



Market Segmentation

Market segmentation is the practice of dividing consumers into groups based on shared needs, desires, and preferences.

❑ Key benefits:

- ❑ Determine market opportunities
- ❑ Tailor-make marketing initiatives
- ❑ Product development and design
- ❑ Determine product pricing



What Companies Use Segmentation?

Numerous types of businesses use market segmentation to optimize their ability to sell to a wide variety of consumers, including:

- Skincare, haircare, and beauty product manufacturers
- Car companies
- Clothing and apparel suppliers
- Banks and other financial institutions
- Television networks and media outlets
- Retailers, ...

Data

Source: [Kaggle dataset](#)

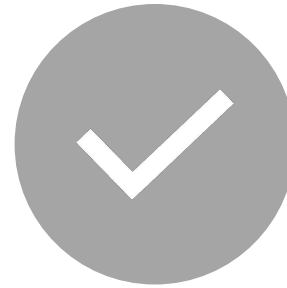
A food retailer company data set with following features:

People	Products	Promotion	Place
ID	MntWines	NumDealsPurchases	NumWebPurchases
Year_Birth	MntFruits	AcceptedCmp1	NumCatalogPurchases
Education	MntMeatProducts	AcceptedCmp2	NumStorePurchases
Marital_Status	MntFishProducts	AcceptedCmp3	NumWebVisitsMonth
Income	MntSweetProducts	AcceptedCmp4	
Kidhome	MntGoldProds	AcceptedCmp5	
Teenhome		Response	
Dt_Customer			
Recency			
Complain			

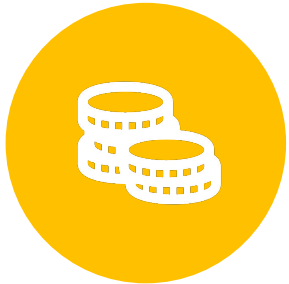
Solution Requirements



Easy implementation



Scalability



Cost efficient



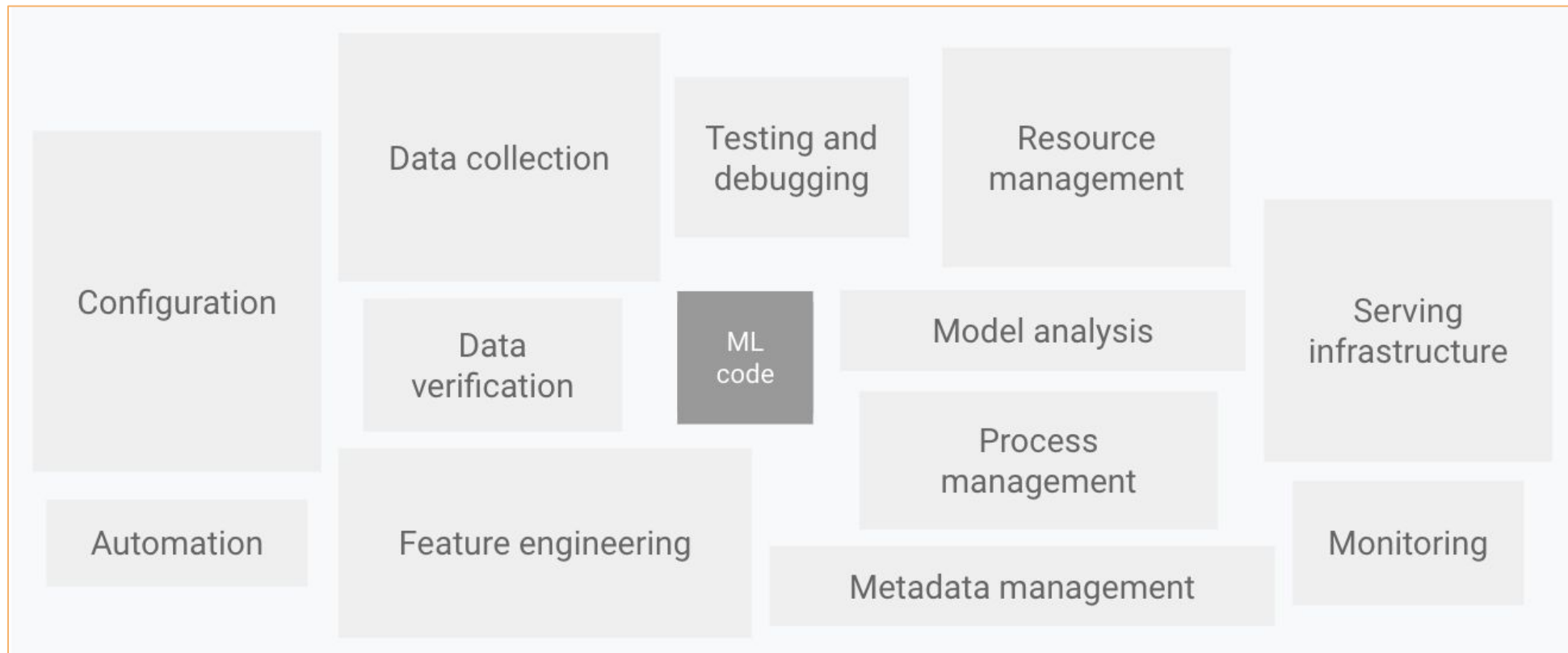
High levels of security

Cloud vs on-perm solution based on Requirements

Feature	Cloud Solution	On-Premise Software	Results
Software ownership	Vendor	Business	On-Premise
Accessibility	Easy	Hard	Cloud
Deployment	Fast	Time consuming	Cloud
Cost	High over time	Predictable and low	On-Premise
Security	High	Low	Cloud
Scalability	High	Low	Cloud

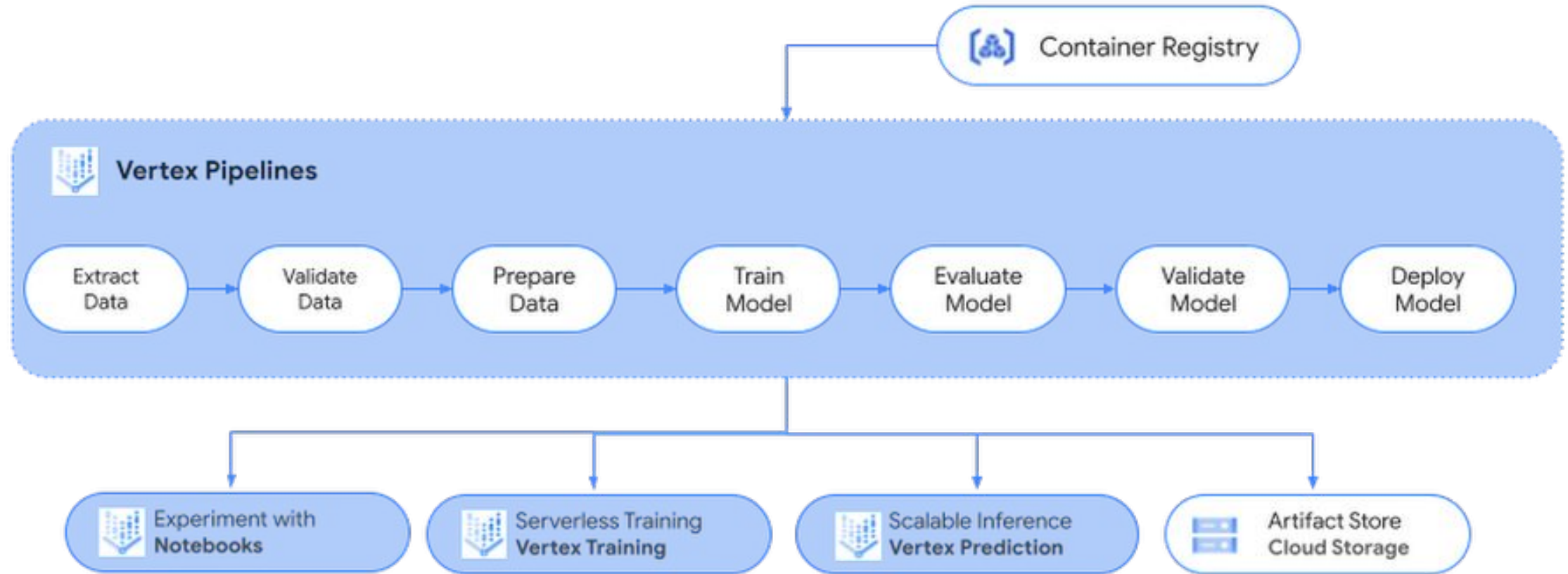
MLOps

A discipline focused on the deployment, testing, monitoring, and automation of ML systems in production.



[source](#)

ML Workflow on Vertex AI



MLOps Architecture

Vertex AI 1/2 - Training

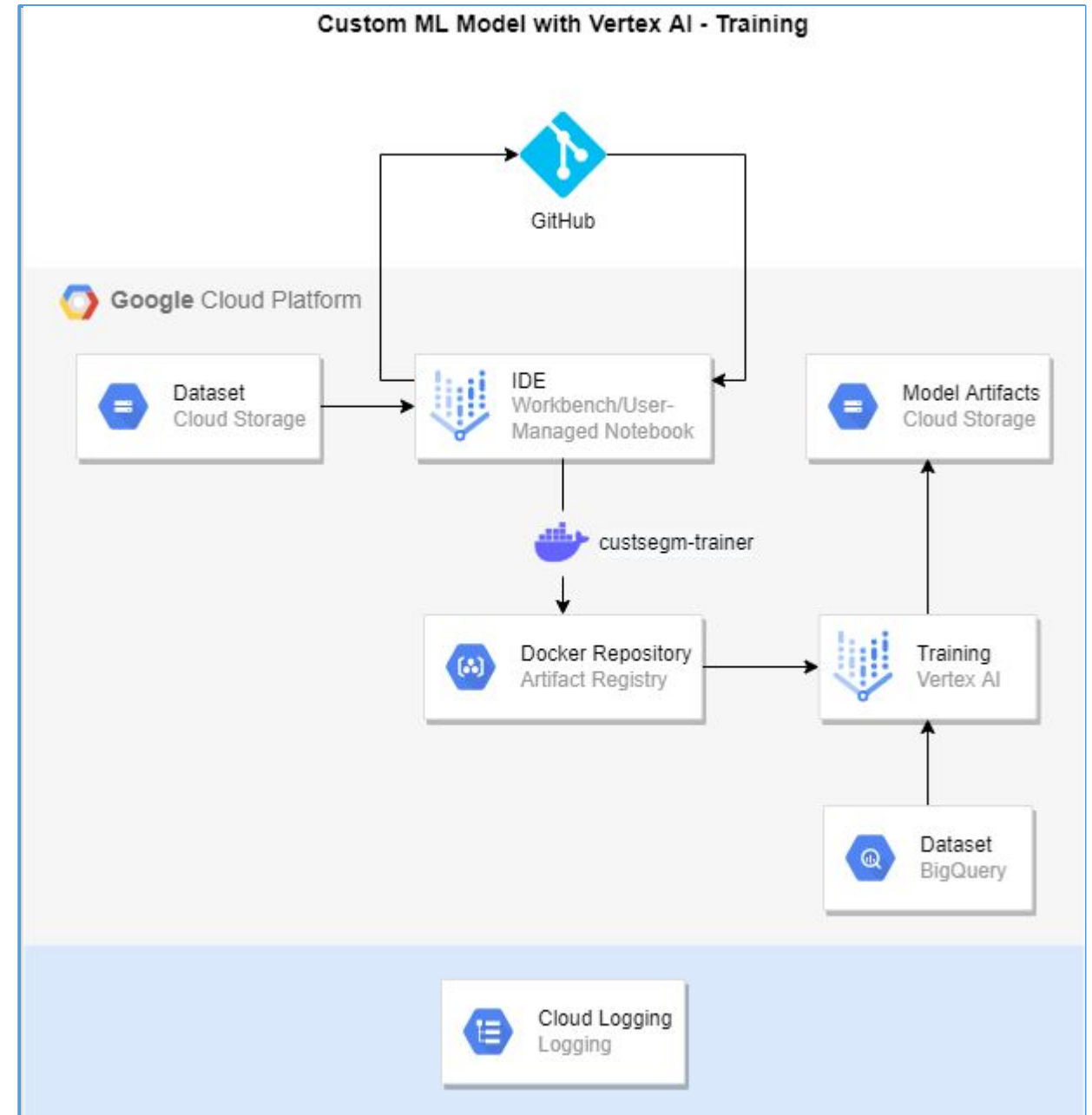
In:

Training Dataset

Out:

Model

Evaluation (not implemented)



MLOps Architecture

Vertex AI 2/2 - Prediction

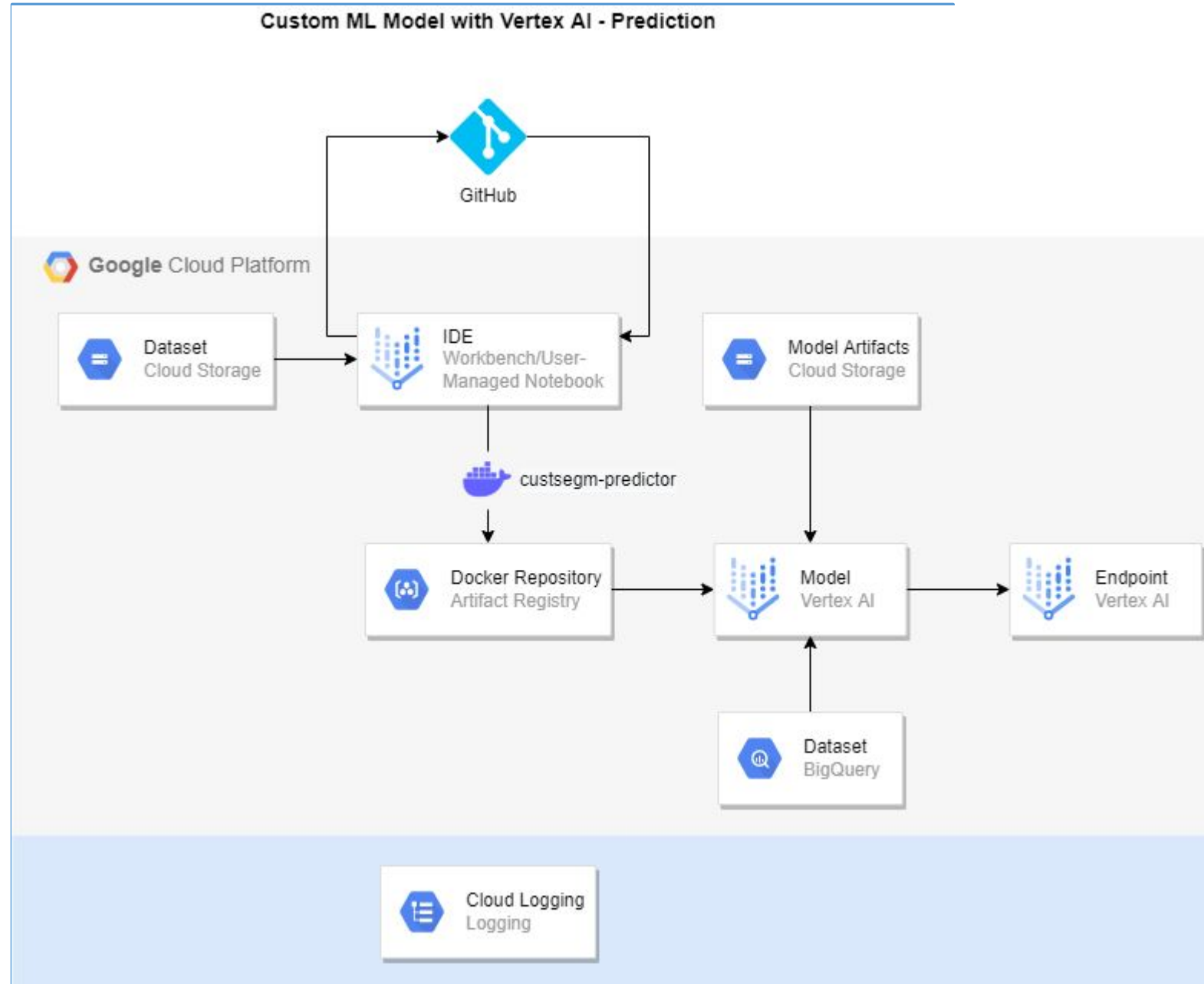
In:

Model

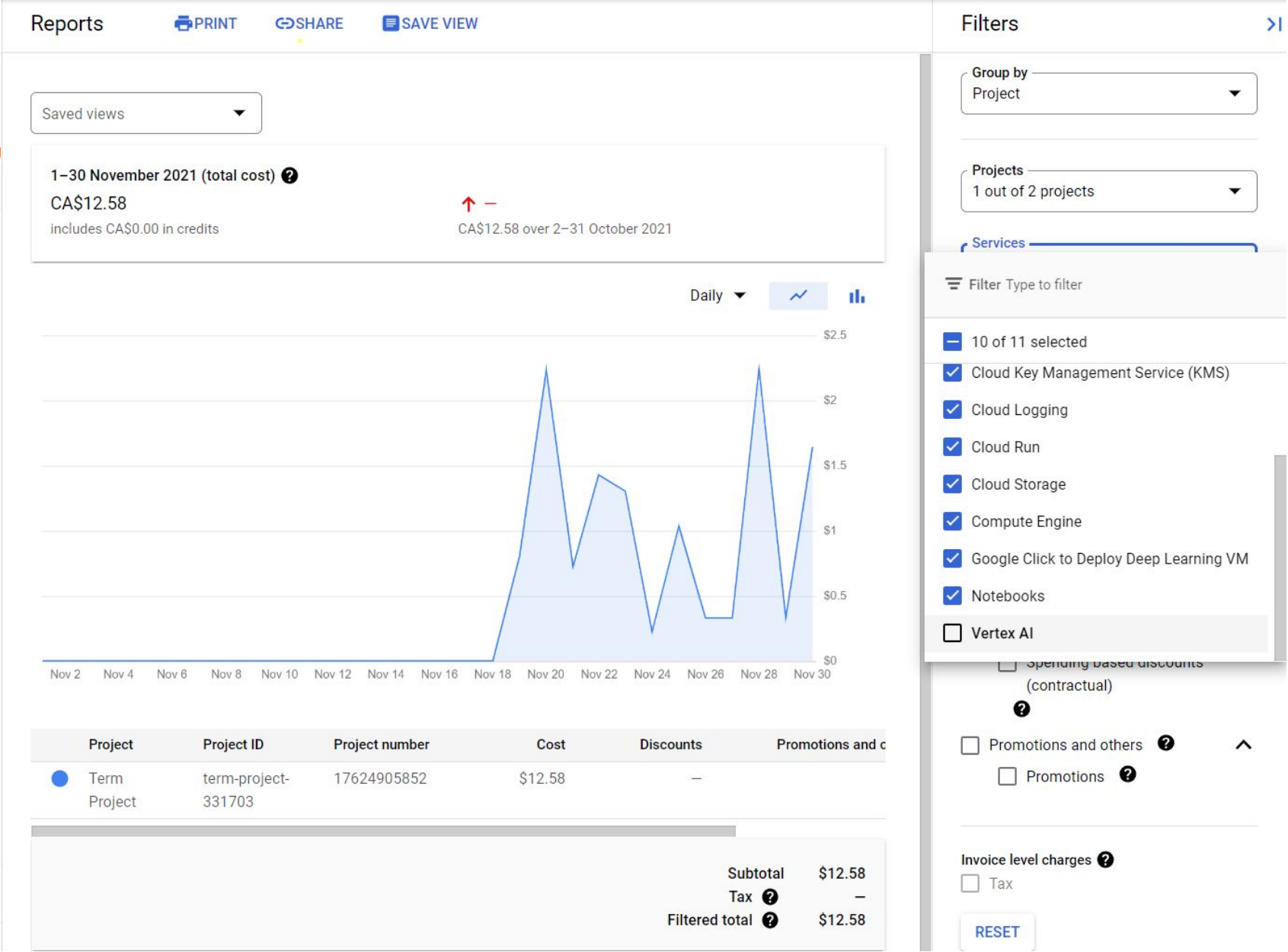
Prediction request

Out:

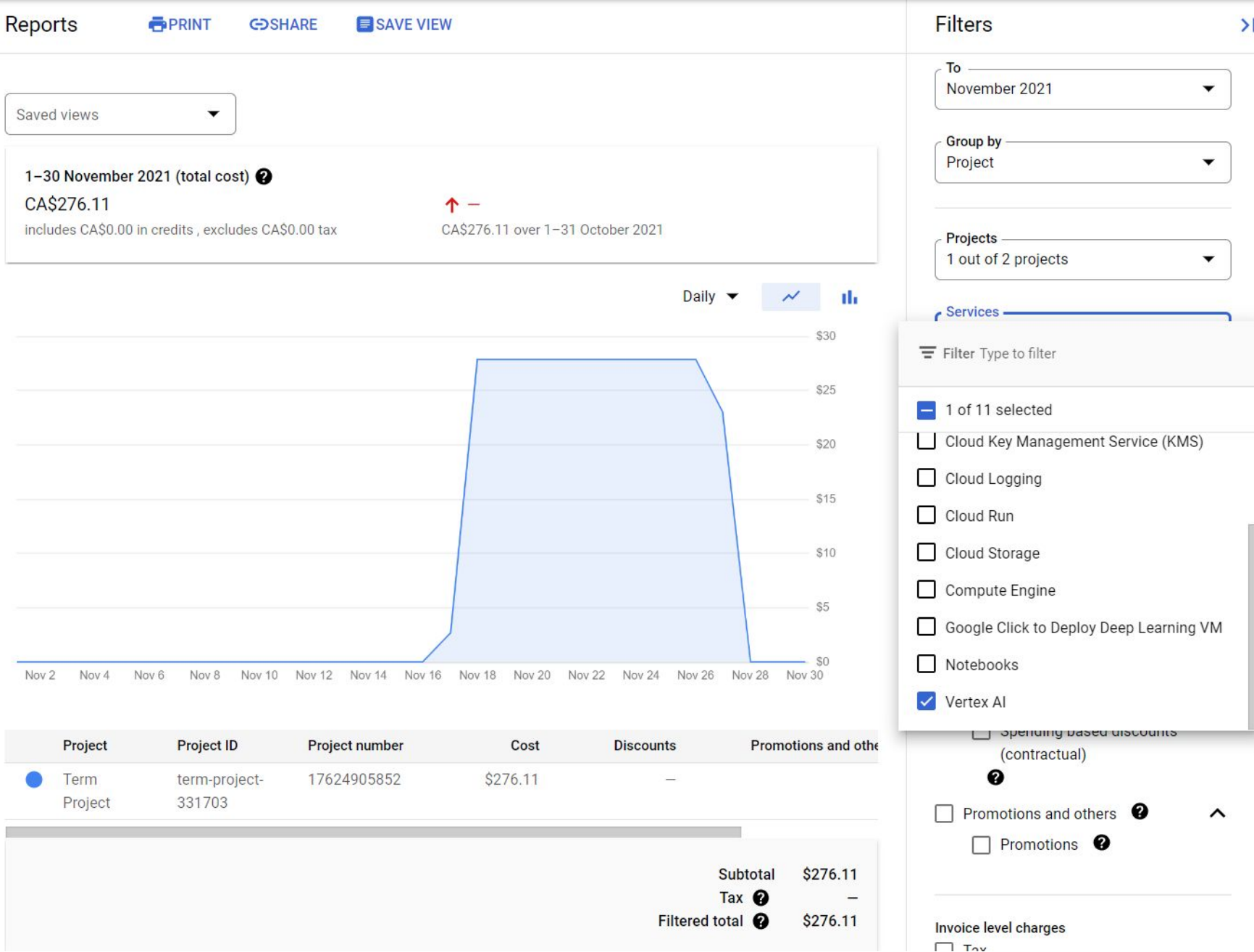
Prediction response



Costs without Vertex AI



Costs of Vertex AI alone



Straightforward Architecture

Cloud Run

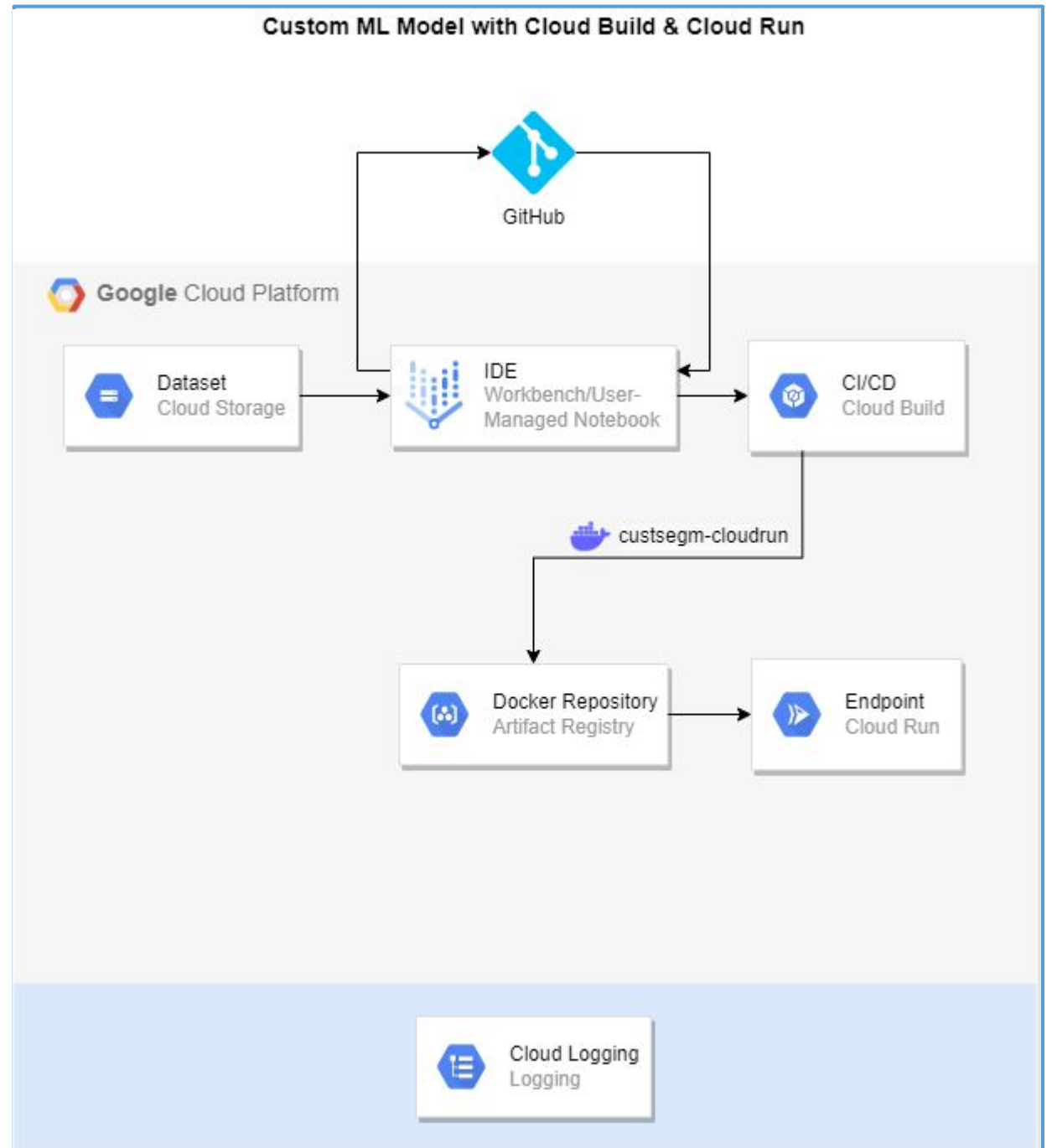
In:

Model

Prediction request

Out:

Prediction response



GCP Cost Estimate

USD 540.24
per 1 year

Estimate

Artifact Registry

Artifact Registry

Total Amount of storage: 25 GiB per month

USD 2.45

Cloud Storage

1x Standard Storage

Location: Iowa

Total Amount of Storage: 10 GiB

Class A operations: 1 million

Class B operations: 1 million

Egress - Data moves within the same location: 20 GiB

Always Free usage included: No

USD 5.600

Cloud Run

Customer Segmentation

Region: Iowa

CPU Allocation Type: CPU is always allocated

CPU: 2

Memory: 4 GiB

CPU Allocation Time: 60 vCPU-second

Memory Allocation Time: 120 GiB-second

Requests: 3,000 requests

minimum number of instances: 1

minimum number of instances Price: USD 39.42

USD 39.42

Total Estimated Cost: USD 45.02 per 1 month

Estimate Currency

USD - US Dollar

EMAIL ESTIMATE

SAVE ESTIMATE

AWS Cost Estimate

78% more expensive

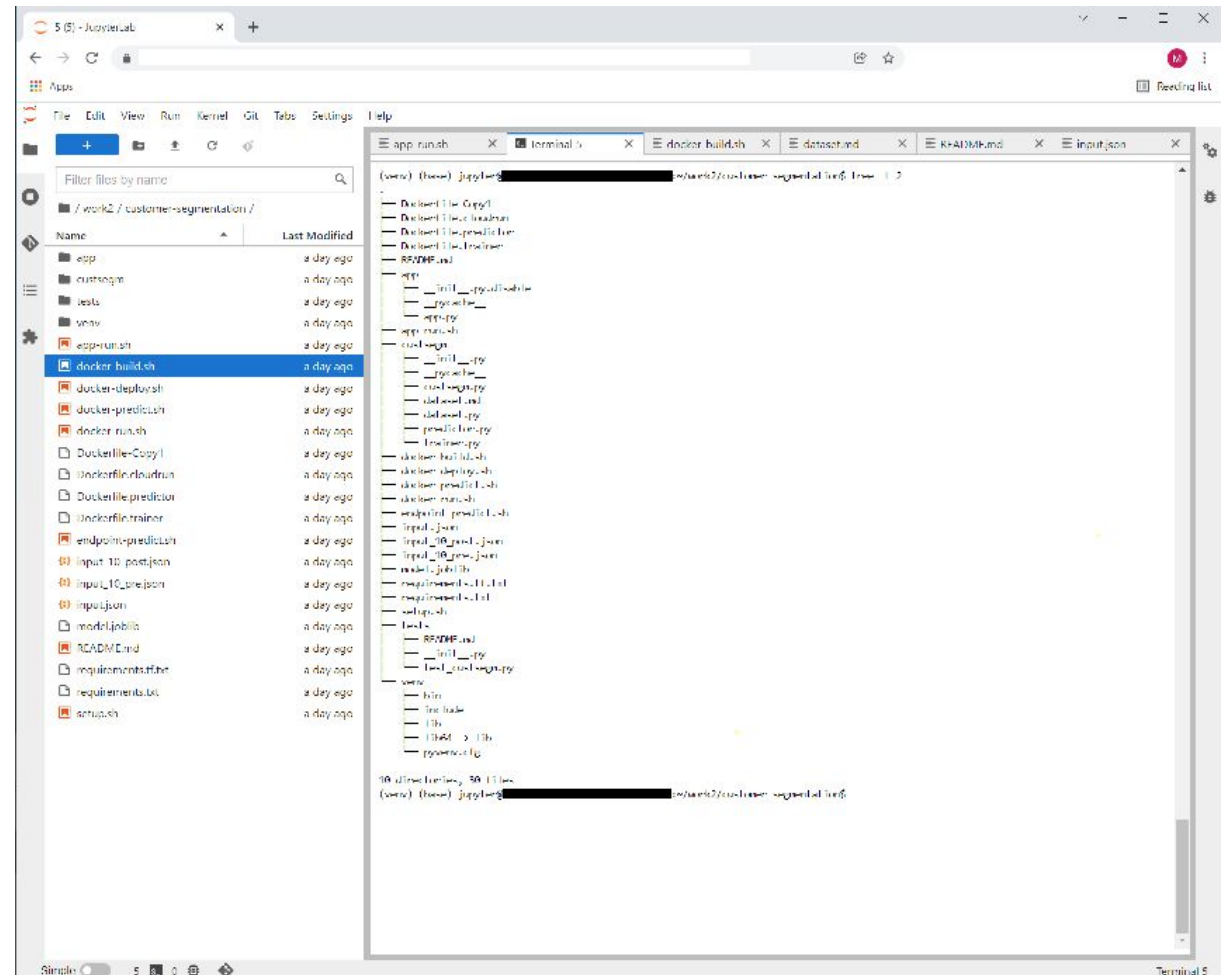
But it's not an apples to apples comparison

The screenshot displays the AWS Pricing Calculator interface for a 'Customer Segmentation' estimate. The top navigation bar includes the AWS logo, 'pricing calculator', and links for 'Feedback', 'English', and 'Contact Sales'. Below the navigation bar, the breadcrumb 'AWS Pricing Calculator > Customer Segmentation' is shown, followed by the title 'Customer Segmentation' and an 'Edit' link. A row of buttons includes 'Add service', 'Add support', 'Add group', 'Clear estimate', 'Export estimate', and a prominent orange 'Share' button. The 'Estimate summary' section provides a breakdown: 'Upfront cost' is 0.00 USD, 'Monthly cost' is 80.27 USD, and 'Total 12 months cost' is 963.24 USD. To the right, a 'Getting Started with AWS' sidebar offers 'Contact Us' and 'Sign in to the Console' buttons. The 'Services (3)' section lists three items: 'AWS Fargate' (Region: US East (Ohio)) with a monthly cost of 72.09 USD, 'Amazon Simple Storage Service (S3)' (Region: US East (Ohio)) with a monthly cost of 5.68 USD, and 'Amazon Elastic Container Registry' (Region: US East (Ohio)) with a monthly cost of 2.50 USD. Each service entry includes an 'Edit' button and an 'Action' dropdown menu.

Service	Region	Configuration	Monthly Cost
AWS Fargate	US East (Ohio)	Operating system (Linux), Average duration (24 hours), Amount of ephemeral storage allocated for Amazon ECS (20 GB), Number of tasks or pods (1 per day), Amount of memory allocated (4 GB)	72.09 USD
Amazon Simple Storage Service (S3)	US East (Ohio)	S3 Standard storage (10 GB per month)	5.68 USD
Amazon Elastic Container Registry	US East (Ohio)	Data transfer cost (0), Amount of data stored (25 GB per month)	2.50 USD

Solution Demo

<https://youtu.be/pilXd4gfZE4>





Conclusions

- Vertex AI (and MLOps tooling in general) is still a work in progress
- Depending on your process maturity, it might not be cost-effective to use specific Vertex AI services
- On GCP, Custom Containers need better documentation and up-to-date examples