

# **Cloud Computing Project**

## **Team 1**

**Rediscover Singapore**

# Overview

The decline in international air travel due to COVID-19 has had a significant impact on tourism establishments.

The “SingapoRediscovers Vouchers” serve as a domestic stimulator by encouraging locals to explore and rediscover Singapore, while supporting local tourism businesses.

**SGD \$320 million in credits has been set aside**

- Estimated SGD \$220 million remain unutilized.
- 2.2 million Singaporeans have not yet used their vouchers.



16:32 93% 93%

channelnewsasia.com/r

CNA

Commentary | Commentary

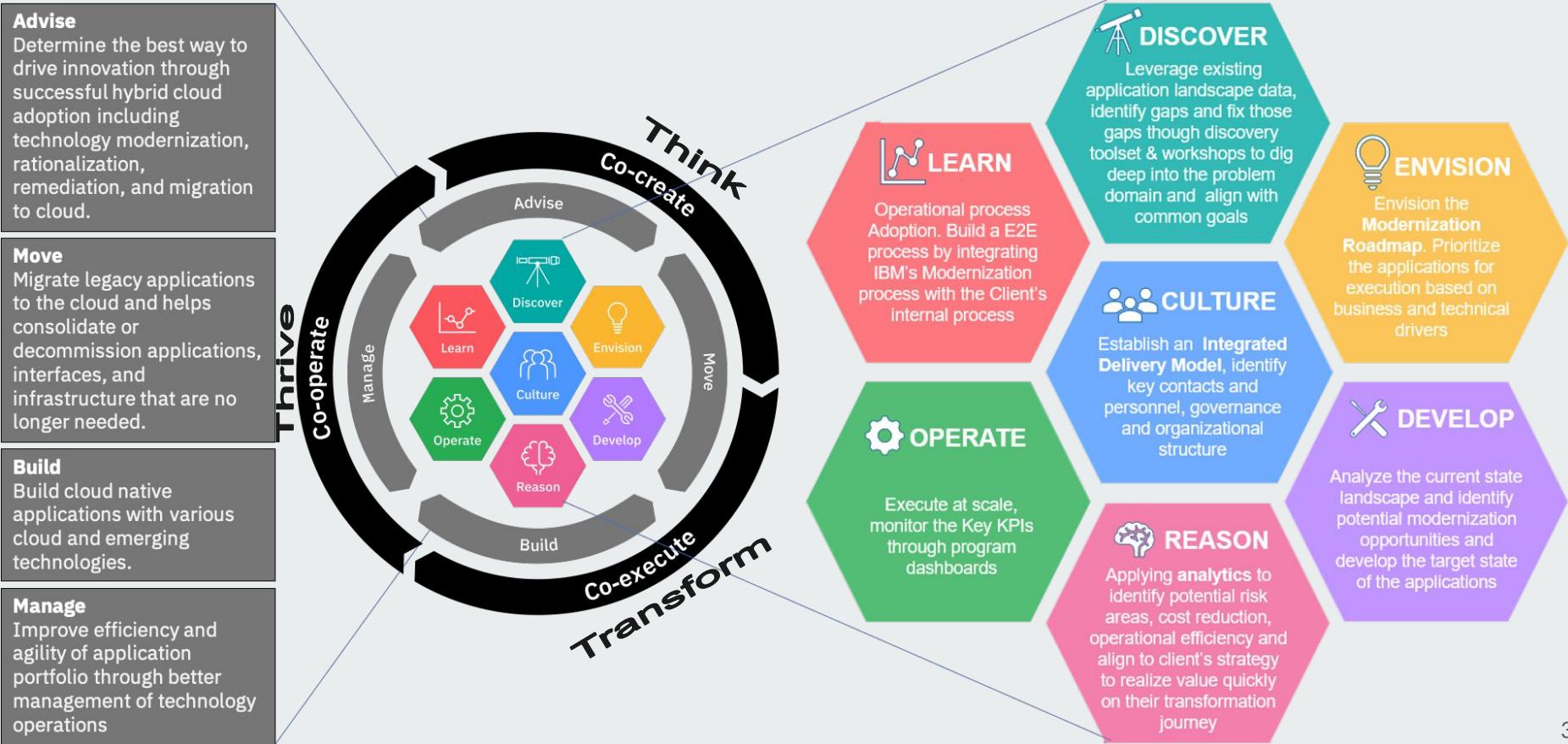
**Commentary: It's a shame redeeming SingapoRedisCOVERS vouchers can be such a hassle**

The Singapore tourism vouchers should be easy to use to encourage more to redeem, but there are many hoops to hop through, making the experience potentially off-putting, says CNA's Erin Low.

The Discovery Pool at SEA Aquarium.  
(Photo: SEA Aquarium)

By Erin Low  
25 Apr 2021 06:00AM  
(Updated: 25 Apr 2021 06:00AM)

# Garage Methodology: EDT, Agile, DevOps



# Methodology, Tools & Technologies

IBM Garage Methodology, Agile, DevOps, CI/CD	
<b>Culture</b>	Mural, Slack, Google Drive, EDT
<b>Discover</b>	EDT: Key Personas, Empathy Map, As-is Scenario
<b>Envision</b>	EDT: Solution Ideation, Idea Prioritization, Storyboarding, Hill
<b>Develop</b>	Git Repository, IBM Digital App Builder, IDE, APIs, SauceLab
<b>Reason</b>	AI, Data Analytics, Chatbot
<b>Operate</b>	Toolchain, PagerDuty, DC, CI/CD Delivery Pipeline, New Relic
<b>Learn</b>	Hypothesis-Driven Development, Google Analytics, Backlog

## Culture

- Collaborative Environment - Google Drive, Slack
- End-to-End Responsibility
- Continuous Improvement
- Automate Almost Everything
- Customer's Needs
- Fail Fast, Learn Fast
- United Team

These are agreed practices we follow throughout the whole project

# **Members**

<b>Members</b>	<b>Role</b>
Raja Pandian	Project Lead/Data Analyst
Ramon (Joseph) Cagas	Architect
Tan Kheng Heang	Marketing and Sales
Teo Beng Poh	Developer/UI/UX
Teo Yong Song	Business Analyst

# RACI Chart - Responsible, Accountable, Consulted, Informed

Activity	Project Lead	Architect	Mktg & Sales	Developer	Business Analyst
EDT	A	C	R	C	A
Wireframe	R	R	A	A	R
Coding	I	I	I	R	C
Deploy	R	A	I	I	I

## Discover

- Problem Statement
- Pain Points
- User Personas
- Empathy Map
- As-is Scenario

## **Problem Statement**

How might we address the low take-up rate of Rediscover Singapore vouchers amongst Singaporeans?

## Pain Points

- 1) Multiple government websites with confusing/contradictory information.
- 2) Non-intuitive user interface
  - a. Difficult to compare the same attraction against multiple vendor websites.
  - b. Lack of consistent and transparent pricing. Vendors and platforms add-on their own markup.
- 3) Want greater flexibility in spending vouchers within family units.
- 4) No refund or rebooking in event of wet weather.



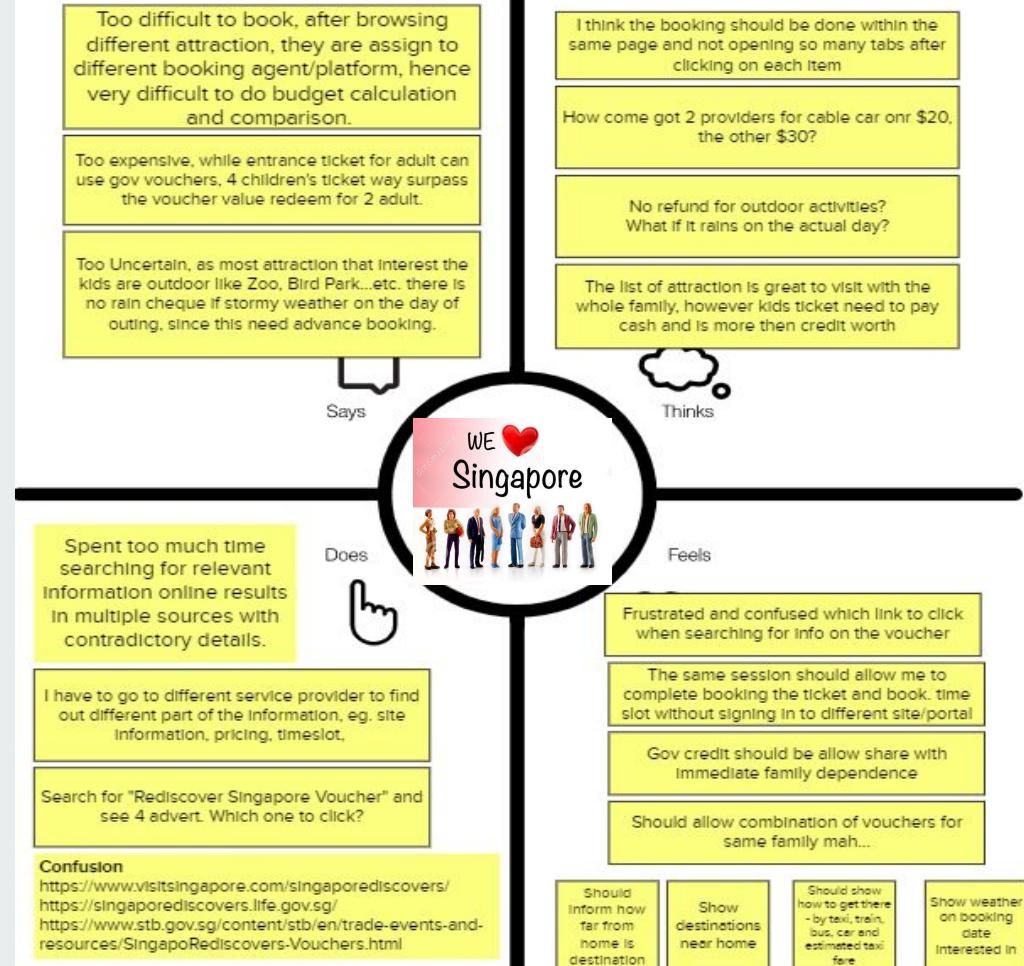
# User Persona

The average singaporean:

- 18+ years old
- With/Without Children
- Able to search online and use smart phone



# Empathy Map



# As-Is Scenario map

Steps	Google for "Rediscover Singapore Voucher" or similar text.	Select items to utilise Rediscover Singapore Voucher	Booking and confirmation of item selected
Doing	 <p>Search for "Rediscover Singapore Voucher" and see 4 advert. Which one to click?</p> <p>Spent too much time searching for relevant information online results in multiple sources with contradictory details.</p>	<p>I have to go to different service provider to find out different part of the information, e.g. site information, pricing, timeslot,</p>	
Thinking	 <p>How come got 2 providers for cable car one \$20, the other \$30?</p>	<p>I think the booking should be done within the same page and not opening so many tabs after clicking on each item</p> <p>The list of attraction is great to visit with the whole family, however kids ticket need to pay cash and is more than credit worth</p>	<p>No refund for outdoor activities? What if it rains on the actual day?</p>
Feeling	 <p>Frustrated and confused which link to click when searching for info on the voucher</p> <p>Confusion  <a href="https://www.visitsingapore.com/singaporediscovers/">https://www.visitsingapore.com/singaporediscovers/</a>  <a href="https://singaporediscovers.life.gov.sg/">https://singaporediscovers.life.gov.sg/</a>  <a href="https://www.stb.gov.sg/content/stb/en/trade-events-and-resources/SingaporeRediscover-Vouchers.html">https://www.stb.gov.sg/content/stb/en/trade-events-and-resources/SingaporeRediscover-Vouchers.html</a></p>	<p>Should allow combination of vouchers for same family mat...</p> <p>Should inform how far from home is destination</p> <p>Show destinations near home</p> <p>Should show how to get there - by taxi, train, bus, car and estimated taxi fare</p> <p>Show whether on booking date interested in</p>	<p>The same session should allow me to complete booking for ticket and book time slot without signing in to different subportal</p> <p>Gov credit should be allow share with immediate family dependence</p>

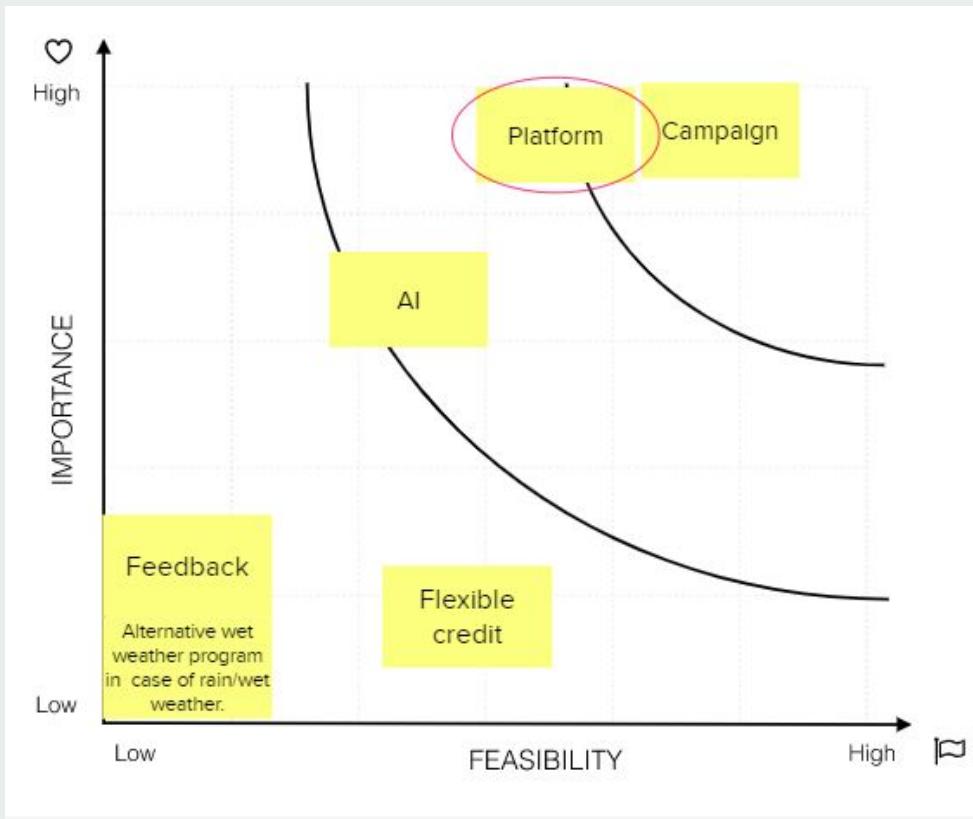
## **Envision**

- Solution Ideation - Big Ideas
- Idea Prioritization
- Storyboard
- Hill

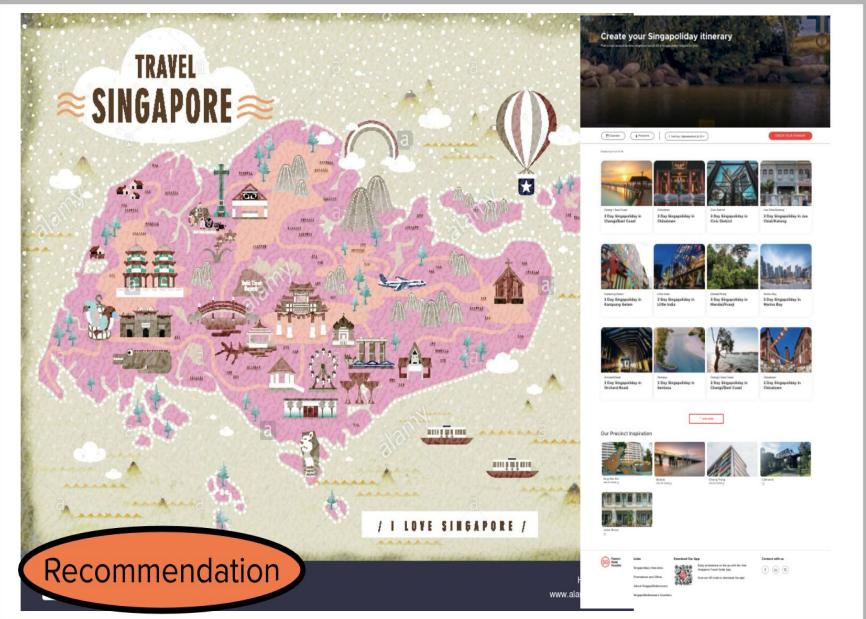
# Big Ideas

Platform	Campaign
<b>Aggregated APP</b> 1) Booking of the session should not need to go in and out of various site for different task  To have a unified platform to browse and complete booking all in the single session	Join campaign with SMRT, Taxi (Grab), etc to cut cost  Campaign with QR code scanning eg. most check-in, most visited, best utilisation of \$100, closest spending to the \$100 without bursting it....et
	Treasure hunt - 1 million dollars prize. (collaborate with singapore pools)
	Celebrity day trip
	Free pass day - (FCFS)
Feedback channel for suggestion on what to add in the approved list	List of attraction is boring unless visit with the whole family, credit should be able extend to immediate dependent(s)
Alternative wet weather program in case of rain/wet weather.	

# Prioritization Grid



# Storyboard



# Storyboard

Home > Singapore Tours & Tickets > Search Results > Singapore Cable Car Mount Faber Line Round-Trip + Beer / Snack (Takeaway; Weekday Only)

Activity ID: 33172002

From \$20.00/adults

Book Now

Changi Recommends Trip.com

GLOBAL Trips

traveloka

KLOOK

Activity Highlights

- If you can not use "SingpassDiscover Vouchers", tap, please update your app to the latest version for booking and redemption of SingpassDiscover Vouchers.
- The cable car is the most unique way to get to Sentosa - no Singapore trip is complete without it!
- Head to the famous Mount Faber peak using the pass and relish breathtaking sceneries from the cable car.
- Get convenient access to other attractions such as Megatop, Universal Studios Singapore, and Siloso Beach.

Reviews

E43\*\*\*\*5986 14 March 2021  
Definitely worth the time and price! The chilli crab potato skins were 😍! The cable car ride was great!

View all 2 reviews?

**Utilize Up-Sell & Cross-Sell Techniques to Increase Sales**



Select your date of visit

From your card What's on Search & Events Shop by category Book a transfer SingPass

Total Payable \$1,274.00

Visit Date: 19 April 2021

Adult Price: \$63.00

Child Price: \$31.50

Singpass Pass: 4 tickets

Admission: Singapore Zoo Admission Adult (non-member) x 2 \$67.00 Child (non-member) x 4 \$42.00

Next

Select your visit time

From your card What's on Search & Events Book a transfer SingPass

Total Payable \$1,274.00

Visit Time: 10:00AM

Adult Price: \$63.00

Child Price: \$31.50

Singpass Pass: 4 tickets

Admission: Singapore Zoo Admission Adult (non-member) x 2 \$67.00 Child (non-member) x 4 \$42.00

Next

**SINGPASS MOBILE**  
More than just a login!

MYINFO PROFILE

view info at a glance

CPF Details HDB Information MyFinances MySource Details

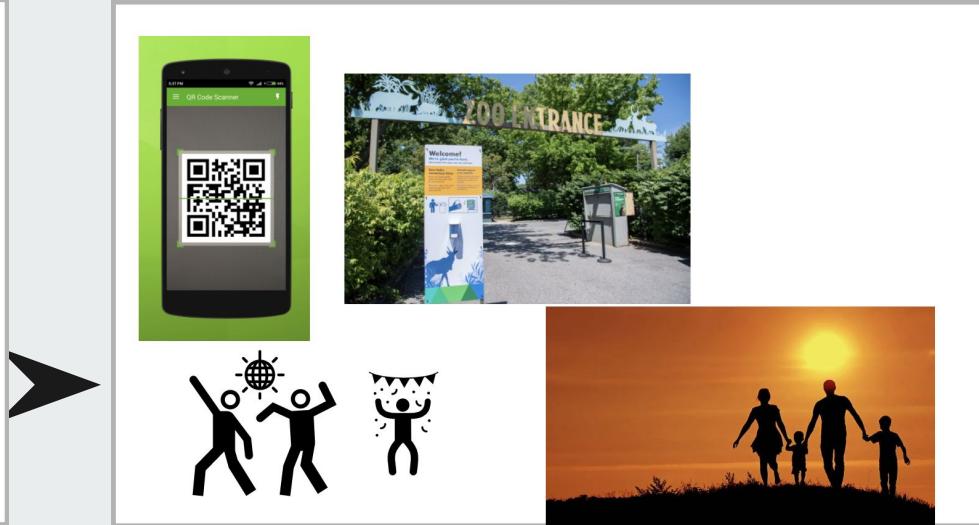
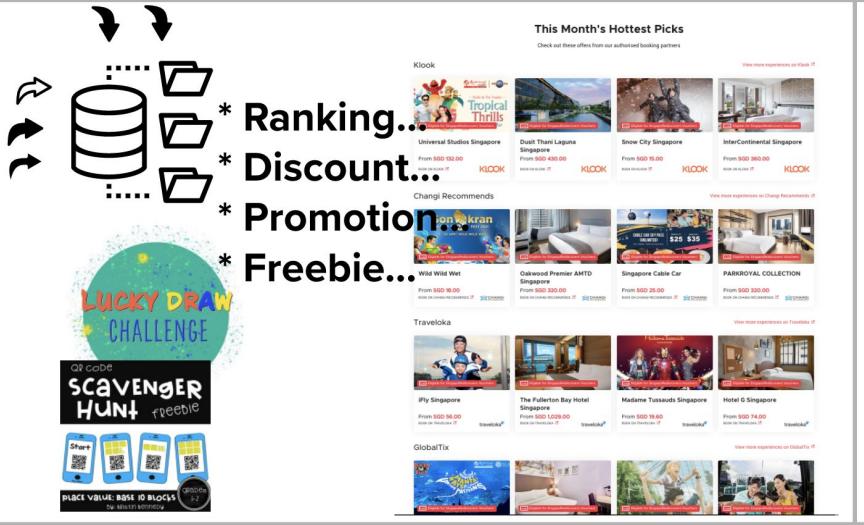
LOGIN SHORTCUTS

No Password required

Access services with a tap

ns.sg

# Storyboard



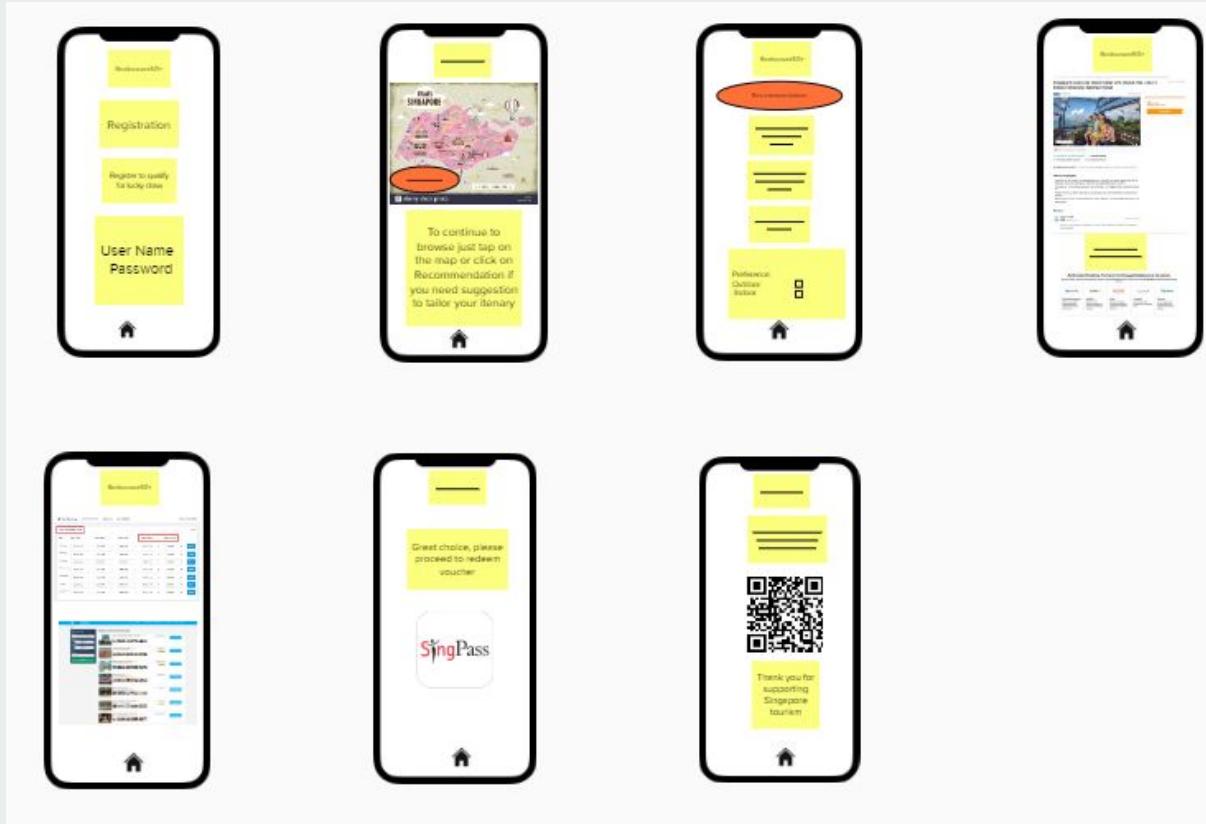
# Hill

Who	What	Wow
Singaporeans (18+), who have not yet utilized their Rediscover Singapore vouchers	Can easily select and book their preferred place of interest	So that they can happily utilize their \$100 voucher in full.

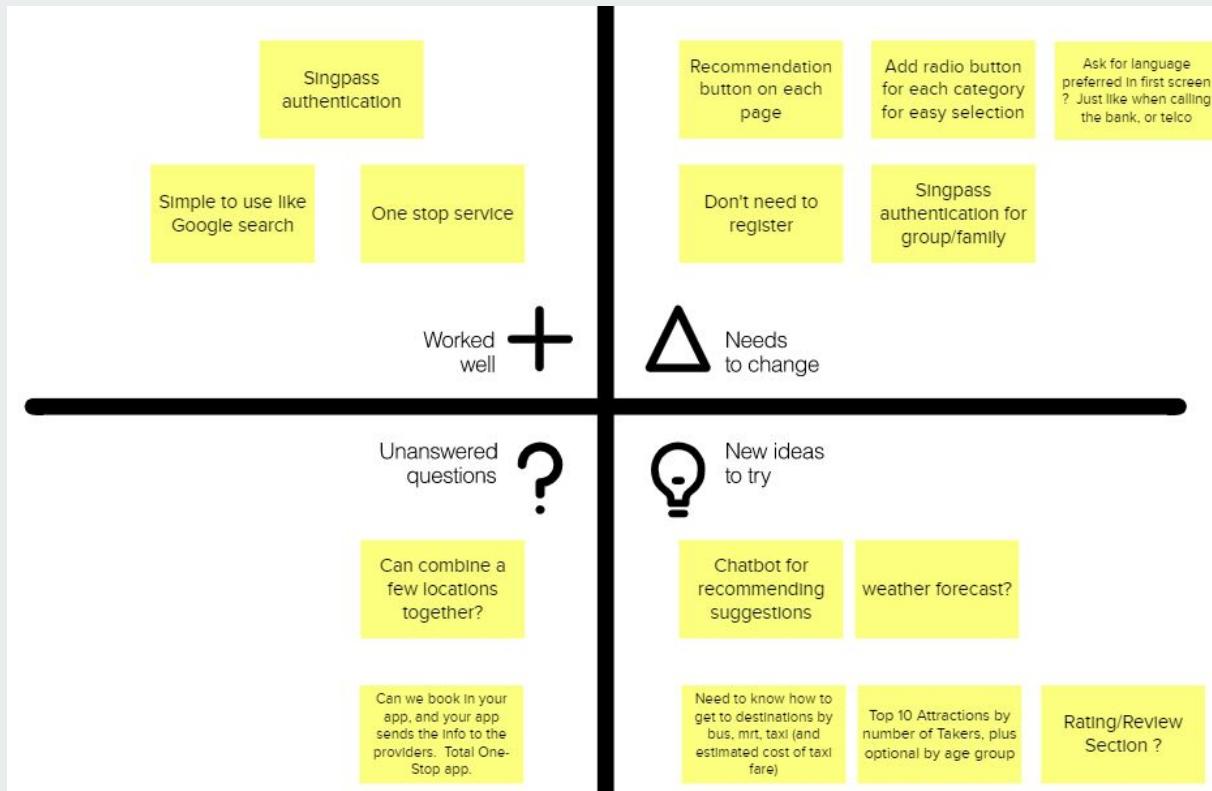
## Develop

- Wireframe
- Feedback
- Wireframe 2nd iteration
- Mobile App Architecture/Code Development Pipeline
- Collaboration & Automation
- API Management
- Security Architecture

# Wireframe



# User Feedback



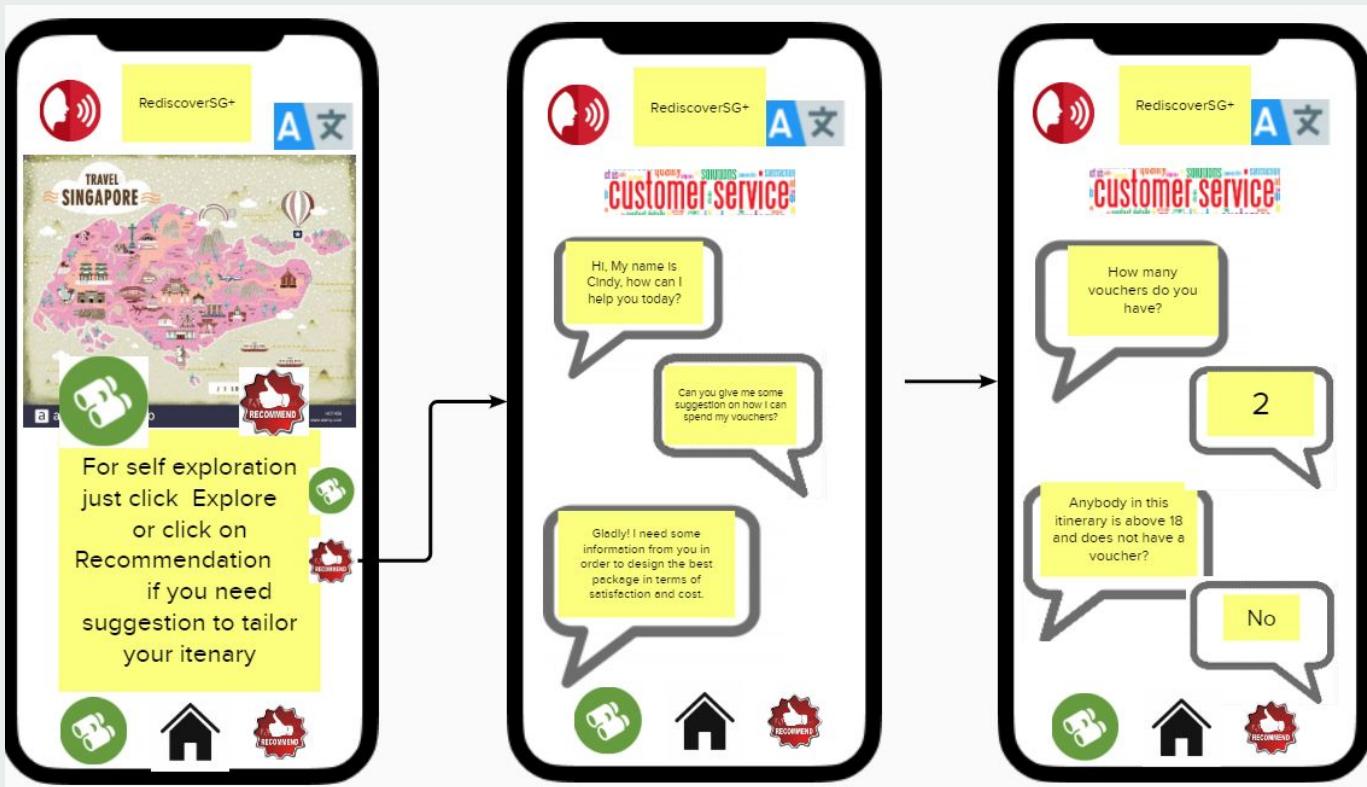
# Wireframe 2nd iteration



## Wireframe 2nd iteration



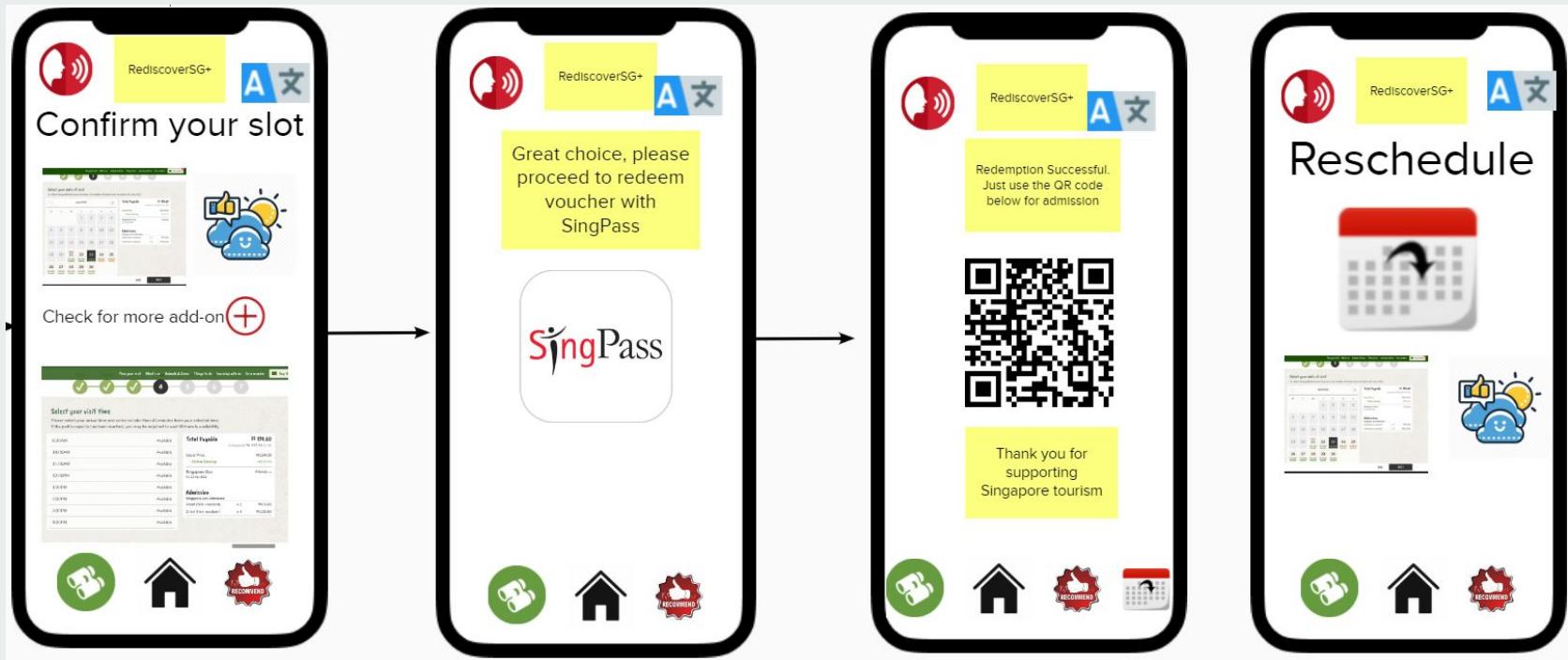
## Wireframe 2nd iteration



## Wireframe 2nd iteration



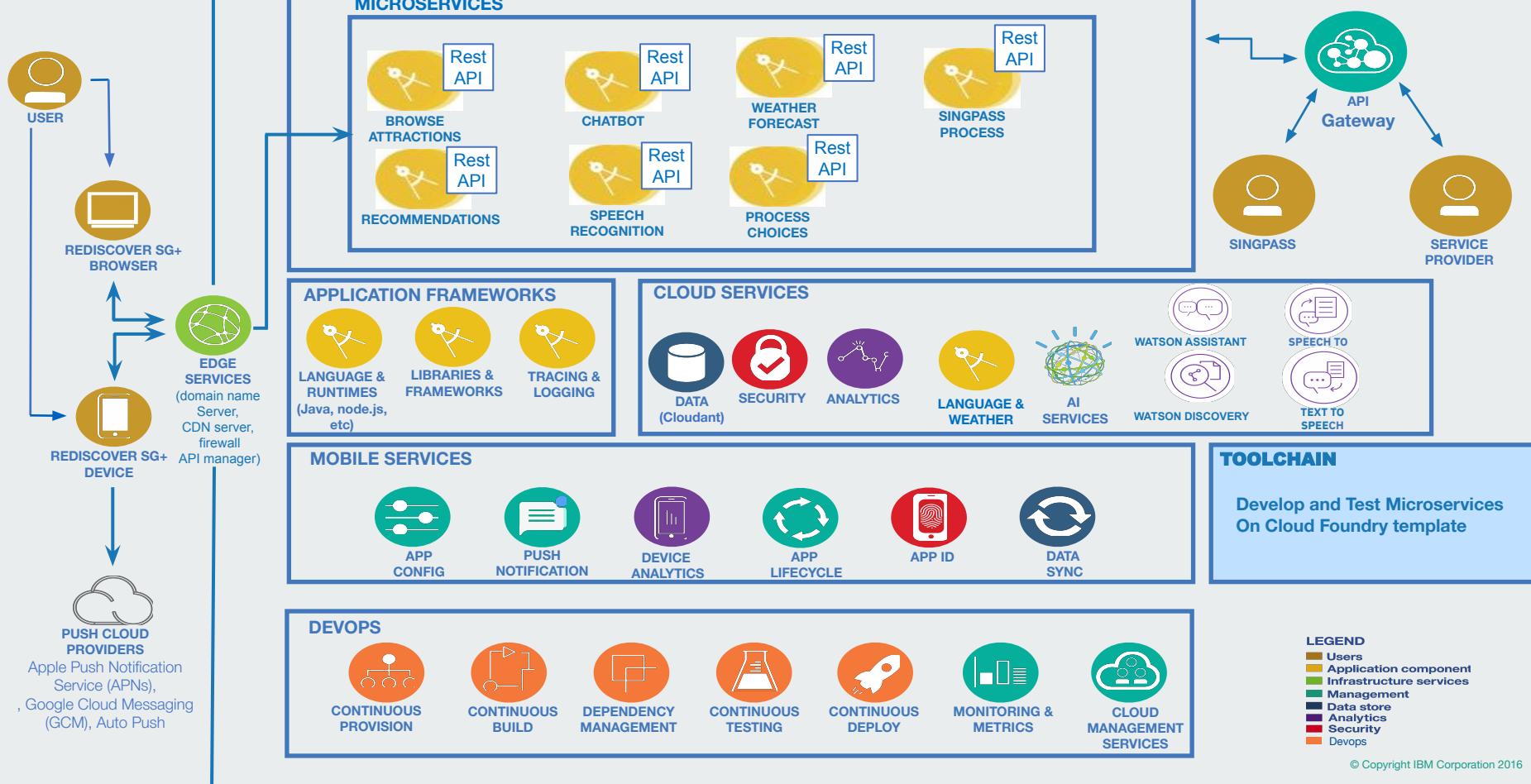
## Wireframe 2nd iteration



## PUBLIC NETWORK

## PROVIDER CLOUD - IBM CLOUD

# RediscoverSG+ Reference Architecture



# Initial Toolchain created by template **Develop and Test Microservices On Cloud Foundry** template

The screenshot shows the IBM Cloud dashboard with the following details:

- Toolchain Components:**
  - Think:** Issues (ui-microservices-toolc...) - Configured
  - Code:** Git (ui-microservices-toolc...) - Configured
  - Deliver:** Delivery Pipeline (ui-microservices-toolc...) - No stages detected
  - Manage:** PagerDuty - Configure button
  - Learn:** DevOps Insights - Configured
  - Culture:** Slack - Configure button
- Bottom Grid:**
  - Git (catalog-api-microservi...)
  - Delivery Pipeline (catalog-api-microservi...)

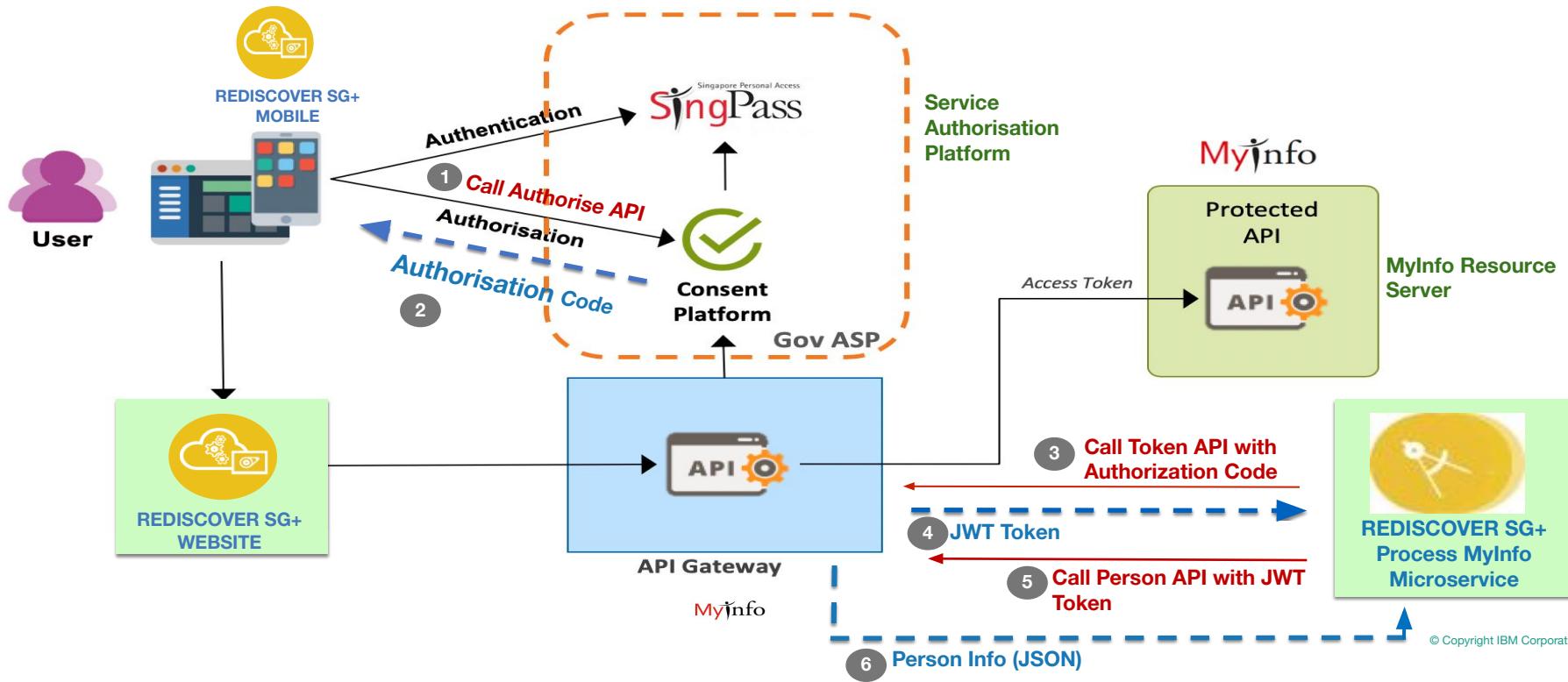
**IBM Cloud Dashboard Navigation:** Search resources and offerings, Catalog, Docs, Support, Manage, Jobs.

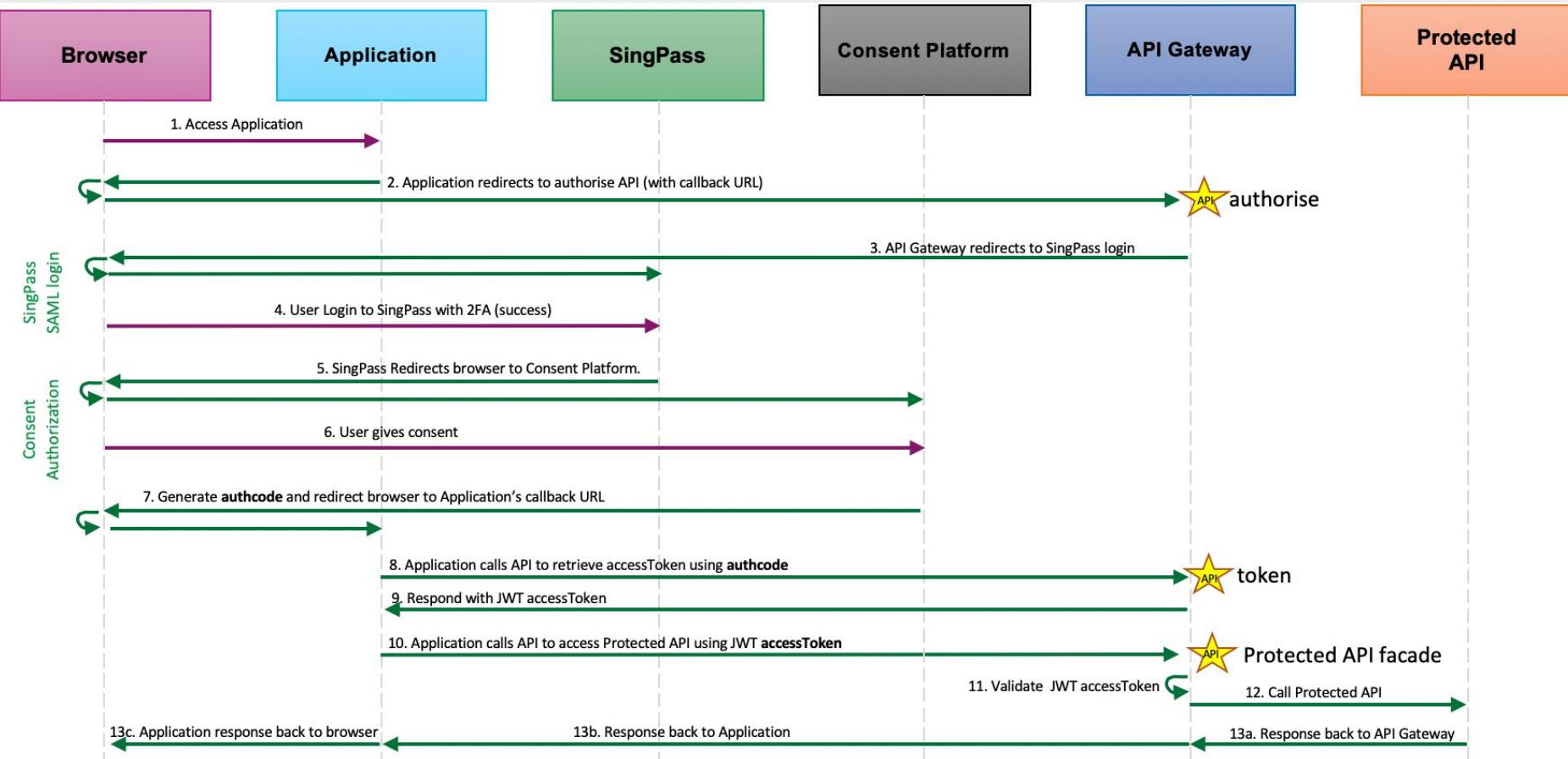
**System Status:** 2:03 pm, 29/4/2021, ENG, Battery level, Signal strength, Wi-Fi, Bluetooth, Volume, and a notifications icon.

# OAuth2.0 Authorisation

RediscoverSG+ will invoke 3 MyInfo APIs :

1. Authorise (/authorize) - triggers the Singpass authentication process, followed by presenting a consent page
2. Token (/token) - generates an access token when presented with a valid authcode
3. Person - returns user's data from MyInfo when presented with a valid access token





## Reason

- Data Analytic
- Artificial Intelligence AI:
  - Chatbot,
  - Translator,
  - Recommender

# Analytics

## Data collection

- User profiles: age, budget, number of children
- Search terms: Frequency, categorising
- Bookings (committed to, abandonment rate)

## Insights: Google Analytics

- **Behavior Flow:** visualizes the path users traveled from one page or attraction to the next. Discover what keeps users engaged.
- **Site search:** Understand which of your users used your site's search function, which search terms they entered, and how effectively the search results created deeper engagement with your site.
- **Conversion:** Analyze purchase activity; product and transaction information, average order value, conversion rate, time to purchase, and other data.

# Ai/Machine learning

## Intelligent Searches

- Improve recommendations for customers.
- AI-powered search engine tracks your browsing patterns and do searches as per that to help you find exactly what you are looking for.
- With deep learning, AI-powered search-engines pull information from big data. They use search term you enter and deeply analyze the conversation held with the customer.

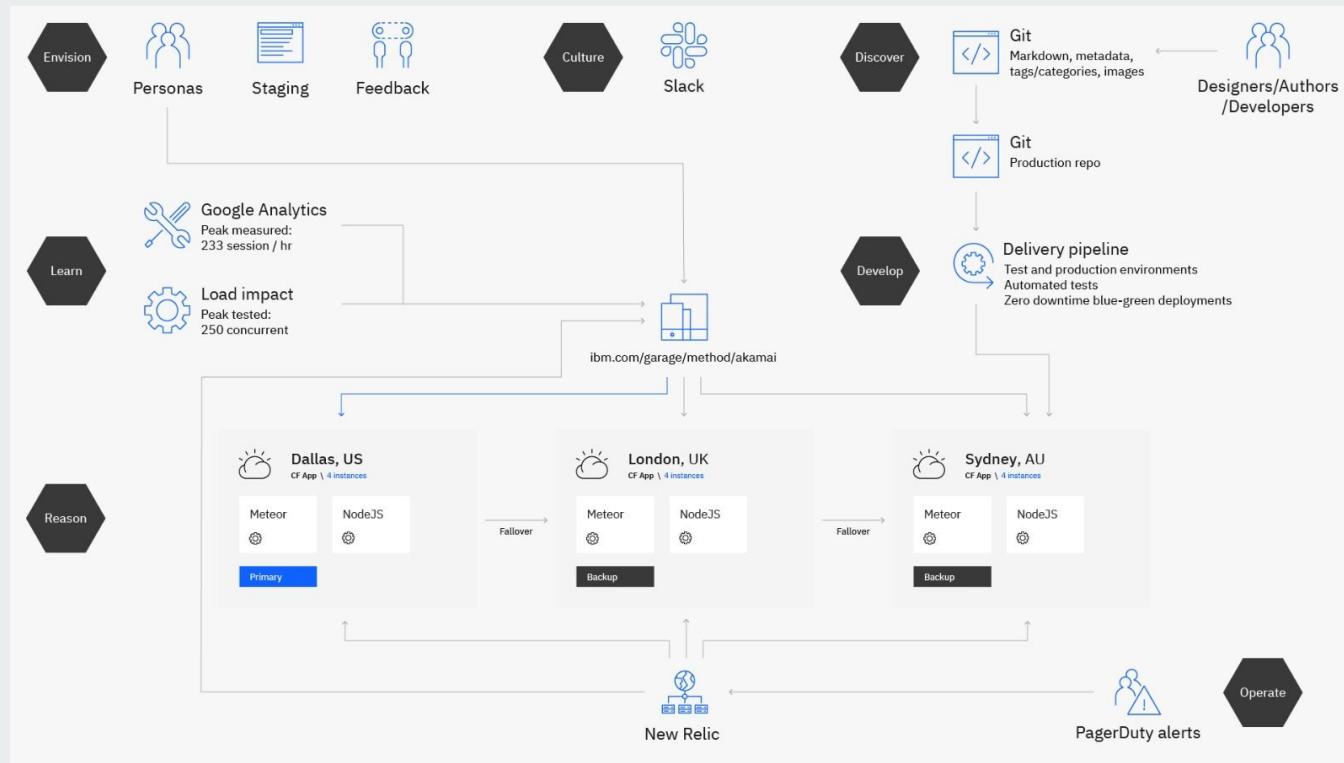
## Chatbot

- Able to offer 24x7 assistance with chatbots.
- Provide a personal touch.
- Bots can offer the customers with all the possible solutions and answers that they tend to deal with. Additionally, able to assist customer to make purchase decisions.

## Operate - Operational Excellence

- Overview
- High Availability
- Active-Active Instance in each Data Centre
- Active-Standby across Regions
- Disaster Recovery

# Overview



# Cloud Native Toolchain

Think	Code	Deliver	Manage	Learn	Culture
 Issues sample-cloud-native...	 GitHub sample-cloud-native...	 Delivery Pipeline sample-cloud-native...	 New Relic Application Monitors	 Google Analytics Analytics	 Slack #general
✓ Configured	✓ Configured	✓ Success	✓ Configured	✓ Configured	✓ Configured
 Sauce Labs teoyongsong		 PagerDuty		 DevOps Insights	
✓ Configured		Configure		✓ Configured	
 Eclipse Orion Web IDE					
✓ Configured					

## Learn - Continuous Experimenting

- Hypothesis Testing
- Users Feedback
- Learning based on outcomes of experiments
- Backlog

## Hypothesis Driven Development (HDD)

**Hypothesis:** The “Recommendation” functionality will increase the **utilization of the vouchers.**

**Observable Metric:** Of the users that clicked on the recommendation button, what proportion of them proceeded to make a booking versus the proportion that opted to search manually and subsequently make a booking.

# Backlog for handling issues

The screenshot shows a GitHub project page for a repository named "Dannyteo / sample-cloud-native-toolchain-tutorial-20210419091544524". The page features a navigation bar with links for Search or jump to..., Pull requests, Issues, Marketplace, Explore, Unwatch (1), Star (0), Fork (0), and a user profile icon.

The main content area displays a backlog board with three columns: Backlog, In progress, and Done. The Backlog column contains three items:

- 5 Backlog (Added by Dannyteo)
  - Create a variation of the API that allows entry of a list of names #2 opened by Dannyteo
  - Add an API that allows the user to tailor the message that is sent to a specific user #3 opened by Dannyteo

The In progress column contains one item:

- 1 In progress (Change the output of hello world sample ... to say "Hello there <name> or stranger!" #1 opened by Dannyteo)

The Done column currently has 0 items.

At the bottom of the backlog board, there are buttons for Automated as To do, Manage, Automated as In progress, Manage, and Automated as Done, Manage.