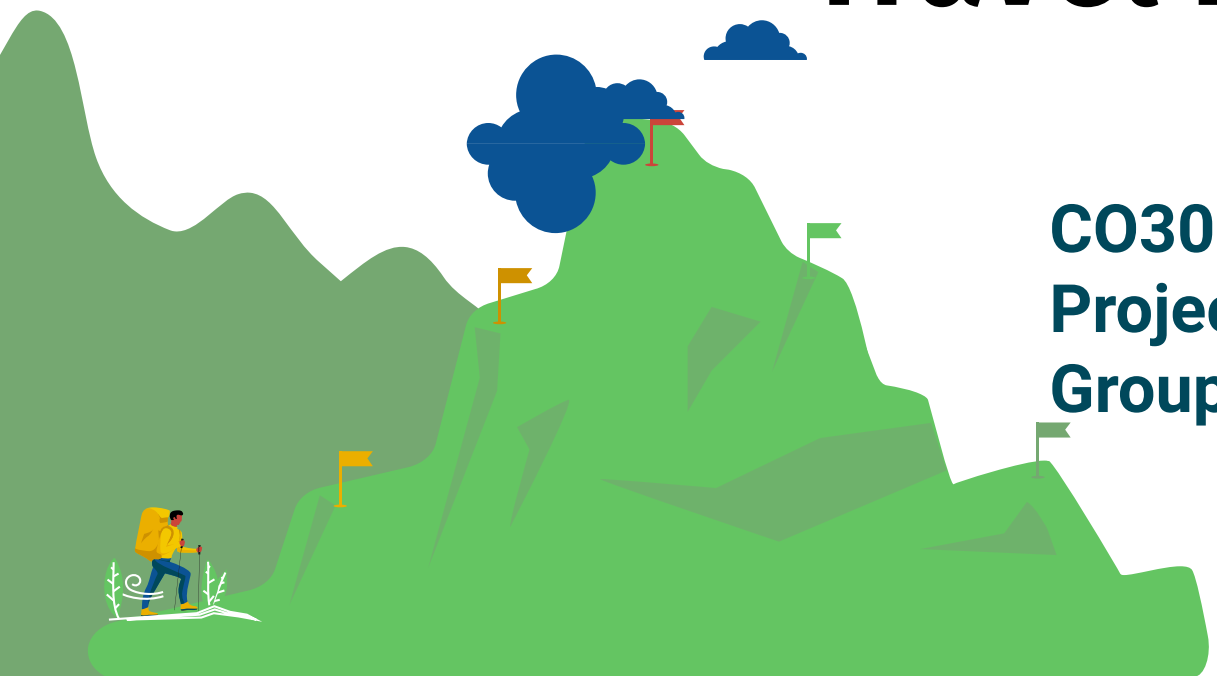
Weather Analytics and Travel Path Guider



CO300 : Third Year Project
Project Proposal
Group 07

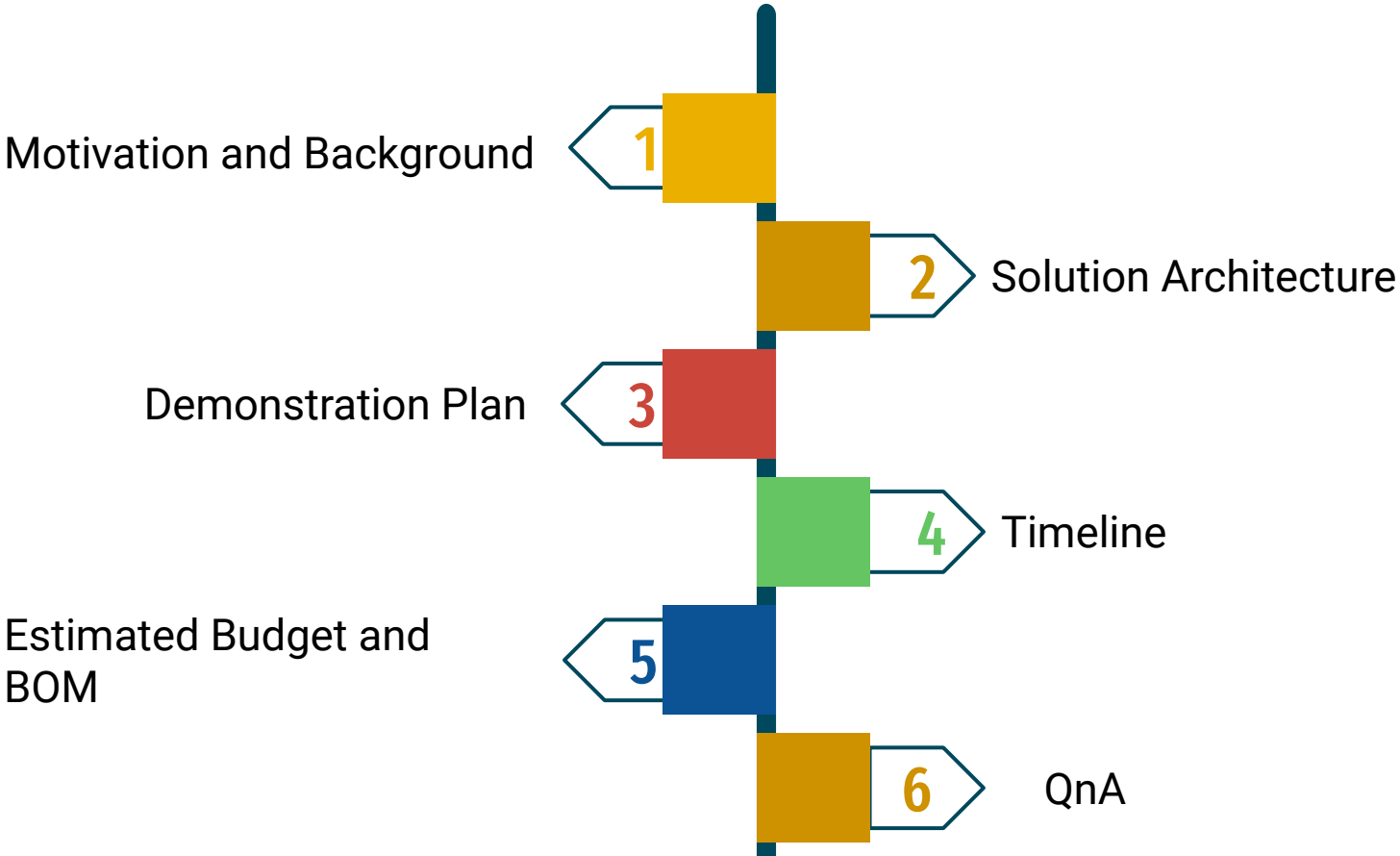
Team Members

Ishan Fernando
E/18/098

Adeepa Fernando
E/18/100

Ridma Jayasundara
E/18/155

Outline


Motivation and Background
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Solution Architecture
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QnA

SURVEY

How about going on a trip? When?

When are you planning to travel next?

- **29%** responded July to September 2023
- **17%** responded October to December 2022
- **14%** responded April to June 2023
- **14%** responded July to September 2023
- **11%** responded April to June 2023
- **9%** responded January to March 2023
- **6%** responded that they are not planning to travel
- 

SURVEY How about going on a trip? Where?

Hiking

- Adam's Peak - Best spiritual hike
- Little Adam’s Peak and Ella Rock - Best easy hike
- Sinharaja Forest Reserve - Best hike for bird lovers
- Sigiriya and Pidurangula - Best hike through history
- Horton Plains & World’s End - Best hike for views
- Lipton’s Seat - Best hike for tea enthusiasts
- The Knuckles - Best hike for adventurers

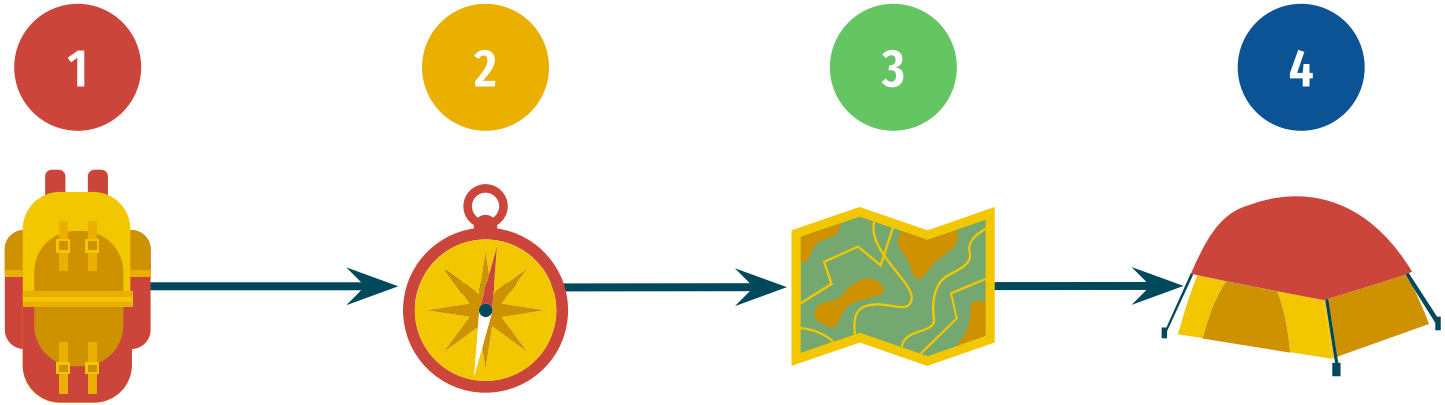
SURVEY How about going on a trip? Where?

Camping

- Meemure Camping
- Belihuloya Camping
- Yala National Park Camping
- Kithulgala Forest Reserve
- Wilpattu National Park
- Vaddha Village (Mahiyanganaya)

Forest exploration
Biking
Fishing
Hunting
Rafting
Birding

How about planning the trip?

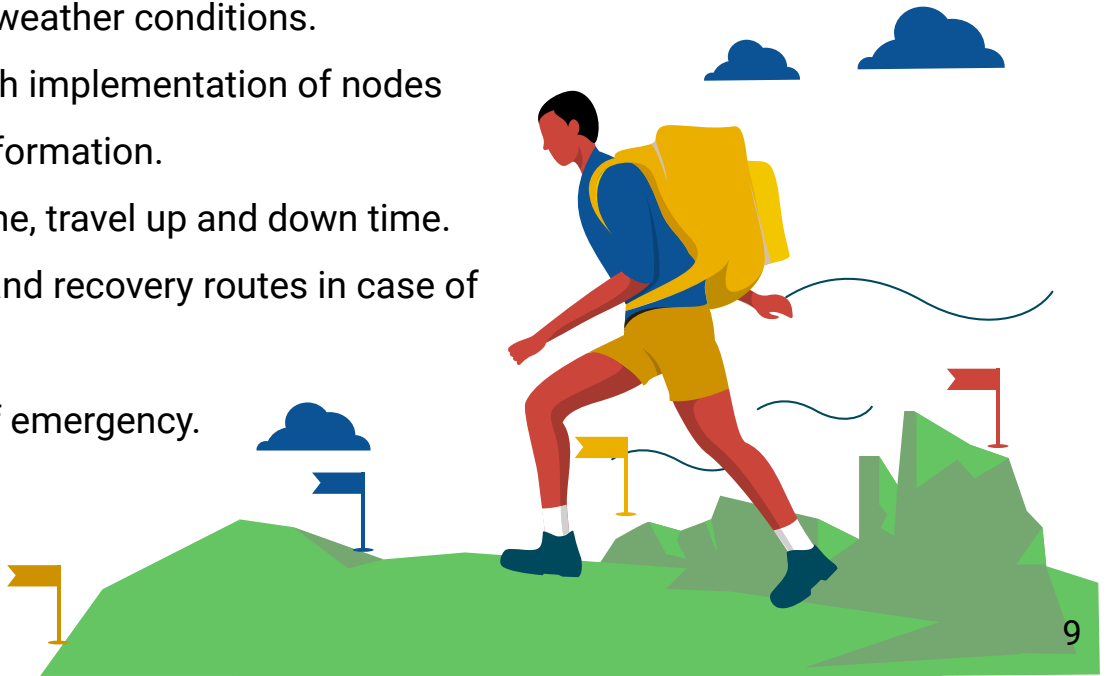


Planning the trip ...

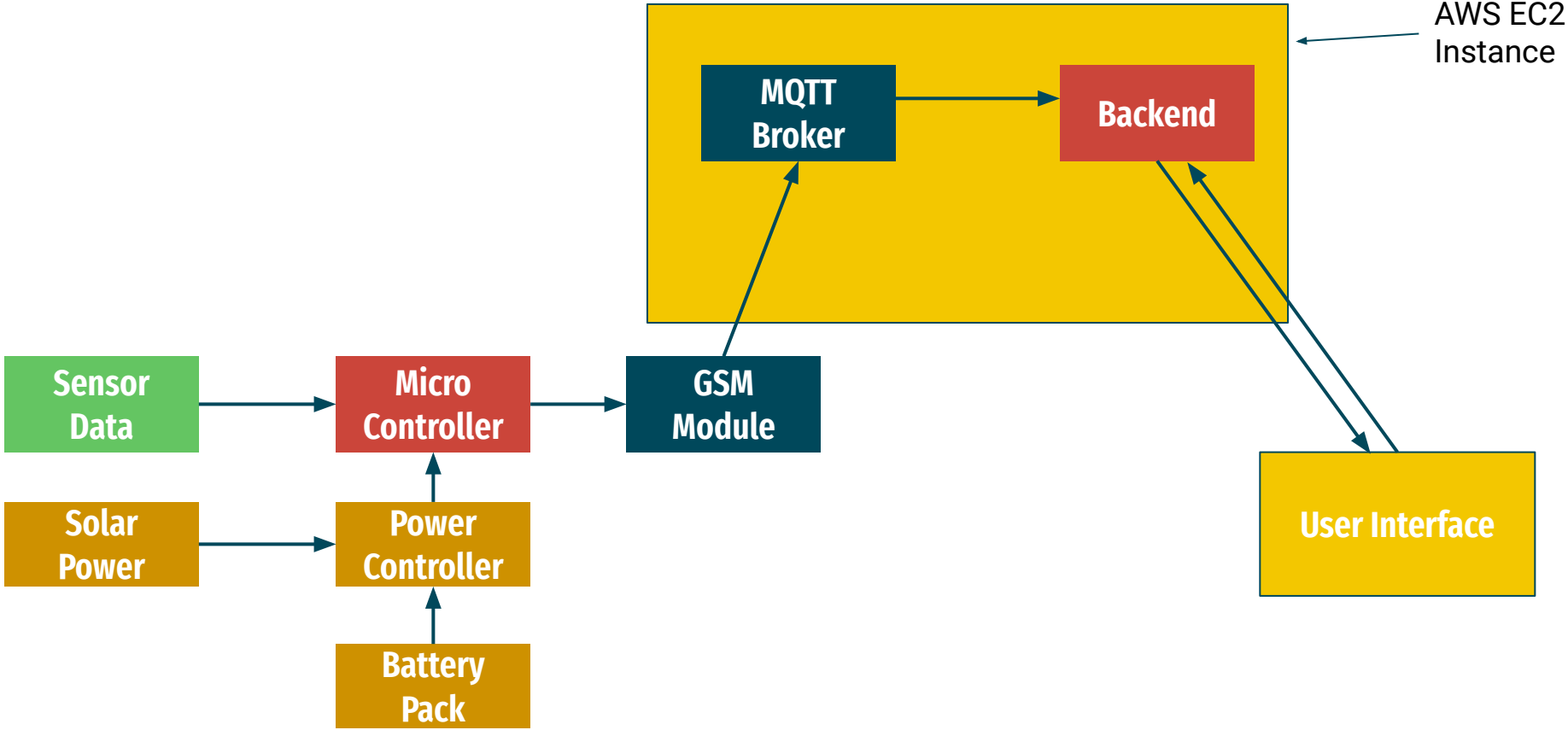
- Where to go?
- When to go?
- Is the climate favourable around that time of the year in that area?
- Does the weather reports include accurate analytics and forecasting about the specific point?
- How about real time weather analytics?
- Is the travel path well defined? Trip up-time, down-time?
- Need of a guide?
- In case of emergency?
- Security?

Motivation and Background

- Provision of Weather analytics and real time weather report of a tourism destination.
- Preview of travel path in different weather conditions.
- Coverage of the travel path through implementation of nodes along way to direct and provide information.
- Analysis of node to node travel time, travel up and down time.
- Mapping of extreme travel paths and recovery routes in case of blockings. (Natural disaster)
- Sending SOS messages in case of emergency.



High Level System Organization



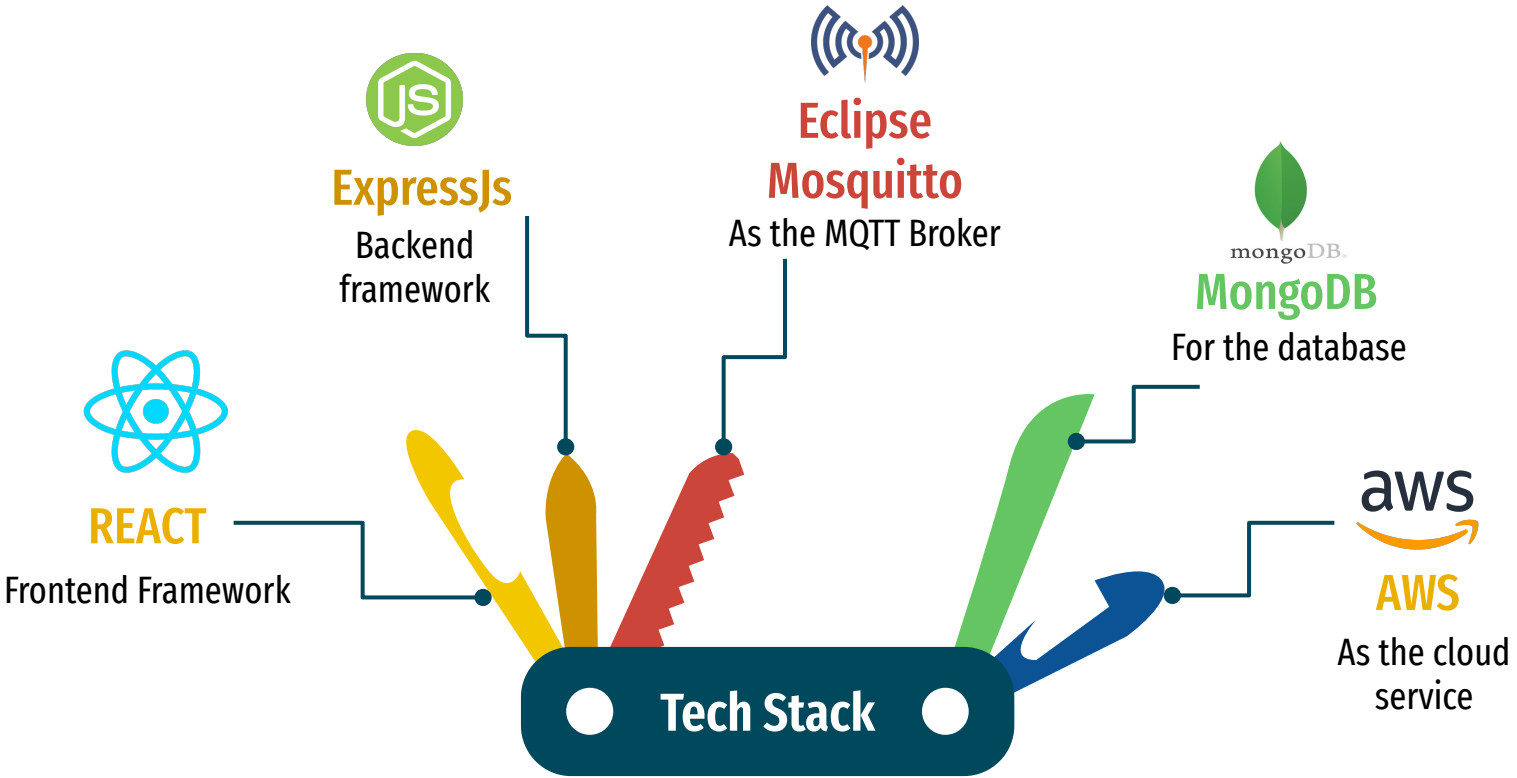
Control Decisions

- If the solar power system is not active by noon system will activate a low power mode.
- If the cellular connection is lost for a moment, system data will be saved and sent after the connection is restored.

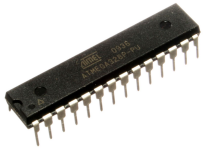
Security and Privacy Concerns

- Users will be authenticated using JWT via the web interface log-in
- User information requests will not be saved in the servers after request is being served.

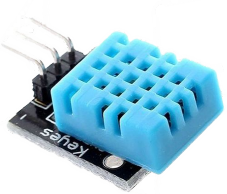
Technology Stack



Embedded System Components

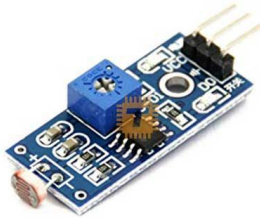


Atmega328P



DHT11 Temperature Sensor

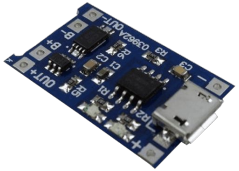
YL-83 FC-37 Rain Sensor



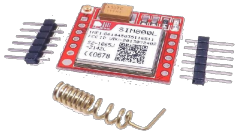
LDR Light Sensor

LED Bulb 7W With Solar Panel

Solar Panel



Battery Charging / Protection Module



SIM800L GSM Module

Anemometer

Demonstration Plan - Before Trip

- Artificially generated data will be used to simulate multiple nodes and prior data
- A pole(node) will be set up near campus
- Real time data from the sensors will be available in the web interface
- The data on the web interface will be shown as the demonstration for the project.

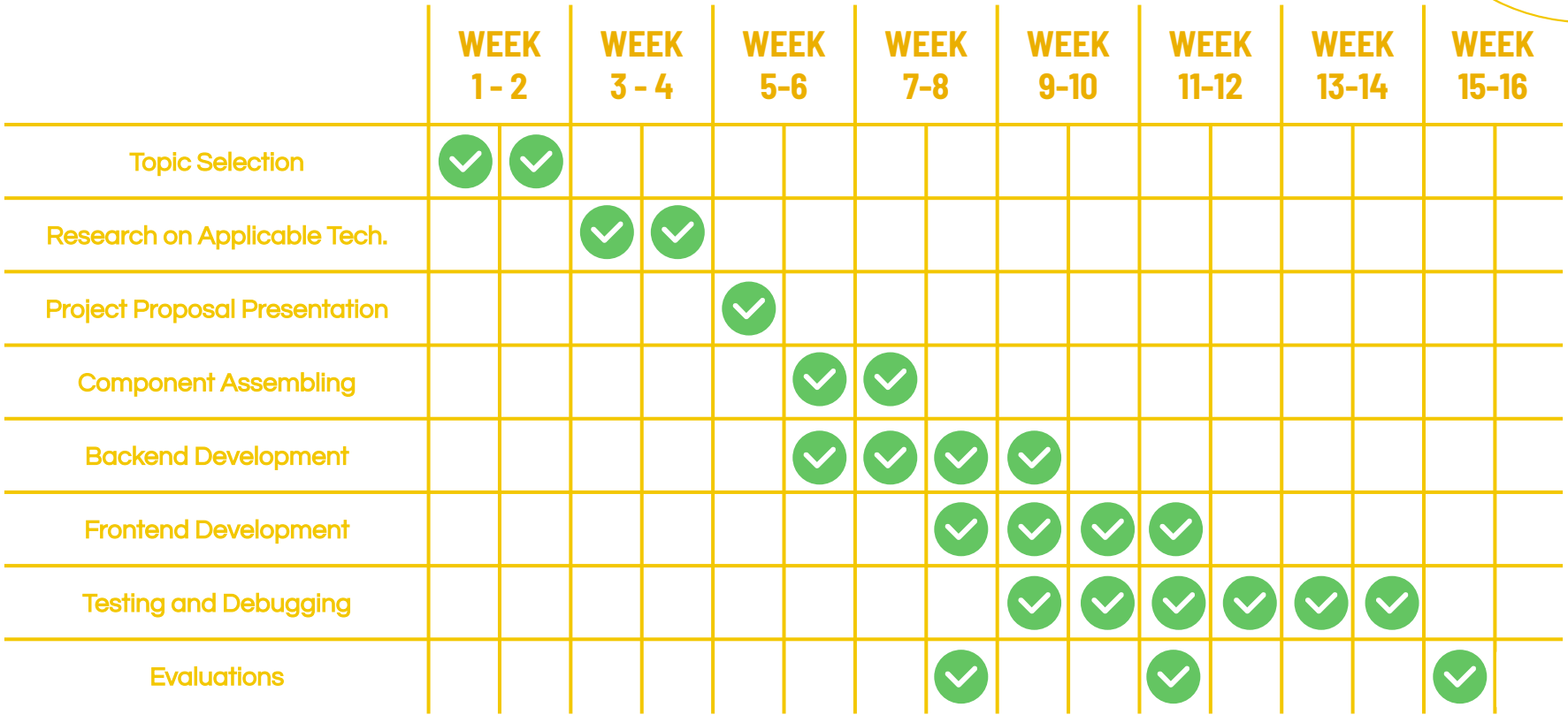
Demonstration Plan - On Trip

- Scanning QR code on Device/Node along the path
- Display of following information:
  - Node to node time of travel
  - Travel up time
  - Travel down time
  - Information about exact location, view points etc...
  - SOS service
  - Travel path directions and alternate routes (Map view)

Budget

Equipment Name	Qty	Price
Arduino UNO Normal Development Board	1	3450.00
DHT11 Temperature and Relative Humidity Sensor	1	600.00
Arduino SIM800L GSM GPRS Quad-Band Network Module	1	1690.00
Mini Solar Panel 6V 1W	3	1500.00
18650 Battery	1	840.00
18650 Battery Charging Module	1	350.00
Rain Sensor	1	280.00
LDR Light Sensor	1	200.00
LED Bulb 7W With Solar Panel	1	950.00
Casing	-	4000.00
Miscellaneous	-	5000.00
TOTAL		18860.00

TIMELINE


WEEK 1 - 2
WEEK 3 - 4
WEEK 5-6
WEEK 7-8
WEEK 9-10
WEEK 11-12
WEEK 13-14
WEEK 15-16
Topic Selection
Research on Applicable Tech.
Project Proposal Presentation
Component Assembling
Backend Development
Frontend Development
Testing and Debugging
Evaluations

GitHub Repo

- https://github.com/cepdnaclk/e18-3yp-Weather-Analytics-And-Travel-Path-Guider

Project Page

- https://cepdnaclk.github.io/e18-3yp-Weather-Analytics-And-Travel-Path-Guider/

Q & A

Thank You !