

## TECH OFFER

### Decentralized IoT System for Urban Farming



#### KEY INFORMATION

TECHNOLOGY CATEGORY:

Electronics - Sensors & Instrumentation  
Life Sciences - Agriculture & Aquaculture

TECHNOLOGY READINESS LEVEL (TRL): **TRL6**

COUNTRY: **SINGAPORE**

ID NUMBER: **TO174238**

#### OVERVIEW

This Technology Offer is an Internet of Things (IoT) based platform designed to assist the modern-day farmers in monitoring the entire farm seamlessly. It can be customized to suit each farm depending on the type of sensors, machine vision camera, cloud storage, etc., and is equipped with detailed data tracking and analytics to provide the most accurate growth process from start to finish. The software architecture used in this technology offer addresses a decentralized framework to provide the ability to exchange data between IoT devices autonomously without any centralized server. In recent years, the development of IoT applications has become increasingly complex. Thus, this technology addresses this problem by providing the ability to simplify the streaming of data to the IoT platforms over the web. This design can be customized for other applications.

#### TECHNOLOGY FEATURES & SPECIFICATIONS

The software has a light-weight runtime, taking full advantage of its event driven, non-blocking model. This makes it ideal to run

at the edge of the network on low-cost hardware such as Raspberry Pi as well as in the cloud. Real-time data can be easily imported and exported for sharing with others. Plug & Play solutions make it easy to connect various sensors. This system has good fault tolerance as each node runs a distinct component of the web server application software and identical copies of each other. Upon a node failure, the application software can be replaced by another good node easily. The failure and restoration processes of the hardware and software are highly dependent on the status of other components as well as the sequence of failure events. Data can be downloaded from each individual node or from the consolidated database in the cloud.

## POTENTIAL APPLICATIONS

This IoT platform architecture can be applied to the following segments of the market:

- Outdoor farming
- Indoor farming
- Laboratories/research/education institutions
- Home Hobbyist

It can also be applied in the following segments of the market:

Office Building, Home, Hotel:

- Fire alarm system
- Electrical system

This technology is a low-cost functioning system, easy-to-install and is compatible with most standard Internet of Things (IoT) sensors, switches, and gateways.

## UNIQUE VALUE PROPOSITION

This Technology Offer allows modern-day farmers to monitor the entire farm seamlessly. It can be customized to suit each farm depending on the type of sensors, machine vision camera, cloud storage, etc., and is equipped with detailed data tracking and analytics to provide the most accurate growth process from start to finish.