



# GBP Quiz

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ImpactXchange 2024



FINNISH NATIONAL  
AGENCY FOR EDUCATION



# Team members



**Diva**  
FrontEnd  
Developer



**Irfan**  
BackEnd  
Developer



**Jack**  
FullStack  
Developer



# About the challenge

What is the problem?

**Lack of awareness of local culture (culture dilution)**

Who is affected?

**Local Community, tourists, educators, future generations**

What is the root cause?

**Globalization, tourism, urbanization/modernization, media influence**



# Solution description

How do you intend to solve the problem?

- **A Quiz Application that promotes local culture. Our main purpose is to educate locals and tourists about our diverse culture while also rewarding them.**

Concept(s) used for solving the problem

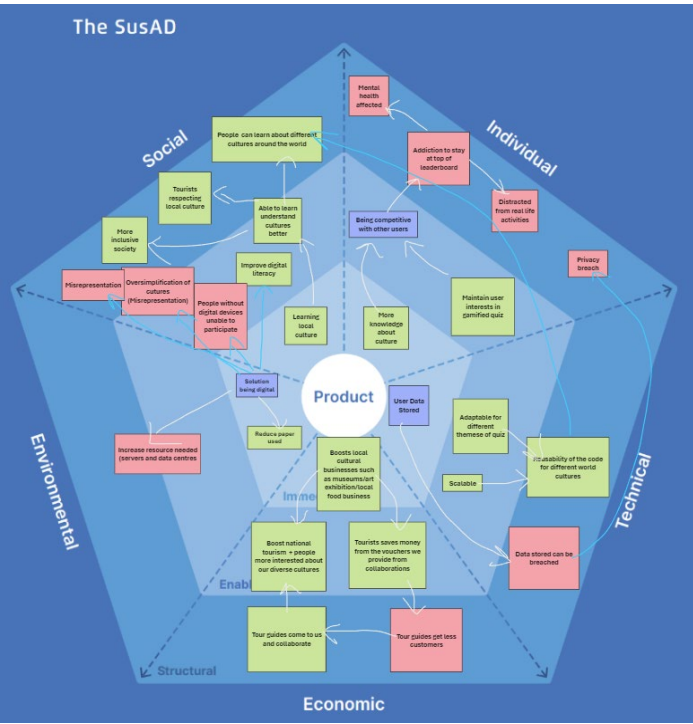
- **SUSAF (Social Dimension and Environment Dimension) and Green Coding in Environmental Dimension.**

Stakeholders considered

- **Users: People who use our application**
- **Investors: People who wants to collaborate to improve industry promoting culture**



# Impact Assessment of the solution



**4 QUALITY EDUCATION**

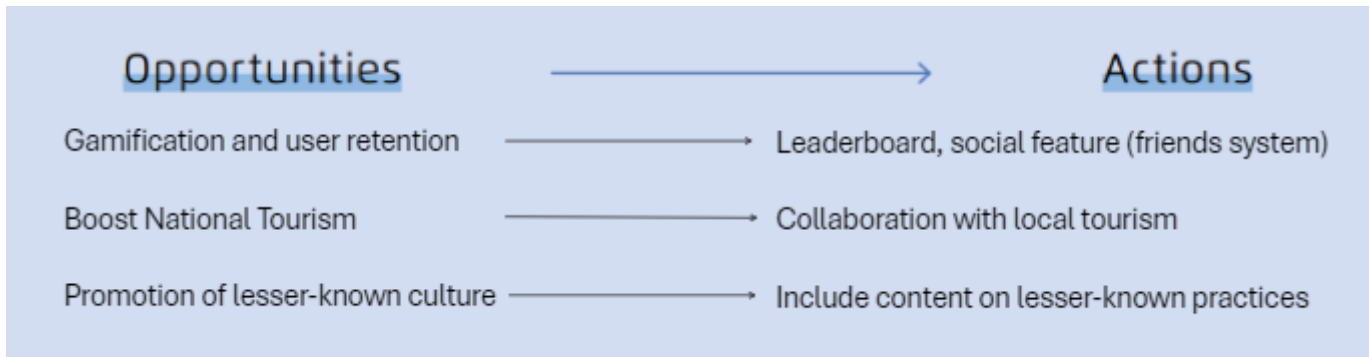
**10 REDUCED INEQUALITIES**

**16 PEACE, JUSTICE AND STRONG INSTITUTIONS**

**4.7.1:** The extent to which (i) global citizenship education and (ii) education for sustainable development are mainstreamed at all levels in: (a) national education policies; (b) curricula; (c) teacher education; and (d) student assessment.


**10.3.1** Proportion of the population reporting having personally felt discriminated against or harassed in the previous 12 months on the basis of a ground of discrimination prohibited under international human rights law.

**Indicator 16.7.1:** Proportions of positions (by sex, age, persons with disabilities, and population groups) in public institutions (national and local legislatures, public service, and judiciary) compared to national distributions.





# Key takeaways from SusAF

- Continuously working on the App revealed new things to us.
- SOCIAL:
  - Trust: Authentication System for Registration and Sign In
  - Inclusiveness & Diversity: Use of colors that are color blind friendly (color contrast ratio of 4.5 )
- Sustainability is NOT only about environment but also social, individual, technical, and economic



# Product sneak peak (Web)

Question 2 out of 10  
Points: 0/3

## Food Quiz


What is the traditional way of eating a Malay meal?



- With chopsticks
- With spoon and fork
- With knife and fork
- With the fingers of the right hand

Question 2 out of 10  
Points: 0/3

**Wrong!**



The traditional way Malays eat their meals is using the fingers of the right hand. This method is commonly used for dishes like rice and curry, allowing for an authentic and personal dining experience. Use the right hand only, reserved for a different use. For everyday meals it is acceptable to use a spoon. The Chinese use chopsticks. You never use a knife on a dish, prefer to do our butchering in the kitchen!

## Quiz Summary

Summary

5 out of 10 correct

- Question Question 1 ✗
- Question Question 2 ✗
- Question Question 3 ✓
- Question Question 4 ✓
- Question Question 5 ✓
- Question Question 6 ✗
- Question Question 7 ✓
- Question Question 8 ✗
- Question Question 9 ✗
- Question Question 10 ✓



## Learning: Penang

What is Penang also known as?



Penang is often referred to as the 'Pearl of the Orient' due to its rich cultural diversity. It is a popular tourist destination known for its vibrant arts and...

Which iconic historical building in Penang is known for its preserved historical sites in Penang. It served as a...



Fort Cornwallis, built by Captain Francis Light in the 18th century, is a well-preserved historical site in Penang. It served as a...

## Leaderboard

Rank	Name	Score
1	Alice	1000
2	Bob	1400
3	Charlie	1900
4	David	1200
5	Eva	1100



<- (you need to register first)





# Product sneak peak (Web)

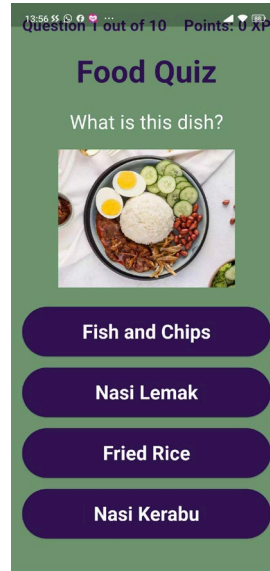
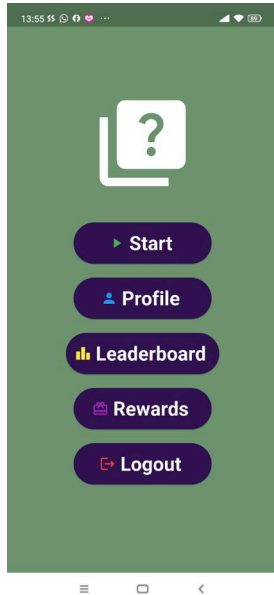


Website link before connecting  
authentication



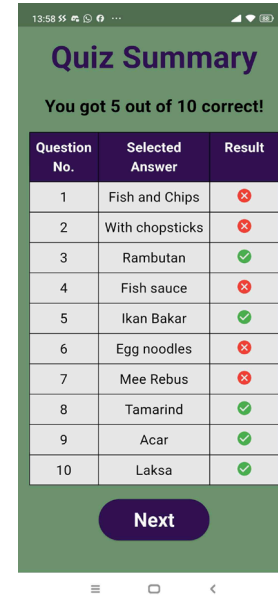
# Product sneak peak (Mobile)

## Menu Selection



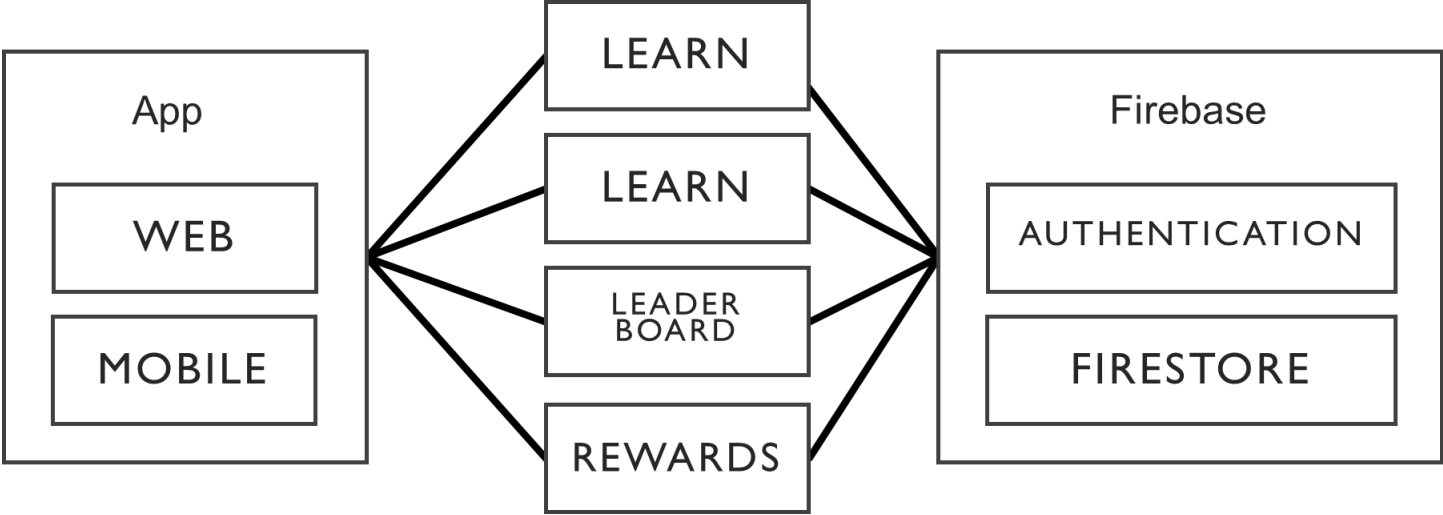
## Quiz Game

## Quiz Summary



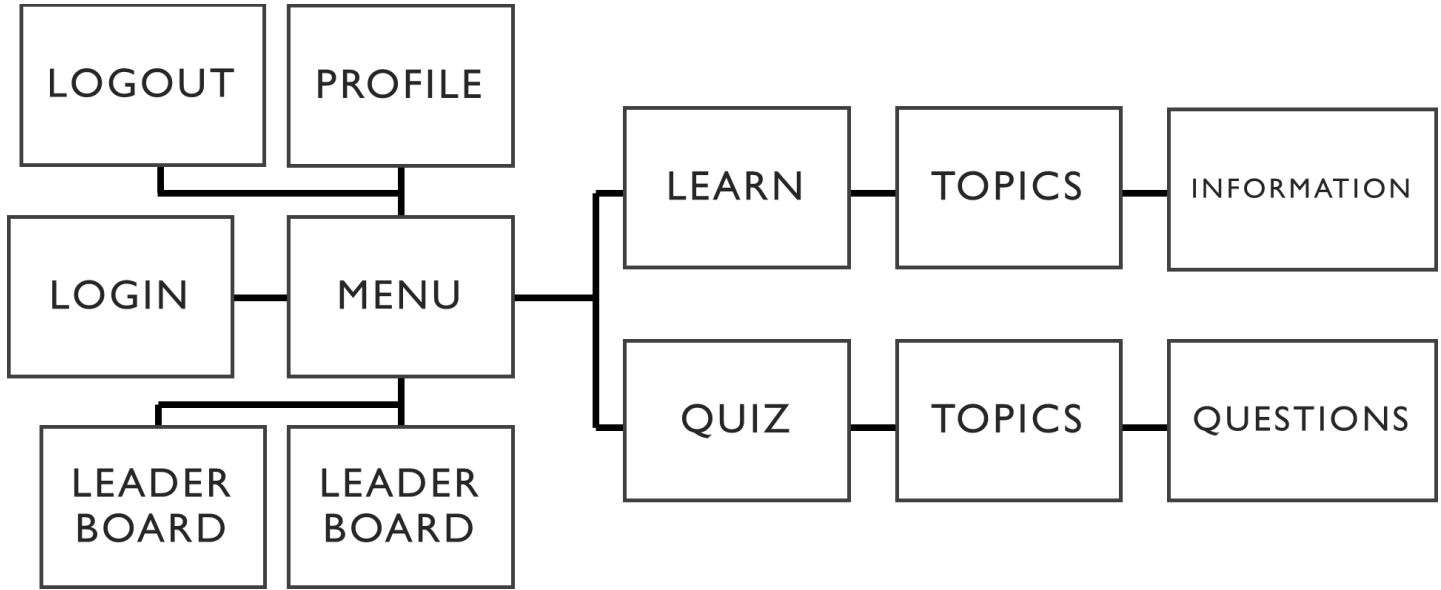


# High level solution architecture





# Implementation - Part 1 (Flow)





# Implementation - Part 2 (Tools)

## Website

- React Framework (html, css, javascript)
- Use Material UI library to support development of user interface

## Mobile

- Flutter + Dart
- Release for Android Platform (Will release to more platforms in future)



# Implementation - (Cloud & Backend)

Cloud based service for Backend – Firebase

Communicate using API Key (HTTPS encryption, secure token management)

Firebase Authentication

- Account System for managing user emails, passwords and token
- Provides verification features

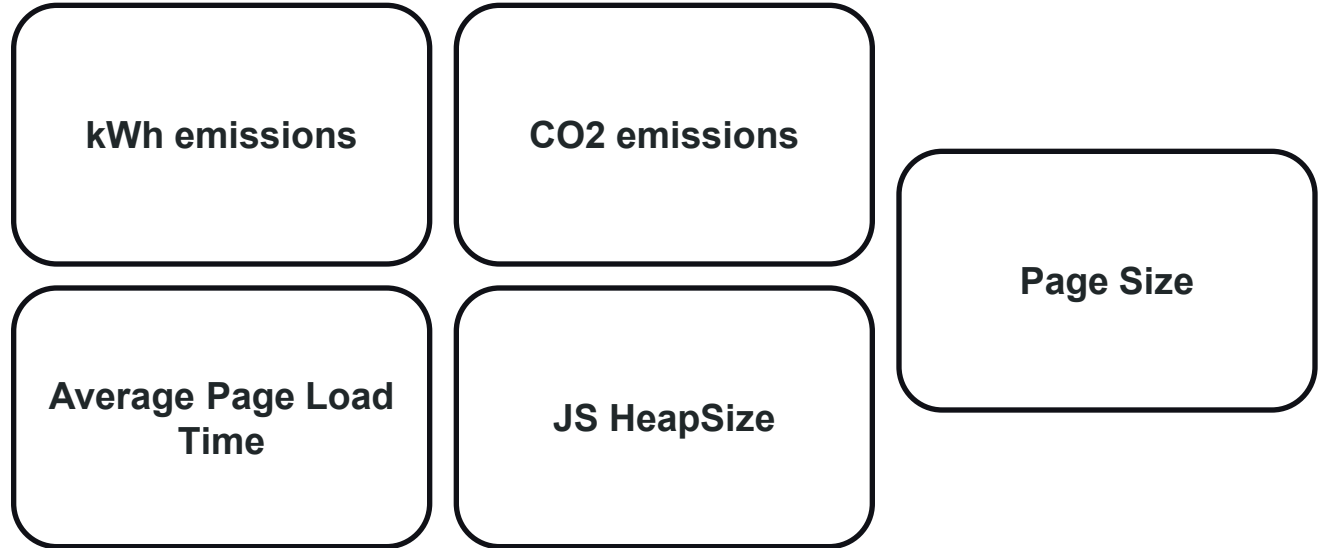
Firestore Database

- Storage of user data (usernames, points, profile picture)



# Measurement Metrics Comparison

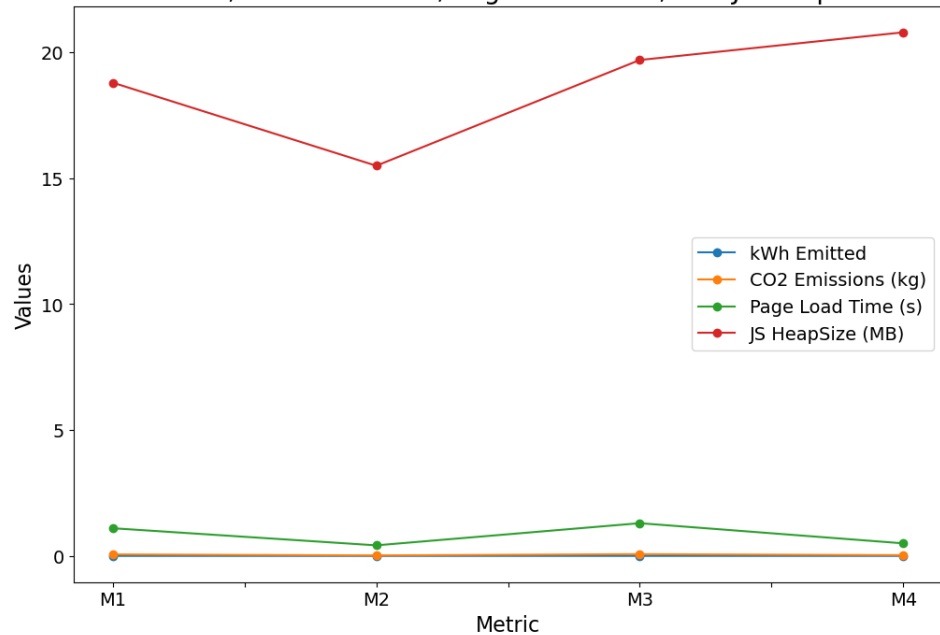
Ecograder  
Beacon  
Lighthouse  
Globemallow  
Websitecarbon





# Average Measurement Trends

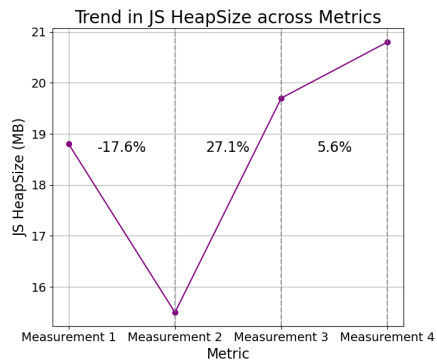
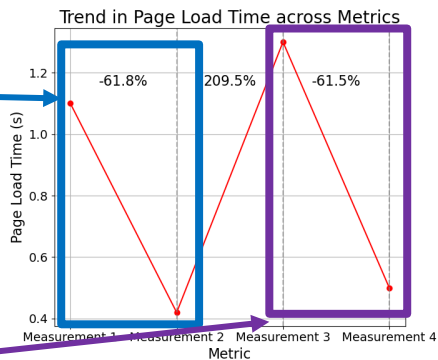
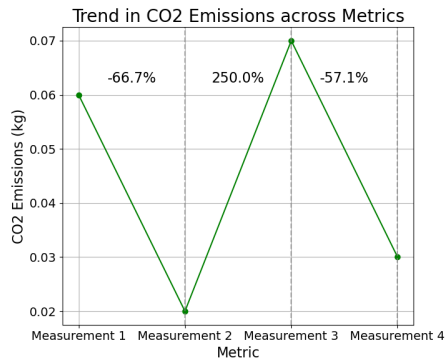
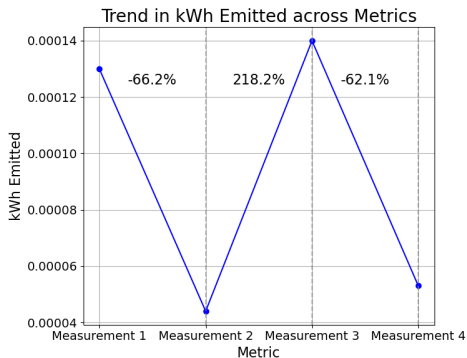
Trends in kWh Emitted, CO2 Emissions, Page Load Time, and JS HeapSize across Metrics







# Average Measurement Trends

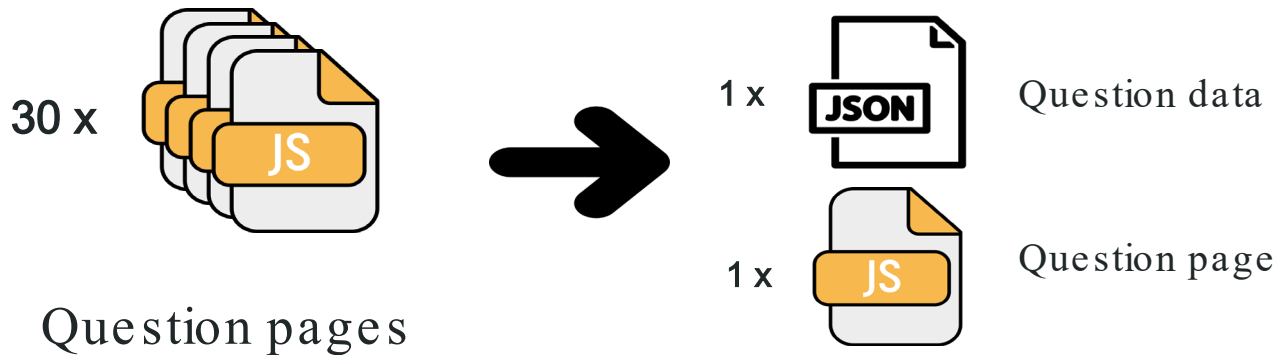


**Frontend**  
(30js) to (1js + 1json)

**Front + backend**  
Before caching to after caching



# Measurement 1 to Measurement 2



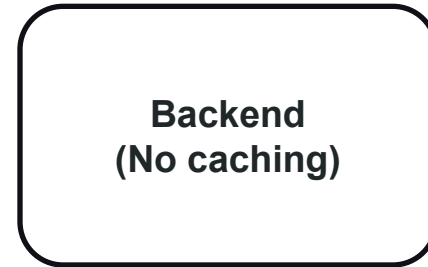
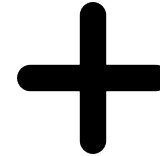
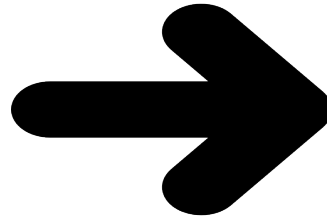
**M1 to M2: saves 86 kWh** (for 1000 page loads)  
 = Powering a 25ft strand of Christmas lights (68W) for 21 minutes.



Reduce Usage  
 of Material UI  
 by 50%



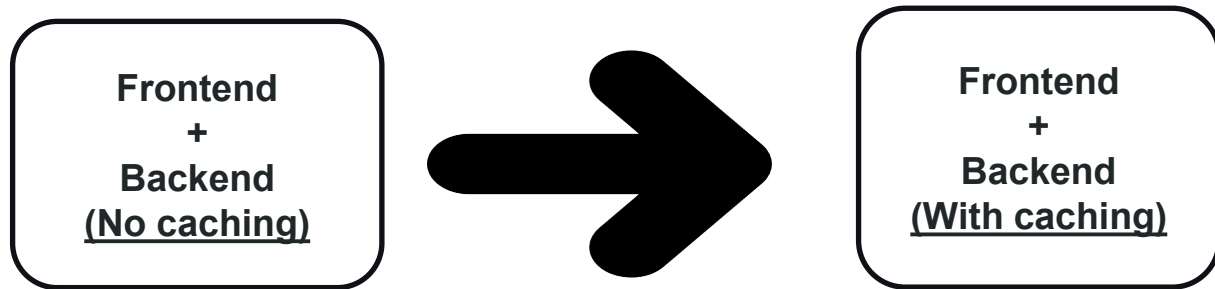
# Measurement 2 to Measurement 3



**M2 to M3:** consumes additional **96 kWh** (for 1000 page loads)  
= Powering a standard 60W light bulb for 1.5 hours



# Measurement 3 to Measurement 4

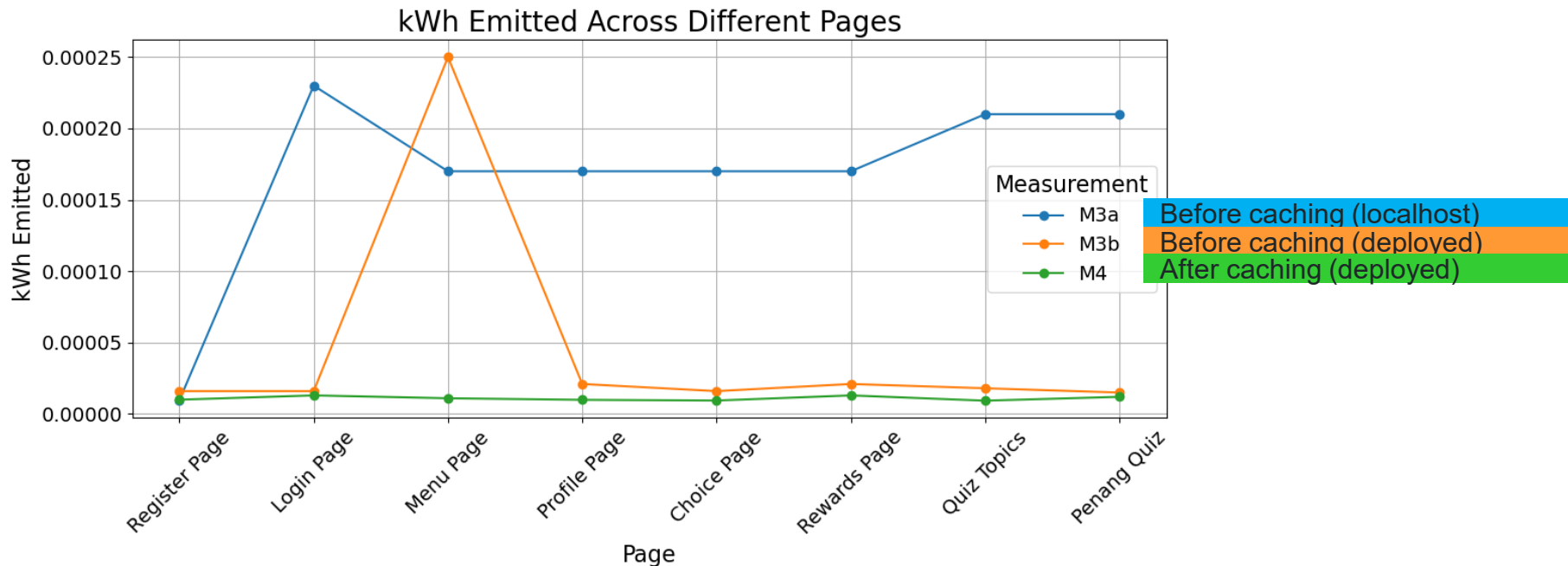


Convert  
Jpeg to  
Webp

**M3 to M4: saves 87 kWh** (for 1000 page loads)  
= Powering a microwave (1kW) for 5 minutes



# Comparison in kWh emissions for our different app versions



Sustainability Grade:



kWh Emitted: 0.000016

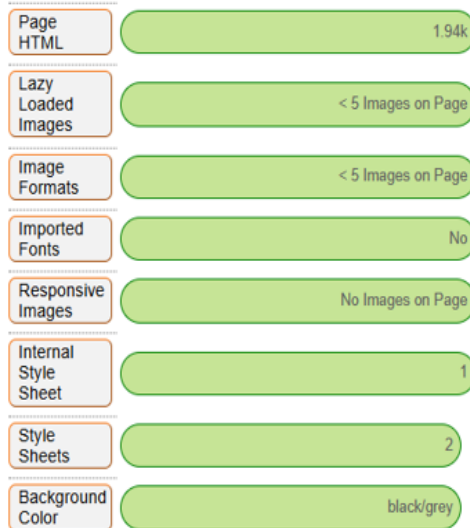
CO2 Emissions: 0.008g

## Pre-Cache Register Page



### Sustainability Grade Metrics:

#### Design



#### Development



Sustainability Grade:



kWh Emitted: 0.000010

CO2 Emissions: 0.005g

## Post-Cache Register Page



### Sustainability Grade Metrics:

#### Design

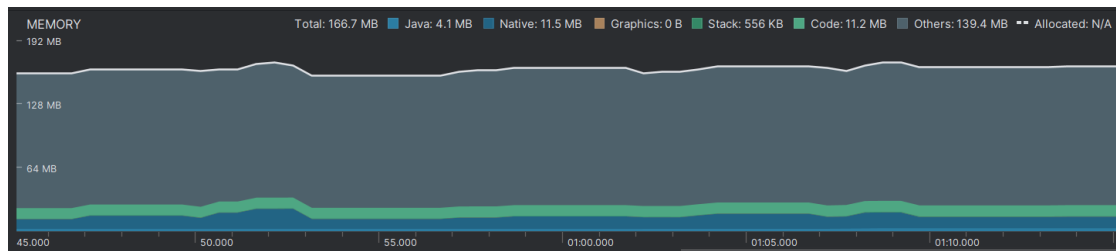
Page HTML	1.94k
Lazy Loaded Images	< 5 Images on Page
Image Formats	< 5 Images on Page
Imported Fonts	No
Responsive Images	No Images on Page
Internal Style Sheet	1
Style Sheets	2
Background Color	black/grey

#### Development

Page Load Time	0.097 sec
Page Size	0 bytes
Transfer Size	600.00 bytes
JS HeapSize	9.78mb
Green Hosted	Yes
Redirects	No redirects
Cookies	0
Empty URL Tags	0
Site Cache	No Caching



# Mobile Measurements







# Reflection / Team's Learning Outcome

**SusAF**

**Green Coding**



# Reflection / Team's Learning Outcome

**SusAF**

**Teamwork**

**Technical Skills**

**Green Coding**

**Project Organization**

Thank you!

Kiitos!

Terima kasih!

