





Advanced Techniques

Session 2



Session Outline

Data Synchronization

Benefits of Data Synchronization

Methods of Data Synchronization

Challenges of Data Synchronization

Recap

What Next?

Gateway

Synoptic Project

Interview

Recap



Learning Objectives



- **Understand** the benefits and challenges of **Data Synchronization**
- **Understand** the **Gateway process**

Data Synchronization

What is Data Synchronization?

Data synchronization is the process of keeping two or more systems in sync so that any updates in one are automatically reflected in the other to ensure consistency.

Benefits of Data Synchronization

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Increased accessibility and availability of data

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Increased security and regulatory compliance

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Avoids data conflicts

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Increased security and regulatory compliance

Avoids data conflicts

More efficient decision making from using up-to-date data

Methods of Data Synchronization

File Synchronization

Version Control

Distributed File System

Mirror Computing

Methods

File Synchronization

The process of ensuring that files in two or more locations are updated in real time via certain rules. It should occur automatically and prevent duplication of data.

Features

Features

Can be done locally or in the Cloud

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Can be done locally or in the Cloud

Updates your files in real time

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Two-way synchronization

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Two-way synchronization

Allows for collaboration between developers

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Can be done locally or in the Cloud

Updates your files in real time

Two-way synchronization

Allows for collaboration between developers

Detects conflicts

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box



Version Control

Synchronization occurs over multiple devices, allowing users to simultaneously edit their own version. Updates are reflected when the versions are pulled together.

Features

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Can be version or revision control

Features

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Allows movement between different revisions

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All changes are tracked

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Can be version or revision control

Allows movement between different revisions

All changes are tracked

Allows for different team members to develop different aspects of the project

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File synchronization allows for simultaneous working on a project

i.e. any updates are reflected instantly for all users

Version control allows developers to work independently on a project and then update each other's versions when ready

Most version control tools integrate some form of file synchronization

Distributed File System

Allows users in different locations to access the same files and systems through a common file system, for example over a local area network (LAN).

Mirror Computing

A mirror is an exact copy of a dataset. It is used to provide different sources with an exact copy of a dataset. More useful for backing up data.



Activity

Discuss in breakout rooms:

- Any data synchrnoization systems you use in your role and organisation
- Whether you think it is important for your organisation to implement a data synchronization system

Challenges of Data Synchronization

Challenges



Challenges

Security

Challenges

Security

Management

Challenges

Security

Management

Data Quality

Challenges

Security

Management

Data Quality

Data Format

Challenges

Security

Management

Data Quality

Data Format

Performance

Challenges

Security

Management

Data Quality

Data Format

Performance

Data Ownership

Security

The Issue

Data breaches and data leaks

Ensuring data sharing conforms to regulatory standards

Could lead to a loss of reputation and/or revenue

Security

The Solution

Put in place data policies and access requirements

All synchronization must follow security needs

Implement data encryption

Management

The Issue

Inconsistencies in synchronization system updates

Difficult to catch errors during synchronization activities

Management The Solution

Data Management systems put in place for managing and integrating data in real time

Data Quality

The Issue

Data integrity is easily compromised due to access from multiple devices

Data Quality

The Solution

Implement constant data validation strategies into
synchronization tools across all sources

Data Format

The Issue

Different data formats lead to complexity issues

Data Format

The Solution

Ensure data format compliance is consistent across organisation
by having policies and templates

Performance

The Issue

Lag time during peak useage of if one of the synchronization steps fails

Performance The Solution

Ensure proper capacity planning is put in place and
synchronization activities made a priority

Data Ownership

The Issue

Difficult to track changes if anyone in an organisation has access to the file/datasets

Data Ownership

The Solution

Restrict access to only those who need it and have a referral process so others can suggest changes

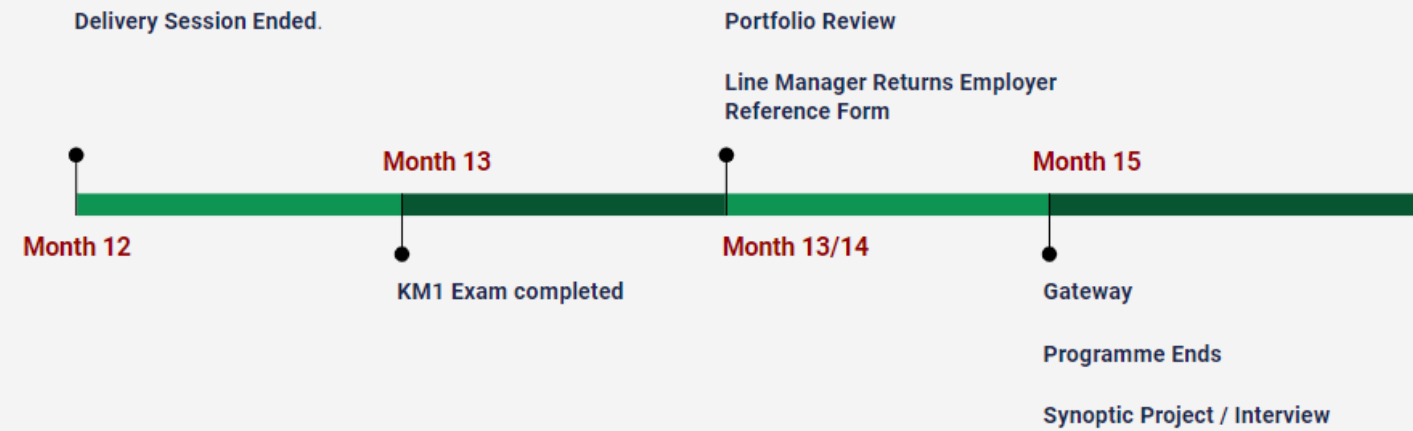
Recap

Learning Objectives



- **Understand** the benefits and challenges of **Data Synchronization**
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What Next?





BCS Data Analytics Tools Exam (KM1)

- Revision pack will be shared with you shortly
- The exam assesses content delivered in the second half of the course as well as some SQL, R and python concepts
- Revision session will be organised by coach prior to the exam
- Member of MultiVerse exam team will be on contact to book your exam

multiverse

Gateway



The Format



The Format

Gateway will be undertaken remotely via Zoom, you must ensure that your evidence is loaded onto applied prior to the meeting.



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Gateway will be undertaken remotely via Zoom, you must ensure that your evidence is loaded onto applied prior to the meeting.

The meeting will be attended by yourself, your line manager (or other representative from your company).

What is needed before Gateway?

- 100% OTJ
- Portfolio & tracker completed
- Employer reference completed
- Both exam certificates uploaded



What happens during Gateway?

Gateway is simply a meeting. We will go through and confirm all evidence has been uploaded before discussing next steps and then:

- Submitting your Gateway Checklist (we send you the link)
 - Signing your Gateway Declaration form (emailed the week of Gateway)
- And then the LEARNING portion of your apprenticeship is over!



What happens after Gateway?

Now the ASSESSMENT part of your apprenticeship begins! You will undertake the remaining parts of the End Point Assessment:

- Synoptic Project
- Competency Interview

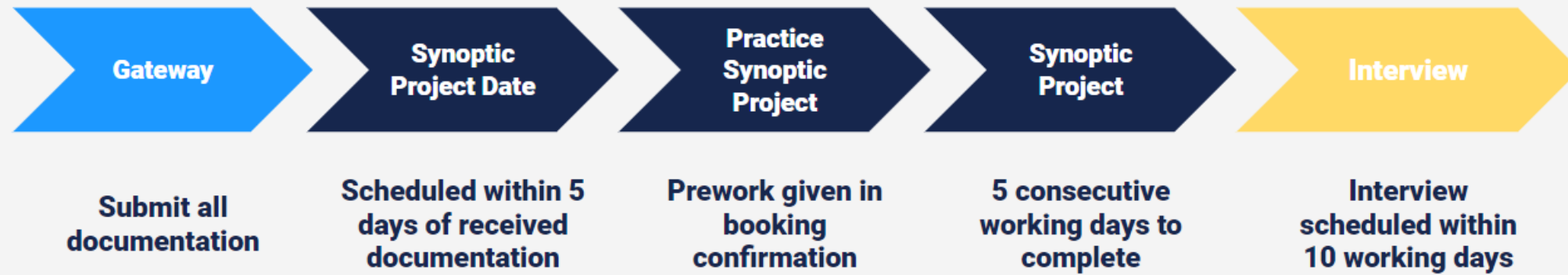
Once these are completed the assessor will assign you a grade.



What happens if I don't pass?

In the (very) unlikely event that you do not pass the EPA first time, the assessor will give detailed feedback on the areas of the standards that did not have sufficient evidence. We will work together to address the shortfalls before resubmitting.

Synoptic Project



What is it?

The Synoptic Project is a chance for the assessor to see your end-to-end analytical skills. You will be simulating 6 elements of a standard piece of analysis:

What is it?

Data Discovery

Data Preparation

Model Planning (and investigation)

Building

Testing

Communication

What is the format?



Data Discovery

A short review and document of key fields to be used for analysis



Data Discovery

- Summarise the question asked
- State the metrics you are using and which column names (in the data) they correspond to
- Explain why you have chosen these fields
- State your assumptions



Data Preparation

A short summary of the processes used to extract, transform and load the data



Data Preparation

- This is your exploratory data analysis section
- What trends did you see?
- Document any issues with data quality
- What did you do to resolve these? Why did you choose those methods?
- What methods were best for your purpose? How did you decide?



Model Planning

Document the final selected models, charts and reports



Model Planning

- What model did you intend to use for your investigation? What features did you plan to select?
- Why did you come to this decision?
- What visualisations did you intend to use to demonstrate this?
- Why did you choose them?



Building

Build the reports/models to answer the questions



Building

- Do the analysis
- Train and test the model
- Pick the best version of your model
- Visualise the results
- Have you answered all of the questions with these?
- Can you show off any relevant additional skills?



Testing

Document how you have tested and validated the results



Testing

- Are your results significant? What statistical tests have you performed to show this?
- Have the assumptions you made about the data invalidate your conclusions?
- How do you know your results are valid?



Communication

Compile a short report answering the questions asked in the Project Objectives section



Communication

- Answer the questions
- Include screenshots of your visualisations where appropriate
- Add in any additional analysis you would like considered
- Check you answered the questions (again...thoroughly)

Practice Synoptic Project

On [Appli.ed](#) there is a practice synoptic project

This will be similar to your actual project during your EPA

We recommend you attempt the practice project before the real thing



Activity

Download and open the DA Practice Project from [Appli.ed](#)

- What is the **GOAL** of the task?
- What are your required **OUTPUTS**?
- What **data preparation** steps do you think will be necessary?
- What **analytics** would you ideally like to do?
- Are there any **assumptions** you need to make?
- What **tools** would you consider using any why?
- What **standards** are you likely to demonstrate?



Plan your project to either:

Show off your strengths (what is your USP?)

Target a standard that has weak portfolio evidence



A final piece of advice...



A final piece of advice...

READ THE INSTRUCTIONS

Interview

What is it?

An opportunity for the Assessor to ask you for further details,
which has three main uses:

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Demonstrate a 'weaker' standard

The Structure

Welcome and introductions

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Photo Id check

The Structure

Welcome and introductions

Photo Id check

Overview of purpose and structure

The Structure

Welcome and introductions

Photo Id check

Overview of purpose and structure

You will then be asked to explain your job role, type of tasks in a typical week and the type of environment

The Structure



Structured Discussion

Explore what you have done and how you've done it

- Portfolio, synoptic project and employer reference form
- Specific comments documented

Explore and identify the range and depth of knowledge, skills and behaviours

Confirm and validate the quality of your work

Opportunity to provide further evidence (what else have you been working on?)

How should you answer?

Use the STAR format, but sometimes it may not be necessary to use all four sections.

Use the assessor's question to determine the type of answer expected

- Why was it important to perform this analysis?
- How did you ensure your analysis was correct?
- How did you ensure your insights were valid?
- What was the impact of...?

Read this [guide](#) for extra advice



Activity

In pairs choose some questions from this [guide](#) and try and answer them

Feedback to each other on your responses

Recap

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- **Understand** the benefits and challenges of **Data Synchronization**
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Complete Session Attendance Log and Update Your OTJ

