WM9B1-15 Big Data Technology & Visualisation

21/22

Department
WMG
Level
Taught Postgraduate Level
Module leader
Michael Mortenson
Credit value
15
Module duration
2 weeks
Assessment
Multiple
Study locations
University of Warwick main campus, Coventry Primary
Distance or Online Delivery

Description

Introductory description

The management of an organisation's data lifecycle is an essential activity in modern business. In recent years, the advent of cloud computing and the emergence of big data, has fundamentally challenged and changed these processes. This module will explore these changes, the challenges and opportunities they bring, and give students practical exposure to the use of these tools.

Module aims

The full data management lifecycle will be covered in this module, from data acquisition, data storage, data cleaning and engineering, data analysis tools through to data visualisation. These techniques will be implemented using the latest, cutting-edge tools made available in modern, cloud environments. This includes a combination of relational and NoSQL data stores, populated by data extracted from source APIs and open data sources. These data stores will be connected to dashboards and visualisations that can communicate the value and insights of the data via web-based applications. Participants will engage in a final, capstone project which applies these methods to a real-world setting.

Outline syllabus

This is an indicative module outline only to give an indication of the sort of topics that may be covered. Actual sessions held may differ.

1. Cloud computing

- Introduction to AWS
- AWS Glue
- Step functions and AWS Lambda

1. Data collection/extraction

- Working with APIs
- Web crawlers
- Open data

1. Data storage

- RDBMs and NoSQL databases
- Building a data store
- Querying and processing data from a database

1. Data processing

- Hadoop and MapReduce
- Apache Spark
- Lambda architecture

1. Data analysis

- Analysis software
- Operationalisation

1. Data visualisation

- Visualisation software
- Interactive data visualisation
- Dashboards

1. A practical simulation of the above topics

Learning outcomes

By the end of the module, students should be able to:

- Demonstrate an comprehensive understanding of the key differences between Big Data technologies and analysis methods and traditional approaches.
- Evaluate real-world scenarios and determine appropriate database solutions (traditional and NoSQL)

- Demonstrate a comprehensive understanding of cloud data architectures, the operational risks associated with them, and develop appropriate mitigation strategies
- Demonstrate an comprehensive understanding of the core concepts of visual communication and data visualisation.
- Practically implement data pipelines and processing in a cloud setting

Indicative reading list

View reading list on Talis Aspire

Interdisciplinary

A mixture of technology/computing topics and business topics

International

Topics are of high international demand

Subject specific skills

Big data, databases, NoSQL databases, APIs and IoT, cloud computing, IT architecture

Transferable skills

Presentation skills, programming, data analysis, IT architecture, critical thinking

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Study

Study time

Type	Required
Lectures	14 sessions of 1 hour 30 minutes (14%)
Seminars	6 sessions of 1 hour 30 minutes (6%)
Supervised practical classes	10 sessions of 1 hour 30 minutes (10%)
Assessment	105 hours (70%)
Total	150 hours

Private study description

No private study requirements defined for this module.

Costs

No further costs have been identified for this module.

Assessment

You do not need to pass all assessment components to pass the module.

Assessment group A

	Weighting	Study time
Big Data Architecture Presentation	20%	15 hours
Design a big data architecture and dashboard based on a client brief		
Post Module Assingment	80%	90 hours
A business-style report discussing core topics in big data technology		

Assessment group R

	Weighting	Study time
Post Module Assingment	100%	
A business-style report discussing core topics in big data technology		

Feedback on assessment

Verbal feedback for in-module element. Written feedback and annotated scripts for post-module element

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Availability

Courses

This module is Optional for:

- Year 1 of TWMS-H1S4 Postgraduate Taught e-Business Management (Full-time)