



A NEW ERA IN DEVICE DIAGNOSTICS AND SUPPORT.

SUMMARY

Woluxi provides As-a-Service diagnostics and support solution that allows hardware companies to lower their customer support costs and provide better support experience for their customers. For the end consumers it is as simple as pointing their mobile phones at a misbehaving device and the app will display workarounds or connect the customer to support, without the need for looking up manuals or searching for support contact info.

It builds on the existing state-of-art technologies, like computer vision, image recognition, web services and containers to provide a shared platform for real-time diagnostics, analytics and support for multitude of hardware devices with differing form factors and capabilities.

SOLUTION

Woluxi uses the existing device LED in an innovative way, it uses the LED to transmit error codes and diagnostic information, using a binary protocol similar to Morse code and interpreting them using a smartphone. Due to the ubiquity of LEDs in devices and smartphones with end-consumers, this novel solution does not require any hardware changes to the device, only firmware upgrade to add required software. Obvious advantage is that the devices which are already in the field can also incorporate this technique.

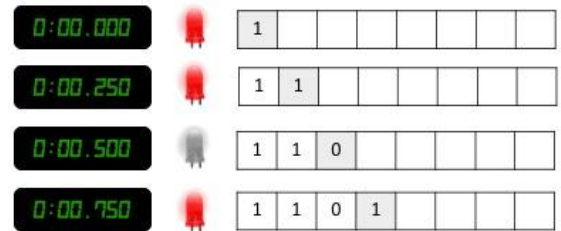


FIGURE 1- DATA TRANSMISSION FROM BLINKING LED AS TIME ELAPSES

It consists of 3 components

- **“Woluxi library”** embedded in the device, controls the blinking of LED to send out information from the device using a predefined protocol, where ON means logic-1 and OFF means logic-0 at a fixed duty cycle.
- **“Woluxi scanner”** mobile app scans the blinking status light and presents the consumer with a user friendly message.
- **“Woluxi web service”**:
 - Decode and translate the message into a user friendly message.
 - Provide high confidence workarounds.
 - Function as Issue tracking system for bugs filed with mobile app.
 - Serve as a portal for vendors.

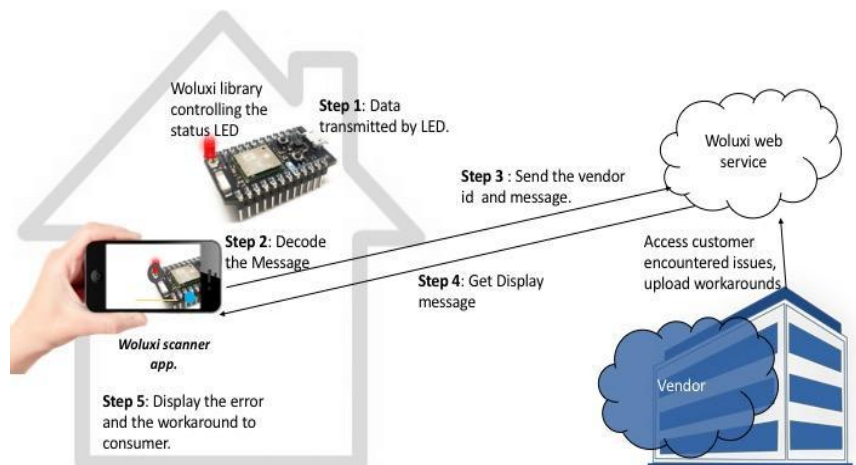


FIGURE 2 - OVERALL ARCHITECTURE OF WOLUXI

HOW TO INTEGRATE WOLUXI IN YOUR PRODUCT

1. Manufactures would register for a unique vendor id using the Woluxi portal.
2. Integrate the Woluxi library in their product, utilize the vendor id and use it to construct diagnostic messages.
3. Provide microservice/container/service for converting message data to useful error messages and provide workarounds.
4. Utilize Woluxi portal to obtain the customer reported issues, obtains metrics and analytics reports.

HOW CONSUMERS WOULD USE WOLUXI

All that the consumers need to do is to install the Woluxi app and point it at the device having an issue. The Woluxi app will:

1. Scan the blinking LED and construct a data message.
2. Send data message to Woluxi backend to obtain user friendly message and workarounds.
3. If still having issues, the customer has to option to dial/email the support at the device vendor using the app. At this stage the support has access to the data message from step 1 and can lead to faster diagnosis.

ADVANTAGES

- Overall it helps in major cost savings related to support and return logistics as this helps in avoiding unnecessary returns of the product.
- In most common simple or configuration related errors, Woluxi phone app enables the end users to identify the issues and resolve it themselves without making any support calls (cost savings as less support calls).
- The customer support will save time asking the customer for problem description.
- This solution can be deployed as a “last-resort” diagnostic tool for high-end devices. When other diagnostic channel such as networking stack, Wi-Fi connectivity, Bluetooth connectivity, etc. fails, this technique would still work and hence can be used to extract information out of a non-working device.
- From end user or consumer perspective, it is much better user experience when using Woluxi phone app. No need for looking for the manual or finding any other details.
- This is good for the environment as a device would be fixed more often that sending it to the land-fill when it fails.

CONCLUSION

This represents a new way of obtaining diagnostics as a service that makes the customer service representative’s life easier by eliminating the ‘lost in translation’ kind of errors. Since this technology can be incorporated in the end device via a software update, devices already in the field can also benefit from it. No hardware change required. Most importantly it enables a smoother customer service experience for the end customers.