Food Tracker

Farm-to-Fork Monitoring with XDK from Bosch

Introduction and Challenge

When you go to the supermarket or to a restaurant, you are effectively placing your health and trust in the hands of many people you have never met. The farmer, the transport companies, processing plants, food inspectors, and many more. And the way they keep you safe is completely old-fashioned: the transport truck might have a thermometer. The processing plant has well-tested processes that have worked in the past. Food inspectors might test every hundred or thousand items that go through the line.
But this system has problems. What if a worker isn't doing his job correctly? What if the transport truck breaks down along the road? What if an inspector misses a defective or dangerous batch? There must be a better way.

Approach

Takeru Kogawa looked at the current system and recognized a solution. The Internet of Things or IoT provides 21st-century solutions for every part of our lives, and it can also provide improvements to food safety. Rather than taking a top-down approach to the food supply chain, he uses a bottom-up approach by using smart sensors. By exactly measuring the conditions at every step of the way, you can ensure top quality products for consumers.

Think of the logistics chain like the human body. Roads and railways form the veins and arteries. Trains and trucks are the blood cells carrying food and nutrients to the organs. But the human body does not use the brain to seek out infections. Everywhere in the body, the cells are constantly on watch to keep the entire system working.

Kogawa chose the Bosch Cross Domain Development Kit (XDK) to realize this project. The XDK serves as the white blood cells in the food chain. The XDK contains a sophisticated suite of sensors to collect a wide range of data. The XDK is small and versatile enough to keep track of every shipment, and give early warning if something goes off track.

Use Case

The XDK food tracker works as follows: The XDK is combined with a battery and an SD card to store data on food conditions. It can optionally upload data constantly to the cloud over Bluetooth, Wi-Fi or an additional cellular connection. Each XDK is assigned to a pallet or individual package, depending on the good, based on the item's freight key.

The full range of sensors comes into use for this project. The integrated temperature sensor makes sure shipments do not get too hot or cold. The humidity sensor ensures conditions are not too damp. The accelerometer and gyroscope checks that the goods are handled properly and with care.

In a pilot project, the XDK food tracker is being used in a Coffee Shop. Customers can interact with the tracker and get detailed information about the items for sale. In a next step, it is planned to expand the use of the tracker to other areas of the distribution chain. Kogawa also plans to move into other industries where storage conditions are important, such as artwork and antiques.

The Role of Bosch Connected Devices and Solutions

As an innovative company, Bosch Connected Devices and Solutions (BCDS) can draw on extensive experience in sensors and software solutions. Partners, including Bosch Sensortec and Akustica, show our added value by combining innovative proposals with low barriers to market entry.

The Bosch Cross Domain Development Kit (XDK) from BCDS offers an all-in-one scalable hardware platform with ready-to-use software. There is no need for component selection, hardware selection, hardware assembly, or deployment of a real-time operating system. Drivers for all system components are included.

In addition, BCDS offers the XDK Workbench. This development platform can be downloaded free of charge. Sample applications and a user community are included with the package.

The XDK is ideally suited to the current project. It provides a powerful array of sensors and connectivity options in a tiny, low-cost package. In short, the XDK is virtually all the food tracker needs to work.

Solutions and Benefits

The USDA estimated that over 96 billion pounds of food was lost to spoilage in a single year. At the micro level, certain foods can be very expensive to produce: truffles, wagyu beef, and other gourmet items. You really don't want to let this food go bad.

The XDK food tracker supplements the current top-down food controls with a bottom-up approach. It allows suppliers to know the exact conditions at all times for every single shipment they send out.

This groundbreaking new idea has the potential to revolutionize the logistics industry. Suppliers can reduce food recalls – or worse, tainted food scandals – before they occur. They can recognize trouble spots more easily and improve the delivery process.

And the XDK food tracker can benefit more than just foods. Unreplaceable items like artwork and historical items can be kept under precise conditions. Precision equipment can be controlled as well. Restaurants can prominently display a seal of quality – or even detailed tracking data – to prove they care about customer health.

Conclusion
The inefficient and imprecise current mode of sell-by dates and shipment tracking can be improved significantly. The XDK food tracker shows one way that this can be achieved. The XDK food tracker constantly monitors all conditions for all shipments at all times. Everyone benefits from this solution.

Consumers benefit from increased safety and transparency. Companies benefit by reducing spoilage and improving their information about the logistics chain.

The solution can be implemented at low cost with off-the-shelf Bosch hardware. The high-quality sensors in the XDK from Bosch virtually eliminate the need for additional parts.

Software setup is easy with the open-source tools and full support of Bosch Connected Devices and Solutions.

We at BCDS, with our experience in IoT, are the right partner for sensor-based IoT projects. We increase comfort, security and productivity by enabling new business models for global markets, improving all areas of your life.

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 and Logistics! We improve everyday life, increase comfort, security and productivity.

Europe
Bosch Connected Devices
and Solutions GmbH

Ludwig-Erhard-Straße 2
72760 Reutlingen
Germany

Contact us worldwide:
info@bosch-connectivity.com
www.bosch-connectivity.com

Asia Pacific
Bosch (China) Investment Ltd.

333 Fuquan Road North,
Changning District
Shanghai
200335 P.R.
China

North America
Robert Bosch LLC

161 N. Clark Street
Suite 3550
Chicago, Illinois 60601
USA

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