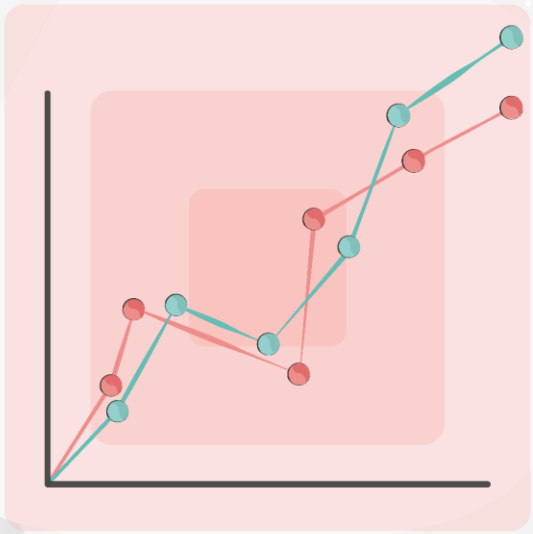
Data engineering

Module: Data pipelines

Topic: Service management



Welcome to today’s webinar.

Ice breaker

Discussion…

- How are you feeling today? Motivated, happy, etc.?
- Is there anything about the EPA you are unsure of?
- Think back to a time when a data pipeline you worked on failed or produced unexpected results. What was the cause - and how did you find out?

Submit your responses to the chat or turn on your microphone

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The 9 AM dashboard disaster

Inspired by a real incident at a global retailer…

- **Monday morning:** dashboards show blank charts and errors
- **Pipeline ran -** but processed no usable data
- **Root cause:** silent API schema change over the weekend
- **No alerts triggered;** issue discovered too late
- Business decisions made on incomplete insights

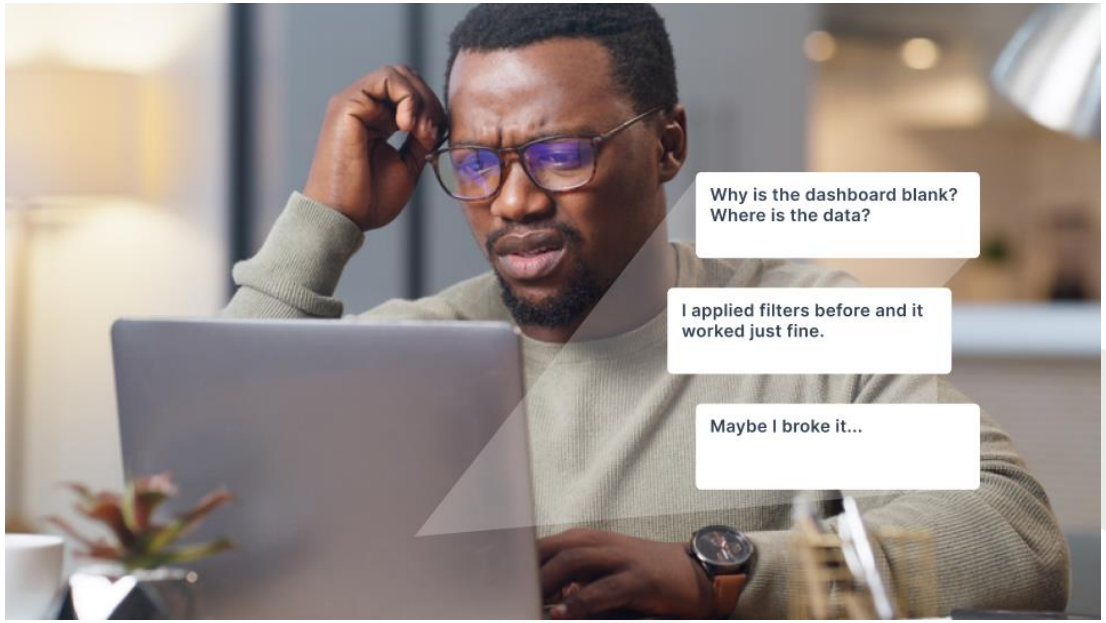
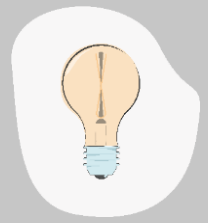


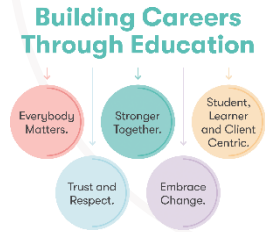
Image source: sellersdorsey.com



This story highlights three key lessons:

1. Pipelines can fail silently.
2. Observability is about more than uptime - it's about correctness.
3. The business impact of data failures is real and immediate.

e-learning recap



Reflecting on your learning…

The e-learning for this topic, covered the following areas:

- **Pipelines need ongoing care -** Service management ensures reliability and trust.
- **Visibility matters -** Monitoring and alerts help catch issues early.
- **Incidents happen -** Respond calmly, communicate clearly, and learn from them.
- **EPA tests more than tech -** It assesses your skills, behaviours, and communication.
- **Prep with purpose -** Reflect, rehearse, and use the STAR method.
- **Clarity counts -** Strong EPA evidence is specific, relevant, and well-explained.

Q&A discussion

- Do you have any questions about any of these areas?
- Did everything in the e-learning make sense?

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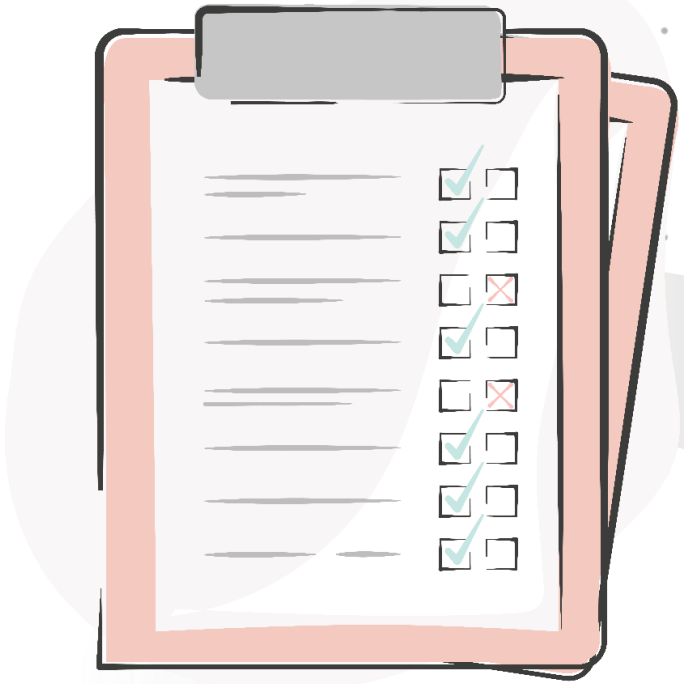
Webinar Agenda

Today, we will cover the following:

1. Welcome and intro
2. Core concept recap
3. Practical lab
4. Summary
5. Q&A



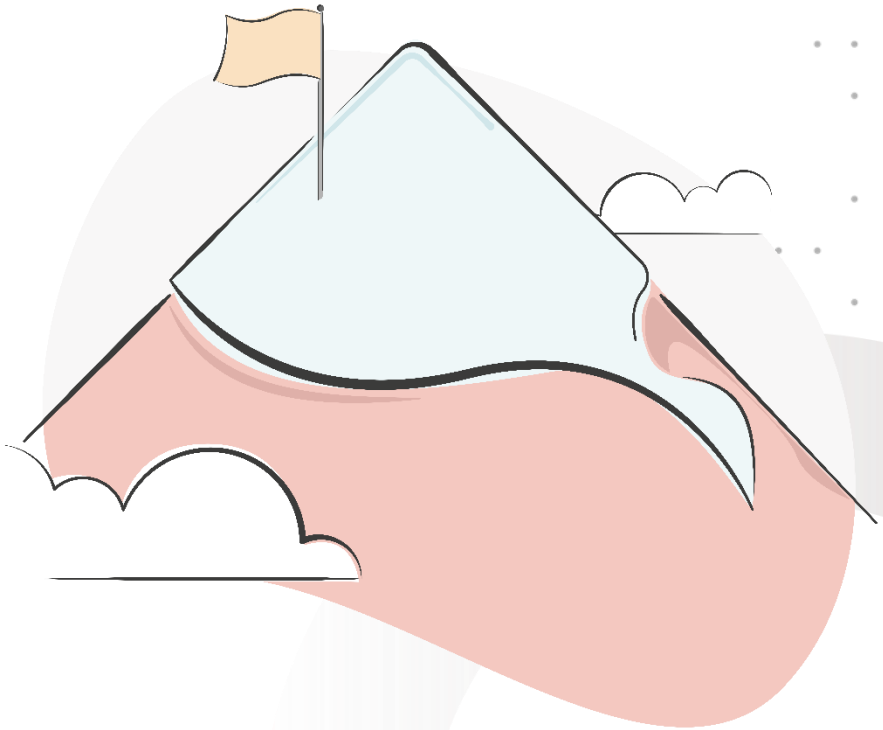
Session aim and objectives

Building Careers Through Education

Everybody Matters. Stronger Together. Student, Learner and Client Centric. Trust and Respect. Embrace Change.

By the end of this session, you should be able to:

- Understand key service management principles: reliability, availability, observability, and ownership
- Use monitoring and maintenance to keep data pipelines stable and trustworthy
- Handle incidents effectively with clear response and continuous improvement
- Know what the EPA assesses: knowledge, skills, and behaviours (KSBs)
- Prepare for the EPA with reflection, practice, and strong communication
- Learn from real examples to improve your EPA performance



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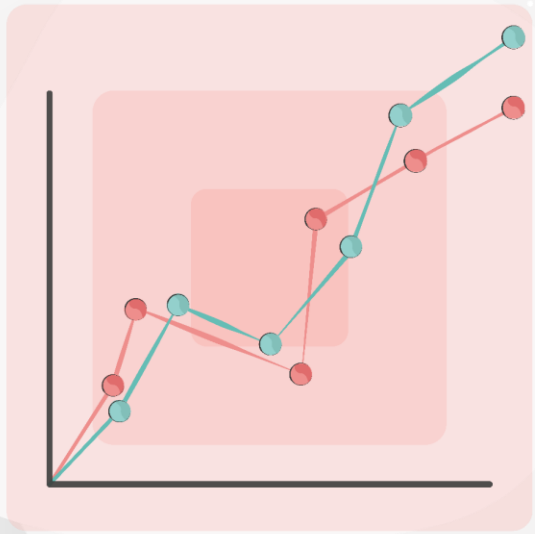
Core concept recap



Knowledge check poll

Which of the following best describes the principle of observability in service management?

A. Ensuring that services are always available to users

B. Automating all data transformations in a pipeline

C. The ability to monitor, measure, and understand system behaviour

D. Writing clean and well-documented code

Feedback: C - Observability is about having the tools and data (like logs, metrics, and alerts) to understand what's happening inside your system - especially when something goes wrong.

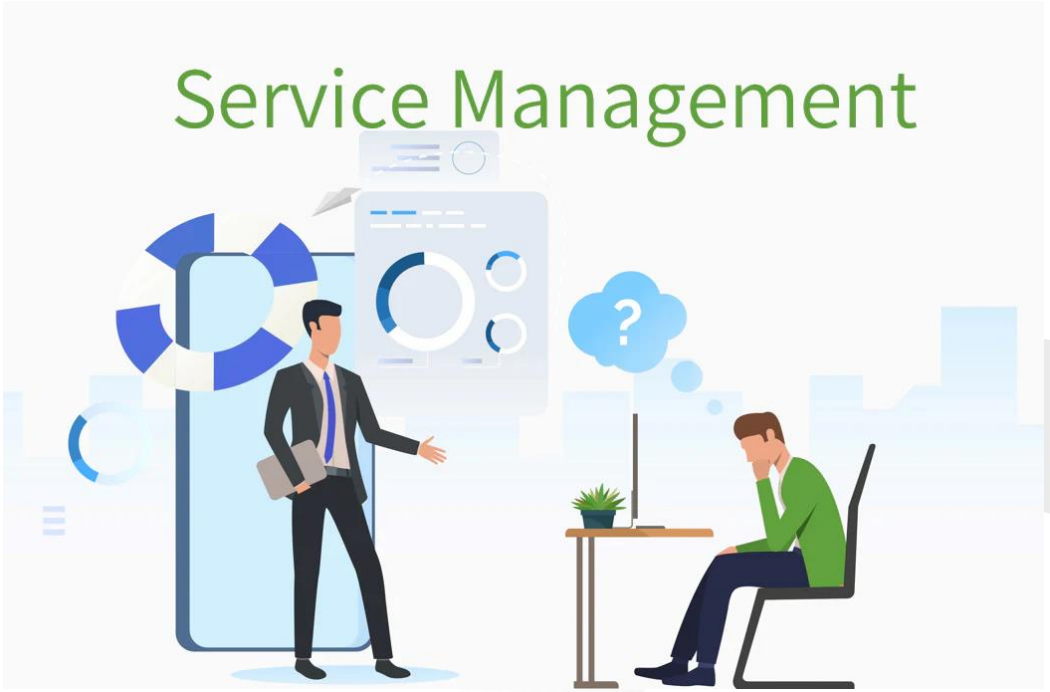
Submit your responses to the chat!

What is service management?

Beyond building pipelines

- Ensures reliability, availability, and trust
- Involves monitoring, maintenance, and ownership
- Keeps data flowing and users confident

- Have you ever seen a pipeline fail silently?
- What happened?



Ensuring data reliability: The role of Service Management in Keeping Pipelines Flowing Smoothly, ***image source:*** *www.itgov-docs.com*

Core principles of service management

The five pillars

The five pillars of service management

Monitoring & maintenance

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Keeping the lights on…

- Track job status, latency, and errors
- Use dashboards, logs, and alerts
- Perform regular checks and updates

- What tools do you use to monitor your pipelines?
- How do you know when something's gone wrong?

Figure: Data Pipeline with Silent Failure

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Incident response & recovery

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When things break…

- Detect → Diagnose → Resolve
- Communicate clearly and quickly
- Learn from post-incident reviews

What's your process when a job fails?

Who do you notify?

Figure: The Incident Management Process

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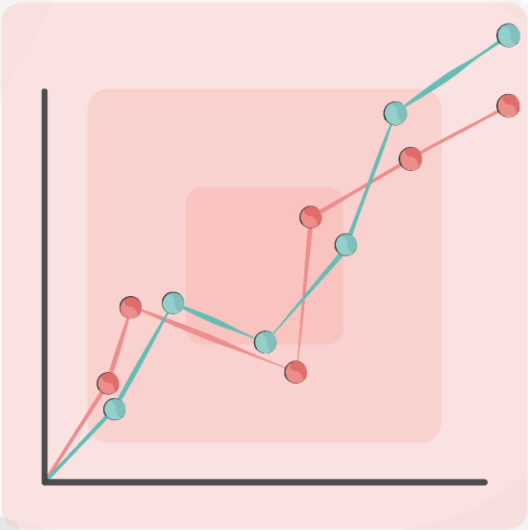
The EPA



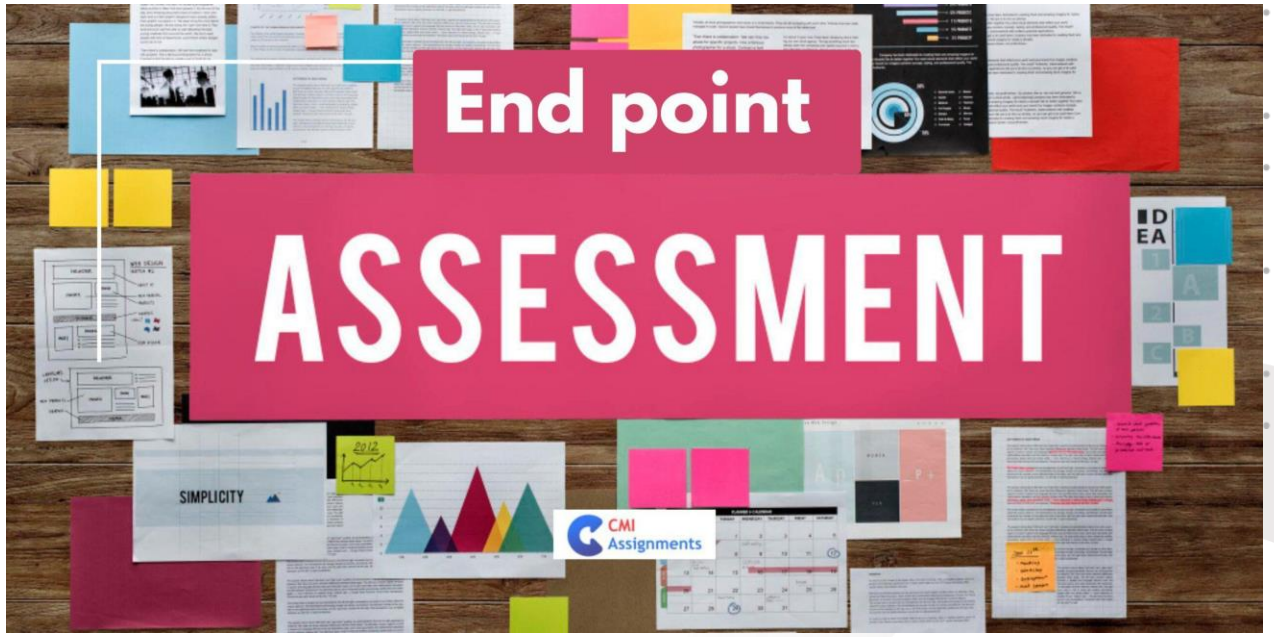
Understanding the EPA

Navigating your academic milestone…

1. Project presentation with Q&A

2. Professional discussion with portfolio

3. Assesses Knowledge, Skills, and Behaviours (KSBs)



Navigating your EPA: What to expect and how to prepare for success, **image source:** cmiassignmenthelp.co.uk

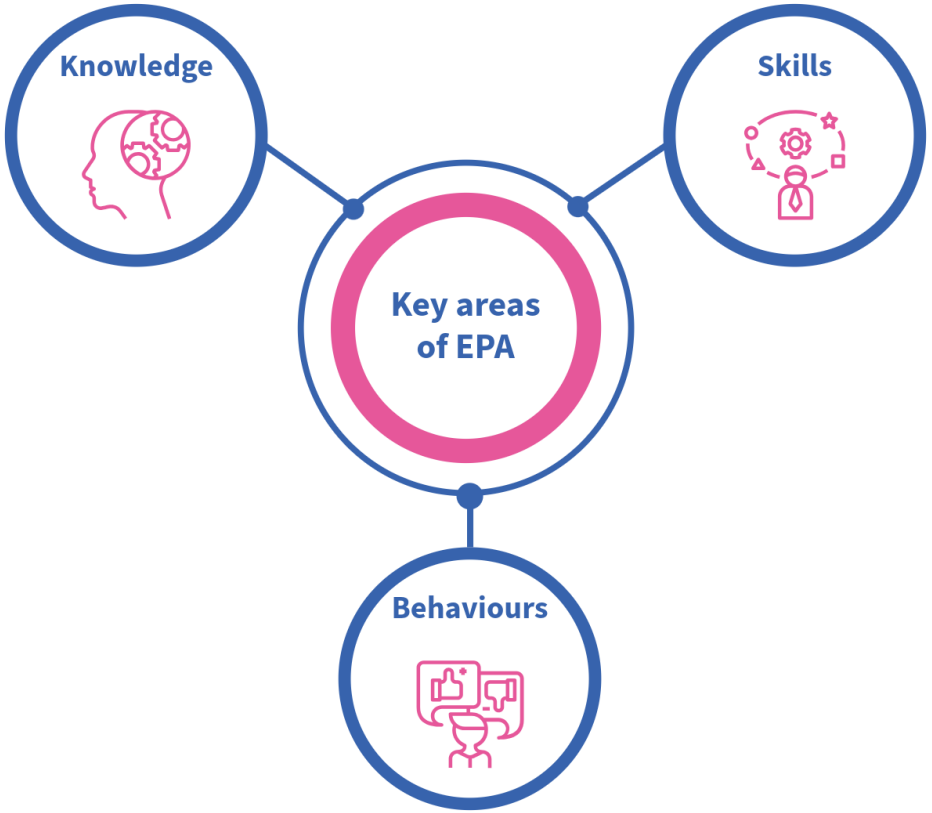
What the EPA looks for

The KSB framework…

1. **Knowledge:** Data modelling, security, quality
2. **Skills:** Pipelines, troubleshooting, collaboration
3. **Behaviours:** Ownership, adaptability, communication

Which of these behaviours do you find easiest to demonstrate?

Which are harder?



Key Areas of the EPA: Demonstrating Knowledge, Skills, and Behaviours with Confidence

Preparing with purpose

Reflect, rehearse, refine…

- Use the STAR method (Situation, Task, Action, Result)
- Practise explaining your work aloud
- Get feedback from mentors or peers

Have you tried explaining your project to a non-technical friend?

What did you learn?

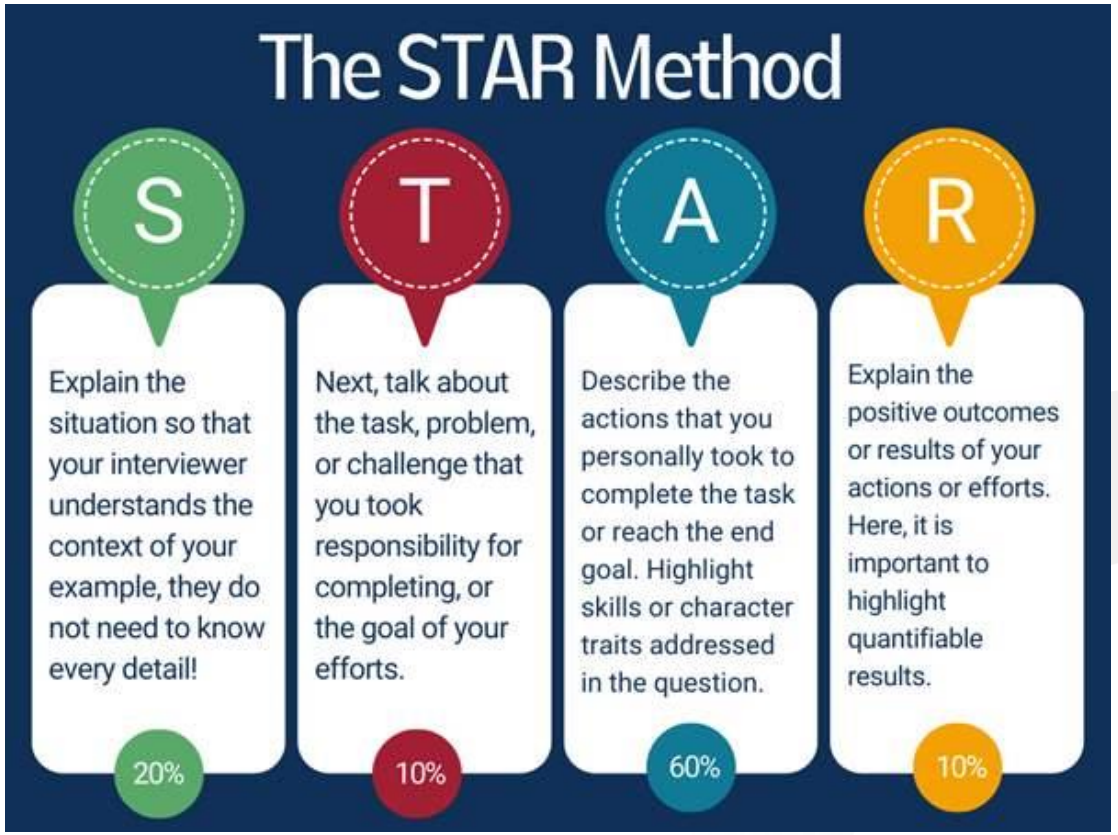
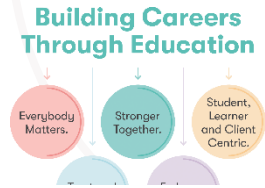


Figure: The STAR method, with percentages representing the time to dedicate to each section of your story. **Image source:** MIT CAPD

What good evidence looks like



Clarity over complexity…

- Be specific and outcome-focused
- Show learning, not just tasks
- Align examples with KSBs
- Even simple projects can shine
- Use the STAR method to structure your story

Strong

"I implemented a data validation layer using Python and Pandas, reducing report errors by 40%. I collaborated with QA and iterated weekly based on feedback."

Vs

Weak

"I worked on a database and fixed some issues. It took a while."

What makes the first example stronger?

What's missing from the second?

Demonstrating Strong Evidence: Focus on Specific Outcomes and Learning Using the STAR Method

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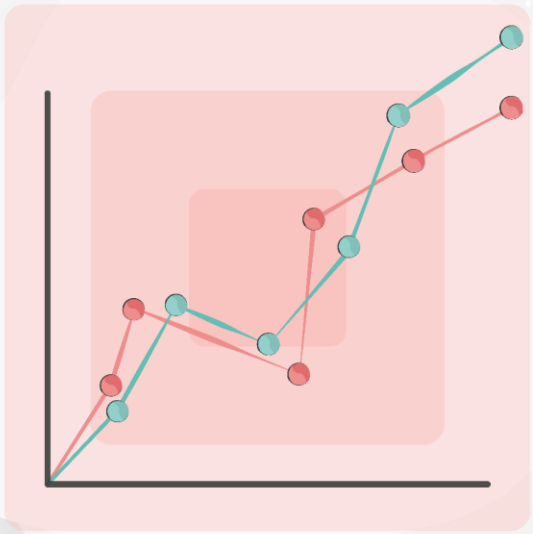
Practical lab



Exercise part 4

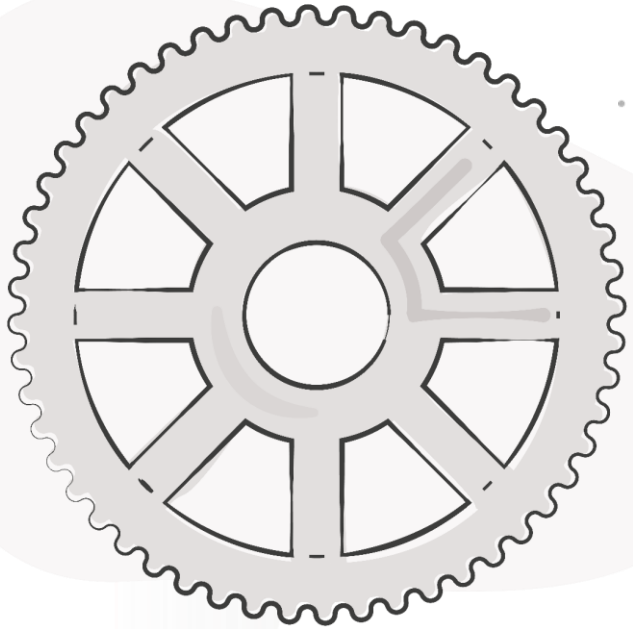
Next phase of design based on Canadian data

Your step-by-step tasks are as follows:

1. **Update Database Schema:** Modify schema for Canadian data
2. **Re-implement Pipeline:** Clean, validate, and load data sets
3. **Use Provided Test Data:** Data for 10 Canadian users
4. **Login timestamps**

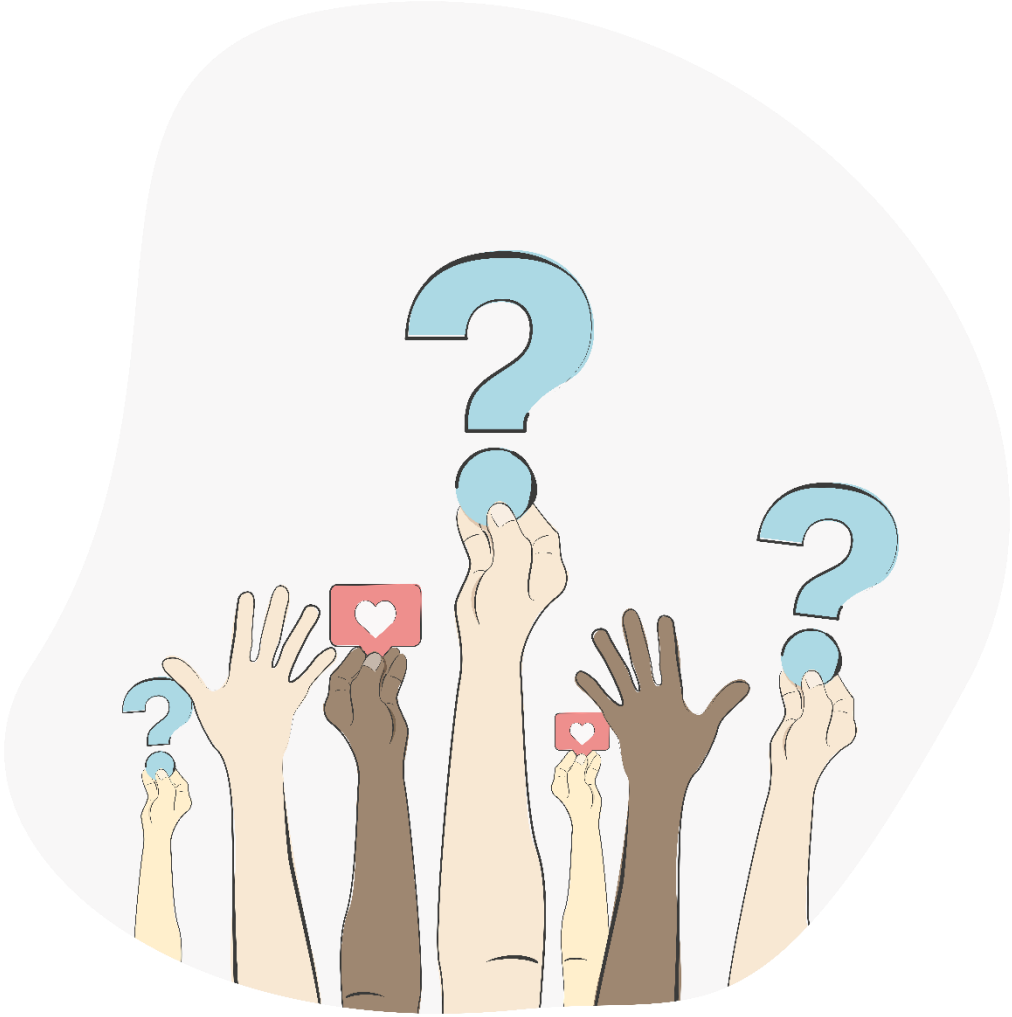
Files Provided in the Hub:

- The 10 sample records from the Canadian subsidiary are in the *CN User Data.csv* file.
- The audit file showing the logins for these 10 users in January 2025 is called *CN-User-LoginTS.csv*



Practical challenge

Any questions or feedback?



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Thank you