Business Design IoT Sensor Kit

Purpose

In some cases it is not possible to gather information about specific user or system behavior by interviewing or by just observing people. This is especially the case when:

- the specific behaviour happens too fast or too often to be documented manually
- the setting restricts us in observing the specific behavior
- the characteristics of the behaviour are of such kind that it simply needs sensitive sensors (e.g. measuring forces, light, temperature, motion...)

Also the collection of data from technical devices, products or infrastructure usually requires sensors in the field that collect and transmit data to a central server. For these cases, we have developed our own IoT Sensor Kit for Business Design projects, which enables us to measure all sorts of things to send data to servers and display them in dashboards in real-time.

Usage Scenarios

- Understanding user behavior in a specific situation
- Tracking technical data from machines, products and infrastructure

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Instructions for Coaches

1. Technically, there is almost no limit to sensor setups. Just as in interviews, the team needs to be aware beforehand of what they really want to find out. There is no meaning in using sensors because it is trendy and cool.
2. The effort needed to learn how to set up a sensor system including data transmission, processing, storage and visualization is often underestimated. If there is no one in the team having done this before, there's probably

The IoT Sensor Kit

This kit contains already pre-configured wireless sensors. By using 4G cell transmitters, these sensors can be used even in very remote places. If needed, the sensor setup can be configured to fit countless use cases.

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How to Use the Kit

Step	Comment
Situation	Describe the situation in which the specific behaviour occurs.
Behaviour	Describe the specific behaviour of a user or a technical system which needs to be captured. And describe why capturing with sensors is more suitable than observing or interviewing.
Sensors	Choose suitable sensors to capture the behavior. Examples of sensors: • Motion/acceleration sensor (1,2 or 3 axes) • Force sensor (grams to tons) • Tactile sensors • Air pressure sensor (also measures altitude) • Humidity sensor (in fluids or in gases) • Distance sensor (mm to meters) • GPS sensor for geographic location • Temperatur sensor • Light sensor • IR sensor (infra red) • Magnetic sensor • Gas sensors (variety of different gases possible)
Frequency	Define how often measurements need to be taken (100 times per second? Once a month?). And define whether you need real time data.
Actuators	Clarify whether the user needs to be given a certain response when a specific behavior is detected. Responses could be given visually, acoustically or haptically. Often, direct user-system interaction is facilitated by displays and buttons.
Data transmission	Define how the sensor data shall be sent. Is a Wifi network available? Or will you need to use a cell phone network to send the data? In the special case of an autark measure-and-response setup it might not be necessary to send data at all. In this case data processing is done within the microcontroller in-situ.
Data storage	Data needs to be stored somewhere if it is to be reviewed. Storing could be done on a remote server or on a local drive. Which one to choose depends on the use case, the amount of data and the availability of networks.
Data analytics	In most cases sensors spit out raw data which needs to processed. This can be done within the microcontroller or on a remote server.
Data visualisation	Finally, data often needs to be visualised in oder to draw conclusions or make decisions. Dashboards are a common way to display aggregated data. Dashboards can be realized stand-alone or can be integrated in software prototypes. A simple but powerful dashboard comes with the Project Workspace.

not enough time to dive into the topic. Talk to experts...and use the Business Design IoT Sensor Kit.