Smart Baby Monitoring System Using Mobile App

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1.INTRODUCTION

• Overview :

This project presents a baby monitoring system for busy parents, so that they can ensure the proper care & safety of their babies. This system can detect the baby's motion & sound. This baby monitoring system is capable of detecting crying condition of the baby automatically.

It is a kind of a system, which can detect baby cry and convey the message about the condition of the baby through concerned authority via mobile. Families have instincts to secure their babies. Engineering inventions for getting advantages and benefits in terms safety issues of their babies.

In this era when parents are busy with their career, a modern baby monitoring system can be solution for handling babies properly instead of keeping them in babies day care centers or appointing a many of them

• Purpose :

The baby monitoring system is a kind of alarm system which can detect baby's movements and activities and can convey the message about the condition of babies to the concerned authority via. When baby cries, monitoring presence of baby in the cradle. Message about baby's cry, and absence of baby in the cradle are sent to parent's mobile number to intimate them about their baby.

2.LITERATURE SURVEY

a. Existing problems:

- since the advent of human civilization, society has specified certain gender roles.
- Taking care of the child is considered as the responsibility of the mother society
- Difficult for women to manage both work and home in this era of gender equality

b. Proposed Solution:

- Reducing burden on women as a mother
- Allow women to contribute more towards the society
- Develop a system capable of soothing and monitoring the baby itself
- Design a smart cradle with distinctive features automatic swing (using cry detection), interactive and two communication

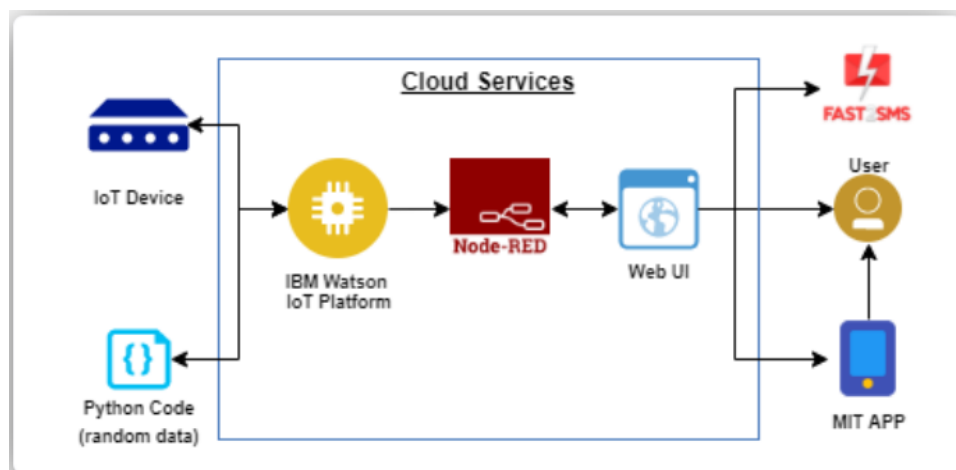# 3.Theoretical Analysis

a. Block diagram

FIG – 1 : BLOCK DIAGRAM

b. Hardware/software designing :

FEATURES :

✓ Monitoring the baby's movement through the mobile app

✓ Speakers and toys connected to the cradle can be controlled using the mobile app.

✓ Whenever the baby is crying you can rotate the toys using the mobile application.

✓ We can even play the music which is already by pressing a button in mobile app

SETTINGUP ENVIRONMENT:

1. Install Python Idle
2. Create IBM Account
3. Create Node-Red Application
4. Create IBM Watson IoT Platform
5. Create The MIT App Inventor Account To Build The Mobile App
6. Setup Hardware And Develop The Code
7. Building Web App
8. Building Mobile App

HOW DO WE IMPLEMENT IT?

1. Setup environment for hardware and develop the code, creating a code(using python) snippet and publish Data to the IBM cloud
2. Building web app create node red flow using dashboard nodes for the crating ui create http Api for mobile app development
3. Building mobile app

4 . EXPERIMENTAL INVESTIGATIONS :

To successfully monitor the condition of a baby, some sensors are placed to the cradle. Since hardware is not available, a python code snippet is used to generate random values such as the condition of a baby. This randomly generated data is sent to IBM IoT platform.

Using node red service, a node red flow is created which retrieves the data from IBM IoT platform. This received data is stored in Cloudant database. If the baby is cried, then it will report the actual situation of a baby, deterioration of goods, the generated data is always checked whether the baby is fine or not.

If the baby senses the actual condition of a baby, the sensor value will send the updated data at every regular interval of time, then the parameters coming from the sensor will alerts the user and playing music & rotating of toys will automatically switched on.
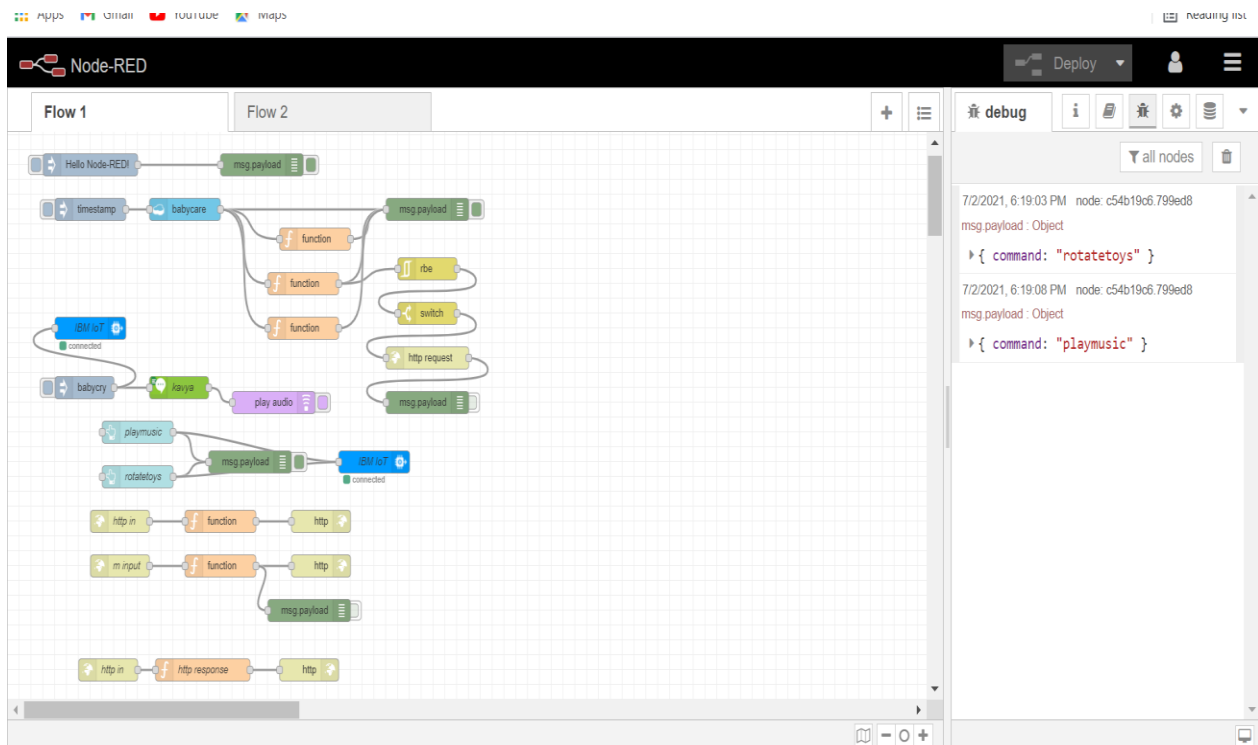
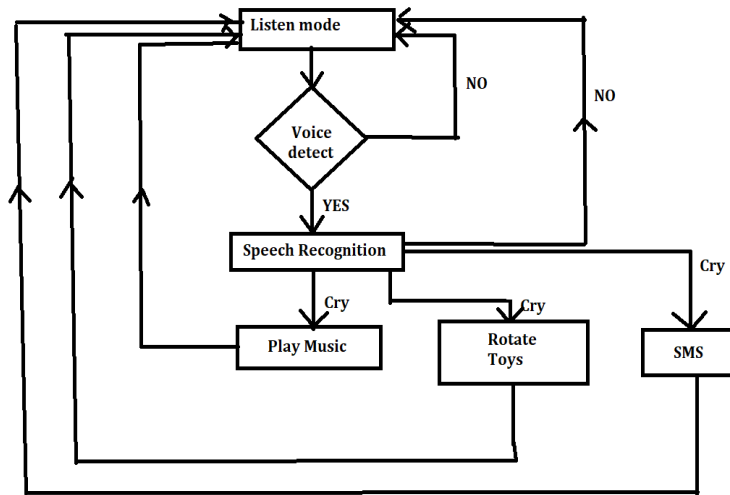**Fig – 3: Node Red Service**

5.FLOW CHART:

FIG – 4 : FLOW CHART

EXPLANATION :

1. Voice activity detection around the cradle.
2. Classification of the detected voice as crying or non-crying.
3. If cry is detected, rock the cradle for a particular time.
4. Again classify the sound around the cradle.

6.RESULT :

```
IDLE Shell 3.9.6
File  Edit  Shell  Debug  Options  Window  Help
Python 3.9.6 (tags/v3.9.6:db3ff76, Jun 28 2021, 15:26:21) [MSC v.1929 64 bit (AMD64)] on win32
Type "help", "copyright", "credits" or "license()" for more information.
>>>
============== RESTART: C:/Users/kavya/Downloads/iotprojectcode.py ==============
'babycare' successfully created.
Document '{new_document}' successfully created.
---------------
the data with id =1001 is
[{'id': '1001', 'key': '1001', 'value': {'rev': '7-50361930e91e2ba773f24ac0b6270981'}, 'doc': {'_id': '1001', '_rev': '7-50361930e91e2ba773f24ac0b6270981', 'name': 'ka
vya', 'babyGood': 'Fine', 'babyCry': 'RotateToys', 'babycru': 'playMusic'}}]
---------------
{'id': '1001', 'key': '1001', 'value': {'rev': '7-50361930e91e2ba773f24ac0b6270981'}, 'doc': {'_id': '1001', '_rev': '7-50361930e91e2ba773f24ac0b6270981', 'name': 'kav
ya', 'babyGood': 'Fine', 'babyCry': 'RotateToys', 'babycru': 'playMusic'}}
[{'id': '1001', 'key': '1001', 'value': {'rev': '8-6098ec93e1f2f1629e660b4945280657'}, 'doc': {'_id': '1001', '_rev': '8-6098ec93e1f2f1629e660b4945280657', 'name': 'ka
vya', 'babyGood': 'Fine', 'babyCry': 'RotateToys', 'babycru': 'playMusic'}}]
>>>
```

The implemented project work is capable of sending condition of the baby using sensor accessible through mobile app, and baby monitoring system , which can detect baby's cry and condition and can convey the message about the condition of baby to the user.

7. ADVANTAGES & DISADVANTAGES :

Advantages :

> ➢ A baby monitoring system consisting of a video camera and microphone without limitations of coverage. It can send data and immediately notify the parents about urgent situations.

> ➢ Thereby shortening the time needed to handle such scenarios. Generally, babies cry because they are hungry, tired, unwell and Can monitor every activity of baby if that event not happen immediate father or mother can help.

Disadvantages :

➢ Very poor security considerations, so they are easy to hack, after which they can be used to spy on your household.

➢ Can know the baby condition but cannot help, if that event happen immediate example : Rolling down on the bed.

8.Applications :

➢ Provide a smart solutions for the child care industry.
➢ Help working women balance their work and domestic chores.
➢ Can be used in day care centers for the aid of human beings.

9.Conclusion:

➢ The electronic baby cradle is the finest solution for today's parents who cannot find the sufficient time for their babies. This intelligent baby cradle would let the working mother to do household works besides taking care of baby at the same time.
➢ It is economical and user friendly. The intelligent baby cradle can be used in hospitals and home. It is very useful for working parents and hospitals to take care of babies.

10.Future Scope:

✓ In future we can add more features to make more efficient and user-friendly. The feature we can add to this device such rotating toy and the sound detector to detect sound of the baby could be added to enhance the system features.
✓ By using machine learning it is possible to detect only baby's voice. We can add music or lullaby which can entertain baby. With the development of technology daily routine has been eased for the parents along with the baby care.

11.Bibliography:

Sreelatha, Shreya Pai, Sonal Cynthia Pereira, Tanya Nicole, Ms. Ushadevi A., ‒ Advanced Baby Monitor‖ International Journal of Internet of Things ,pp 51-55 , June 2017.

12.Appendix:

a. SOURCE CODE:

```
from cloudant.client import Cloudant
from cloudant.error import CloudantException
from cloudant.result import Result
from cloudant.result import Result, ResultByKey


# IBM Cloudant Legacy authentication
client = Cloudant("apikey-v2-5jk8pfubd1yc1rgkyaol6aadz67jj9y6zwsvoaqoeuw",
"533d636dbf1f1af287084765af2385ae",
            url="https://apikey-v2-
5jk8pfubd1yc1rgkyaol6aadz67jj9y6zwsvoaqoeuw:533d636dbf1f1af287084765af2385ae@18f2c
b94-c45a-4276-b31d-702c0306bcb0-bluemix.cloudantnosqldb.appdomain.cloud")
client. Connect()

database_name = "babycare"

my_database = client.create_database(database_name)

if my_database.exists():
    print(f"'{database_name}' successfully created.")
    json_document = {
            "_id": "1001",
            "name":"kavya"
            }
    new_document = my_database.create_document(json_document)
    if new_document.exists():
        print("Document '{new_document}' successfully created.")

result_collection = Result(my_database.all_docs, include_docs=True)
# Get the result for matching a key
result = result_collection['1001']  #search by id, if id=1001
```

```python
print("---------------")
print("the data with id =1001 is")
print (result)
print("---------------")
# Iterate over the result collection
for result in result_collection:
    print(result)# it will print all the records

# First retrieve the document
for document in my_database:
    my_document = my_database['1001']

# Update the document content
# This can be done as you would any other dictionary
my_document['babyGood'] = 'Fine'
my_document['babyCry'] = 'RotateToys'
my_document['babycru'] = 'playMusic'

# You must save the document in order to update it on the database
my_document.save()

result_collection = Result(my_database.all_docs, include_docs=True)
# Get the result for matching a key
result = result_collection['1001']
# Iterate over the result collection
print (result)
```
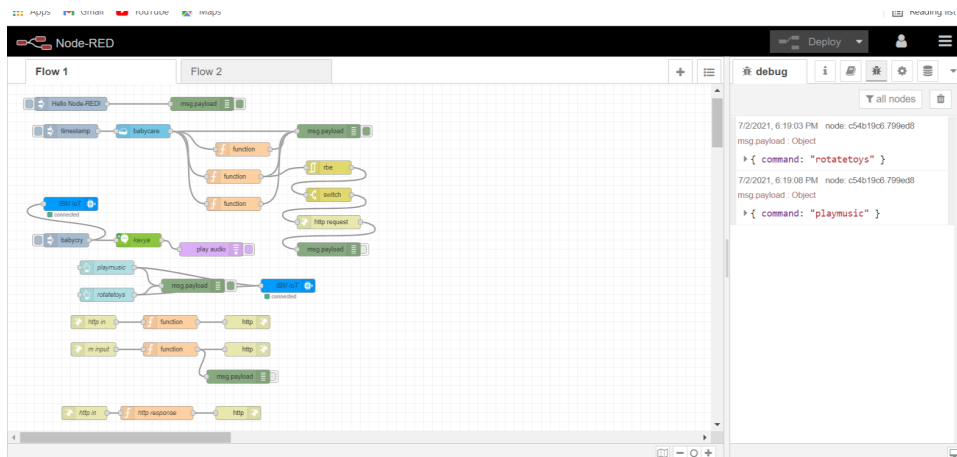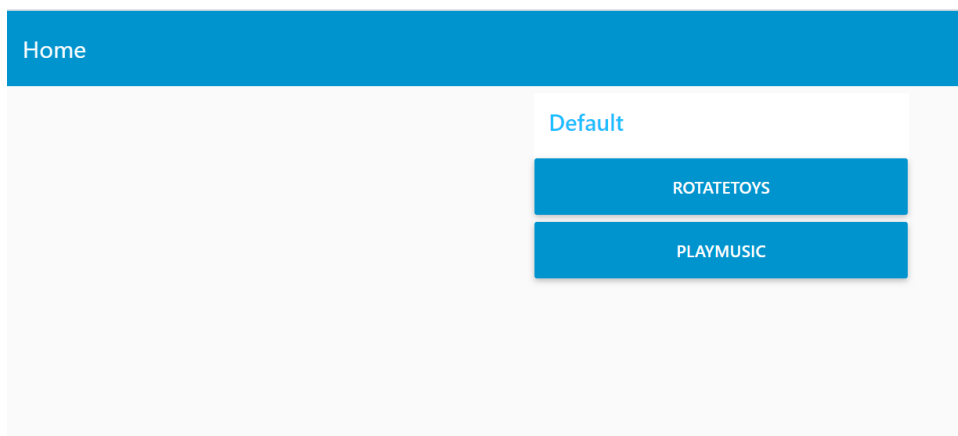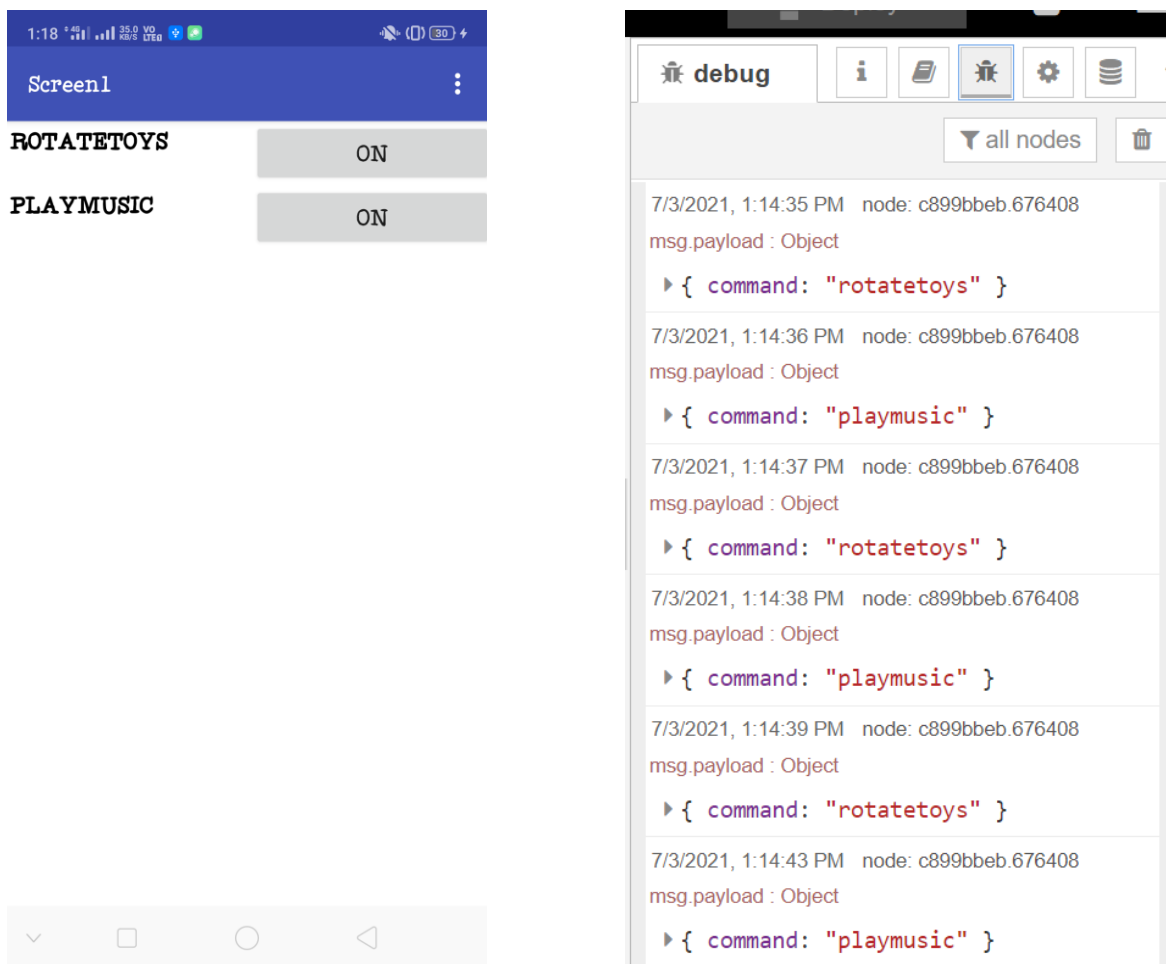
b. UI OUTPUT :

FIG – 5 : OUTPUT OF UI

C. OUTPUT OF MIT :

FIG – 6 : MIT APP INVENTOR OUTPUT