DISCOVERY WORKSHOP

iBot works with the client to create a comprehensive requirements document through a discovery process.

1

THE BRIEF

With the advent of Industrial Internet of Things (IIoT), a new opportunity emerges to innovate entire manufacturing ecosystems.

While machines were always connected to controllers, and sensors have been in use for several years, IIoT is a new revolution because it is now more practical to

connect these same machines due to lower cost of sensors, better connectivity, and superior ability to manage the integration between physical world of machines with that of the digital world. Platforms such as that of iBot's make it easy for these two erstwhile worlds – digital and physical - to join together.

iBot has been engaged with customers whose core operations have substantial manufacturing component, besides managing supply chain, channels, etc. In the context of manufacturing operations, the focus of improvement of our customers are the follows:

- Availability
- Scalability
- Reliability
- Economy

all leading to superior asset utilization and improved productivity.

This customer is part of a conglomerate with leadership in consumer, industrial and retail segments. One of the several hundred manufacturing units of the company is designed to produce soaps. Led by IT and operations leaders, the organization embarked on a Digital/IIoT initiative with high level objectives of improving asset utilization and productivity.

Over multiple interactions with stakeholders including plant officials, the following specific objectives were identified for the overall initiative:

1. Measure Energy Consumption at machine level, as opposed to that of plant or at best plat unit level
2. Track Performance of Soap Finishing Plant
3. Implement Predictive Maintenance
4. Identify Production Leakages

iBot's engineers personally visited the plant and spent 3 days to understand the plant's set-up and operations. The engineers identified specific steps that would be required to accomplish each objective above and published a detailed report to the customer.

Since this is a first attempt at IIoT implementation, the scope of the program was identified to be the first item – measuring energy consumption under three heads: (a) Power (b) Fuel (c) Steam. This was the choice because this would potentially help save the huge costs being incurrent on energy. Further, a solution for energy saving would be replicable across all 40 soap manufacturing plants the organization has established globally.

The heart of the connected machine is the revolutionary iQu tech, which was retro-fitted into this machine.

MACHINE INTERFACE DEVELOPMENT

With the clarity of project scope at hand, iBot's engineers visited the plant and undertook a detailed engineering study of the plant focused on electricity, fuel and steam flow measurements. In depth interaction with the plant's instrumentation and electrical teams was required to understand characteristics of specific equipment and controls.

iBot proposed to leverage some existing sensors, while proposing to install new ones in other locations. In a few exceptional cases, existing sensors feed data to SCADA system. iBot's engineers proposed an innovative solution to leverage this information while at the same time ensuring continuity of existing operations.

Senior management of the plant was briefed on the process of implementation of an IIoT solution, including any requirements of shutdown of specific units. Deliberations were also undertaken to work out ways to minimize impact of implementation – such as how the downtime could be limited to specific areas of plant, as well as to shorten the downtime.

The data from the plant would be received by iBot Hive which is a cloud environment hosted on Microsoft Azure. Application for consumption of this data, including alerts, MIS and analytics will be developed on this platform. The specification of these applications were also defined simultaneously.

2 a

A detailed solution approach was prepared based on this visit and mutually signed off, which would be put into implementation.

The integration of iBot system with the plant equipment varied depending on the nature of the measurement. For steam and gas flows, the interface is 4-20mA, whereas for power, the Current Transformer installed in the plant generates 0-5A. Appropriate interface engineering has been undertaken to accommodate these ranges.

iBot devices are powered by mains power, and the necessary supply was worked out with cooperation of the plant's electrical and instrumentation teams. Further, enclosures with IP65 rating have been procured and engineered to meet the stringent operating requirements of the plant environment.

APP DEVELOPMENT

3

IBOT's software engineers and designers create efficient and beautiful interfaces for the machine, user, and machine manufactures to talk to each other, securely.

WRITING
THE SOFTWARE
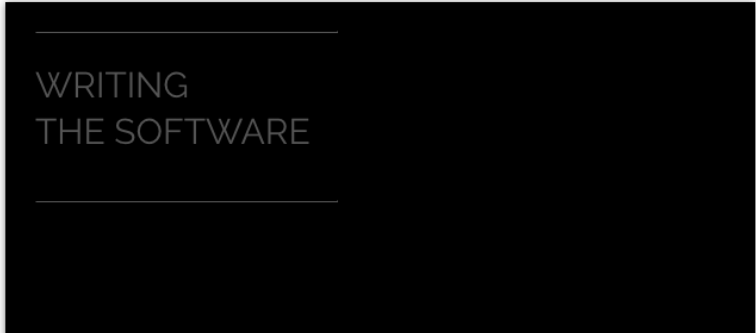
The firmware of the system focused on receiving a signal from flow sensors or current transmitters, validating the signal, and transforming the information into a data value that reflects the actual flows and power consumption.

3 a

The data is transmitted to cloud over GSM/GPRS.

MOBILE AND WEB DEVELOPMENT

4

MOBILE AND WEB DEVELOPMENT

A dashboard depicting the location and data available from iBot devices deployed in the plant is developed. It shows location, graphical variation, and actual historical data. The data can also be downloaded in Excel format for any specific analysis.

4 a

4 b

4 c

SMART FACTORY GOES LIVE!

The solution was extensively tested in iBot's labs, and once there was an agreement amongst the stakeholders on testing methodology and results, the devices were deployed in the plant. The results have been encouraging, and plans are afoot to deploy similar solution across all plants of the customer.