MGMT220

Fundamentals of Business Analytics

S2 Day 2017

Dept of Marketing and Management

Contents

General Information	2
Learning Outcomes	2
General Assessment Information	3
Assessment Tasks	3
Delivery and Resources	5
Unit Schedule	6
Learning and Teaching Activities	7
Policies and Procedures	7
Graduate Capabilities	8
Changes from Previous Offering	11
Global Contexts and Sustainability	11
Research and Practice	11

General Information

Unit convenor and teaching staff
Unit convenor
Hume Winzar
hume.winzar@mq.edu.au
Contact via 02 9850 6468
E4A 633
Wednesday 4:00pm to 5:00pm, or by appointment

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 be 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
Spreadsheet functions	10%	No	Week 4
Data visualisation	30%	No	Week 7
Complex systems	30%	No	Week 10
Interactive model	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 7**
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.

Complex systems

Due: **Week 10**
Weighting: **30%**

Students will create a model of complex interactions among industry or social factors.

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 systems relationships within a chosen problem domain.

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

No formal textbook has been set for this unit. None suits the range of topics introduced here.

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

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	
Week #4	Data visualisation using Tableau®	Spreadsheet Functions Assignment
Week #5	Data editing for visualisation, in Tableau® Data cleaning - pre-processing and transformation, dealing with noisy and missing data.	
Week #6	Dashboard in Tableau® Storyboards in Tableau®	
Week #7	Complex Systems: Agent-based models and Dynamic Systems models	Data Visualisation Assignment
Week #8	Dynamic Systems models: Stocks, Flows & Feedback Loops	
Week #9	Dynamic Systems: Connecting stocks and flows	
Week #10	Social Network Mapping	Complex Systems Assignment
Week #11	Classification & clustering: Market Segmentation Prediction: Customer churn	
Week #12	Interactive models for decision-making	
Week #13	Documentation and project packaging for clients and decision makers.	Group Project Report

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. We have a subscription for the online complex-systems modelling software, InsightMaker, and we will access related services. Students some exercises will involve complex-systems and Agent-based Modelling software, NetLogo.

Policies and Procedures

Macquarie University policies and procedures are accessible from Policy Central. Students should be aware of the following policies in particular with regard to Learning and Teaching:

Academic Honesty Policy http://mq.edu.au/policy/docs/academic_honesty/policy.html

Assessment Policy http://mq.edu.au/policy/docs/assessment/policy_2016.html

Grade Appeal Policy http://mq.edu.au/policy/docs/gradeappeal/policy.html

Complaint Management Procedure for Students and Members of the Public http://www.mq.edu.au/policy/docs/complaint_management/procedure.html

Disruption to Studies Policy (in effect until Dec 4th, 2017): http://www.mq.edu.au/policy/docs/disruption_studies/policy.html

Special Consideration Policy (in effect from Dec 4th, 2017): https://staff.mq.edu.au/work/strategy-planning-and-governance/university-policies-and-procedures/policies/special-consideration

In addition, a number of other policies can be found in the Learning and Teaching Category of 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/support/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
- Complex systems

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

- 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.

Assessment tasks

- Spreadsheet functions
- Data visualisation
- Complex systems

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

- 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.

Assessment tasks

- Spreadsheet functions
- Data visualisation
- Complex systems
- Interactive model

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

Assessment tasks

- Spreadsheet functions
- Data visualisation

- Complex systems
- Interactive model

Changes from Previous Offering

This is the third offering of this unit. 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 added important additional components of analytics around Market Segmentation and Social Network analysis. Marking guides have been updated to make our expectations more clear.

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 ans 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.