Background on the Analytical Consulting Lab

The Analytics Consulting Lab (ACL) is part of the Foster experiential learning initiative. The specific interest in the Analytics 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.

READ THIS!!!!!! Course Expectations

Analytics 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 Foster MBA students to get real-world experience in consulting and in applying analytics and market measurement techniques to actual business challenges and opportunities.

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.
- 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 MKTG 579, a full credit course.
Most projects in the ACL are sponsored by Seattle-based firms, professional contacts of Dr. Walker, and alumni of the school, 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.

Information about Dr. Walker’s course at Kellogg can be found at: http://kellogg.northwestern.edu/faculty/walker/htm/acl
You might look at student videos to learn about their experiences and thoughts on how the course helped in the professional development.

This course is now at Foster. Join us and make it a great tradition here!

Application Process
Students interested in the ACL must select MKTG 579 during elective bidding. Once in the class, email Dr. Walker of your:
• Project Choice #1
• Project Choice #2
• Any fellow desired 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 5) 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. 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:


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. 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  

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, Tableau  

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

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
MKTG 579: Winter 2020 Analytics Consulting Lab
Russell Walker, Ph.D.
Foster School of Business

- Quality of presentation
- Professional impact of the presentation
- 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.
Role of the Team

The team will consist of 3 to 5 Foster 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 400-500 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 in other MBA programs. 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 a statistics class. There are no other requirements.

Some FAQs:

What is the Analytical Consulting Lab?
It is a course available to Foster 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 Analytics 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.

**How does this experience benefit the students?**
Foster MBA students taking the ACL will work on a real-world problem under the direction of Dr. Walker. 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 Analytics field is one of the most demanded in the workforce and students have expressed deep interest in developing strong skills in analytics. This course meets an interest in our students and provides them an exceptional experiential learning opportunity.

**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 5 will commit about 500 working hours to the project. Additionally, the student project will be overseen by Dr. Walker, who has 20 years plus experience and deep 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 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 project selections to Dr. Russell Walker upon entering the course.

Contact Information
Please contact Russell Walker, Ph.D.
Via e-mail: rwalker1@uw.edu
WINTER 2020
ACL PROJECTS
Changing Tastes

Project 1: Understanding Protein Choices

Protein is the macronutrient of the moment. Americans are consumed with eating enough protein, as we've become fearful of fats and carbs. Simply adding the word "protein" to a food item almost guarantees higher sales. But beneath the surface, Americans aren't just eating more protein. We're also undertaking a rare transformation in what proteins we eat. Red meat consumption is declining and, despite the headlines, chicken and not plant-based foods are gaining market and belly share. This is the consequence of a decades' long effort by all types of protein producers — beef, pork, poultry, dairy and more recently fish and shrimp farmers — to more efficiently produce protein, and farmers also are becoming more efficient at producing corn and soy for animal feed.

What role has efficient production and price had on consumption? At what point has the relative price of different proteins resulted in change in what we eat and how does price compare as a driver of diet compared to the "headlines about to current consumer tastes, cultural preferences and concerns about our diet and health, antibiotics, and other factors. With this project, we hope to answer the question: how does the price of different proteins affect our food choices and diet as a nation? And what further price changes would be needed to raise up shrimp, plant-based, or other less popular proteins to be the new national favorite?

Note on Data and Analysis: Students will download and assemble price and consumption data on protein (from various US governmental sites) and through analysis develop insights on protein trends in the US overtime and what this says about the future.

Project 2: Fishing for Plastics

Is plastics the future of the global fishing industry? Scientific studies regularly highlight that the world's commercial fisheries are largely at or above their peak yields, and many are being overharvested and will soon collapse. Recent studies about the impact of climate change and ocean acidification indicate the global wild-fish harvest will decline by at least a third in the coming decade or so. Forecasts show that by about that time the oceans may even contain more plastic waste than fish by weight. So here's the challenge: can we convert some of the world's industrial fishing fleet to instead reclaim plastics? And based on what we know about the market for both, at what price should plastics be bought
to make that transition a viable one, and what industries are best suited to make the market and repurpose reclaimed ocean plastics?

Note to the team who are considering this project: This is a BIG idea that may become a new feedstock for today's plastic or other industries and also be included in national and international efforts to subsidize the transformation of the legacy fishing industry. This is also a way to preserve the livelihoods of coastal economies as wild fishing declines and also becomes more expensive, while farming or cellular aquaculture gain market share.

**Note on Data and Analysis**: Focus will be on the price and viability of recycled plastics. The team will do various price sensitivity analyses.

**Teams may select one of the projects**.

Arlin Wasserman and Changing Tastes are each ACL alumni clients my Kellogg program!
Element Bars

Selling Health Bars on Amazon

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 3rd party software interface like Jungle Scout.

Note on Data and Analysis: Element Bars will have data about their sales on their own online channel. Through comparative analysis, the team will identify best options for Amazon selling. This is a great project to explore and learn about how to sell on Amazon. It involves a lot of decisions. Be part of that!

Jonathan is an ACL alumnus and Element Bars are an ACL client alumnus firm from my time at Kellogg!

Check out Jonathan Miller on Shark Tank! He killed it. You get to work with him.
Project 1 Supply Portal Business Case: Car rental suppliers come in many shapes and sizes. Some are big, sophisticated, and fully automated; others are small, highly manual operations. All of them want to learn from our data sets as an online travel agency, and all of them want to make sure that the data we get from them is up to date and accurate. We would like help building out a product proposal and business case for a supplier portal on our technology stack. Work would entail teardowns of similar functionality from other Expedia brands, interviews of supply account managers, design work, sizing, and NPV analysis.

Project 2 Marketing Placement Strategy and business plan: currently CarRentals does not put a lot of investment into displaying marketing messages from our suppliers to our customers (for instance, while customers are waiting for search results to be returned). We think that there could be a lot of value in developing a media management solution. Work would entail competitive teardowns, interviews of media teams at Expedia, supply team interviews to assess demand from suppliers, tool analysis to see what’s out there to manage this, development of a pricing sheet, and a business case.

Project 3 Payments Business Case: CarRentals currently accepts credit cards only as payments; but there is a whole world of potential payment options out there. We could accept international payment cards, bitcoin, or wire transfers. There are tools out there which can help us accept these payments types. Work would entail analysis of these tools, competitive teardowns, interviews with technical leaders to ascertain expected engineering costs, and the development of a business case.

Project 4 Customer No Shows: The hitch with a “pay at the counter” (postpaid) car rental business is that ~50% of customers do not pick up their car, and there is no disincentive for this. When a customer does not pick up their postpaid car, we do not make money, and conversely, when a customer picks up their car, we make money. As a company, we have not made efforts to optimize this part of the business, but the time is ripe to tackle this opportunity. Every incremental customer picking up their car goes straight to our bottom line with nearly no cost. “No Shows” is a green field, and we would like your help develop a comprehensive business strategy that optimizes this piece of the customer journey and ultimately leads to an increase customer show rate. Work would entail competitive teardowns, interviews with product, marketing, analytical, and
tech leaders, design recommendations, data analysis, and other activities that will enhance our “show” opportunities.

Teams may select from the projects listed or possibly some combination of these that is feasible.

CarRentals.com is a Seattle-based entity owned by Expedia. The project team includes alumni of Professor Walker’s Kellogg programs. CarRentals.com is excited to join the Foster ACL program!
MINDSPAND.com
Developing Online Marketing Channel Choices

Mindsand is a local startup building a lifelong learning community that helps people learn anything, anywhere, at any time. We have courses that range from technical and professional learning to cooking classes. We have courses that are one-hour workshops and courses that span multiple weeks. We help people navigate in person, online, and on-demand classes. We have found in our efforts to bring customers to our site that different marketing channels work best to draw people to different courses. For example, a hand lettering class brought most of its referral traffic from Facebook campaigns, while an introduction to developing programs for Amazon Alexa did best through Google search.

We are looking for a team to help us define the best campaigns to bring people to our site. What are the channels and forums we should look at beyond Google, Facebook, Instagram, and Pinterest? What should the campaign copy and target audience be? How can we get our customers to be more engaged to draw out the communal aspect of lifelong learning? We can make available data from various platforms to help in this effort – both channel-specific information as well as Google Analytics details to show the customer flow through our site. Teams will have regular access to Mindsand’s co-founders (CEO and CTO) as part of this project.

**Note on Data and Analysis:** The team will need to process Mindsand performance data and look to best practices to develop a compelling marketing channel strategy. This is also a great opportunity to learn about starting a new firm from two local entrepreneurs.

Mindsand and their founders are Seattle-based and great supports of UW!
Predicting Cloud Economics: Snowflake vs AWS

The cloud-based data warehousing industry has exploded in growth in recent years. The market leaders in cloud computing and data warehousing are Seattle-based Amazon Web Services (AWS) and Microsoft Azure. A new market entrant, Snowflake, which has raised over $1 billion in capital has created a new set of capabilities in its cloud-based data warehousing. It has been signaled that Snowflake will be part of Google’s new effort to rebuild its cloud business. Snowflake has gained a surprisingly large capital and customer following. It is believed that their approach to secure data discovery and sharing is changing how cloud-based data warehousing operates.

In this study, you will work with Val Razyman. Val lives in Seattle and is the former CEO and founder of two self-funded data warehouse firms, each of which he sold successfully. He is an international expert in data warehousing. The focus of the study is to examine the pros and cons of Snowflake and compared to AWS and to developed an economic model for the operation of these cloud-based systems.

Note on Data and Analysis: The team will need to research Snowflake and AWS and summarize work and findings in a report, while also developing a first-generation economic model for each.

Val is a serial entrepreneur and friend and supporter of UW.
NFL Game Predictions - Further Improvements to A Unique and Successful Data Science Model

Dr. Andy Guyader
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.
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 from my Kellogg programs!