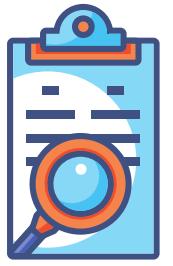


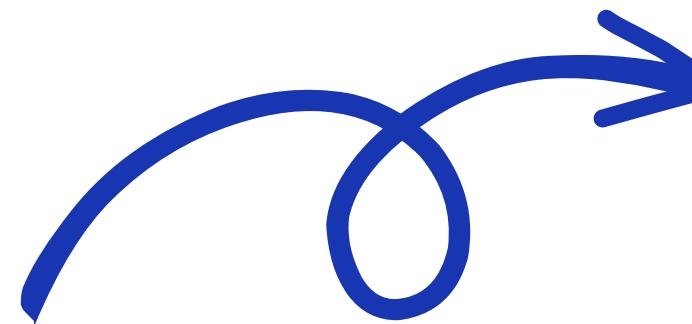


# Problems



## Problem 1

Unavailability of  
Preliminary  
Diagnosis Service



**Anxiety**

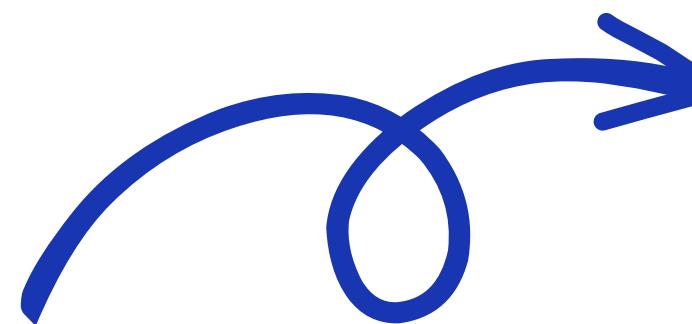
**Delayed treatment**

**Inaccurate self-diagnosis**



## Problem 2

Difficulty Finding  
Suitable Doctors

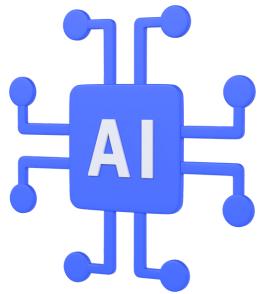


**Suboptimal treatment  
outcomes**

**Frustrating healthcare  
experience**

# Solutions

## Solution 1



### AI-Driven Preliminary Diagnosis

Our AI-driven solution provides users with a preliminary diagnosis service, utilizing advanced algorithms and medical knowledge. This empowers individuals to seek appropriate medical attention.

## Solution 2

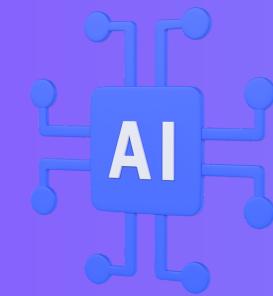


### Personalized Doctor Recommendations

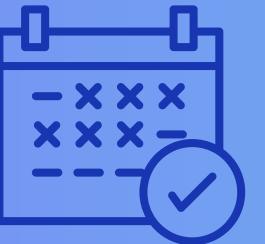
Utilizing an extensive dataset of specialized doctors, users can connect with doctors with expertise and experience to address their unique needs, enhancing their experience and access to specialized doctors.

# Product

Our health startup offers a comprehensive range of innovative products and services that address the key challenges faced by individuals seeking preliminary medical diagnosis and accessing suitable doctors.



Preliminary Diagnosis Service

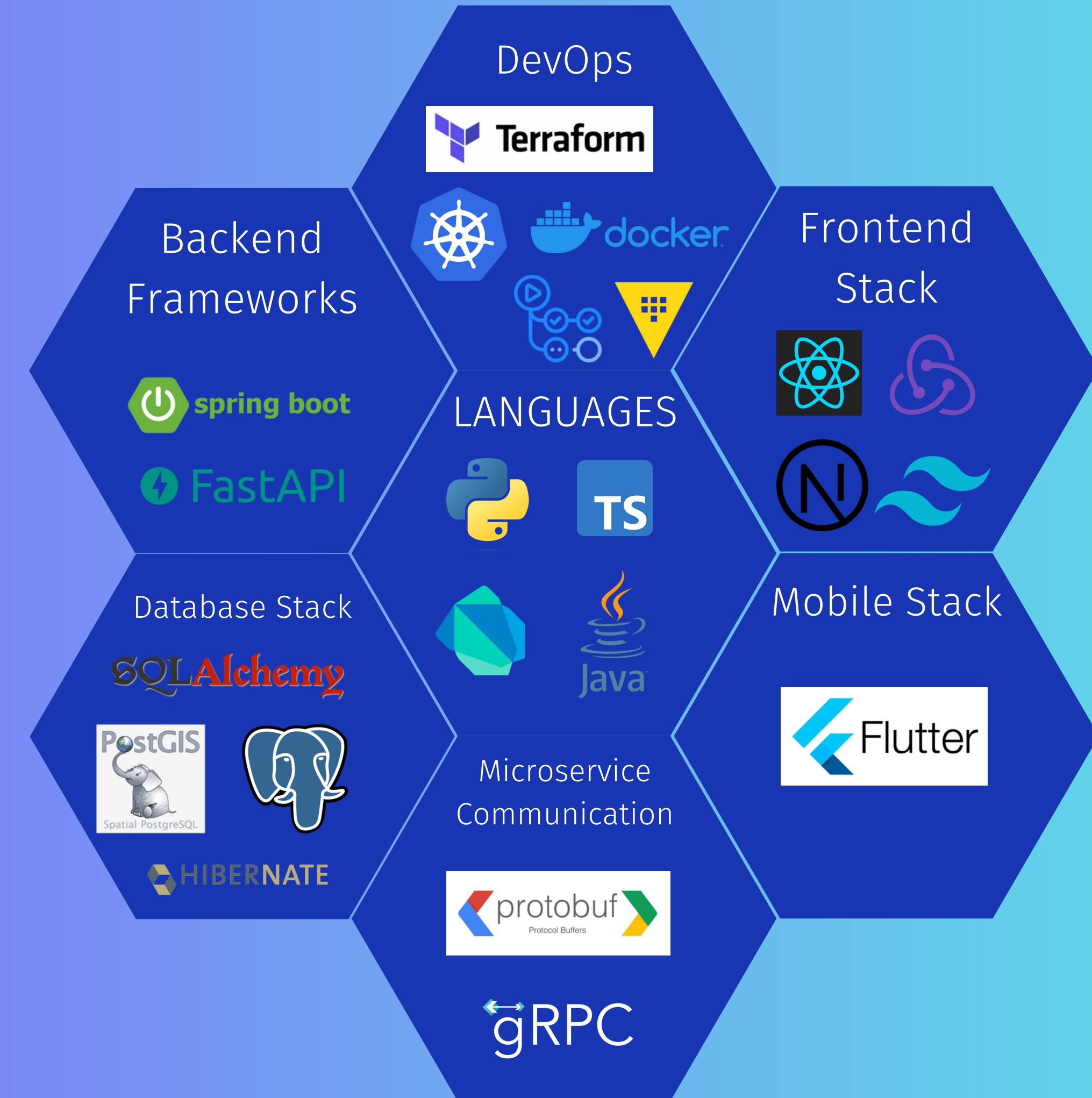


Doctor Discovery and Booking



Health Records Management

# Technology Stack



# Website Demo

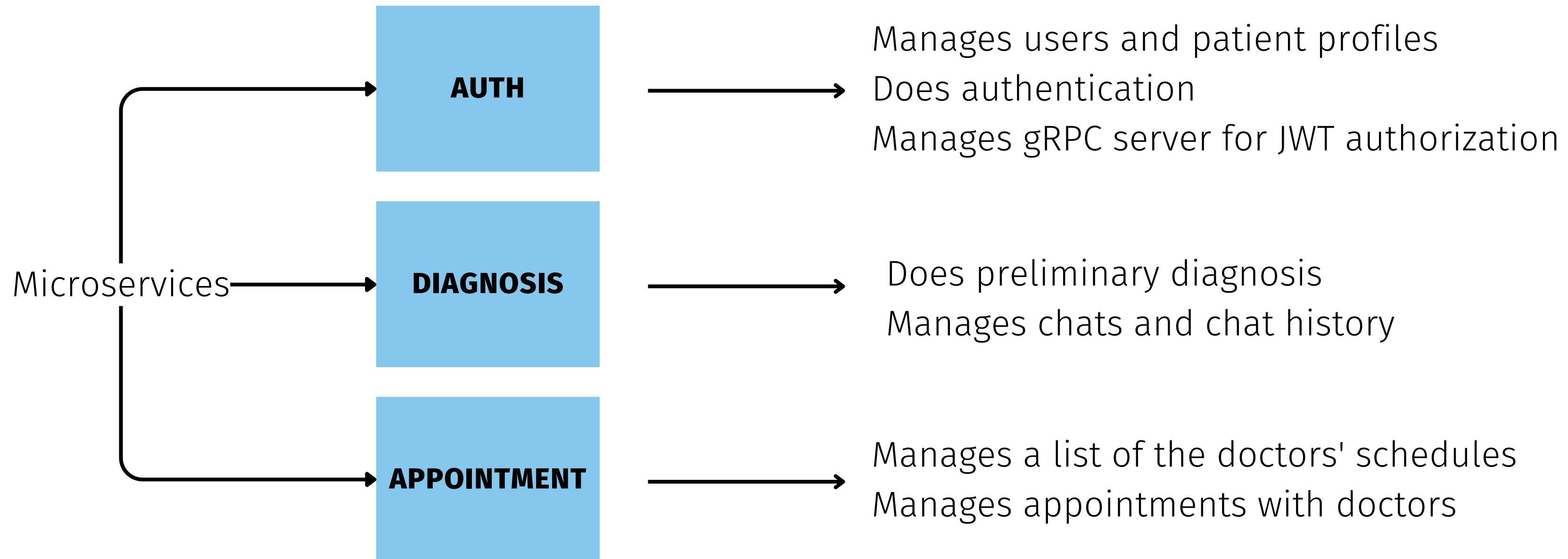
Website Demo

# Mobile Application Demo

# Mobile App Demo

# BackEnd

# Architecture



# Utilities

**Scraper**



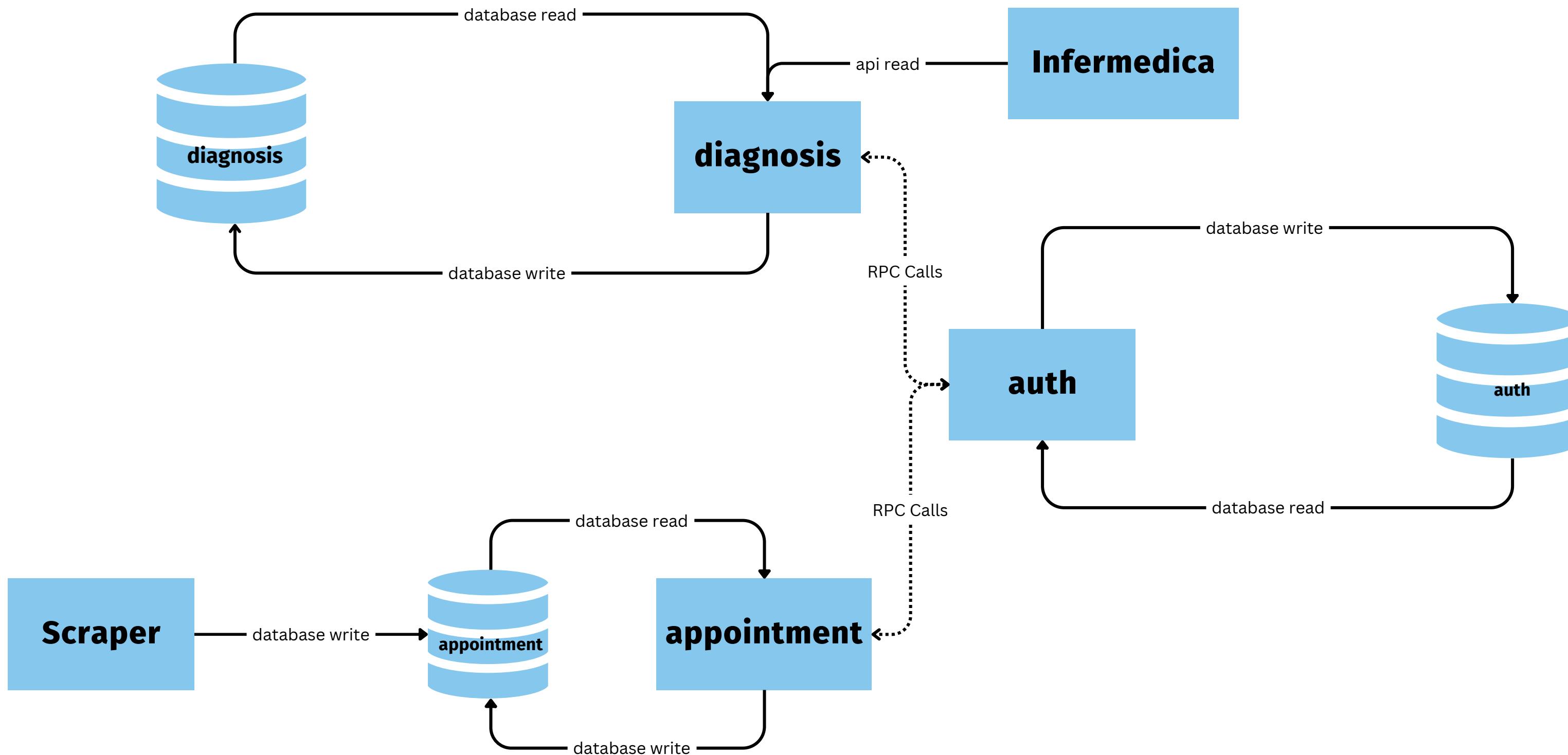
Collects data about 1400 doctors in Bangladesh Data includes: names, specializations, schedules, etc.

**Python  
Infermedica  
Library**



Provides abstraction for API calls to Infermedica endpoints  
Manage states for the stateless Infermedica api

# Component Diagram



# Swagger Documentation

FastAPI 0.1.0 OAS 3.1

</auth/openapi.json>

Servers  
[/auth](#) ▾

Authorize 

## default

[GET](#) / Index



## auth

[POST](#) /register Register



[POST](#) /confirm Confirm Registration



[POST](#) /login Login



## profile

[POST](#) /profile/create Create Profile



[GET](#) /profile/current-profile Current Profile



# API Specification

default

GET / Index

auth

POST /register Register

POST /confirm Confirm Registration

POST /login Login

profile

POST /profile/create Create Profile

GET /profile/current-profile Current Profile

Schemas

BaseResponse > Expand all object

ConfirmRegistration > Expand all object

CreateProfile > Expand all object

HTTPValidationError > Expand all object

POST /login Login

Parameters

No parameters

Request body required

application/json

Example Value | Schema

```
{ "identifier": "string", "password": "string" }
```

Responses

Code	Description	Links
200	Successful Response	No links
	Media type application/json	Controls Accept header.
	Example Value   Schema	
	{ "success": true, "message": "string", "token": "string" }	
422	Validation Error	No links
	Media type application/json	
	Example Value   Schema	
	{ "detail": [ { "loc": [ "string", 0 ], "msg": "string", "type": "string" } ] }	

Try it out

# Interactivity

POST /login Login

Parameters Cancel

No parameters

Request body required application/json ▼

```
{  
  "identifier": "string",  
  "password": "string"  
}
```



Execute

Responses

Code	Description	Links
200	Successful Response	<span style="color: gray;">No links</span>
	<p>Media type <span style="border: 1px solid #ccc; padding: 2px;">application/json</span> <span style="float: right;">▼</span></p> <p><small>Controls Accept header.</small></p> <p><a href="#">Example Value</a>   <a href="#">Schema</a></p> <pre>{   "success": true,   "message": "string",   "token": "string" }</pre>	
422	Validation Error	<span style="color: gray;">No links</span>

POST /login Login

Parameters

No parameters

Request body required

application/json

```
{ "identifier": "rfd@gmail.com", "password": "1234" }
```

G 1 ↻

Execute Clear

Responses

Curl

```
curl -X 'POST' \
'https://api/ayoto.health/auth/login' \
-H 'accept: application/json' \
-H 'Content-Type: application/json' \
-d '{
  "identifier": "rfd@gmail.com",
  "password": "1234"
}'
```

Request URL

https://api/ayoto.health/auth/login

Server response

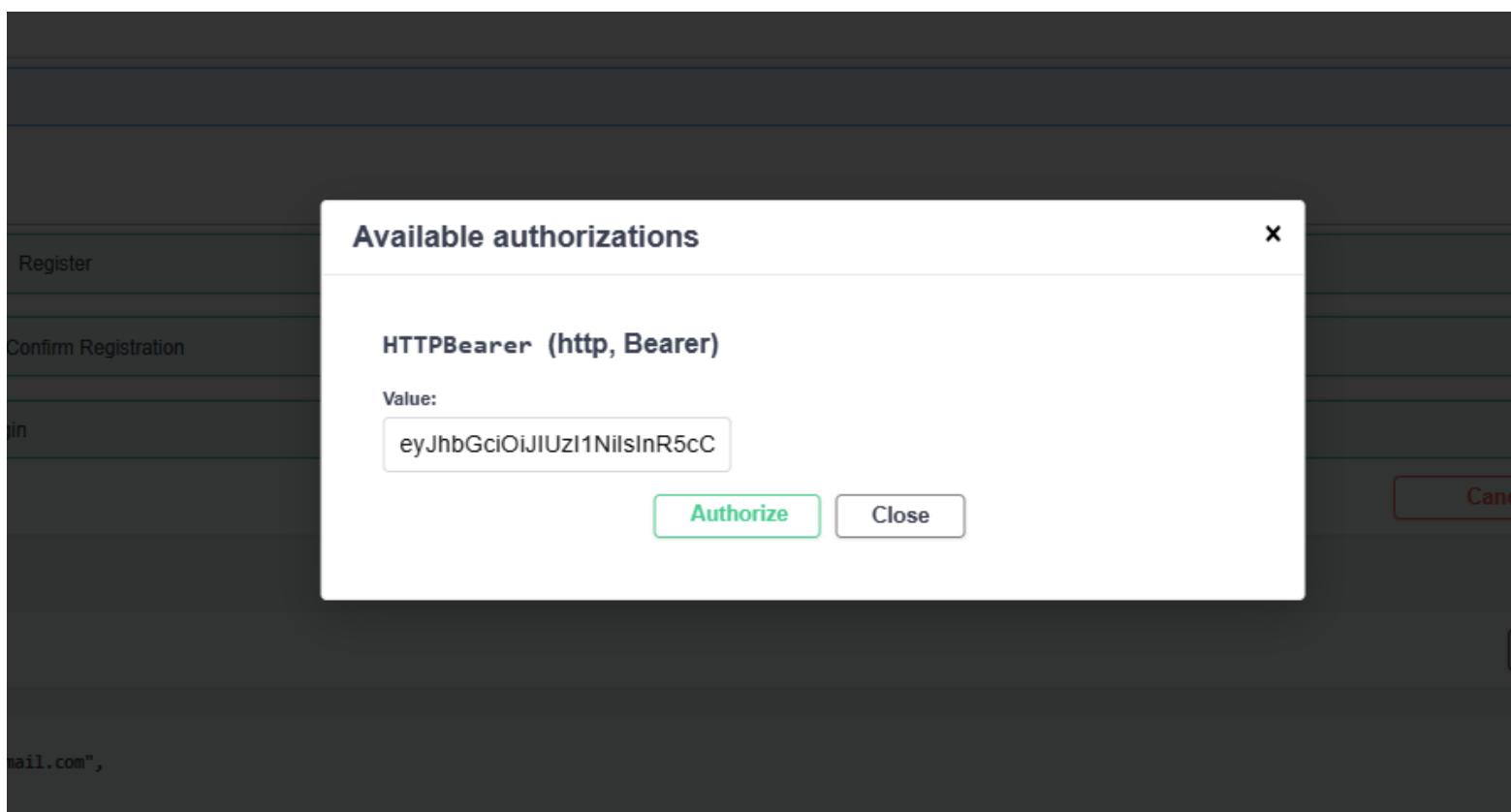
Code Details

200 Response body

```
{ "success": true, "message": "Login successful", "token": "eyJhbGciOiJIUzI1NiIsInR5cCI6IkpxVCJ9.eyJwdWIiOiIxZGY1NjFjYy00MTA1LTQ5MTEtYTItZS1jNDdiNTIzMjZmQjIiLCJWXRpzW50Ijoia2k4ZDNlNGEtNjuZYy00MjZhLNFjmjqTyUyNDVjZDFKM2IzIiivdWFeOjivhieSMiCw" }
```

Download

# Authorization



GET /profile/current-profile Current Profile

Parameters

No parameters

Responses

Curl

```
curl -x 'GET' \
  'https://api/ayoto.health/auth/profile/current-profile' \
  -H 'accept: application/json' \
  -H 'Authorization: Bearer eyJhbGciOiJIUzI1NiIsInR5cCI6IkpXVCJ9.eyJzdWIiOiI0ZGY1NjFjYy00MTA1LTQ5MTctYTI4ZS1jNDdiNTIiZmVjZmQiLCJwYXRpZW50IjoiaNzk4ZDNlNGEtNjUzYy00MWhLWFjMjQtYzUyNDVjZDFkM2IzIiwiawF0IjoxNjgSMjC'
```

Request URL

https://api/ayoto.health/auth/profile/current-profile

Server response

Code Details

200 Response body

```
{
  "id": "4df561cc-4105-4917-a28e-c47b59bfecfd",
  "patient_id": "798d3e4a-653c-41fa-ac24-c5245cd1d3b3",
  "name": "Rfd",
  "age": "20 years, 9 months",
  "height": 17500,
  "weight": 75,
  "latitude": 23.8517183,
  "longitude": 90.4188884,
  "sex": "male",
  "email": "r*d@gmail.com",
  "phone": "+880199*****14"
}
```

Download

# Security and Privacy

## Security

- Secrets management on the deployment stage only (using Vault)
- JWT tokens for authentication
- SSL enabled for all subdomains
- GRPC calls only within the cluster network
- Protection against common cyber attacks (DDoS, path traversal, etc.)

## Privacy

### Compliant to GDPR and HIPAA

- User data is pseudonymized
- Automatic removal of chat history after 7 days
- Short authorization token expiry time
- Accurate personal data (excl. name) is never shown on the screen

# DevOps

# DigitalOcean Apps

# DigitalOcean Apps

## Create App

1 Resources

2 Environment Variables

3 Info

4 Review

### Create Resource From Source Code

#### Service Provider



GitHub



GitLab



DigitalOcean Container Registry



Docker Hub



Other: Choose Sample App

#### Repository

AyotoAI/ayoto-backend-diagnosis



# DigitalOcean Apps

(✓) Environment Variables

(✓) Info

4 Review

Name	ayoto-backend-diagnosis	Edit
Resource Type	Web Service Python	Edit
Build Phase	STEPS	Edit
	1 Python Buildpack v2.231.4	
	2 Procfile Buildpack v0.0.3	
	3 Custom Build Command Buildpack v0.1.1	
	No build command defined	
Run Command		
Run Command	<pre>alembic upgrade head unicorn main:app --root-path /diagnosis --host 0.0.0.0 --port 8080</pre>	

# Kubernetes

# Kubernetes

The screenshot shows the Kubernetes dashboard interface. The top navigation bar includes the Kubernetes logo, a dropdown for 'All namespaces', a search bar, and icons for '+' (Create), a bell (Notifications), and a user profile.

The main header is 'Workloads' with a sub-header 'Workload Status'. Below this, there are four large green circles representing the status of different workload types:

- Daemon Sets: Running: 6
- Deployments: Running: 10
- Pods: Running: 23
- Replica Sets: Running: 50

The left sidebar contains several sections:

- Workloads**: Cron Jobs, Daemon Sets, Deployments, Jobs, Pods, Replica Sets, Replication Controllers, Stateful Sets.
- Service**: Ingresses, Ingress Classes, Services.
- Config and Storage**: Config Maps, Persistent Volume Claims, Secrets.
- Cluster**: Cluster Role Bindings, Cluster Roles, Events, Namespaces, Network Policies, Nodes.

The 'Daemon Sets' section is currently selected and displays a table with the following data:

Name	Namespace	Images	Labels	Pods	Created
do-node-agent	kube-system	docker.io/digitalocean/do-agent:3.16.2	app: do-node-agent c3.doks.digitalocean.com/component: do-no-de-agent c3.doks.digitalocean.com/plane: data	2 / 2	4 days ago
csi-do-node	kube-system	registry.k8s.io/sig-storage/csi-node-driver-registrator:v2.8.0 docker.io/digitalocean/do-csi-plugin:v4.6.1	c3.doks.digitalocean.com/component: csi-node-service c3.doks.digitalocean.com/plane: data doks.digitalocean.com/managed: true app: cpc-bridge-proxy	2 / 2	4 days ago
cpc-bridge-proxy	kube-system	digitalocean/cpbridge:1.24.0	c3.doks.digitalocean.com/component: cpc-bridge-proxy c3.doks.digitalocean.com/plane: data	2 / 2	4 days ago

# Terraform

# Terraform

[Code](#) [Issues](#) [Pull requests](#) [Actions](#) [Projects](#) [Security](#) [Insights](#) [Settings](#)

 ayoto-tf-digitalocean Private

[Edit Pins](#) [Unwatch](#) 1 [Fork](#) 0 [Star](#) 0

[main](#) [1 branch](#) [0 tags](#)

[Go to file](#) [Add file](#) [Code](#)

**ahmedXDR Update AUTH\_RPC\_HOST** ✓ a05357f 14 hours ago 70 commits

<a href="#">.gitignore</a>	init	last week
<a href="#">.terraform.lock.hcl</a>	Update AUTH_RPC_HOST	14 hours ago
<a href="#">README.md</a>	Create README.md	last week
<a href="#">backendauth.tf</a>	Update AUTH_RPC_HOST	14 hours ago
<a href="#">backenddiagnosis.tf</a>	Update AUTH_RPC_HOST	14 hours ago
<a href="#">certmanager.tf</a>	add backenddiagnosis to kubernetes	last week
<a href="#">cloudflare.tf</a>	Add authrpc	2 days ago
<a href="#">dataserver.tf</a>	Add db creds to dataserver	4 days ago
<a href="#">digitalocean.tf</a>	Bug fixes	4 days ago
<a href="#">provider.tf</a>	change domain	last week
<a href="#">traefik.tf</a>	Add dataserver	4 days ago
<a href="#">webfrontend.tf</a>	Bug fixes	4 days ago

[README.md](#) 

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**Packages**

No packages published [Publish your first package](#)

**Languages**

HCL 100.0%

# Terraform

Workspaces

ayoto-tf-digitalocean

Overview

Runs

States

Variables

Settings

ayoto

## Latest Run

View all runs

Update AUTH\_RPC\_HOST

ahmedXDR triggered a run 14 hours ago via main -o a05357f

✓ Applied

Policy checks: Add    Estimated cost change: Enable    Plan & apply duration: Less than a minute    Resources changed: +0 ~1 -0

See details

Resources 38 Outputs 0

Current as of the most recent state version.

NAME	PROVIDER	TYPE	MODULE	CREATED
api-main-cluster	cloudflare/clo...	cloudflare_r...	root	Jul 11 2023
ayoto	digitalocean/di...	data.digital...	root	Jul 8 2023
ayoto	digitalocean/di...	digitalocean...	root	Jul 8 2023
ayoto_secrets	hashicorp/hcp	data.hcp_vau...	root	Jul 8 2023
backend	hashicorp/kuber...	kubernetes_n...	root	Jul 8 2023
backendauth	hashicorp/kuber...	kubernetes_s...	root	Jul 8 2023
backendauth	hashicorp/kuber...	kubernetes_d...	root	Jul 8 2023
backendauth	hashicorp/kuber...	kubernetes_i...	root	Jul 8 2023

Filter resources Q

Metrics (last 21 runs)

Average plan duration < 1 min

Average apply duration < 1 min

Total failed runs 7

Policy check failures 0

Tags (0)

Add a tag

Tags have not been added to this workspace.

Run triggers

No source workspaces have been selected. Adding run triggers will allow runs to queue automatically in this workspace.

Contributors (1)

o

# Github Actions

# GitHub Actions

Code Issues Pull requests Actions Projects 1 Security Insights Settings

← Build and deploy

## Add deployment workflow #1

**Summary**

Re-run triggered 4 days ago Status Total duration Billable time Artifacts

ahmedXDR -o- f58c90b develop Success 1m 16s 5m -

Jobs

- build\_and\_push
- restart\_deployment

Run details

Usage Workflow file

deploy-on-push.yml  
on: push

```
graph LR; A[build_and_push] -- "51s" --> B(restart_deployment)
```

This screenshot shows the GitHub Actions interface for a repository. The top navigation bar includes links for Code, Issues, Pull requests, Actions (which is the active tab), Projects (with 1 item), Security, Insights, and Settings. Below the navigation is a breadcrumb trail: Build and deploy > Add deployment workflow #1. The main title is 'Add deployment workflow #1'. On the left, there's a sidebar with tabs for Summary, Jobs, Run details, Usage, and Workflow file. The 'Summary' tab is selected. It displays a single workflow run: 'ahmedXDR -o- f58c90b develop' was triggered 4 days ago and completed successfully in 1m 16s with 5m billable time. The 'Jobs' section lists two jobs: 'build\_and\_push' and 'restart\_deployment', both of which are marked as successful. The 'Run details' section shows the workflow file 'deploy-on-push.yml' triggered by 'push'. The workflow graph shows a sequence of steps: 'build\_and\_push' followed by 'restart\_deployment'. The total duration for the workflow is 51 seconds, with 6 seconds for the final step.

# Business Plan

# Business Model

## Customer Segments

### Individual Users

We target individuals who require preliminary medical diagnosis and assistance in finding suitable doctors.

### Corporate Clients

We also target corporate clients, including hospitals and individual doctors, who seek to provide value-added healthcare services to their customers.

## Revenue Streams

### Doctor Booking Fees

Percentage from the doctor and diagnosis appointment fees

### Advertising and Sponsorships

We offer advertising opportunities to relevant stakeholders who want to reach our user base

### Premium Accounts

Enhanced features and benefits

Subscription-based model, generating recurring revenue

## Key Partnerships

### Health Insurance Companies

Partnerships with health insurance providers to offer our services as part of their offerings, providing added value to their policyholders

# Market Size

**169.4 M**

Total Available Market (TAM)

---

**90 M**

Serviceable Available Market (SAM)

---

**35M**

Serviceable Obtainable Market (SOM)

# Direct Competitors

- ◆ Praava
- ◆ DoctorKoi
- ◆ Pulse
- ◆ Hia
- ◆ Lifeplus
- ◆ Doctime

# Indirect Competitors

- ◆ Traditional Brick-and-Mortar Clinics
- ◆ General Health Information Websites

# Competitive Advantages

## ◆ **Advantage 1**

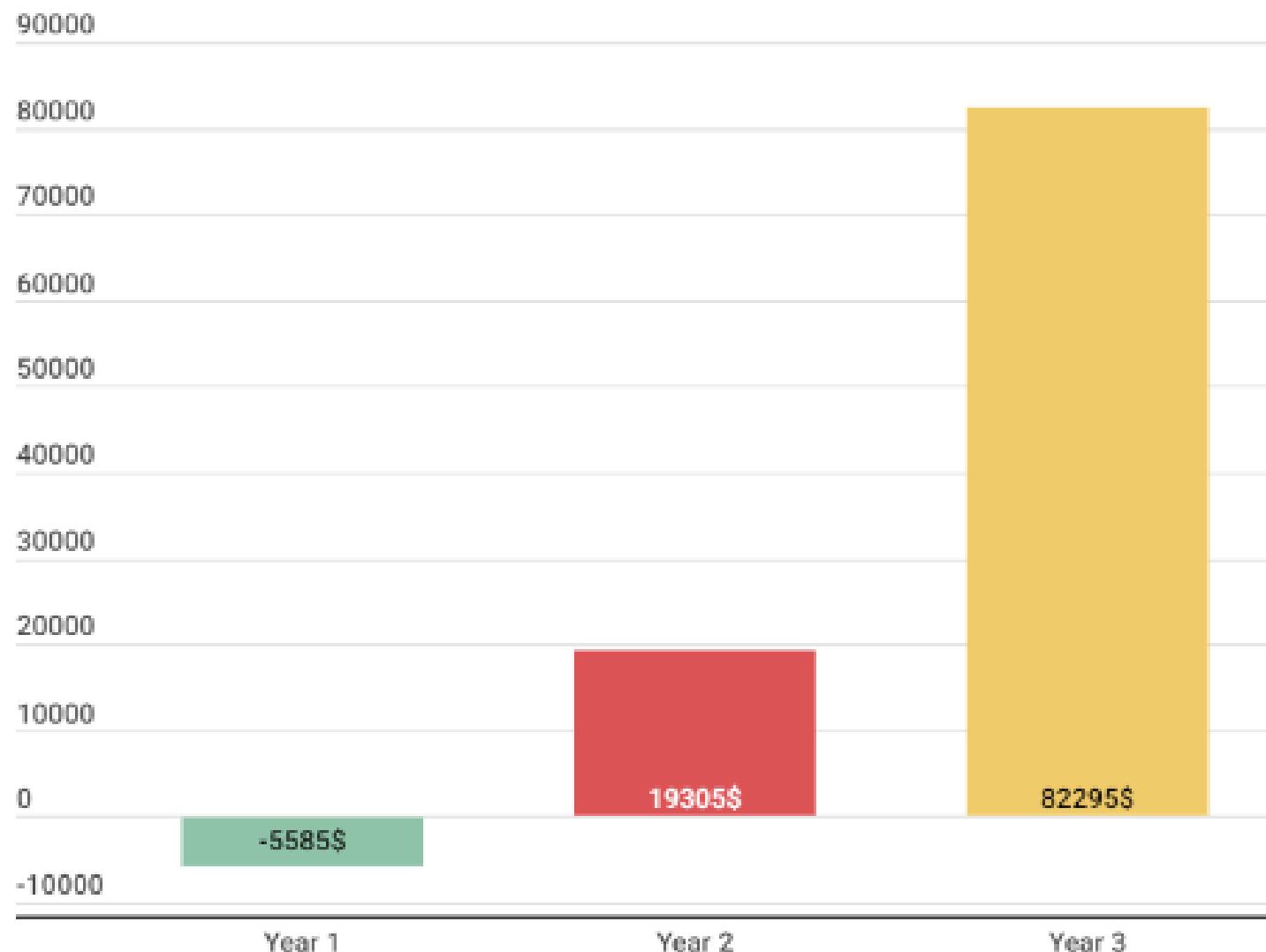
AI-driven diagnosis: The game changer. Unprecedented in the country.

## ◆ **Advantage 2**

Personalized doctor recommendations instead of generic doctor name lists.

# Break-Even Analysis

## Break-even Analysis



The following table shows the projected profit and loss for the first 3 years:

Item	Year 1	Year 2	Year 3
Hosting and APIs	4,055\$	2,530\$	2,530\$
Marketing	1,680\$	1,680\$	1,680\$
Developing our own models	3,050\$	0\$	0
<b>Total Expenses</b>	<b>8,785\$</b>	<b>4,210\$</b>	<b>45,010\$</b>
<b>Total Revenue</b>	<b>3,200\$</b>	<b>29,100\$</b>	<b>108,000\$</b>
<b>Profit</b>	<b>-5,585\$</b>	<b>19,305\$</b>	<b>82,295\$</b>

# Expected Costs & Revenue of First 3 years

Year 1			
Item	No. of Items	AVG. Price	Total
Commission Per Visit	10000	0.3\$	3,000\$
Premium Accounts	100	2\$	200\$
<b>Total</b>			<b>3,200\$</b>
Year 2			
Item	No. of Items	AVG. Price	Total
Commission Per Visit	75000	0.3\$	22,500\$
Advertisement	36	100\$	3,600\$
Premium Accounts	750	4\$	3,000\$
<b>Total</b>			<b>29,100\$</b>
Year 3			
Item	No. of Items	AVG. Price	Total
Commission Per Visit	300000	0.3\$	90,000\$
Advertisement	60	100\$	6,000\$
Premium Accounts	3000	4\$	12,000\$
<b>Total</b>			<b>108,000\$</b>

Item	Unit	No. of Units	No. of Items	Unit Price	Total
<b>Team Salaries</b>					
CEO	Month	12	1	500\$	6,000\$
COO	Month	12	1	400\$	4,800\$
Fronend web developer	Month	12	1	500\$	6,000\$
Backend Developer	Month	12	2	500\$	12,000\$
DevOps Engineer	Month	12	1	100\$	1,200\$
Mobile Developer	Month	12	2	450\$	10,800\$
<b>Salaries Total</b>					<b>40,800\$</b>
<b>Others</b>					
Domain	Year	3	2	15\$	90\$
Web hosting & APIs	Month	36	1	200\$	7,200\$
PlayStore Account	Account	1	1	25\$	25\$
AppStore Account	Year	3	1	100\$	300\$
Infermedica API	API Call	3000	1	1\$	1,500\$
Paid Ads	Month	36	1	10\$	360\$
Graphics Freelancer	Month	36	1	30\$	1,080\$
Influencers Payment	Person	18	2	100\$	3,600\$
ML Engineer Payment	Model	2	1	450\$	900\$
High Performance GPUs	Month	3	1	50\$	150\$
Data Annotators	Month	4	5	100\$	2,000\$
<b>Others Total</b>					<b>17,205\$</b>

# Our Team



**Mostafa Kira**  
Business Manager



**Md Motasim Bhuiyan**  
PR Manager, Backend Developer



**Zeyad Alagamy**  
Frontend Developer



**Fedor Krasilnikov**  
Backend Developer



**Ahmed Soliman**  
DevOps Engineer



**Mohamed Nguira**  
Mobile Developer



**Pavel Roganin**  
Mobile Developer

# Acknowledgement



**Abrar Auhin**

Helped us to collect data about the market in Bangladesh



**Mohamed Ayoub Chebbi**

Helped us to make a beautiful design for our platform



**Arnold Etaba**

Helped us designing our database schema based on pseudonymization



**Abdullah Al Noman**

Helped us go through HIPAA and GDPR policies



Ayoto

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---

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