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BUSA8090 Data and Visualisation for Business

S1 2023

Week 13 Lecture & Workshop

Week 13: Learning objectives

The main objectives of week 13 lecture & workshop are to:

- Prepare for the final exam
- Revise the key points covered in weekly lectures & workshops in order to help to understand the big picture and connect different topics
- Reflect on your own learning in this unit and take the next step in your professiona career

Final exam (40 marks)

- Held in-person on Sat 10 June at 10am (make sure you triple-check the location)
- Managed by the MQ examination office (not me)

Duration: 2h and 10mins (10mins for reading the questions and 2h work work)
It is a closed book written exam

- IMPORTANT: MQ Quality Assurance Processes for exam preparation, marking, validation of final marks and the release of final marks (6 July)

- Exam approach

Exam requirements and expectations:

- You are required to demonstrate your learning in this unit (important clarification: your learning in other units, your professional practice and common-sense knowledgeable answers do not demonstrate your acquired learning in this unit)
- The exam questions will cover the content and activities covered in Weeks 1 – 12 (inclusive) and Assignments 1 & 2 (which were designed to cover the respective weeks)
- You will not be asked to use software tools (MySQL workbench and Tableau)

Exam Structure

- **Part 1:** 10 Multiple Choice Questions, each with one correct answer (10 marks – 1 mark each)

  These questions will cover Week 1 – Week 12

- **Part 2:**

Short Business scenario

The following 2 questions are both related to the given business scenario

Question 2.1.– Design and implementation of OLTP for the given business scenario

Will include applied questions which require you to apply learning from this unit

- A question related to BA foundations – covered in Weeks 1-3
- Design of an ERD
- SQL – you will be asked to write 3 SQL queries for the given questions
- Application of PAPA framework

Exam Structure (cont.)

Question 2.2. – Design and implementation of OLAP for the given business scenario

Will include applied questions which require you to apply learning from this unit

- Design of a MD for a particular business purpose
- Example of OLAP operations
- Application of appropriate Do No Harm (a.k.a Do Not Harm) principles and practices

- IMPORTANT: As you can see Questions 2.1 and 2.2. give you an opportunity to demonstrate your learning of the content covered in W1 – 12 as well as apply your learning acquired in Assignment 1 & 2.

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BUSA8090 Revision

LET'S 'CONNECT THE DOTS'

This is how we started in Week 1

Essential questions about business analytics (a sample)

What is the contemporary landscape of data science / data analytics/ business analytics (including data visualisation) today?

How is business analytics understood and used in practice?

Who is using business analytics and for what purpose?

How is business analytics integrated in other organisational practices such as business process management, innovation, design and implementation of strategy and ongoing strategiz**ing,** performance management, knowledge management, digital transformation, competitive differentiation and enabling organisational resilience?

How to determine the business value of business analytics?

How to use business analytics to support ethical & responsible decision making and value creation?

What are the unintended consequences of business analytics for individuals, organisations and/or society at large?

Your questions?

Week 1: Learning Objectives

At the end of this class you will:

- Understand the foundation concepts and terms used in business analytics practice
- Distinguish the concept of data from information, intelligence and knowledge
- Define 'big data' and learn to recognize it correctly in different business situations
- Distinguish three different perspectives used in today's business analytics: business (which is the main perspective used in this unit), data science and IT and their respective scope of practice
- Recognise the important difference between **visualization** used as **a noun** or as a **verb** (more than semantic!)
- Start to appreciate the role of data management and visualization tools in business from **the business perspective**
- Get an overview of the data management and visualization tools used in this unit and appreciate the rationale for selecting them (out of many!)

Week 2: Learning objectives:

At the end of this class you will:

- Understand BA as an Information System – why the socio-technical view of BA matters in practice
- Distinguish among different decision-making environments and understand the role of BA in each of them
- Acquire the foundations of data quality (DQ):
  - Understand its importance
  - Link it to today's business priorities
  - Distinguish among 3 different types of DQ – syntactic, semantic and pragmatic (DQ framework)
  - Appreciate the importance of data governance & data management
- Start to explore different aspects of data integration (in preparation for data modelling and analysis covered later in this unit)

Week 3 Learning objectives:

At the end of this class you will:

- Understand the concept of business value of BA and DV and learn how to use Business Processes (BPs) to determine it
- Understand the importance of BA maturity at different levels and the associated analytical capabilities at each level
- Appreciate the human factors and their importance with determining business value of BA and DV

Important business questions explored & answered in W1-3

Week 1:

- What is BA? - definitions and three different perspectives
- Who is using BA and for what purpose? – different types of users
- What kinds of decisions are supported by BA? – different types of decisions from structured to unstructured
- What kinds of data are used in BA and for what purpose – from numerical to visual (DV)
- Why do we need and use DV?

Week 2:

- What kind of system is BA? – different components of an IS (socio-technical) system
- What kind of decision environment is BA used in? – 4 decision environments
- What kind of DQ issues will impact BA applications – 3 types of DQ (DQ Framework)
- How are BA applications governed in organization? – Data Governance
- What is the current state of DQ across different industry sectors? (Reality check)

Week 3

- What is business value of BA and DV? What are other value propositions (e.g. societal value)? How to answer this important question in different organizational settings?
- What is BA maturity and how to determine different levels? What kinds of analytical capabilities are needed at each level?
- The reality of BA maturity: What is the current state of BA use across different industry sectors? Where are current challenges and opportunities?
- How do human characteristics of decision-makers impact their use of data and BA?

Week 4: Learning objectives

At the end of this class, you will:

- Understand the main purpose of database modelling
- Describe three different levels of database modelling (conceptual, relational and physical)
- Acquire the foundations of conceptual data base modelling using ERDs (Entity-Relationship-Diagrams)
- Apply the acquired foundations to design ERDs for simple business scenarios

  (more complex scenarios will be explored in Week 5)

- In Week 4 we also had the first formative quiz (10 MCQs) – answers were discussed in Week 4 lecture and recorded

Week 5: Learning objectives

At the end of this class, you will:

- Apply the acquired foundations to design more complex ERDs for different given business scenarios
- Master the step-by-step process of ERD design
- Learn to recognise and elicit the business needs and translate them into a conceptual ERD model for real-life case scenarios
- Learn about popular FREE software tools that you can use to draw ERDs and have a hands-on experience with using ERDPlus (in workshop 5)

Important: All solutions are provided in the updated version of lecture notes (after the lecture and workshop)

Week 6: Learning objectives

At the end of this class, you will:

- Learn to translate/transform an ERD into a database design
- Understand the history and significance of Structured Query Language (SQL)
- Learn the foundations of SQL including Data Definition language (DDL) and Data Manipulation Language (DML) statements
- Learn to create SQL queries to retrieve and interrogate data from a single table
- (Note in Week 7 we will work with multiple tables)
- Start using MySQL workbench (on Windows, Mac OS or Linux/Unix)

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Week 7: Learning objectives

At the end of this class, you will:

- Learn to create SQL queries to retrieve and interrogate data from multiple tables
- Understand how and why we use views
- Gain more advanced SQL skills
- Understand and reflect on the main purpose & limitations of operational/transactional systems (also known as OLTP) you have been working with so far (by using EDRs and SQL) in preparation for Weeks 8-11 when your will start working with other category of analytical systems (known as OLAPs) for which we use Tableau and other DV tools

- IMPORTANT: In the Final exam you will be asked to write SQL queries for more than one table

Week 8: Learning objectives

At the end of this class, you will:

- Understand how and why we use views (from week 7)
- Gain more advanced SQL skills – Relational Database Operators
- Understand and reflect on the main purpose & limitations of operational/transactional systems/environments (also known as **OLTP**) you have been working with so far (by using EDRs and SQL) in preparation for your learning about, and working with, analytical systems/environments (known as OLAPs) for which we use Tableau and other DV tools

- In week 8 we had the second formative MCQ Quiz. All answers were discussed in class and recorded in Week 8 Lecture.

- IMPORTANT: Make sure you revise ALL SQL queries covered in Weeks 6-8
- The final exam will NOT include SQL commands beyond those covered in Weeks 6-8. Therefore you do not need to study 300+ page SQL manual to prepare for the exam.

Week 9: Learning objectives

At the end of this lecture, you will be able to:

- Compare and contrast OLTP and OLAP environments
- Understand the basics of OLAP – what it is, how it is used and for what purpose
- Design a simple multidimensional (MD) model
- Start using Tableau
- Understand the elements of MDs used in Tableau's OLAP environment

Week 10: Learning Objectives

At the end of this class you will:

- Distinguish three different perspectives of Data Visualisation (DV) - business (which is the main perspective used in this unit), data science and IT and their respective scope of practice
- Build the foundations of visual ethics
- Use several frameworks to guide your DV thinking and practice
- Advance your understanding of the important difference between **visualisation** used as **a noun** or as a **verb** (more than semantic!)

Week 11 Learning Objectives:

At the end of this session you will:

- Gain a good understanding of different patterns of effective visual design
- Analyse the key elements of effective visual design
- Learn about effective design of visual dashboards
- Apply the principles of ‘Do No Harm’ to design of DVs and Visual dashboards

Week 12: Learning objectives

At the end of this lecture, you will be able to:

- Recognise some common data-related practices known to create potential ethical issues
- Distinguish different dimensions of data ethics
- Apply a well-known framework for ethical reasoning in Business Analytics
- Understand the importance of professional code of practice and emerging regulatory frameworks for ethical use of data in Business Analytics
- Reflect on your use of data and BA so far, including data modelling, management and visualisation and detect potential ethical issues

Let's apply BUSA8090 Learning to a familiar case

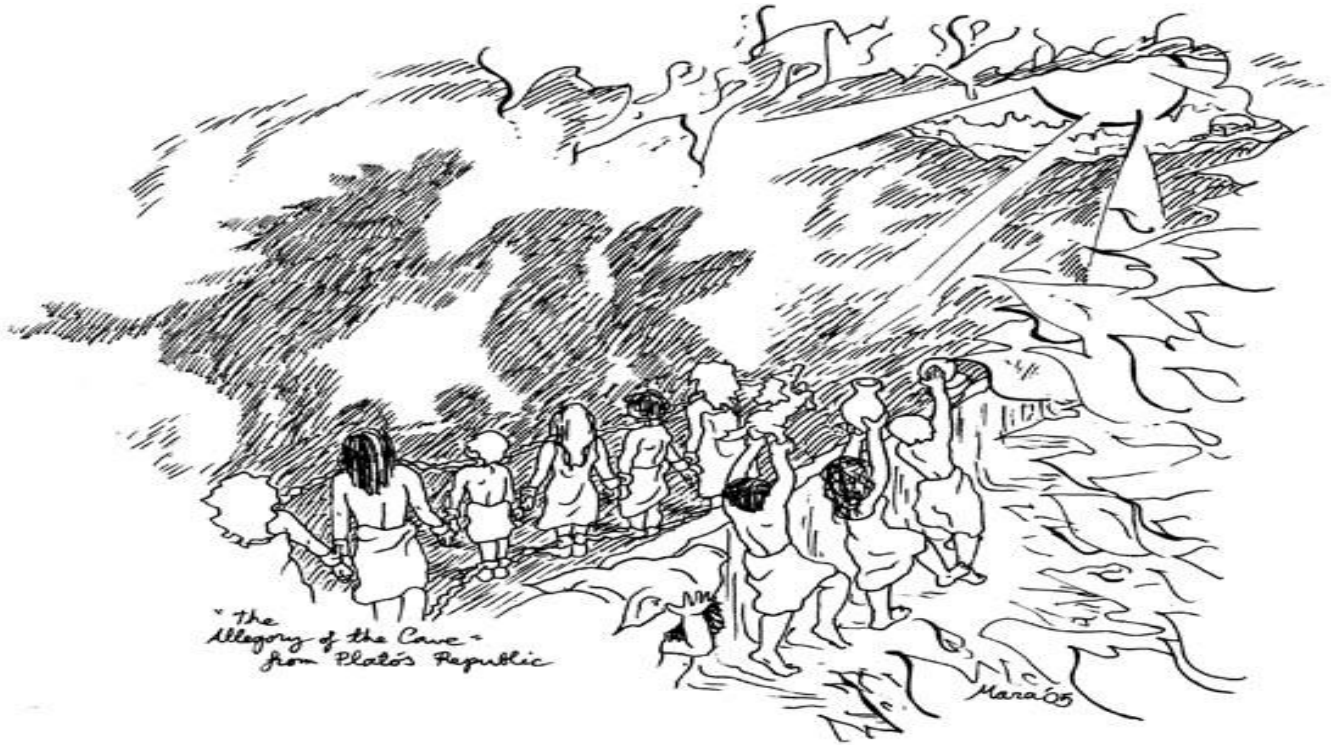
(A VERY EFFECTIVE LEARNING METHOD)

- From Week 2: Red Cross Case – Powerful and breathtaking

- Week 1:
- Week 2:
- Week 3:
- Weeks 4 & 6: Design an ERD to represent 'One Red Cross'
- Week 6,7,8: Write DML SQL queries
- Week 9: Design an MD for 'One Red Cross'
- Week 10: (Tableau is not included) but you can still apply your understanding of different perspectives of DV
- Week 11: Do No Harm (also known as Do Not Harm); Tableau is not included but you can still apply a method for designing a dashboard
- Week 12: PAPA framework

When working with data

Always keep this in mind….



Let's work towards data humanism…