Smart Pour

GROUP 16

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Contents

- Problem
- Solution
- Solution Architecture
- Embedded Aspect
- Network and Security Aspect
- Software Aspect
- Hardware Aspect
- Used Technologies
- Budget
- Timeline
- Future Plans
- Plan for Demonstration

Problem

My lazy soul and this coffee addiction don’t go together

[Survey Responses]

I wish a coffee would appear in front of me.

When will this queue end !!!

I don't know how to Make coffee!

Ewww. This coffee is too sugary.

If someone could make a coffee for me when I'm home :(

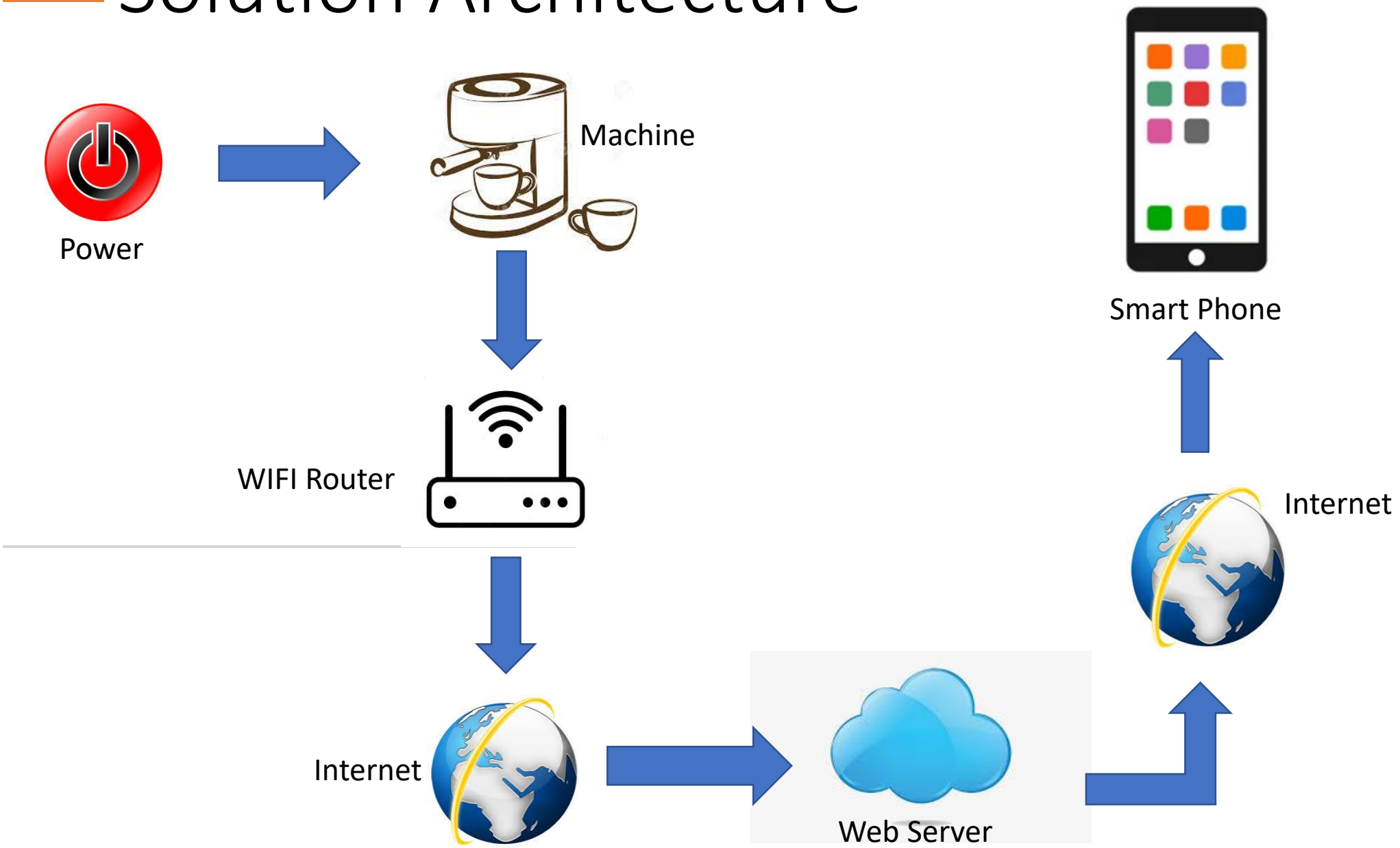
Solution

‘Smart Pour’, an automated coffee machine that is controlled through a mobile application

Solution

- Scheduling coffee making
- Ingredient tracking mechanism
- Can be customized according to user’s preference
- User friendly interface
- High security
- Durability and simplicity

Solution Architecture



Embedded Aspect

- Ingredient tracking
  - Ultra-sonic Sensors connected to microcontroller
- Get ingredients in the required amounts from the stored containers
  - Valves, Servo motors controlled by the microcontroller
- Check whether the coffee cup is available
  - Reflective Optical Sensor connected to microcontroller

Network and Security Aspect

Device

Ingredient storage access is only given through mobile application

Cloud

Database

Mobile Application

Access is given only if the user is authorized with username and password

Software Aspect

- Mobile Application
  - Make coffee per instruction of the user
  - Save and reuse recipes
  - Track and notify when the ingredients are ending
  - Schedule coffee making and setting reminders to verify the scheduled request

- Database
  - Store the amount of ingredients available in real time.
  - Store recipes and give them when needed.

Hardware Aspect

- Power supply
- Separate containers for storing water, coffee and sugar.
- Heater to boil the water.
- Motor to stir the ingredients.

Used Technologies

Microcontroller

- I/O ports are more than enough
- High processing power with in-built Wi-Fi module
- Inexpensive

Programming Language

- Compatible with Nodemcu
- Familiar

Used Technologies

Web Server

- High Scalability
- Flexible Pricing
- No maintain costs

Database

- On demand scalability
- High Performance
- Data Security

Used Technologies

Mobile Application

Back-end

- High Security
- High maintainability
- Multi-threaded – Several tasks can be performed concurrently

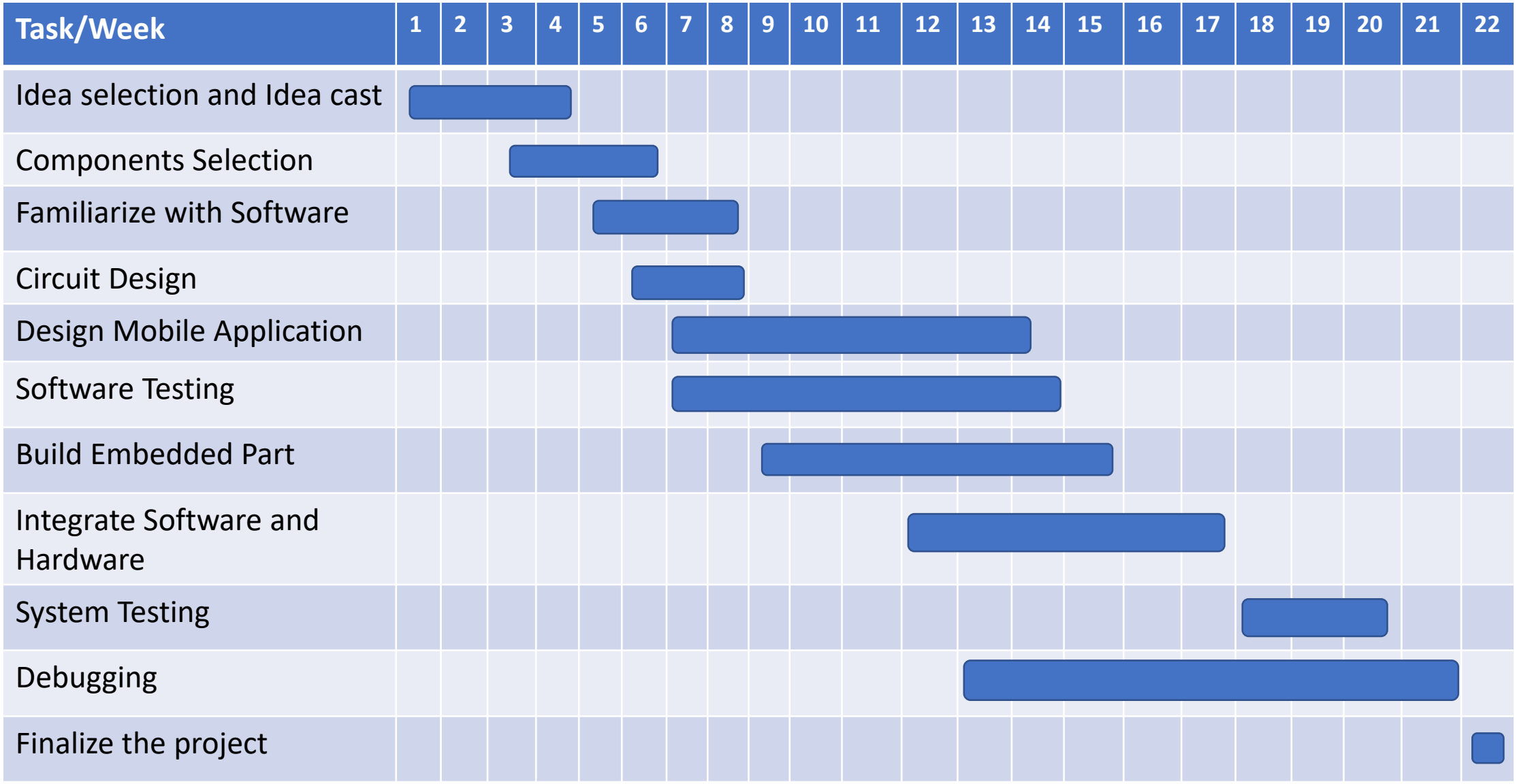
Front-end

- The implementations support both Android & IOS

Budget

Item Name	Quantity	Unit Price(LKR)	Total Cost (LKR)
Nodemcu ESP8266	1	700	700
Heater	1	400	400
Brushless Motor	1	95	95
Relay	2	60	120
Valves	2	690	1380
Servo Motor	2	350	700
TCRT5000L Reflective Optical Sensor	1	175	175
Ultra-sonic Sensor	3	165	495
Resistors	10	5	50
Transistors	6	25	150
Jump Wires	75	2	150
Containers	4	250	1000
			5415

Timeline


Task/Week
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19
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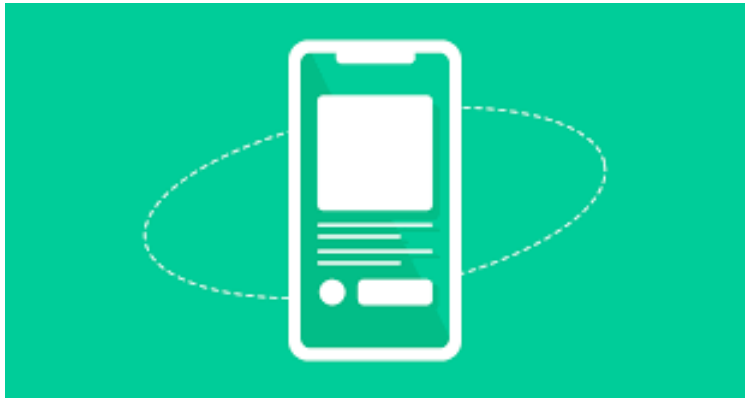
22
Idea selection and Idea cast
Components Selection
Familiarize with Software
Circuit Design
Design Mobile Application
Software Testing
Build Embedded Part
Integrate Software and Hardware
System Testing
Debugging
Finalize the project

Plan for Demonstration

- Coffee Machine Prototype

- Mobile Application



Future Plans

- Use rechargeable battery power to ensure availability.
- Increase the types of beverages.
- Increase the amount of servings per request.
- Portability - 'Smart Bottle'


THANK
YOU !


Q
A