Maximizing the yield of rural agriculture

How the XDK provided optimal conditions on a farm in South East Asia

Introduction and Challenge

Developing solutions for local markets is one of the things Bosch Singapore started to pursue in the summer of 2016. In cooperation with the Singapore Polytechnic University, Bosch is trying to help Indonesian farmers improve their yield by exploring the possibility of collaborating with local polytechnics. In Indonesia, agriculture is one of the key business sectors and provides income for the majority of Indonesian households. Therefore, it is very important for the farmers to monitor the environmental and growth conditions to be able to maximize their yield – and this is exactly where the XDK from Bosch Connected Devices and Solutions can help.

Approach

Bosch Connected Devices and Solutions (BCDS) is offering products in different IoT domains. Besides Connected Mobility and Industry 4.0, BCDS also optimizes the supply chain with connected logistic solutions. Additionally, the Cross Domain Development Kit (XDK) was introduced to simplify IoT prototyping, but now through further developments, the XDK can be used as a universally programmable sensor device. It contains a set of numerous microelectromechanical sensors such as an accelerometer, gyroscope, light sensors and more. All packed into about the size of a tin of mints, the XDK is a powerful tool for any prototype. In this way users get supported while developing new product ideas.

Use Case

Bosch Singapore initiated the project “Local-For-Local” to evaluate the use of Bosch sensors in rural agriculture. The Singapore Polytechnic University was chosen as a potential partner due to their programs, which allows students to go to village communities in South East Asia to learn about local problems and develop solutions. After visiting a post-program exhibition in Singapore, Bosch proposed the topic of using sensors to monitor environment conditions of a mushroom farm. This farm was previously visited by students who will determine the optimal conditions to maximize yield.

Mushrooms require specific growth conditions (humidity, temperature, etc.) for optimal growth; but in most rural communities, farmers rely solely on experience and human judgement to determine these conditions. Therefore, the use of sensors could assist the farmer to ensure these optimal conditions are met.

The Role of Bosch Connected Devices and Solutions
As a leader of innovation, Bosch Connected Devices and Solutions can draw on extensive sensors and software solutions experience. By combining our expertise with partners from different business entities, we enable new value propositions and new ways of value creation.

Concerning the Singapore project, Bosch provided some Cross Domain Development Kits to bring the project to life. Due to the XDKs functions, Bosch Connected Devices and Solutions enables the students to collect, store, manage and analyze different data at the farm. Temperature, humidity, pressure and light were key measurements during the project. Via the online platform the tracked live sensor data was available for Bosch during the whole project.

Solutions and Benefits
The different functions of the XDK made it possible to create a sensor system which is now implemented in a rural mushroom farm in Indonesia. After several consultation sessions with Bosch, the students from Singapore developed two versions of the mushroom farm sensor system, and the final version was implemented in Indonesia in April 2017.

This final version consists of one XDK sensor kit and is able to sense relative humidity, temperature, light and atmospheric pressure. Watering and feedback buttons were included to allow the farmer to indicate watering activity and yield. Data is stored every 15 minutes via a 3G modem on an online platform. Additionally, the student implemented an SMS notification feature to alert the farmer if the farm conditions went out of range.

Conclusion
It has never been easier than it is today to monitor the environment with the help of the integrated sensors in devices. Bosch Connected Devices and Solutions makes this even easier by offering the possibility to develop IoT applications with the XDK. It helps you along the way by supporting you with an online community and mass-tailored solutions for your project.

About Bosch Connected Devices and Solutions
Bosch Connected Devices and Solutions GmbH is based in Reutlingen, Germany and is a 100% owned subsidiary of Robert Bosch GmbH. As an innovative company, it serves the new market for the Internet of Things. We offer compact electronic devices, comprehensive software and end-to-end solutions in many fields of application. Our main businesses are in the areas of Connected Mobility and Industry 4.0 & Logistics! We improve everyday life, increase comfort, security and productivity.

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