BATTERY CHARGER

Group 2

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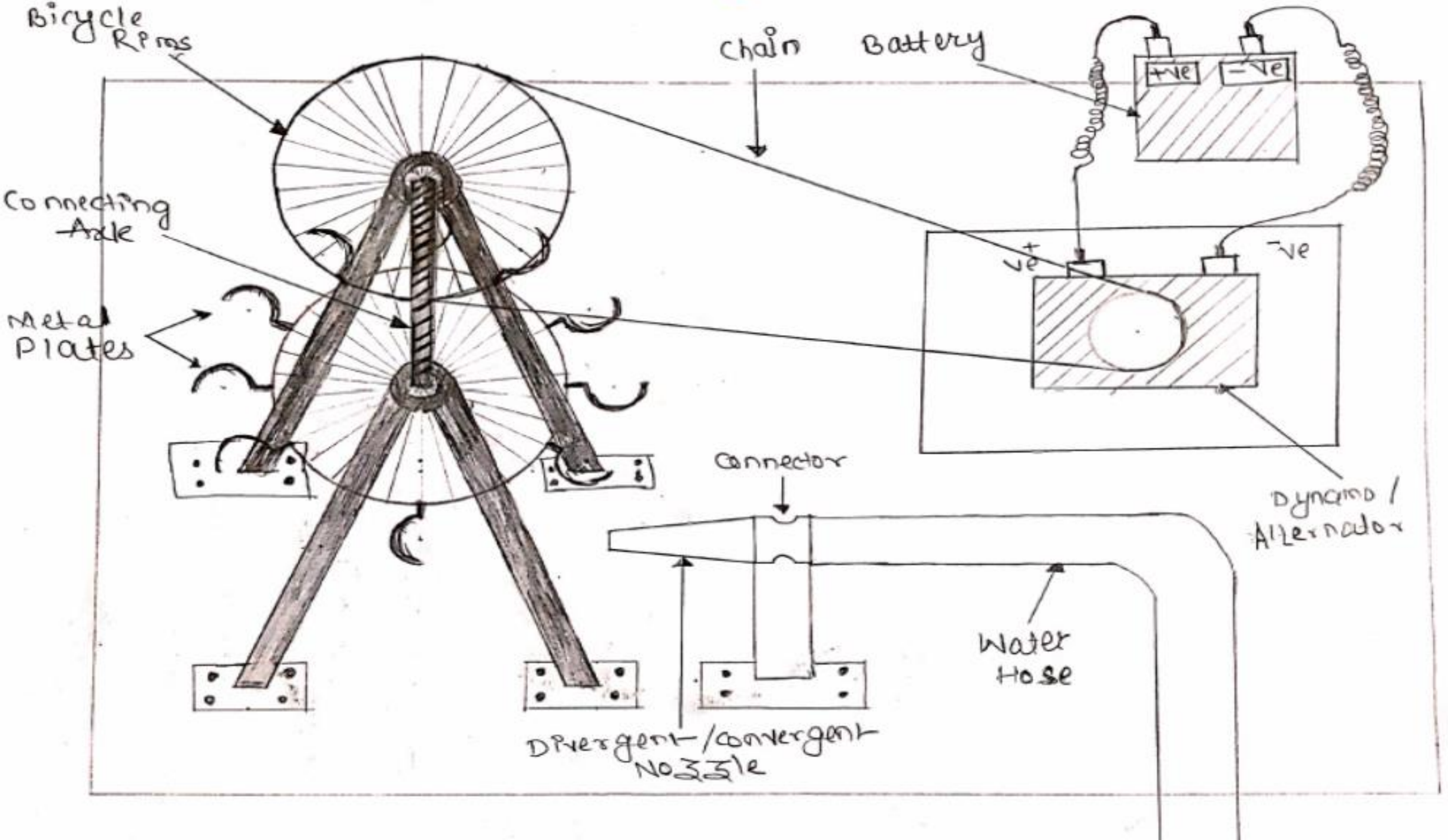
Contents

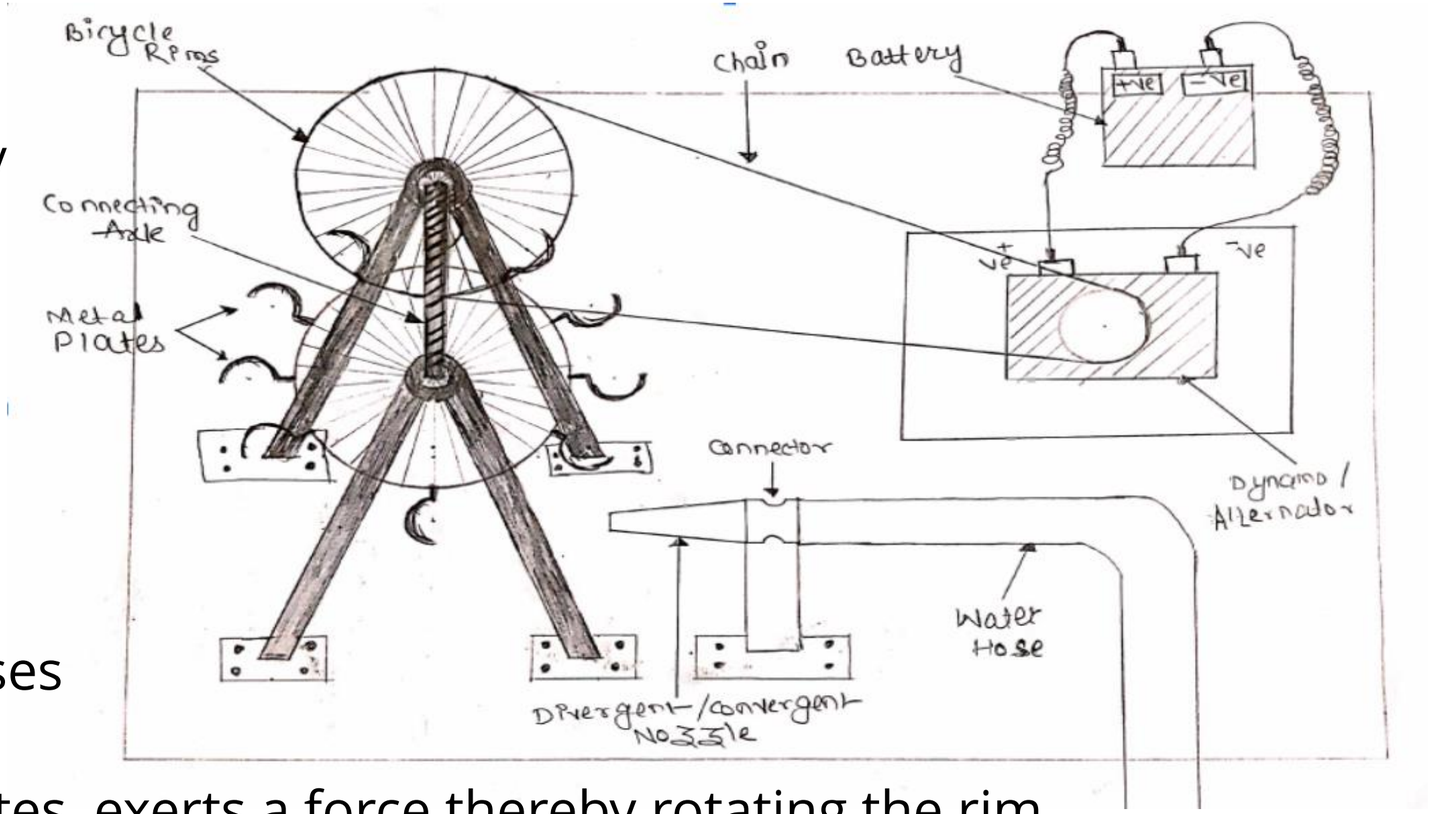
EDIPT Process

EMPATHIZE	DEFINE	IDEATE	PROTOTYPE	TEST
• Farmers • Villagers • Students / Youth	• Frequent Power Cuts	• System connected to Water Pump	• Manual driven	• Demo


Bicycle Rims
Chain
Battery
+ve
-ve
Connecting Axle
Metal Plates
+ve
-ve
Connector
Dynamo / Alternator
Water Hose
Divergent/convergent Nozzle

EQUIPMENT

Bicycle Rims - 2, Connecting Axle, Chain/ Rope, Metal Plates, Battery, electric cables, Divergent Convergent Nozzle, Water Hose, Dynamo/ Alternator, Flywheel.

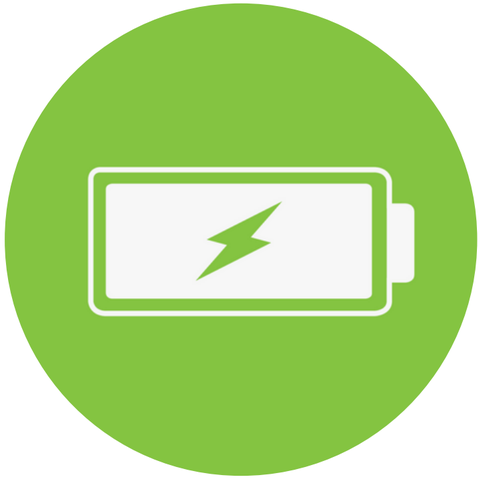


WORKING

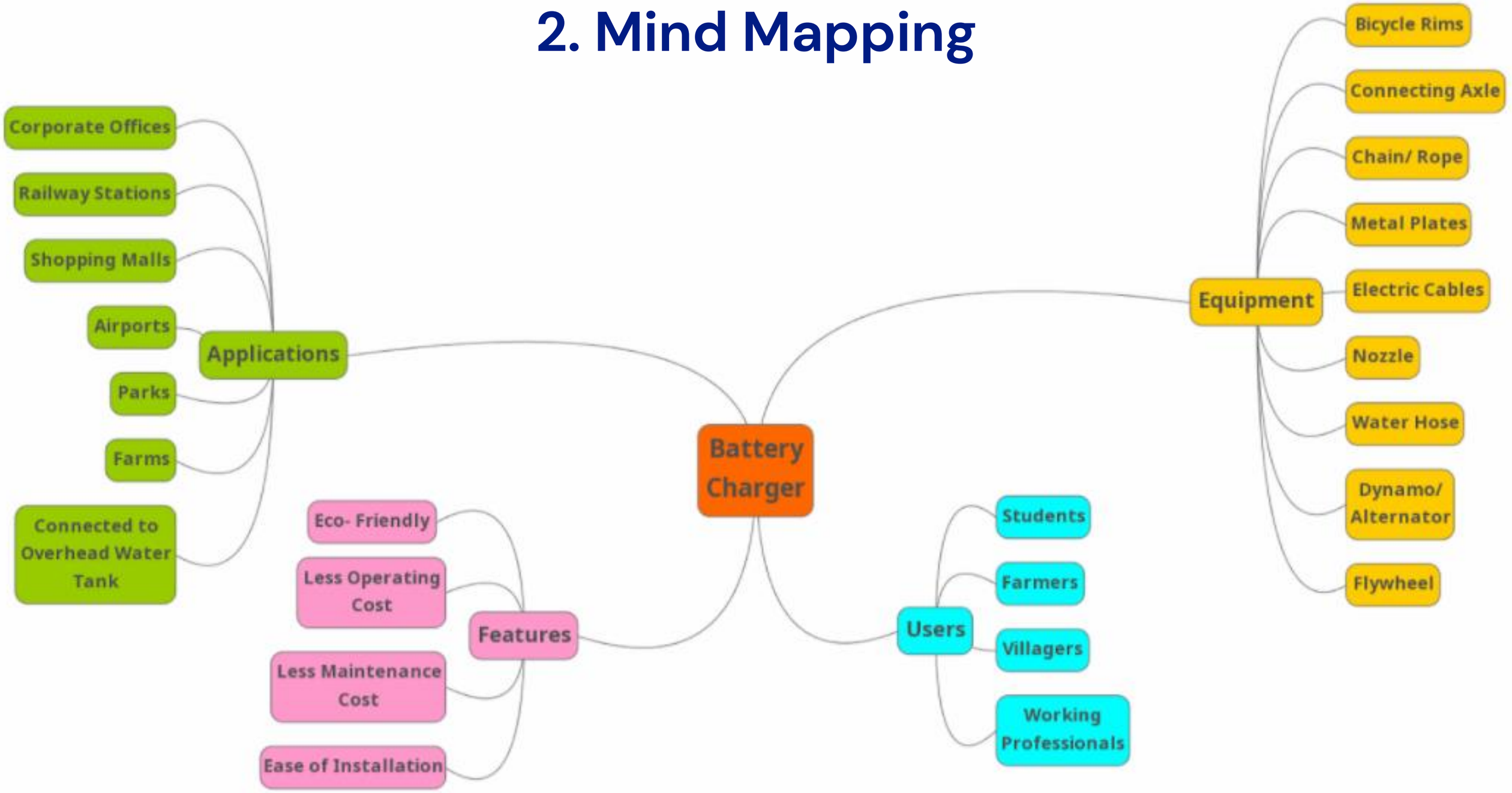
- Divergent Convergent nozzle increases the water pressure.
- Pressurized water hits the metal plates, exerts a force thereby rotating the rim.
- The other rim connected via axle also rotates.
- The rim and dynamo is connected through a rope/ chain.
- As the dynamo starts to rotate, it converts mechanical energy into electrical energy (12V).
- The electrical energy is stored in a battery.

Tools for Design Thinking

1.Visualization



2. Mind Mapping



3. Rapid Concept Prototyping

- **Stage 1: Idea generation**
  - Need for continuous supply of electricity
  - Source of activity for the villagers, students and youth
  - Fun competition among youth / team building activity
  - Reduce wastage of unclean water
  - Use freely available components
  - Way of exercise for working professionals
  - Exercise equipment in playgrounds and parks

- **Stage 2: Concepts**
  - **Concept 1:** Store enough charge in a single large battery to light up houses via multiple 1-wheeled units (having pedals)
  - **Concept 2:** A 1-wheel unit (pedal) connected to a single smaller battery enough for one house
  - **Concept 3:** A two-wheeled unit having metal plates to be used in farms
  - **Concept 4:** 1-wheel unit in parks and playgrounds as a means of exercise
  - **Concept 5:** A small 1-wheeled unit extended below the chairs in offices to ensure that employees have some physical activity along with getting the work completed.

- **Stage 3: Business Design**
  - **1-wheel unit (with pedals)**
    - For exercising purposes and as a battery charger
    - Wheel is connected to a dynamo via a rope/chain
    - Dynamo converts the rotational motion into electrical energy and is stored in a battery.

  - **2-wheeled unit (with metal plates)**
    - For use in agricultural fields and as a battery charger
    - The 2 wheels are connected via an axle
    - The second wheel is connected to the dynamo via a rope/chain
    - The dynamo is then connected to a battery to store the electrical energy
    - A divergent/convergent nozzle is used to increase the water pressure onto the metal plates
    - Pressurized water hits the metal plates causing the first wheel to rotate.
    - Rotational motion of the first wheel induces a rotational motion in the second wheel which causes the dynamo to rotate.
    - The dynamo converts the rotational energy into electrical energy (12V) and is stored in a battery

4. Prototyping

Why prototyping : we want to test & reduce the failure after the deployment , So we need to check for the feedback from customer once they use the prototype.

Steps

Step 1: **User scenario 1:** ideate to use it in farmlands that has water pump ,

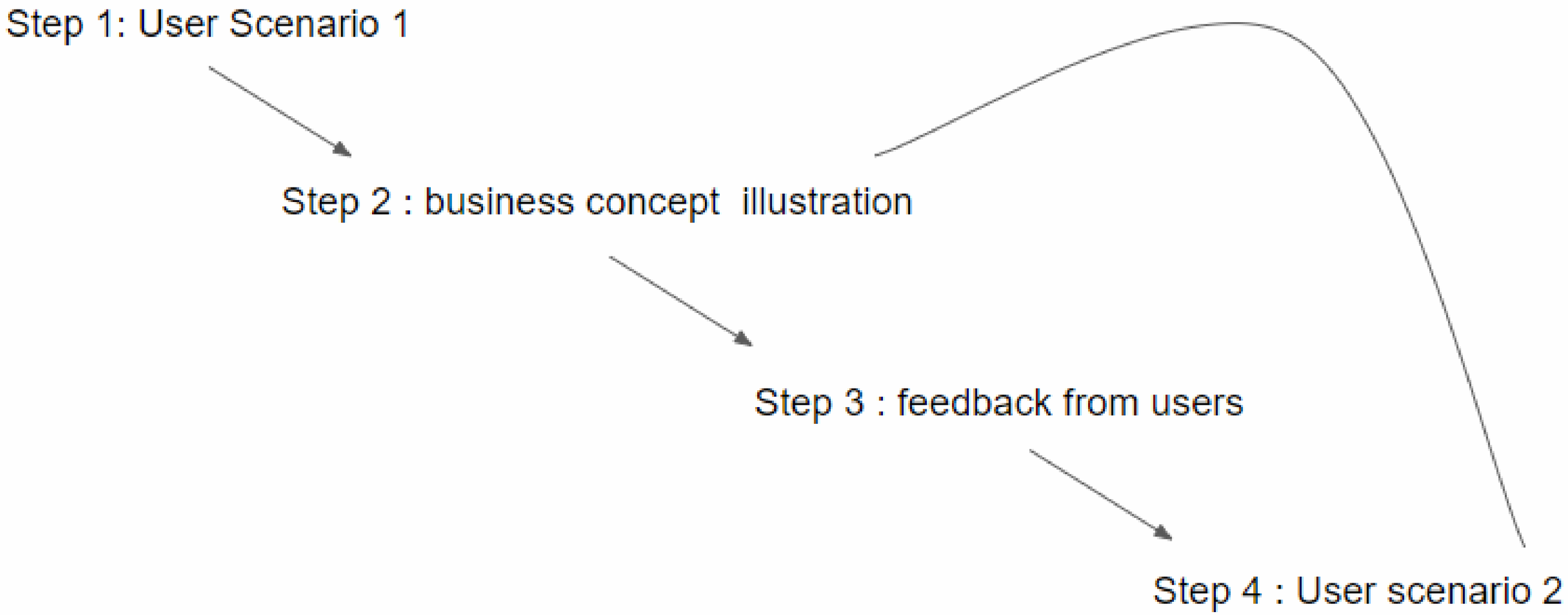
Step 2: Business concept illustration : illustrated the design to the people (the contacts)

Step 3: Feedback from the Users : they want it to work in the absence of water pump (we want to make mistake faster)

Step 4: **User scenario 2:** once again we came up with idea of 1 wheel connected with pedal & explained to the people

Step 5: User / stakeholders feedback : the customers / people whom we have talked had a good impression about the product.

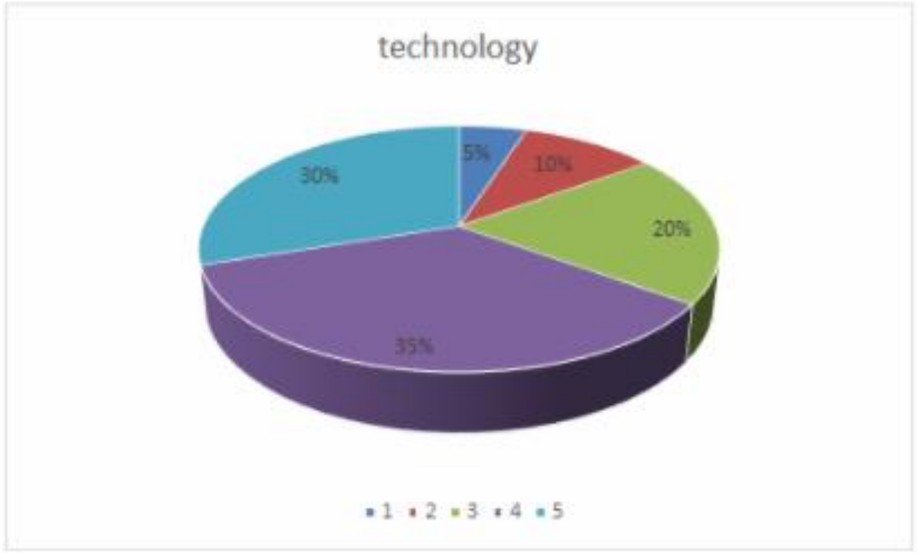
Our Experience Journey

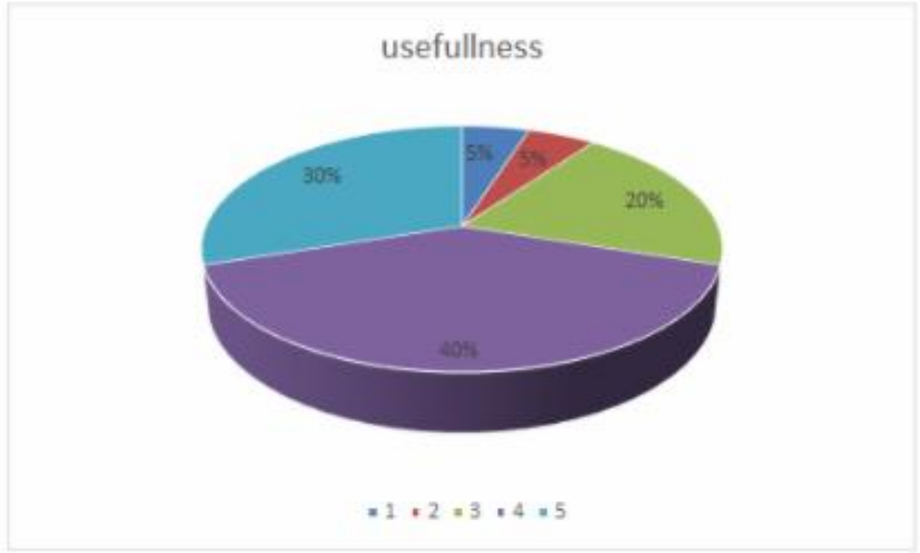


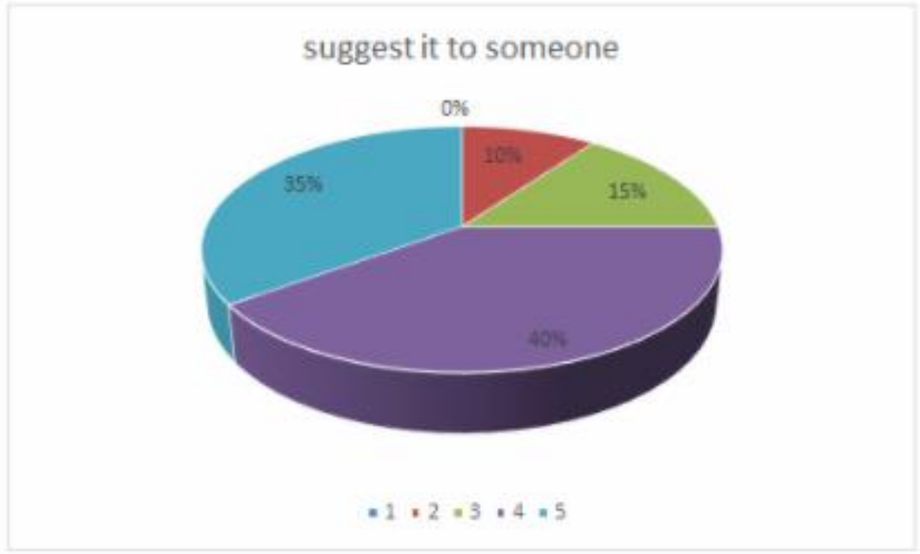
5. Learning Launches

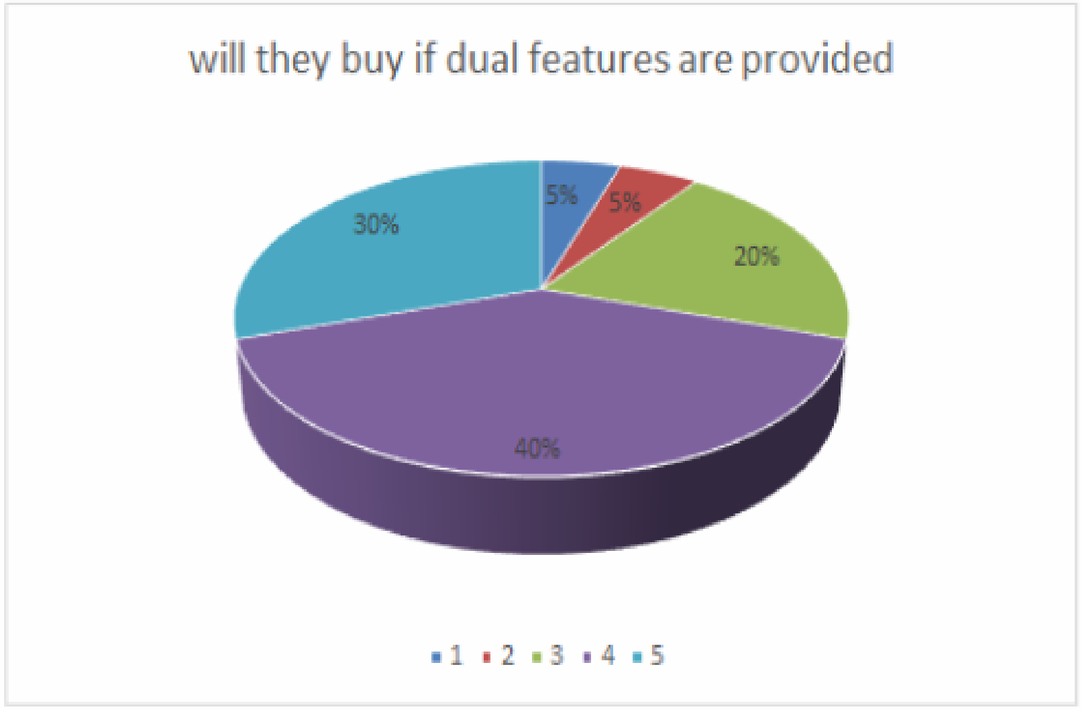
- We introduced the final design to them (people whom we contacted)
- We went through their behavioral metrics to make a product more successful
- We plan to have 50 days pilot test / demo with all our customers just to get the feedback about their performance before our original launch
- This 50 day test is to verify the critical assumptions that we made & to gather market driven data for further version or improvement

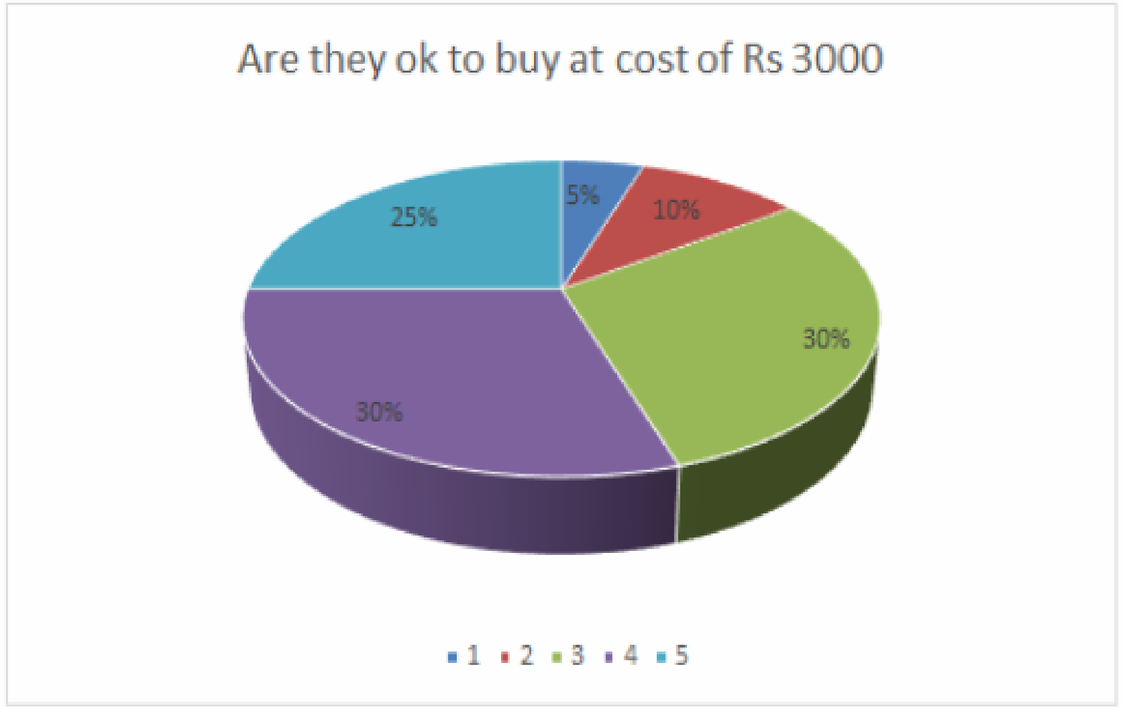
Observations











Feedback or suggestion from Gym trainers (for expansion of business)

Ready to buy if :

- One-wheel model
- More Compact (reduction in subparts , size, better design)
- They prioritize themselves to use LED Lamp in Gym.

Areas for Future Expansion

- **Two-Wheel**
  - Uplifted Cycle in playgrounds and parks
    - Customer: Children and Old age
      - Task: Promotes leg workout and charging battery
  - Basic Prototype at river banks and in farms
    - Customer: Farmers
      - Task: Water pressure moves wheels generating stored electricity in batteries, which can be used during evenings to light bulbs or charge phones amidst large farms.
- **One-Wheel**
  - Paddle and wheel in seating areas in corporate offices
    - Customer: Professional workers who have negligible movement during work (example, Customer care on call)
      - Task: Movement during work keeping body healthy + battery charger

DESIGN THINKING ISN'T A SUBJECT. IT'S AN EMPATHY-CENTERED APPROACH TO CREATIVITY.

JOHN SPENCER


THANK
YOU