
Data Analytics and Business Decision Making

F 2017

F 7:00 PM – 9:50 PM

Room: TBC

Tech Lecturer: Eric Kwon

Prof. Youngsuk Chi

E-mail: ysyonse@gmail.com

Office hours: By appointment

Please send an email to the Professor 2 weeks prior to the appointment

Size: 30

Language: English

Credits: 3

Course Description

Virtually everything we do in our day-to-day lives produces data – whether it is making your morning commute, listening to music, or liking a post on Facebook. Today, this information about our lives, our choices and the choices of everyone around us is collected, processed, analyzed, and repackaged to improve our experiences and empower us to make better decisions. Behind it all are the organizations that seek to create valuable business intelligence. In recent years, data has become a critical asset to every enterprise, from Google to the local grocery store. Advances in the quantity and quality of available data along with stronger data analysis technologies (sometimes called “Big Data”) lets organizations collect better consumer information, improve efficiency and operations, and enhance customer experiences – and this is only the tip of the iceberg.

The purpose of this course is to provide an in-depth look into the role of data analytics in business management and strategic decision making. Towards the beginning of the course, we will discuss the basics of how data are collected, stored, and processed. We will then study some of the ways that data analytics is being used to solve business problems across industries. In order to provide a rich perspective on big data analysis in the context of business decision making, over half of the lectures will feature insights from business leaders who will share how they deal with big data in real-world business scenarios.

The business component of this course will be complemented by a technical introduction into data analytics software to familiarize you with the basic technologies involved in data analysis and ground your understanding of how data scientists approach problems. Finally, to put our study of data analytics into a larger societal context, we will also consider complex legal, ethical and social questions surrounding data analytics.

Course Requirements and Expectations

This is an interactive course, and you will be expected to express your viewpoints each lecture during Q&A and discussion sections.

Readings for this class have been broken down into required readings and optional readings. You are expected to come to class each week prepared to discuss the assigned readings. Although they are not required, you are strongly encouraged to supplement your knowledge with the optional readings.

Students are required to bring their laptops to all software sessions. Laptops are allowed in lectures but not required. Seats will be assigned at the beginning of each lecture.

Class Participation (25%)

Class participation will be measured by (i) attendance (10%), (ii) active participation in discussions (10%), and (iii) submission of thoughtful questions about the readings in advance of each lecture (5%). Attendance and punctuality are mandatory. If you are unable to attend any session, please contact ysyousei@gmail.com.

Data Analytics Software Homework (25%)

Students will complete short homework assignments using *R* (20%), based on the technical concepts learned in the four tech sessions. Attendance and punctuality (5%) are mandatory.

Midterm Project (15%)

Each student will write a max 1,000-word project proposal on how they would design a business that leverages data analytics to address a real-life business problem. In this proposal, you should imagine you are submitting a memo to an investor or CEO of a business. The proposal must include a description of a real-life problem or opportunity, and a description of how you would use data analytics to address it.

Components

- **Identify a real-life challenge**
 - Identify a real-world problem or opportunity for improvement in a process, product, or service – whether for businesses, consumers, or other organizations and stakeholders.
- **Describe how you could leverage data to solve the problem**
 - What type of data would you use, and how would it help you address the challenge that you have identified?

Grading Rubric

- **60% – Content**
 - Proposes a useful service that offers a unique value add to customers
 - Applies data analytics in a practicable way to serve a distinct business purpose
- **40% – Writing & structure**
 - Describes the business clearly, logically, effectively, and in an organized manner
 - Proposal is written succinctly in a professional tone, and is grammatically correct

Final Project (35%)

Teams of 5 students each will present on 6 proposals selected from the midterm project submissions. Students are expected to expand on a proposal for how data analytics can be used to solve a real-life business problem. You will need to discuss the method of gathering, processing and analyzing data and how you will use it to create your business. Teams will submit written proposals using the following suggested components. However, it is not necessary to apply the exact formats as below at all. Students will then present their business in detail to the class.

Components

- 1. Executive summary**
 - Overview of the business/project, outlining its name, mission, goals, and core function(s)
- 2. Description of core function(s)**
 - Description of the need addressed and value added by the core product or service
 - Concept of core product or service offered and description of the target customer
- 3. Explanation of the role that data analysis will play in the business**
 - What type of data will be used, how will you collect it, how will you process or curate it, and how will you analyze it to achieve your business objectives?
 - What challenges do you foresee (whether technical, legal, or ethical)?
- 4. Initial operations**
 - What talent, equipment, supplies and facilities will you need on day one?
 - What functions will you need to outsource and what external products and services will constitute your supply chain?
 - How will you scale personnel, equipment, and supply chain as your business grows?
- 5. Industry analysis**
 - How do you view the industry size and segmentation?
 - Who are your major competitors?
 - What are key trends, opportunities, and threats to the industry and to your business?
- 6. Marketing**
 - What is your go-to-market plan to attract the right customers?
- 7. Budget and financing**
 - What factors would contribute to your costs, revenues, and profits?
 - What is your budget for your first year of operations?

Grading Rubric

- **50% – Content**
 - Addresses Components 1-7 comprehensively and convincingly
 - Achieves clarity and cohesion in a unified proposal that works logically as a whole
 - Proposes a service that adds unique value to customers
- **15% – Structure and Clarity of Written Proposal**
 - Communicates the business plan clearly, succinctly, and logically
 - Language is professional and grammatically correct
- **15% – Preparation & Teamwork**
 - Demonstrates strong cooperation among team members towards a unified vision
- **20% – Presentation**
 - Highly organized, clear, simple, and compelling
 - Makes good uses of visualizations and engages the audience

COURSE SCHEDULE

Lecture One | September 13th **FiscalNote: Predictive Analytics and Business Decision Making**

Prof. Youngsuk Chi [*in person*] Guest Speaker: Tim Hwang (Founder and CEO, FiscalNote) [*in person*]

Topics

- Scaling and adapting advanced analytics to serve new user needs and create new opportunities
- Predictive analytics and how it has evolved to drive preemptive (vs. reactive) business decisions
- FiscalNote: how a startup can reinvent government relationship management to maximize impact

Lecture Two | September 14th **RELX: Introduction to HR Analytics**

Prof. Youngsuk Chi [*in person*] Guest Speaker: Holly Krafft (CP, Corporate Strategy, RELX) [*by video*]

Topics

- Course description, topics, and objectives
- Introduction to major topics in data analytics in the business world
- Breaking down the types of business questions that analytics is beginning to answer more and more about customers, products, and HR

Lecture Three | September 15th **Bain & Company Korea: Consulting**

Prof. Youngsuk Chi [*in person*] Guest Speaker: Hewie Kang (Bain & Company Korea) [*in person*]

Topics

- TBC

Lecture Four | September 25th **LexisNexis Risk Solutions: Risk Technology**

Prof. Youngsuk Chi [*in person*] Guest Speaker: Vijay Raghavan (CTO, LexisNexis) [*by video*]

Topics

- Introduction to Risk Solutions: content, technology, algorithms and analytics
- Linking meaningful content from diverse sources accurately
- Fraud prevention in healthcare, social security, and tax refund claims

Lecture Five | September 26th **Microsoft: Machine Learning, Chat Bot, and AI**

Prof. Youngsuk Chi [*in person*] Guest Speaker: Seokjin Han (Microsoft Korea) [*in person*]

Topics

- Digital transformation of Microsoft
- Machine learning technologies and its applications
- The potential of chatbots and the rise of chatbots as new types of RX
- Usage of AI in business and demos of Microsoft products

Lecture Six | September 27th **Avero: Big Data Analytics in the Restaurant Business**

Prof. Youngsuk Chi [*in person*] Guest Speaker: Halim Lee (Avero) [*in person*]

Topics

- Faster and more effective management of sales and workflow through Big Data
- Improving customer experience through management of servers
- Avero's Food Cost Management (FCM) system

Lecture Seven | October 11th **Tech Session #1: Introduction to R**

Lecturer Eric Kwon

Topics

- Introduction to R
- Explanation of data types used in R
- How to handle different types of data

Lecture Eight | October 17th **Tech Session #2: Processing and Management of R**

Lecturer Eric Kwon

Topics

- Data cleansing
- Processing and management
- Exploratory data analysis (e.g. graphical illustrations, descriptive statistics, ANOVA)

Lecture Nine | October 20th **No Class – Midterm Week**

Midterms to be submitted to Prof. Chi by 10:00 PM on October 20th

Lecture Ten | November 6th **Tech Session #3: Data Mining Analysis**

Lecturer Eric Kwon

Topics

- Data mining analysis (e.g., PCA, FA, Clustering)
- Survey analysis (e.g., structural equation modeling)

Lecture Eleven | November 13th **TMON: Data Analytics in E-commerce**

Prof. Youngsuk Chi [*in person*] Guest Speaker: Daniel Shin (CEO, Ticket Monster) [*in person*]

Topics

- What 'big' data analytics has done for e-commerce companies big and small
- Examining a business: interactive discussion of TMON's business model and dashboards
- Creating a competitive edge: how TMON leverages key technologies to deliver a better service

Lecture Twelve | November 14th **Lean Execution: Making Technology Deliver Competitive Advantage**

Prof. Youngsuk Chi [*in person*] Guest Lecturer: Dan Olley (CIO, Elsevier) [*by video*]

Topics

- Digital First: The changing role of technology in a digital organization
- The Lean Enterprise: Digital operating models for delivery and innovation
- Next Generation Technology: exploiting big data, advanced analytics, and machine learning
- Right the First Time: Building products customers love

Lecture Thirteen | November 15th **Ethics: Title TBC**

Prof. Youngsuk Chi [*in person*] Guest Speaker: TBC

Topics

- TBC

Lecture Fourteen | November 24th **Tech Session #4: Statistical Analysis**

Lecturer Eric Kwon

Topics

- Statistical analysis (e.g., statistical methodologies for continuous, choice, count, and censored variables)

Lecture Fifteen | December 8th **Final Project Presentation**

Students are required to turn in the project proposal by December 1st. Teams will make presentations on the 8th. Projects will be evaluated in person by Professor Chi and Lecturer Kwon.