

THE ESPRESSO TEA MAKER WITH IOT

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Abstract:

In today's world every process is completely automated with the help of the Internet of Things concept. So why not a tea maker with IoT? So according to the design and development of IoT, here comes Espresso Tea maker with IoT to enhance our daily life in an automated way. This helps make our daily routine more bright. We can prepare a cup of tea in one go by tapping on a single button. This following automation comes under the concept of User-Interface, Arduino Mega Controller, and Raspberry Pi which makes our tired day more freshful with a cup of tea within minutes.

Keywords: IOT Tea Maker, Smart Tea Maker, Advanced tea technique

I. Introduction:

IoT is emerging in the world in a broad way and making our everyday life automated with one tap. Automation helps the people to do their work in an easier way. Espresso Tea Maker helps us to make a cup of tea within minutes without standing for more time near the burner even on a tired day. This tea maker concept with IoT brings a new automated way with the systematic methods ensuring to manufacture a tea maker with IoT concept.

II. Literature Survey:

Across the globe there are different espresso coffee machines with different concepts but there are no Tea makers which make fresher. There is a small tale to know before enhancing the tea maker concept. A person who comes home working on a bundle of projects. But when coming home to relax he got to make tea but there was 0% energy to make tea. This situation comes to everyone who is very fond of tea and feels tea is fresher. So, the tea maker with the IoT concept helps the same person to make tea even with 0% energy and just one tap and relax.

There are many basic concepts of coffee maker with IoT but the preparation technique might be different than tea. It can be portable and no heavy machine is carried out over.

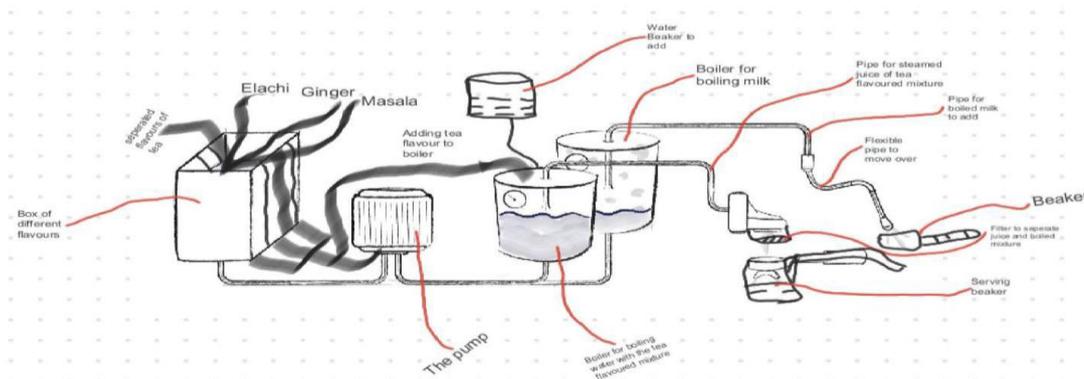
This concept explains the tale of a tired person before and after the Espresso Tea Maker.

III. Proposed System:

Espresso tea maker has three boilers inside with separation of boiling tea powder which gives us tea decoction, and another boiler for boiling milk at a given medium flame by the microwave radiation, and other one getting two boilers component into one, by filtering and mixing over with some medium flame and

which is attached to opening capsule. The three boilers are attached to an air pump which helps the boilers to pass the component from one boiler to another boiler. This process starts by the User interface on top of the machine with a small touch screen having three buttons one for preparation of tea and another one for temperature and another one to clean the machine after 10 gos. This system is with the help of the internet which is connected to wi-fi. It continues only after inserting a coin to it. The push-button interface and electronic board are replaced by the new graphic touchscreen and Arduino Mega microcontroller, respectively. The previous functional switches installed inside the machine are still available for hardware configurations and maintenance purposes. The touchscreen offering serial-networking feature can directly connect to the Arduino Mega microcontroller, which is the machine controller. The Raspberry Pi module is installed for data transfers between the upgraded vending machine and the Ubidots cloud server via the Internet. The Node-RED processing on the Raspberry Pi is defined as the IoT device using message queuing telemetry transport (MQTT) protocol. The Arduino Mega board and the Raspberry Pi module operate and communicate together through the Modbus RTU protocol. Thus, the Raspberry Pi module functions as the gateway that converts from the Modbus RTU protocol to the MQTT protocol and vice versa.

Inside Mechanism



IV. Design and Development:

In the process of collecting information, there are a lot of references I referred to. Most information is taken from journals and articles regarding Espresso coffee machines.

Hardware Requirements:

The entire project is done with hardware requirements which are more important to the project.

Below there are list of hardware requirements for the project:

1. Arduino Mega 2560:



2. Raspberry Pi Node Red:



3. UI - Touch Screen:



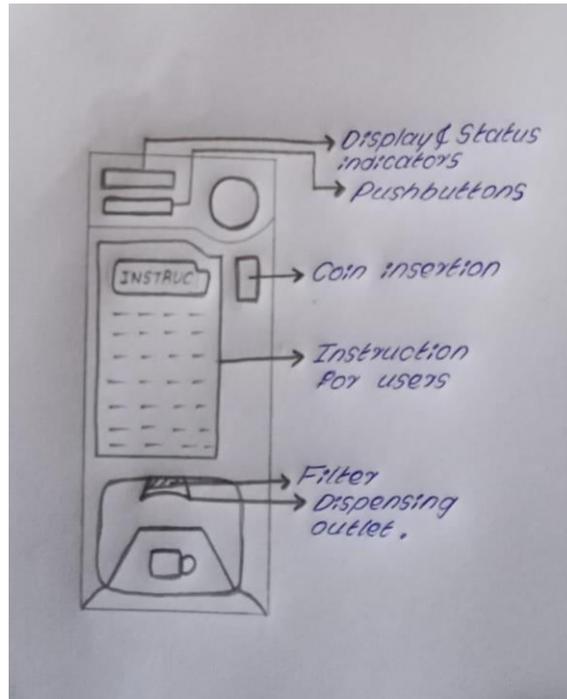
Above hardware requirements are taken from the web. These hardwares are importantly used to implement Espresso Tea maker.

V. Implementation Techniques:

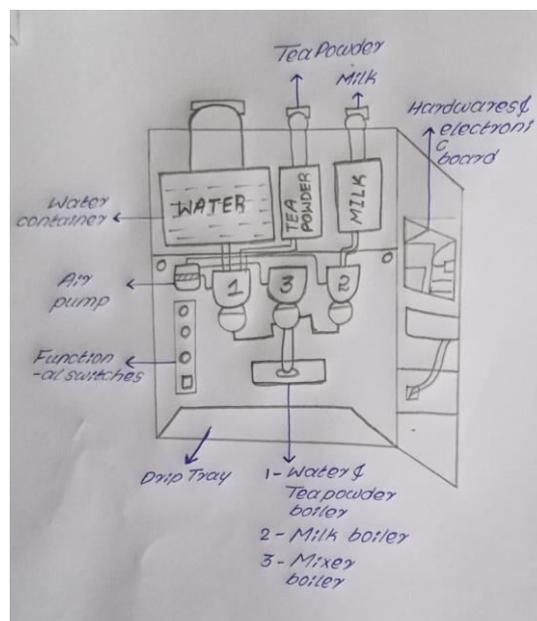
On a cuboid shaped wooden box, we will be having a UI touch screen attached on top to signalize. Working requirements can be done with Arduino Mega 2560 which is attached to the downside of UI touch screen

and which is together with Raspberry-Pi Node Red. The previous functional switches installed inside the machine are still available for hardware configurations and maintenance purposes. The touchscreen offering serial-networking feature can directly connect to the Arduino Mega microcontroller, which is the machine controller. The Raspberry Pi module is installed for data transfers between the upgraded vending machine and the Ubidots cloud server via the Internet. The Node-RED processing on the Raspberry Pi is defined as the IoT device using message queuing telemetry transport (MQTT) protocol. The Arduino Mega board and the Raspberry Pi module operate and communicate together through the Modbus RTU protocol. Thus, the Raspberry Pi module functions as the gateway that converts from the Modbus RTU protocol to the MQTT protocol and vice versa.

Cups in the dispenser are required to be monitored to ensure the machine operation status. The temperature of hot water as well as the ratios of instant powder and hot water for brewing the beverages can be controlled to ensure the consistency in quality and taste of products. After inserting the 10-bath coin, the customer can choose the beverage menu and check the machine operation status from touchscreen displays. To produce the selected beverage, the electromagnetism valve is utilized to pour or intercept hot water into the cup. The feeding motor is used to discharge the instant drink powder, while the stirring motor is used to stir the instant drink powder into hot water. The machine operation parameters and purchase transactions are recorded in the Arduino Mega board. The Node-RED editor for flow-based programming to automatically transfer the recorded data to the cloud computing server. To provide gateway function, the Node-RED Modbus node properties such as function code and address are required to be configured. Similarly, the Node-RED MQTT node properties such as server and port are required to be configured. Tea makers have partitioned box of Elachi, Ginger, and Masala flavoured tea powder. So the opening capsules located down of the three partitioned box and that capsule connected with our device's bluetooth. So when we select the particular flavour of tea the particular capsule opens and the flavoured tea powder goes through the pipe into the beaker. With the help of an air pump the powder will go to the water boiler and the boiler consists of 15 degree celsius. And on the other side milk which had been added will boil upto 15 degree celsius. And the timer will be attached to both boilers, in 15 minutes both the boilers will boil and give us the product. The boiled powder comes out completely with the help of an air pump attached to it. The powder will be filtered out from the filter and gives us the decoction with tea flavoured powder. And on the other side the milk boiler gives the milk which should be added to the decoction. The IoT hardware connected to the buttons and the opening capsule, and software attached to it and that software being connected to web applications with the wi-fi connection. So cloud computing with IoT helps us to get the process done.

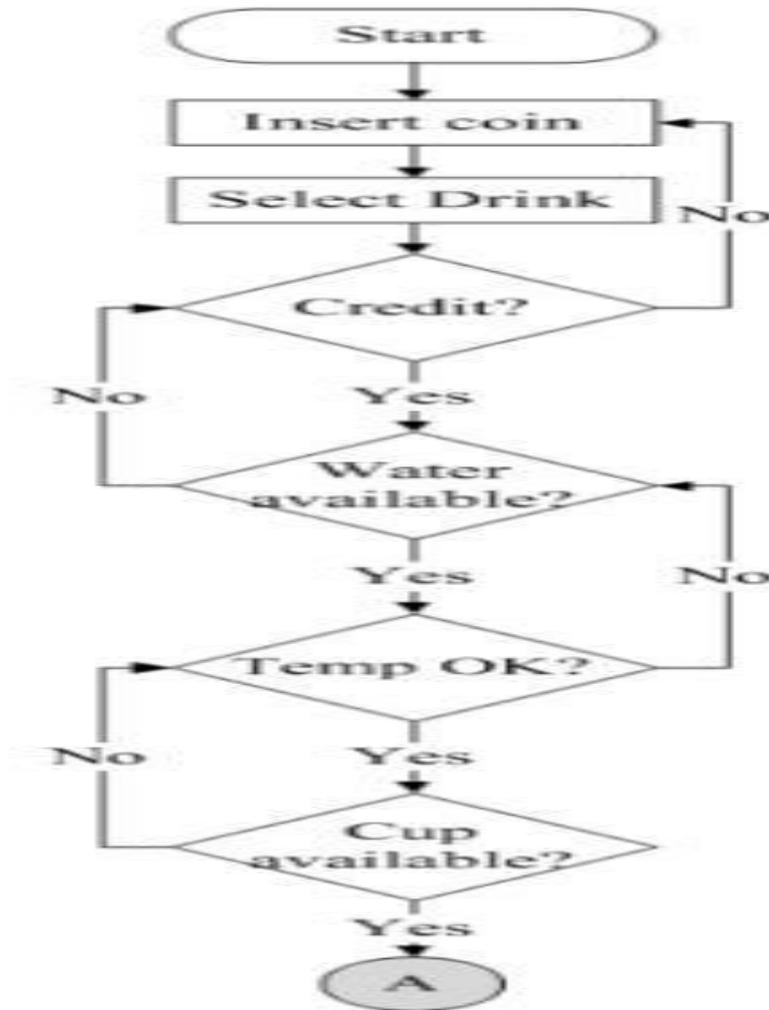


Outsider



Insider

Flowchart of working prototype:



VI. Conclusion:

Thus, Espresso Tea maker with IoT is working under Arduino Mega 2560, Raspberry-Pi Node Red and user interface connected to the internet. In order to improve the prototype several concepts are made to enhance the productivity. This design and development also comes under various forms with sensors and apps, etc..

VII. References:

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