MGNT837

Big Data and Decision Analysis

Term 2 North Ryde 2019

Department of Actuarial Studies and Business Analytics

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General Information

Unit convenor and teaching staff
PhD - Lecturer
Viken Kortian
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Credit points
4

Prerequisites
32cp including MGNT604

Corequisites

Co-badged status

Unit description
This unit is a bridge between business and information technology and will equip students with the knowledge and skills required to help them utilise big data on projects. Specifically, the unit focuses on big data applications at both strategic and operational levels. More importantly, it focuses on transforming business processes and business models through big data and analytics, the impact of big data on companies' IT infrastructure, the use of resources (especially human resources) to conduct big data analyses, and identifying the necessary technological underpinnings of big data and analytics. The unit is especially tailored for Masters of Management students with a primary focus on managerial discussions surrounding big data employment and decision-making using big data and analytics insights. The technical aspects of the unit are on a comprehensible and applicable level for management students.

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:

Frame a research question based on an issue for a firm for which data is needed to make a decision

Identify and select appropriate research methods to answer the research question

Design and carry out a research project for a given business unit and make a

recommendation based on data they collect and analyse

Critically evaluate research proposals and results so that they are useful for business practice

Assessment Tasks

Name	Weighting	Hurdle	Due
Contribution to class	10%	No	All sessions
Group case study analysis 1	20%	No	23:59 (Syd), 23 April 2019
Group case study analysis 2	20%	No	23:59 (Syd), 4 June 2019
Final examination	50%	No	Exam week: 10 - 15 June 2019

Contribution to class

Due: **All sessions**
Weighting: **10%**

Contribution to class requires students to be actively engaged in class discussions of the cases and examples and lecturer's presented material. To this end, students should be prepared in advanced so that they will be part of the active learning in the classroom. Class discussions by the students should be **relevant to the topic** and **add value** to the overall lecture quality. Sharing experiences from students' working environment and extra-curricular activities relevant to class topics will have extra bonus points.

The marking criteria for this assessment will be made available in iLearn.

On successful completion you will be able to:

- Frame a research question based on an issue for a firm for which data is needed to make a decision

Group case study analysis 1

Due: **23:59 (Syd), 23 April 2019**
Weighting: **20%**

The assignment will involve using the methods and models discussed in lectures to solve decision-making problems that arise in the business context. Regarding the assessment criteria, students should demonstrate sufficient understanding of the theoretical principles in this unit, including data collection, model selection and design, application, and the ability to draw meaningful inferences based on the data and model output.

This group assessment will have 50% of the marks allocated to individual performance. The assignments may involve data analysis using computer tools, as well as draw on theoretical

material from lectures. Students need to self enroll in groups of no more than five in the first week. There might be minor changes to group assignments by the end of session 3.

Students are to submit their assignment through iLearn on or before the due date. Further instructions on how to do this will be provided to students via iLearn.

Your submission should include:

- Responses to the questions should be included in one word document (including all relevant tables and figures and their explanations) and one excel (if necessary) file containing the decision tree and additional requested calculations discussed in class using Palisade software package.
- The word document above should also include in its first page a clear, written indication of the contribution of each group member to the project, i.e., by student name, exact contribution of each member.Your report will be graded only if this page is provided.
- No appendices are accepted.

The marking criteria for this assessment will be made available in iLearn.

Extensions and penalties:

No extensions will be granted. There will be a deduction of 10% of the total available marks made from the total awarded mark for each 24 hour period or part thereof that the submission is late (for example, 25 hours late in submission – 20% penalty). This penalty does not apply for cases in which an application for disruption of studies is made and approved. No submission will be accepted after solutions have been posted.

On successful completion you will be able to:

- Frame a research question based on an issue for a firm for which data is needed to make a decision
- Design and carry out a research project for a given business unit and make a recommendation based on data they collect and analyse
- Critically evaluate research proposals and results so that they are useful for business practice

Group case study analysis 2

Due: **23:59 (Syd), 4 June 2019**
Weighting: **20%**

Students will be given a case study to analyse the decision making process. It will be required to model the decision making process and provide suggestion to the firm based on the performed analysis and findings.

This group assessment will have 50% of the marks allocated to individual performance. Students will be evaluated based on their ability to justify the models applied, solve the problem under

consideration, explain the findings and present their findings in a brief answer format. Group members for both assignments are the same.

Students are to submit their assignment through iLearn on or before the due date. Further instructions on how to do this will be provided to students via iLearn.

Your submission should include:

- Task responses containing discussion of the case, gap analysis, and recommendations in one word document (no more than 10 pages - including all relevant tables and figures and their explanations) and one excel file (if necessary) containing the decision tree and additional requested calculations discussed in class using Microsoft Azure software package.
- The word document above should also include in its first page a clear, written indication of the contribution of each group member to the project, i.e., by student name, exact contribution of each member.Your report will be graded only if this page is provided

The marking criteria for this assessment will be made available in iLearn.

Extensions and penalties:

No extensions will be granted. There will be a deduction of 10% of the total available marks made from the total awarded mark for each 24 hour period or part thereof that the submission is late (for example, 25 hours late in submission – 20% penalty). This penalty does not apply for cases in which an application for disruption of studies is made and approved. No submission will be accepted after solutions have been posted.

On successful completion you will be able to:

- Identify and select appropriate research methods to answer the research question
- Design and carry out a research project for a given business unit and make a recommendation based on data they collect and analyse
- Critically evaluate research proposals and results so that they are useful for business practice

Final examination

Due: **Exam week: 10 - 15 June 2019**
Weighting: **50%**

At the conclusion of the unit, there will be an open book examination of 3 hours plus 10 minutes reading time. The final examination will concern all the material (*class lectures, simulations and classroom discussions*) from the entire unit. More details on the exam will be provided in class.

You are expected to present yourself for examination at the time and place designated in the MGSM examination timetable. The timetable will be available on 17 April 2019 at https://students.mgsm.edu.au/sydney-students/units/exams/

On successful completion you will be able to:

- Critically evaluate research proposals and results so that they are useful for business practice

Delivery and Resources

Required text

Lake P., Drake R. (2014). Information Systems Management in the Big Data Era. Springer International Publishing, **ISBN (Hardcover)**: 9783319135021, **ISBN (Softcover)**: 9783319355078, **DOI**: 10.1007/978-3-319-13503-8

Please note: The Coop Bookshop has advised us that this textbook has a 2-3 week delivery turnaround time from the time the order is made. It is highly recommended that students place their order of this textbook in advance.

Laptop and Azure software package

Students should go to the Microsoft Azure website and access the free Microsoft Azure AI & ML studio.

https://azure.microsoft.com/en-au/services/machine-learning-studio/

You should bring your laptop to every lecture.

Where to purchase textbook?

The Coop Bookshop

The Coop Bookshop is our main retailer for textbooks and other related academic material. For information on textbook prices and online ordering, please refer to The Co-Op Bookshop webpage at http://www.coop.com.au

Springer Online Website – Online store

This textbook is also available for order via the publisher's online store. For information on textbook prices and online ordering, please refer to the Springer Online Website store at https://www.springer.com/gp/book/9783319135021.

eBook disclaimer

Please note that although this unit has an open book final examination, only hard-copy versions of this textbook will be allowed into the examination room. eBooks will not be allowed in the examination room, but you can however print your eBook out and bring the printed copy into the examination room. Students who wish purchase the eBook and have it printed must do so at their own expense. MGSM will not be providing printing services of eBooks.

Disclaimer: MGSM does not take responsibility for the stock levels of required textbooks from preferred retail outlets and other book retailers. While we advise our preferred book retail outlet, The Co-op Bookshop, of our maximum expected number of students purchasing specific required text each term, The Co-op Bookshop and other book retailers will make their own

judgement in regards to their physical holding stock levels. To prevent disappointment if a textbook is out-of-stock, we highly advise students to order their textbooks as early as possible, or if the required textbook is currently out-of-stock, place an order with the book retailer as soon as possible so that these book retailers can monitor demand and supply, and adjust their stock orders accordingly.

MGSM iLearn

The web page for this unit can be found at: https://ilearn.mq.edu.au/login/MGSM

Unit Schedule

Students are required to attend all classes. Please only attend the class you are enrolled in as reflected in your e-Student account. This unit will be presented over 10 sessions as follows (*The proposed program might be subject to some minor changes as the term progresses (TBA)).*

Class sessions are scheduled from: 6pm to 10pm of every Tuesday starting from 2 April 2019 (session 1) until 4 June 2019 (session 10).

Final exam week: 12 - 17 June 2019 (The exam timetable will be available on 17 April 2019 at https://students.mgsm.edu.au/sydney-students/units/exams/)

Session	Topics covered	Required readings
1	- Introduction to Big Data and Analytics (I) - Big Data Analytics Software and Platforms (I)	**Required textbook reading before class:** • Chapter 1 **Allocated supplementary readings:** • **HBR article:** Big Data: The Management Revolution (2012) • **Mini-case:** WALMART: How Big Data Is Used to Drive Supermarket Performance[1] [1] Marr, Bernard. Big Data in Practice: How 45 Successful Companies Used Big Data Analytics to Deliver Extraordinary Results (Kindle Location 659). Wiley. Kindle Edition.
2	- The 9S Framework: Big Data and Strategy - Introduction to Data Science Framework	**Required textbook reading before class:** • Chapter 1 **Allocated supplementary readings:** • **MIS Quarterly:** Business Intelligence and Analytics: From Big Data to Big Impact (2012) • **HBS:** An Introduction to NoSQL Database Design (2016) • **Mini-case:** How Netflix Used Big Data To Give Us The Programmes We Want[1]

Session	Topics covered	Required readings
3	- The 9S Framework: Big Data and Strategy - Introduction to Data Science Framework	**Required textbook reading before class:** • Chapter 2 **Allocated supplementary readings:** • **HBS article:** Big Data Dreams: A Framework for Corporate Strategy (2017) • **HBS case:** Neighbourhood Watch: The Rise of Zillow (2017) **Class discussion question:** • How has the rise of big data and analytics affected business models and strategic frameworks of industries and services in Australia?
4	- The 9S Framework: Big Data, Structure and Style - Introduction to Microsoft Azure Platform - Microsoft Azure Case: • Demand Estimation	**Required textbook reading before class:** • **Chapters 3-4** **Allocated supplementary readings:** • **HBR article:** How the Big Data Explosion has Changed Decision Making (2016) • **Mini-case: BBC:** How Big Data Is Used in The Media[1]
5	- The 9S Framework: Big Data, Staff and Synthesis - Microsoft Azure Case: • Predict Employee Retention	**Required textbook reading before class:** • Chapters 5 and 7 **Allocated supplementary readings:** • **HBR article:** Data Scientist: The Sexiest Job of the 21st Century (2012) • **MIT Sloan article:** Should You Outsource Analytics? (2014) **Class discussion questions:** • What are various 'data scientist' jobs offered in Australia? • What specific skills are required for this job? • Is being a data scientist relevant to management? How? • How do you see the future of this profession?
6	- The 9S Framework: Big Data and Statistical Thinking - Microsoft Azure Case: • Building a decision tree classifier model • Breast Cancer Detection	**Required textbook reading before class:** • Chapter 6 **Allocated supplementary readings:** • **Book Chapter and Mini-case:** Statistical Challenges with Big Data in Management Science[1] • **Book Chapter and Mini-case:** Managing Large-Scale Standardized Electronic Health Records[2] [1] Laha A. (2016) Statistical Challenges with Big Data in Management Science. In: Pyne S., Rao B., Rao S. (eds) Big Data Analytics. Springer, New Delhi [2] Batra S., Sachdeva S. (2016) Managing Large-Scale Standardized Electronic Health Records. In: Pyne S., Rao B., Rao S. (eds) Big Data Analytics. Springer, New Delhi

Session	Topics covered	Required readings
7	- The 9S Framework: Big Data, Systems and Sources - Microsoft Azure Case: • Walmart Store Sales Forecasting • Evaluating and Parameter Tuning a Decision Tree Model	**Required textbook reading before class:** • Chapters 8-9 **Allocated supplementary readings:** • **HBS case:** Alibaba Group: Technology, Strategy and Sustainability (2016)
8	- The 9S Framework: Big Data, Systems and IS (Information Security) - Technical Insights - Group Presentations	**Required textbook reading before class:** • Chapters 10-11 **Allocated supplementary readings:** • **HBS case:** Netguardians: Beating Fraud from The Inside (2016)
9	- Big Data Applications with Disruptive Technologies - Group Presentations	**Required textbook reading before class:** • Chapter 12 **Allocated supplementary readings:** • **HBS case:** Shotspotter: Public Safety, IoT, and Big Data (2017)
10	- Big Data Applications with Disruptive Technologies - Exam Preparation - Group Presentations	**Required textbook reading before class:** • Chapter 12 **Allocated supplementary readings:** • **MIT Sloan article:** Building A More Intelligent Enterprise (2017) • **McKinsey Global Institute Report:** The Age of Analytics: Competing in a Data-Driven World (2016)

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). 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 (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 (https://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 published on platform other than eStudent, (eg. iLearn, Coursera etc.) 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 or if you are a Global MBA student contact globalmba.support@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

If you are a Global MBA student contact globalmba.support@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

PG - Capable of Professional and Personal Judgment and Initiative

Our postgraduates will demonstrate a high standard of discernment and common sense in their professional and personal judgment. They will have the ability to make informed choices and decisions that reflect both the nature of their professional work and their personal perspectives.

This graduate capability is supported by:

Learning outcomes

- Design and carry out a research project for a given business unit and make a recommendation based on data they collect and analyse
- Critically evaluate research proposals and results so that they are useful for business practice

Assessment tasks

- Group case study analysis 1
- Group case study analysis 2
- Final examination

PG - Discipline Knowledge and Skills

Our postgraduates will be able to demonstrate a significantly enhanced depth and breadth of knowledge, scholarly understanding, and specific subject content knowledge in their chosen fields.

This graduate capability is supported by:

Learning outcomes

- Identify and select appropriate research methods to answer the research question
- Design and carry out a research project for a given business unit and make a recommendation based on data they collect and analyse
- Critically evaluate research proposals and results so that they are useful for business practice

Assessment tasks

- Group case study analysis 1
- Group case study analysis 2
- Final examination

PG - Critical, Analytical and Integrative Thinking

Our postgraduates will be capable of utilising and reflecting on prior knowledge and experience, of applying higher level critical thinking skills, and of integrating and synthesising learning and knowledge from a range of sources and environments. A characteristic of this form of thinking is the generation of new, professionally oriented knowledge through personal or group-based critique of practice and theory.

This graduate capability is supported by:

Learning outcomes

- Frame a research question based on an issue for a firm for which data is needed to make a decision
- Identify and select appropriate research methods to answer the research question
- Design and carry out a research project for a given business unit and make a recommendation based on data they collect and analyse
- Critically evaluate research proposals and results so that they are useful for business practice

Assessment tasks

- Contribution to class
- Group case study analysis 1
- Group case study analysis 2
- Final examination

PG - Research and Problem Solving Capability

Our postgraduates will be capable of systematic enquiry; able to use research skills to create new knowledge that can be applied to real world issues, or contribute to a field of study or practice to enhance society. They will be capable of creative questioning, problem finding and problem solving.

This graduate capability is supported by:

Learning outcomes

- Frame a research question based on an issue for a firm for which data is needed to make a decision

- Identify and select appropriate research methods to answer the research question
- Design and carry out a research project for a given business unit and make a recommendation based on data they collect and analyse
- Critically evaluate research proposals and results so that they are useful for business practice

Assessment tasks

- Contribution to class
- Group case study analysis 1
- Group case study analysis 2
- Final examination

PG - Effective Communication

Our postgraduates will be able to communicate effectively and convey their views to different social, cultural, and professional audiences. They will be able to use a variety of technologically supported media to communicate with empathy using a range of written, spoken or visual formats.

This graduate capability is supported by:

Learning outcomes

- Frame a research question based on an issue for a firm for which data is needed to make a decision
- Critically evaluate research proposals and results so that they are useful for business practice

Assessment tasks

- Contribution to class
- Group case study analysis 1
- Group case study analysis 2
- Final examination

PG - Engaged and Responsible, Active and Ethical Citizens

Our postgraduates will be ethically aware and capable of confident transformative action in relation to their professional responsibilities and the wider community. They will have a sense of connectedness with others and country and have a sense of mutual obligation. They will be able to appreciate the impact of their professional roles for social justice and inclusion related to national and global issues

This graduate capability is supported by:

Learning outcome

- Design and carry out a research project for a given business unit and make a recommendation based on data they collect and analyse

Assessment tasks

- Group case study analysis 1
- Group case study analysis 2

Changes from Previous Offering

Assessment tasks: None

Delivery and resources: None

Unit schedule: None

Alignment with MGSM's mission-driven attributes

Leadership: The unit develops quantitative skills required of leaders with respect to the wide range of techniques available to deal with array of information in order to make well-informed and robust strategic decisions.

Global mindset: The unit facilitates assessing the implications of strategic decisions from a whole of entity perspective, across of a national and international spectrum of stakeholders.

Citizenship: The unit applies an accurate and fair approach to deriving business strategies and disclosure of any difficulties or ethical issues that may arise from them.

Creating sustainable value: The unit promotes the adoption of a forward-looking perspective on the impact of qualitative decisions and how they may be readily adapted if parameters change in the future.

Attendance Policy (MGSM)

The interactive environment of the classroom is central to the MGSM experience. Students are required to attend the full duration of all classes for the units in which they are enrolled. We recognise that exceptional circumstances may occur, such as unavoidable travel on behalf of your organization or the serious illness or injury of you or a close family member.

Special consideration may be given for a maximum of 20% non-attendance for such circumstances as long as lecturers are contacted in advance, and supporting documentation provided, to request exemption from attendance. Failure to abide by these conditions may result in automatic withdrawal, with academic and/or financial penalty. The full Student Attendance Policy is published in the MGSM Student Handbook at https://students.mgsm.edu.au/handbook

Content Disclaimer

These unit materials and the content of this unit are provided for educational purposes only and no decision should be made based on the material without obtaining independent professional

advice relating to the particular circumstances involved.