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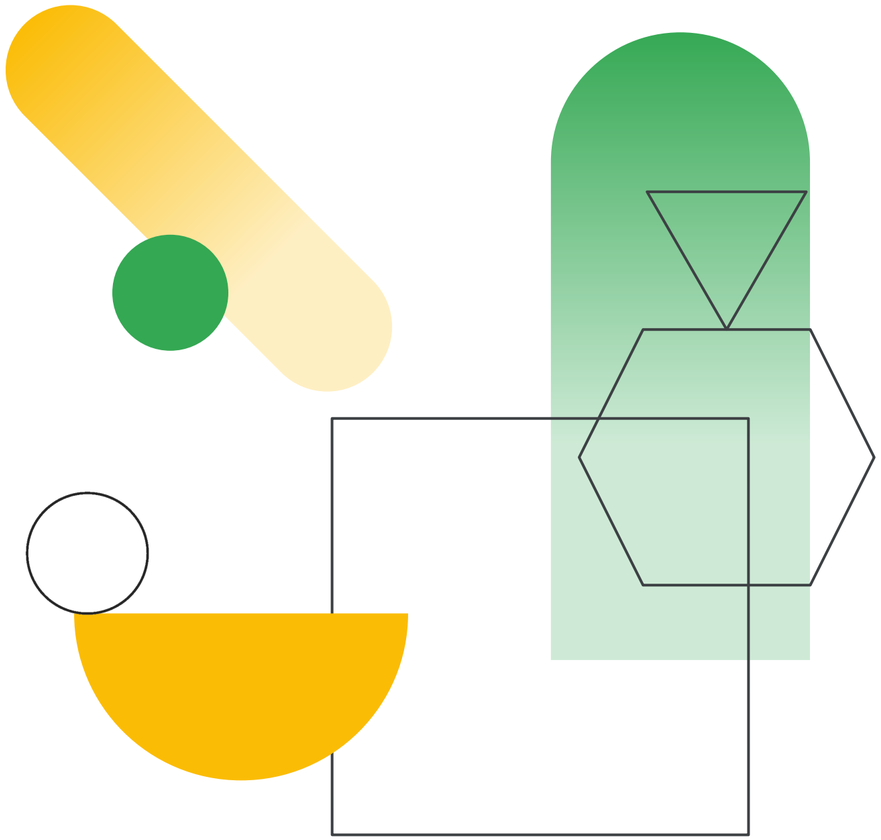
Google Cloud

# Google Africa Developer Scholarship Community Projects



**FON'O MEMGUE SERGE**
**ACE | MG46**

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# 1a. Defining your case study

# Health Sector

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# 1b. Health Sector

**Brief description:**

As families gathered indoors, mental health cases and gender-based violence steadily increased. Hospitals similarly became flooded, as the number of COVID cases increased.

**List a few main features:**

- mental health patients must register online to make an appointment with a psychiatrist
- people suffering from gender-based violence must fill out an online form and attach a photo showing the problem
- people with symptoms of covid 19 must fill out an online form and indicate the symptoms that they have and the application will determine if they have  covid or not

**List roles of typical users:**

- A patient
- Health personnel

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# 2a. Writing user personas

**Ricardo:**

*Ricardo was 21 years old and was preparing for his university exams when he started to suffer from mental problems. He felt lonely, sad and particularly tired after having spend 18 years of his life in school. In addition, he feels that his transition from the world of childhood to his adult life was difficult. When the crisis came, his life was thrown into chaos. When the crisis occurred, his life went into chaos. Strange ideas and painful feelings came over him, and he was no longer able to live a normal daily life. his delusion and paranoia frightened everyone around him, including himself. Fortunately, he had the support of his family and friends, but his relationship with them quickly deteriorated with his mental health. They(family...) felt as helpless as he did, and the situation seemed hopeless, knowing that the ailment he was suffering from was mental.He was suffering from schizophrenia, as it is called. Fortunately, he only had one or maybe two seizures, but he was never hospitalized. Since then, he has been seeing his doctor regularly. he has undergone talk therapy, a positive experience that has helped him to understand himself better. he believes that the desire to improve his situation and personal efforts to do so are the most important steps to recovery and reintegration into society.*

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# 2a. Writing user personas

**Norah:**

*Norah, victim of domestic violence*

*"Under the influence of my partner, I spent 17 years of my life locked in a cycle of violence without being aware of it. At the beginning of our relationship, I left the father of my children to settle down with him because I was captivated by his personality. He then asked me to quit my job to move in with him and I refused. I was then subjected to several marital rapes and my body gave out: I had to be hospitalized because I was in a state of malnutrition, in psychological and physical fatigue. The violence of a closed-door situation is imperceptible from the outside, and it took me a while to realize it myself."*

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# 2b. Writing user stories

**Online consultation:**

*As a person with a mental health problem and with the onset of COVID-19, I would like to be able to continue my therapy online with my treating doctor*

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# 2b. Writing user stories

**Online Registration:**

*As a person affected by violence at home and unable to be consulted at the hospital by a doctor because of the appearance of COVID-19, I would like to file a complaint against my spouse and for that, I would like a doctor to consult me and draw up a document attesting that I was indeed sexually aggressed by my spouse on the bases of the photos that I would have provided him*

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# 2b. Writing user stories

**Automatic disease recognition:**

*As a person with some symptoms of COVID-19, I would like to have an idea if I have this disease*

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# 3. Defining SLIs and SLOs

| User story | SLO | SLI |
|---|---|---|
| ***Automatic disease recognition*** | *Available 99.95%* | *Fraction of 200 vs 500 HTTP responses from API endpoint measured per day* |
| ***Automatic disease recognition*** | *95% of requests complete in under 300 ms* | *Time to last byte GET requests measured every 10 seconds aggregated per minute* |
| ***Online Consultation*** | *Available 99.95%* | *Fraction of 200 vs 500 HTTP responses from API endpoint measured per day* |
| ***Online Consultation*** | *95% of requests complete in under 300 ms* | *Time to last byte GET requests measured every 10 seconds aggregated per minute* |
| ***Automatic disease recognition*** | *Available 99.95%* | *Fraction of 200 vs 500 HTTP responses from API endpoint measured per day* |
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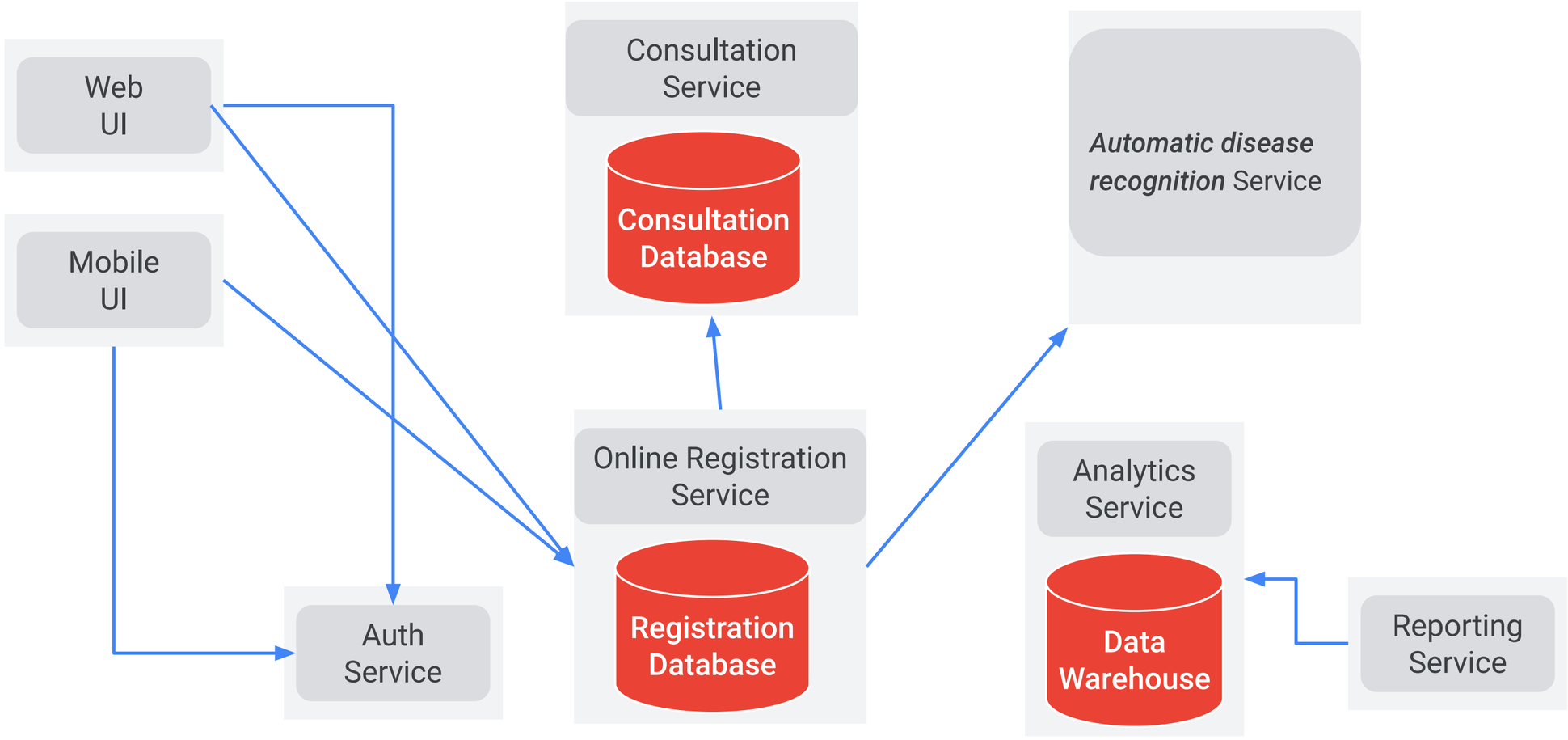
# 4. Design microservices for your application



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# 5. Designing REST APIs

| Service name | Collections | Methods |
| --- | --- | --- |
| *Online Registration Service* | *healths mentals ,violence steadily,covid* | *add*<br>*get*<br>*update*<br>*remove* |
| *Online Consultation Service* | *consultation* | *get*<br>*update*<br>*save* |
| *Analytics Service* | *problem* | *analyze*<br>*get*<br>*list* |
| ***Automatic disease recognition*** | *search(symptom)* | *find*<br>*save* |

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# 6. Defining storage characteristics

| Service | Structured or Unstructured | SQL or NoSQL | Strong or Eventual Consistency | Amount of Data (MB, GB, TB, PB, ExB) | Read only or Read/Write |
|---|---|---|---|---|---|
| *Registration Service* | *Structured* | *NoSQL* | *Strong* | *GB* | *Read/Write* |
| *Consultation Service* | *Unstructured* | *NoSQL* | *N/A* | TB | *Readonly* |
| *Analytics* | *Structured* | *SQL* | *Eventual* | TB | *Readonly* |

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# 7. Choosing Google Cloud Storage and Data Services

| Service | Persistent Disk | Cloud Storage | Cloud SQL | Firestore | Cloud Bigtable | Cloud Spanner | BigQuery |
|---|---|---|---|---|---|---|---|
| *Registration* | | | | X | | | |
| *Consultation Uploads* | | X | | | | | |
| *Analytics* | | | | | | | X |

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# 8a. Defining network characteristics for your services

| Service | Internet facing or Internal only | HTTP | TCP | UDP | Multiregional? |
|---|---|---|---|---|---|
| *Registration* | Internal facing | *X* | | | *Yes* |
| *Consultation* | Internal only | | *X* | | No |
| *Analytics* | Internal facing | *X* | | | No |
| *Web UI* | Internal facing | *X* | | | Yes |
| ***Automatic disease recognition*** | Internal facing | *X* | | | Yes |

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# 8b. Select the load balancers for your services

**Based on those network characteristics, we chose the global HTTP load balancer for our public-facing services and the internal TCP load balancer for our internal-facing services.**

| Service |  HTTP |  TCP |  UDP |
|---|---|---|---|
| Registration | *X* | | |
| Consultation | | X | |
| Analytics | X | | |
| Web UI | X | | |
| **Automatic disease recognition** | *X* | | |

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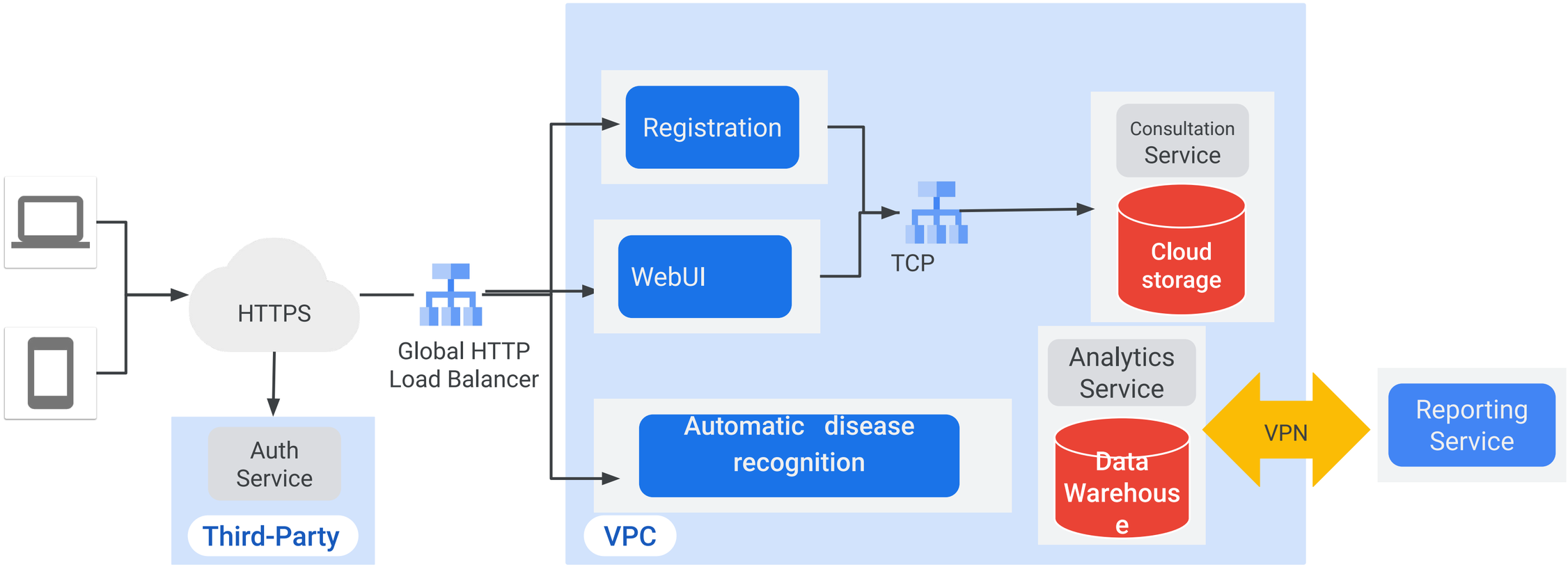
# 9. Diagramming your network



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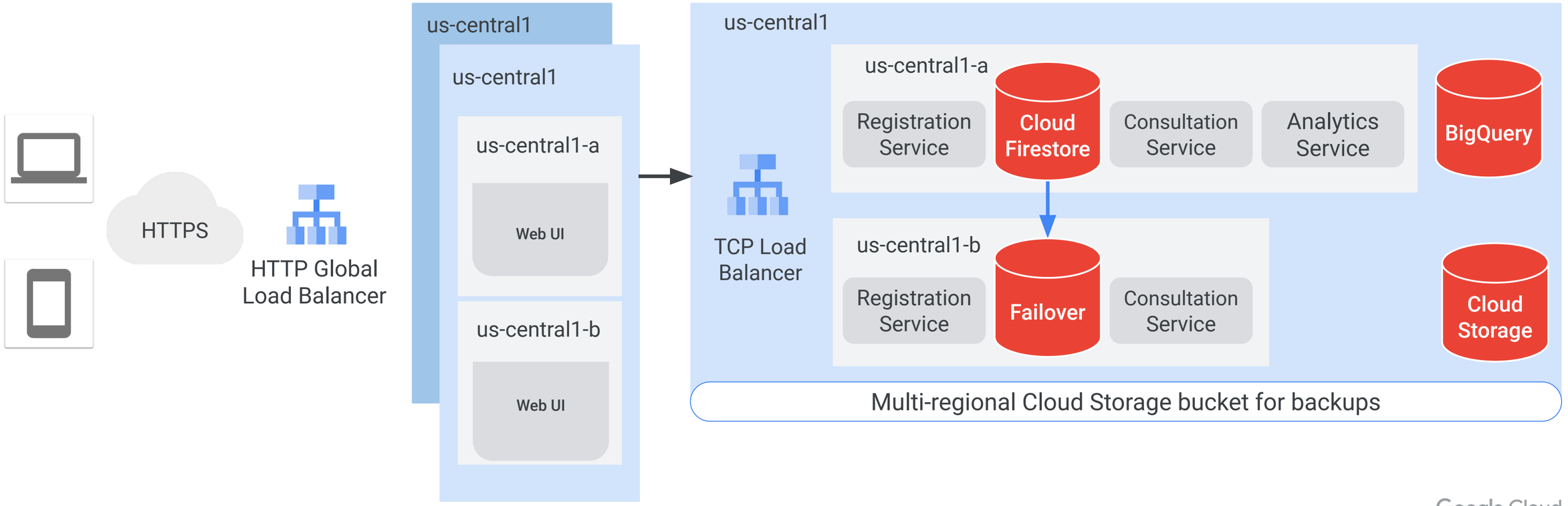
# 10. Designing reliable, scalable applications



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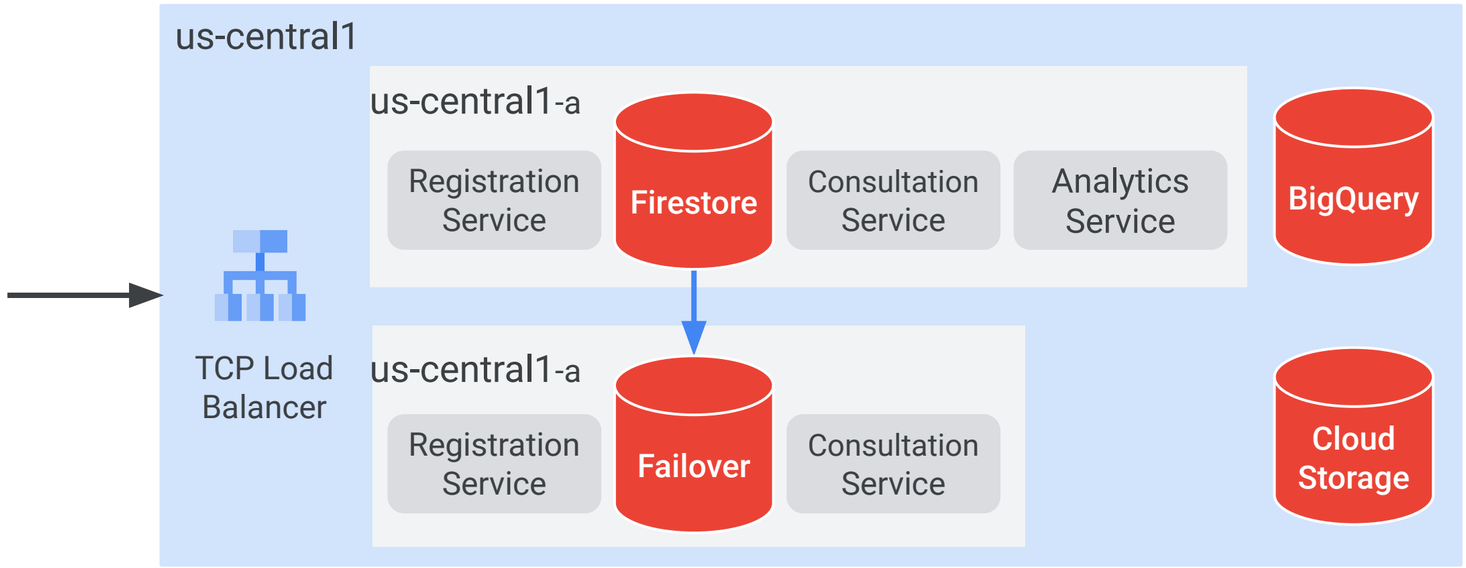
# 11a. Disaster recovery scenario



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# 11b. Service disaster recovery scenarios

| Service | Scenario | Recovery Point Objective | Recovery Time Objective | Priority |
|---|---|---|---|---|
| *Registration Service* | *Registration database crashes* | *0 (can't lose any data)* | *2 minutes* | *High* |
| *Analytics BigQuery database* | *User deletes tables* | *0 mins* | *24 hours* | *Med* |
| *Consultation Uploads storage cloud* | *Consultation storage crashes* | *1 hour* | *1 hour* | *Med* |

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# 11c. Resource disaster recovery plans

| Resource | Backup Strategy | Backup Location | Recovery Procedure |
|---|---|---|---|
| *Registration Firestore* | *Binary logging and backups*<br>*Failover replica in another zone* | *Multi-Regional Cloud Storage Bucket* | *Cloud Functions and Cloud Scheduler* |
| *Analytics BigQuery database* | *No specific backup required* | *NA* | *Re-import data to rebuild analytics tables* |
| *Consultation Uploads storage cloud* | *Daily automated backups* | *Multi-Regional Cloud Storage Bucket* | *Cloud Functions and Cloud Scheduler* |

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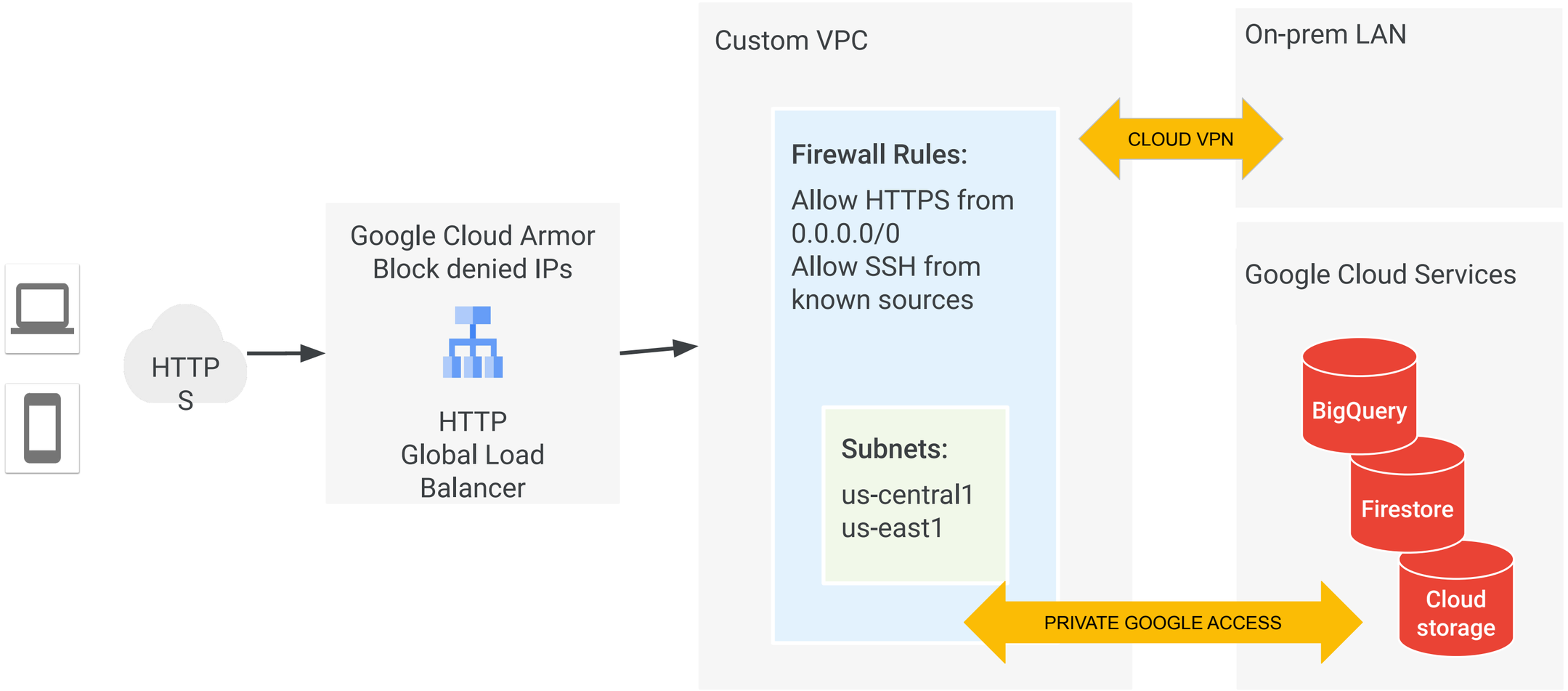
# 12. Modeling secure Google Cloud services



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# 13. Manage your application’s code and environment

- Store your application’s code in a code repository in a version control system such as Git or Subversion. This will enable you to track changes to your source code and set up systems for continuous integration and delivery.

- Do not store external dependencies such as JAR files or external packages in your code repository. Instead, depending on your application platform,explicitly declare your dependencies with their versions and install them using a dependency manager.

- Separate your application’s configuration settings from your code. Do not store configuration settings as constants in your source code. Instead, specify configuration settings as environment variables. This enables you to easily modify settings between development, test, and production environments.

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# 14. Cost estimating and planning

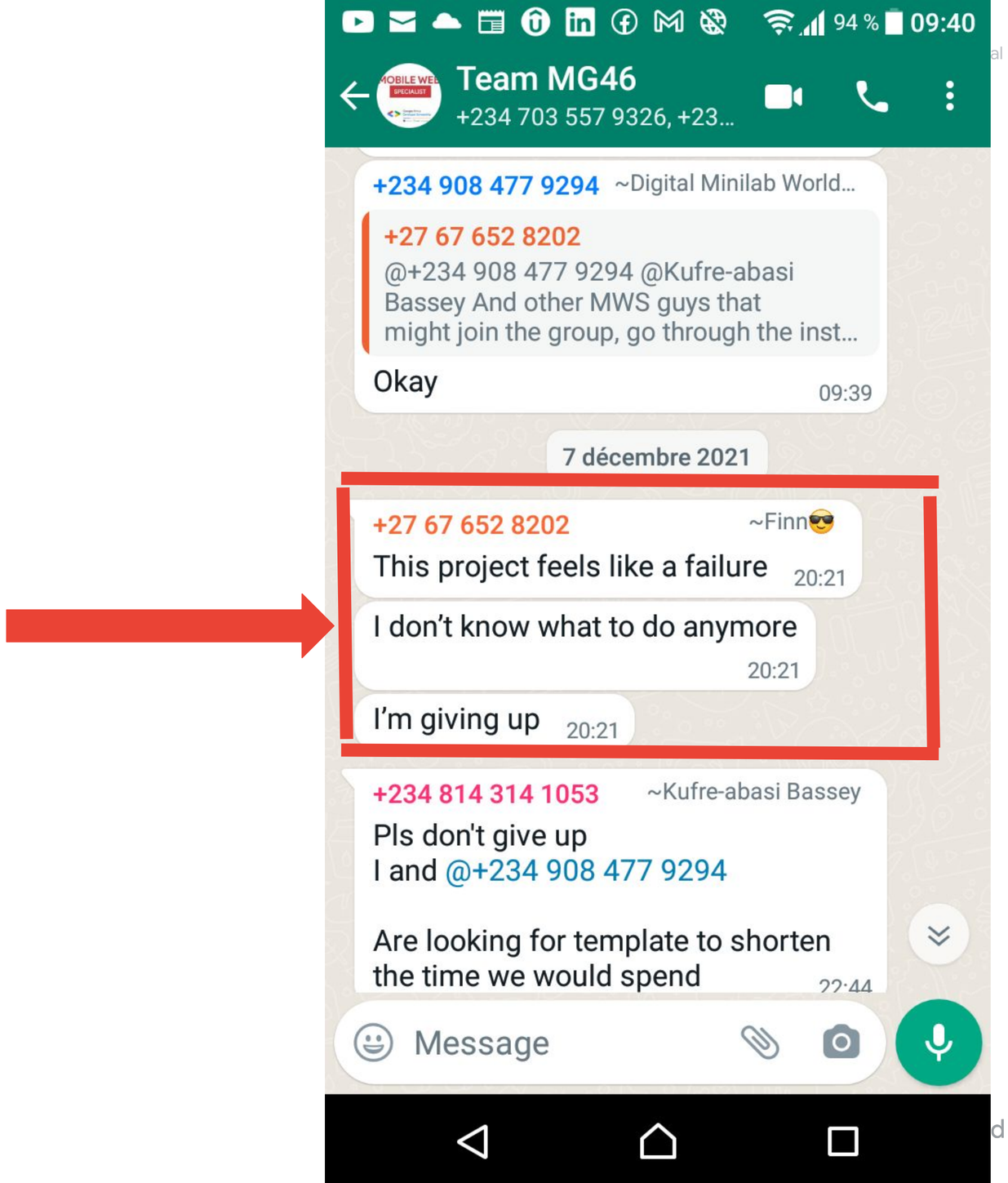
Use the **pricing calculator** to determine and record the cost of your microservices.

| Service name | Google Cloud Resource | Cost |
|---|---|---|
| *Consultation* | Cloud storage | *20,479.90 per 1 month* |
| *Registration* | *Firestore* | *36,679.50 per 1 month* |
| ***Automatic disease recognition*** | *BigQuery ML* | *257.50 per 1 month* |
| *Analytics* | *BigQuery* | *282.39 per 1 month* |
| *Web UI* | *App Engine standard* | *30.42 per 1 month* |
| | | |

# Request

When the project was place out, I asked to my group to choose a theme on which we shall work on but I got their response last two weeks then nobody wanted to work . Due to the fact that the assignment had to be done by each group,  I then decided to do it by myself in time .

This is proof that they didn’t wanted to work

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