Keeping your medicines cool

Overview

Across the world, millions of dollars' worth of medicines are wasted every year. During a patient's hospital journey, there are many points where medicines wastage could occur. The pharmacy staff can help identify and work on innovative solutions to reduce this wastage.

For certain life-saving medicines, refrigeration at a specific temperature is mandatory. A single refrigerator unit in the hospital stores hundreds of drugs worth thousands of dollars. These refrigerator units are opened multiple times every hour by nurses. Given that the environment in a hospital is one of intense pressure, high tensions, and stress, can we really blame them if they leave the door slightly ajar by mistake? Unfortunately, when that happens, thousands of dollars' worth of life-saving medicines are spoiled and go waste.

This solution is intended to reduce such wastage thus saving money, time and even lives.

Goals

The solution offered needed to meet the following goals,

1. **Identify -** Whenever a door is left open by recognizing rise in temperatures.

2. **Alert -** Nurses and other medical staff about the incident.

3. **Log -** The incident needs to be logged in order to track resolution and compliance

Solution

An innovative Bluetooth powered IoT device with multiple temperature probes attached is used in the field. Each temperature probe is capable of monitoring the temperature of a refrigeration unit or other medical assets.

This device would then interact with the REST API that we provided. It would call the API periodically to report the temperature recordings and on an adhoc basis to alert the server of any excursion outside the configured temperature range.

The server would then record the temperature time series data and process any temperature excursion alerts that the monitor might have sent. The server will notify the medical staff of the excursion on their preferred mode of communication - Email, SMS,

Voice call or pager. It also creates an incident associated with each unique alert raised by the devices that can be viewed on the incident management portal.

This is a classic IoT implementation where 1000's of IoT devices communicate with a cloud server every few minutes. The server processes the data and makes decisions based on it.

We also developed an iPhone application that would allow clients to pair the device with their iPhone via BLE and get real time temperature readings.
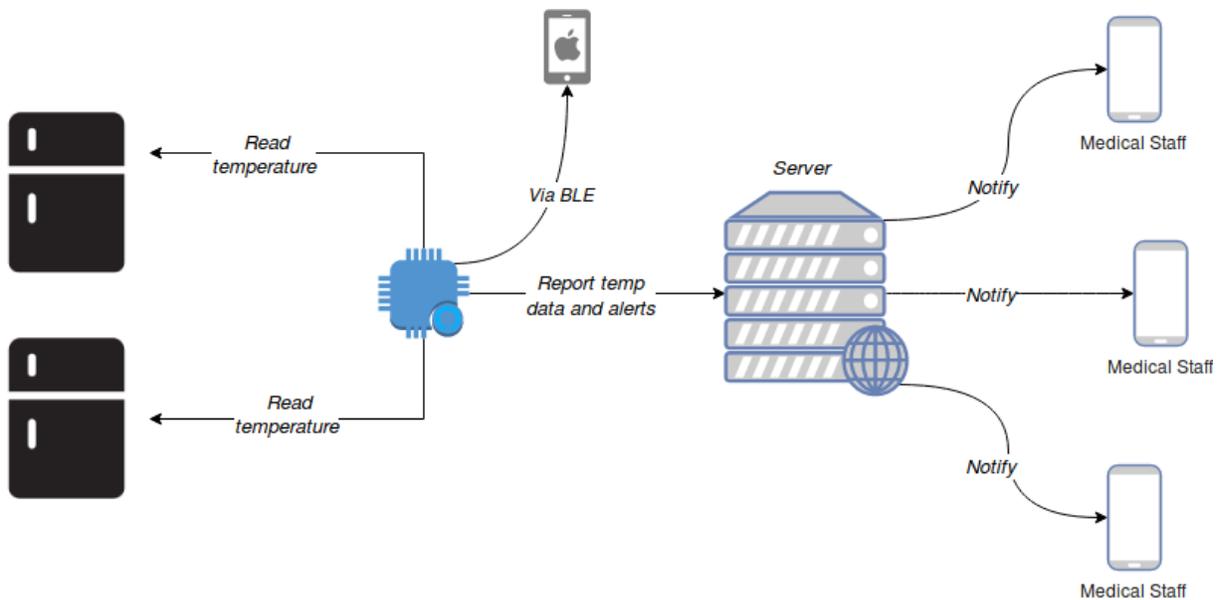
Impact

The system has been in place at 4 major US hospital for over a year now, and during this time it has helped the medical staff identify over 150 cases of temperature being out of range due to the door being left ajar or due to the compressor of the refrigeration unit

failing. *There is a reduction of 85% in such cases.* We've sent out over 1,500 notifications via SMS, emails, pagers and voice calls. Being informed promptly about these occurrences has allowed the medical staff to take immediate corrective action and helped them save tens of thousands of dollars.

Through the incident management system, the medical staff discuss and log the corrective actions taken. It allows them to review the status of incidents, identify the reasons and the corrective actions taken.

The temperature data collected on the server has been used to meet the compliance requirements of the health-care Joint Commission. The temperature data is also used to identify trends and perform predictive maintenance on medical assets.

Powerpath software is an intellectual property of Emanate Wireless, USA. Osmosys is the development partner for this product and is currently maintaining the product.

Team Osmosys always did the right thing for our product and been there for all our needs. As I have said many times, my experiences working with your team continue to be excellent and I am very pleased to have found a software development company I can count on for our software needs.

Gary Sugar
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