

Plumbing Sensor Network for Legionella Control

The goal of this project is to enable data collection on complex plumbing systems, in order to identify and characterize areas at risk for Legionella growth.



Olin College
of Engineering
SCOPE 2019

Legionella

Legionella grows in hot water systems between 68° F and 113° F (20° C - 45° C).

Without proper monitoring and maintenance, it is very easy for areas of a hot water system to fall into the temperature range at which Legionella thrive. In a large system, it is extremely difficult to pinpoint the source of a Legionella outbreak.



Immediate disinfection

158° F (60° C)

Legionella die in minutes

113° F (45° C)

Growth range

68° F (20° C)

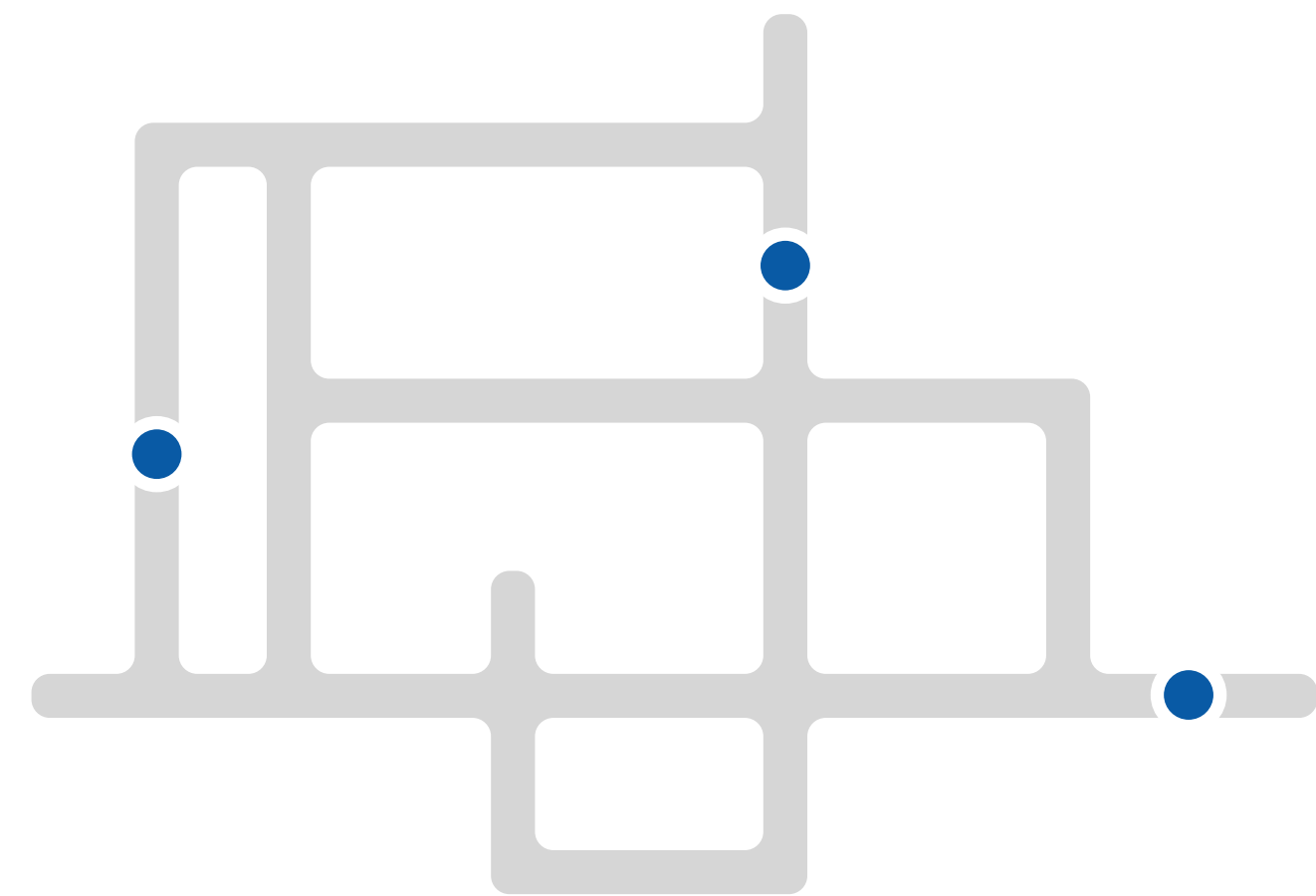
Hospitals

The individuals who are most susceptible to contracting Legionnaire's disease are the elderly, those with respiratory conditions, and those with weakened immune systems. All of these groups can be found in hospitals.

Hospitals also have large, frequently older plumbing systems which pose a higher risk for Legionella growth. This combination of factors creates a high risk environment for a Legionella outbreak.

The three main components of the project are temperature sensing at points of use, connectivity among sensor devices, and data collection to a centralized location.

Our solution is a plumbing temperature sensor network that centralizes data to allow for data collection and analysis.



Simple

Each sensor in the network performs a small number of tasks.

Compact

Sensors are small enough to fit under a sink.

Centralized

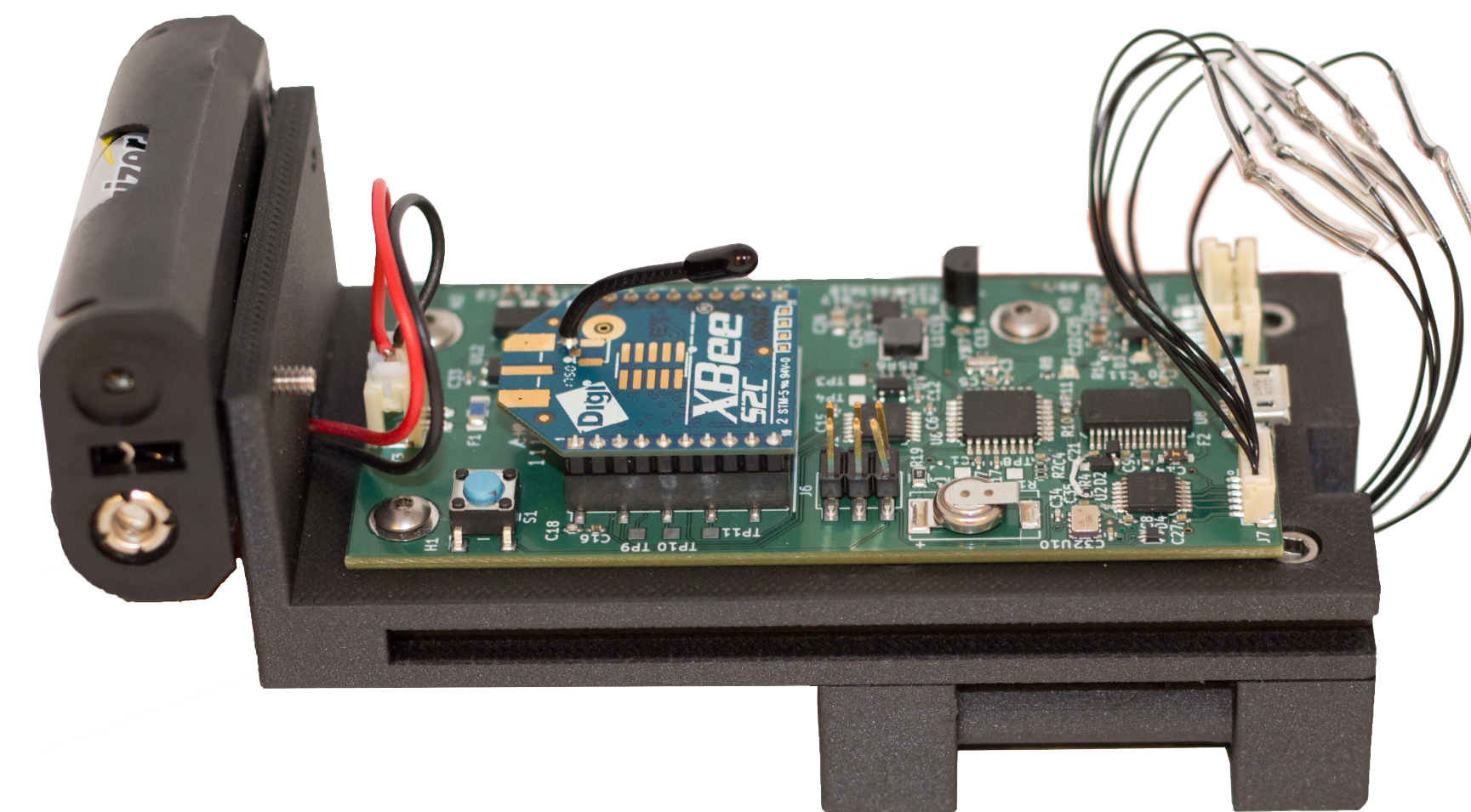
Data is gathered in one central location for analysis of the entire system.

Scalable

The number of sensors can be adjusted based on the needs of the hospital.

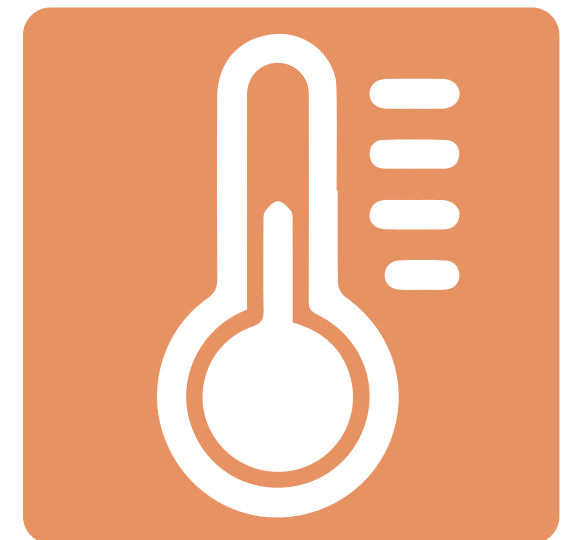
Effective

Sensors are easy to install and automatically integrate into the network.



Temperature Sensing

Sensing the temperature of the hot water at various points of use in the plumbing system allows for identification of potential areas of risk for Legionella outbreaks.



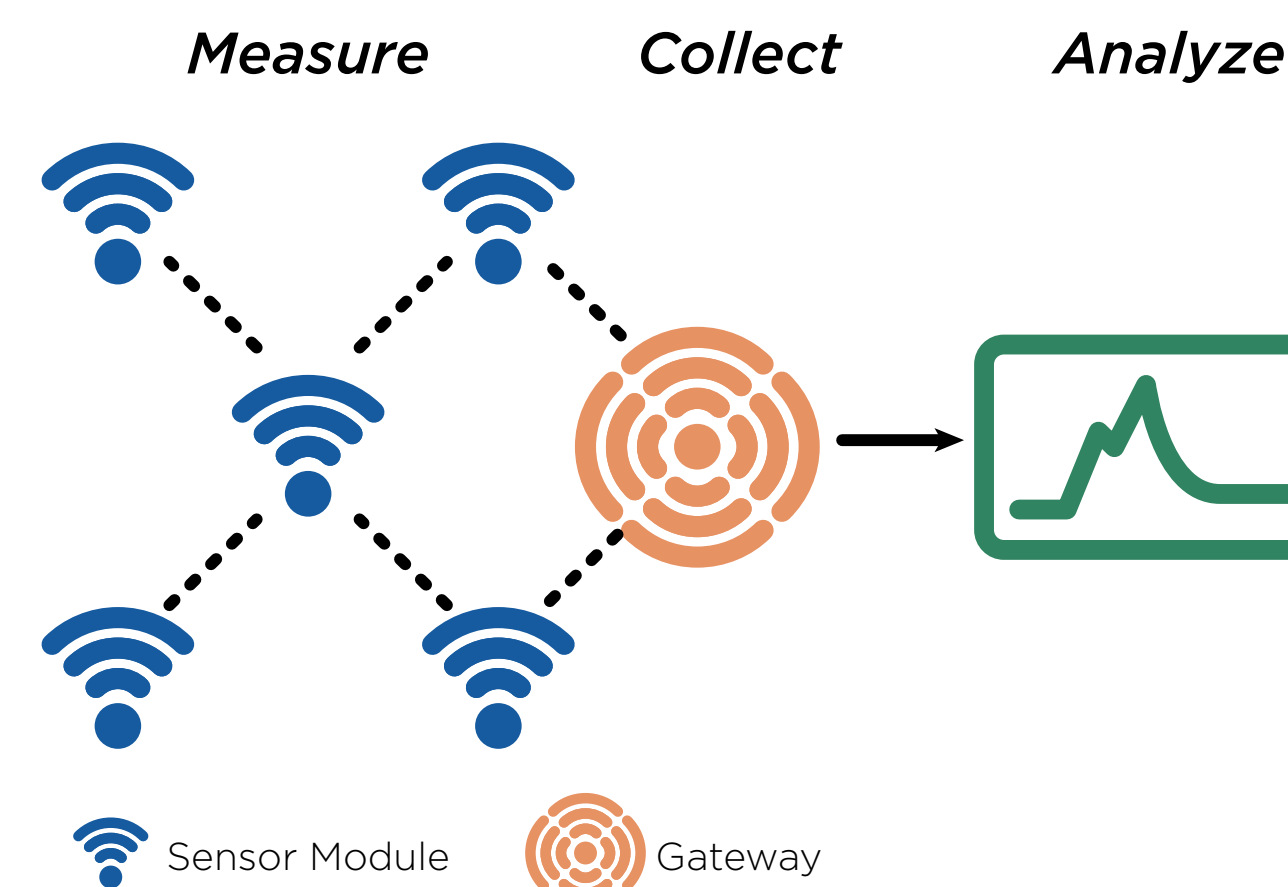
Connectivity

By connecting discrete sensors together in a wireless mesh network, they can communicate temperature data from throughout the hospital to one centralized location.



Data Collection

The data from each sensor in the network is collected in a centralized location for analysis. The data can be used to alert facilities about high risk areas in the plumbing system.



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