



MGMT220

Fundamentals of Business Analytics

S2 Day 2018

Archive (Pre-2019) - Dept of Marketing and Management

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General Information

Unit convenor and teaching staff

Unit convenor

Hume Winzar

hume.winzar@mq.edu.au

Contact via 02 9850 6468

4ER, room 633 (previously called E4A 633)

Friday 9:00am to 10:00am, or by appointment

Tutor

Dr. Viken Kortian

viken.kortian@mgsm.edu.au

see iLearn

see iLearn

Credit points

3

Prerequisites

(15cp at 100 level or above) including ISYS114

Corequisites

Co-badged status

Unit description

Growing quantities of data collected by business, government, the internet and social media provide opportunities for better management and a better society through evidence-based decision-making and the provision of new services. This unit introduces students to quantitative techniques and approaches to achieve these goals. Students will gain hands-on experience with software tools to analyse and present quantitative data. Students will be introduced to the discovery and analysis of social networks, social trends, and relationships amongst industry factors using spreadsheets and data visualisation software. The unit thus is an introduction to the technical and philosophical skills required, and the many applications of business analytics.

Important Academic Dates

Information about important academic dates including deadlines for withdrawing from units are available at <https://www.mq.edu.au/study/calendar-of-dates>

Learning Outcomes

On successful completion of this unit, you will be able to:

Understand different methods of data analysis and presentation for social networks, complex systems and relational links.

Apply intermediate skills in spreadsheets and data visualisation software to demonstrate trends and relationships among factors in industry and society.

Analyse government, industry and social media data to identify relationships and trends.

Evaluate conclusions drawn from different data and analytic tools.

Create interactive models using appropriate software to aid decision-makers in understanding interrelationships and trends.

General Assessment Information

All assignments are to be submitted online using the link on the unit website in iLearn.

Late submissions will be penalised 10% per day, or part thereof, including weekends.

(That is, penalty of 1 mark per day on a 10% assignment; 3 marks per day on a 30% assignment. For example, a 10% assignment due on Friday night, submitted on Monday morning, will be penalised 3 marks.)

If you have a problem and need an extension then contact the unit convenor **before** the due date (i.e. not on the due date). Lack of organisation, other assignment deadlines, or outside work commitments (excepting military service or elite sports) are not acceptable reasons for an extension.

Assessment Tasks

Name	Weighting	Hurdle	Due
<u>Spreadsheet functions</u>	10%	No	Week 4
<u>Data visualisation</u>	30%	No	Week 8
<u>Model Sensitivity Analysis</u>	30%	No	Week 11
<u>Interactive model</u>	30%	No	Week 13

Spreadsheet functions

Due: **Week 4**

Weighting: **10%**

Students will be asked to demonstrate skills in data sorting and integration, lookup and transformation procedures

On successful completion you will be able to:

- Understand different methods of data analysis and presentation for social networks, complex systems and relational links.
- Apply intermediate skills in spreadsheets and data visualisation software to demonstrate trends and relationships among factors in industry and society.

Data visualisation

Due: **Week 8**

Weighting: **30%**

Students will use visualisation software to extract spreadsheet data to demonstrate trends and interrelationships in different ways appropriate to the task. Evaluate the better presentation mode.

On successful completion you will be able to:

- Apply intermediate skills in spreadsheets and data visualisation software to demonstrate trends and relationships among factors in industry and society.
- Evaluate conclusions drawn from different data and analytic tools.

Model Sensitivity Analysis

Due: **Week 11**

Weighting: **30%**

Students will create a model of complex interactions in Excel and test the sensitivity of outcomes to various inputs using DataTables or Optimisation methods.

On successful completion you will be able to:

- Understand different methods of data analysis and presentation for social networks, complex systems and relational links.
- Analyse government, industry and social media data to identify relationships and trends.
- Evaluate conclusions drawn from different data and analytic tools.

Interactive model

Due: **Week 13**

Weighting: **30%**

Groups will create an interactive model using appropriate software tools to allow a user to better understand relationships within a chosen problem domain.

- 50% of this assessment is based on the group report
- 50% of this assessment is based on individual presentation to the class.

On successful completion you will be able to:

- Apply intermediate skills in spreadsheets and data visualisation software to demonstrate trends and relationships among factors in industry and society.
- Analyse government, industry and social media data to identify relationships and trends.
- Create interactive models using appropriate software to aid decision-makers in understanding interrelationships and trends.

Delivery and Resources

Textbook

Camm, Cochran, Fry, Ohlmann, Anderson & Sweeney, (2019) **Business Analytics, 3^{ed}**, Cengage ISBN 978133740642.

Technology used and required

Students should have access to standard spreadsheet software. We will be using MS-Excel[®] and make reference to similar software by other brands.

We will make extensive use of Data-Visualisation software, **Tableau[®]**. We have a teaching license for the semester, and students will be given a key to download the full program for use in study at home.

Important note

Our iLab system is not compatible with our **Tableau[®]** Teaching License, so we cannot install **Tableau[®]** in the labs. Students are strongly encouraged to bring laptop computers (either Windows or Apple OS) to the tutorial-workshops for these sessions.

Recommended readings

Suggested online readings, and resources are presented in each week's exercises.

Without a formal textbook students will need to routinely read the sources shared in the unit website, and contribute others that they find.

Unit Web Page

Course material is available on the learning management system (**iLearn**). The general online website is <http://ilearn.mq.edu.au>

Unit Schedule

The unit schedule appears on the following pages. We are still learning about the expectations of industry, and the capabilities and interests of our students, so we may make small changes to the timing and attention to different topics as the unit progresses.

Research and Practice

This unit draws from current research undertaken by the instructor and other members of

the *Faculty of Business and Economics*. Examples of research results, instrumentation, and raw data are used in lectures and workshops to expand on and update the information presented in the unit readings.

Timetable

Timetables for this and other units, and for end-of-session examinations can be found at the [Timetables portal: http://timetables.mq.edu.au](http://timetables.mq.edu.au)

Unit Schedule

MGMT220 Fundamentals of Business Analytics

Week #	Topic	Deadlines
Week #1	Introductions Basic Spreadsheet Functions Software demonstration & practice	
Week #2	Spreadsheet functions, MS-Excel graphs	
Week #3	Advanced Spreadsheet functions "Tidy Data", Pivot Tables & Pivot Charts Presenting Analytics to Management	
Week #4	Data cleaning - preprocessing and transformation, dealing with noisy and missing data.	Spreadsheet Functions Assignment (10%)
Week #5	Data editing for visualisation, in Tableau®	
Week #6	Dashboard in Tableau®	Guest Speaker
Week #7	Storyboards in Tableau®	Guest Speaker
Week #8	Model-building in Excel	Data visualisation (Tableau) 30%
Week #9		
Week #10	What-if, Sensitivity Analysis	
Week #11	Optimisation (Solver)	Sensitivity Analysis (Excel) 30%
Week #12	Interactive Excel functions: drop-down, spinner, choose, etc.	

Week #13	Looking to next semester: Classification & Clustering	Interactive model 30% <ul style="list-style-type: none">• 15% Group report• 15% Individual presentation
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Learning and Teaching Activities

Lecture and Demonstration: 2 Hours each week

Technical and Analytical skills are demonstrated and their applications to different organisational problems.

Workshop: 1 Hour

Personal hands-on exercises and experimentation with aid from fellow students and tutor.

Tableau®

In addition to standard spreadsheet and related software, we will make extensive use of the Data-Visualisation software program, Tableau®. We have a teaching license, and students are encouraged to download and make use of this program for home study.

Open-source and Online services

We will take advantage of several open-source (free) software packages for some exercises: R statistical environment, R-Studio and Gephi.

Policies and Procedures

Macquarie University policies and procedures are accessible from [Policy Central \(https://staff.mq.edu.au/work/strategy-planning-and-governance/university-policies-and-procedures/policy-central\)](https://staff.mq.edu.au/work/strategy-planning-and-governance/university-policies-and-procedures/policy-central). Students should be aware of the following policies in particular with regard to Learning and Teaching:

- [Academic Appeals Policy](#)
- [Academic Integrity Policy](#)
- [Academic Progression Policy](#)
- [Assessment Policy](#)
- [Fitness to Practice Procedure](#)
- [Grade Appeal Policy](#)
- [Complaint Management Procedure for Students and Members of the Public](#)
- [Special Consideration Policy](#) (**Note:** *The Special Consideration Policy is effective from 4 December 2017 and replaces the Disruption to Studies Policy.*)

Undergraduate students seeking more policy resources can visit the [Student Policy Gateway \(htt](#)

[ps://students.mq.edu.au/support/study/student-policy-gateway](https://students.mq.edu.au/support/study/student-policy-gateway)). It is your one-stop-shop for the key policies you need to know about throughout your undergraduate student journey.

If you would like to see all the policies relevant to Learning and Teaching visit [Policy Central](http://staff.mq.edu.au/work/strategy-planning-and-governance/university-policies-and-procedures/policy-central) (<http://staff.mq.edu.au/work/strategy-planning-and-governance/university-policies-and-procedures/policy-central>).

Student Code of Conduct

Macquarie University students have a responsibility to be familiar with the Student Code of Conduct: <https://students.mq.edu.au/study/getting-started/student-conduct>

Results

Results shown in *iLearn*, or released directly by your Unit Convenor, are not confirmed as they are subject to final approval by the University. Once approved, final results will be sent to your student email address and will be made available in [eStudent](#). For more information visit ask.mq.edu.au.

Student Support

Macquarie University provides a range of support services for students. For details, visit <http://students.mq.edu.au/support/>

Learning Skills

Learning Skills (mq.edu.au/learningskills) provides academic writing resources and study strategies to improve your marks and take control of your study.

- [Workshops](#)
- [StudyWise](#)
- [Academic Integrity Module for Students](#)
- [Ask a Learning Adviser](#)

Student Services and Support

Students with a disability are encouraged to contact the [Disability Service](#) who can provide appropriate help with any issues that arise during their studies.

Student Enquiries

For all student enquiries, visit Student Connect at ask.mq.edu.au

IT Help

For help with University computer systems and technology, visit http://www.mq.edu.au/about_us/offices_and_units/information_technology/help/.

When using the University's IT, you must adhere to the [Acceptable Use of IT Resources Policy](#). The policy applies to all who connect to the MQ network including students.

Graduate Capabilities

Capable of Professional and Personal Judgement and Initiative

We want our graduates to have emotional intelligence and sound interpersonal skills and to demonstrate discernment and common sense in their professional and personal judgement. They will exercise initiative as needed. They will be capable of risk assessment, and be able to handle ambiguity and complexity, enabling them to be adaptable in diverse and changing environments.

This graduate capability is supported by:

Learning outcomes

- Understand different methods of data analysis and presentation for social networks, complex systems and relational links.
- Evaluate conclusions drawn from different data and analytic tools.

Assessment tasks

- Spreadsheet functions
- Model Sensitivity Analysis

Learning and teaching activities

- In addition to standard spreadsheet and related software, we will make extensive use of the Data-Visualisation software program, Tableau®. We have a teaching license, and students are encouraged to download and make use of this program for home study.
- We will take advantage of several open-source (free) software packages for some exercises: R statistical environment, R-Studio and Gephi.

Discipline Specific Knowledge and Skills

Our graduates will take with them the intellectual development, depth and breadth of knowledge, scholarly understanding, and specific subject content in their chosen fields to make them competent and confident in their subject or profession. They will be able to demonstrate, where relevant, professional technical competence and meet professional standards. They will be able to articulate the structure of knowledge of their discipline, be able to adapt discipline-specific knowledge to novel situations, and be able to contribute from their discipline to inter-disciplinary solutions to problems.

This graduate capability is supported by:

Learning outcomes

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trends and relationships among factors in industry and society.

- Analyse government, industry and social media data to identify relationships and trends.
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Assessment tasks

- Spreadsheet functions
- Data visualisation
- Model Sensitivity Analysis

Learning and teaching activities

- Technical and Analytical skills are demonstrated and their applications to different organisational problems.
- Personal hands-on exercises and experimentation with aid from fellow students and tutor.
- We will take advantage of several open-source (free) software packages for some exercises: R statistical environment, R-Studio and Gephi.

Critical, Analytical and Integrative Thinking

We want our graduates to be capable of reasoning, questioning and analysing, and to integrate and synthesise learning and knowledge from a range of sources and environments; to be able to critique constraints, assumptions and limitations; to be able to think independently and systemically in relation to scholarly activity, in the workplace, and in the world. We want them to have a level of scientific and information technology literacy.

This graduate capability is supported by:

Learning outcomes

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- Apply intermediate skills in spreadsheets and data visualisation software to demonstrate trends and relationships among factors in industry and society.
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Assessment tasks

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- Interactive model

Learning and teaching activities

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- We will take advantage of several open-source (free) software packages for some exercises: R statistical environment, R-Studio and Gephi.

Problem Solving and Research Capability

Our graduates should be capable of researching; of analysing, and interpreting and assessing data and information in various forms; of drawing connections across fields of knowledge; and they should be able to relate their knowledge to complex situations at work or in the world, in order to diagnose and solve problems. We want them to have the confidence to take the initiative in doing so, within an awareness of their own limitations.

This graduate capability is supported by:

Learning outcomes

- Understand different methods of data analysis and presentation for social networks, complex systems and relational links.
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Changes from Previous Offering

This is the fourth time we have offered of this unit. With each iteration we have made some subtle changes to accommodate the skills that students can demonstrate in class and the size of the class. Some changes have been made to the time allocated to some unit content. More attention is paid to problems of data cleaning and creation of "tidy data". We have postponed some components of analytics related to Clustering (Market Segmentation), Predictive Analytics and Social Network analysis to the Advanced unit so that we can reinforce fundamental analytics concepts. Marking guides have been updated to make our expectations clearer.

Global Contexts and Sustainability

- This unit encourages students to understand and investigate the multidimensional nature of problems and events - that apparently simple relationships often are the outcome of complicated interactions over time and space.
- Students are expected to attain higher level of awareness of sustainability by investigating the characteristics, market size, profitability, potential, and variation of markets directed towards consumer wellbeing, environmental and social benefits.

Research and Practice

- This unit uses research by the Unit convenor and other researchers from the Faculty of Business and Economics.
- This unit uses research from external sources, such as other published scholars and current industry practice
- This unit gives you opportunities to conduct your own research and to refine your interest in Business Analytics different contexts.

Student Representatives

Two or more students will be asked to act as Student Representatives for this unit. They will be a liaison between students and the Unit Convenor and the Faculty. It's an important role and it means that we can learn of problems and fix them before it affects your learning and progress. Much of the material in this unit is new and abstract. It's not easy. The Student Representatives will help to let us know when to step back if we need to.