CSE441
Instrumentation and Measurements
Spring 2023

Project Proposal:
Smart Cradle

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**Submitted to**
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Project Goals

The reason behind our idea was the endless complaints from parents of toddlers from all over the world, be it our close relative, a mentor, a colleague and posts on social media, about one thing, "Sleep". The recommended hours of sleep for an adult would be at least 7 hours, but for parents with toddlers, it's just a dream. To make it a reality, we have proposed this idea where it will take care of both parties, the child and the parent. Our main goal is to create a device that will be very customizable according to the baby's needs. It will act as a part-time nanny to take care of a baby's immediate tantrums and the system will be built in such a way that the robot will only alert the parents if the baby's cry is a cry for help. Primary users of this system are going to be both parents as well as neonatal wards of healthcare facilities. The system will reduce the stress on caregivers and the babies.

Experimental Block Diagram

Project Timeline
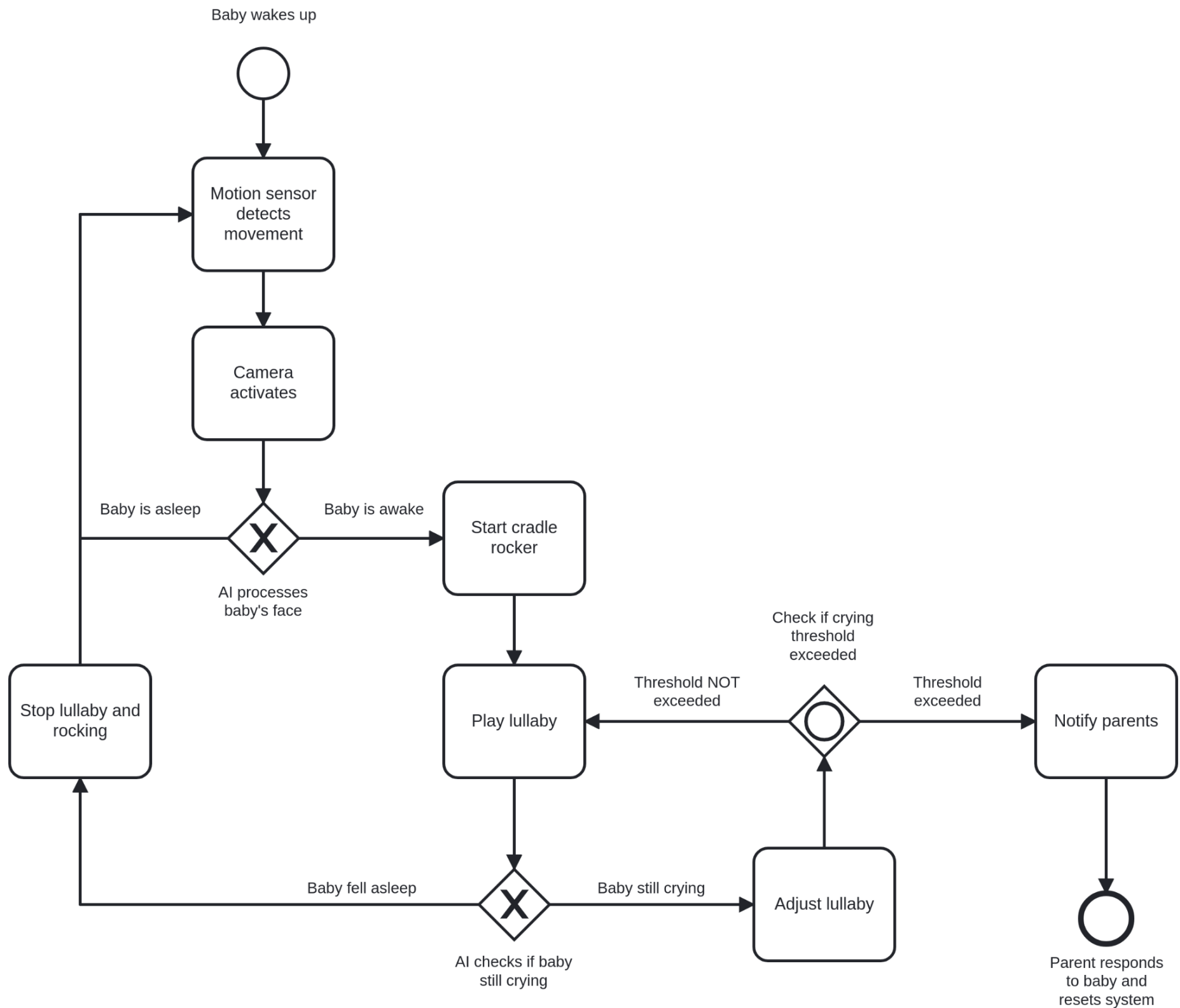
Gantt Chart for Smart Cradle
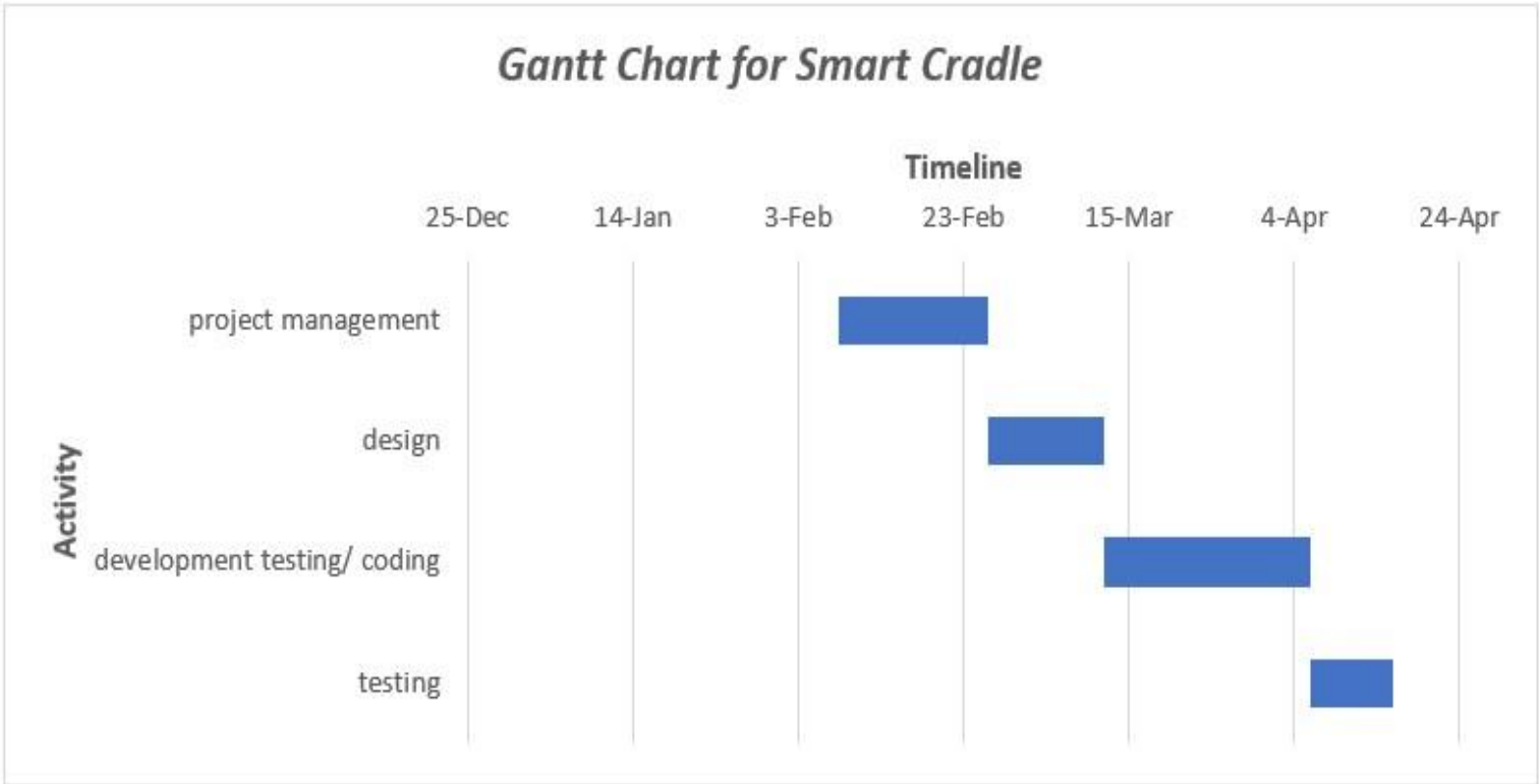
Component Details and Budget

The prototype will be constructed out of readily available hardware. To save on cost, instead of a camera and a dedicated Raspberry Pi to process the feed, an android smartphone will be used instead. The smartphone will also save cost and complexity by serving as the speaker system for the lullabies and the WiFi parental notification module.

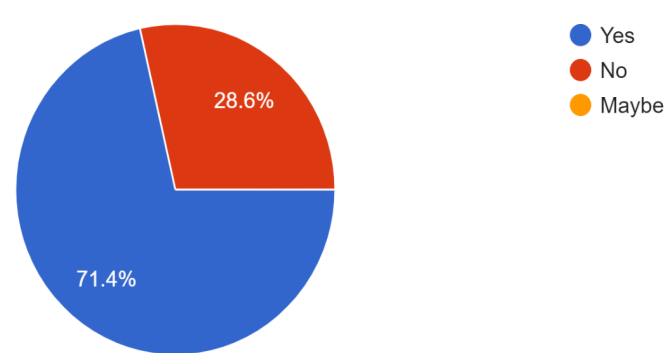1. Arduino Uno R3.
2. Stepper motor.
3. Android smartphone.
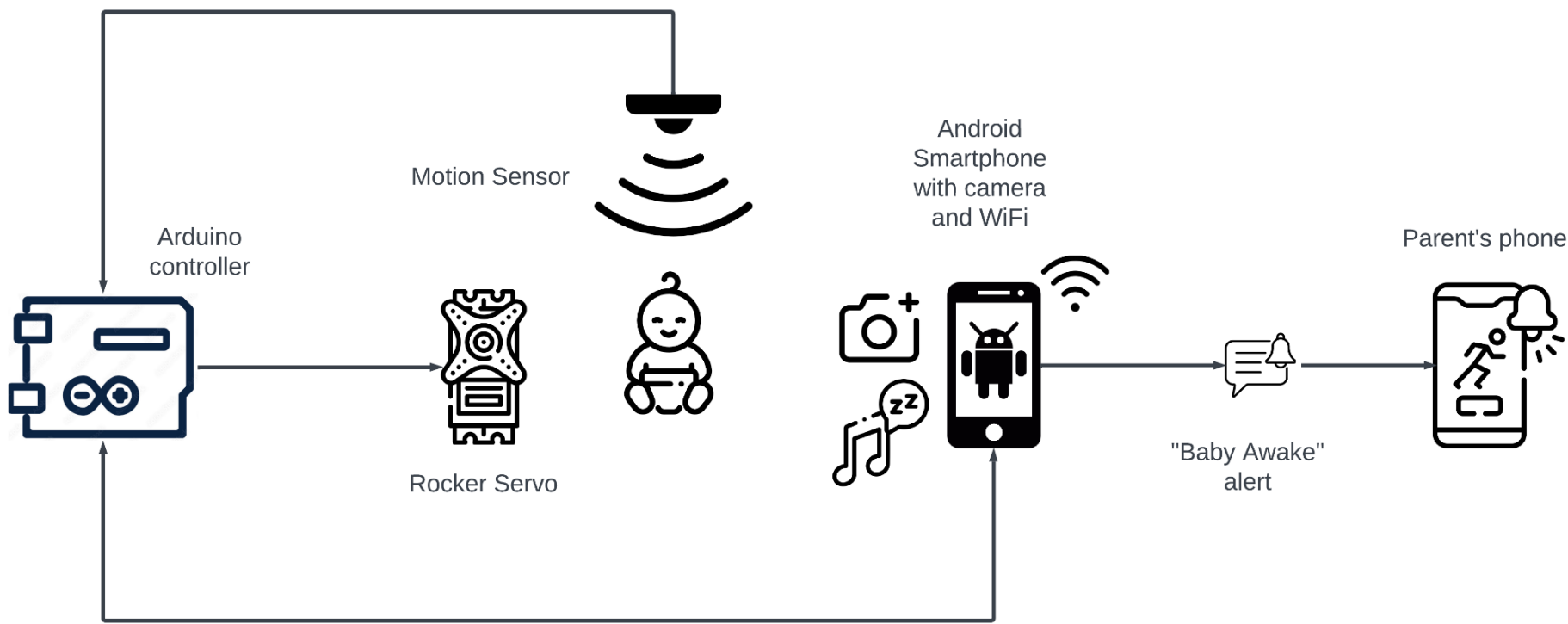
Pre-survey questions responses

Are you sleep-deprived because of your newborn waking up in the middle of the night?
6 responses

- Yes
- No
- Maybe

100%
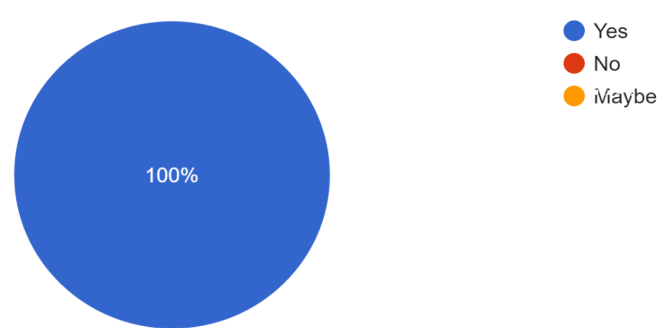
Do you often ask for help from family and friends as you are often sleep deprived?
7 responses

- Yes
- No
- Maybe

28.6%

71.4%

Do you feel uncomfortable asking for help from friends and family?
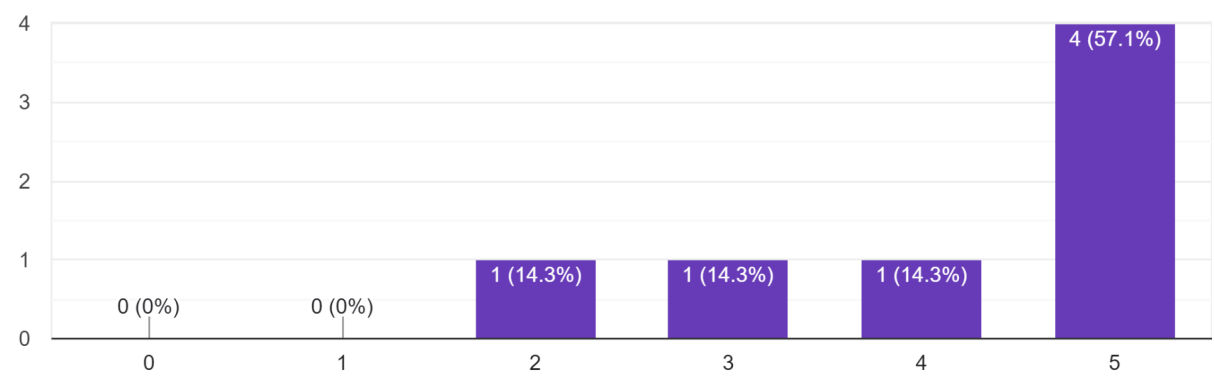7 responses

- Yes
- No
- Maybe

28.6%

42.9%

28.6%
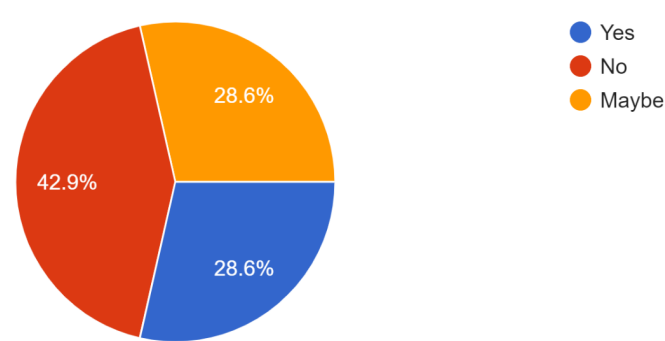
How many nights do you think you get poor sleeping in a week when you have a newborn baby?

7 responses

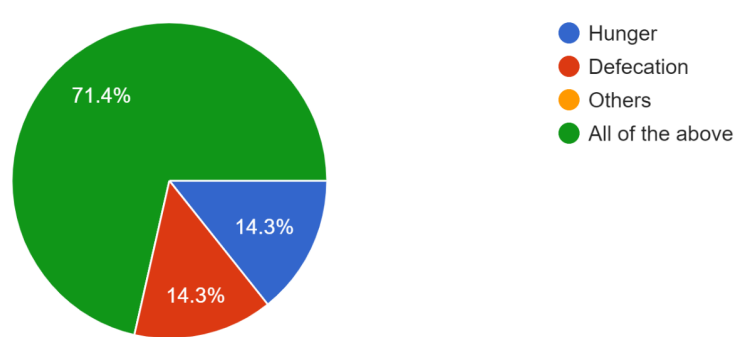| Every night |
| --- |
| 5 days a week |
| 3 |
| 7 |
| 5 days |
| 4 |

How difficult it is to respond to your newborn every time he/she wakes up at night?
7 responses

1.   What are the most common reasons for the baby to wake up in the middle of the night?
7 responses

- Hunger
- Defecation
- Others
- All of the above

Do you ever delay responding?
7 responses

- Yes
- No
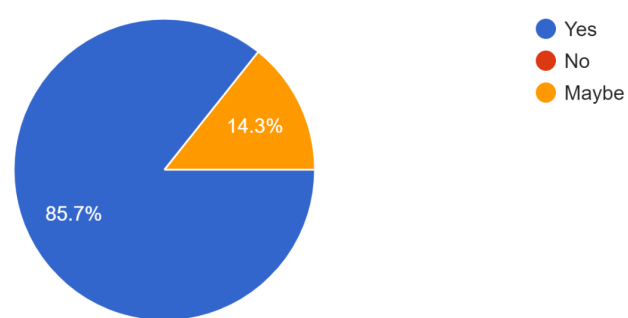- Maybe
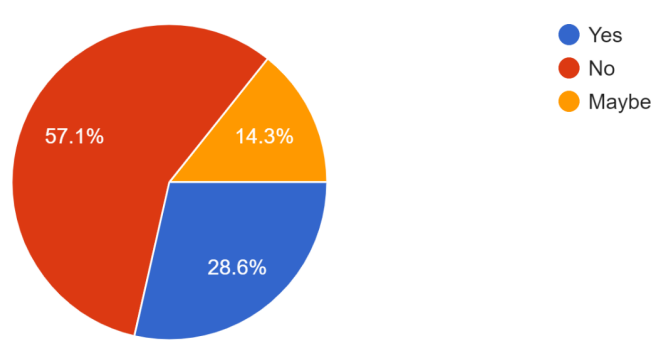
How tough it is to put the baby back to sleep?
7 responses
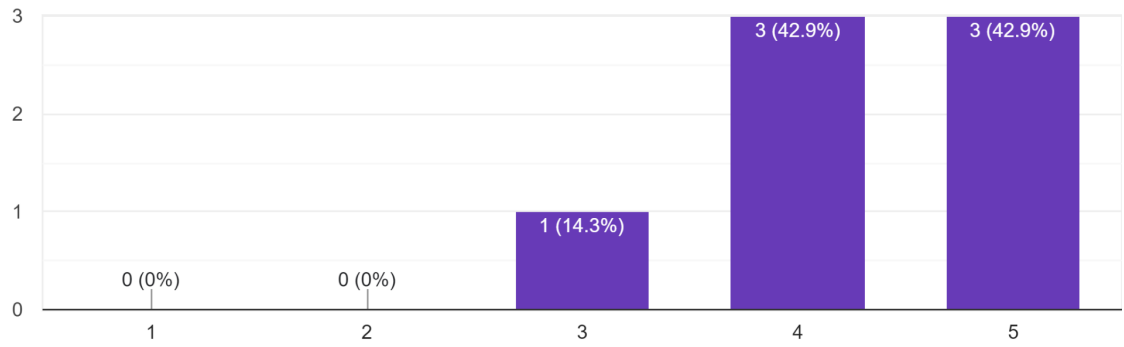
Is getting back the baby to sleep a time-consuming process?
7 responses

- Yes
- No
- Maybe

Do you think an automated system would be of help in such circumstances?
7 responses

- Yes
- No
- Maybe

71.4%
14.3%
14.3%
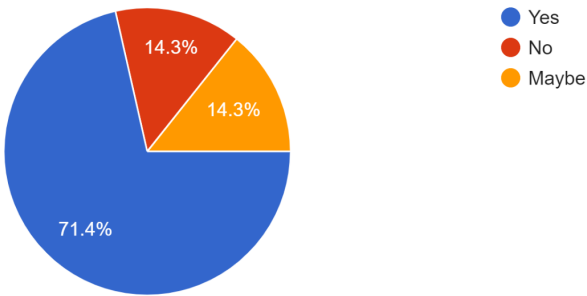
Will you be buying one if it's available in the market?
7 responses

- Yes
- No
- Maybe, depends on the price

42.9%
14.3%
42.9%
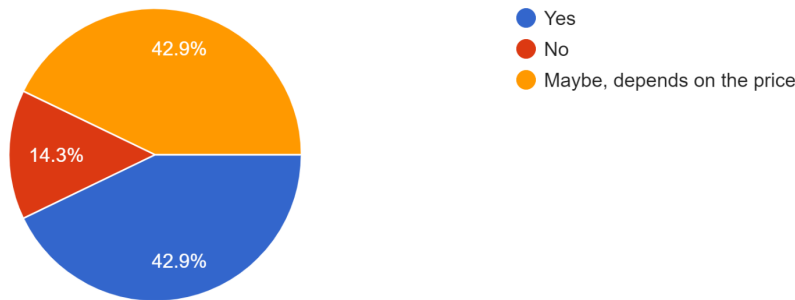
What is your expected price?

7 responses

2000
No idea
20000
BDT. 20,000
200
15000
1000-3000 tk

Do you think notifying/alarming the parent would make waking up easier and faster?
7 responses

- Yes
- No
- Maybe

42.9%
14.3%
42.9%
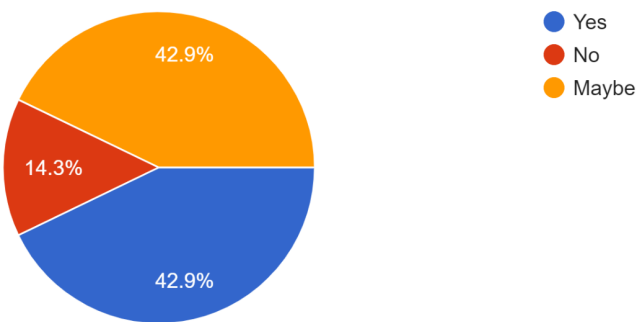
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