



Sri Lanka Institute of Information Technology

PROJECT CHARTER

The purpose of this form is to allow 2nd year students of the B.Sc. (Hon) degree program to enlist in the 2nd year project group. The description of the project entered on this form will not be considered as the formal project proposal. It should however indicate the scope of the project and provide the main potential outcome.

PROJECT TITLE	Smart Baby Room With IOT
---------------	--------------------------

GROUP NUMBER	1
--------------	---

PROJECT GROUP MEMBER DETAILS:

	STUDENT NAME	STUDENT NO.	CONTACT NO.	EMAIL ADDRESS
1	Dampage V.I	IT22092724	0778956067	it22092724@my.sliit.lk
2	Vithanage V. T. M	IT22198204	0715332819	it22198204@my.sliit.lk
3	Jayawardhana K. G. M. S	IT22112996	0762637696	it22112996@my.sliit.lk
4	Shaethayine R	IT22315700	0776601556	it22315700@my.sliit.lk

PROJECT DETAILS

1. INTRODUCTION

1.1 Purpose of Project Charter:

The purpose of this project charter is to outline the objectives, scope, and responsibilities of our smart baby room with the IOT project. By gaining approval from project stakeholders, we aim to create an innovative and safe environment for infants, integrating smart devices and technologies to enhance their well-being.

2. BRIEF DESCRIPTION OF YOUR PROJECT

2.1 Project description

Our project aims to create an intelligent and safe environment for infants using Internet of Things (IoT) devices. Here are the key features:

1. Cry Detection and Cradle Automation.
2. Moisture Sensor for Diaper Changes.
3. Mosquito Detection and Protection.
4. Smart Lighting and Door Control.
5. Temperature Regulation.

The project is expected to take approximately 5 months to complete, with an allocated budget of Rs 15 000, ensuring sufficient resources to complete hardware development, testing, implementation, and any necessary iterations for optimal functionality within the specified timeframe and financial constraints.

2.2 Project objectives

Let's define the project objectives for creating a Smart Baby Room with IoT, incorporating the specified features. We'll structure these objectives using the SMART concept:

Specific:

- Develop a Smart Cradle System that integrates with the baby room environment
- Implement features such as Cry Detection, Moisture Sensing, Mosquito Detection, Smart Lighting, and Temperature Regulation.

Measurable:

- Measure the effectiveness of the Cry Detection mechanism by accurately identifying baby cries.
- Monitor the Moisture Sensor to detect diaper changes promptly.
- Track the Mosquito Detection system's efficiency in protecting the baby.
- Quantify energy savings achieved through Smart Lighting and Door Control.
- Monitor the room's temperature regulation to ensure comfort for the baby.

Achievable:

- Utilize existing IoT technologies such as ESP32, Arduino, and Humidity & Temperature sensors.

Relevant:

- The project directly addresses the needs of working parents who require continuous monitoring and care for their infants.
- It aligns with the growing trend of smart home automation and IoT applications.

Time-bound:

- Finish the project within a 5-month timeframe starting from the commencement date.
- Regularly evaluate progress and milestones to stay on track.

3. JUSTIFICATION**3.1 Business Need****1. Enhanced Infant Safety and Well-Being:**

- Business Need: Parents and caregivers prioritize the safety and health of their infants.
- Justification: By integrating IoT devices (such as smart monitors, sensors, and lights), we create a secure environment that actively monitors the baby's vital signs, sleep patterns, and room conditions. This proactive approach enhances infant safety and provides peace of mind to parents.

2. Efficiency and Convenience for Caregivers:

- Business Need: Parenting involves numerous tasks, especially during nighttime.
- Justification: Smart features like automated cradle swinging, cry detection, and diaper wetness alerts reduce the manual effort required by caregivers. This efficiency allows parents to focus on other essential aspects of childcare.

3. Health Monitoring and Early Intervention:

- Business Need: Timely detection of health issues is critical for infants.
 - Justification: IoT sensors (such as temperature monitors) track vital signs and alert caregivers to any abnormalities. Early intervention can prevent serious health complications and reduce medical costs.
-

4. Energy Efficiency and Cost Savings:

- Business Need: Energy consumption impacts household budgets.
- Justification: Smart lighting adjusts based on natural light and time of day, optimizing energy usage. Additionally, remote door control ensures efficient use of resources. Over time, these energy-saving features contribute to cost savings.

5. Competitive Edge and Market Demand:

- Business Need: The baby care market is competitive, and parents seek innovative solutions.
- Justification: A smart baby room with IoT features differentiates our product. Meeting the demand for tech-savvy parenting solutions positions us as a forward-thinking brand.

3.2 Business Impact**1. Product differentiation:**

Our smart baby room with IOT stands out with unique features such as cry detection and cradle automation, moisture sensor for diaper changes, mosquito detection and protection, smart lighting and door control, temperature regulation

2. Market Differentiation:

Position our brand as a leader in providing smart solutions for childcare.

3. Enhanced Reputation:

Showcase our commitment to innovation and safety in infant care.

4. Business Growth:

Attract new customers and retain existing ones through the delivery of a unique and advanced childcare solution

5. Operational Efficiency:

Streamline monitoring and control processes, leading to more efficient operations.

4. SCOPE**4.1 Description of the Solution:****1. Cry Detection and Cradle Automation:**

- Develop a sound sensor system to detect when the baby cries.
- Implement an automated cradle that swings gently to soothe the baby.
- Integrate lullabies to play automatically for comfort.

2. Moisture Sensor for Diaper Changes:

- Install a moisture sensor to monitor mattress wetness.
- Send real-time alerts to caregivers when the baby has peed.

3. Mosquito Detection and Protection:

- Deploy PIR (Passive Infrared) sensors to detect mosquito presence.
- Automatically apply a net cover to shield the baby from mosquitoes,

4. Smart Lighting and Door Control:

- Integrate IOT-based smart lights.
- Adjust light brightness based on the time of day.
- Enable token locking/unlocking of the room door.

5. Temperature Regulation:

- Utilize a temperature sensor to monitor room conditions.
- Automatically activate a fan when the room becomes too warm.

4.2 Main Expected Outcomes of the Project:

1. Continuous Baby Monitoring and Safety:
2. Efficient Diaper Management:
3. Mosquito Protection:
4. Smart Lighting and Door Control:
5. Temperature Regulation:
6. Cloud-Based Data Storage and Analysis:
7. Instant Mobile Notifications.

4.3 Boundaries:

- The baby's age can't be more than one year.
- Sensors should strive for high accuracy, but they cannot guarantee 100% accuracy due to variations in fingerprint recognition and environmental factors.
- We will be able to maintain and support only initial setup and basic troubleshooting.
- We are staying within the allocated budget.
- Can deployment within a specific location.

5. BUDGET & TIME ESTIMATIONS**5.1 Executive Milestones:**

- Project proposal
- SRS document
- Progress presentation
- Final presentation with final product
- Final report

5.2 Budget Estimation:

Budget Item	Total
Equipment	Rs.10 140
Development cost	Rs. 2 500
Transportation	Rs. 1 000
Printing & Replacements	Rs. 1 000
Total	Rs.14 640

6. ASSUMPTIONS, CONSTRAINTS AND RISKS

These are the assumptions, constraints, and risks for our **Smart Baby Room with IoT** project:

1. Assumptions:

- Assumption 1: Reliable Power Supply
 - We assume that there will be an uninterrupted power supply to operate all IoT devices consistently.
- Assumption 2: Stable Internet Connection
 - We assume a stable internet connection for cloud-based data storage and remote monitoring.
- Assumption 3: Sensor Accuracy
 - We assume that the sensors (sound, moisture, temperature) provide accurate readings.
- Assumption 4: User Adoption
 - We assume that caregivers will adopt and use the smart baby room features effectively.

2. Constraints:

- Constraint 1: Budget
 - The project must operate within the allocated budget for hardware, software, and installation.
- Constraint 2: Time
 - The project timeline is limited to the second semester.
- Constraint 3: Space
 - The smart baby room design must fit within the available physical space.
- Constraint 4: Regulatory Compliance
 - Compliance with safety and privacy regulations is mandatory.

3. Risks:

- Risk 1: Sensor Malfunction
 - Sensors may fail or provide inaccurate data, affecting baby monitoring.
- Risk 2: Security Breach
 - Unauthorized access to the smart room or data could compromise privacy.
- Risk 3: Integration Challenges
 - Integrating various devices and technologies may pose technical difficulties.
- Risk 4: User Resistance
 - Caregivers may resist adopting new technology or find it overwhelming.




7. WORKLOAD ALLOCATION

MEMBER 1	Dampage V.I. - IT22092724
Smart Lighting and Door Control	
MEMBER 2	Vithanage V. T. M - IT22198204
Moisture Sensor for Diaper Changes.	
MEMBER 3	Jaywardhana K. G. M. S - IT22112996
Cry Detection and Cradle Automation, Temperature Regulation.	
MEMBER 4	Shaethaynie R - IT22315700
Mosquito Detection and Protection.	

DECLARATION

“We declare that the project would involve material prepared by the Group members and that it would not fully or partially incorporate any material prepared by other persons for a fee or free of charge or that it would include material previously submitted by a candidate for a Degree or Diploma in any other University or Institute of Higher Learning and that, to the best of our knowledge and belief, it would not incorporate any material previously published or written by another person in relation to another project except with prior written approval from the lecturer of the module and that such unauthorized reproductions will construe offences punishable under the SLIIT Regulations.

We are aware, that if we are found guilty for the above-mentioned offences or any project related plagiarism, the SLIIT has right to suspend the project at any time and or to suspend us from the examination and or from the Institution for minimum period of one year”.

	STUDENT NAME	STUDENT NO.	SIGNATURE
1	Dampage V.I.	IT22092724	
2	Vithanage V. T. M	IT22198204	
3	Jaywardhana K. G. M. S	IT22112996	
4	Shaethaynie R	IT22315700	