University of Southern California
Marshall School of Business

DSO-573: Data Analytics Driven Dynamic Strategy & Execution

Fall 2019
Units: 3.0
Schedule: Monday, 6:30-9:30 p.m. JFF 236 & Tuesday, 6:30-9:30 p.m. JFF 236

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Office Hours: TBD

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To schedule a video conference call
<Click Here> to use automated on-line calendaring tool.

Course Introduction

The advent of BIG DATA has had a significant and life changing impact on all business, large and small. The ability to harness vast amount of information and to quickly turn that data into actionable insight has empowered companies to get closer to their customers, discover challenges and opportunities previously hidden and formulate more dynamic and responsive strategies to improve their competitive position through a more agile and connected execution. Technological advances in processing significant amount of data in an expedited fashion and capabilities to access the ever-expanding knowledge embedded in previously inaccessible unstructured data offer a unique opportunity for growth and creating new competitive advantages. Data Analytics provides the tools and techniques to unleash the value of BIG DATA. This course focuses on the use of Data Analytics for business advantage across the value chain. It addresses advanced thinking in leveraging Data Analytics and achieving and sustaining competitive advantage in today's era of BIG DATA and tomorrow's unavoidable future of BIGGER DATA.

This course is not focused on teaching tools, discussing data manipulation methods and/or covering statistical and modeling techniques. It assumes prior knowledge of business analytics and use of basic tools and techniques and aims to advance the students ability to apply that knowledge to solve critical strategic or tactical business challenges and to discover opportunities for enterprise advancement.

Data Analytics Driven Dynamic Strategy and Execution Concepts

There are a number of conventional and new strategy formation and execution models, as well as Data Analytics applications and methods will be examined. At high level the key concepts will include but is not limited to:

Key Concepts	Remarks
Connected Enterprise	• Framework of connected enterprise and extraction of noise, signals and patterns • Use of integrated analytics in identification of emerging trends • Advanced applications of data analytics in product design and development, demand forecasting, supply chain optimization, customer experience and churn, marketing and positioning, sales and channel management
Probabilistic Causation, Chaos Theory & Game Theory	• Framework for mathematical probabilistic causation models and concepts overlaid on strategy formulation models. • Review of Chaos Theory & Game Theory and applications and impacts of dynamic strategy formulation and execution
Value of Unstructured Data	• Understanding the role of unstructured data and triangulation with structured data at both internal and external levels • Discussion of Natural language Processing • Discussion of Machine learning applications
Shifting Focus, Agility, and Convergence	• Role of analytics in creation of strategic focus and corporate agility • Concepts and elements of strategic "achievability" explored through analytics. • Discussion of the Essential factors for dynamic strategy and execution powered by Data Analytics.
Achieving Competitive Advantage	• Tactical and strategic execution across the value chain powered by data analytics • Targeting sustainable competitive advantaged through use of data analytics • Measurement systems and use for effective execution at various functional, business and corporate strategy levels. • Getting results out of analytics driven strategies: organizational rhythm, achievability concept, etc.
Exploration & Discovery	• Framework for opportunity and challenge recognition based on "discovery" methods and concepts • Analytics insight extraction methods – exploring value of noise, outliners, signals, and shifts in patterns.
Big Data Value Zones	• Data analytics driven methods and concepts for extracting actionable insight from BIG DATA – understanding the concept of "VALUE ZONES" – analytics containment of BIG data by focusing on growth, effectiveness and risk zones of data and business value. • Comparable universe creation & analytics foundation- changing of frame of reference • Creation of algorithmic models for insight extraction – e.g. remarkable anomalies, exceptional exceptions, impactful trends, etc.
Artificial & Augmented Intelligence	• Impact on jobs and consequences • Types of technology & business applications • Role of AI coupled with data & analytics

Learning Objectives

In this course, the student will learn:

- Practical applications of dynamic data analytics in achieving and sustaining competitive advantage
- Advanced approaches to strategy formulation and execution in the "new" dynamic era of BIG DATA
- Applications of Data and Analytics with a connected enterprise view , utilizing both structured and unstructured data
- Methods and approaches for distilling continuous and analytics driven insight from BIG DATA and exploration of impacts of cognitive computing and AI on business.
- Fundamentals of Machine Learning, Natural Language Processing and Text Mining applications and turning unstructured data into structured.
- Use of predictive modeling in planning and execution at functional, business unit and corporate levels

Course Format

This course meets for 15 class sessions (except for any conflicts with holidays), including final exam. Lectures will be focused on concepts and guest speakers - real life experience summaries, videos and case studies will be utilized to provide color to the concepts and group work / projects will be used to have the students gain hands on experience.   A number of teaching techniques will be used including:

- Use of case studies – from educational institutions such as HBR, Sloan, etc., as well as, providers such as Deloitte, KPMG, McKinsey, etc.
- Expert Guests "fireside type chats" – speakers may include experts from the industry, Venture Investors with futuristic views of trends in data analytics and Big Data, service and platform providers discussing in field implementations of analytics and results
- Group projects design to apply data analytics to real life issues that students may be facing at their work
- Use of simulation style cases to apply knowledge and analytics and evaluating impacting simulated results.
- Interactive lectures - use of Videos and Polling systems to increase student participation

Students are expected to read the materials in advance of class, come to class prepared to discuss the readings, apply analytics skills to assigned projects, and present their project or assigned research activities in class to demonstrate their data-driven decision making and creativity. Students are encouraged to collaborate with others on their project to foster ideas and get feedback for improvements.

Recommended Preparation

- Advanced use of spreadsheets & presentation tools
- Moderate to advance – practical knowledge of – modeling tools such as SAS, R, etc.
- Knowledge of decision trees and networks, sensitivity analysis, and experiment design
- Advance knowledge of statistical methods, regression and correlation analysis
- Basic knowledge of simulation modeling and linear programming concepts

Course Reading Materials

Students are required to purchase a course reader from the USC Bookstore. Following is an initial list of the material that will be covered in as advance reading or for in class discussions. Additional material may be added based on the specific class dynamics.

Books

Assigned
- Predictive analytics by Eric Siegel, Publisher: John Wiley & Sons;
  ISBN: 978-1-119-14567-7 -- Reading of the entire book is optional but recommended, the key chapters as required reading are: chapters 1,3,4,5,6,7 plus the introduction.

Recommended for Extra Credit
- The Caterpillar's Edge by Sid Mohasseb. Published by Rugged Land Media;
  ISBN 978-0-9966363-1-5

Optional BUT Recommended Books:

- o The Good Strategy Bad Strategy by Richard Rumelt; Publisher: Crown; ISBN:878-0-307-88623-1 -- Reading of the entire book is optional but recommended, the key chapters as required reading are chapters: 1,2,3,5,7,12,13 and 14.

- o The End of Competitive Advantage by Rita Gunther McGrath; publisher: Harvard Business Review Press; ISBN-13: 978-1422172810

- o The signal and the noise by Nate Silver; publisher: Penguin Press ; ISBN: 978-1-59420-411-1 -- Reading of the entire book is recommended, the key chapters will however be chapters 1,2,3,4,5,6,7,12,13 and the conclusion.

Assigned Articles

- Article #1 - The 7 Sins of Performance Measurement
  - MIT Sloan Management Review, by Michael Hammer

- Article #2 - The Framework for a winning monetization strategy
  - KPMG, by: Sid Mohasseb July 2014 – provided through blackboard.

Optional BUT Recommended Articles:
- Why and How to Measure the Value of Your Information Assets
  - Doug Laney – Gardner Report August 2015
- Ten-red-flags-signaling-your-analytics-program-will-fail
  - Oliver Fleming, Tim Fountaine, Nicolaus Henke, and Tamim Saleh , McKinsey
- Competing on Analytics - With External Processes
  - Harvard School Business Press - Thomas Davenport & Jeanne G. Harris
- Competing on Analytics - With Internal Processes
  - Harvard School Business Press - Thomas Davenport & Jeanne G. Harris
- HBR Guide to Data Analytics Basics for Managers
  - Pub Date: Apr 2, 2018; Source: HBS Press Product #: 10185-PDF-ENG - Length:256 pages Find on HBR Site
- Thriving on A Big Data World
  - MIT Sloan Management review, Winter 2014; By: Alden M. Hayashi
- Why and How to Measure the Value of Your Information Assets
  - Gardner Report – provided through blackboard.
- Big Data: The Management Revolution
  - Harvard Business Review - By: Andrew McAfee and Erik Brynyolfsson
- Competing on Analytics
  - Harvard Business Review - By: Thomas Davenport
- Data, Analytics and the Path from Insight to Value
  - MIT Sloan - By: Steve Lavelle, Eric Lesser, Rebecca Shockley, Michael Hopkins, and Nina Kruschwitz
- Raising the Bar With Analytics
  - MIT Sloan – by: David Kiron, Pamela Kirk Prentice and Renee Boucher Ferguson
- Rethinking Analysis: The insight – Driven Organization
  - Business Strategy Review – by: Alessandro Di Fiore
- Don't try to protect the past
  - HBR -- Interview with Ginni Rometty , CEO of IBM
- What's new with the Internet of Things
  - McKinsey & Company – provided through blackboard
- Why Microsoft is betting its future on AI
  - By Casey Newton – provided through blackboard
- AI and Life in 2030
  - - Stanford report – provided through blackboard

Assigned Cases

- CASE# 1- Simulation Model Capsim – IoT / Sensor Strategy Case – special sign up instructions to be provided in class
- CASE#2- FOODSTUFF- How Big Data Can Transform Outcomes – Singapore Management University: SMU 478 <see link below, available @ HBR>
- CASE#3- Consumer Tastes at GAP – HBR 9-517-115 <see link below, available @ HBR>
- CASE#4- Tencent – HBR 9-718-426 <see link below, available @ HBR>
- CASE#5- Dow Chemical Co. - Big Data in Manufacturing – IVEY Publishing W17696 <see link below, available @ HBR>
- CASE#6- The Indian Experience and Evolution expressed by a CEO (provided in class)

Videos: Various videos will be used in class presentations – links available in class presentations.

ALL ARTICLES AND CASES ARE AVAILABLE TO PURCHASE AT:

<CLICK HERE> OR

GO TO: https://hbsp.harvard.edu/import/641430

CASE #1: Capsim Simulation Link & Contact Information
Class Simulation project can be accessed & purchased
through a link to be provided in a document uploaded to Blackboard –
providing specific direction and sign up code for the class you are
registered for (Monday vs. Tuesday)

Course Outline

Class Session	Discussion Focus	Articles / Cases / Books/ Speakers	Due Dates & Exams / Assignments
#1	**INTRO & RULES OF THE GAME** • Course Administration (expectations and objectives) • Projects & Cases + Course Overview	• Industry report assignment provided	• Polling system Testing & Sign up. • Internship / Work experience exercise
#2	**COMPETING ON ANALYTICS** • Data Analytics & Big Data Trends • Broad Industry Applications • IR reports & group discussion – example, results, and commonalities • Introduce the Capsim Model and open for testing & learning	• Predictive Analytics Book: Chapter 1 & Introduction • Case#1: Simulation Case Capsim OPEN for testing <u>\<link will be provided></u>	• DUE: Industry Report (IR) Assignments **HARD COPY DELIVERED IN CLASS** • Extra Credit Book Report Submission Criteria & Format Available on Blackboard
#3	**ANALYTICS & METHODS** • Concepts Behind Analytics – what makes it work & Basic Theories (e.g. machine learning) • Predictive Analytics Methods, Definitions and Tools / Team & Process needs • The analytics Framework & Insight Funnel • What is insight – first view	• CASE#2- HBR - FOODSTUFF- How Big Data Can Transform Outcomes	• Be prepared to participation in discussions around the case. • Be ready to finalize your Simulation team (LAST CHANCE)
#4	**WHAT IS STRATEGY?** • Discussion of Analytics & Strategy – optimizing vs. strategizing • Strategy history, definitions, evolution and key parameters • Dynamic Strategy & Waves	• CASE#3- HBR- Consumer Tastes at GAP	• CAPSIM training must be completed • Be prepared to participation in discussions around the case • Next week: success criteria for Capsim MUST BE finalized)
#5	**ANALYTICS & STRATEGY** • Conversion Framework • Alignment with Uncertainty / Appreciating Reality an aspiring for more – three missions • Frame of Reference discussion • BI / PI / SI discussion	• CASE#4 - HBR - Tencent	• Be prepared to participation in discussions around the case • DUE: MUST HAVE Simulation success criteria finalized before
#6	**SPEAKER & OPEN DISCUSSION ROUND 1** • Speaker discussion – D&A leadership + Business roles now and tomorrow • Capsim Round 1 discussion	• SPEAKER: TBD • PA book CH 2	• ROUND 1 Board Reports Due – **HARD COPY DELIVERED IN CLASS**
#7	**MID-TERM** • In class / open book & notes	• ----	• ----

Class Session	Discussion Focus	Articles / Cases / Books/ Speakers	Due Dates & Exams / Assignments
#8	<u>PERFORMANCE / BIG DATA ZONES & INSIGHT</u> • Review of Mid-term • Data sources – buckets of signals • Growth / Risk & Performance Zones • Connected & Continuous Structures • Discussion of 7 sins of performance management and the implications	• Articles #1: 7 sins of Performance Management • Toyshop Small Case Discussion – will be assigned in class • PA book CH 3	• Be prepared to participation in discussions around article
#9	<u>PERFORMANCE / BIG DATA ZONES & INSIGHT (continued)</u> • Data sources – buckets of signals (expanded) • Growth / Risk & Performance Zones (expanded) • Insight Paths (expanded)	• Case #5: Dow Chemical	• Be prepared to participation in discussions around the case
#10	<u>SIMULATION BOARD MEETINGS</u> • CAPSIM Simulation one on one meeting with team before their final two runs. • Learning & Adjustments	• CASE#1: simulation discussion – midpoint	• DUE: ROUND 2 Board report – be prepared to discuss in one on one sessions in class - **HARD COPY DELIVERED IN CLASS**
#11	<u>DATA MONETIZATION</u> • Data Monetization Strategies • Type of Monetization & Paths • Challenges to Monetization • Value of data assts • In class exercise	• Article #2: Framing a Winning Data Monetization Strategy • Group exercise in class: identifying monetization opportunities • PA book CH 4	• Be prepared to discuss Articles #2 • DUE: Round 3 simulation Board report **HARD COPY DELIVERED IN CLASS**
#12	<u>INNOVATION / MISSIONS / CULTURE & ADDICTIONS</u> • Business Addictions Fears & Consequences • Winners / Losers & Originals • Biases & Orthodoxies + Hopes & Fears • Rhythm of organization & Crisis + Innovation • Leading in an era of constant change • Leadership qualities – what is the same & what is different	• Case#6: Indian Company Evolution – from the CEO (Ravi's) perspective – short case • PA book CH 5	• DUE: CATERPILLAR'S Edge Book report for extra Credit **HARD COPY DELIVERED IN CLASS** • Be ready to discuss the case
#13	<u>AI & the Future</u> • Robotics, Cognitive & IoT • Investments & Opportunities • Implications (jobs & productivity) • Fear & Future – partners or enemies • The ethics & consequences	• PA book CH 7 • SPEAKER: TBD	• DUE: Round 4 Capsim Report **HARD COPY DELIVERED IN CLASS**
#14	<u>CAPSIM FINAL STUDENT PRESENTATIONS</u>	• Student Presentation	• Final Project PowerPoint Due: **HARD COPY DELIVERED IN CLASS**
	FINAL EXAMS on DEC 16th and DEC 17th According to MARSHALL SCHEDULE OF EXAMS		

Course Grading

Several dimensions of performance factor into the grades for students. The following table defines the detailed breakdown of the course grading.

Grading Type	Description	Grade Breakdown	Grade Total
Industry Reports (IR)	Students will be assigned a random industry to create a short report on – the report will include a brief description of extent of use of Analytics in that industry from various aspects (e.g. supply chain, customer, HR, etc.) and an assessment of strategic approaches.	Individual Assignment	10%
Midterm Exam	Will cover all materials discussed in class (lectures, cases and articles) and all assigned reading from the beginning of the course; including the recommended chapters of the course book. The exam will be open book and notes (NO LAPTOP) and conducted in class at the specified time.		20%
Simulation Training	It is critical for students to complete the Simulation on-line training on time. This training will greatly impact how a student can be a value-add member of the team – to this end, completion of training on time will have a no partial credit grade assignment.		2%
Final Group Project - Capsim IoT Simulation Case	Randomized teams will be created to work on a business strategy simulation case. Teams will be assigned a company and compete against each other. Students will be provided the data for the company they are assigned to and industry for a 4-year period and are expect to analyze the data and develop a data driven strategy for their assigned company for 4 years in the future. Each team's success will be measured based on various group and individual company factors.	All team members will receive the same grade	35%
Peer Review	Each team member will have a chance to evaluate its team members and the level of their contribution to the team on the project. Unsatisfactory contribution to the team will have a negative effect on the student's grade.		3%
Exam: Final	Will cover all materials discussed in class (lectures, cases and articles) and all assigned reading from the beginning of the course; including the recommended chapters of the course book. The exam will be open book and notes (NO LAPTOP) and conducted in class at the specified time.		20%
Class participation	Class participation will be assessed subjectively. All students will be expected to contribute to the class discussions. Participation grades will not directly correlate to attendance. Automated in class polling tools may be used to encourage and measure participation.		10%
BONUS	Students in class will get an opportunity to evaluate and judge the work of other teams during the final presentation – based on given criteria (to be provided) – the top 3 teams will qualify for extra points.		ADDED
Total			100%

Course Communication

Course communication occurs through the posting of class materials into Blackboard (http://blackboard.usc.edu), email, and announcements in class. All of the presentation materials will be posted into Blackboard, and class announcements will be sent via email using Blackboard. Therefore, all students are required to have an active Blackboard account that they use regularly and this account needs to define a correct email address.

Assignment Submission Policy:

Assignments must be turned in on the due date/time electronically via Blackboard; unless specific in class to be turned in in person and in class. Any assignment turned in late, even if by only a few minutes, will receive a grade deduction every week the assignment is late (for example, if your work is a B+ grade, you will be given a C+ grade) -exceptions are the phase I (Mid-point) and Phase II (final) client project assignments where no late submissions will be accepted. If your internet breaks down on the due date, you must deliver a hard copy at the beginning of class on that day. If you are unable to attend class on that day, make arrangements for it to be delivered to the classroom by the start of class. Late or not, however, you must complete all required assignments to pass this course.

USC and Marshall Policies

Evaluation of Your Work:

You may regard each of your submissions as an "exam" in which you apply what you've learned according to the assignment. I will do my best to make my expectations for the various assignments clear and to evaluate them as fairly and objectively as I can. If you feel that an error has occurred in the grading of any assignment, you may, within one week of the date the assignment is returned to you, write me a memo in which you request that I re-evaluate the assignment. Attach the original assignment to the memo and explain fully and carefully why you think the assignment should be re-graded. Be aware that the re-evaluation process can result in three types of grade adjustments: positive, none, or negative.

Academic Conduct

Plagiarism – presenting someone else's ideas as your own, either verbatim or recast in your own words – is a serious academic offense with serious consequences. Please familiarize yourself with the discussion of plagiarism in *SCampus* in Part B, Section 11, "Behavior Violating University Standards" https://policy.usc.edu/scampus-part-b/. Other forms of academic dishonesty are equally unacceptable. See additional information in *SCampus* and university policies on scientific misconduct, http://policy.usc.edu/scientific-misconduct.

Support Systems

Student Counseling Services (SCS) - (213) 740-7711 – 24/7 on call
Free and confidential mental health treatment for students, including short-term psychotherapy, group counseling, stress fitness workshops, and crisis intervention. https://engemannshc.usc.edu/counseling/

National Suicide Prevention Lifeline - 1-800-273-8255
Provides free and confidential emotional support to people in suicidal crisis or emotional distress 24 hours a day, 7 days a week. http://www.suicidepreventionlifeline.org

Relationship & Sexual Violence Prevention Services (RSVP) - (213) 740-4900 - 24/7 on call
Free and confidential therapy services, workshops, and training for situations related to gender-based harm. https://engemannshc.usc.edu/rsvp/

Sexual Assault Resource Center
For more information about how to get help or help a survivor, rights, reporting options, and additional resources, visit the website: http://sarc.usc.edu/

Office of Equity and Diversity (OED)/Title IX compliance – (213) 740-5086
Works with faculty, staff, visitors, applicants, and students around issues of protected class. https://equity.usc.edu/

Bias Assessment Response and Support
Incidents of bias, hate crimes and microaggressions need to be reported allowing for appropriate investigation and response. https://studentaffairs.usc.edu/bias-assessment-response-support/

Student Support & Advocacy – (213) 821-4710
Assists students and families in resolving complex issues adversely affecting their success as a student EX: personal, financial, and academic. https://studentaffairs.usc.edu/ssa/

Diversity at USC – https://diversity.usc.edu/
Tabs for Events, Programs and Training, Task Force (including representatives for each school), Chronology, Participate, Resources for Students

Students with Disabilities

USC is committed to making reasonable accommodations to assist individuals with disabilities in reaching their academic potential. If you have a disability which may impact your performance, attendance, or grades in this course and require accommodations, you must first register with the Office of Disability Services and Programs (www.usc.edu/disability). DSP provides certification for students with disabilities and helps arrange the relevant accommodations. Any student requesting academic accommodations based on a disability is

required to register with Disability Services and Programs (DSP) each semester. A letter of verification for approved accommodations can be obtained from DSP. Please be sure the letter is delivered to me (or to your TA) as early in the semester as possible. DSP is located in GFS (Grace Ford Salvatori Hall) 120 and is open 8:30 a.m.–5:00 p.m., Monday through Friday. The phone number for DSP is (213) 740-0776. Email: ability@usc.edu.

Emergency Preparedness/Course Continuity

In case of a declared emergency if travel to campus is not feasible, the *USC Emergency Information* web site (http://emergency.usc.edu/) will provide safety and other information, including electronic means by which instructors will conduct class using a combination of USC's Blackboard learning management system (blackboard.usc.edu), teleconferencing, and other technologies.