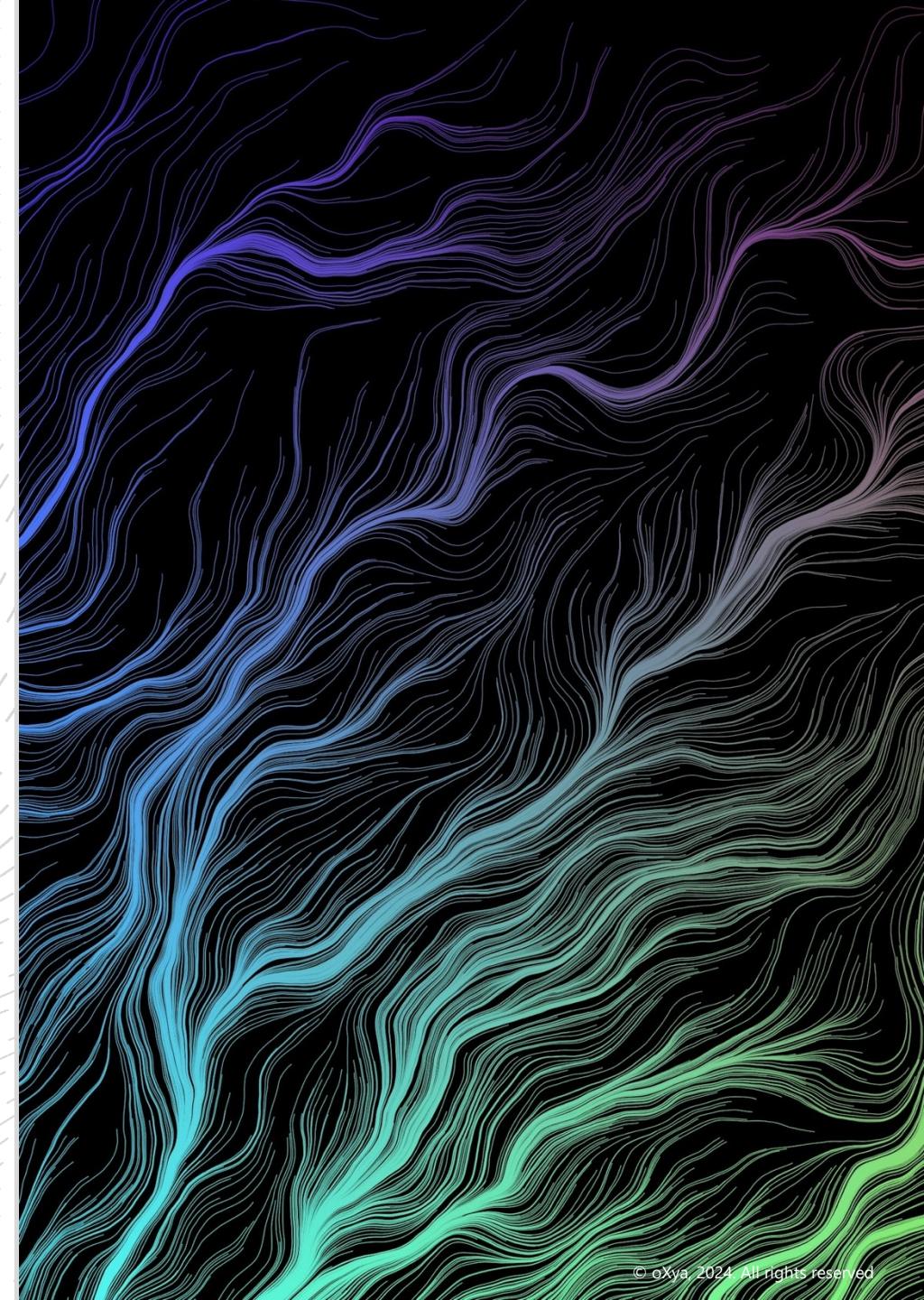


oXya

# FLASH CARD it

April 2024

oXya's participation to Google Gemini Hackathon



# Project Introduction



## Building Smart Learning Flashcard with Gemini

### THE FLASHCARD'IT PROJECT

- oXya is thrilled to be participating in this hackathon, leveraging the power of Gemini technologies to revolutionize the way we learn! Our project focuses on building an innovative application that streamlines the creation of flashcards from educational PDFs.
- Imagine a world where certification documents, training manuals, and any learning resource can be transformed into interactive flashcards with just a few clicks. Our application tackles this challenge by utilizing Gemini's capabilities. Here's how it works:
  - **PDF Ingestion:** Users upload a PDF document containing valuable learning material.
  - **Intelligent Text Extraction:** Gemini's AI extracts key concepts, definitions, and factual points from the PDF, understanding the structure and context.
  - **Flashcard Generation:** The extracted information is then automatically converted into well-formatted flashcards, each represented as a JSON object. These flashcards can include text, images, or even audio snippets, depending on the content of the PDF.
  - **Testing and Learning:** Users can leverage these Gemini-powered flashcards to test their knowledge and solidify their understanding of the learning materials.
- Our project aims to empower learners by:
  - **Saving Time:** Eliminate the tedious task of manually creating flashcards.
  - **Enhanced Learning:** Improve knowledge retention through interactive flashcards.
  - **Accessibility:** Make learning materials more digestible and engaging.
- By harnessing the potential of Gemini, oXya's application aspires to make the learning process more efficient and enjoyable for everyone.

# Gemini Hackathon

## Why are we using Gemini for this Solution?

- We leverage Gemini's powerful **Large Language Model (LLM)** to create flashcards seamlessly, drawing information directly from its **vast knowledge base**.
- Uploading training materials in PDFs provides **additional context for Gemini**, enabling it to build even smarter and more accurate flashcards that are specifically tailored to the content. This significantly **reduces the likelihood of errors or irrelevant information** appearing in the generated flashcards (a phenomenon known as **hallucination**). This process is called **Retrieval-Augmented Generation (RAG)**.
- While automation streamlines the process, **human oversight remains crucial**. Instructors can review the automatically generated flashcards and ensure their accuracy before using them.

```
    > os,s))},n)},n)}},</pre>
```

# The Project Team



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# Description of the Solution



## Key definition

### FLASHCARDS

- Flashcards are small study tools, typically cards, used to aid memorization. They are designed with information on one or both sides. One side with a question and the other side with the correct answer and some explanation.
- The flash cards are stored in the Firestore database in JSON format. It contains one question and a list of affirmation (e.g., true, false, or other character chains) associated with a boolean value revealing if the affirmation is valid or incorrect.
- There is always one only valid affirmation per flashcard that properly answers the question on the top of the flashcard.

### TOPIC

- The training topic is the subject of the training, and a group of flashcards. The topic could be either related to a technical training, an employee on-boarding or the preparation of a specific certification (e.g., Google Cloud certified Professional Architect, Project Management Professional...) We associate tags to each topic to help the trainee find the proper topic (for e.g., aws, google, azure, pmp, certification, ...)

### RUN MODES

- Once the trainee connects to the platform and selects a topic, he or she has the possibility to select one of the 2 run modes available: learning mode or training mode.
- In the learning mode, the trainee will see first the question on the top of the card. Once he or she flips the card, only the right answer will show up with a short explanation.
- In the training mode, the trainee will see first the question on the top of the card. Once he or she flips the card, several affirmations will show-up. The trainee will be invited to click on the affirmation he or she consider the valid answer. After clicking, the flashcard will reveal if the answer is correct or not.

# Description of the Solution



Key definition

## Instructor

- The instructor is a user role that has the ability to create the topic, tags, and upload the PDFs materials to create the flashcards on the "Flashcard'it" platform.

## Trainee

- The trainee is a user role that has the ability to select a topic and display the flashcards in learning mode or training mode.

# Description of the Solution

## Application workflows

### › Instructor workflow to create the flashcards



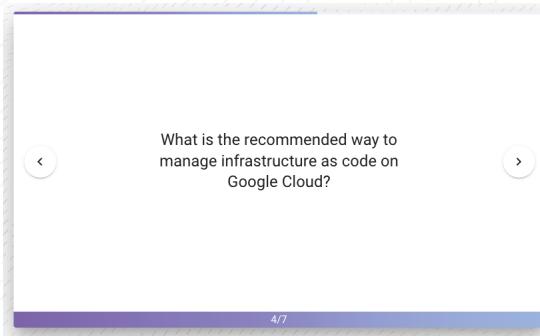
### › Trainee End-user workflow to learn and test his or her knowledge with the generated flashcards



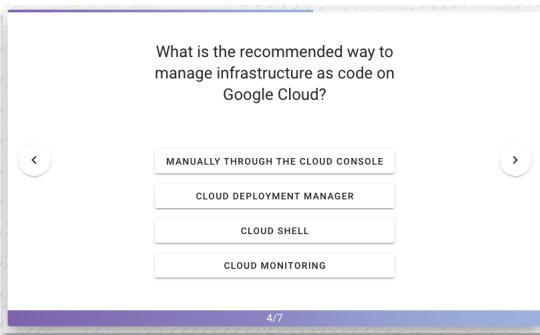
# Description of the Solution

Example of a flashcard

## › Front side of the flashcard



## › Flip side of the flashcard in training mode

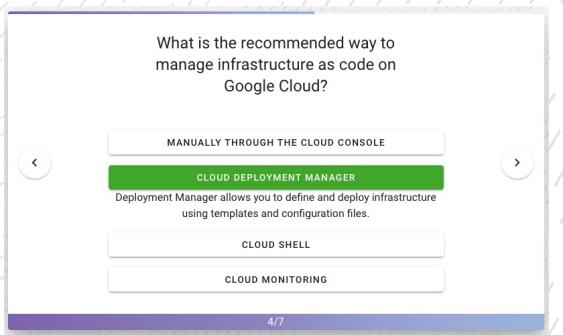


## › Flip side of the flashcard in learning mode



## › Flip side of the flashcard in training mode

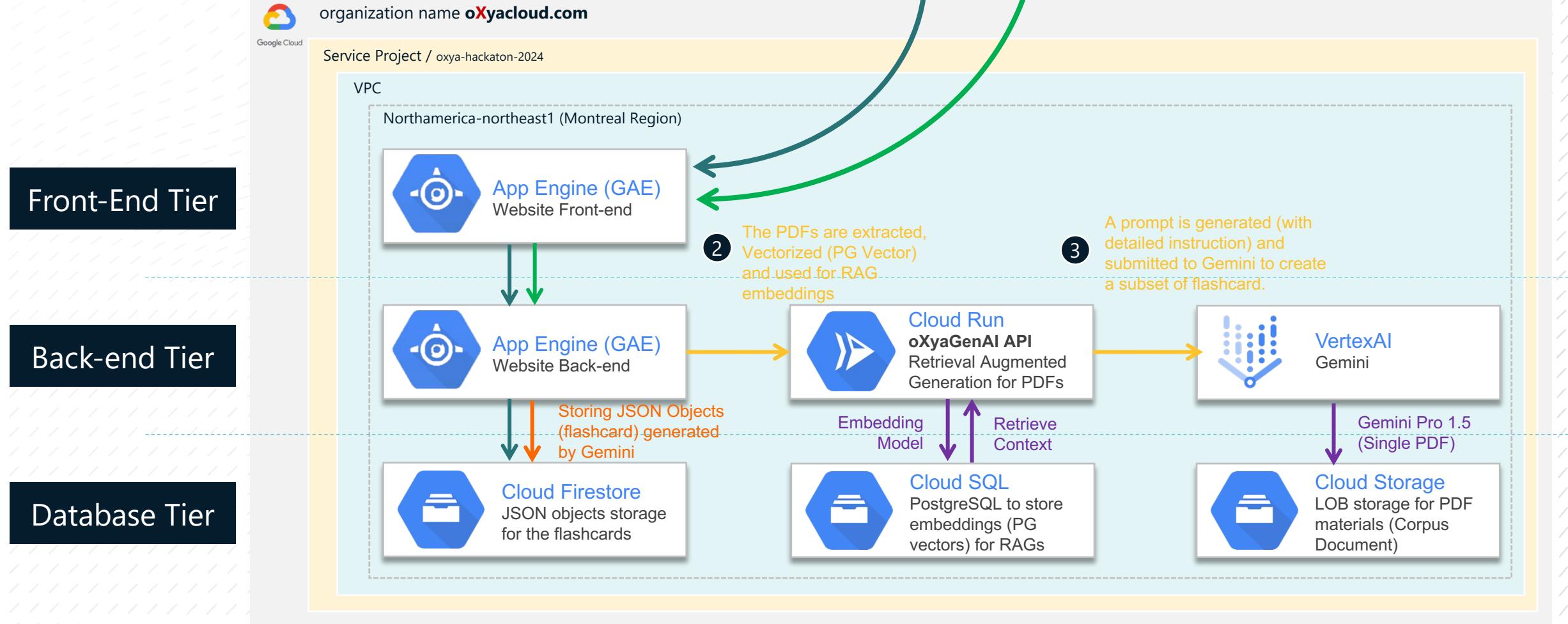
(After the trainee clicked on the affirmation, he or she consider the valid answer.)



# Description of the Solution



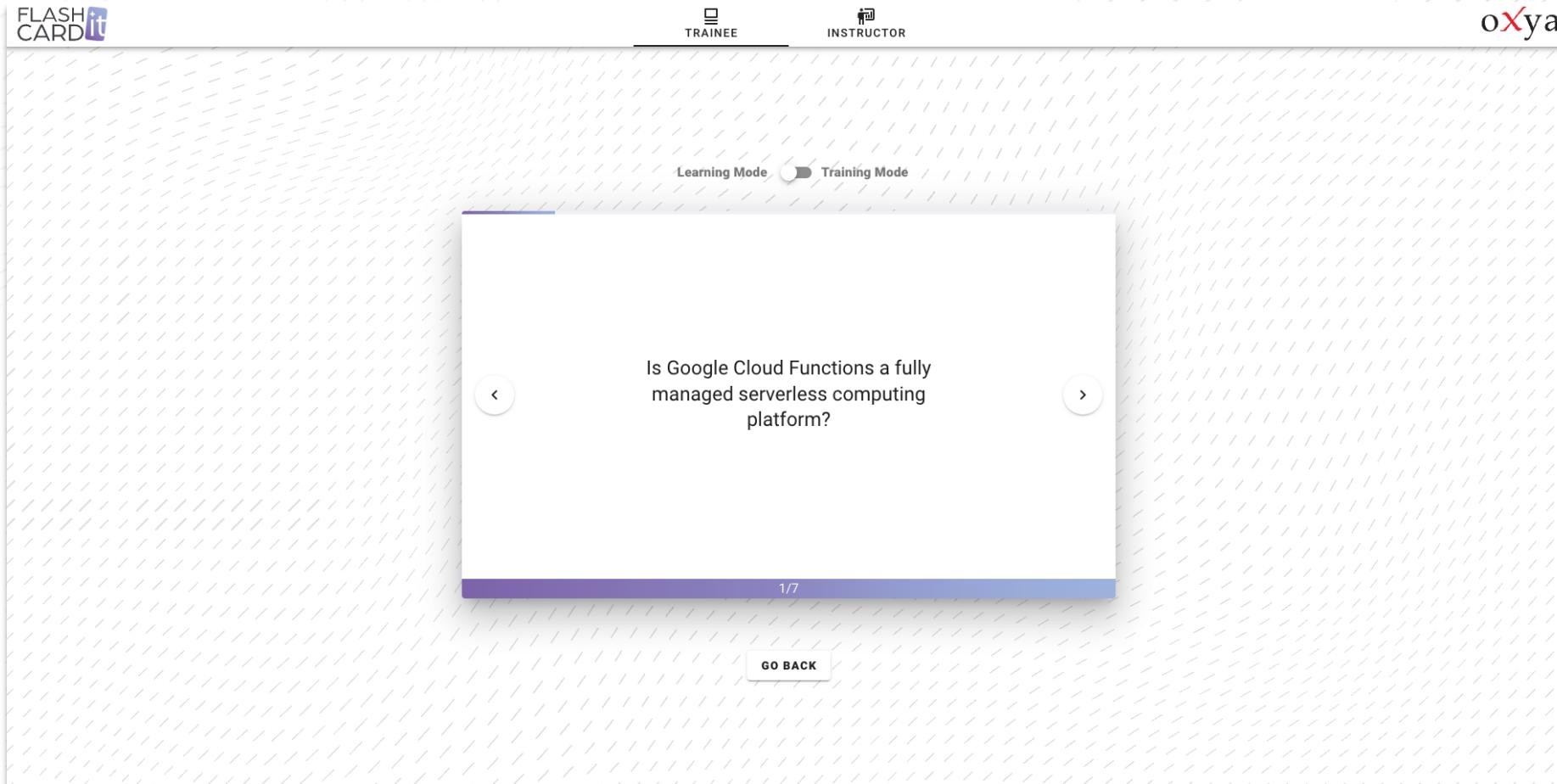
# Architecture on Google Cloud



# Description of the Solution

Sneak peak of the Interface

## ► Trainee interface



# Description of the Solution

Sneak peak of the Interface

## ► Instructor interface

The screenshot shows the FlashCardIt platform's instructor interface. At the top, there are tabs for "TRAINEE" and "INSTRUCTOR". The "INSTRUCTOR" tab is active, indicated by a blue underline. On the left, there's a sidebar with a "Topic name" section set to "Google Professional Cloud DevOps Engineer" and a "Files" section containing three PDF documents: "Nova - Documentation.pdf", "Nova - User Guide.pdf", and "Nova - Technical architecture.pdf". Below these are four answer cards:

- Answer 2**: Increased flexibility and agility. Explanation: GitOps enables rapid deployment and allows for quick updates and changes. Status:  Correct.
- Answer 3**: Improved collaboration and visibility. Explanation: While GitOps can provide visibility into infr. Status:  Correct.
- Answer 4**: Increased security and compliance. Explanation: GitOps promotes security by using immutable infrastructure and enforcing code reviews. Status:  Correct.

A central modal window is open, titled "Adding question(s)". It contains four options for generating cards:

- Manual
- From Topic Name
- From One PDF file
- From Library PDF files

Below these options is a "PDF input" button with a PDF icon. A "Number of cards" input field is set to "1". At the bottom of the modal is a purple "GENERATE WITH GEMINI" button with a white star icon.

At the bottom right of the main interface, there are buttons for "DELETE TOPIC", "RESET", and "SAVE".

# Description of the Solution

Example of a JSON object stored in the Firestore database

```
{  
  "id": "f2NHj6Ju0vIhYdhwoJSb",  
  "topic": "Google Cloud Associate",  
  "flashcards": [  
    {  
      "question": "Is Google Cloud Functions a fully managed serverless computing platform?",  
      "answers": [  
        {  
          "correct": true,  
          "text": "True",  
          "explanation": "Google Cloud Functions is a fully managed serverless computing platform that allows users to deploy and run code without having to provision or manage servers."  
        },  
        {  
          "correct": false,  
          "text": "False",  
          "explanation": "Google Cloud Functions is not a fully managed serverless computing platform."  
        }  
      ],  
      "id": "3H8HWqfwyEfG5Q9hdUw"  
    }  
  ]  
}
```

Prompt template submitted to Gemini with 2 variables: \${numberOfCards} / \${topic}

Generate \${numberOfCards} question-answer for the \${topic} 2024 certification.

The question should present four potential answers.  
Only one of these answers should be correct.  
Each answer should come with a unique explanation.  
The output needs to be in JSON format, similar to the following example :

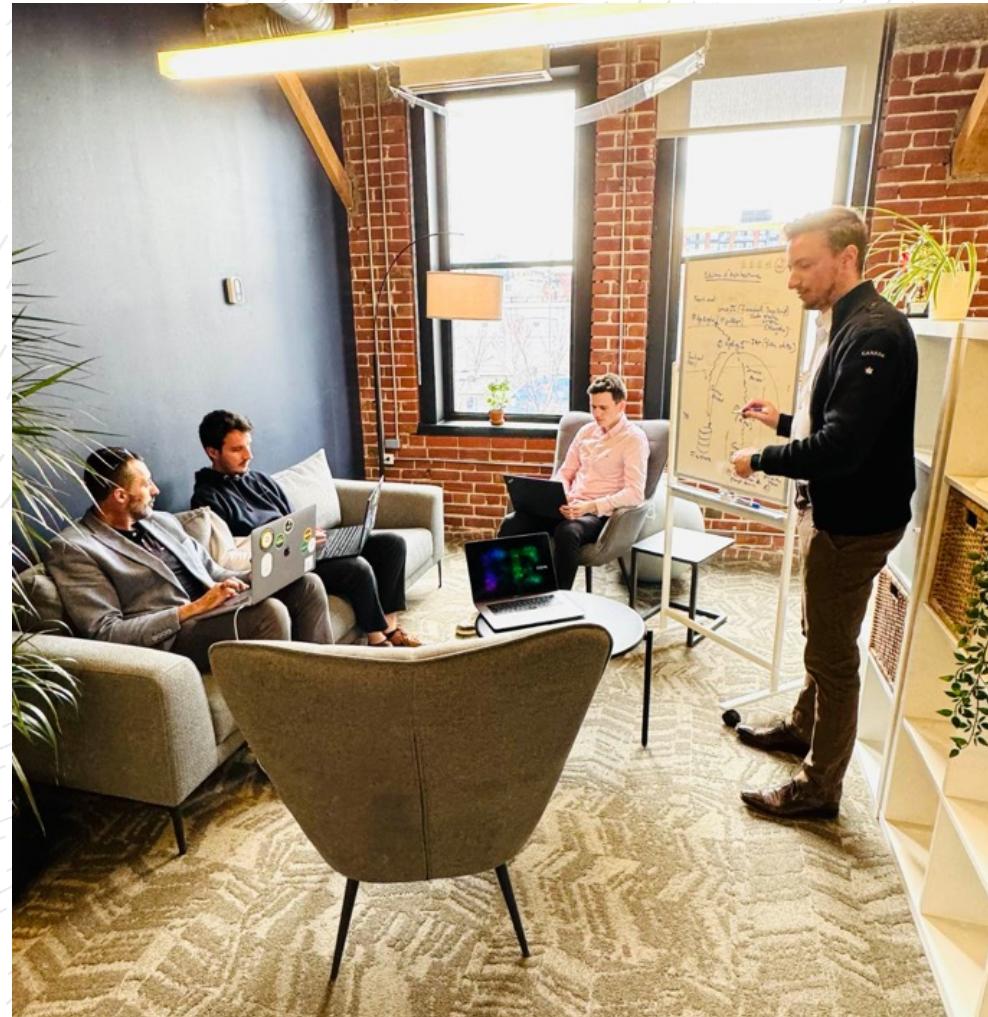
```
[  
  {"question": "What is the color of the sky?",  
   "answers": [  
     [  
       {  
         "text": "green",  
         "correct": false,  
         "explanation": "The sky is not green, it's blue."  
       },  
       {  
         "text": "blue",  
         "correct": true,  
         "explanation": "The sky is blue because it reflects the water"  
       }  
     ]  
   ]  
}
```

# Future Improvement of the Application

## Project Backlog

We are planning to use this application internally after the hackathon. You will find below the backlog of features we are planning to implement:

- › Authentication through okta with name account,
- › A role-based access with 3 types of profiles: Trainee, Instructor and Admin,
- › Building and storing a corpus of document per topic,
- › Creating a score for each trainee users with a feedback sent to the instructor into a dashboard,
- › Using Gemini based on user response to question his or her weakness and generate new flashcards accordingly,
- › Allow users to mark some flashcards as favorite to easily retrieve it for learning purposes on the welcome page.



# Thank you

## EMEA

### France

Paris, Lyon, Nice, Lille, Pau,  
Nantes

### Belgium

Kortrijk, Leuven

### Denmark

Aalborg, Copenhagen, Odense

### UK

Southampton

### Spain

Barcelona

## AMER

### USA

New York, Dallas, Denver,  
Grand Rapids

### Canada

Montréal, Toronto

## APAC

### China

Shanghai



```
You, 7 months ago | 1 author (You)
import VueRouter from "vue-router";
import routes from "./routes/routes";
import store from "./store/index";
import vuexI18n from "vuex-i18n";
import enLangFile from "./lang/en";

// Set config file into the global variable
window.config = require("./vue.config");

// Import bootstrap file
require("./bootstrap");

// Set vue globally
const Vue = require("vue");
const VueRouter = require("vue-router");
const Vuex = require("vuex");
const VuexI18n = require("vuex-i18n");
const enLangFile = require("./lang/en");

// Create store
const store = new Vuex.Store({
  state: {
    user: null,
    token: null
  },
  mutations: {
    setToken(state, token) {
      state.token = token;
    }
  }
});

// Create router
const router = new VueRouter({
  routes
});
```