Project Plan
Product-based Capstone Project

Many individuals lack reliable information and guidance on how to care for minor wounds independently, often leading to improper treatment, delayed healing, and even avoidable complications. This problem highlights the need for a user-friendly mobile application capable of accurately identifying different types of minor wounds and delivering tailored, easy-to-follow care instructions. Such a solution would empower users to manage minor wounds effectively, reduce the risk of infection or further complications, and promote quicker recovery through informed self-care practices.

Research Question:

1. What specific wound care guidelines and product recommendations should be provided to ensure safe and effective self-treatment of minor wounds?
2. Which machine learning algorithms are most effective for accurately classifying minor wounds (such as cuts, burns, bruise, normal or not injured, and abrasions) based on image data in a mobile application?
3. How can personalized wound care reminders impact the consistency and effectiveness of self-treatment in users?
4. What impact does integrating a wound detection app have on reducing complications and infections from improper wound treatment?

Team ID : C242-PS086

Team Member :

1. (ML) M014B4KX0472 – Anak Agung Istri Intan Permata Sari – Udayana University - [Active]
2. (MD) A014B4KY1870 – I Putu Andika Prasetya – Udayana University - [Active]
3. (ML) M014B4KX3329 – Ni Komang Ayu Juliana – Udayana University - [Active]
4. (CC) C014B4KX3330 – Ni Komang Dinda Mayori – Udayana University - [Active]
5. (MD) A014B4KX3337 – Ni Made Gita Satviki Nirmala – Udayana University - [Active]
6. (CC) C014B4KX3347 – Ni Putu Nadila Sinthadewi – Udayana University - [Active]
7. (ML) M014B4KX4133 – Shelomita Putrinda Culio – Udayana University - [Active]

Project Plan
Product-based Capstone Project

Final Selected Themes:

Health Innovation: Empowering Vulnerable Communities for Health and Well-being

Title of the Project:

MediSight (Medical Insight)

Executive Summary/Abstract:

Our project aims to develop a mobile application that can detect and provide appropriate treatment for various types of minor wounds. The main problem to be solved is the lack of accurate information and guidance on how to treat minor wounds independently, which often leads to improper treatment and slows down the healing process. This application will use a machine learning-based image classification model to recognize the type of wound, such as burn, cut, bruise, normal (not injured), and abrasions (abrasions). In addition, the app will provide recommendations for appropriate medical products and remind users about wound care on a regular basis. Our team wants to address this issue to raise public awareness about proper wound care.

How did your team come up with this project?

Our team was inspired to develop this application because we and the people around us often experience minor injuries in our daily lives, such as abrasions, scratches, bruises, cuts, normal (not injured) or burns. In some cases, we realized that improper treatment can cause infection or slow down the healing process. Personal experience and seeing friends and family facing similar problems prompted us to find a better solution. We also observed that many people do not have sufficient knowledge about how to properly care for wounds, so they have the potential to make mistakes in handling them. By utilizing machine learning technology, we strive to provide accurate and easily accessible information about the types of minor injuries and how to treat them.

Project Scope & Deliverables:

Week 1		
Machine Learning	**Mobile Development**	**Cloud Computing**
• Collecting minor wounds dataset on the internet (9th November - 10th November)	• Making User Interface design from wireframe until HI-FI design (9th November - 13th November)	• Designing the service to be used (9th November - 10th November) • Choosing google cloud storage and data

Project Plan
Product-based Capstone Project

• Validating and preprocessing the images (11th November - 13th November) • Finding the optimal machine learning model for our model (13th November - 15th November)	• Check if the user interface is clear (14th November - 15th November)	services (11th November) • Building cloud firestore infrastructure (12th November - 15th November) • Building and setting cloud storage to GCP (12th November - 15th November)
Week 2		
Machine Learning	**Mobile Development**	**Cloud Computing**
• Create the model with machine learning using Python Tensorflow (16th November - 22nd November) • Evaluate and test the model to achieve the desired accuracy with development dataset (19th November - 22nd November) • Deploying model (20th November - 22nd November)	• Translate final design to XML code (16th November - 18th November) • Implementing functional code and back end services (19th November - 21st November) • Testing functional code and Record feature(21st November - 22nd November)	• Creating RESTful API with Node.js for data retrieving (16th November - 22nd November) • Deploying Application Programming Interface (API) on postman (22nd November)
Week 3		
Machine Learning	**Mobile Development**	**Cloud Computing**
• Test and evaluate the ML model that has already been deployed on android (23rd November - 28th November) • Fix the model if the	• Integrate the machine learning model API to device (23rd November - 25th November) • Allowing the mobile app to send data and receive predictions	• Deploying Application Programming Interface (API) on postman (day 23rd November - 25th November) • Optimizing devices (day 26th November - 29th

Project Plan
Product-based Capstone Project

accuracy and speed that has been deployed on android does not reach the expected target (23rd November - 28th November)	while ensuring proper error handling for API responses (26th November - 29th November)	November)
Week 4		
Machine Learning	**Mobile Development**	**Cloud Computing**
• Monitoring and evaluation (29th November - 6th December) • Finishing project (5th December - 6th December)	• Testing the application and make sure all feature working as we expected (30th November - 1st December) • Finishing the application and resolving any bugs (2nd December - 6th December)	• Maintenance front-end & back-end issues (day 30th November - 6th December) • Finishing project (3rd December - 6th December)
Week 5		
All		
• Create project brief document (7th December - 9th December) • Create presentation slide (7th December - 9th December) • Create youtube presentation (10th December - 12th December)		

Project Schedule:

Activity Start from 9th November 2024 - 12th December 2024	**Week 1**							**Week 2**						
	9	10	11	12	13	14	15	16	17	18	19	20	21	22
Collecting dataset														
Images preprocessing														
Finding optimal model														
Model creation														
Model evaluation														

Project Plan
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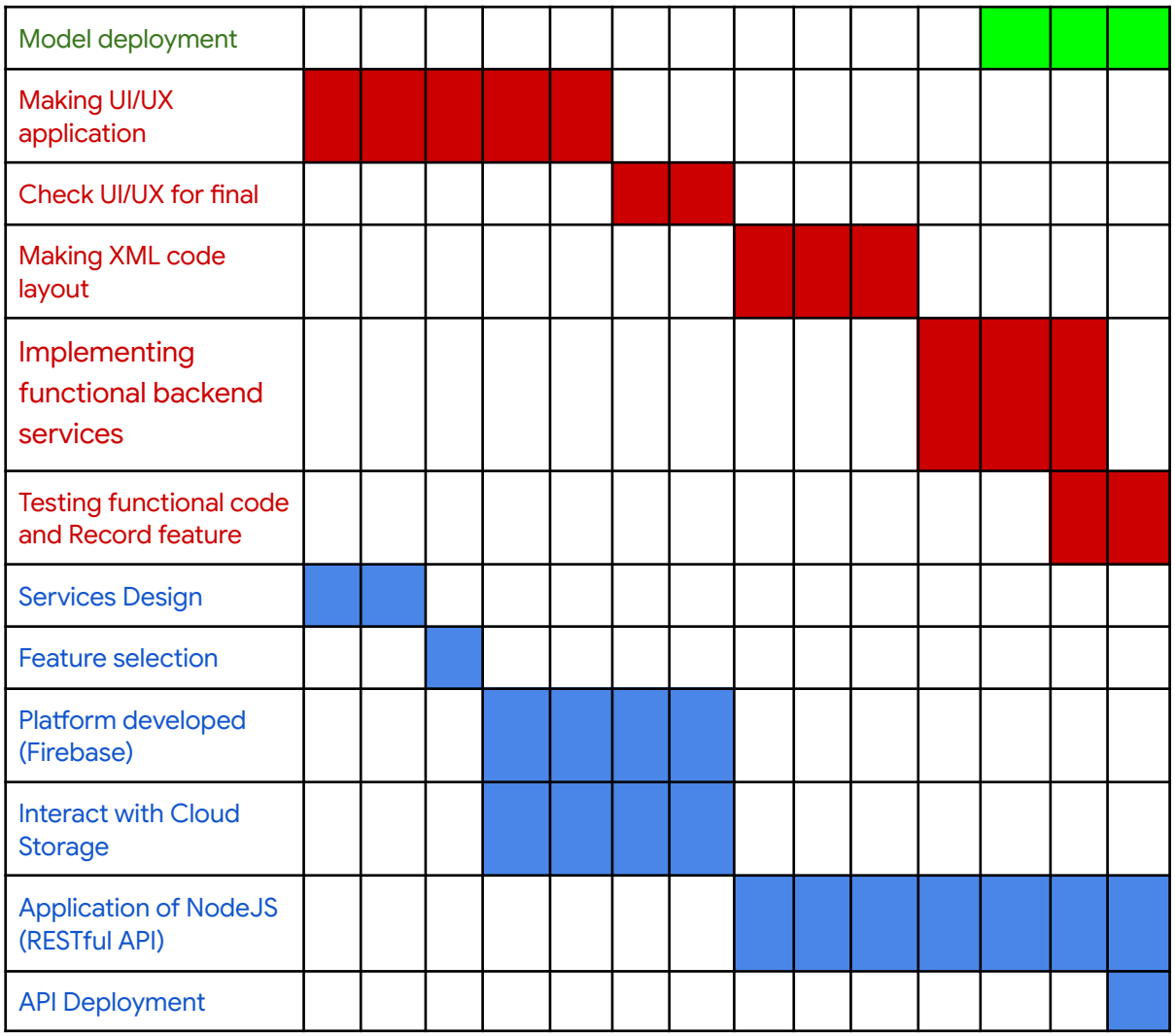
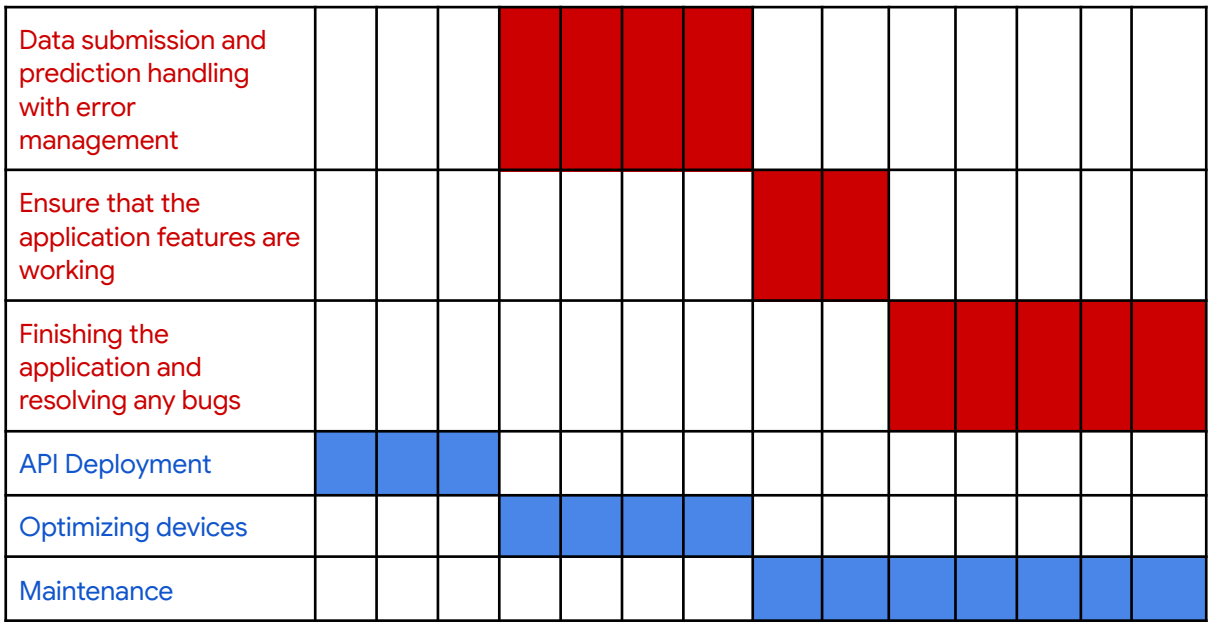


Activity Start from 9th November 2024 - 12th December 2024	**Week 3**							**Week 4**						
	23	24	25	26	27	28	29	30	1	2	3	4	5	6
Testing and fixing model performance														
Monitoring model														
Evaluating model														
Integrate the machine learning model API to device														

Project Plan
Product-based Capstone Project



Activity Start from 9th November 2024 - 12th December 2024	Week 5					
	7	8	9	10	11	12
Create project brief						
Create presentation slide						
Create video presentation						
Editing video presentation						
Submit all final progress						

	Machine Learning
	Cloud Computing
	Mobile Development
	All Learning Path

Project Plan
Product-based Capstone Project

Based on your team's knowledge, what tools/IDE/Library and resources that your team will use to solve the problem?Final Selected Themes:

Health Innovation: Empowering Vulnerable Communities for Health and Well-being

Title of the Project:

MediSight (Medical Insight)

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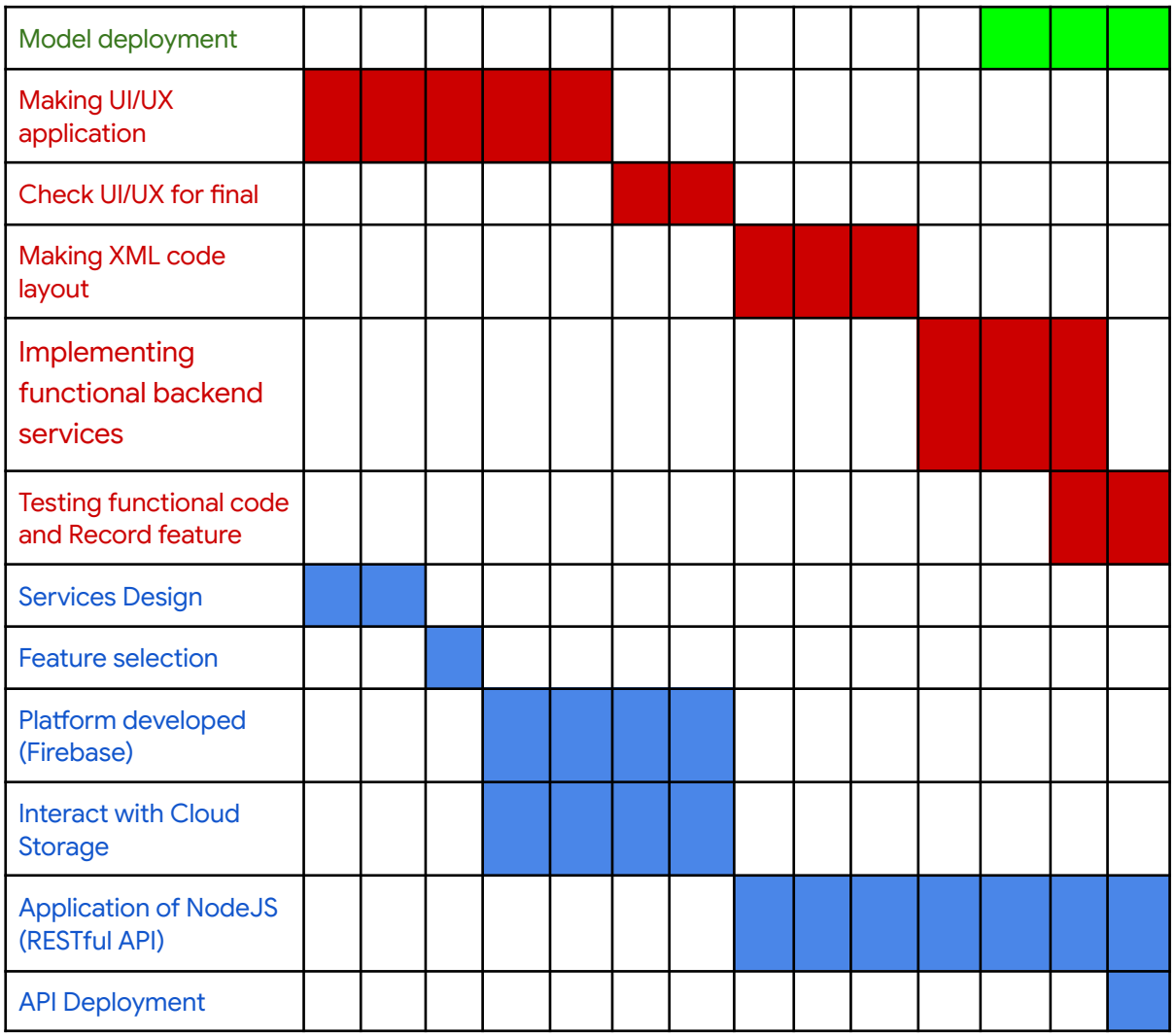

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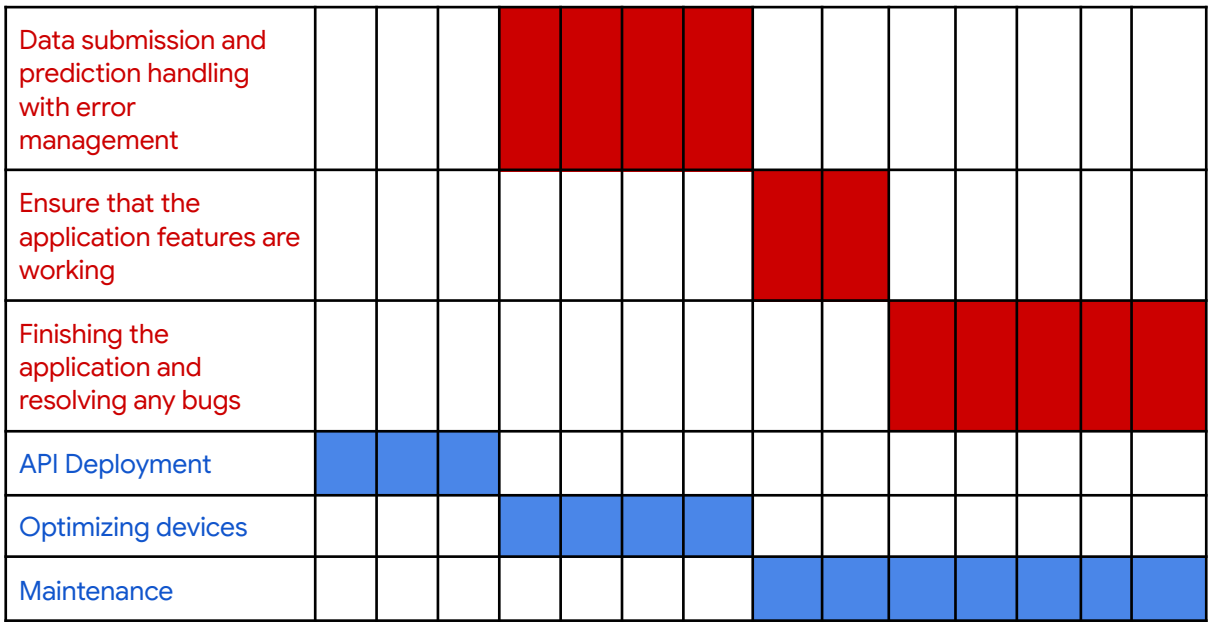

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	Machine Learning
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Based on your team's knowledge, what tools/IDE/Library and resources that your team will use to solve the problem?

Machine Learning

- Tools:
    a. Google Colaboratory: Cloud-based environment for running machine learning experiments and collaborating in real-time.
    b. Jupyter Notebook: Interactive platform for data analysis, model training, and visualizations.
    c. Visual Studio Code: Lightweight IDE for coding, debugging, and organizing scripts.
- Libraries:
    a. TensorFlow and Keras: For building, training, and deploying deep learning models.
    b. Scikit-learn: For implementing machine learning algorithms and preprocessing.
    c. NumPy and Pandas: For numerical computations and data manipulation.
    d. Matplotlib: For creating data visualizations to analyze model performance.

Mobile Development

- Tools:
    a. Android Studio: Official IDE for Android app development.
    b. Postman: For API testing and debugging during development.
    c. Figma: For designing user interfaces and prototypes.
- Libraries:
    a. Glide: Image loading and caching for smooth app performance.
    b. Retrofit: Simplifies API requests and data handling.
    c. Room: Local database integration for storing app data.
    d. JUnit and Espresso: For unit and UI testing.
    e. AndroidX, Material Components, Navigation Components: For modern, responsive design and navigation.
    f. Coroutines: For managing background threads efficiently.
    g. Injection, Data Binding, View Binding: For optimizing app architecture and minimizing boilerplate code.
    h. OkHttp: For handling HTTP requests.

Cloud Computing

- Tools:
    a. Google Cloud Project: Platform for hosting the app, managing APIs, and storing data securely.
    b. Visual Studio Code: For writing and testing cloud-related code.

Project Plan
Product-based Capstone Project

   c. Postman: For validating API functionality.
- Libraries:
   a. Firestore: NoSQL database for storing and syncing app data in real-time.
   b. Google Cloud Storage: For securely storing multimedia files and datasets.
   c. RESTful API: For seamless communication between the app and cloud services.

Based on your knowledge and explorations, what will your team need support for?

1. **Expert Mentorship in Health, Machine Learning, and UI/UX**
   To ensure accuracy in wound detection and treatment suggestions, we need guidance from medical experts and machine learning mentors, especially those experienced in image classification models. We also need feedback from UI/UX experts to design a user-friendly interface for the general public.
2. **Dataset of Minor Wound Images**
   We need a dataset of labeled minor wound images (e.g., burn, cut, bruise, normal or not injured, and abrasions) to train our classification model.

Based on your knowledge and explorations, tell us the Machine Learning Part of your Capstone!

The machine learning part of our capstone project involves developing a TensorFlow-based image classification model to identify types of minor wounds, such as burns, cuts, bruises, and abrasions. The model will integrate into a mobile app, providing wound type detection and personalized care recommendations.

Based on your knowledge and explorations, tell us the Mobile Development Part of your capstone?

The mobile development part is to design the UI/UX for the application, incorporate machine learning and cloud computing into the application and ensure the application runs perfectly to help provide information on handling minor injuries. The design we designed uses Figma and uses the Kotlin programming language in Android Studio.

Based on your knowledge and explorations, tell us the Cloud/Web/Frontend/Backend Part of your capstone?

The cloud computing part of our capstone project leverages Google Cloud Platform (GCP) to provide infrastructure for application interaction. We use Cloud Firestore for data storage and Cloud Storage for assets. Our Node.js backend includes a RESTful API, enhancing data management, scalability, performance, and security.

Project Plan
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Based on your team's planning, is there any identifiable potential Risk or Issue related to your project?

Activity	Risk or Issue	Plan (If Any)
Recommending medical products.	Concerns about product recommendations being inappropriate or not suitable for the individual due to allergies etc.	Consult with professionals knowledgeable in health fields.
Testing the application to ensure all features function as intended.	The application may crash, force close, or certain features may not work as expected.	Identify and resolve any issues.

Any other notes/remarks we should consider on your team's application

Our team's app emphasizes accessibility and ease of use, aiming to assist users with minimal medical knowledge in proper wound care. Additionally, we plan to collaborate with more knowledgeable direct medical professionals to provide clear guidance, disclaimers, and customization options to make wound care recommendations as safe and applicable as possible.

Machine Learning

- Tools: Google Colaboratory, Jupyter Notebook, and Visual Studio Code.
- Library: TensorFlow, Keras, Scikit-learn, Numpy, Matplotlib, and Pandas.

Mobile Development

- Tools: Android Studio, Postman, and Figma.
- Library: Glide, Retrofit, Room, JUnit, Espresso, AndroidX, Coroutines, Material Components, Navigation Components, Injection, Data Binding, View Binding, OkHttp.

Cloud Computing

- Tools: Google Cloud Project, Visual Studio Code and Postman.
- Library: Firestore, Google Cloud Storage, and RESTful API.

Based on your knowledge and explorations, what will your team need support for?

3. **Expert Mentorship in Health, Machine Learning, and UI/UX**
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