

DORA

Discover Observe Relate Achieve

Group 18

Ishita Misra

Nandini G

Gargey Pandey

Rutuja Bidwai

Under the supervision of:

Ayushi Bapna

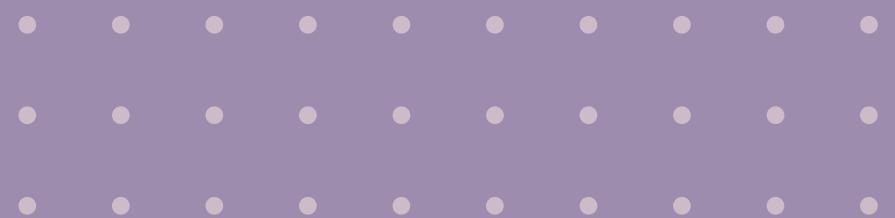
Purnendu Bhattaru





EMPATHISE

Understanding the needs of parents
and children

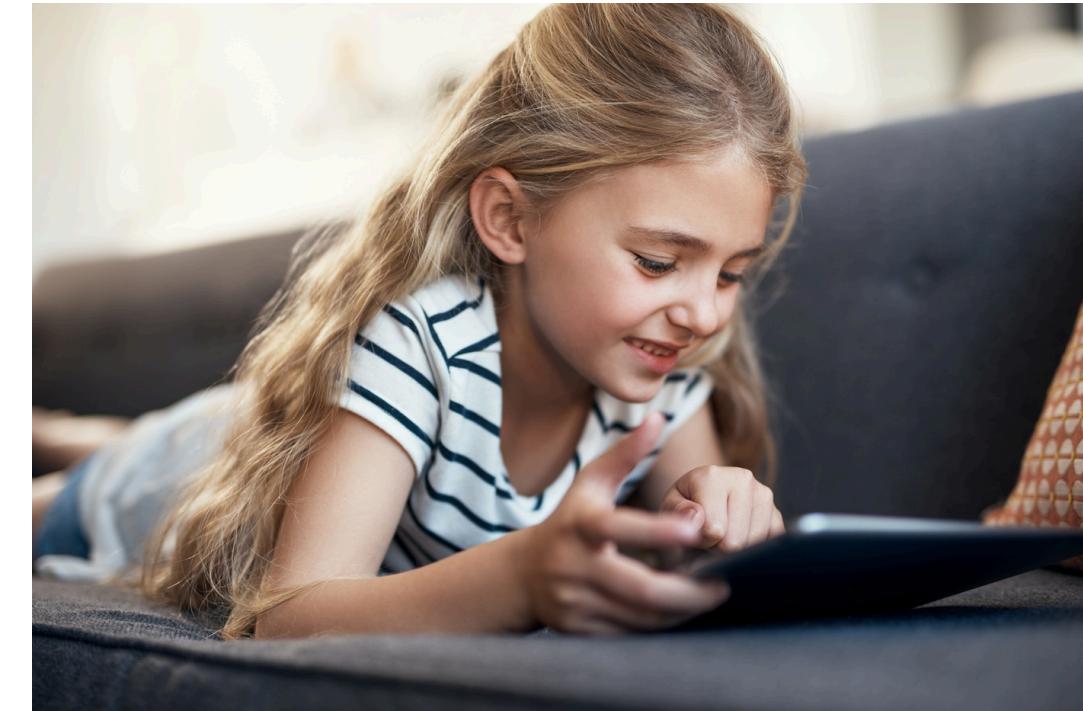


Keeping Children Engaged and Entertained

- Parents struggle to find activities that consistently capture their children's attention and interest they end up increasing the screentime.
- They need innovative ways to keep their children engaged in learning, especially during downtime or when they need to focus on other tasks.

Balancing Screen Time and Digital Interactions

- Parents are concerned about excessive screen time and its impact on their children's well-being.
- They need educational, tech-based alternatives to passive screen use. They want their kids to be kids



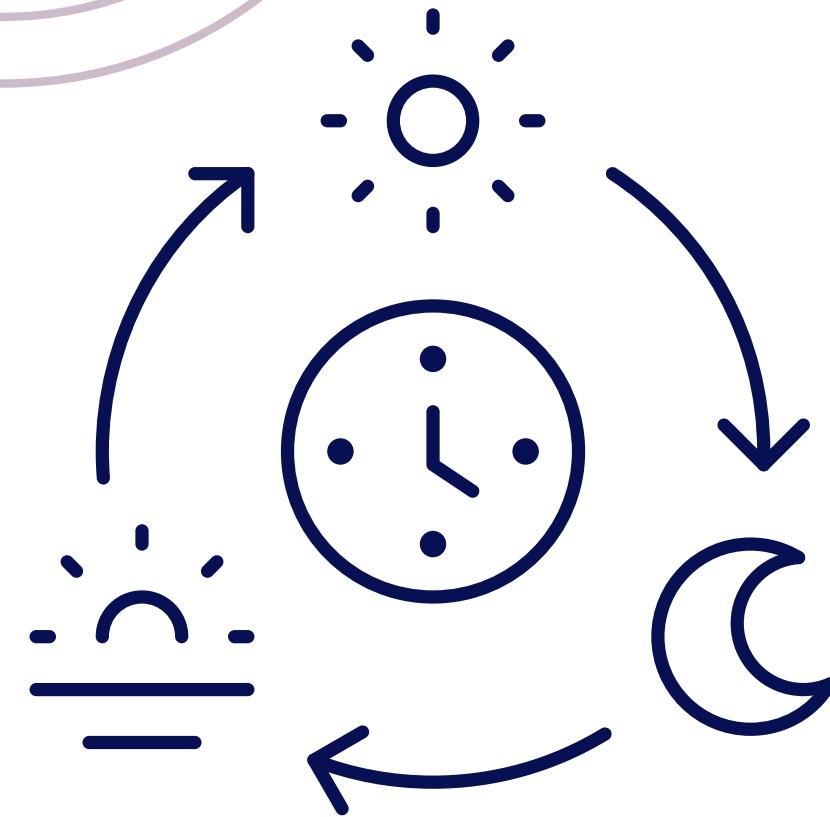
Supporting Learning and Development

- Parents want to support their children's development but often lack the time, resources, or expertise
- They seek educational tools and toys to enhance their children's learning experiences.



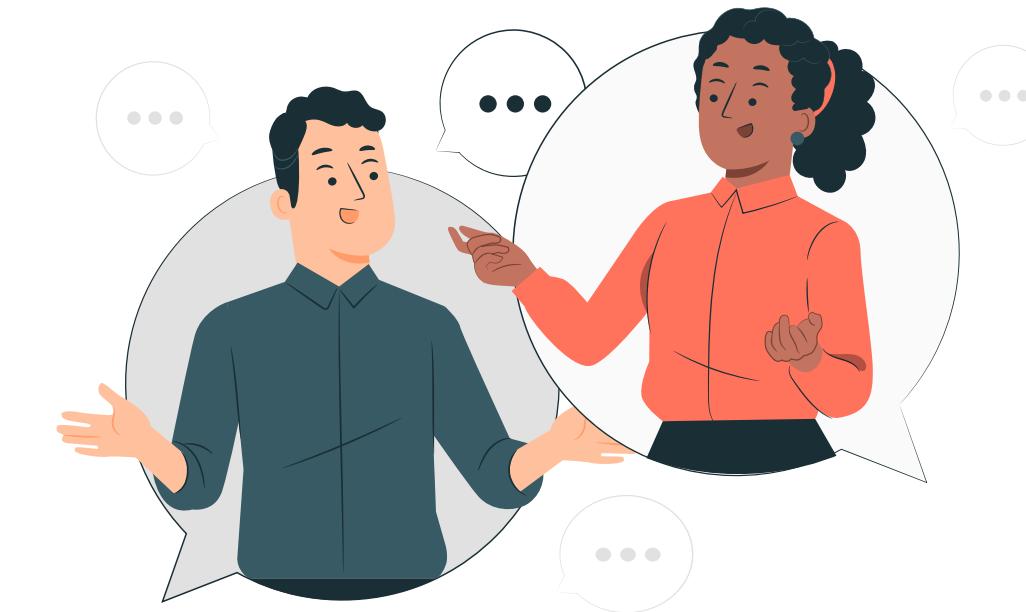
Gadgets enhancing creativity

- Kids go with cheat codes and YouTube solutions even for their video games. Being this tech-savvy eliminates their imagination and leads to behavioural problems like violence.



Tailoring to Individual Needs and Preferences

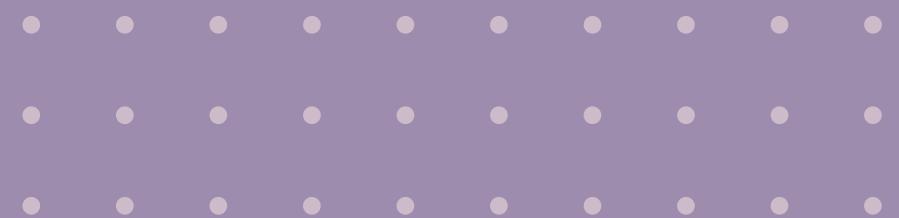
- Every child has unique learning styles, interests, and developmental needs, making it hard for parents to find one-size-fits-all solutions.
- Personalized and adaptive learning approaches are highly valuable for meeting individual needs





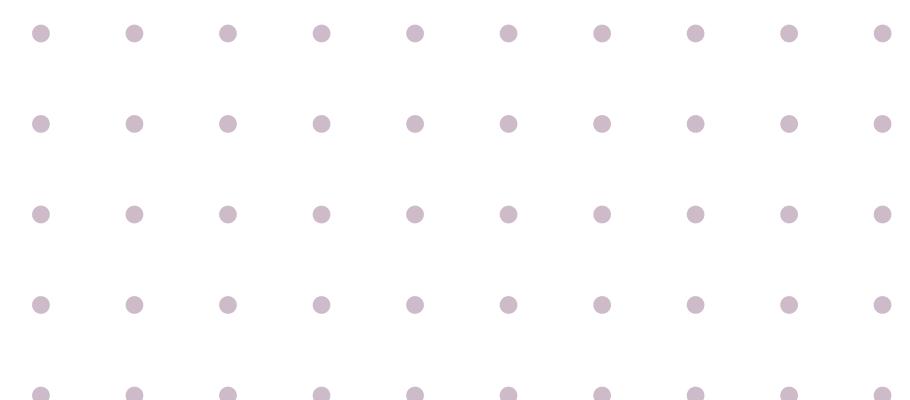
DEFINE

Look beyond with different point of view



CONTEXT

- In today's world, children are increasingly drawn to electronic gadgets, worrying parents about the negative effects of too much screen time.
- While traditional toys like wooden ones and paper books offer developmental benefits, they often fail to keep children interested.



CORE PROBLEMS

- There's a need for an innovative solution that combines the engagement of electronic toys with the developmental benefits of traditional toys.



USER RESEARCH

Methodology:

- Surveys and interviews with parents to understand their concerns about screen time.
- Observations of children's play habits to identify needs for engaging and educational toys.

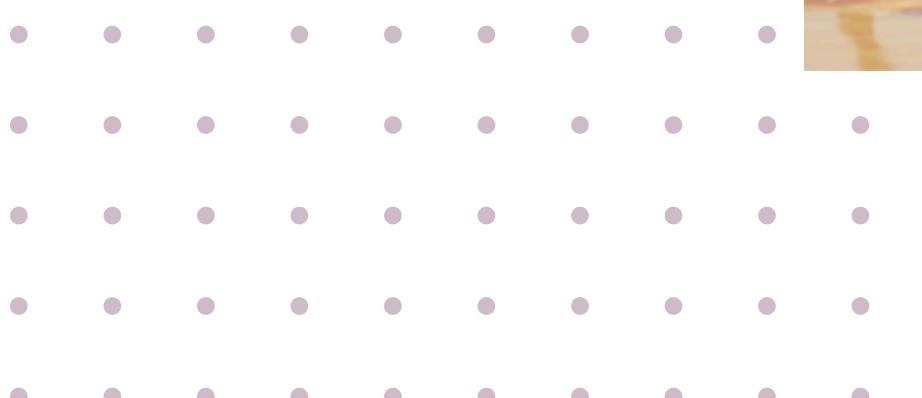


Key Findings:

- Parents prefer toys that are cost-effective and reduce screen time.
- Children need interactive and engaging toys that combine learning with fun.

Implementation:

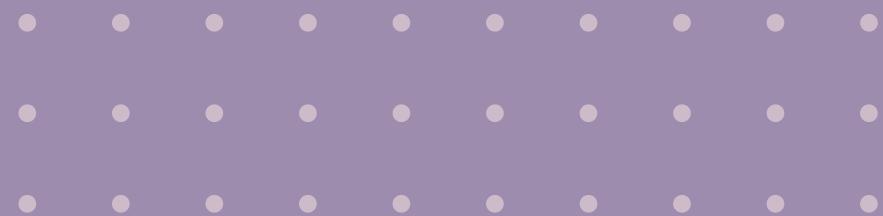
- Engaging, Interactive Modes:
 - Morse code detector/generator
 - House game for energy and water conservation
 - Storytelling mode for engaging and fun sessions
- Cost-Effective, Durable Design:
 - Supports independent play and learning
 - Ideal for helping busy parents



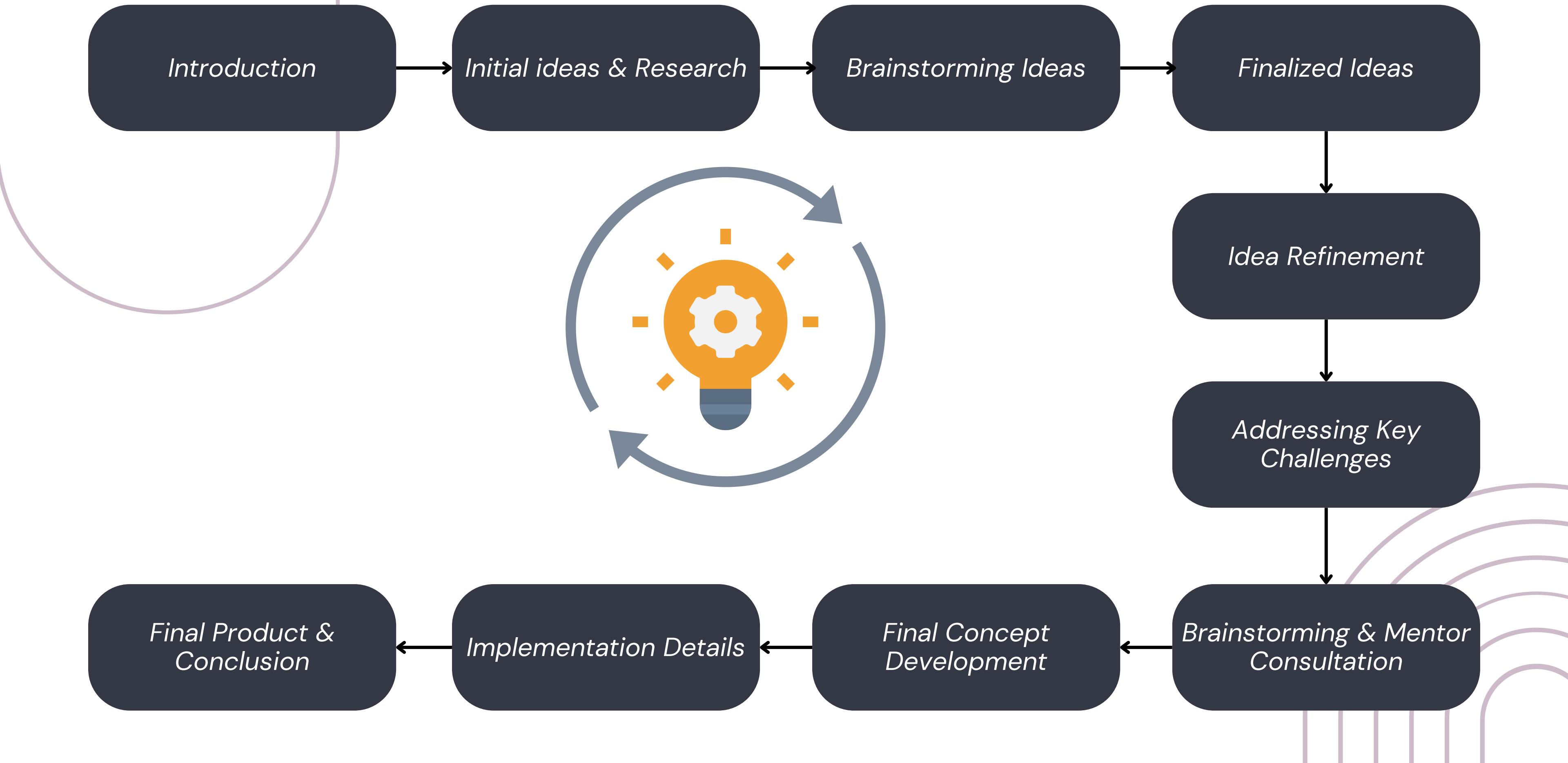


IDEATION

From Concept to Creation



IDEATION PHASE WORKFLOW CHART



INTRODUCTION AND INITIAL RESEARCH

- Explore **microcontrollers** and **FSM** through YouTube videos
- Review **Julie Doll's** research on sensors and human interaction (to make our toy more interactive)
- Intrigued by the concept of customer care calls where questions are answered by entering a number.
- **Automatic dispenser** for rewards(keeps children engaged)

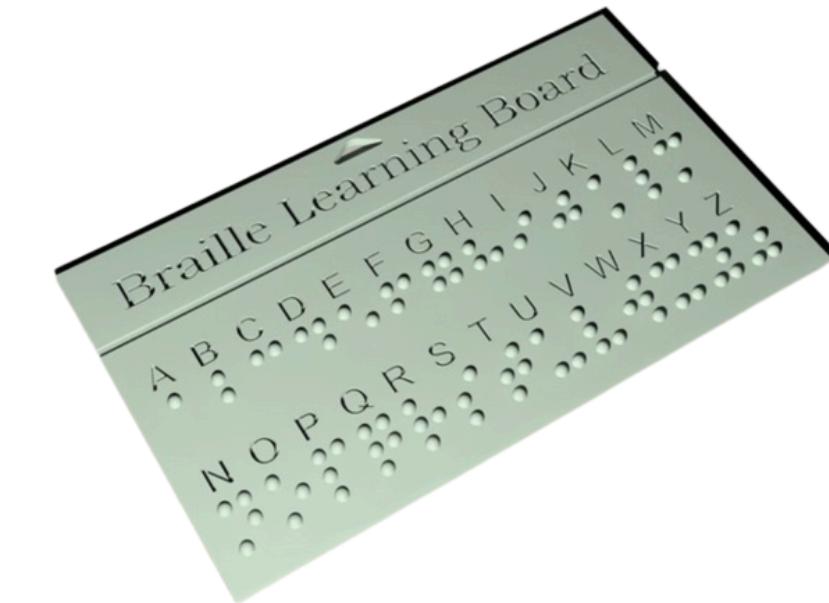


BRAINSTORMING AND FINALIZED IDEAS

- Discuss potential uses (e.g., teaching aid at daycare centers, parental engagement, emergency Morse code use)
- Identify viable learning systems:
 - Braille System Learning
 - Morse Code with Tapping Patterns and Sound Beeping
 - House Games for Water and Energy Conservation or Basic Science Facts
 - Learning Languages or Instruments with Speech Recognition
 - Games for Teaching Personal and Internet Safety

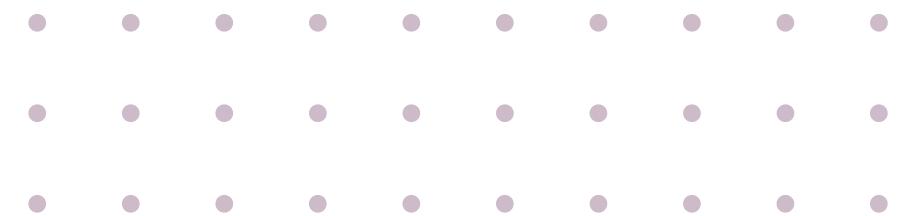
IDEA REFINEMENT

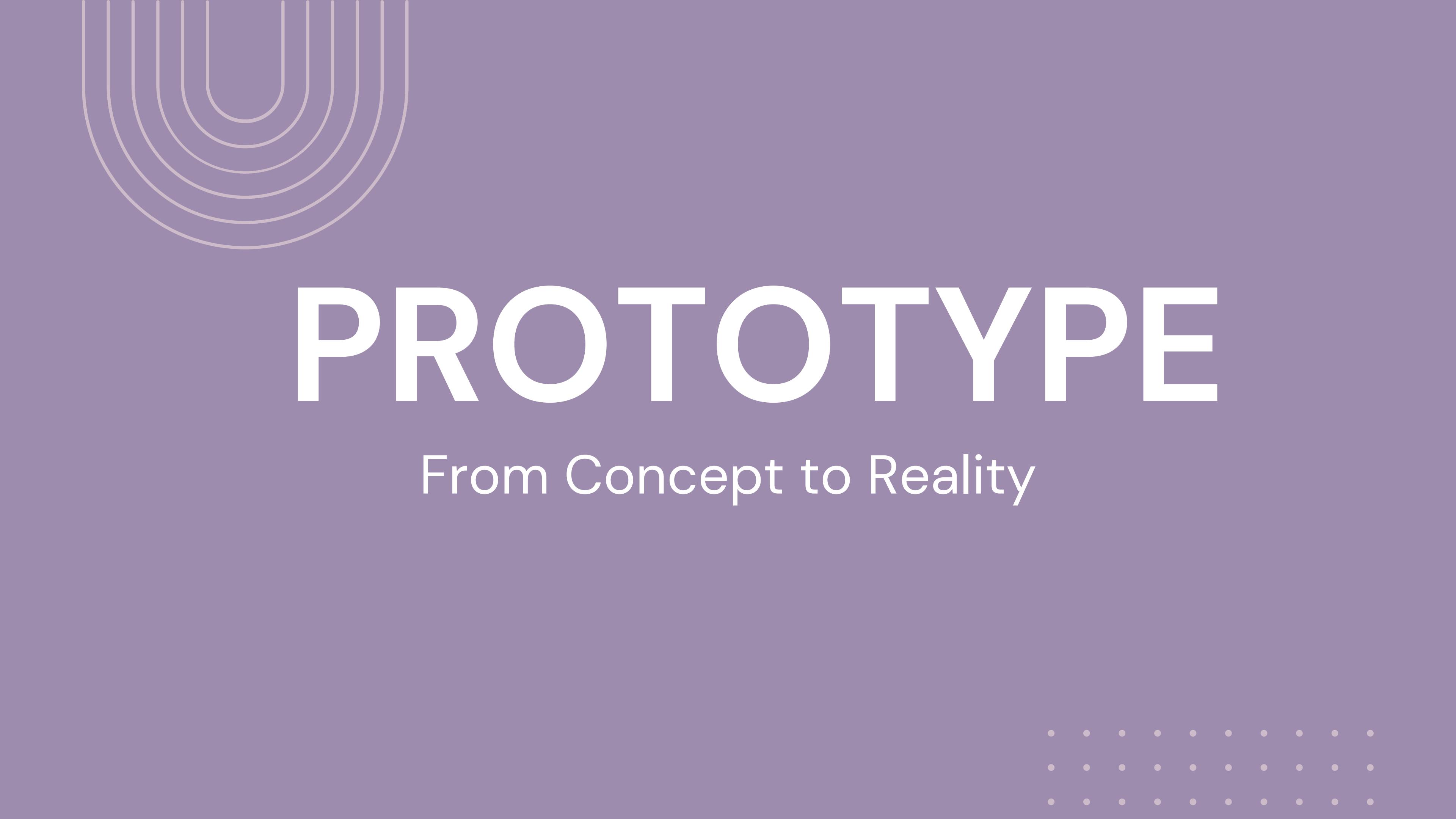
- Reject less viable ideas:
 - Braille devices (due to existing solutions)
 - Speech recognition for languages (too monotonous)
 - Screen-based safety games (to minimize screen time)
- Focus on key concepts:
 - House Games: Teach conservation and science principles through intriguing questions
 - Morse Code Detector: Engage children in learning Morse code



FINAL CONCEPT AND IMPLEMENTATION

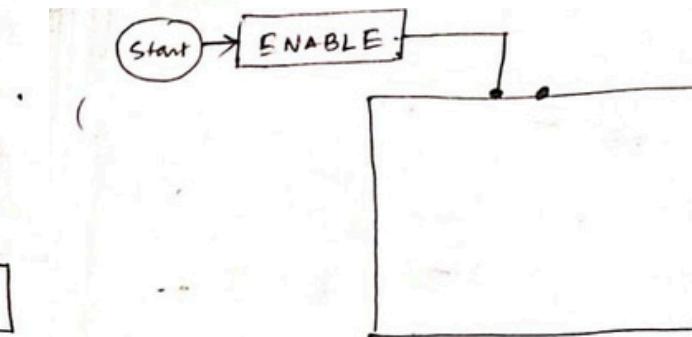
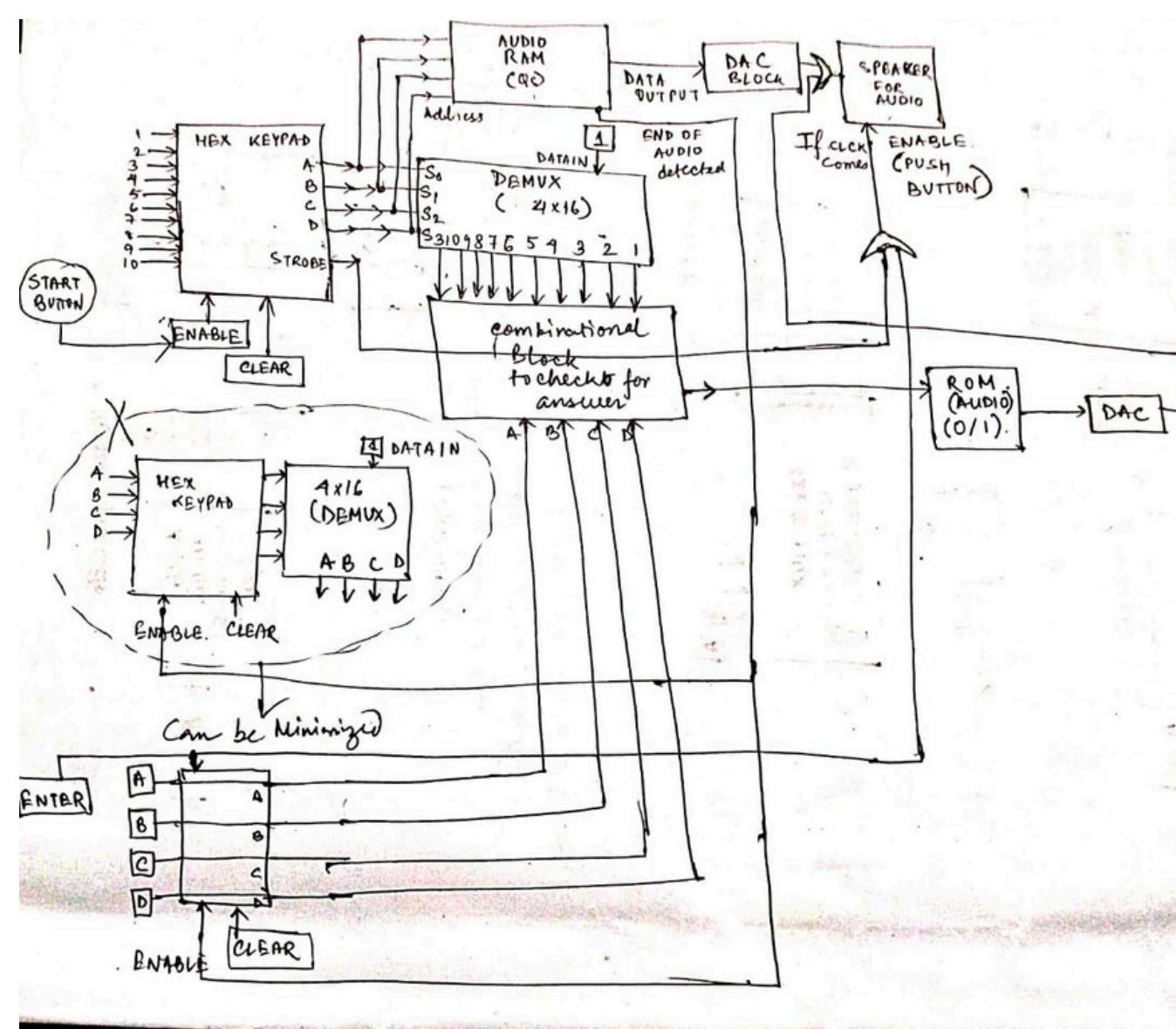
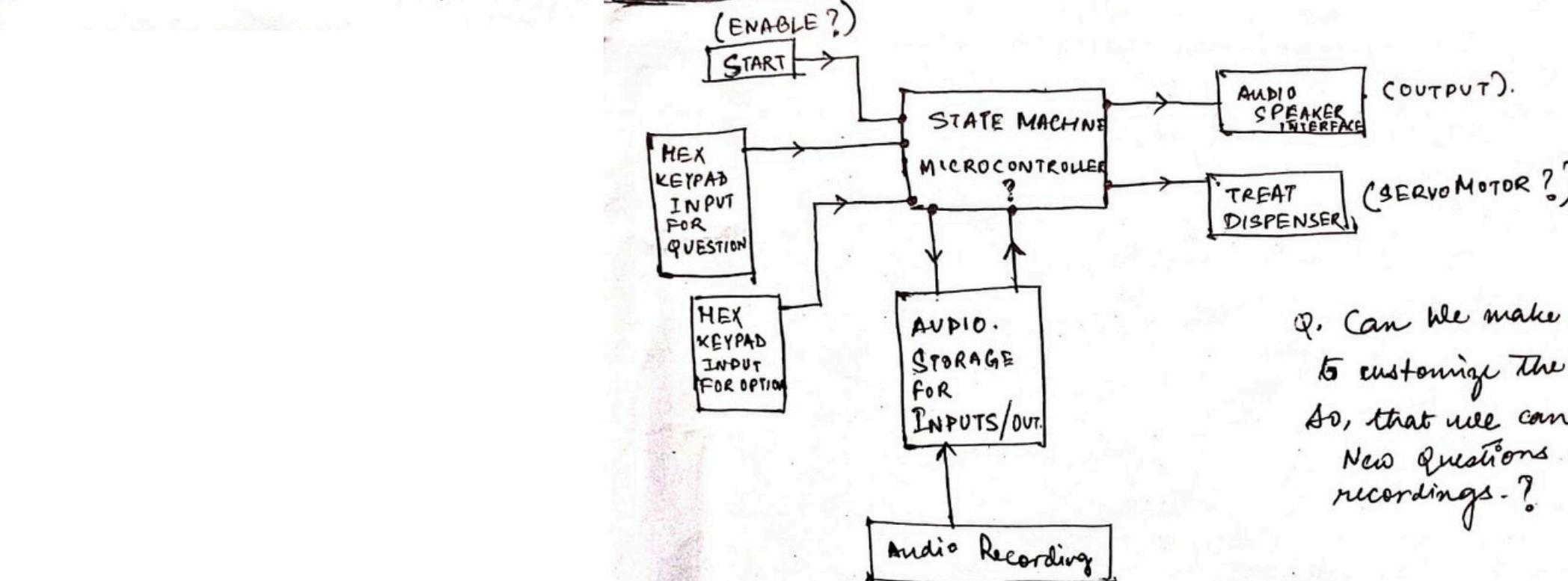
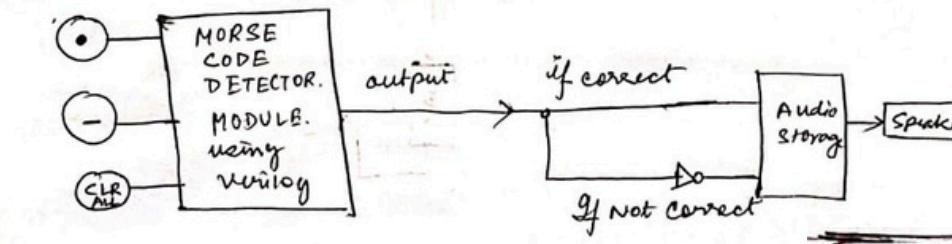
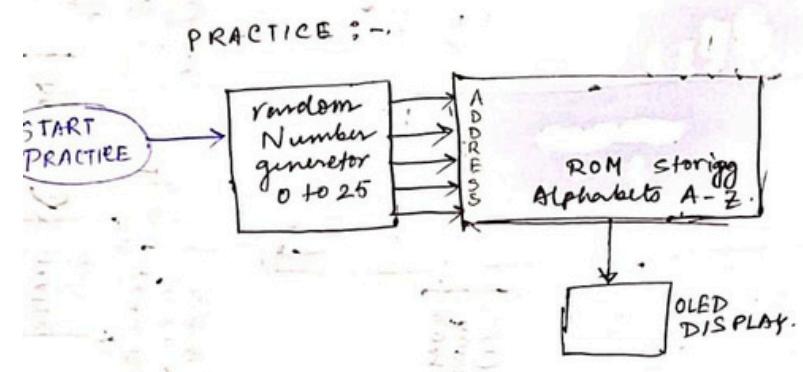
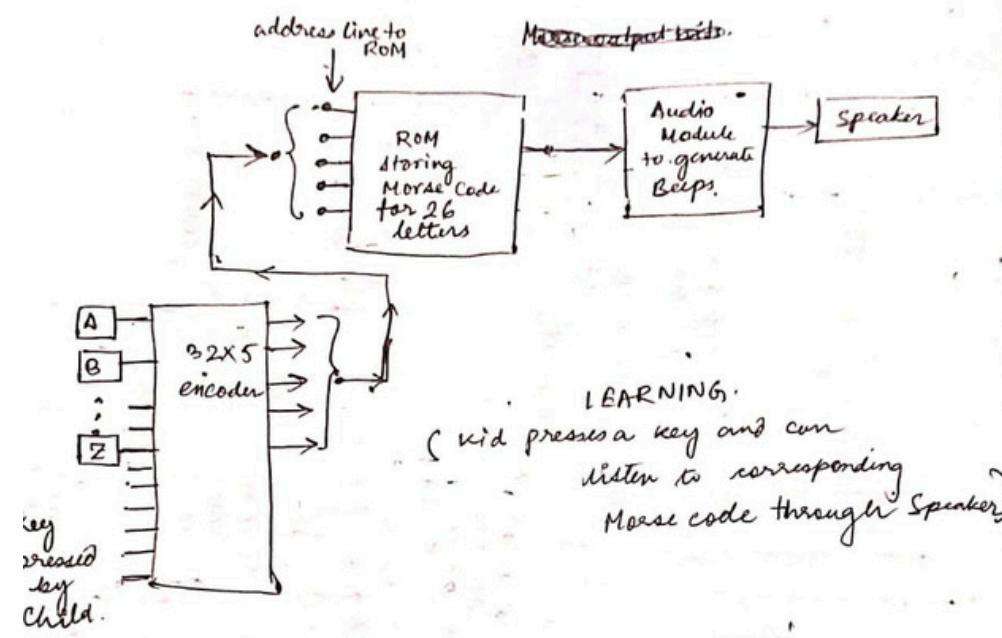
- *Product Modes Description:*
 - *Morse Code Mode: Type Morse code to receive treats*
 - *Question-Answer Mode: Audio questions with hex keypad responses*
 - *Story-time Mode: Stories or theoretical sessions*
- *Implementation:*
 - *Customizable questions and personal touch by recorded questions in parents voice.*
 - *Piezoelectric charging for sustainability.*



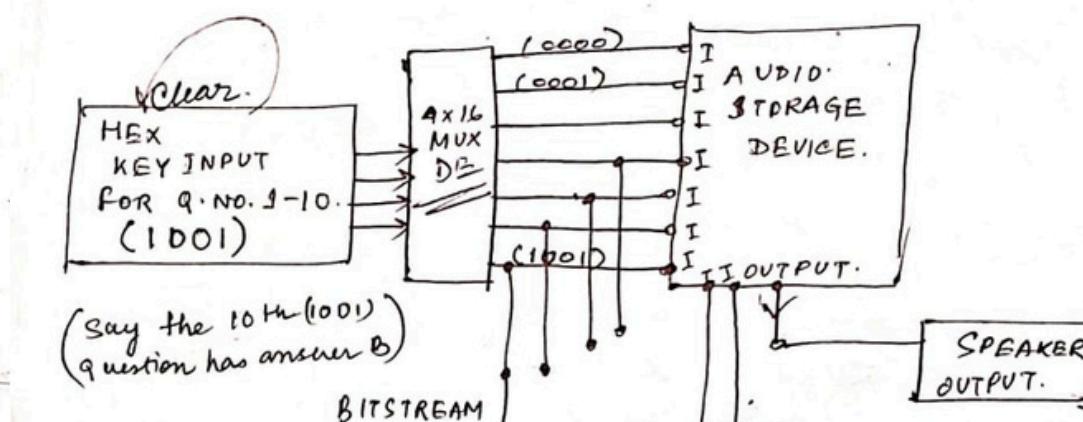


PROTOTYPE

From Concept to Reality

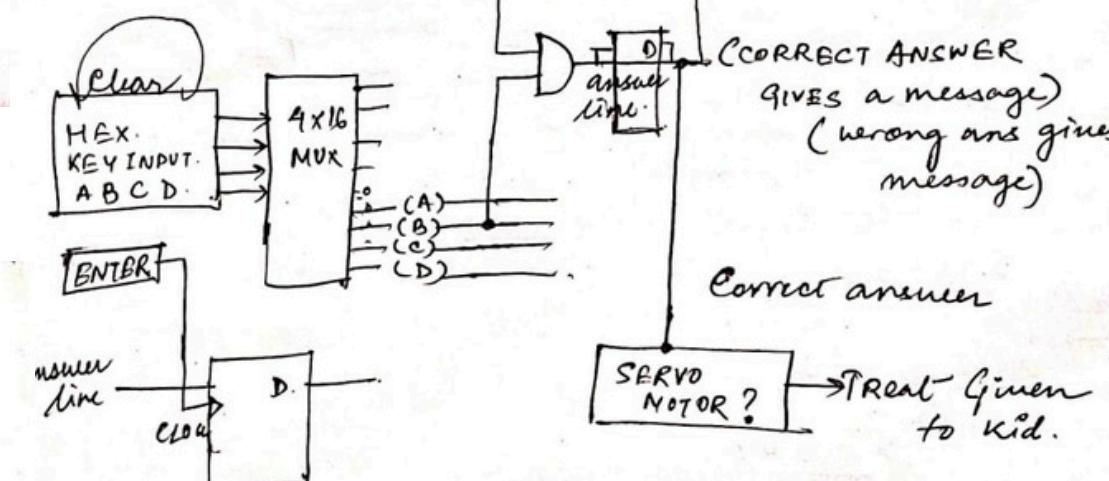


Q. Can we make it
customizable?
like can we record
different questions
on audio device?

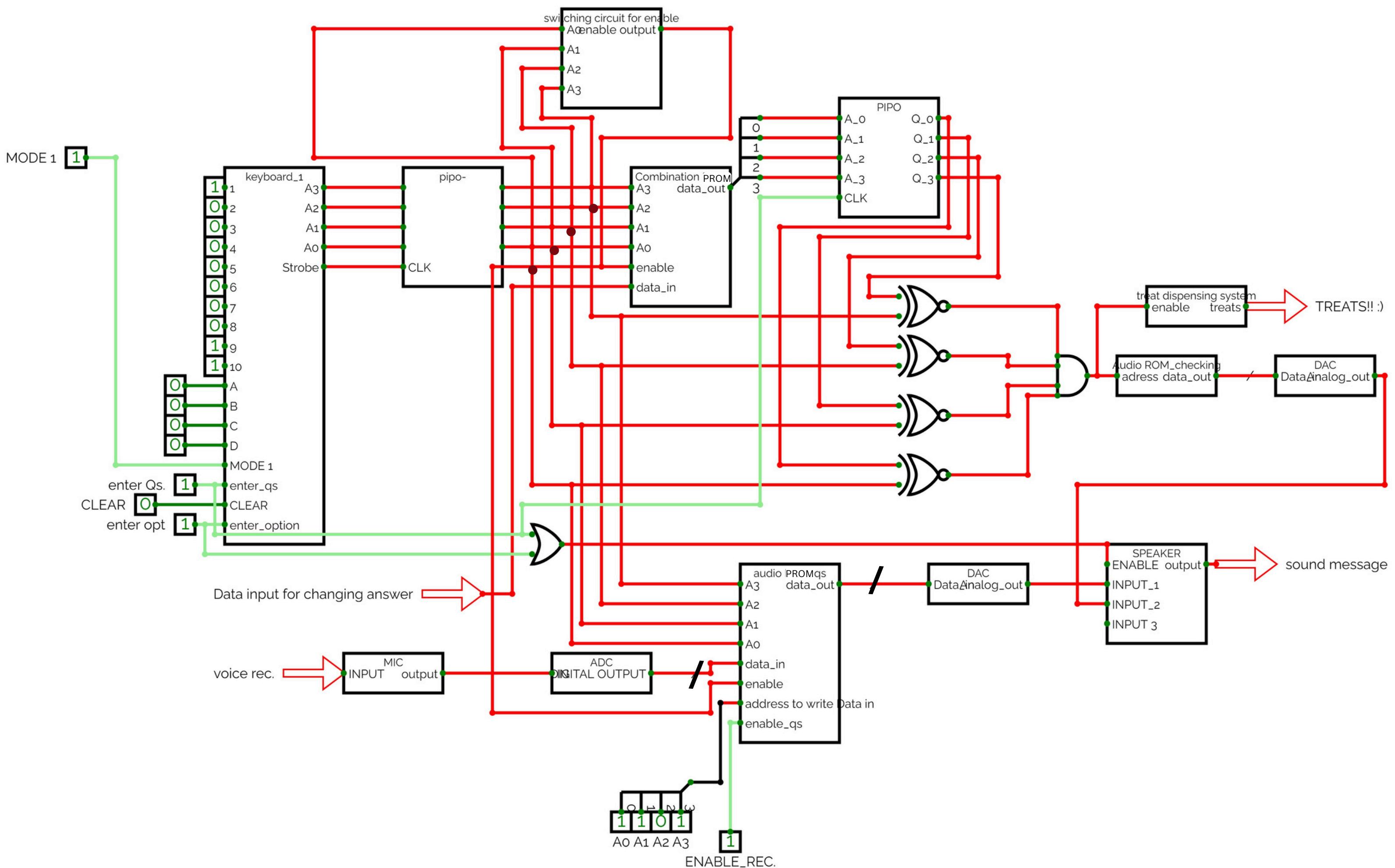


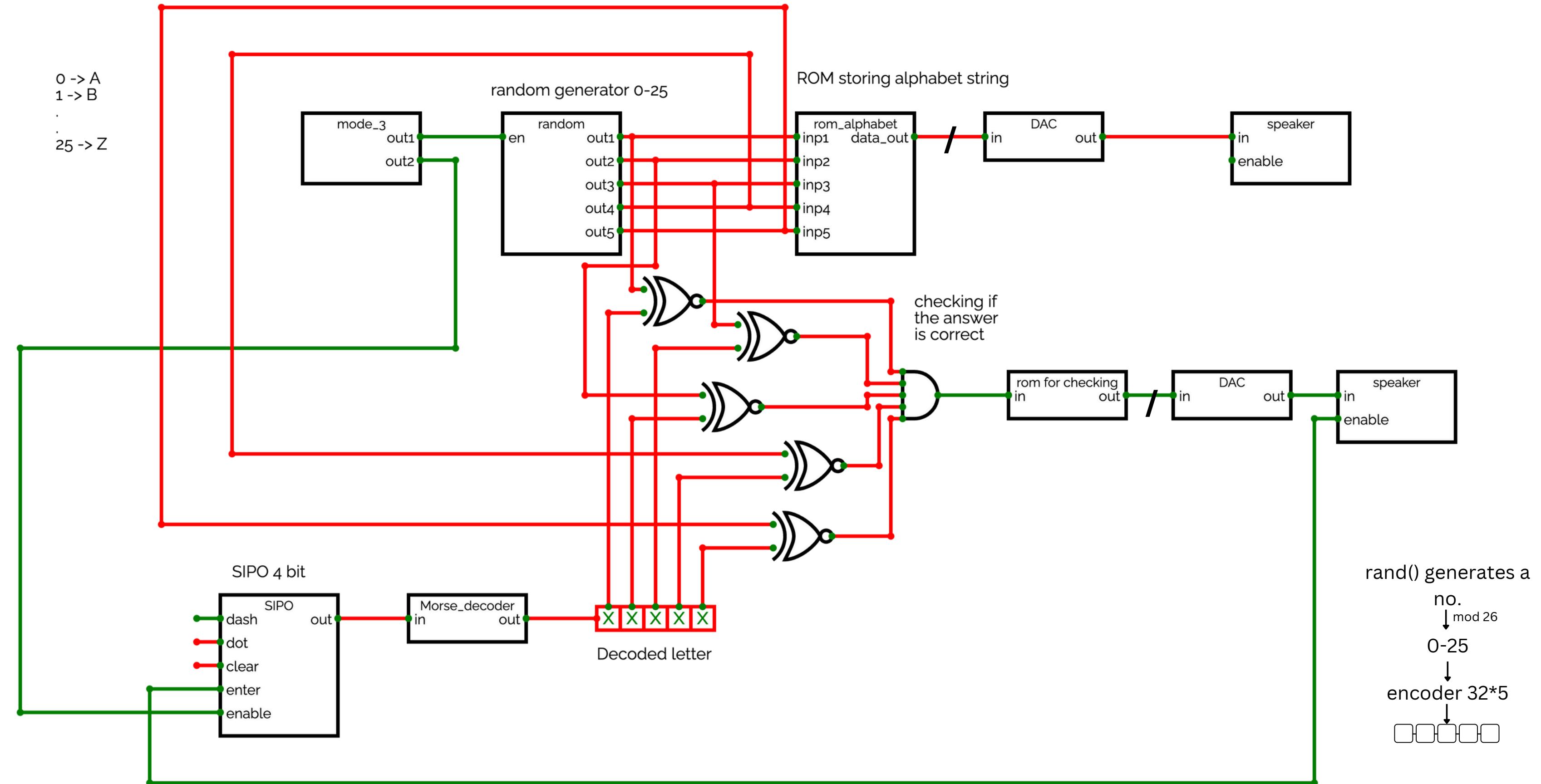
(Say the 10th (100)
Question has answer B)

ED TO
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Q. Can we make a way
to customize the Questions
so, that we can set
New Questions by new
recordings - ?







TESTING

From Validation to Perfection

KEYBOARD INPUT MANAGEMENT

Challenge: Using the same keyboard for question and answer input.

Solution:

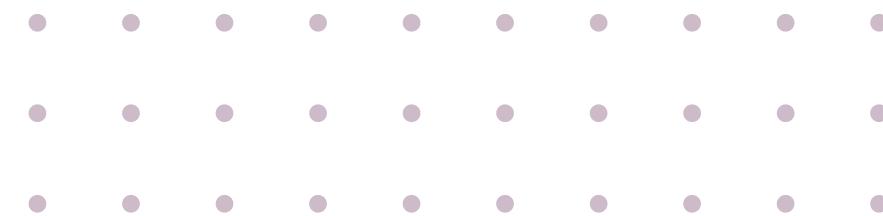
- *Question Input: Enables audio RAM and combinational RAM.*
- *Answer Input: Enables the comparator and disables the two RAMs*

REPETITION OF QUESTIONS

Challenge: Repeating the questions for more clarity

Solution:

- *Re-entering the question number and press Enter_qs would solve that problem.*



INTERACTIVE FEATURE: MORSE CODE

Challenge: Enhance user engagement.

Solution:

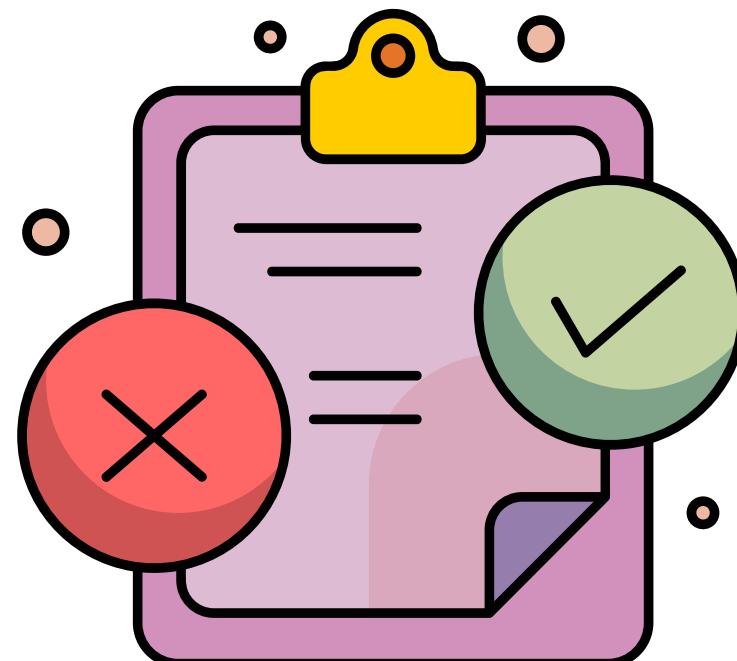
- *Morse Code Game: The toy plays Morse code, and the user guesses the answer.*

REDUCING RAM POWER CONSUMPTION

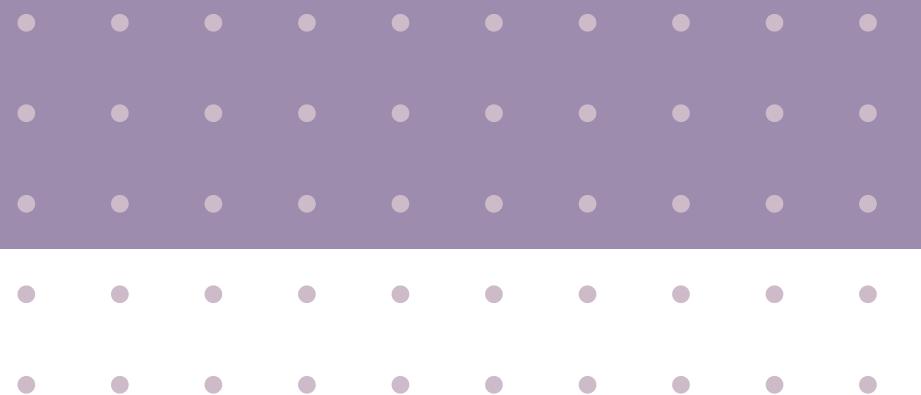
Challenge: Excessive power usage by the RAMs.

Solution:

- *Using a combinational logic that disables the RAMs when answer keys are pressed.*



COST ESTIMATION



Total cost without solar cell : 2748/-

Profit Margin:

1. Production Cost :

Cost Estimate: ₹2,800 approx. per unit

2. Manufacturing and R&D Cost :

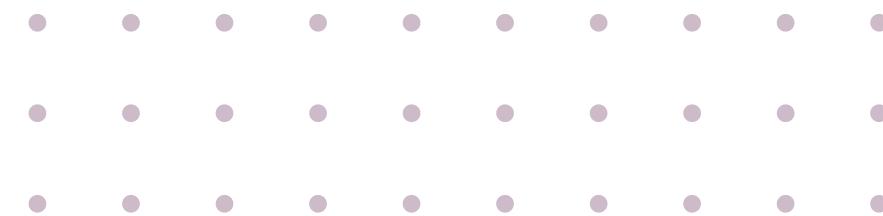
Cost Estimate: ₹700 approx. per unit

3. Overhead Costs

Cost Estimate: ₹500 approx. per unit

Total Cost of Production: ₹4,000 approx. per unit

Assuming a target profit margin of 15%, the retail price should be ₹4,700 approx. per unit.





THANK YOU

References:

1. https://www.researchgate.net/publication/296790880_Julie_The_application_of_DSP_to_a_consumer_product
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4. Documentation :
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usp=docslist_api&filetype=msword](https://docs.google.com/file/d/1xiFrBGcZL1JRkgs-SVXMGQa9dpP3_8nk/edit?usp=docslist_api&filetype=msword)