

**Project Design Phase-II**  
**Solution Requirements (Functional & Non-functional)**

Date	03 October 2022
Team ID	PNT2022TMID00392
Project Name	Project - IoT Based Safety Gadget For Child Safety Monitoring & Notification
Maximum Marks	4 Marks

**Functional Requirements:**

Following are the functional requirements of the proposed solution.

FR No.	Functional Requirement (Epic)	Sub Requirement (Story / Sub-Task)
FR-1	<b>Real time monitoring</b>	A strategy that makes it possible to ascertain the child's current position. It involves the zero- or low-latency delivery of continuously updated information streaming. Real-time monitoring software displays relevant data on customizable dashboards.
FR-2	<b>Collection of data</b>	Periodic data tracking with streaming and live updates. They detect and capture different kinds of data. These collections of data will then be sent to the cloud over the internet for securely process, analyze, monitor, store, access and retrieve data remotely. After that, the information indicating children's status, along with reference values will be sent to parents' devices.
FR-3	<b>Authentication</b>	IoT authentication methods, including digital certificates, two-factor or token-based authentication, hardware root of trust, and trusted execution environment. Admins who decide which IoT authentication method to use must consider the IoT device type, the data it transmits over the network and the device's location.
FR-4	<b>Geofencing</b>	The first objective is to obtain a latitude, longitude, and time information of a child's location in real-time using GPS tracker. The second objective is to develop a smartphone application that capable to track the location of children in real-time. The third objective is to evaluate the functionality of the developed smartphone application in tracking children's location. Features, advantages, and disadvantages of three commercialized application are compared to collect requirements.
FR-5	<b>Notification</b>	The sensors output data should be read from the child safety device. The counter time should be checked for time interval of 30minutes. For every 30minutes except serial camera, the data from GPS, temperature, touch, pulse rate data is pushed into the cloud. The monitoring parameters are displayed on

		<p>webpage. The counter is reset to restart the timer. So as to post the data into the cloud for every 30minutes. The sensors data is continuously read by the controller. When the value of temperature read from the sensor crosses the threshold1, notification messages are sent.</p>
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### Non-functional Requirements:

Following are the non-functional requirements of the proposed solution.

FR No.	Non-Functional Requirement	Description
NFR-1	<b>Usability</b>	The application is made to track the child's location round-the-clock. Child tracker helps the parents in continuously monitoring the child's location. They can simply leave their children in school or parks and create a geofence around the particular location.
NFR-2	<b>Security</b>	Each and every parent should take care of their own children, without letting them to fall into the dark world of abuse, which entirely ruin them physically, mentally and emotionally destroying our future. Hence, considering the importance of our future, our project makes it easy for parents to track their children and to visually monitor them on regular basis, which makes them ensure the safety of their children and reduces the rate of incidents of child abuse
NFR-3	<b>Reliability</b>	Schools and working places need high surveillance for ensuring the safety among children and women. Smart phones are playing major role for ensuring the safety, where some mobile based applications provide alert systems. During the emergency, mobile apps alert the control room of nearby police station or caretakers of children.
NFR-4	<b>Performance</b>	GPS is useful for tracking child and also provides the information where the child is currently located as well as it also informs the parents how long his child is far away from his parents. SMS services used when smart phones do not support internet connectivity in this case child is able to send a text message or exact location in the parents. This system is going to help the parents to track the location of their children without informing them because their movement is displayed on the parents phone.

NFR-5	<b>Availability</b>	The solution represented takes advantages of NODE RED, IBM cloud, IBM IoT platform.
NFR-6	<b>Scalability</b>	If any abnormal values are read by the sensor, then an SMS is sent to the parents mobile and an MMS indicating an image captured by the serial camera is also sent. The future scope of the work is to implement the IoT device which ensures the complete solution for child safety problems.