

HOW WE DID IT



DISCOVERY WORKSHOP

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

1



A coffee making company is known by the fragrance it generates in its stores. That's what pulls the consumers to its outlets.

A major coffee vending manufacturer and brand in India was seeking to take their stores to the next level – coffee machines should never shut down, coffee beans should never run out of stock, and customers should always get the same consistent flavour of coffee that they are accustomed to, whichever coffee shop of our client they step into.

That's where iBot comes in. We worked with this manufacturer, and installed one of their vending machines in our own office. We semi-automated this machine first, just to know the numbers of cups of tea or coffee dispensed by the machine. That got us started with the journey to building a Smart & Connected Coffee Vending Machine.

The objectives that our client outlined focused on are improvement in operations visibility (When do we replenish coffee beans in a given store?) and reduction of service costs (Is there anything wrong with this machine? Is it likely to suffer a failure? If so, why and when?)

MACHINE INTERFACE DEVELOPMENT



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

2

MACHINE INTERFACE DEVELOPMENT

Like we do with most machines, our engineers took the coffee machine apart (and suffered the ire of rest of the staff because their regular supply of caffeine suddenly stopped while the machine was being studied). We understood the operations of vending machine, and assisted by the engineers from our client, worked out the mechanism of its operations in future when iQu Connected Processor would operate it.

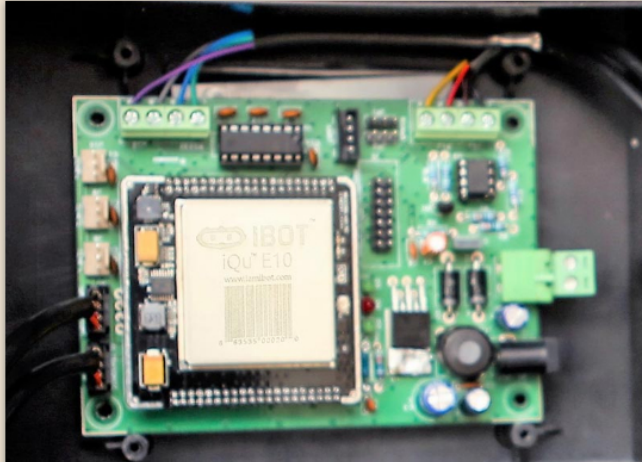
We identified a few important aspects that contribute to the vending machine's operations and customer experience. The temperature of coffee served, the quantity of beans ground, and the quantity of coffee dispensed are the key parameters.

2 a



iBot engineers, with help from client's engineering teams, understood the way these and other parameters of the machine are set and modified, and designed a scheme to run it more efficiently with iQu. A Base Board was designed to help integrate iQu Connected Processor and the coffee machine. This combination PCB would replace the traditional "non-connected processor" which previously operated the coffee machine.

2 b



The Base Board provides interfaces to monitor and control the heating element (temperature), coffee content (the grinding time), and the coffee quantity (dispenser time). Inputs to the Base Board are received from the iQu Connected Processor.

2 c



The assembly of Base Board + iQu Connected Processor are installed in the door of the vending machine, and the slot is closed so as to protect the entire assembly from the environment.

APP DEVELOPMENT



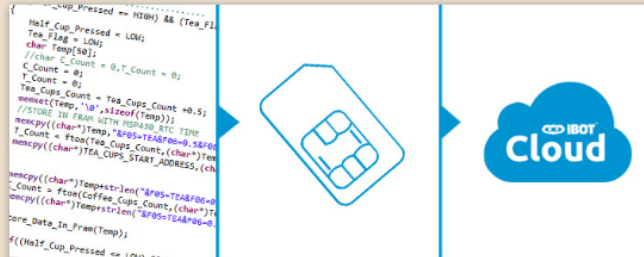
IBOT's software engineers and designers create efficient and beautiful interfaces for the machine, user, and machine manufactures to talk to each other, securely.

3

WRITING THE SOFTWARE

iQu Connected Processor and the Base Board are programmed to operate the vending machine. The "firmware" which takes in these instructions are coded on these processors by the iBot engineers. The firmware performs three key functions. Firstly, it monitors the state of the coffee machine – including to know whether the machine is on or off. Secondly, it instructs the electromechanical parts of the machine to operate based on user instructions which are passed on to it through the keyboard or cloud. Dispensing coffee at the press of a button is one example, and initiating a flush of the machine is another. Finally, the firmware takes instructions from iBot Hive and sets operating parameters based on the inputs provided.

3 a



Once we worked out the existing PCB's functionality we started designing an interface - an intermediary PCB to connect the machine to iQu, which would then connect the machine securely to the cloud. While the interface and functionality was finalized our mobile and cloud app teams started with the UI design and coding.

MOBILE AND WEB DEVELOPMENT



4

MOBILE AND WEB DEVELOPMENT

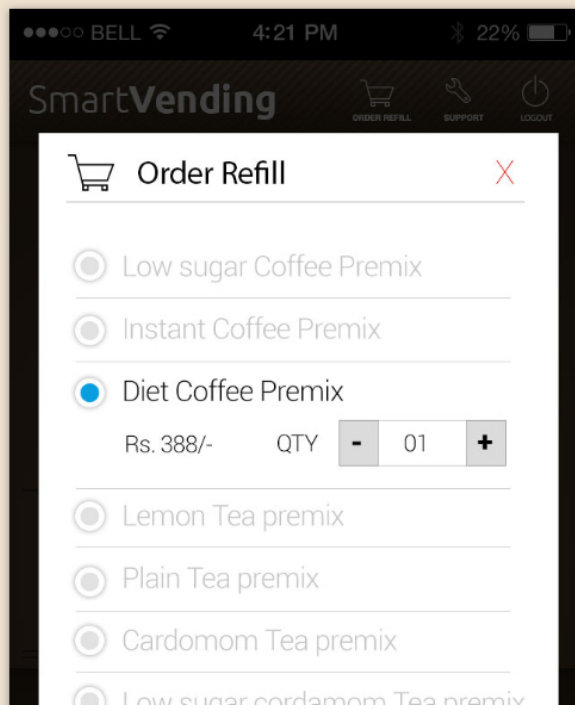
A coffee shop operator is the target customer of this story. She would like to know the cups of coffee consumed on a given day, as well as MTD or YTD. The operator would also like to know when to reorder coffee beans. The mobile app is designed to make the life of a coffee operator simple, so that she can focus on provisioning superior customer service.

4 a



The mobile app shows numbers of cups of coffee and tea dispensed on a day, and total cups from the beginning. This app is 'live' which means the numbers of cups will increase as and when the vending machine dispenses them. The operator can also report issues by entering it on the mobile app instead of calling a toll free number.

4 b




Low sugar cream tea premix

Ginger Tea premix

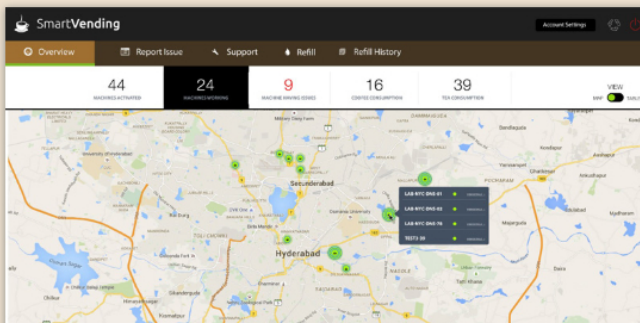
SUBMIT ORDER >

Cafe
DESIRE

Powered by  iBOT

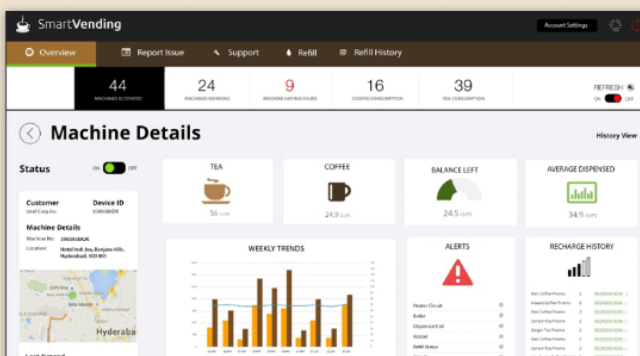
The operator can order refills of a particular bean or premix based on the type of the machine, and the preferences of the customers.

4 c



iBot's client uses a web-based interface to know where these machines are located. This is an important variable – we have learnt over the past quarter that the consumption of coffee is more in Southern states of India as compared to the Northern states, where tea is a clear winner!

4 d



The web-based app provides significant detail on the health of the machine including alerts, recharge history and an ability switch on/off the vending machine. Further, iBot's client can remotely set the parameters of the machine so that the quality, quantity and temperature of dispensed coffee can be modified as appropriate to a region or customer profile.

IQU POWERS SMART COFFEE IN 7 DAYS!



iQu Connected Processor-enabled coffee vending machines undergo testing at various levels – hardware, firmware and software. The testing is undertaken to ensure the customer consistently gets coffee at the right temperature, quantity, and quality. Once signed off, the machine is ready to roll off the assembly, and on into the coffee shop. We welcome you to have a hot cup of coffee!