PROJECT INITIAL REPORT

Energy Consumption Optimizer

Using IoT

The Visionaries

Team#18

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Team Members

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Contents

Abstract

In our day to day life, we use a lot electrical appliances, unaware of the actual power consumption to find the scope for optimization so as to save energy and move towards smarter and greener planet. Awareness about the appliances that consume more energy will help the PG&E customer to make better choices in their lives and also to gain detailed information about the real time power consumption. With the help of IoT devices like Arduino and sensors we record real time consumption rate and send it to the cloud to generate visual representation of the usage statistics enabling them to gain effective insights.

Competitive Landscape

In the trending market now, there are a lot of energy consumption optimizing devices that are available in market. These include Plugwise, Kill A Watt, Watts Up Pro and Brultech ECM-1220. These devices help in tracking the power consumption per socket basis and share the gathered data to the customer.

Differentiator

1) We use niche technologies and IOT devices to capture and stream the data at the real time to the cloud. It will then be processed and data will be shared to the customers in a graphical format which gives them an insight on their power consumption along with break up consumption of each devices.
2) Our solution also provides insights to the customers in deciding which devices are energy efficient in the market. It provides the power usage statistics of different energy devices at the real time with visual representation which helps users to decide on the device instantly.
3) Easy to install (Plug & Play)
4) Accuracy up to decimal point

Project Hills

Hill 1

Harry, a PG&E customer is confused as to which home appliances he should choose in order to reduce his monthly electricity consumption.

Proposed Solution

If Energy Consumption Optimizer is made available to Tom, it will help him make an informed decision about the purchase of various appliances and progressively move towards energy efficient devices by providing him with the real time power consumption rate of multiple devices available in the market.

Hill 2

Tom, another PG&E customer is not fully aware of real time per device power consumption in his house.

Proposed Solution

Energy Consumption Optimizer would enable Harry to build awareness of the specifics of energy consumption, thereby, giving him insights on the proper usage of his home appliances. This will help him to reduce his monthly PG&E bill by providing him with the detailed statistics of power consumed by every device used in his house.

User Stories

As a PG&E user, Harry wants to educate himself on the real time energy consumption of home appliances so that he can purchase energy efficient appliance.

As a PG&E user, Tom wants to know the individual power consumption of each appliance so that he can get the proper break down in his monthly PG&E bill.

As a PG&E user, Tom wants a visual representation of his power consumption at real time so that he can clearly analyze and make well informed decisions and follow better practices.

Tasks & Team Members

Backlog Item	Task	Task Owner	Initial Estimate (Total Sprint Hours = 40 x 5) 160
As a PG&E user, I want to educate myself on the real time energy consumption of home applicances so that I can purchase energy efficient appliance.	Feasibility analysis of wall sockets/arduino/raspberry pi	Neha	8
	POC on wall socket connectivity with IOT device with necessary configurations	Piyush	15
	Implementation of back-end code to enable Real-time streaming of the data to IBM Bluemix Cloud	Rekha	22
	Application front-end development for graphical representation of the real time data	Srushti	18
	Complete Application Integration	Neha	12
	Unit testing and Integration testing	Piyush	7
	Documentation and Reporting	Rekha	5
As a PG&E user, I want to know the individual power consumption of each applicance so that I can get the proper break down in my monthly PG&E bill.	Implementation of back-end code to enable Real-time streaming of the data to IBM Bluemix Cloud	Srushti	12
	Logic for providng the monthly bill break down for each of the home applicance	Neha	10
	Application front-end development for graphical representation of the real time data	Piyush	18
	Complete Application Integration	Rekha	13
	Unit testing and Integration testing	Srushti	10
As a PG&E user, I want a visual representation of my power consumption at real time so that I can clearly analyze and make well informed decisions and follow better practices.	Working with google charts, Angular JS and Bootstrap for Visual representation for the user	Neha	10

GitLab Link

GitLab will be used for team collaboration.

https://gitlab.com/CmpE272-PowerOptimizer/CmpE272-EnergyOptimizer

Technology

1) IoT devices like Arduino/Raspberry Pi
2) Wall Sockets with Bluetooth/WiFi
3) AngularJS and Bootstrap for the Graphical User Interface
4) Google Charts for generating interactive graphs based on real time data gathered

Project Plan

The Project Plan with weekly milestones

Backlog Item	Task	Task Owner	160	W1 11/1	W2 11/8	W3 11/15	W4 11/22
As a PG&E user, I want to educate myself on the real time energy consumption of home applicances so that I can purchase energy efficient appliance.	Feasibility analysis of wall sockets/arduino/raspberry pi	Neha	8	Y			
	POC on wall socket connectivity with IOT device with necessary configurations	Piyush	15	Y			
	Implementation of back-end code to enable Real-time streaming of the data to IBM Bluemix Cloud	Rekha	22		Y	Y	
	Application front-end development for graphical representation of the real time data	Srushti	18		Y		
	Complete Application Integration	Neha	12			Y	
	Unit testing and Integration testing	Piyush	7		Y	Y	Y
	Documentation and Reporting	Rekha	5				Y
As a PG&E user, I want to know the individual power consumption of each applicance so that I can get the proper break down in my monthly PG&E bill.	Implementation of back-end code to enable Real-time streaming of the data to IBM Bluemix Cloud	Srushti	12		Y		
	Logic for providng the monthly bill break down for each of the home applicance	Neha	10		Y	Y	
	Application front-end development for graphical representation of the real time data	Piyush	18			Y	
	Complete Application Integration	Rekha	13			Y	
	Unit testing and Integration testing	Srushti	10		Y	Y	Y
As a PG&E user, I want a visual representation of my power consumption at real time so that I can clearly analyze and make well informed decisions and follow better practices.	Working with google charts, Angular JS and Bootstrap for Visual representation for the user	Neha	10	Y			