

ANALYTICAL CONSULTING LAB CANDIDATE PROJECTS

Welcome to the Analytical Consulting Lab!

In the following pages, you will find candidate projects from sponsoring companies under the Analytical Consulting Lab. In addition to the listed projects, I expect projects to be confirmed with HSBC Holdings North America, PepsiAmericas, and Deere. Details on projects with Grainger and the Chicago Mercantile Exchange are being finalized very soon.

The projects listed include working with actual company data, developing meaningful analytical models for managerial decision-making, and presenting results and recommendations to company executives. Most projects will require some level of Non-Disclosure Agreement (NDA) with the sponsoring company.

Please feel free to contact me at
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with any questions and interest

Please take a moment to visit the Analytical Consulting Lab on the web at:

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

Thanks for your interest.

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OBERWEIS DAIRY STORES
WWW.OBERWEIS.COM**Candidate Projects**

The following projects are available with Oberweis Dairy Stores, sponsored by Joe Oberweis, President and Kellogg EMP Alumnus. Student groups may work on any or any combination of these projects.

List of Projects

1. Does the Oberweis loyalty program pay for itself?
2. Develop the strongest model possible for predicting the success of retail Oberweis store locations by studying site attributes that are observable *prior* to committing to a site that best predict annual revenues from any given location.
3. Develop a tool to identify underserved geographic areas and a methodology to successfully target those potential customers.
4. We need to get a better handle on who our store customers actually are and what needs they're really looking for us to fill. Our current and future secret shop is based on what we think is important to our customers, but maybe we're wrong and need to change our own paradigm. This project would entail conducting market research and analyzing results to determine what needs we are currently fulfilling well and what we may be missing.
5. Should Oberweis expand its commitment to growing the wholesale channel of distribution? What is the long-term impact on Dairy stores and Home Delivery? Does it help or hurt?
6. Develop a model for evaluating pricing decisions looking at volume response in each channel. What is the expected impact in wholesale, home delivery and/or dairy stores?
7. Analyze business unit profitability (home delivery vs. dairy store vs. wholesale).
8. Analyze expansion potential
9. Analyze pricing policy
10. Take a look at our roughly 1,000 wholesale customers and our 50 retail stores (all of which are delivered from the same type of truck) and built a routing system for efficiency.

THE NIELSEN COMPANY
WWW.NIELSEN.COM**Candidate Project**

The following project is available with The Nielsen Company, sponsored by Jon Busman, Nielsen executive and Kellogg EMP alumnus.

Analysis of Product Marketing in Retail

Represent a manufacturer position with specific objectives around end-cap displays, planogram changes, and holiday promotions to be presented to Retailer X's buyer for an optimal quantitative & quantitative solution.

The live data provided by The Nielsen Company and include

- Category background including overall category dynamics, key competitors, and retail environment.
- Top-line volumetric trends for category, key segments, and key brands
- Consumer demand estimations by product by store
- Shopper profiles by store and categories
- Diagrams of the shelf set (Planogram)

**WILLIAM BLAIR AND CO.
WWW.WILLIAMBLAIR.COM****Candidate Projects**

The following projects are available with William Blair and Co., the largest investment bank in Chicago. Projects are sponsored by Scott Stevens, William Blair executive and Kellogg EMP alumnus.

1. Performance of micro-cap companies in the “micro-cap trap”.

Companies whose market cap has drifted down to micro-cap status face a number of structural issues that impact their stock price and often long term prospects. William Blair has conducted a preliminary analysis on this dynamic (see attached). Specifically we would like to collaborate with an Analytical team to expand and strengthen this study to address a few primary questions: (i) do MicroCap stocks trade at lower multiples than larger capitalization stocks and what are the fundamental issues relating to the equity capital markets that result in stock price underperformance and (ii) what strategies can managers of MicroCap businesses employ to overcome this underperformance and deliver acceptable returns to shareholders?

2. Performance of individual stocks based upon listing exchange.

Conduct a statistical analysis of the performance of companies who list on a given exchange. Key questions to answer: (i) is there a difference between the performance of those companies who list on NASDAQ vs NYSE (ii) is there a measurable stock performance impact for those companies that move from NASDAQ to NYSE, (iii) is there a measurable share price increase for those companies who move from an international exchange to NASDAQ or NYSE, and (iv) what is the relative performance of those companies that are dual listed.

3. Performance of companies who institute buybacks.

Analyze the relative performance of those companies who announce buybacks over the short term and long term. Is there any variation in performance based upon (i) the type of buyback (tender offer, Dutch auction, open market, etc.) or (ii) the amount of shares actually bought back relative to amount initially authorized.

**FIRST ANNAPOLIS
WWW.FIRSTANNAPOLIS.COM****Candidate Project**

The following project is available with First Annapolis, LLP, a consulting firm specializing in servicing the credit card industry, payment technology firms, and other participants in the credit card industry. The project is sponsored by Paul Grill, Partner at First Annapolis, LLP and Kellogg alumnus.

Analysis of the US Credit Card Portfolio Under Economic Stress

First Annapolis Consulting, Inc., the leading independent consulting and M&A advisory firm to the \$200 billion payments industry, will be providing a real world case study the analytical consulting class. The case study will be focused on using Analytical to evaluate the impacts of the overall economic environment on the performance of the nearly \$1 trillion dollars in credit card debt. More specifically, students will leverage historical data to identify and evaluate the key drivers of industry growth, losses, and profits based on factors such as pricing, industry concentration, funding costs, and unemployment rates. The resulting historical analysis will then be utilized to form a perspective on how credit card asset performance will be impacted by current market conditions.

First Annapolis will provide the majority of the data required for this analysis, particularly credit card industry data. Kellogg students under the direction of Professor Russell Walker will evaluate the data using a variety of analytical techniques. The results will be presented and discussed with a First Annapolis partner at the end of the term, and the analysis may be utilized thereafter by First Annapolis as part of its client communication and education materials.

UNITED AIRLINES
WWW.UNITED.COM**Candidate Projects**

There are three candidate projects with United Airlines. These projects are sponsored by Krishnan Saranathan, VP of Enterprise Optimization at United and a Kellogg alumnus.

Business Problem # 1

It is not uncommon for travelers to be a member of more than one airline's frequent flyer program. Travelers often choose flights based on a number of factors such as schedule convenience, price, corporate agreements, service and frequent flyer program. The proportion of total flights of a traveler on a given airline is termed as his share of wallet allocated to that airline.

United's frequent flyer program, Mileage Plus has about 40 million enrolled members. We would like to understand the share of wallet that these members are allocating to United and develop strategies for increasing share from our high value customers. Historical data for United-related travel activity is available at an individual member level. This includes information on destinations, routes, revenue paid, classes flown, flight timings, corporate tickets, upgrades, seats etc. Non-United travel is NOT observable; so in order to determine United's share of wallet, the total travel of each member needs to be estimated first.

Other useful information may include mileage plus status (elite, non-elite), length of membership, economy plus subscription, Mileage Plus credit card activity on hotels, restaurants and cars, profitability score, domestic vs. international travel, frequency of travel, and United airport lounge membership. Demographic information is limited to member location, email address and industry, if the member happens to be on a corporate contract.

Objectives:

- Identify large wallet but low share customers and develop targeting strategies for representative member segments
- Generalize the analysis to characterize high value customers with large wallet size and propose new customer acquisition strategies

Deliverables:

- Report discussing students understanding of the business problem, solution approaches, challenges and assumptions, data definitions, results of quantitative model, benchmarks with other techniques attempted, if any. A section on insights obtained and recommendations on the business objectives specified above, with supporting analysis and data
- Model prototype and detailed results archive

Organization setup and liaisons:

- United Mileage Plus division is the business partner for this project
- Enterprise Optimization will facilitate problem clarification, access to data and other logistics

Business Problem # 2

Mileage Plus is United's frequent flyer program that rewards customers' travel or partner spending with miles redeemable for future travel (free flights, upgrades) and perks with other partners. Customers' engagement with the program can be judged by how they earn and redeem their miles. For example, highly engaged customers earn miles frequently and tend to

have multiple ways for earning and redeeming miles while less engaged customers earn and redeem their miles less often and use fewer program options.

One of the primary goals of Mileage Plus is to target customers who are likely to stay engaged in the program and prevent their future cashing out of miles. We would like to understand the triggers for redemption and develop strategies for keeping our most valued customers engaged. It will be important to understand customers' behavior in between redemptions in order to identify the triggers for redemption.

Individual customer level data is available for analysis. Data includes miles balance, redemptions (free flights, upgrades, and other partners), total miles redeemed, first redemption, frequency, elapsed time etc. Data on miles earned includes rate of earn, sources of earn, total miles earned, distance from redemption hurdles, time since last earn etc. Other useful information may include Mileage Plus credit card activity on hotels, restaurants and cars, profitability score, domestic vs. international travel, frequency of travel, and United airport lounge membership.

Objectives:

- Identify common patterns of post redemption behavior of Mileage Plus members
- For each behavior segment, identify triggers for redemption activity and predict when a customer is ripe for an offer of redemption
- Recommend targeting strategies so as to engage truly valuable members

Deliverables:

- Report discussing students understanding of the business problem, solution approaches, challenges and assumptions, data definitions, results of quantitative model, benchmarks with other techniques attempted, if any. A section on insights obtained and recommendations on the business objectives specified above, with supporting analysis and data
- Model prototype and detailed results archive

Organization setup and liaisons

- United Mileage Plus division is the business partner for this project
- Enterprise Optimization will facilitate problem clarification, access to data and other logistics

Business Problem # 3

Economy plus one-time option, Premium Cabin up sell and Red Carpet Club one-time pass are some of the travel options offered by United to travelers (<https://store.united.com/enhancements/control/main>).

These travel options are currently being offered using basic inventory control logic and mileage-based pricing policies. For example, a certain percentage of economy plus seats are reserved upfront for elite Mileage Plus members on all United flights. Remaining seats are offered to travelers for anywhere between \$14 and \$149 depending on the length of their flight.

There is huge revenue upside by developing optimal pricing strategies and incorporating revenue management practices for managing the inventory of these travel products. We would like to understand the customer value proposition for Economy plus one-time option and develop strategies to maximize the revenue generated from this product.

Objectives:

- What are the key market /customer segmentations to be considered for defining the optimal pricing model for Economy plus one-time option? What is the price elasticity of demand based on the proposed segmentations?

- Utilizing the framework developed above, propose a methodology to forecast the demand for Economy plus one-time option.
- Assess the risks in implementing such a model.

Deliverables:

- Report discussing students understanding of the business problem, solution approaches, challenges and assumptions, data definitions, results of quantitative model, benchmarks with other techniques attempted, if any. A section on insights obtained and recommendations on the business objectives specified above, with supporting analysis and data
- Model prototype and detailed results archive

Organization setup and liaisons:

- United Merchandizing division is the business partner for this project
- Enterprise Optimization will facilitate problem clarification, access to data and other logistics

SEARS HOLDINGS
WWW.SEARSHOLDINGS.COM**Candidate Project**

The candidate projects with Sears Holdings is sponsored by Kurt Kendall, VP of Enterprise Decision Analytics and has visibility with the head of corporate strategy.

Project Description #1
Sears Project Proposal**Real Time Offer Enhancements Base on Basket Content****Background:**

Sears has real time offer capabilities at the point of sale (POS) where customers are given customized messages/offers/coupons. The current program relies on past customer demographic and purchase behavior and is primarily focused on driving purchase behavior change with secondary focus on promoting with seasonal events. Example campaigns include cross shop (incenting customers to shop in other departments), basket expansion (incenting customers to spend more in categories they do shop), life stage (incenting customers to fulfill needs at sears for specific life stage changes – just moved, new baby, just married, etc...) In 2009 current basket content information will be made available to the offer engine currently in place.

Project:

The project is to research, propose, and proto-type/test various means of incorporating this new information into the customization or arbitration of offers for customers at POS. Exploration concepts may include but need not be limited to:

- Item, line, or category level collaborative filtering or affinity modeling (people who bought this also bought...)
- Inferred context and influence on purchase probability (appliance buyers may be duress or remodel customers – how can we infer this from the data? – how can we use this in designing offers? -- How can we infer a gift purchase vs. a personal or replacement purchase? What are the implications on offer design?)
- Offer arbitration or ranking enhancements based on basket content (design logic or algorithms to choose the most relevant offer from a list of pre-loaded offers)

Project Mile Stones

- Research brainstorm and category scoping
 - Arrive at two or three ideas to explore
- Exploratory data analysis
 - Refine hypotheses with real data exploration
- Model/rules development
 - Develop predictive/contextual inference model or rules based algorithms
- Model/rules validation
 - Validate or test model/rules based on past shopping behavior
- Results presentation and real market test plan
 - Final report on models/rules, validation, and a real world in market test plan to be implemented late 2009 after technology changes are complete

Project Description #2
Kmart Project Proposal**Brands to meet the needs of the Kmart customers****Background:**

Kmart has an opportunity to leverage Private Label and National brands to fulfill the unmet needs of targeted customer segments, to bring in incremental traffic, and to increase EBITDA.

However, we currently do not have sufficient clarity on the exact portfolio of brands needed to achieve our business objectives.

Project:

The project is to research and then recommend a brand portfolio strategy for a particular category (e.g., apparel) that indicates what brands should be in the assortment, what customer segments will find these brands appealing, and how we should go about shifting from our current mix to the one proposed.

- Using data from our Customer Data Warehouse (CDW) identify profitable brands that would meet the needs of our core customers. What brands bring in an incremental customer? What brands drive incremental traffic? What brands are most profitable?
- What mix of brands and private label are most profitable and drive incremental traffic for Sears and Kmart? What is the right mix to defend the core (drive more share of wallet of the existing customer) to protect and grow the base business as well as attack the new (drive incremental customers, traffic into the store).
- Identify the success criteria and how success will be measured (incremental customers, increased traffic, increased EBITDA).
- Create profitable effective marketing strategies for each target segment

Project Mile Stones

- Identify profitable brands (both national brands that increase credibility and celebrity/exclusive brands that generate buzz/excitement) that meet the needs of these segments
- Optimize the mix of national brands that increase credibility, celebrity/exclusive brands that generate buzz and private label that would generate the most overall profitability for the format and drive incremental traffic to the store
- Compare and contract to competition to ensure product is just as fashionable at a better value
- Final report on recommendation to be implemented in 2010

SOCIAL COMPACT
WWW.SOCIALCOMPACT.ORG**Candidate Projects**

The following projects are available with Social Compact, a not-for-profit organization to provides economic analysis on low-income communities for the purpose of invite investment by retailers, banks, grocery stores, pharmacies, and the like. These projects are sponsored by Carolina Valencia, Director of Research and Development for Social Compact. The project is also sponsored by Clark Abrahams who is a member of the Board of Directors for Social Compact and advises on its use analysis to make compelling and honest statements about the economic vibrancy of communities otherwise overlooked.

More on Social Compact:

Social Compact is a coalition of business leaders from across the country who are promoting successful business investment in lower-income communities for the benefit of current residents.

For years, Social Compact sponsored the highly competitive and prestigious Social Compact Awards that recognized successful business performance and investment in America's under-served neighborhoods. Social Compact is now further leveraging its leadership's combined business expertise to address some of the key impediments to private investment in inner-city communities, namely, negative stereotypes – reinforced by poverty and deficiency data coupled with a lack of dependable business-oriented market information -- and an absence of effective inner-city market analysis models.

Social Compact addresses these issues through its inner-city neighborhood market analysis, the DrillDown, and through municipal and community trainings and consulting, and contributions to community development innovation.

List of Projects**1. Los Angeles Neighborhood Banking Analysis**

As part of its commitment to demonstrating the economic opportunities in lower-income neighborhoods, Social Compact has polled over 1800 families in three distinct predominantly Hispanic neighborhoods of Los Angeles. The data includes information on personal banking preferences, reliance on wiring of funds, family borrowing, and the need for banking services. The goal is to process this information to assess the opportunity for banking and financial service firms to enter these markets. The neighborhoods have different Hispanic compositions, such as one of recent immigrants and more established. The results of the project will be beneficial to the community and will likely provide evidence that additional services would be profitable in the community. There is no need to travel to the communities to successfully conduct the analysis, but students are welcome to perform a city visit.

2. Retail Leakage Analysis

As lower-economic neighborhoods are often overlooked by retailers, banks, pharmacies, and other major service providers, it is known that the phenomena of “Retail Leakage” occurs in such neighborhoods. In Retail Leakage, residents leave their immediate community to conduct business in surrounding neighborhoods. Quantifying the volume of such retail leakage out of the community is important and useful in developing a business case for investment in the community showing leakage. This project involves analyzing the leakage of sales from neighborhoods in any of the major Social Compact cities, including Miami, Washington, DC, Baltimore, San Francisco, Louisville, to name a few. Visit the web site www.socialcompact.org for a complete list of cities. It is not necessary to travel to the cities to successfully complete this project, but students are welcome to perform a city visit to support the work.

GRAINGER
WWW.GRAINGER.COM

Candidate Project

The candidate project with Grainger is sponsored by Yolanda Daniel, VP of Internal Audit at Grainger and Kellogg EMP alumna.

Fraud Detection

Grainger supplies millions of items and orders daily. As part of Internal Audit, an analytical model is needed to assess the likelihood that an order includes fraudulent (or at least erroneous) information.

**CHICAGO MERCANTILE EXCHANGE
WWW.CME.COM****Candidate Project**

The candidate project with CME is sponsored by Christopher Mead, Director at CME and Kellogg EMP alumnus.

Project Description

A more detailed project description is forthcoming, but this project will generally focus on how CME can analyze aspects of the trade data in the marketing to customers.