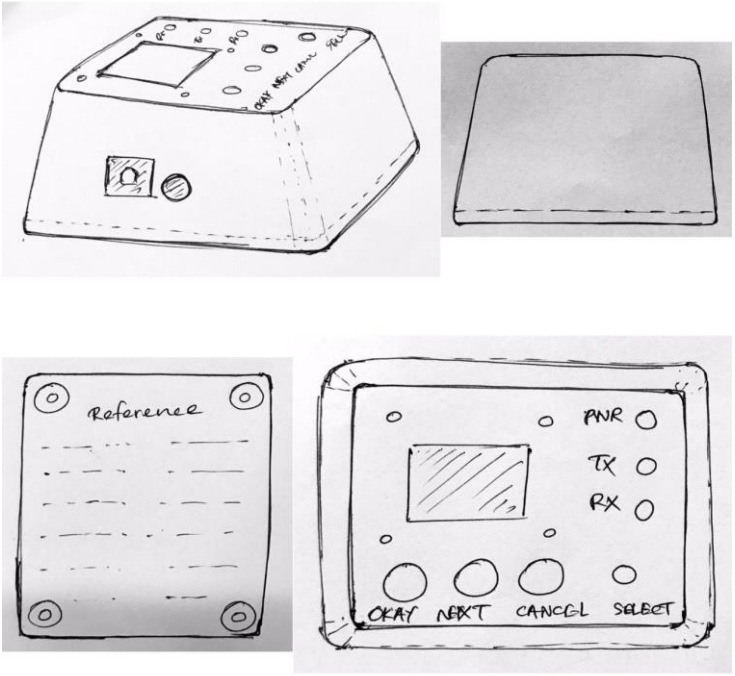
Criterion	Diagram 1	Diagram 2	Diagram 3	User Centred Design
Simplicity	8	8	4	9
Size	8	6	5	8
Safety	6	7	8	8
Durability	7	4	9	7
Reliability	7	5	6	7
Efficiency	6	6	7	7
Scalability	6	6	6	9
Cost	7	9	5	8
Total	55	51	50	63

4.d. Features Update

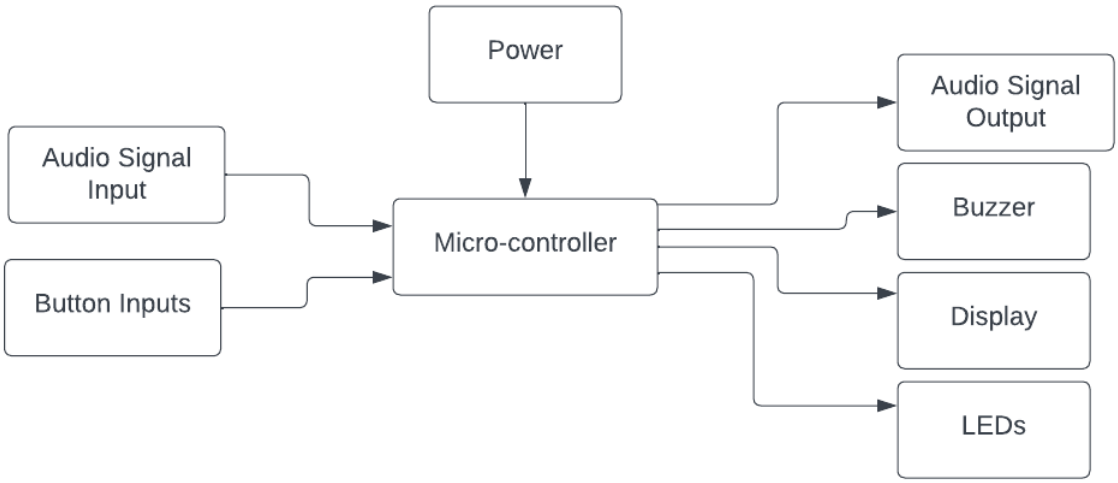
Features	Diagram 1	Diagram 2	Diagram 3	User Centred Design
Added	DC Power Simple	Serial Communication	AC Power Tapper	DC Power Simple
Removed	Tapper	Tapper	Portability	Tapper

5. Selected Design

5.a. Conceptual Design



5.b. Block Diagram



6. Contribution from group members

1. Anuki Pasqual – 200445V
2. Tharusha Pathirana – 200449L
3. Navindu Gunawardena – 200201V
4. Peshala Gunathilaka – 200439G
5. Chehal Jayasuriya – 200262G
6. Chamodh Kavinda – 200301D
7. Malanban Kuganenthiran – 200373X

All the members of the group contributed since this was the product that was discussed on the first physical gathering. (On the day where the groups were formed.)