# Analytics Consulting Lab Syllabus Winter 2022

## 10-13-21 Update

**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.

## MKTG 579: Winter 2022 Analytics Consulting Lab
### Russell Walker, Ph.D.
### Foster School of Business

- **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.
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.

## 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 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 text is recommended and optional:
   1)  The McKinsey Way, Ethan M. Rasiel, McGraw-Hill
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
  - 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: | 35% |
| Professor Evaluation of Work plan and Mid-point review: | 20% |
| Client Evaluation of Final project materials and presentation: | 15% |
| Peer Evaluations and Participation: | 15% |
| Professor Evaluation of Preparation during meetings: | 15% |

**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 6 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 expected 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 2022 PROJECTS

# Seattle Kraken

## Marketing Analytics

Company Background

On December 4, 2018, the NHL granted the 32nd NHL franchise to Seattle Hockey Partners. Two years later, we revealed the Seattle Kraken brand to the world. As the newest addition to the Pacific Division in the Western Conference, the Kraken continues to prepare for its first puck drop in the 2021-2022 NHL season. In addition to the redevelopment of Climate Pledge Arena, Seattle Kraken are consecutively building their front office headquarters and training facility with three NHL regulation rinks at the Kraken Training Centre. This development represents not only further investment in making Seattle the epicenter of the Pacific Northwest but establishing a skating presence within the city for the first time in more than 40 years.

Problem/Challenge Statement

The purpose of this project is to develop customer personas for the Seattle Kraken fanbase. As a brand-new franchise, we would like to better understand our fans to develop ticket sales strategies, pitch new sponsorships, capitalize on ancillary revenue opportunities, and more. Additionally, we would like insight into the lifetime value of these personas, whether they represent a single-game ticket buyer, a season ticket holder, or a fan who roots on the team from home.

Successful completion of this project will help the Kraken curate better experiences for different segments of our fanbase and provide business leaders with insights into fan value beyond traditional ticket revenue.

Deliverables

· Development of (4-6) customer personas that represent the Seattle Kraken fanbase

· Lifetime value determination for each persona, based on current and future purchases on tickets, retail, food & beverage, concerts, etc.

Commitments

The Seattle Kraken will provide customer data and assistance as needed throughout the duration of the project.

*Alex Steinhoff (UW Foster MBA, Class of 2021 and ACL alumnus) will be the main point of contact for this project!*

# Seattle Seahawks

## Fan Experience Analysis

**Project:** Help the Seattle Seahawks create the best fan experience in sports

**Description:** The Seattle Seahawks have ranked in the top 5 in the NFL in surveyed game satisfaction in five of the previous seven seasons, including two #1 rankings. To continue this strong performance, the Seahawks collect as much data as possible on the gameday experience including sending a comprehensive survey to thousands of fans after each home game. The Seahawks are fortunate to have passionate customers that provide detailed and thoughtful feedback in these gameday surveys on topics ranging from concessions to security to guest services to game entertainment elements. The survey data has been used to drive numerous operational and structural changes in the stadium, as well as pricing for tickets and concessions. The Seahawks need your help to identify actionable changes and opportunities to improve the fan experience on gamedays using this rich data set. You will be provided with multiple years of individual survey responses from fans – geolocated to the fan's specific seat in Lumen Field. With this data, you will need to come up with specific recommendations to present to the Seahawks' Business Strategy & Analytics team based on identified trends or isolated weak spots.

**Hints:**
• Each question is standalone, including the "overall gameday satisfaction" question and "overall" question for each

     gameday element (F&B, security, arrival, technology, etc.). Which gameday element has the most influence on the fan's answer to the "overall gameday satisfaction" question?

• Can you enrich the data with publicly available data such as weather data, day of the week for the game, kickoff time for the game, and game results (win, loss, blowout) to uncover other insights?

• Summarizing the data by section is a helpful way to organize the data and isolate issues pertaining to specific areas of the stadium.

• Single game buyers are generally more generous in their assessment than season ticketholders.

Think about the impact of certain recommendations: i.e., fans will always complain about pricing of concessions, but dropping the price will result in more demand and longer lines plus declining revenue.

# Changing Tastes

## Food, And Environment Economics

**Project 1: What Should We Eat Next? How Will the Long-Term Effects of COVID19 Reshape Innovation in the Food Sector?**

The U.S. is the world's consumer largest food market. Before COVID, $1 out of every $4 spent on eating out globally was spent in the U.S. and about $1 out of every $5 on food overall. For decades, the playbook for introducing new foods, producers, cuisines and other kinds of eating habits in the U.S.: have chefs at independent restaurants put something new on the menu, if it works, larger corporate restaurants copy them and offer it to millions of diners in a low risk environment: order it, see how its cooked and see if you like it. Then buy it and make it at home. In store sampling in grocery stores also helped with more familiar foods, such as items with new flavors.

Then COVID 19 changed it all. Over 10,000 independent restaurants closed and many fear that 20,000 more will close if another there's another winter wave of reduced occupancy or diner hesitancy. Whenever restrictions are lifted, Americans are again flocking back to restaurants, but labor shortages and supply chain disruptions have curtailed innovation in favor of "simpler menus."

Grocery stores also are dealing with supply chain issues and work harder to keep existing products on shelves more than ever, leaving less capacity for new product innovation. There's also no sticking your hand into a tray of food at the grocery store and inventory management has taken a priority over finding shelf space for new items.

On-line grocery shopping is another COVID release valve, that so record growth during the spring of 2021 followed by sharp declines as restrictions were lifted during the summer.

These all beg the question: how will new food products successfully enter the market, or "tastes be changed," in the post-COVID era? And what channels or market segments should new food entrants work with to introduce their products.

That's what this project will answer. There's be no shortage of launches by big and small companies since March 2020, some of which "broke through" from on-line to bricks and mortar grocery stores and all which can be evaluated, as well as looking at parallels in other industries that relied on small retailers and "foot traffic" as the gateway to change.

There's also plenty forecasts about the future of the consumer marketplace after COVID along with your best ideas and insights

**Project 2: Go fish or Stop Fishing? At What Point Does the Business Case for Continued Canned Tuna Production Change?**

The market for canned tuna is a bit of a mess: sales in the U.S. market continue to decline (aside from a brief spike during COVID which was driven more by hoarding than increased appetites) along with popularity and frequency of consumption, recent revelations about

forced labor and price fixing have come to light, and well as revelations that sustainability standards aren't being met while possible populations decline in major Pacific fisheries require more effort and cost to catch them.

Still production continues on at the world's three largest companies that produce the large majority of the world's canned tuna: Thai Union (Chicken of the Sea), Dongwon Industries (StarKist) and FCF Fisher Co Ltd (Bumble Bee). All three companies are actively diversifying by investing in and acquiring companies that produce other kinds of fish and seafood. Their tuna canning operations continue on, with some recently acquired in distressed sales.

With this project, we hope to answer the question: when does the business case for continued operations end and is the industry "kicking the can down the road." And would government action to ensure at least labor standards are upheld improve business prospects.

*Changing Tastes in an Alumni firm of the ACL!!!*

# Rubicon

## Software for Recycling Solutions



**About Rubicon:** *Rubicon is a software company that provides smart waste and recycling solutions for businesses and governments. Using technology to drive environmental innovation, the company helps turn businesses into more sustainable enterprises, and neighborhoods into greener and smarter places to live and work. Rubicon's mission is to end waste, in all its forms, by helping its partners find economic value in their waste streams and confidently execute on their sustainability goals.*

### Project Proposal: Accelerating decarbonization through the circular economy

Growing awareness of climate-related risks, changing consumer demand, and legislative and regulatory activity may result in growing customer demand for sustainable services -- such as commodities sales, organics services, specialized recycling, and reuse offerings. Such a trend would present favorable opportunities to our business, given the margins from our portfolio of circular services are higher than those from landfill services.

In 2020 Rubicon saw an uptick in customer requests for sustainability and diversion services, resulting in significant revenue growth of our sustainability service portfolio. We believe that, in the near future, these services may likely represent our fastest growing revenue streams and greatest drivers of profitability, accordingly, have made expansion of our circular economy services portfolio a central pillar of our growth/go-to-market strategy.

As an example, as addressing food waste has become a more prominent climate issue for many companies, we have made aggressive growth of our organics recycling services a priority in anticipation of growing demand -- establishing new partnerships, expanding our scale to achieve better service costs, diversifying the types of services (anaerobic digestion, composting, animal feed) we are able to offer.

Using market data and conversations with internal stakeholders, we would like students to identify and prioritize go-to-market strategies for Rubicon's circular economy (non-landfill) services. Key questions needing to be answered include:

- Based on Rubicon's brand positioning and existing capabilities, how can the company efficiently expand its sustainability product and service offerings?
- What additional capabilities should the organization develop to meet future demand for circular economy services? Should these be internal or outsourced?
- What markets should the company be targeting?
- What types of key partnerships are most critical to the success of this strategy(ies)?

# DriveTime
## www.DriveTime.com
## Fintech/auto Financing and Sales

**Project 1: Business problem: Vehicle display problem**

Customers who visit DriveTime's web page and view vehicles are more likely to purchase a vehicle than customers who don't view vehicles. Initially what the customers see are a list of vehicles sorted from highest to lowest price.

We hypothesize that the more the initial collection of vehicles we show a customer intersects with the vehicles and price points that the customer is looking for, the more likely the customer is to look at some of those vehicles and the more likely to purchase a vehicle from DriveTime.

The business problem is to recommend a way to show a customer an initial collection of vehicles that maximizes the probability that the customer will apply for credit to purchase a based vehicles on purchased by customers with similar demographics.

The Foster MBA team will be asked to
- Research how other used car companies feature vehicles to encourage customers to apply for credit to purchase a vehicle and describe best practices DriveTime might adopt
- Build a model that predicts the type of vehicle a customer is likely to purchase as their next vehicle given their demographic profile. Optionally the team could also model the price point that demographic typically looks for. The definition of type of vehicle is flexible but could include features such as size, make, model, year, odometer reading, amount financed, and apr.
- Propose a strategy for using the model to get customers to look at vehicles on our website
- Propose a plan for testing the effectiveness of the proposed strategy


**Project 2: DriveTime Floor Price**


When a customer fails to repay their car loan DriveTime must repossess the vehicle. We then sell the vehicle in an auction. Over a year we sell around 40,000 vehicles so even a minor improvement in the average vehicle sales price can have a significant economic impact. The main lever we have to influence the sales price of a vehicle is the minimum bid or floor price that we set. For this project we ask that the Fosters MBA team to

- Research best practices for setting the floor price

- Build a model/analytic tool that will improve our floor price considering both expected sales price and the cost of failing to sell the vehicle given floor price.
- Drivetime has numerous strategies that can be deployed at auction to enhance performance such as weekend vs weekday sales, in lane vs online, auction vendor and location, Vehicle repairs, minimum bid allowed, etc
- Drivetime can sell their vehicles in regions across the country. Typically, we send the vehicles to the region with the lowest shipping cost. Are there cases shipping a vehicle to a region with a higher shipping cost is justified by an increased expected auction sales price?
- Recommend a strategy for testing their recommendations before they are implemented for all of our repossessed vehicles
- Recommend a strategy for monitoring the efficacy of their recommended floor price so that we can detect market changes and rapidly respond to them.

# Element Bars

## www.elementbars.com
## Health Bars, Production Analysis

In the food industry, the FDA sets a standard maximum allowable variance (MAV) for how much the actual net weight of a product is permitted to be under the declared label weight. Typical MAV for a product is around 9%. Food manufactures work to find an optimal balance to safely avoiding falling under this weight, while also producing the most output possible. As a food bar manufacturer, the initial goal would be to identify the mean of four of our most popular bars (listed below) vs the declared label weight of 26gs. Internal records of the daily baked averages for each bar can be used to sample the population and estimate the mean. Provide confidence intervals to show the range of the true mean. The estimated means and data provided can be used to find trends in yield and profit, and reveal opportunities for improvement. Data for the four food bars that will be provided: final production yields, daily baked averages, ingredient cost, rate, water activity

| Legacy | Expansion |
|---|---|
| Apple Spinach | Blueberry Oatmeal |
| Banana Carrot | Banana Strawberry Sun butter |

**Some questions to consider:**
How do the means of the different bars vary?
Is there a correlation to yield quantity based on what bar is being produced? How does that relate to the mean? Use production yield data to help calculate.
What bars generate the most profit based on ingredient cost, rate, yield, labor cost?
The four bars can be placed in to two separate categories, Legacy and Expansion. The most notable difference between legacy bars and expansion is the expansion bars have puree in them and the legacy do not. Water activity is historically higher in the bars containing puree. Are there noticeable trends in the data between the two categories?
*Element Bars in an Alumni firm of the ACL!!!*

*Founder, Jonathan Miller, is a Shark Tank Winner – check him out!*

# David Stine Furniture



## Social Media, Digital Marketing Analysis
## Sustainable, Environmentally Conscious Bespoke Furniture

### About Us

We specialize in natural wood furniture handcrafted from sustainably harvested American hardwoods. Our work is offered to the trade and to the public. The work is high end; our average price point is $3,500. We've been in business 25 years. We have three full-time employees and two part-time employees.

### Strengths

We are vertically integrated. We own the land where we harvest the wood; the sawmills where we mill the wood; the kilns where we dry the wood; the seasoning and storage sheds where we store the wood; and the wood shop and showroom. We have no debt.

We stay in our lane and play to our strengths: We do not do cabinetry or small items (like boxes). We stick to large, flat surfaces like tables, coffee tables, benches, etc. that come in at a high price point.
We have a devoted following on Instagram.
We have a strong foothold in the St. Louis area and have developed a strong commercial/trade clientele.

### Weaknesses

We have a very limited budget for marketing.
We can no longer rely on serendipity and eyeballs at large shows, like the Architectural Digest Show in New York or the One-of-a-Kind Show in Chicago, which we stopped doing during covid. Despite boosting posts and following algorithms, our Instagram feed is not growing nearly as much as our competitors, who have hundreds of thousands of followers while we have just 45,000.

**Problem Statement**

We seek to better understand the landscape of social media and marketing for a small company like ours.

We seek to better understand how people shop for high-end custom furniture and how we can capture that.

We seek to better understand Google Analytics, our customer buyer data, and our social media outreach so that we can market our work more effectively.

What are the sales and marketing opportunities we are missing?

We envision the students helping us wade through the data to better understand how our marketing efforts are — or are not — paying off. We also envision the students helping us to develop data on our buyers so that we may market more effectively. As resources and expertise are limited, we are interested in creative ways to follow up and utilize this information in cost-effective ways.

***David Stine Furniture is an Alumni firm of the ACL!!!***

David Stine Furniture
*Visit our [Website](#) for more information.*
[Instagram](#) • [Facebook](#) • [YouTube](#)

## Project Description for the Analytical Consulting Lab

After years of tireless efforts to get kids interested and engaged in math classes, Tracy, a passionate math teacher, was frustrated with the lack of field trip opportunities for her students: "Why do my colleagues have the opportunity to take kids to the art, history, natural history, and science museums, but I have nowhere to take my kids to play and experiment with math?? How are we supposed to help our kids appreciate the universal applications of math if there is no place that makes math fun, accessible, and engaging?"

Summ years later, Tracy Drinkwater founded Seattle Universal Math Museum (SUMM) – a nonprofit organization that has a mission to spark each and every person to love math. With such a mission, it was not hard to find passionate supporters, build a board of directors, and enlist volunteers. Now, all together, we are building a math museum – to create a better future where kids can become anything they want through math.

### What have we done so far?

- We found over 30 passionate and talented individuals who comprise our board of directors, our advisory board, and a pool of volunteers who work on multiple committees, including exhibits, programs, and communications committees;
- We launched a Lunch + Learn bi-weekly virtual series where our founder, Tracy Drinkwater, tells our story, shares our progress, and spreads the passion for SUMM with the community;
- We started our seed fundraising stage at the end of the summer with the goal to raise $150,000, and are already more than one third into the goal;
- We curated and displayed an exhibit of mathematically-inspired art at a local gallery and ran our first awareness and fundraising event at the exhibition;
- We partnered with several local organizations, such as, e.g., Prime Factor Math Circle, and ran and planned summ joint programs to raise awareness about SUMM and raise funds;
- We started working with a design strategy consulting firm and completed our first workshop, where we created a project timeline, built an understanding of what it takes to build a museum (in sq. f. and $), and put together our preliminary project program.

**SEATTLE UNIVERSAL MATH MUSEUM**

## What's next?

As we are working on the exhibit and concept development, we need help forming our strategy, business model, and business plan. In particular, should we focus on static physical presence, or should we supplement it with traveling exhibits, outdoor exhibits, museum van, etc.? How can we take advantage of what we've all learned and grown accustomed to during the pandemic, and create a hybrid model, such that the museum offers virtual tours, virtual programs, etc? What should be the revenue model (e.g. % fundraised, % from revenue-generating programs, rental, etc)? What is an effective outreach and marketing plan? What programs should we offer? What data should we collect and what KPIs should we use to help us make these decisions? For example, we have a good relationship with MoMATH, the only other math museum in the country, and they are willing to share data with us - if you formulate a data request, we should be able to get the requested data. Finally, what are the philanthropic opportunities (foundations, family offices, individuals, corporations) we should target and how our strategy can be supported by fundraising (which we perceive to be the main revenue source).

There are many questions that need to be answered and we will work with you to formulate the project scope with your interest in mind during the initial meeting. Dr. Masha Shunko, Associate Professor of Operations Management at Foster School of Business, is one of the board members at SUMM, and will be happy to talk to you about any questions you have about the project and SUMM. The project team will be invited to and encouraged to participate in SUMM events (next one scheduled Nov 5). The outcome of the project will be a presentation to the Board with key recommendations and reference materials.

# Product Launch for an Urban Air Mobility Service

## About Archer

Archer ([archer.com](archer.com))  is an aerospace company based in Palo Alto, California building an all-electric vertical takeoff and landing aircraft with a mission to advance the benefits of sustainable air mobility.  We are designing, manufacturing, and operating a new fleet of aerial vehicles that will be used to improve mobility in congested cities by using the third dimension to save individuals valuable time lost in congestion. As the world's only vertically integrated airline company, Archer is designing, manufacturing, and operating a fully electric vertical takeoff and landing aircraft that can carry passengers for 60 miles at speeds of up to 150 mph. Moving to an electric aircraft creates several advantages around cost, noise, and safety that are all fundamental to enable this new mode of transportation. Archer has announced plans to launch into service in Los Angeles and Miami in late 2024 before expanding operations in other cities. We have formed strategic partnerships with United Airlines, Stellantis automotive group, REEF Technologies, and Urban Movement Labs to make this vision a reality.

## Project Description

A critical component to building a profitable Urban Air Mobility (UAM) business includes selecting the right cities in which to operate. The investment to launch a UAM service into a city is high, so one must be highly strategic in selecting initial markets. There are a number of factors which need to be considered during the city selection process, many of which conflict with one another. Such factors may include, but are not limited to: population, economics,  infrastructure, congestion, mobility patterns, weather, operations, infrastructure, policy, and many more.

For this project, please devise and implement a methodology for selecting cities based on their commercial viability for a UAM operation, and helping to shape scaling the service.  This methodology will likely involve both quantitative and qualitative elements. Your methodology will help address the following problems:

- Understanding which cities are initial targets to launch a new mode of transportation
- Helping form a strategy to scale operations: should we scale in a small number of cities before launching new markets, first launch new markets before explaining within them?
- Helping identify the people and nature of trips likely that will be early adopters
- Determining how to allocate vehicles and infrastructure across the launch markets

# Selecting Vertiport Locations for Urban Air Mobility

## About Archer

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## Project Description

Finding good locations for aircraft to operate out of is extremely important for the commercial viability, and user experience, of this new mode of transportation. So-called vertiports --- fixed sites where aircraft can take off and land inside the city --- will be transportation hubs within the city. Many factors need to be considered when selecting vertiport locations. A non-exhaustive list of important factors might include:
- Trip demand in close proximity to the vertiport's location
- Mode of transportation used to access vertiports (e.g. by car, walking, transit)
- Equitable access to urban air mobility throughout the city
- Routes to and from that location that create most time savings
- Available ground and rooftop space
- Airspace limitations
- Electric grid infrastructure to support charging
- Etc.

For this project, please devise and implement a methodology for selecting vertiport locations within a given city. Your analysis can take a mix of perspectives into account, including making a good business case, considering city policy, and ensuring accessibility. The methodology will likely involve both quantitative and qualitative elements. We will point you to existing data sets, and you are encouraged to identify and collect open source data that might be useful for selecting vertiport locations.

Your work will help influence:
- How vertiports are selected by considering a host of tradeoffs
- The nodal network for a new mode of transportation
- The total number of passengers served
- Impact on existing mobility patterns and modes of transportation used