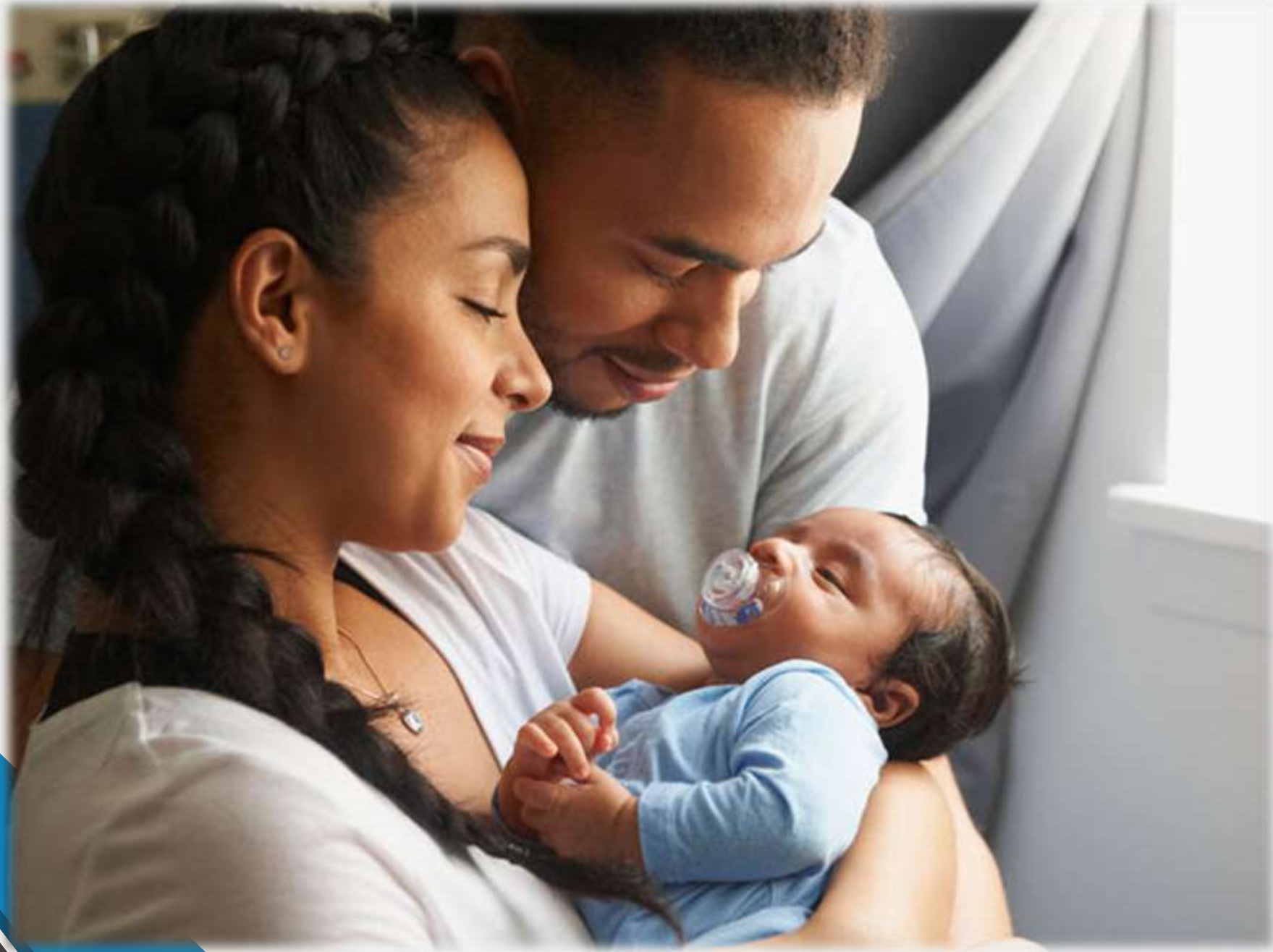


**A MECHANISM TO  
KEEP THE  
IMMUNIZATION  
HIGH OF  
NEWBORNS  
WITH CRUCIAL  
TECHNIQUES VIA  
REMOTE  
CONSULTATION  
(TMP-23-103)**



# Research Team

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**Co-Supervisor** : Mr. Thusithanjana Thilakarthna

# Introduction

- In Sri Lanka, giving birth involves medical procedures and paperwork, usually taking place at a hospital or birthing center with the help of medical staff. Newborns receive health checks, treatments, and vaccinations, and their births are recorded through an automated national birth registration system maintained by the government. Some hospitals also keep their own manual records for administrative and medical purposes.
- Having a mechanism to keep track of newborns' health information in Sri Lanka can improve health outcomes for babies. A software system with features such as remote consultation, image processing to identify malnutrition, and guidance on the child life cycle could be beneficial. A decentralized information system could provide parents and medical professionals with greater information and resources to manage their children's health.

# Research Problem

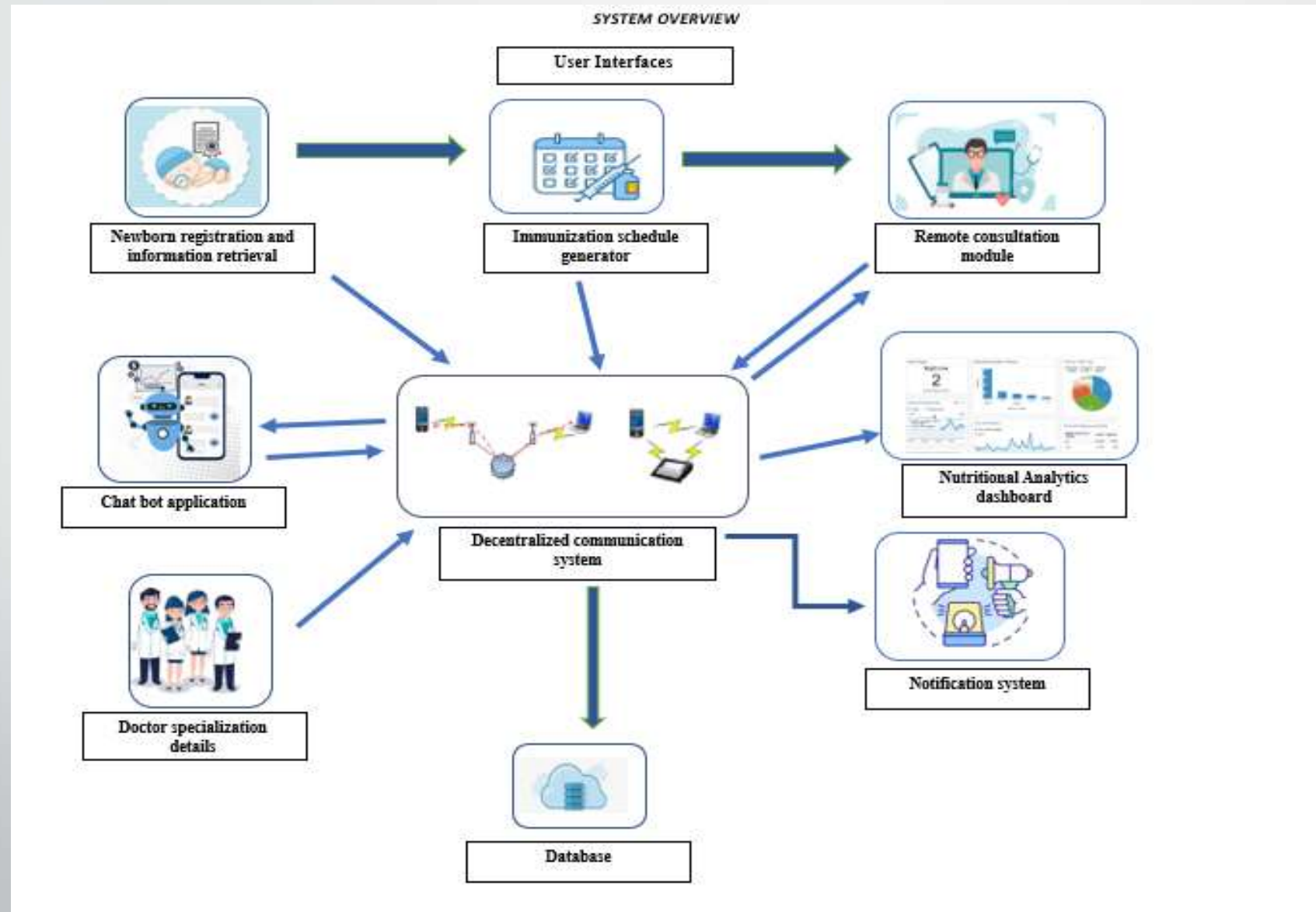
- There should be a proper mechanism for the infants' parents to manage health data and other related information of their babies to access from anywhere
- How can malnutrition or the nutritional level, be identified without going to a clinic physically and measuring the body measures of the baby?
- For some parents it can be hard with their first child as they do not have any experience. Is there a method to help them?
- Without meeting a doctor physically, is there a method for virtual communication via electronic devices and identify the diseases?
- Can a physical file health data be changed into a digital report?

# System Objectives

- To provide a secure, transparent, and efficient way to manage critical information related to newborns and their parents using a decentralized system.
- A chatbot solution for parents who have long distances to the hospital and a lack of knowledge about the infants' behaviors, with each infant's profile data that has a practiced solution set related to emergencies that can occur for an infant.
- Improve early identification and intervention for malnutrition by creating a tool that parents can easily access and use, ultimately improving child health outcomes by preventing the causes of malnutrition and its consequences.
- Determine and treat symptoms and diseases in newborn babies and temporary solutions will be provided while connecting parents with healthcare professionals through remote technologies using establish clear communication channels for accurate diagnoses and effective treatments.



# System Overview



IT20015244 | Wijesinghe R.M.U.S



Decentralized Patient Registration.

Software Engineering

# Background

## Decentralized Patient (Newborns) Registration (DPR)

- Decentralized newborns Registration refers to the process of registering newborns' and their parents' information and manage their medical information using a decentralized system.
- The first step is to choose a decentralized technology to build the system on. This could be a blockchain platform such as Ethereum or a decentralized database such as IPFS.
- The next step is to build the web application in This component would be responsible for handling the user interface using React, interacting with the Ethereum network using Web3.js, storing the data securely on MongoDB, and handling encryption and decryption of the data using private keys.
- Additionally, it would implement a permission-based access control mechanism to ensure that only authorized parties can access the data.
- The system also allows parents and healthcare providers to manage the child's medical and personal information in a way that's both efficient and accessible.
- For example, if a child needs to see a specialist, the specialist can quickly access the child's medical history and provide the necessary treatment. Finally, our system offers a user-friendly interface that is easy to use, even for non-technical users.
- By encapsulating all of these features into a single component, the DPR component could be easily integrated into a larger decentralized healthcare system.



# Research Gap

Research paper title	year	Used Ethereum Blockchain for Decentralized system	Used interacting with the Ethereum network using Web3.js	Accessible only to authorized parties, such as parents or healthcare providers.
01-Centralised versus Decentralized Management of Patients' Medical Records	2009	No(only research paper)	No	Yes
02-Decentralized Patient-Centric Report and Medical Image Management System Based on Blockchain Technology and the Inter-Planetary File System.	2022	Yes (Only focuses in lab test , not implement and )	No	Yes
03-Decentralized Electronic Medical Records.	2019	No(Only focuses on the adults used in hyperledger)	No	Yes
04-Digital and Decentralized Management of Patient Data in Healthcare Using Blockchain Implementations.	2021	Yes(Only focuses on the adults not implement ,only research pape)	No	Yes

# Research Question

- How will the system ensure the privacy and security of the data collected?
- How will the system handle updates to the registered information?
- How will the system ensure that authorized parties have access to the necessary information?
- How will the system interface with existing healthcare systems and databases?

# Research Novelty

- Permission-based access control to ensure that only authorized parties can access the data.
- An information-sharing system with a local database to share patients' details among the other remote hospital networks.
- The use of blockchain technology ensures that the data is immutable and tamper-proof, providing a high level of security.
- This makes it easier for parents to register their newborns and update their details, regardless of their location.

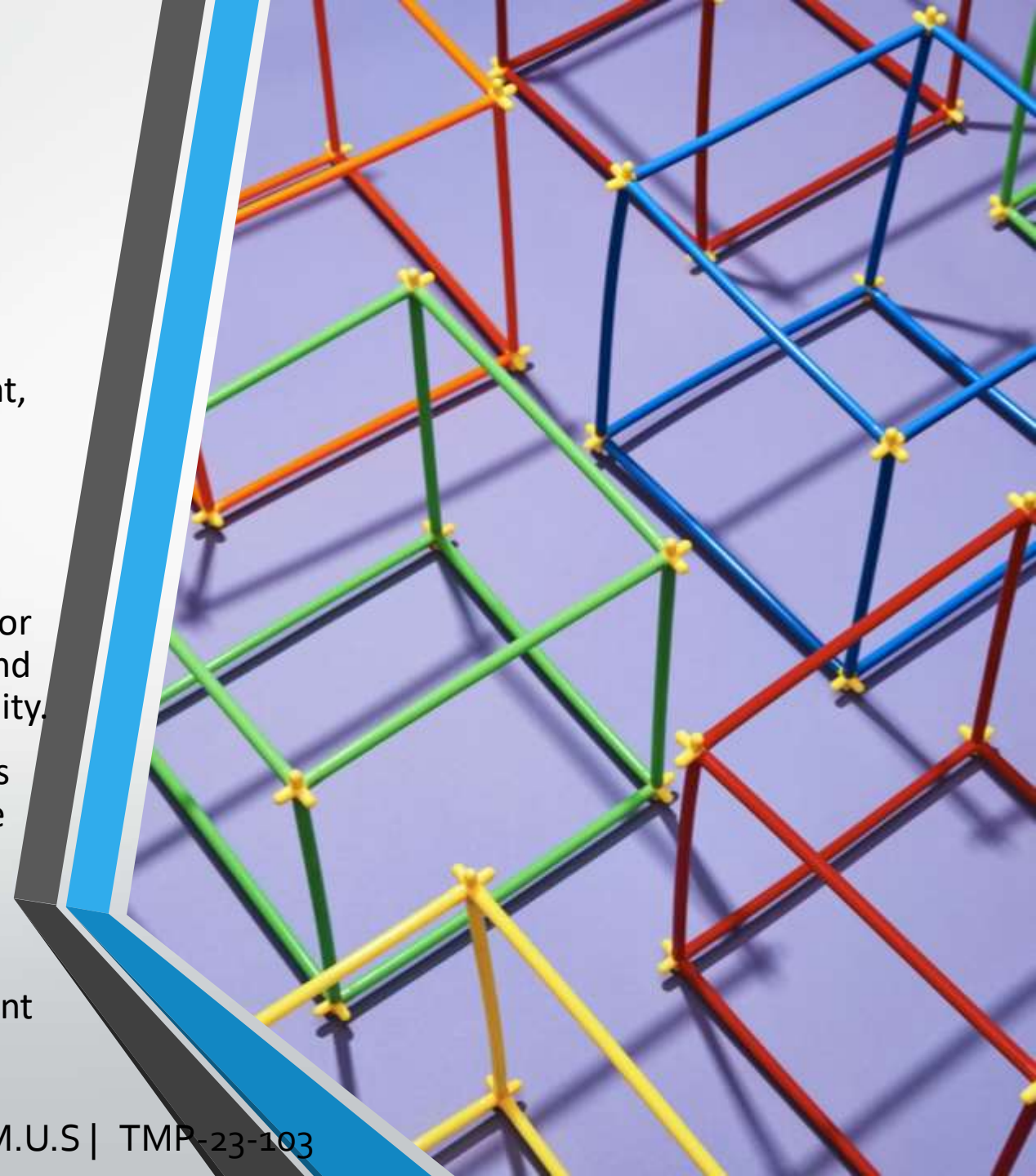
# Specific Objectives & sub-Objectives

## Specific Objective

The goal of using a decentralized system for the registration of newborns and parents' details is to provide a secure, transparent, and efficient way to manage critical information related to newborns and their parents.

## Sub Objectives

- By leveraging decentralized technologies such as blockchain or decentralized databases, this system can enhance security and privacy, prevent data tampering, and improve data accessibility.
- The smart contract stores the newborns' and parents' details on the Ethereum blockchain, ensuring that the data is secure and immutable.
- This system also allows parents and healthcare providers to manage the child's medical and personal information in a transparent and secure way, while providing access to relevant parties as needed.



# Methodology

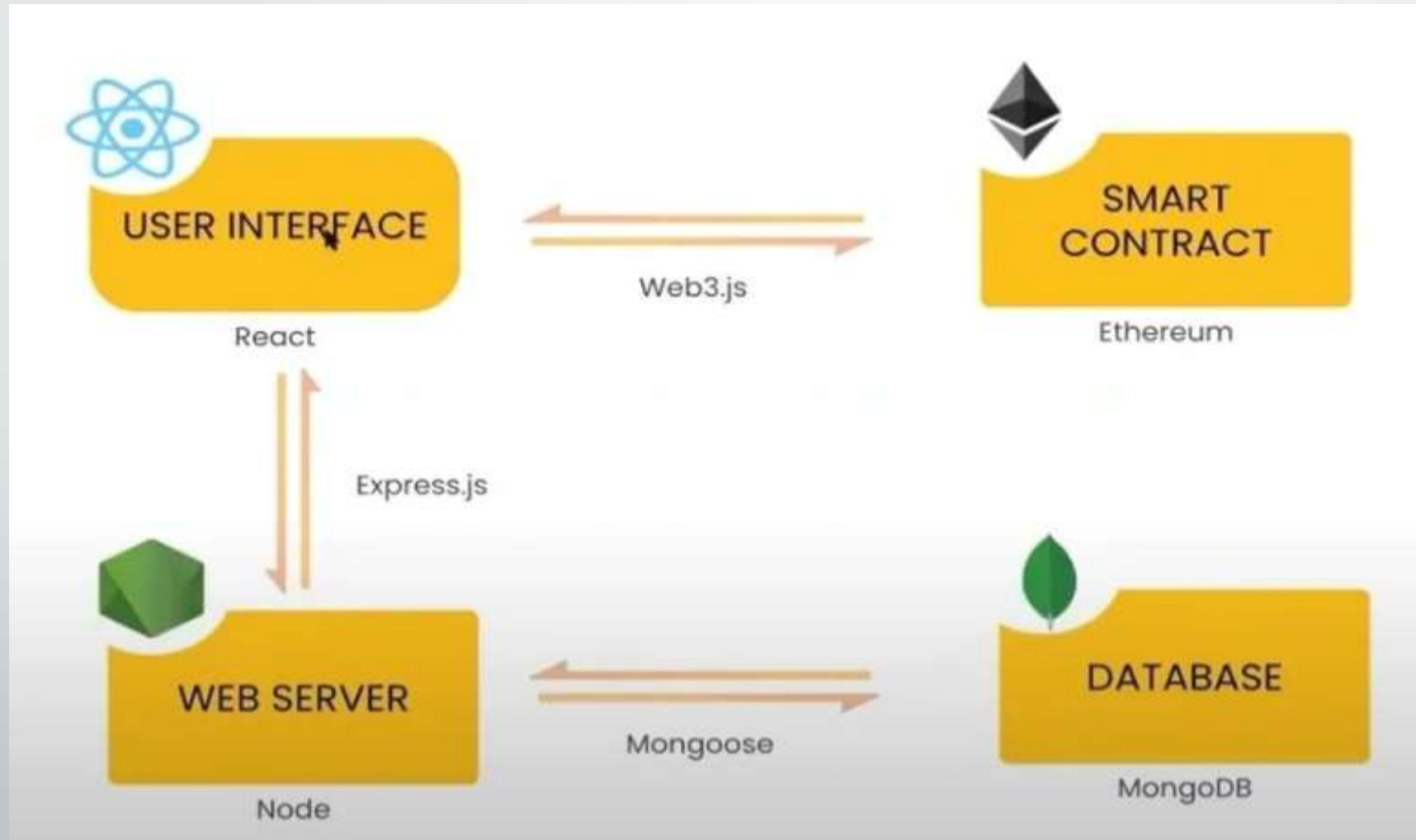
System overview Diagram

Technologies

Requirements

Work Breakdown Diagram

# System Overview Diagram





# Technology Involved

## Frontend

- React

## Backend

- Node.js and Express
- Python

## Libraries

- Web3.js Ethereum network
- Mongoose and Axios

## Database

- MongoDB



# Project Requirements

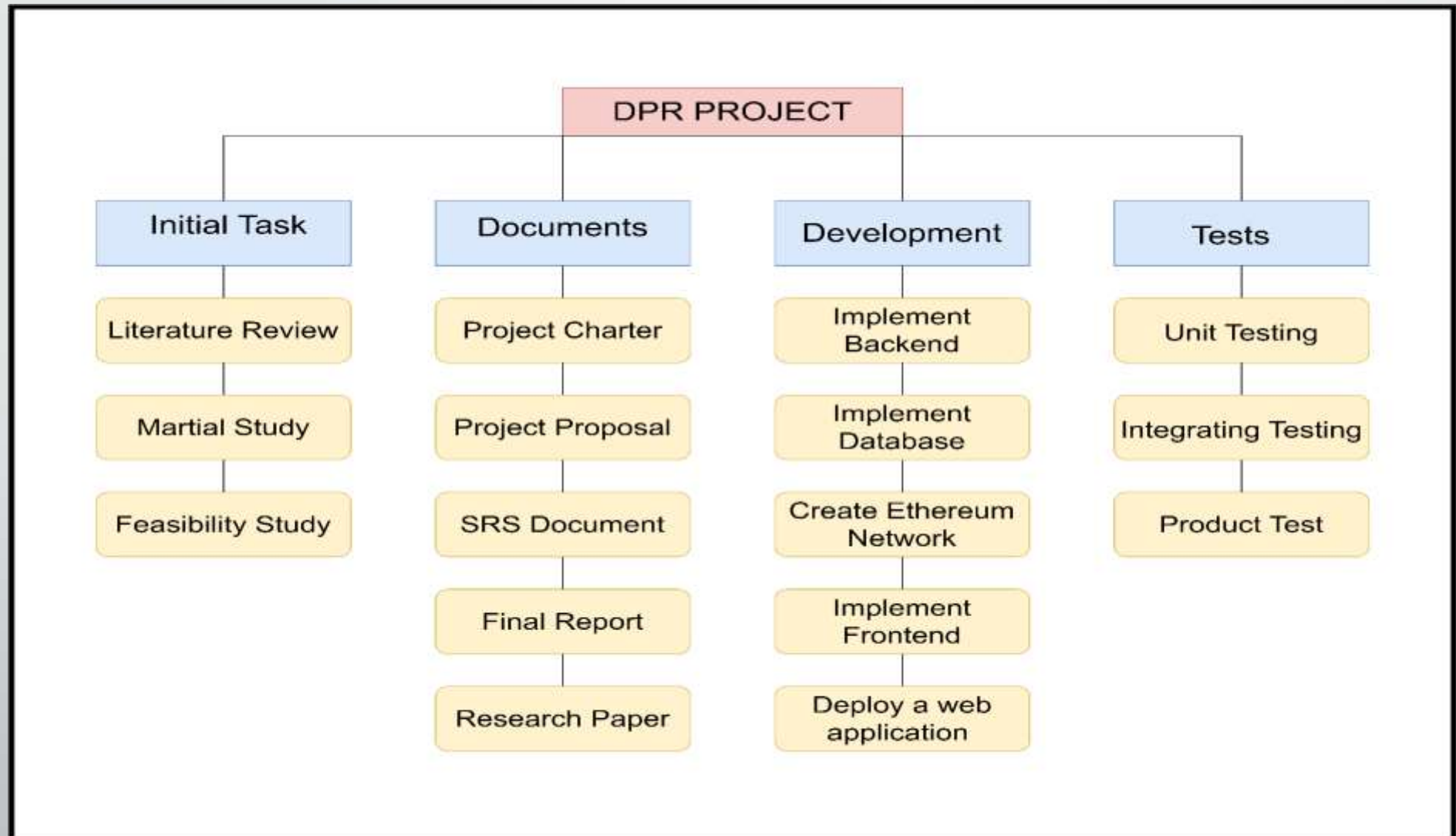
- **Functional requirements**

- Distributed storage: The system must be able to store data in a distributed manner, with multiple copies of data spread across nodes in the network.
- Decentralized consensus: The system must use a consensus algorithm to agree on the state of the network without relying on a central authority. This could be achieved using a blockchain, DAG, or other consensus mechanisms.
- P2P communication: The system must be able to facilitate communication between nodes without relying on a centralized server. This could be achieved using a peer-to-peer (P2P) network.
- User authentication and access control: The system must provide secure authentication and access control mechanisms to ensure that only authorized users can access and modify data

- **Non-Functional requirements**

Accuracy, Reliability, Performance, Usability , Accessibility,

# Work Breakdown Diagram



# References

1. Secure decentralized electronic health records sharing system based on blockchains:  
<https://www.frontiersin.org/articles/10.3389/fbloc.2021.732112/full>
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<https://www.sciencedirect.com/science/article/pii/S1319157821001051>.
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7. Zhang P, White J, Schmidt DC, Lenz G and Rosenbloom (2018), FHIR Chain: Applying Blockchain to Securely and Scalably Share, Computational and Structural Biotechnology Journal, 16: 267-278
8. Crypt Bytes Tech (2017), Medical Chain - A blockchain for electronic health records. [https:// medium.com/crypt-bytes-tech/medicalchain-a-blockchain-for-electronic-health-recordseef181ed14c2](https://medium.com/crypt-bytes-tech/medicalchain-a-blockchain-for-electronic-health-recordseef181ed14c2).
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# IT20147778| Jayawickrama N.D.D



Health Informatics Chatbot Application

Software Engineering

# Background

- **An infant medic supporting and assisting the chatbot application**
  - Parenting is a challenging yet rewarding experience, especially during the first few years of a child's life. Infants require a lot of attention and care, and new parents may find it overwhelming to keep up with their needs.
  - In Sri Lanka, traditional methods such as physical examinations by meeting the doctor. But with the race of humans, and considering the time management, and the cost management, an alternative but successful method is needed for the parents.
  - Fortunately, technology has provided us with many tools that can assist parents in raising their children, and one of these tools is a chatbot application that helps parents navigate the ups and downs of parenting an infant.



# System sub-components

**Remote Consultation:** The chatbot provides a platform for remote consultation with healthcare professionals or trained agents, allowing parents to ask questions and receive advice and solutions in real time.

**Natural Language Processing (NLP):** NLP enables the chatbot to interpret and understand natural language input from parents and respond in a conversational manner with helpful solutions and precautions.

**Medical Knowledge Base:** The chatbot is equipped with a comprehensive medical knowledge base to provide guidance, home remedies, and medicines for sicknesses and related matters. The chatbot can also provide contact details for doctors or hospitals if necessary.

**Conversation History:** The chatbot keeps a record of the conversations between parents and the chatbot, storing the records of symptoms over a given time duration and outputting results. This enables parents to track the progress of their infant's health.

**Personalized Profiles:** The chatbot maintains a state of the child profile with personal details, including medications, allergies, vaccinations, and consultations. This personalized profile allows the chatbot to provide certain information based on the infant's data.

**Practice Solution Set:** The chatbot application includes a practiced solution set related to common ailments and emergencies that can occur for an infant. This solution set is developed based on medical expertise and experience.

**Home Remedies and Precautions:** The chatbot can provide guidance on home remedies and precautions to take for various common ailments, such as fever, cold, cough, and diarrhea. This information can be useful for parents who want to avoid giving too many medicines to their infants.


# Research Gap

Research paper title	year	Conversational environment with history	Diagnosis and predict treatments	Medical Knowledge based	Personalized profiles for users	Notifications and reminders
A mechanism to keep the immunization high of newborns with crucial techniques via remote consultation	N/A	Yes	Yes	Yes	Yes	Yes
Medical Assistance Chatbot	2020	Yes (but no history)	Yes	Yes (but focused on mental health)	No	No


A novel approach for medical assistance using trained chatbot	2017	Yes	Yes	Yes	Yes	No
COVID-19 Pandemic and Remote Consultations in Children: A Bibliometric Analysis	2022	Telecommunication included	Yes (focused on children as well)	Yes (mostly focused on Covid treatments )	No	No

# Experiments with existing chatbots

## ChatGPT



can you recommend me any remedies or medicine for my babies rashes? she is 1 month old



As a language model, I am not qualified to provide medical advice or recommend specific remedies or medications for your baby's rash. It's important to consult with your pediatrician before giving your baby any medication or applying any remedy to their skin.

There are many different types of rashes that can occur in babies, and the treatment will depend on the cause and severity of the rash. Some common types of rashes in babies include diaper rash, eczema, and heat rash.

In general, there are some steps you can take to help prevent and treat rashes in babies:

- Keep the affected area clean and dry
- Change your baby's diaper frequently
- Use a gentle, fragrance-free soap and moisturizer on your baby's skin
- Avoid using harsh detergents or fabric softeners on your baby's clothes and bedding
- Dress your baby in loose-fitting, breathable clothing
- Keep your baby out of direct sunlight

[Regenerate response](#)

Send a message.

Free Research Preview. ChatGPT may produce inaccurate information about people, places, or facts. [ChatGPT May 3 Version](#)

In general, there are some steps you can take to help prevent and treat rashes in babies:

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- Dress your baby in loose-fitting, breathable clothing
- Keep your baby out of direct sunlight

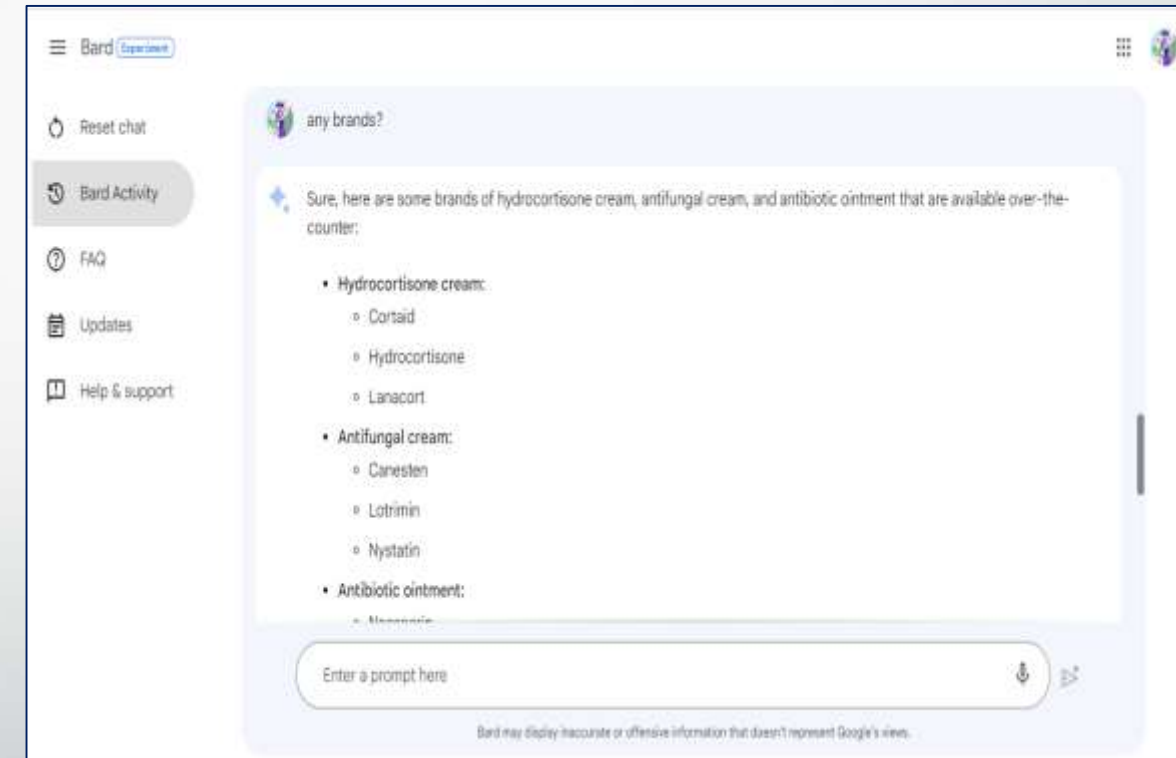
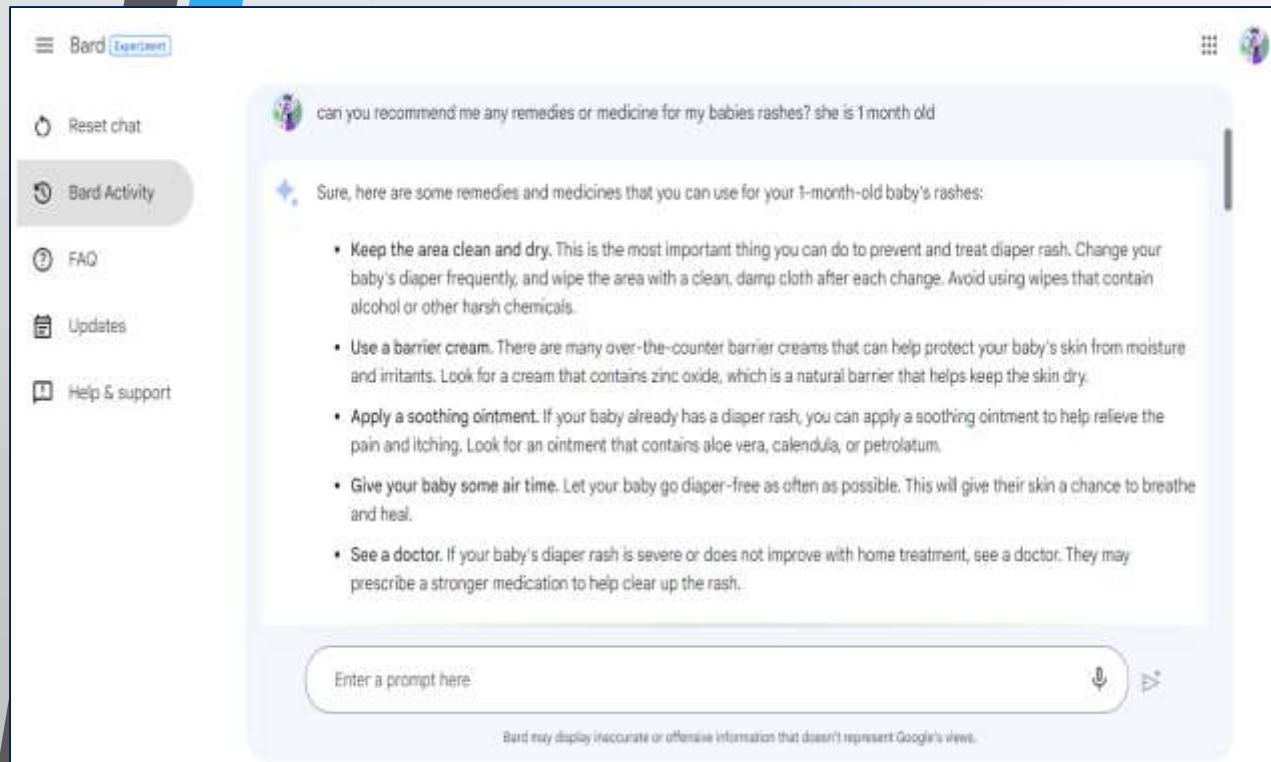
If the rash persists or becomes worse, or if your baby develops a fever or other symptoms, contact your pediatrician immediately. They can help you determine the cause of the rash and provide appropriate treatment.

[Regenerate response](#)

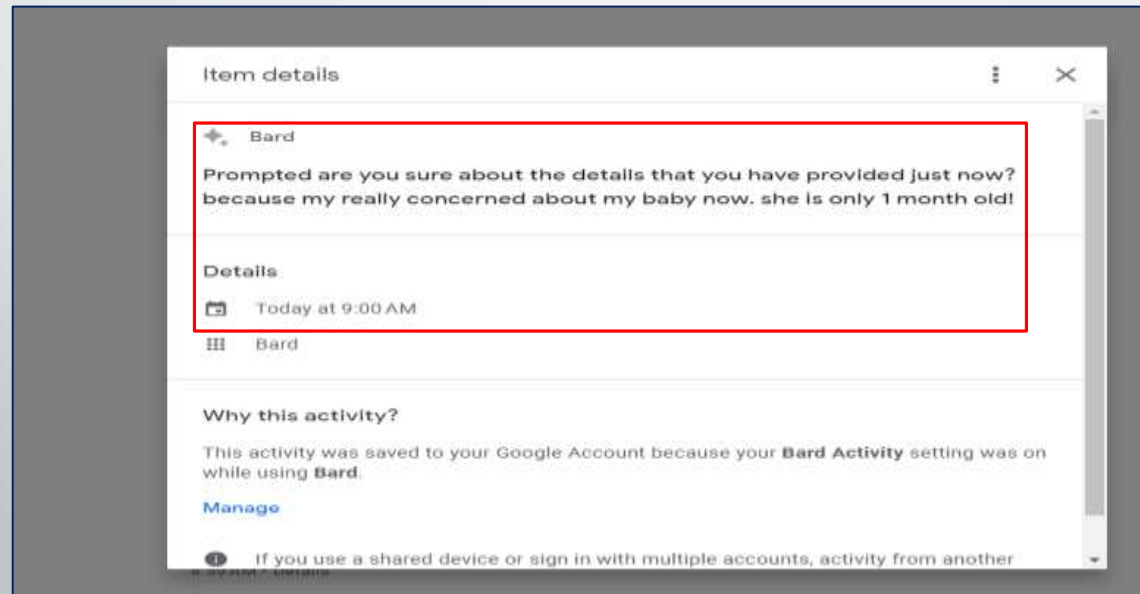
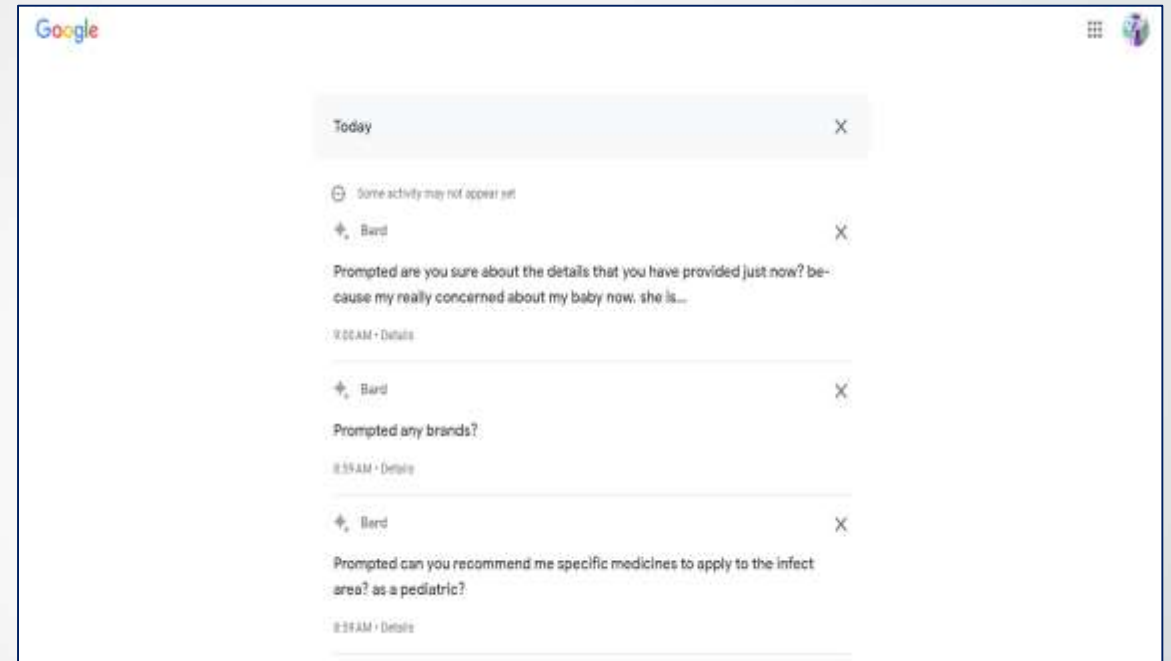
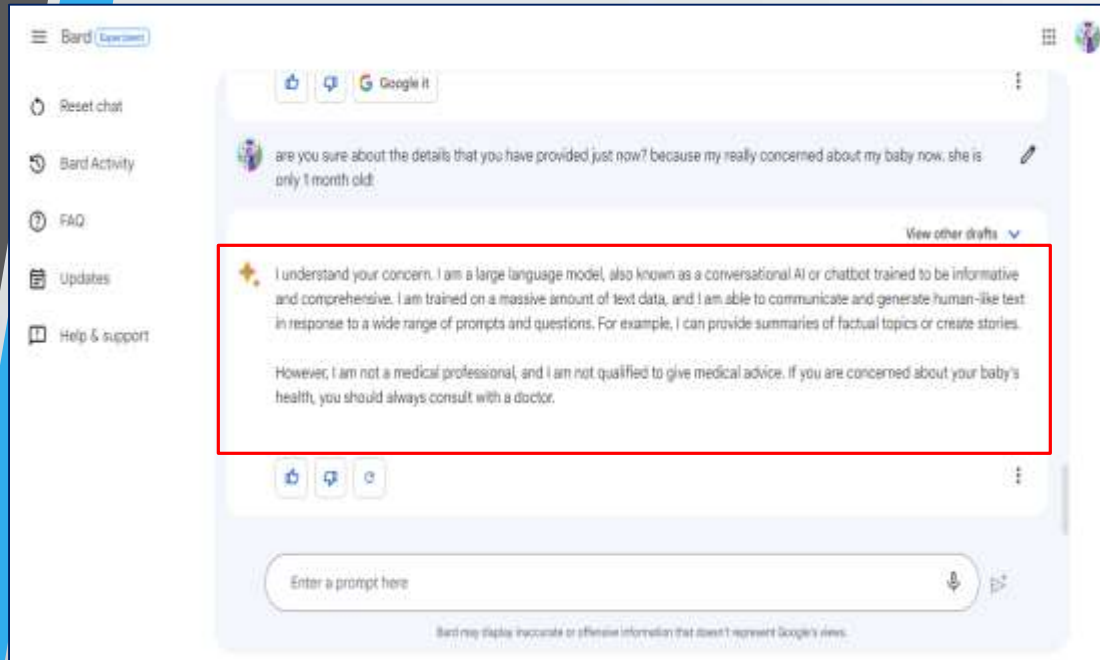
Send a message.

Free Research Preview. ChatGPT may produce inaccurate information about people, places, or facts. [ChatGPT May 3 Version](#)

# Bard chatbot







11/6/2023

27

11/6/2023

27

# Research Question

- How reliable and accurate is the trained chatbot that can be used as an infant medical assistant?
- What are Natural Programming languages?
- How to process information to keep track of the infant's medications and consultations in a personal profile?
- How will the chatbot analyze the parents' answers about the emergency conversationally and predict solutions for helpful precautions?

# Objectives

## Specific Objective

A Personalized chatbot application for parents who have long distances to the hospital and a lack of knowledge about the infants' behaviors, with each infant's profile data that has a practiced solution set related to emergencies that can occur for an infant.

## Sub Objectives

- A well-trained medical knowledge AI bot mechanism to predict the solutions, remedies, and guidance according to the parent's input data.
- Natural Language Processing (NLP) enables them to interpret and understand natural language input from parents and respond in a conversational manner with helpful solutions and precautions.
- Conversation History that enables storing the records of symptoms over a given time duration and outputting results allowing tracking the progress of their infant's health.
- Personalized Profiles maintains personal details, including medications, allergies, vaccinations, and consultations.

# Methodology

- System overview Diagram
- Technology Involved
- Requirements
- Work Breakdown Diagram

# System Overview Diagram



# Technology Involved

- OpenCV
- Frontend - MERN
- Backend - Python
- PyTorch/ TensorFlow
- Scikit-learn.
- NLP
- Mongo DB (PyMongo)





# Project Requirements

## Functional requirements

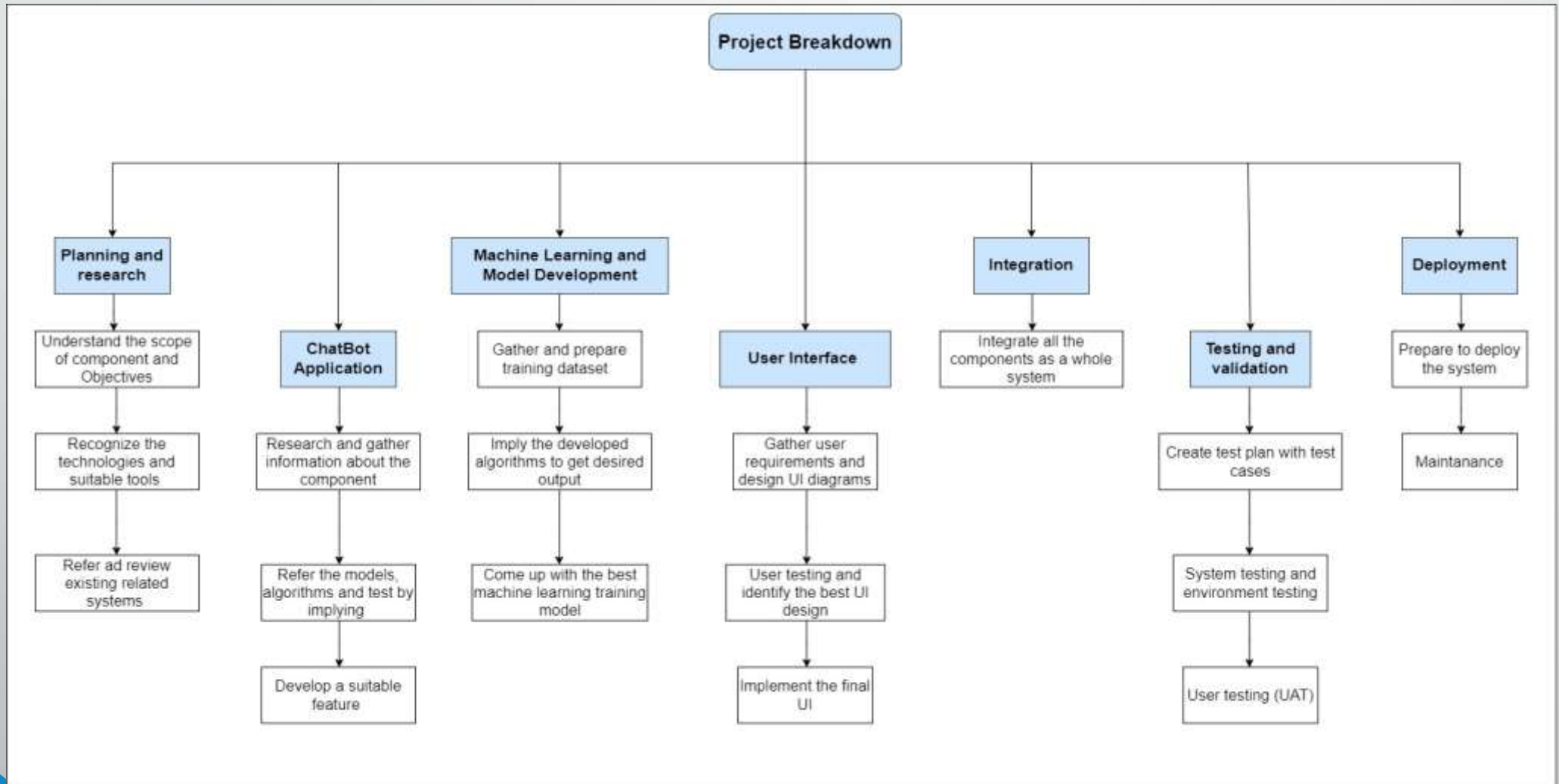
- The system should be able to verify and authenticate the user from the data that are taken from the decentralized system.
- Chatbot should provide a platform for remote consultation with the help of healthcare professionals or trained agents, allowing parents to ask questions and receive advice and solutions in real-time.
- With the assistance of an NLP chatbot should have the ability to interpret and understand natural language input from parents and respond in a conversational manner with helpful solutions and precautions.

- With a comprehensive medical knowledge base, the system should have to provide guidance, home remedies, and medicines for sicknesses and related matters. The chatbot can also provide contact details for doctors or hospitals if necessary.
- For a given time duration, chatbots should have access to the history of the conversation records and enable parents to track the progress of their infant's health.
- Every user should have their own personal chatbot

## None Functional Requirements

- Accuracy, security, Reliability, Availability, Performance, Usability

# Work Breakdown Diagram



# References

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6. "ChatGPT", Available: <https://chat.openai.com/>
7. "Bard", Available: <https://bard.google.com/>

# IT20405090 | Vanhoff R. L.



Nutrition level and malnutrition detection by image processing

Software Engineering

# Background

- **Determining the nutritional level of the infant using body measures and facial features**
  - Neonatal malnutrition is a major public health concern globally, especially in underdeveloped countries, where it can result in stunted development, cognitive deficits, and other health problems. Early discovery is critical in dealing with the issue.
  - In Sri Lanka, traditional methods such as physical examinations are used to identify infant nutrition levels; however, technological interventions such as mobiles and digital health solutions are being used to monitor infant nutrition in real-time to collect data on infant feeding practices and growth parameters from healthcare workers in the field.
  - Recent technological advances have enabled the identification of infant nutrition levels utilizing image processing techniques and algorithms, assisting in the early detection of malnutrition and improving health outcomes.



# Research Gap

Research paper title	Year	Input given as an image of the infant	Process image and analyze facial features and head circumference	Predict nutritional level of infant	Features considered when measuring the nutritional level (height, weight, head circumference)
Detect Malnutrition in Underage Children by using TensorFlow Algorithm of Artificial Intelligence [3]	2019	yes	yes	yes	Height, weight only
Malnutrition Detection using Convolutional Neural Network [2]	2020	yes	No (Facial features were considered)	yes	Not specified

# Research Gap

Identification of malnutrition and prediction of BMI from facial images using real-time image processing and machine learning [1]	2021	yes	yes	yes	Height, weight, head circumference (but the target group was adults only)
A mechanism to keep the immunization high of newborns with crucial techniques via remote consultation	N/A	yes	yes	yes	Height, weight, head circumference

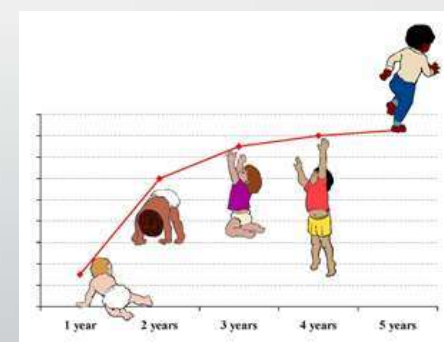
# Predict The Nutritional Level

- Head circumference-for-age (WHO child growth standards 0-2 years)

Age (months)	Weight (kg)	Height (cm)	Head Circumference (cm)
0	3.3 - 4.4	48.4 - 54.9	33.5 - 37.7
1	4.0 - 5.7	53.0 - 60.1	37.0 - 40.9
2	4.7 - 6.8	56.5 - 63.7	38.8 - 42.6
3	5.4 - 7.9	59.2 - 66.8	40.2 - 44.0
4	6.0 - 9.0	61.5 - 69.1	41.3 - 45.0
5	6.4 - 10.1	63.5 - 71.1	42.2 - 46.0
6	6.8 - 11.1	65.1 - 72.8	42.9 - 46.7
7	7.2 - 12.1	66.5 - 74.3	43.5 - 47.4
8	7.5 - 13.0	67.8 - 75.7	44.0 - 47.9
9	7.9 - 13.9	69.0 - 77.0	44.5 - 48.5
10	8.2 - 14.7	70.2 - 78.3	44.9 - 49.0
11	8.5 - 15.5	71.3 - 79.5	45.3 - 49.5
12	8.8 - 16.3	72.4 - 80.6	45.7 - 50.0
15	9.7 - 18.3	75.1 - 83.1	47.2 - 51.0
18	10.4 - 20.4	77.6 - 85.6	48.4 - 52.2
21	11.0 - 22.4	79.8 - 88.0	49.4 - 53.1
24	11.5 - 24.5	81.8 - 90.3	50.3 - 53.9

- Head circumference-for-age (WHO child growth standards 0-30 days)

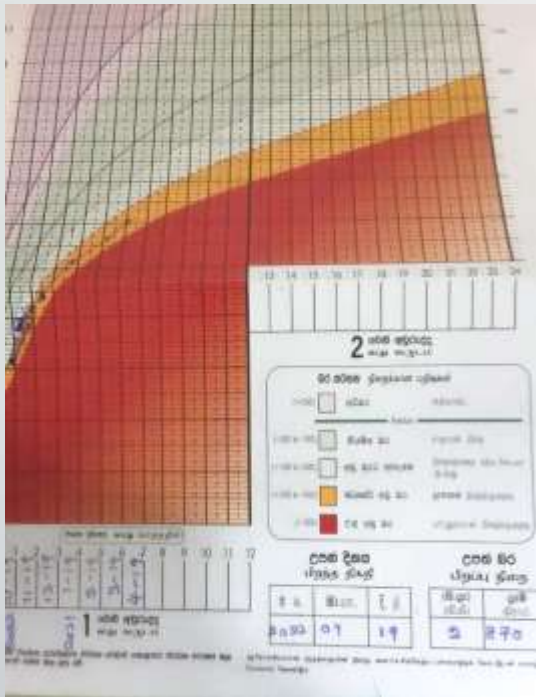
Age (days)	Weight (kg)	Length (cm)	Head Circumference (cm)
0	3.5-4.5	50-54	33-35
1	3.6-4.6	50-54	33-35
2	3.7-4.7	50-54	33-35
3	3.8-4.8	50-54	33-35
4	3.8-4.9	50-54	33-35
5	4.0-5.0	50-54	33-35
6	4.1-5.1	50-54	33-35
7	4.2-5.2	50-54	33-35
8	4.3-5.3	50-54	33-35
9	4.4-5.4	50-54	33-35
10	4.5-5.5	50-54	33-35
11	4.5-5.6	50-54	33-35
12	4.7-5.7	50-54	33-35
13	4.8-5.8	50-54	33-35
14	4.9-5.9	50-54	33-35



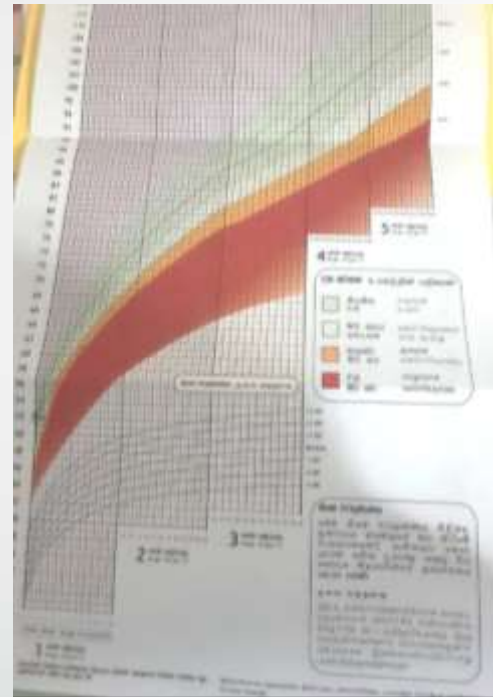
Age (in days)	Head Circumference (cm)	Weight (kg)	Height (cm)
15	35.4	2.4	50.8
16	35.6	2.5	50.9
17	35.8	2.6	51.4
18	36.0	2.7	51.9
19	36.2	2.8	52.4
20	36.4	2.9	52.9
21	36.6	3.0	53.4
22	36.8	3.1	53.9
23	37.0	3.2	54.4
24	37.2	3.3	54.9
25	37.4	3.4	55.4
26	37.6	3.5	55.9
27	37.8	3.6	56.4
28	38.0	3.7	56.9
29	38.2	3.8	57.4
30	38.4	3.9	57.9

# Current Methodology (In Sri Lanka)

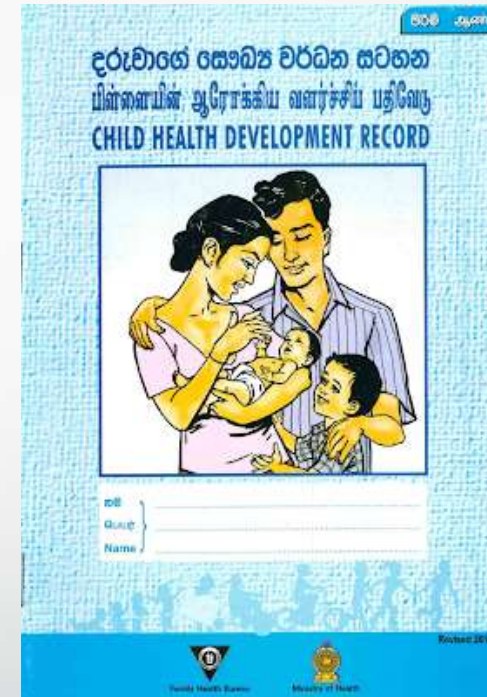
- A booklet is maintained to mark the observations of the infant during the physical clinics.



Height and weight measures are marked on each clinical visit



Head circumference will be measured and marked on each clinical visit



The information of the baby and the medical history will be recorded in a booklet

# Research Question

- How effective is the combination of image processing techniques and machine learning algorithms in identifying malnutrition in infants compared to traditional methods of nutritional assessment?
- What is the accuracy rate of the proposed system in identifying different levels of malnutrition in infants?
- Does face analysis and head circumference offer precise enough data to detect newborn malnutrition, or do other criteria such as weight need to be considered?
- How well can I anticipate the nutritional level based on the information gathered?

# Objectives

## Specific Objective

Improve early identification and intervention for malnutrition by creating a tool that parents can easily access and use, ultimately improving child health outcomes by preventing the causes of malnutrition and its consequences.

## Sub Objectives

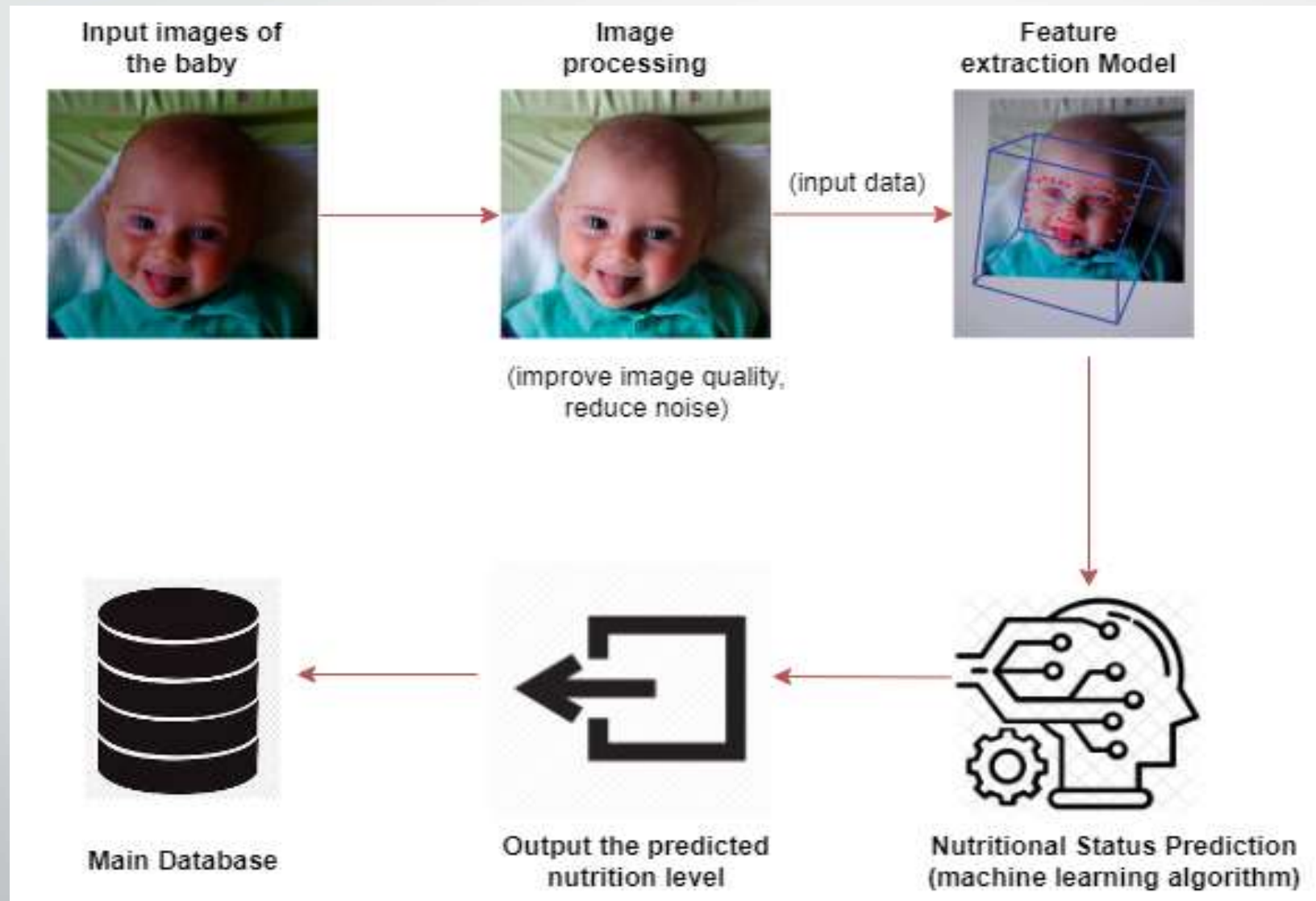
- Developing a mechanism to pre-process images to improve image quality and reduce noise
- Developing an algorithm to extract relevant features from the images, such as facial features and head circumference.
- Training and validating the model to predict nutritional status from the extracted features.
- Developing a robust nutrition level identifier for infants using image processing



# Methodology

- System overview Diagram
- Technology Involved
- Requirements
- Work Breakdown Diagram

# System Overview Diagram



# Technology Involved

- Jupyter Notebook
- OpenCV
- Frontend – MERN
- Backend - Python
- keras
- Matplotlib
- PyTorch
- Scikit-learn.
- TensorFlow
- dlib
- NumPy



# Project Requirements

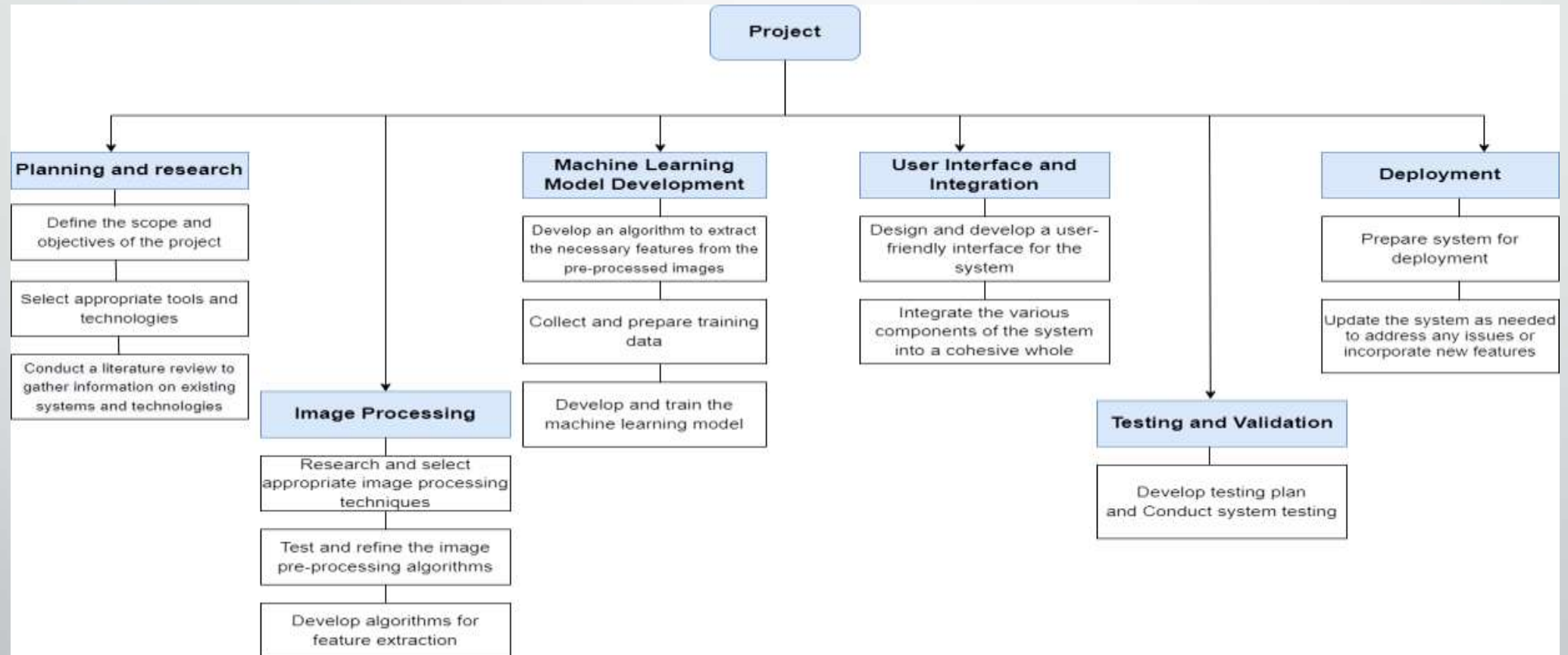
- **Functional requirements**

- **Process image to improve quality and reduce noise:** to preprocess images by removing noise or distortion through techniques such as image enhancement and filtering.
- **Extract the features from the image to identify malnutrition:** to develop an algorithm to extract relevant features from pre-processed images, including facial features and head circumference, to identify malnutrition.
- **Adaptability according to the child's image to detect the necessary features that are needed:** to develop an adaptive system that can detect necessary features based on a child's image by adjusting the feature extraction algorithm according to the visibility of the head in the image.
- **Predict the nutrition level correctly:** to develop a prediction model that can accurately predict the child's nutrition level based on the extracted features and output the prediction results to the user.

- **User Requirements**

Accuracy, Reliability, Performance, Usability

# Work Breakdown Diagram



# References

1. "Identification of malnutrition and prediction of BMI from facial images using real-time image processing and machine learning," 2021.  
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# IT20156374| Fernando A.P



Remote consultations over video conference and sickness  
identification by image processing

Software Engineering

# Background

- **Remote consultations over video conference and sickness identification by image processing**
  - remote consultations over video conference and sickness identification by image processing refers to a method of providing medical consultations where a healthcare professional communicates with a patient over a video conferencing platform and uses image processing technology to identify and diagnose illnesses or medical conditions based on images provided by the patient.
  - This approach allows for medical consultations to be conducted remotely, without the need for in-person visits, and may be particularly useful in situations where access to healthcare is limited or when patients are unable to travel to a medical facility. The use of image processing technology can aid in the accurate and efficient diagnosis of medical conditions, allowing for prompt and effective treatment.
  - Sri Lanka's healthcare sector lacks processes and structure for executing the immunization program.
  - The use of remote consultations and image processing technology has the potential to revolutionize healthcare by improving access to medical care, reducing costs, and improving patient outcomes.

# Research Gap

Research paper title	year	Get the inputs of the infant while video conference	Process the video and analyze the movements of the infant	Determine the symptoms And diseases
<a href="#">The influence of maternal anxiety and depression symptoms on fNIRS brain responses to emotional faces in 5-and 7-month-old infants</a>	2020	Yes	Yes	Yes. But for the 5-7 months old babies. More than 7 months not available.
<a href="#">Diagnosing Parkinson disease through facial expression recognition: video analysis</a>	2021	Yes	No	No (Only focuses on the adults)
<b>Identification of Abnormal Movements in Infants: A Deep Neural Network for Body Part-Based Prediction of Cerebral Palsy</b>	June 2021	Yes	Yes	No. Only capture the movements
<b>Future Directions for Infant Identification and Intervention for Autism Spectrum Disorder from a Transdiagnostic Perspective</b>	2020 July	No	No	No

# Research Question

- How does the accuracy of sickness identification through image processing technology compare to traditional in-person consultations?
- What are the factors that influence patient satisfaction with remote consultations over video conferences, and how do they differ from in-person consultations?
- What are the barriers and limitations to the implementation of remote consultations and image processing technology in different healthcare settings, and how can they be overcome?
- How does the use of remote consultations and image processing technology impact healthcare costs and access to healthcare services, particularly in underserved or remote areas?
- What are the privacy and security concerns associated with remote consultations and image processing technology, and how can they be addressed to ensure patient confidentiality and data protection?
- How can the integration of remote consultations and image processing technology into existing healthcare systems be optimized to ensure the best possible healthcare outcomes for patients?

# Objectives

## Main Objective

Determine and treat symptoms and diseases in newborn babies and temporary solutions will be provided while connecting parents with healthcare professionals through remote technologies using establish clear communication channels for accurate diagnoses and effective treatments.

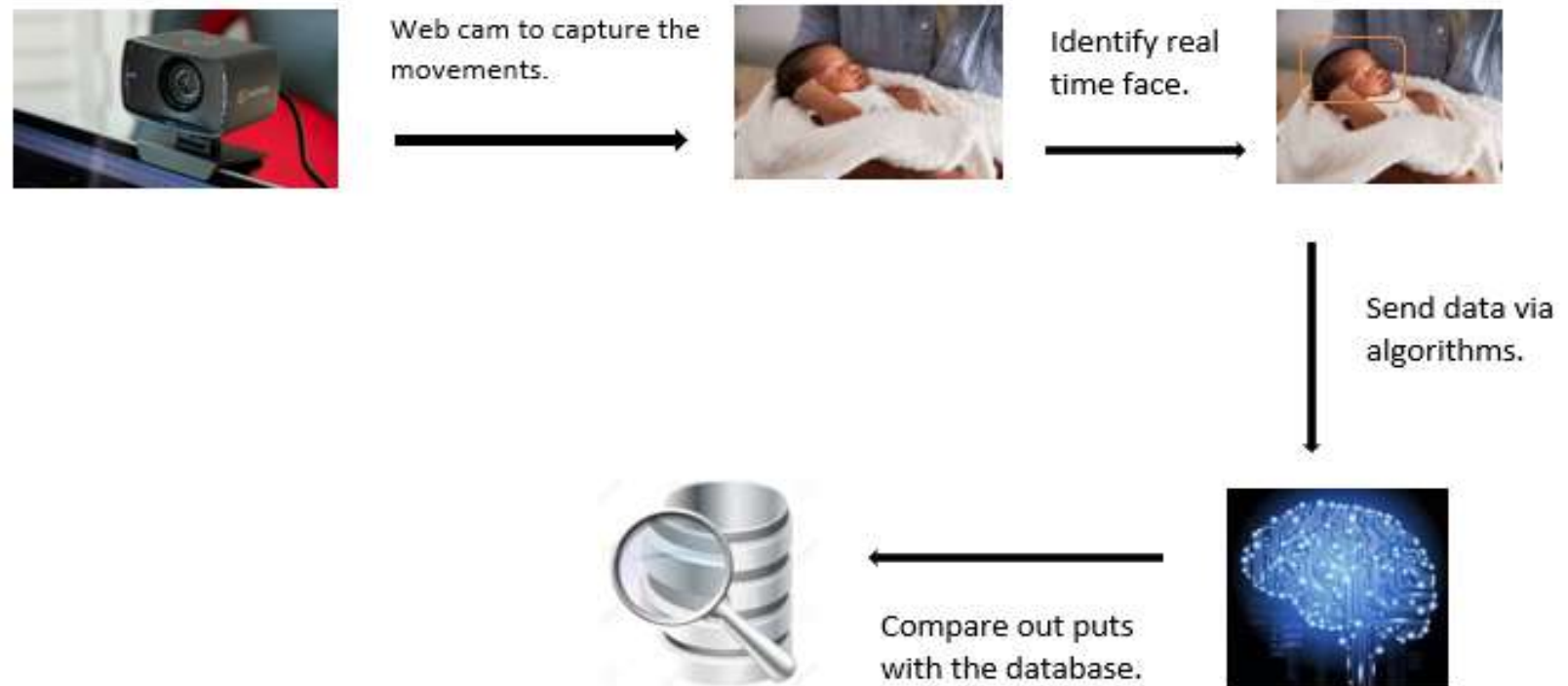
## Sub Objectives

- Developing a mechanism to provide voice commands for easy communication
- Develop an algorithm to extract relevant features from the videos
- Developing an accurate identifier treatment for infants using video processing

# Methodology

- System overview Diagram
- Technology Involved
- Work breakdown diagram
- Requirements
  - Functional Requirements
  - Non- Functional Requirements

# System Overview Diagram

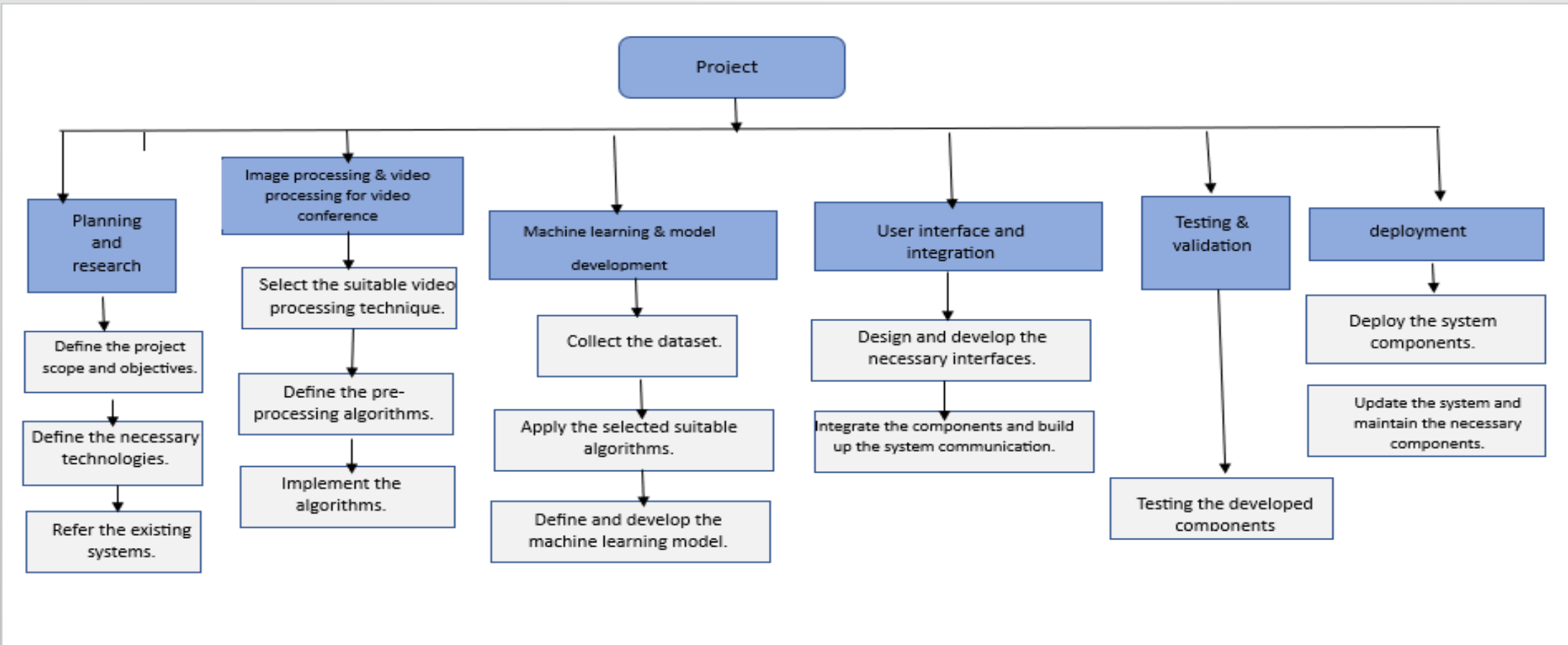




# Technology Involved

- **Frontend** – MERN Stack, **Backend** - Python
- **WebRTC**: WebRTC is a free, open-source project that provides real-time communication capabilities to web browsers and mobile applications. It includes features such as video and audio conferencing, file sharing, and screen sharing. It also includes APIs for image processing, which can be used for tasks such as face detection, recognition, and tracking.
- **OpenCV**: OpenCV is an open-source computer vision library that can be used for image and video processing. It includes functions for tasks such as image filtering, edge detection, and face recognition. OpenCV can be integrated into video conferencing systems to enhance the video quality and add features such as background blur and noise reduction.
- **TensorFlow**: TensorFlow is an open-source machine learning library that can be used for tasks such as image classification and object detection. It can be used to enhance the image processing capabilities of a video conferencing system by providing features such as automatic background removal and virtual backgrounds.
- **Intel RealSense**: Intel RealSense is a suite of depth-sensing cameras that can be used for tasks such as 3D scanning and gesture recognition. It can be integrated into a video conferencing system to enhance the video quality and add features such as automatic depth-of-field adjustments and hand tracking.

# Work Breakdown Diagram



# Project Requirements

- **Functional requirements**
  - **Video and audio communication:** The system should be able to transmit real-time video and audio streams between participants.
  - **Video processing:** The system should be able to perform various video processing tasks, such as noise reduction, background blur, and image stabilization.
  - **Face detection and recognition:** The system should be able to detect and recognize faces of participants for various purposes, such as auto-framing and identification.
  - **Symptom detection:** The system should be able to detect symptoms such as facial expressions, body movements, and speech patterns that can indicate a medical condition.
  - **Treatment recommendations:** The system should be able to recommend appropriate treatments based on the identified symptoms and medical conditions.

# Project Requirements

- **Non-Functional requirements**
- **Data privacy and security:** The system should ensure the privacy and security of patient data and comply with data protection regulations.
- **Usability:** The system should be easy to use, with a user-friendly interface that is intuitive and requires minimal training.
- **Performance:** The system should perform well, with fast response times and high-quality video and audio streams.
- **Compatibility:** The system should be compatible with different devices and platforms, including mobile devices, desktop computers, and various web browsers.

# References

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# Gantt Chart



# Supportive Information

- Commercialization
- Budget




## Commercialization

- The proposed system aims to streamline the registration process for newborns and their parents by utilizing decentralized technology like blockchain. By doing so, the system offers increased security, transparency, and accessibility.
- To meet the functional requirements, the system would need to enable hospitals and healthcare providers to register newborns and parents' details, provide a user-friendly interface for parents to register their information, and ensure that the data is stored accurately on the blockchain.
- Nonfunctional requirements would include performance, scalability, and security, such as ensuring that the system can handle a large volume of registrations and protect data from unauthorized access.
- To commercialize the system, it could be marketed to hospitals and healthcare providers as well as parents who want a secure and accessible way to register their child's details.
- The system could be monetized through subscription or usage fees and could also be integrated with other healthcare systems or applications to provide additional value to users.

# Budget

<u>Task</u>	<u>Cost (Rs.)</u>
• Domain Name	5000.00
• Hosting	9000.00
• Backups	5000.00
• Website Strategy	2000.00
• Testing	2000.00
• Other	3000.00
• Maintenance	2000.00
• Marketing	10000.00
<b>Total Cost</b>	<b>38000.00</b>



Thank You!

Team TMP 23-103