Google Cloud

Cloud Digital Leader Training

Student workbook

Course modules

Course objectives

01 Identify Google Cloud products and solutions that support digital transformation.

02 Explain how cloud technology and data can be used to innovate within organizations.

03 Identify how organizations can innovate using Google Cloud's artificial intelligence and machine learning solutions.
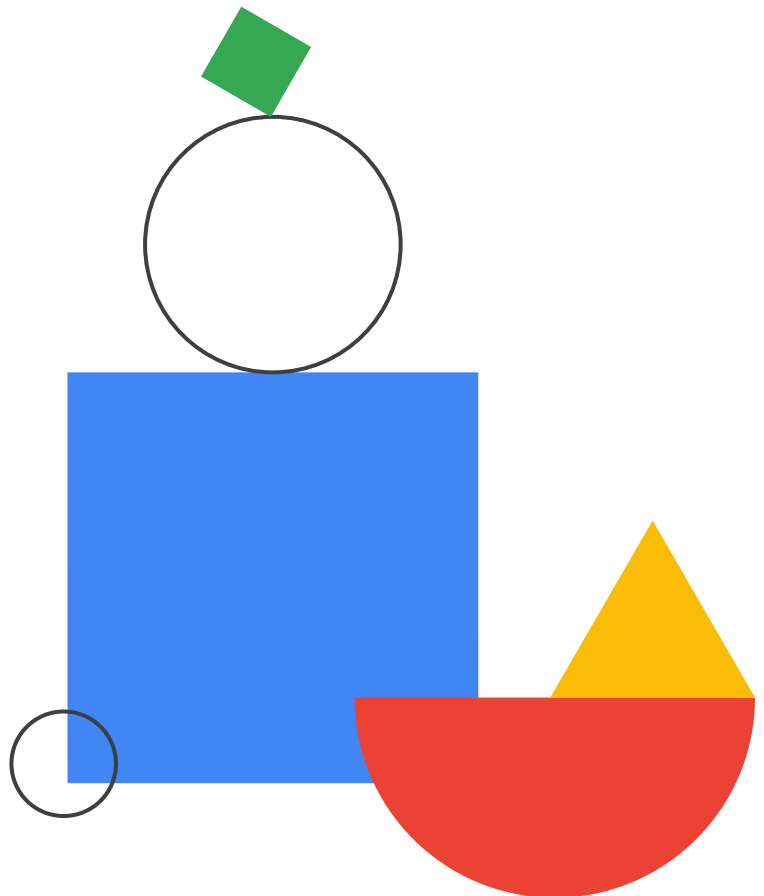
04 Explain infrastructure and application modernization with Google Cloud.

05 Describe the fundamentals of cloud security Google's trusted infrastructure.

06 Explain how to optimize cloud costs and achieve operational excellence with Google Cloud.

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Introduction

Can you think of a product or technology that no longer exists?

Module 1, lesson 1:

Modernizing IT Infrastructure with Google Cloud

Discussion: What are your current and future IT infrastructure implementations?

Why do you think the majority of organizations are implementing hybrid and/or multicloud?	
What cloud strategy are you using today?	
What was your goal for moving to the cloud?	

Discussion: What is your "why" for embracing transformation?

What are you trying to achieve with digital transformation?	
What is your organization's mission statement? Does it align more with *why* or *how*?	
What is the risk of not embracing transformation and new technology for your organization?	

Module 1, lesson 1:

Modernizing IT Infrastructure with Google Cloud

Discussion: Do the transformation cloud themes align with your organization's goals?

|				
Data	Open infrastructure	Collaboration	Trust	Sustainable technology

Which are most important to your organization?	
What challenges do you foresee on the journey?	
Where in the cloud journey are you today?	

Discussion: What impact would an OpEx model have on your organization?

Considerations:

- Procurement
- Forecasting
- Billing
- Cost management
- Impact on people and teams
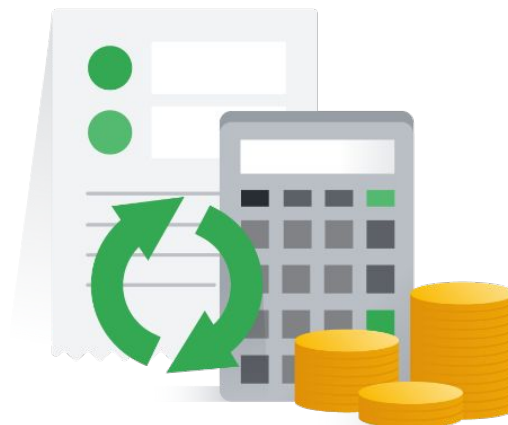
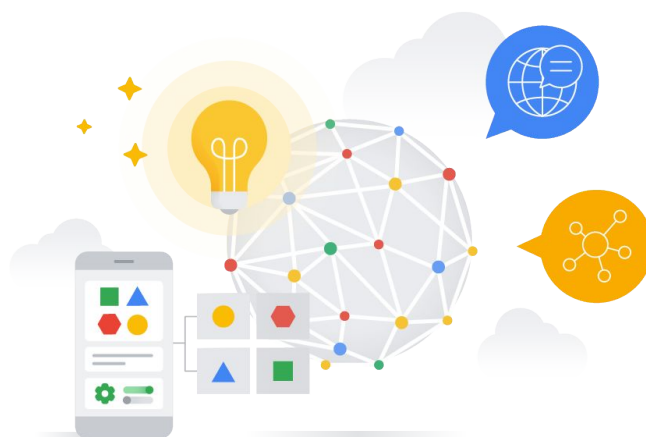|	
What impact would an OpEx model have on your organization? What value might it bring?	

Module 1, lesson 2: Fundamental cloud concepts

Discussion: What impact could poor network performance have on digital transformation?

Considerations:

- User experience
- Business operations
- Communication
- Data management
- Innovation and transformation

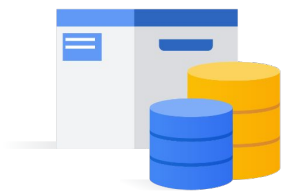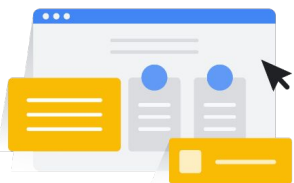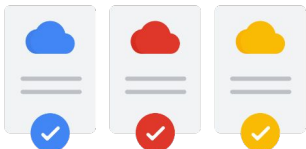|	
What impact could poor network performance have on digital transformation?	

Cloud computing models and shared responsibility

Discussion: Think of an application in your business today...

	What business drivers would lead you to choose this service model?	What benefits would using this service model bring your organization?
IaaS		
PaaS		
SaaS		

Module 1, lesson 3:

Cloud computing models and shared responsibility

Scenario:

A retail company with on-premises servers is struggling to meet **seasonal peaks** in their business and the impact on their **supply chain**. One of the appeals of cloud is offloading **repetitive IT management**, yet they are concerned about **giving up control**, and the **expertise** needed to be responsible for the **cloud security.**

They considered building a **custom supply chain app**, but are unsure they have the **expertise and resources** to manage the **app infrastructure**, as it's not their core business focus.

What service model would you recommend and why?

Module 2, lesson 1: The value of data

Discussion: How data-driven is your organization? Do you have unstructured data that's not being used to its full potential?

How would you describe your company's data culture?	
How do you feel about using the full potential of your unstructured data?	

Exercise: Identify the best data management solution

Step 1. Read the case studies below and choose the data management solution that fits best with the example. Take 2 minutes per example.

Step 2. Review the use cases as a class after attempting all examples.

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Example 1

A coworking office rental business uses an **online tool to record** daily desk, room, and meeting **bookings**. If a client books a desk for the day, that data is captured and desk availability is **updated in real time** on all customer channels. The rental business now wants to do even more with their data. They **want to use multiple types and sources of data to gain insights about facility quality** and, ultimately, to **improve their service** to customers. Which data management solution best fits the coworking business' needs?

Database	Data warehouse	Data lake

Example 2

A bank is launching a **mobile banking app**, and wants to **track money transfers** from one account to another. They want to make sure that the transferred figure is **updated** in the bank's records in **real time** and that the user is able to see the **most up-to-date account balance**. Which data management solution best fits this bank's needs?

Database	Data warehouse	Data lake

Exercise: Identify the best data management solution

Example 3

An online music streaming company **stores raw music data** that is accessed by users worldwide, and constantly analyzed by their systems. They want to geographically disperse **backup copies** of their **raw data in very large volumes**. This data comes in a **variety of formats**, must retain **full fidelity**, and must be **accessible for processing and analysis at any time, at short notice**. Which data management solution best fits this streaming service's needs?

Database	Data warehouse	Data lake

Example 4

A lifestyle company is launching a casual dating **mobile app**. By signing onto the app through social media, **users provide details** such as gender, location, and interests, as well as headshot images. The lifestyle company wants to **display this information** to other app users **through an algorithm**, which **depends on compatibility**, and needs a **cost-effective data management** solution that can hold **large volumes of data**. They also **can't afford downtime** that would drive users away. Which data management solution best fits this company's needs?

Database	Data warehouse	Data lake

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Module 2, lesson 2: Google Cloud data management solutions

Exercise: Identify the Google Cloud storage product that matches the listed criteria.

Structured or semi-structured data

Transactional workloads accessed without SQL

1 _____

Structured or semi-structured data

Transactional workloads accessed with SQL

Global scalability

2 _____

Unstructured data

3 _____

Structured or semi-structured data

Analytical workloads accessed without SQL

4 _____

Structured or semi-structured data

Transactional workloads accessed with SQL
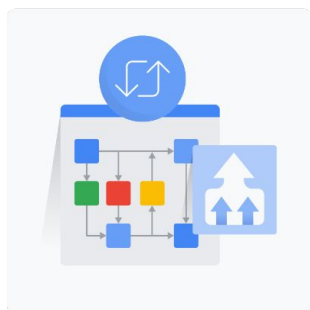
Local or regional scalability

5 _____

Structured or semi-structured data

Analytical workloads accessed with SQL
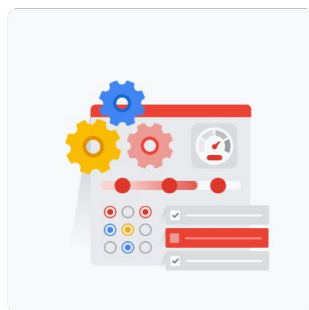
6 _____

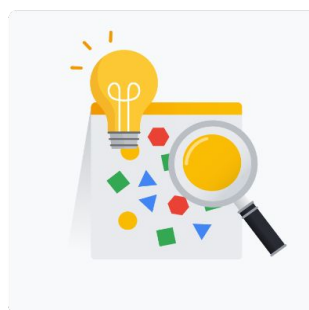## Module 3, lesson 1: AI and ML fundamentals

Discussion: We've presented four common business problems ML can solve...

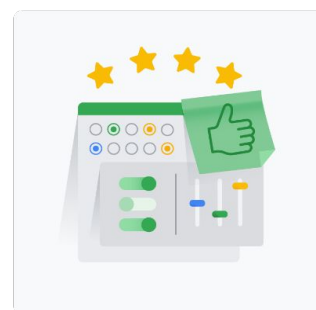| Replacing or simplifying rule-based systems | Automating processes | Understanding unstructured data | Personalization |

Which of these problems are you experiencing in your organization?	
How can ML solve these problems?	

Module 3, lesson 1: AI and ML fundamentals

Activity: You work for a lead generation company. Which data quality dimension will be impacted by each of these events?

You're driving traffic to a website, but there's a huge spike in traffic that can be attributed to automated bots clicking the links.

1 _____

You're launching a survey campaign, collecting names and email addresses, but neither of those fields are marked as required, so some users leave one or the other blank.

2 _____

You're driving traffic for a dropshipping campaign. The procurement team is collecting zip codes in a five-digit format and the marketing team is collecting them in a nine-digit format.

3 _____

At the year end you've amassed 50,000 leads, but it turns out that 20% are duplicates from customers who had filled out the information previously.

4 _____

You're launching a global survey campaign that collects phone numbers in the 10-digit US phone number format.

5 _____

You're using data to score leads but the scoring model isn't being updated to reflect changes in the market.

6 _____

Discussion: What are your thoughts around Google's AI principles?

- AI should be socially beneficial.

- AI should avoid creating or reinforcing unfair bias.

- AI should be built and tested for safety.

- AI should be accountable to people.

- AI should incorporate privacy design principles.

- AI should uphold high standards of scientific excellence.

- AI should be made available for uses that accord with these principles.

Which principles resonate with you the most or are of concern to your organization?	

Discussion: ML options on Google Cloud

- BigQuery ML

- Pre-trained APIs

- AutoML

- Custom training

How do you foresee using these approaches in your organization?	

Scenario:

Your company is looking to implement an AI solution to improve product recommendations. There's a lot of historical data on customer purchases, but the data is not well-structured. In addition to data on customer purchases, your company also has access to customer demographics, product reviews, and social media data.

Considering the tradeoffs of **speed**, **differentiation**, **expertise**, and **effort**, which of the following options should your company consider?

Pre-trained APIs are quick to deploy and can be used to generate recommendations based on a variety of factors, such as customer purchase history, product popularity, and customer demographics.	**AutoML** can be used to build a product recommendation model based on the company's historical purchase data.	**Custom training** can be used to build a product recommendation model that takes into account all of the company's data, including structured data, unstructured data, and external data sources.

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Exercise: Identify key modernization strategies

Step 1. Read the case studies below and circle the modernization strategy that fits best with the scenario. Take 2 minutes per scenario.

Step 2. Review the use cases as a class after attempting the examples.

Scenario 1

A multinational coffeehouse chain currently accepts orders in-person, by phone, or on their website. They want to provide customers with another way to order by building a new smartphone app. The app needs to be scalable and to function globally at low latency.

Rehost	Replatform	Refactor	Reimagine

Scenario 2

A video game manufacturer distributes its products through applications on consoles and mobile devices, supported by legacy infrastructure. Consumers are complaining that the app lacks features like cloud gaming and customizable profiles. The manufacturer wants to provide these but is struggling to integrate them into the current application and can't risk extended downtime.

Rehost	Replatform	Refactor	Reimagine

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Module 4, lesson 1: Important cloud migration terms

Exercise: Identify key modernization strategies

Scenario 3

A financial services company has a legacy application that is used to process customer transactions. The application is running on an outdated operating system and is not compatible with the company's newer hardware. The financial services company wants to modernize the application without having to rewrite the entire application from scratch.

Rehost	Replatform	Refactor	Reimagine

Scenario 4

A high-profile law firm has a large on-premises database of legal resources which can be accessed on-site or on a web portal which is slow and unreliable. The firm now wants its databases to be accessible quickly and easily from anywhere.

Rehost	Replatform	Refactor	Reimagine

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Activity: Identify the Google Cloud product that matches the listed criteria.

Google's serverless platform that allows you to run containers without having to manage any infrastructure.

1
_____

Google's virtual machine service that allows you to create and manage virtual machines in the cloud.

2
_____

Helps migrate existing VMware workloads to the cloud without having to rearchitect the applications or retool operations.

3
_____

Google's API management platform that allows you to secure, manage, and publish APIs.

4
_____

Google's managed Kubernetes service that allows you to deploy and manage containerized applications in the cloud.

5
_____

Google's fully managed platform for developing and hosting web applications.

6
_____

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Activity: Identify the cloud security concept that matches the description.

Establishing policies, procedures, and technical safeguards to protect against unauthorized access, misuse, and potential threats.

1

_____

Making sure that cloud systems and services are always accessible and ready for use by the right people when needed.

2

_____

Ensuring that security practices and measures align with established standards and guidelines.

3

_____

Ensuring that information doesn't get changed or corrupted, no matter where it's stored or how it's moved around.

4

_____

Ensuring that only authorized people can access sensitive data, no matter where it's stored or sent.

5

_____

Module 5, lesson 1: Trust and security in the cloud

Exercise: Cybersecurity threats

Step 1. Read the case studies that follow, and then identify the specific cybersecurity threat that's present in each scenario. Take 2 minutes per scenario.

Step 2. Review the use cases as a class after attempting the examples.

Scenario 1

An employee finds an old USB memory stick in his home and connects it to his work computer. Soon after, the device begins acting erratically, with many of his files being corrupted or deleted.

Phishing	Physical damage	Malware/virus
Ransomware	Unsecured third-party systems	Misconfiguration

Scenario 2

A colleague is searching for an application online. They find the software on an unfamiliar website, download it, and run it. Their files then become locked and unusable, with an accompanying message demanding a payout to release the information.

Phishing	Physical damage	Malware/virus
Ransomware	Unsecured third-party systems	Misconfiguration

Module 5, lesson 1: Trust and security in the cloud

Exercise: Cybersecurity threats

Scenario 3

Your organization begins using an external system to manage its HR department and employees' personal details. A few months later, these employee details begin to appear online. Your organization's IT teams search and confirm that the data breach was not internal, and your security remains uncompromised.

Phishing	Physical damage	Malware/virus
Ransomware	Unsecured third-party systems	Misconfiguration

Scenario 4

You receive an email from an unfamiliar address claiming to be from a colleague. It says she has urgent work for you and needs you to reply with a mobile number so that she can brief you.

Phishing	Physical damage	Malware/virus
Ransomware	Unsecured third-party systems	Misconfiguration

Discussion: Cloud security operations

Why is SecOps important for organizations?	
What are some of the challenges that organizations face when implementing SecOps?	
How does Google Cloud help organizations implement SecOps practices?	

Module 5, lesson 3: Google Cloud's trust principles and compliance

Discussion: Collecting customer data in your organization

Organizations are constantly collecting, storing, and using customer data to improve their products and services. However, this data also needs to be protected from unauthorized access and use.

How can your organization strike a balance between respecting customer data privacy and leveraging data to drive innovation?	
How can your organization effectively navigate challenges in managing data storage and complying with local regulations while maintaining global operations?	

Module 6, lesson 1: Fundamentals of cloud financial governance

Discussion: Financial governance

What challenges do you face when managing cloud spend?	
What processes or framework does your organization have in place to manage cloud costs?	

Discussion: The importance of designing resilient and scalable infrastructure for high availability and disaster recovery

Think about the trade-offs involved in implementing redundancy, replication, and autoscaling in cloud environments.

What factors should be considered when deciding on the appropriate level of redundancy and scalability for a specific application or service?

Notes

Notes