# Project Design Phase-I
## Solution Architecture

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| Date | 14 October 2022 |
| Team ID | PNT2022TMID01794 |
| Project Name | Project - IoT Based Safety Gadget for Child Safety Monitoring and Notification |
| Maximum Marks | 4 Marks |

## Solution Architecture:

### Existing problems:

- The child safety monitoring system via mobile phones is a current growing smart technology among the society.But still the awareness and its importance is not wide spread due to its complexity and high cost.
- Another cause for the invention of this safety gadget is due to the recent news about child abuse and trafficking put parents in anxiety and create an insecure atmosphere for children.

### Solution for existing problems:

- The invisible child safety band consists of a GPS sensor to track the live location and send the information to the synced mobile phone.
- The vibration sensor attached to the invisible child safety band detects the accident.
- The invisible child safety band is efficient and low cost, the awareness of the child safety monitoring system can be spread among the society.
- The child safety band is a user friendly gadget as its functionalities can be controlled via the synced mobile phone like setting the distance range, buzzer indication.

### Structure of the gadget:

- The gadget is designed as a wearable band.
- The child safety band is considered to be invisible as the outer material of the band is similar to the skin color of the child, which is customized by the users.
- This child safety band notifies the parent or guardians if something unusual happens around the child or to the child.

### Characteristics of the gadget:

- The invisible child safety band consists of a GPS sensor to track the live location and send the information to the synced mobile phone.
- The vibration sensor attached to the invisible child safety band detects the accident.
- This child safety band contains 4-5 touch sensors that do specific functions.
- Two of the touch sensors enable flash light and buzzer when touched simultaneously.
- If any one of the touch sensors is touched it turns off the light and buzzer.
- When three sensors are touched it captures the scene and sends it to the parent or guardian mobile connected to it.

- The device guarantees the child safety through constant monitoring via mobile phones, thus reducing the safety concern among the parents.
- The child safety band is a user-friendly gadget as its functionalities can be controlled via the synced mobile phone like setting the distance range, buzzer indication.

**Behavior of the gadget:**

- The device guarantees the child safety through constant monitoring via mobile phones, thus reducing the safety concern among the parents.
- It reduces the risk of the child during emergency situations as the device notifies immediately to the parent when unexpected events happen.
- Thus, the action is taken immediately and the child is protected from further consequences.

**Features of the gadget:**

- The device can be manufactured in different forms according to the convenience of the users, which thereby increases the productivity and sales.
- As child safety bands are low costs, the awareness of the device will be spread among the entire society creating an impact.
- This increases the number of users hence the profit also increases, as the number of users is directly proportional to the profit of the manufacturer.
- The child safety band is a user-friendly gadget as its functionalities can be controlled via the synced mobile phone like setting the distance range, buzzer indication.
- The band is also efficient and faster in communication as the device always synced with the mobile phone.

**Development phases:**

- The child safety band is flexible and can be designed in any form according to the convenience of the user.
- The invisible child safety band can be customized into different ornamental forms,skin color according to the requirement of the user.
- The child safety band has GSM,a module which sends the message from the child to the parent or guardian.
- GPS is a global navigation satellite system that provides location,velocity and time synchronization.GPS is used to track the live locations and send the information to the synced mobile phone.
- The child safety band has vibrator sensor which detects the accident.
- The battery power in the gadget can be recharged with the help of body heat.
- The child safety band has 4-5 touch sensors which contain flash light,buzzer and camera to capture the scene.
- If the child presses the touch sensor then immediately the information will be notified by the parent or guardian.

**Solution requirements:**

- The invisible child safety band is efficient and low cost, the awareness of the child safety monitoring system can be spread among the society.

- The invisible child safety band can be customized into different ornamental forms according to the requirement of the user.
- The battery gets charged with the help of body heat.

**Solution architecture diagram:**

CHILD SAFETY BAND

INVISIBLE BAND IS CUSTOMIZED SIMILAR TO THE COLOUR OF THE CHILD ACCORDING TO THE REQUIREMENT OF THE USER

GSM (SENDS MESSAGE TO THE SYNCED MOBILE PHONE OF THE PARENT OR GUARDIAN)

GPS (TRACKS THE LIVE LOCATION OF THE CHILD)

WEARING SAFETY BAND — NO → CHILD IS NOT WEARING SAFETY BAND (MESSAGE SENT TO THE PARENT)

TRACKS THE LOCATION TO CHECK WHETHER THE CHILD IS WITHIN THE ALLOCATED DISTANCE RANGE — NO → CHILD IS NOT WITHIN THE DISTANCE RANGE (MESSAGE SENT TO THE PARENT)

VIBRATOR SENSOR — IF CHILD IS INJURED → CHILD IS INJURED (MESSAGE SENT TO THE PARENT)

TOUCH SENSOR

TWO OF THE TOUCH SENSORS ENABLE FLASH LIGHT AND BUZZER WHEN TOUCHED SIMULTANEOUSLY

IF ANY ONE OF THE TOUCH SENSORS IS TOUCHED, IT TURNS OFF THE FLASH LIGHT AND BUZZER

WHEN THREE TOUCH SENSORS ARE TOUCHED IT CAPTURES THE SCENE AND SENDS IT TO THE PARENT OR GUARDIAN MOBILE CONNECTED TO IT

BATTERY GETS CHARGED WITH THE HELP OF BODY HEAT