

**ANALYTICAL  
CONSULTING LAB  
SYLLABUS  
SPRING 2019**

**JANUARY 24, 2019 UPDATE**

**Background on the Analytical Consulting Lab**

The Analytical Consulting Lab (ACL) is part of the Kellogg experiential learning initiative. The specific interest in the Analytical Consulting Lab comes out of the deep demand for business leaders that can provide guidance in analysis and focus that analysis to specific business questions. Additionally, many recruiters and employers have commented that finding talent that bridges the business and analytical communities is difficult. The ACL strives to provide a real-world learning experience for students to work with sponsoring companies on business questions that revolve around analysis. Students work in teams using analysis (broadly defined) to answer current and important business questions.

Kellogg has a strong tradition in bringing analysis to bear on business questions. In fact, the Analytical Consulting Major is the second most popular major at Kellogg, suggesting that not only does the ACL support this major, but it will resonate strongly with the goals of many a Kellogg MBA student.

**READ THIS!!!! Course Expectations**

Analytical Consulting Lab is an experiential class, with a strong focus on the application of analytics and market measurement in a real-world, client-facing, consulting environment. It provides an excellent opportunity for Kellogg MBA students to get real-world experience in consulting and in applying analytics and market measurement techniques to actual business challenges and opportunities.

In previous years, some students have expressed expectations of the course that are outside the scope of the class. Therefore, it is important to set some very important expectations in regards to this class:

- **The class does NOT involve lectures to present new theory or analytical techniques. Students seeking new analytical techniques or lectures on analytics, primarily, should consider other courses for that goal. This is a class on the application of analytics in a real-world, team-based environment.**

## SPRING 2019 ANALYTICAL CONSULTING LAB: MECN 615

Department of Managerial Economics and Decision Sciences  
Kellogg School of Management • Northwestern University

Professor: Russell Walker

- **You will work in a team. Team dynamics will be instrumental in your experience.** It is important that you are available, accountable, dedicated, and willing to contribute in a team. In most cases, you get to choose your teammates. Be extremely open and honest with your teammates in terms of their contribution and hold each other accountable in a supportive and respectful manner.
- **The Professor is your advisor, coach, aide, and sounding-board.** He is here to help you in your journey through the project. **The MBA team is in a leadership role to execute the project, communicate and present to the client, and formulate recommendations.**
- The Professor can help you with reviewing regression, analytical concepts, data visualization, consulting best practices, and most any topic that arises on the project. **Execution of the project is, however, the responsibility of the MBA team.**
- **Each project in ACL is unique, real, and driven by an actual client-facing challenge or opportunity.** Your project will vary from others. Projects have different goals, different analytical opportunities, and clearly different clients. You can apply for the project(s) that most interests you.
- **ACL is a lot of work, a lot of learning, and a lot of fun.** Many students consider it a top Kellogg experience. Be sure that your schedule, life, and other commitments permit you to get the most from the class.

### Course Details

The ACL is offered as MECN-615, a full credit course.

Most projects in the ACL are sponsored by Kellogg alumni, at very senior levels in their organizations. Students taking the ACL are assured a strong learning experience and a commitment from the firm to provide access to decision maker and information that will make the experience meaningful.

Details on projects, companies, and information about selecting projects is available at:

<http://kellogg.northwestern.edu/faculty/walker/htm/acl>

## SPRING 2019 ANALYTICAL CONSULTING LAB: MECN 615

Department of Managerial Economics and Decision Sciences  
Kellogg School of Management • Northwestern University

Professor: Russell Walker

### **Application Process**

Students interested in the ACL must submit an application for project selection.

The application permits optimal project assignment, based on student goals, client needs, and project requirements.

Applications are accepted by the Kellogg Experiential Learning system. Students should apply for MECN 615 via the Kellogg Experiential Learning System, at:

<https://www4.kellogg.northwestern.edu/el/>

The application start date is Jan 25 or before.

The application close date is Feb 8.

Decision date is on or before Round 1 bidding, Feb 15

Key parts of this application include:

- Resume or CV
- List of courses taken at Kellogg with grades
- Description of any professional Analytical Experience (no specific experience needed)
- Description of any professional Consulting Experience (no specific experience needed)
- Special service to Kellogg
- Reasons for taking the ACL
- Goals for taking the ACL
- Project Choice #1
- Project Choice #2
- Any fellow desired Kellogg student for a team (limit of one student to specify). Team member preference is only considered if both people select each other.
- Other information that you may wish to share in your application, personal goals, career aspirations, etc.

Student teams that are fully formed (a team of 4) are encouraged and will be given special preference. If you are forming a team and submitting as a team, do make that clear in the application and stress how your team has come to select the project and how it meets your goals.

Student information in the application process is used in formulating teams and assigning projects so that goals, backgrounds, skills, and expectations are all best aligned.

### **Project Assignment**

Student assignments to client projects will be based on individual preferences, requested skill sets and industry experience, and team member diversity. Every attempt will be made to grant students their first or second choice of projects. Student information is collected via the application. Students may select one fellow student for a project. This fellow student selection is honored as possible, if the both students select each other.

# SPRING 2019 ANALYTICAL CONSULTING LAB: MECN 615

Department of Managerial Economics and Decision Sciences  
Kellogg School of Management • Northwestern University

Professor: Russell Walker

Students will be notified about their project assignments during the term before the class. All efforts are taken to accommodate first choices, while forming teams with an appropriate set of skills and interests.

## Case Packet and Readings

As this course is an experiential one, there are no specific cases to prepare. However, many students have looked for examples of companies that have excelled at Analytics. Also, as the course emphasizes consulting and best practices in a professional client engagement, there is a need to consider some of these best practices. Given this, the following texts are recommended and optional:

- 1) The McKinsey Way, Ethan M. Rasiel, McGraw-Hill
- 2) From Big Data to Big Profits: Success with Data and Analytics, Russell Walker, Oxford University Press, 2015.

These texts are easily purchased on-line, so these are not requested in the bookstore.

## Course Meetings

As with other experiential courses, the focus is on the team project and its delivery to the sponsoring company.

Teams will meet with the Professor on a regularly and frequent basis in order to discuss the analysis, flow of work, final presentation and delivery to the sponsoring team. The class will also meet with the prescribed schedule to review concepts and themes important in being successful with the analytical consulting function and in order to provide presentations for the purpose of group learning.

All Group Meetings are to be held with the team and the Professor at a pre-defined time that works mutually. Meetings with the Professor and Client must conclude before 4:30PM on weekdays. PTMBA students are welcome to the class, but cautioned on this scheduling constraint. Students who cannot make meetings in person are encouraged and welcome to join via telephone.

### Pre-term activities

- Project identification
- Team formation
- Identification of Team Liaison to Client
- Identification of Team Liaison to Professor
- Client Introduction
- Project description
- Schedule first group meeting with Professor
- Schedule first client meeting with Client

# SPRING 2019 ANALYTICAL CONSULTING LAB: MECN 615

Department of Managerial Economics and Decision Sciences  
Kellogg School of Management • Northwestern University

Professor: Russell Walker

## Week I:

### Class Session I

- Getting Started with ACL
- Managing Project Ambiguity
- Managing Teams
- Overview of the Consulting Approach
- Dealing with Data
- Descriptive Statistics
- Using Tools: JMP, Excel, @Risk
- STATA Resources at Kellogg

Guest Speaker: NWU Librarian:

Using Business Databases from the NWU Library for market and firm measurement.

Bring your laptop and be ready to explore databases!

## Week II:

### Group Meeting I:

- Developing a Work Plan, Project Analysis
- Examples of Past Analysis
- Use of Graphics
- Best Practices in Presentation of Data
- Building Points Through Analysis

## Week III:

### Group Meeting II:

- Preliminary Analysis of Data
- Teams to bring descriptive statistics to meeting with Professor
- Work Plans due to Professor**

## Week IV

Group Meeting III: Focus on Data and Analysis  
Address questions and issues in analysis

## Week V

Group Meeting IV: Prep for Midpoint Check-in

### Class Session II

- Mid-term progress review and **team mini-presentations**
- Mid-point document due at beginning of class**
- Mid-point team and mid-point peer feedback due to professor**

## Week VI :

### Group Meeting V:

Mid-point feedback, planning for next phase

# SPRING 2019 ANALYTICAL CONSULTING LAB: MECN 615

Department of Managerial Economics and Decision Sciences  
Kellogg School of Management • Northwestern University

Professor: Russell Walker

## Week VII

Group Meeting VI:  
As per team needs

## Week VIII

Group Meeting VII:  
As per team needs

## Week IX

Group Meeting IX:  
Dry-run of presentation with Professor

## Week X

Class Session III  
Project Findings  
**Final project deliverable due to Professor and Client on last Wednesday.  
Meetings with Clients to be held and presentations made to client in person  
during or before final week of classes.**

As in any professional consulting engagement, the students are requested to regularly meet with the client to receive input, data, direction of project goals, and feedback on the progress as needed. All clients are committed and dedicated to fulfilling the learning and business aspect of the project.

Teams may schedule additional time with the Professor as needed and as available.

## Grading

Grading of the project is driven largely by the quality of the team project. The Professor will evaluate the project, its analysis, presentation, and delivery on the following major points:

- Analysis:
  - Quality of analysis (thoroughness, appropriateness)
  - Clarity and quality of model summary and description
  - Intellectual impact (was the analysis creative, novel, clever, or otherwise compelling?)
- Project Document
  - Quality of project description
  - Quality of analysis summary
  - Quality of recommendations and conclusions
  - Use of meaningful graphs, graphs, and presentation of data
- Presentation Documents
  - Quality of presentation
  - Professional impact of the presentation

# SPRING 2019 ANALYTICAL CONSULTING LAB: MECN 615

Department of Managerial Economics and Decision Sciences  
Kellogg School of Management • Northwestern University

Professor: Russell Walker

- Ability to communicate main points of the analysis and recommendations
- Team Meetings
  - Preparation
  - Organization
  - Progress

The Professor will ask the client company to provide feedback on the same above points.

Peer evaluations will also be collected from each member. Each student must rate their teammates on the following dimensions:

- Intellectual and creative contribution
- Workload and willingness to take initiative
- Organization, preparation, and availability
- Collaboration and respect for peers

Peer evaluations will be on a 1-10 scale with 10 being excellent and 1 being poor. All peer evaluations will be treated confidentially.

All ACL students must participate, as participation is also important to make this a meaningful learning experience for all involved.

## Grade Breakdown

Professor Evaluation of Final project materials and presentation:	30%
Professor Evaluation of Work plan and Mid-point review:	20%
Client Evaluation of Final project materials and presentation:	10%
Peer Evaluations (*):	20%
Professor Evaluation of Preparation during meetings and participation:	20%

\* Note: The Professor reserves the right to adjust any student's final grade up or down by a full letter grade in the event that the student's peers unanimously score his or her contributions significantly above or below the overall team effort.

## Role of the Professor

The Professor serves as an aide, counselor, and advisor for the team. The Professor does not conduct the analysis, but will provide detailed direction on analytical approaches. The Professor does not serve as the team liaison or representative to the client. The team must organize itself and identify such a liaison. The Professor may accompany the team to select team meetings and or participate in calls, but the Professor cannot in practically, attend all such meetings.

In the event that the client or the ACL student team encounter an incompatibility or encounter an issue, the Professor will intervene to remedy the situation.

The Professor may also resolve project assignments, as needed.

# SPRING 2019 ANALYTICAL CONSULTING LAB: MECN 615

Department of Managerial Economics and Decision Sciences  
Kellogg School of Management • Northwestern University

Professor: Russell Walker

## **Role of the Team**

The team will consist of 3 or 4 Kellogg MBA students working as a team to complete analysis, as defined by the client as agreed to before the start of the academic term.

The team should be mindful to control the amount of time that is required of the client. This means being prepared for meetings, having a designated liaison to schedule meetings, request information, and follow-through with next steps. This level of preparation and understanding is needed as most clients sponsor this project but do not allocate a full-time associate to work with the ACL team.

The team should expect to contribute about 300-400 hours over the 10-week period to this ACL project. This is a reasonable expectation for a team working on a project and is consistent with other experiential and lab courses at Kellogg. This translates to 8-10 hours per person per week.

The team will produce a white paper that documents the study, results, and recommendations. The team will also prepare a presentation and deliver it in person to the client and its team. A reduced version with emphasis on key findings is also to be presented at the last class.

## **Role of the Client**

The client provides the real-world learning opportunity, data needed to complete the appropriate analysis, and feedback on the quality of the project and its analysis. The Client is not expect to solve the problem, but should provide ample expertise, data, and contextual information to the ACL team.

## **Prerequisites**

All students in the ACL must have completed DECS core. There are no other requirements.

## **Some FAQs:**

### **What is the Analytical Consulting Lab?**

It is a course available to Kellogg MBA students that are interested in the use of analytics in business. Students must take specific prerequisites and have strong academic performance in such classes to take the Analytical Consulting Lab. Students work in teams to resolve a real-work business problem using analytics.

### **What do you mean by Analytics?**

It is meant to be broad but includes the use of specific quantitative approaches, such as regression analysis, time series analysis, forecasting, market segmentation, data mining, optimization, logistical analysis, scenario simulation, and risk analysis, as examples. In particular, we mean solving a business problem using data and applying one of these quantitative approaches.

## **SPRING 2019 ANALYTICAL CONSULTING LAB: MECN 615**

Department of Managerial Economics and Decision Sciences  
Kellogg School of Management • Northwestern University

Professor: Russell Walker

### **How can PTMBA Students participate?**

The ACL is open to PTMBA students on a limited basis, subject to all meetings with the Client and Professor being conducted during normal business hours, which are taken as before 4PM on weekdays only. Please contact Dr. Russell Walker on any questions regarding your interest on the course. PTMBA students should organize in groups.

### **How can Saturday MBA Students participate?**

At this time the ACL is not available to Saturday MBA students, given the need to meet in person with the Client and Professor on a regular basis outside of the Saturday format of the Kellogg Saturday MBA.

### **How does this experience benefit the students?**

Kellogg MBA students taking the ACL will work on a real-world problem under the direction of a Kellogg faculty member. The opportunity to apply analytical theory and learn about a business, make recommendations, and bring together many aspects of their business education is unparalleled. We also ask that the students focus on how to communicate the results of analysis in the context of business decision-making. For students interested in moving to an industry to deep in analytics after graduation or developing new business skills in analytics, this course will be very attractive.

The Analytical Consulting Major is one of the most popular majors at Kellogg and students have expressed deep interest in developing strong skills in analytics. This course meets an interest in our students and provides them an experiential learning opportunity that will prepare them for business opportunities.

### **How does the Client benefit from this opportunity?**

The ACL is an intensive analytics elective that attracts some of our most analytically talented MBA students. It is expected that the student group of 4 will commit about 400 working hours to the project. Additionally, the student project will be overseen by a Kellogg faculty member that has expertise in analytics and its application in business.

We expect that the project deliverables, recommendations, and report will provide direct value to your organization. However, we also believe that the project provides your organization and opportunity to determine how and where to invest in more analytics. If this includes the acquisition of more analytical talent, the project provides an excellent conduit to members of our student body that are talented and interested in this space.

### **How does the team work with the Client?**

For the student team, the partnering company is a client. They will conduct their analysis and provide recommendations through a report and presentation in the same format and in the same manner as a consulting service. The faculty member also serves as an important liaison between the partner and the student, serving to manage time commitments and negotiate deliverables. It is

## SPRING 2019 ANALYTICAL CONSULTING LAB: MECN 615

Department of Managerial Economics and Decision Sciences  
Kellogg School of Management • Northwestern University

Professor: Russell Walker

expected that the student team can meet with and speak with key members of your team that can help them answer questions relevant to the analysis.

### **Which software will we use?**

It really depends on the project and your familiarity with software packages. This course is software agnostic, meaning most software packages are acceptable. The course does not have as a goal to teach a particular package, but rather to enable analytics in a business project. You are welcome to use software of your choice. Most projects can well be completed with a combination of Excel and one statistical package. If you are unsure or unfamiliar with statistical software, we will discuss that during our first meeting. Some packages may have a minimal cost.

### **What about the data?**

To make this experience valuable to the students and the to solve the business problem at hand, we do need access to data. It is important that the data be available before the project begins. Additionally, the project should make use of “scrubbed” data, that is data that is free of specific information that would be sensitive or otherwise governed by a law, such as social security numbers of customers or names of customers.

### **What types of business problems can be considered?**

As analytics is helpful in many business functions, we are open to many applications of analytics. Specific business problems in marketing, forecasting, customer segmentation, pricing, commodity analysis, logistics, risk management, operations, inventory leveling, supply chain improvement, and scenario planning are sure to provide great analytical opportunities.

### **Will the analysis become public?**

The work between the students and your organization is considered confidential. If necessary, the students may be asked to sign a non-disclosure agreement. If this is necessary, we ask that the non-disclosure agreement be such that it does not prevent the students from seeking employment or from building on their experience gained on the project.

From time to time, such company-student projects lead to very interesting business lessons. As a leading business school, we are interested in sharing such lessons with our next generation students and business leaders. We do this through business cases. If such an opportunity exists with your project, we will seek your permission to relate the business lesson through a case study.

### **How to I join the Class?**

First, you must meet the prerequisites. Then submit your application to Professor Russell Walker before the deadline. The application is used to build teams, assign you to one of your top project choices.

### **Contact Information**

Please contact Russell Walker, Ph.D.

Via e-mail at [russell-walker@kellogg.northwestern.edu](mailto:russell-walker@kellogg.northwestern.edu)

# **SPRING 2019 ACL PROJECTS**

# CHANGING TASTES

## CHANGINGTASTES.NET

### **A Cellular Future.... will “manufactured meat” become part of our future? And what will it mean for Real Animals and Farmers**

Venture capitalists, animal welfare organizations, some of the most forward looking innovators and corporate partners are all excitedly leaning into cellular agriculture and making replacements for animal products including meat and fish first in the lab and perhaps then in the factory without involving animals or killing them. While cultured meat may be a better term than “lab grown” or “brewed,” which quickly disappeared, the fundamental shift is towards manufacturing something that used to be grown and done so in more diverse locations by both big and small producers. **With this project, we answer the question: *What will the transition look like over perhaps 5-10 years. What will the ability to produce cellular meat and fish mean for the land, the environmental impact of livestock production, and the smallholders who have been raising animals or fishing for them.*** How? By finding 3-4 case studies where other sectors have moved from distributed to centralized, from reliant on natural conditions to separated, and describe the transitions, then make some predictions about both cellular companies and traditional producers and legacy companies.

### **A New Food World: Can the Best Known Early Stage companies all succeed...and what happens if they do?**

In recent years, food is one of the most active areas for scaling up new and disruptive business models and attracting the interest and support of investors. And business and food media are full of announcements about companies that intend to dramatically change how we eat, or at least a portion of us eat some of the time. From meal kit delivery businesses like Blue Apron, Amazon, Chef Jet and Hello Fresh that intend to deliver complete meals to our homes and replace both restaurants and grocery stores, companies like Sweet Greens or Roti that intend to be the next Chipotle of one type of cuisine or another, BrightFarms and AeroFarms that will change our relationship to salad (and leafy greens) to Shake Shack and Fat Burger which intend to make their better burgers so irresistible we eat them more often, along with a host of other business models that are about delivering a meal that is somewhere between partly assembled and fully cooked and ready to eat. ***So the question is: if all this disruption occurs and these***

## SPRING 2019 ANALYTICAL CONSULTING LAB: MECN 615

Department of Managerial Economics and Decision Sciences  
Kellogg School of Management • Northwestern University

Professor: Russell Walker

***startups achieve what they've promised their investors and the market , how will we eat, what will our dietary patterns or habits look like, can they all win (or are they forecasting to sell us more than we can eat) and what will happen to larger legacy companies, and are there enough eating opportunities to go around ?***

### **Genetically Modified Organisms (GMOs): Understanding Value Creation in the GMO and agricultural technology segment**

A recent study by the USDA Economic Research Service concluded that GMO soy and corn have not increased per acre yields over the past two decades but did increase the use of glyphosate, a chemical pesticide in Round Up that is now detected in breast milk and tentatively linked to the rise of gluten intolerance (not a major health concern, but noteworthy). The larger issue is that GMOs have created patentable intellectual property in the agriculture sector, which previously lacked vehicles to create value through information. If not on the field, then where is wealth shifting or being created by the advent of GMOs among companies that sit in the farm input to major food production/processing supply chain. How as intellectual property as a share of valuation shifted among supply chain segments, and/or has the introduction of patentable intellectual property created new value.

**One of the above projects is available for the term. The team may choose and should specify in their application. Arlin and Changing Tastes are ACL alumnus clients!**

# THE Q5

## WWW.THEQ5.COM

**NFL Game Predictions - Further Improvements to A Unique  
and Successful Data Science Model**

**Dr. Andy Guyader**  
[www.theq5.com](http://www.theq5.com)

In May, the United States Supreme Court overturned the Professional and Amateur Sports Protection Act and now states have the legislative authority on sports gambling. The market is expanding - creating more opportunities to attack market imbalances that may exist, especially in early-week NFL spreads. This project aims to improve an already profitable game point differential predictive model for NFL games. Drive data performance, game and team analysis are incorporated in a novel non-linear multi-dimensional optimization model. A generalized reduced gradient solver produces an optimal solution over the 32 team space, uniquely taking into account the quality of opponents.

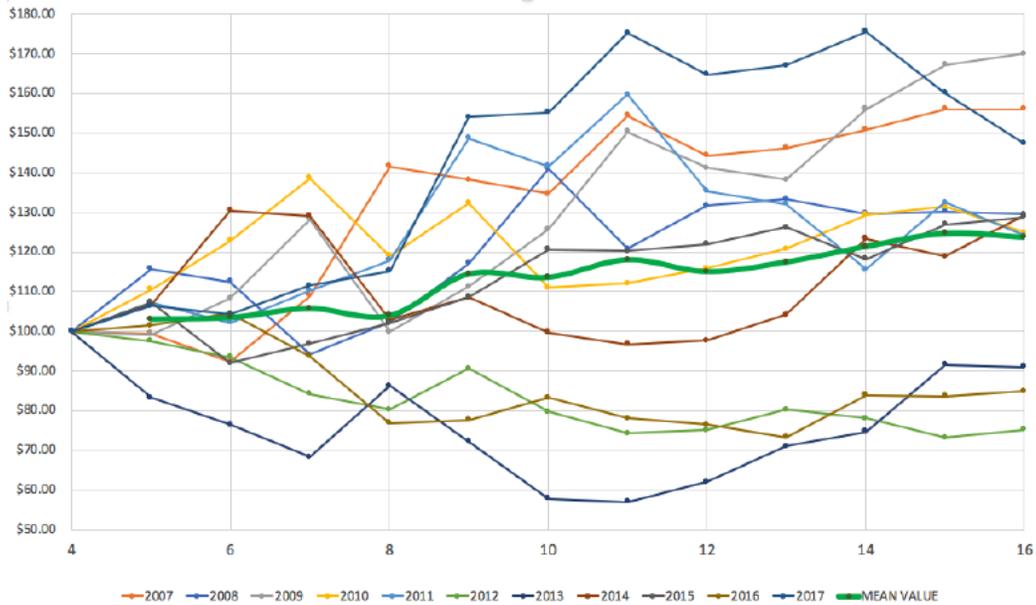
The point prediction model was trained on only four years of complete regular-season NFL data and executed in real-time during the 2017 season. Model version 1.0 in 2017 recorded a 26-12 record and a mutual fund style betting model produced a 38-percent Return On Investment (ROI), including the vigorish. In preparation for the 2018 season, training was implemented on all 11 years of data: 2007-2017. Historical analysis shows improvements in fund model ROI, a t-stat calculation nearing 2.75 and an expected number of games triggering to near 75. Historical analysis and week to week fund visualizations are shown in Figure 1. These numbers top all journal published models dealing with point spread betting.

Improvement for the model exists in several areas of study - the gradient solver, the current game and team covariates as well as increasing the number of them, implementation of Kelly Criterion for the betting mutual fund model, creating in-season variations to the model, the inclusion of injury data and several others. No data management will be required unless new data is introduced. Currently the data set includes over 100,000 lines of drive data in chronological order with starting field position, plays, yards covered, drive result and unique IDs for game and drive. Game score results are also included.

# SPRING 2019 ANALYTICAL CONSULTING LAB: MECN 615

Department of Managerial Economics and Decision Sciences  
Kellogg School of Management • Northwestern University

Professor: Russell Walker



Year	W/L outcomes				Bet %	Betting Units			Mutual Fund \$100	% return	Avg last 3 yrs	Avg last 5 yrs	High Pt. - Year	Low Pt. - Year	Actual \$ Used
	Bets	Over 50%	wins	losses		IN	OUT	Diff							
2007	64	4	34	30	53.1%	131	161	30	\$ 157.15	57%			\$ 157.15	\$ 92.32	-\$48.30
2008	82	6	44	38	53.7%	160	180	20	\$ 130.57	31%			\$ 141.81	\$ 94.37	-\$37.72
2009	67	11	39	28	58.2%	141	175	34	\$ 170.11	70%	\$ 152.61		\$ 170.11	\$ 99.20	-\$35.06
2010	73	7	40	33	54.8%	154	174	20	\$ 125.96	26%	\$ 142.22		\$ 138.99	\$ 100.00	-\$41.80
2011	68	4	36	32	52.9%	157	174	17	\$ 125.05	25%	\$ 140.38	\$ 141.77	\$ 160.67	\$ 100.00	-\$28.99
2012	64	-2	31	33	48.4%	133	124	-9	\$ 75.63	-24%	\$ 108.88	\$ 125.47	\$ 100.00	\$ 73.50	-\$52.96
2013	72	0	36	36	50.0%	154	157	3	\$ 91.69	-8%	\$ 97.46	\$ 117.69	\$ 100.00	\$ 57.18	-\$62.26
2014	78	14	46	32	59.0%	177	197	20	\$ 130.51	31%	\$ 99.28	\$ 109.77	\$ 130.79	\$ 97.19	-\$35.85
2015	54	10	32	22	59.3%	116	128	12	\$ 129.65	30%	\$ 117.28	\$ 110.51	\$ 129.65	\$ 92.08	-\$38.70
2016	52	-2	25	27	48.1%	116	106	-10	\$ 85.32	-15%	\$ 115.16	\$ 102.56	\$ 104.62	\$ 73.50	-\$50.02
2017	69	9	39	30	56.5%	144	170	26	\$ 148.52	49%	\$ 121.16	\$ 117.13	\$ 176.95	\$ 100.00	-\$44.00
sum	743		402	341		1583	1746	163	\$ 1,370.16						
averages	67.5		36.5	31.0	54.1%	143.9	158.7	14.8	\$ 124.56	25%					
Standard Dev					4.0%			14.63	\$ 29.71						
11					betting units win %:	55.1%	T-stat:	2.74							

Figure 1: Model version 2.1 at 2% bet per unit trained on previous 11 seasons

**The effort will focus on improving ROI and investment decisions in predicting football outcomes, from the perspective of an investor.**

**Dr. Guyader and theQ5 are ACL client alumni clients!**

# **ELEMENT BARS**

## **ELEMENTBARS.COM**

Amazon's marketplace has lowered the barriers to entry for new products and also provides unprecedented data to new and emerging trends. Many of the new food brands we work with decide to launch on Amazon first and may choose Amazon as their only distribution channel. As a contract manufacturer, we would like to develop "Library recipes" that closely follow these key trends. The goal would then be to partner with a "trend troll" with Amazon expertise and launch a few similar products.

The output would be to identify 6-12 new bar products on Amazon with key attributes. The data would come from either Amazon sales data directly or a 3<sup>rd</sup> party software interface like Jungle Scout.

**Elements Bars and its CEO, Jonathan Miller, are alumnus clients of the ACL! Jonathan is a Kellogg alumnus!**

# **BROWN BROTHERS HARRIMAN BBH.COM**

## Project Description:

Brown Brothers Harriman Private Banking (BBH) is a \$34B wealth manager and advisor for private business owners and affluent families. As our business grows, we continue to seek new segments of clients to serve and partner with. As we continue to try to anticipate the next generation of wealth, we'd like to understand where wealth will be created over the next decade. The question to answer is over the long-term, where should we consider dedicating resources

What will be the profile of newly created wealth in the US in 2030?

Age? Family size? Needs?

What sectors will be producing the most wealth in the US?

What will become of major urban centers (e.g. NYC, SF)? Will they grow?

The answers to these questions should be based in data, particularly macroeconomic and capital markets data, including but not limited to: IPOs, corporate data, census data, real estate values, etc.

**BBH and Nick of the ACL! Nick is a Kellogg alumnus and class alumnus!**

# AZUL BRAZILIAN AIRLINES

[WWW.VOEAZUL.COM.BR](http://WWW.VOEAZUL.COM.BR)

## Company Background

Briefly describe your company's business, your major product and service lines, and the markets you currently serve.

Azul is the largest airline in Brazil in number of flights and destinations served, and the third largest by capacity. We serve approximately 110 destinations mainly in Brazil but also in the US, Europe and South America. We also have other relevant business units for loyalty, cargo and travel packages.

What year was the company established, and how would you describe its stage of development (e.g.: start-up, early stage, mature, etc.)?

Azul is celebrating its tenth anniversary this year and is a well-established player in the aviation market and one of the 100 largest companies in Brazil. Still we remain very much in growth mode, increasing capacity by about 20% per year.

How many employees does the company currently have?

Approximately 12,000.

## SPRING 2019 ANALYTICAL CONSULTING LAB: MECN 615

Department of Managerial Economics and Decision Sciences  
Kellogg School of Management • Northwestern University

Professor: Russell Walker

### Project Description

Describe the business challenge or opportunity that you are looking for the student team to help you solve. (Please note that the most attractive projects are typically those of high priority to the client company and center around issues of corporate strategy, marketing, finance and/or operations.)

Azul's Revenue Strategy – Azul's revenues are primarily in BRL, while 50% of our operating expenses are linked to the USD. When the BRL depreciates against the USD, this impacts our operating margin in the short term. But we have been able to recover our profitability in the medium term by increasing fares and also pursuing ancillary revenue opportunities.

We would like the team to analyze how our fares are influenced by factors such as the exchange rate, economic activity, seasonality, competitive behavior etc. most likely through multivariate regression analysis.

We would also like the team to consider possible new potential sources of revenue, studying Azul's market demands and benchmarking what other airlines and other industries have been pursuing around the world.

What are the key deliverables that the team should provide at the end of the project?

- An analysis of the main drivers of Azul's average fares
- A recommendation and estimated size of new revenue opportunities to pursue

**This project is sponsored by the CFO of Azul, a Kellogg Alumnus!**

**Azul is a client alumnus of ACL!**

# **QANTAS AIRWAYS**

## **WWW.QANTAS.COM**

The Qantas Frequent Flyer program is one of the leading coalition loyalty programs in the world and often viewed as a benchmark to other airline loyalty programs on how it can extend and grow to be a profit-generating business in its own right. In Australia, we are the market leader and have over 12 million members in a country with a population of only ~25 million. In addition, a significant proportion of our members reside outside of Australia and we are looking to see how we can improve our offering for these members.

### **Scope of Work:**

**Research and analyse the loyalty program market and competitive landscape in the USA and Europe (both airline and non-airline loyalty programs)**

**Identify and articulate the strategic options available to increase member engagement and business profitability in these two regions**

**Recommend a member engagement and market entry strategy tailored to each region (and potentially sub-region, where relevant), including any potential local partnership opportunities**

### **Deliverables:**

**Summary of analysis and findings**

**Proposed recommendations for Qantas Frequent Flyer program expansion into the USA and Europe**

## **SPRING 2019 ANALYTICAL CONSULTING LAB: MECN 615**

Department of Managerial Economics and Decision Sciences  
Kellogg School of Management • Northwestern University

Professor: Russell Walker

---

### **Key Contacts:**

**Head of Loyalty Program Design - Qantas Loyalty**

**Manager Loyalty Program Design - Qantas Loyalty**

**Head of Member Engagement Marketing - Qantas Loyalty**

### **Confidentiality:**

**Handling of data and sharing of findings would need to be treated with confidentiality (likely under an NDA similar to last time, which we can discuss further)**

**Qantas is an alumnus client of the ACL!**