BEO CAPSTONE • 2017-18 PROJECTS

The C.V. Starr Program in Business, Entrepreneurship and Organizations (BEO) is a unique, interdisciplinary, undergraduate concentration at Brown University focused on the study of business, entrepreneurship, technological innovation, and organization theory. BEO educates students to be creative and flexible leaders for careers in for-profit, social mission and startup organizations. Through the disciplines of economics, sociology, engineering and entrepreneurship, students learn methodological approaches to address challenges in national and global economic context.

All BEO seniors take a required capstone course that includes a one- or two-semester long project. Project teams, usually comprised of five students, are supervised by a faculty advisor. Students apply conceptual and theoretical grounding obtained in BEO courses to deliver analysis and recommendations related to a specific challenge facing a sponsor organization. Sponsor organizations appoint a senior level mentor to help define and guide the project.

This academic year marks the fifth cohort of BEO students to participate in the capstone. Since the inception of the BEO Capstone, BEO students have participated in over 90 projects. For the 2017-18 academic year, nearly 100 students worked on 19 projects in the fall with 10 of the 19 projects continuing in the spring. Student learning experiences were excellent. Mentors and faculty were incredibly impressed by the depth and quality of analysis and recommendations produced by the teams. Please join us in celebrating this accomplishment.

Faculty

LISA DiCARLO
Senior Lecturer, Sociology

BRENDAN MCNALLY
Interim Director, BEO
Adjunct Lecturer in Sociology

TIMOTHY NGUYEN
Adjunct Lecturer In Economics

STEVE PETTERUTI
Adjunct Lecturer in Engineering

Teaching Assistants

ELIZABETH BRENNAN
Teaching Assistant, PhD Candidate in Sociology

JONATHAN SHEEDY
MA Candidate, PRIME
Planning and Executing a Signature Fundraising and Awareness Event

Rhode Island Special Olympics is one of the state's most dynamic programs, providing sports training and athletic competition opportunities to more than 3,200 children and adults with intellectual disabilities. Each year R.I. hosts summer games for athletes at the University of R.I. Kingston campus. To celebrate Special Olympics 50th anniversary the R.I. summer games will include high-profile social events to draw attention to the organization’s mission and effectiveness. The BEO capstone team worked with R.I. Special Olympic leaders to research best practices and evaluate case studies on effective print and digital marketing; volunteer, donor and sponsor engagement; and large event planning and execution. A particular focus was on how to best plan, market, fund and execute R.I. Special Olympics’ 2018 opening event kick off event. The team’s fundraising efforts yielded over $40,000 from newly identified donors!
Enhancing “Eco-to-Go” – Understanding and Investing in “Green Behavior”

In 2016 Brown University adopted a waste diversion goal of 50% by 2020. One persistent challenge has been the amount of waste leaving dining facilities that ends up in the landfill waste stream. To address the challenge, the Office of Energy & Environment launched Brown’s “eco-to-go” program providing students with the option of washable reusable to-go containers. The capstone team worked to improve the enrollment, marketing and business model for this program. The team surveyed and interviewed students to understand behavior and preferences in order to make their recommendations. This spring they conducted a cost-benefit analyses of operational processes to quantify implementation priorities. With the tools and resources of this project, Brown is better able to shape the future of stainability efforts.

Employing Gamification Strategies to Increase “Green Behaviors”

Community education and behavior change are at the root of the Brown Office of Energy and Environmental (E&E) Initiative’s sustainability efforts. To meet waste diversion goals, E&E communicates and educates students, staff, faculty, and other community members through posters, emails, events, and other methods. The capstone team explored the concept of using gamification to increase campus “green behaviors.” Encompassing the realm of quizzes, competitions, video games, and more, the capstone
team researched the academic literature and best practices of gamification. The team designed and implemented their own surveys and focus groups to better understand community behavior and provided recommendations for incentives and marketing of new “games” to increase green behavior on campus. A developer is incorporating the capstone team’s recommendations into a new web-based game scheduled to launch next academic year.

Measuring Impact, Student Satisfaction and Program Effectiveness

BEO students were tasked with developing a set of metrics to measure the impact of BrownConnect, a 2014 CareerLab initiative to increase student access to internships and research positions. Utilizing survey data, web metrics and award information as well as developing new tools to measure student satisfaction with the BrownConnect website, the capstone team quantified the relevant components of program’s impact and customer satisfaction. With new metrics adopted, the team conducted focus groups to design an annual survey that will be used for all Brown undergraduates in the coming years. Using research feedback, the team also provided recommendations to improve website aesthetics and functionality.
Building Management Capacity in Nonprofits

The Rhode Island Foundation is a proactive community and philanthropic leader dedicated to meeting the needs of the people of Rhode Island and building capacity within R.I. nonprofit organizations. The BEO capstone team worked with their mentors to evaluate trends and best practices in nonprofit management and engagement. The team researched and became expert in the latest theories and practices in organizational management structures and explored strategies to better engage millennials as potential volunteers, board members and managers. In the spring semester the team surveyed Brown students to better understand perceptions (and misperceptions) of nonprofit career opportunities and compensation. Recommendations include broader outreach to juniors and seniors about opportunities to make an impact in nonprofit organizations, a priority of many Brown students.

Sponsor: The Rhode Island Foundation, Providence, R.I.
Mentor: Jill Pfitzenmayer, Ph.D., V.P. of the Initiative for Non-Profit Excellence and Kevin Tavares, Program Officer
Project Advisors: Lisa DiCarlo and Elizabeth Brennan

Team members:
Quinn Andersen, Mikaela Karlsson, Zachary Neill and Tyler Williams
Supporting Technology
Startup with Marketing and User Experience Expertise

Epicenter Experience is an early-stage technology-based market research venture that enables customers to share their daily, in-location experiences with brands via mobile and web platforms. The capstone students worked with the Epicenter leadership team to evaluate the user interface (UI) and user experience (UX) of their web application and reporting dashboard. Additionally, the team analyzed the competitive landscape and drafted public relations releases for various audiences, working to hone the value propositions for customers (companies seeking market data) and users (clients who are incentivized to provide data on their brand experiences.)

Understanding School Absenteeism

The Rhode Island Department of Education (RIDE) oversees myriad programs and reporting systems for the state’s 54 school districts. Absenteeism for elementary school students is tracked nationally and is considered a critical metric in determining educational outcomes. The capstone team employed both quantitative and qualitative methods to better understand why Rhode Island has an exceptionally high absenteeism rate in elementary schools.

Using existing RIDE data, the team ran regression analyses to measure the correlation of variables across districts including relationships between
attendance and factors such as standardized test scores, subsidized lunches, and race. A major finding of the capstone team was differences in reporting practices among districts that were negatively affecting the results. In the spring, the team reviewed and recommended new software-based tools for schools to increase parent engagement. The team also provided suggestions for more consistent reporting practices across districts.

Advancing Rhode Island’s Alternative Energy Portfolio

Rhode Island Governor Gina Raimondo set an ambitious goal to significantly increase the state’s percentage of energy consumed from alternative energy sources: 1,000 megawatts by the year 2020. The Rhode Island Office of Energy Resources (OER) and the Rhode Island Division of Public Utilities and Carriers (DPUC) were tasked to develop a plan and tapped the BEO capstone team to analyze the most viable green energy sources and identify available real estate to accommodate large-scale projects. The team explored capped landfills, “brown fields” and other sites currently dormant or under remediation for their suitability. The research required students to delve into the economics of site development, policy and zoning considerations, and best practices in partnering with commercial developers. Final recommendations were based on GIS maps, public data searches, energy and real estate economics, and best practice comparisons.

Sponsor: Rhode Island Department of Education, Providence, R.I.
Mentor: Carol Blanchette, Chief of Teaching and Learning
Project Advisors: Lisa DiCarlo and Elizabeth Brennan
Team members: Connor Coughlin, Annaly Ferrell, Constance Gamache (Fall semester only), Jacob Hall and Alexandra Klapper (Fall semester only)

Sponsor: Rhode Island Division of Public Utilities and Carriers, Warwick, R.I. and Rhode Island Office of Energy Resources, Providence, R.I.
Mentor: Macky McCleary, Administrator
Project Advisor: Brendan McNally
Team members: Carey Hunter, Cameron Keegan, Zachary Marti, Jennifer Mundelius and Austin Werkheiser
New Opportunities in Shutter-Valve Industry - Poseidon Sensors*

Many valve applications have not yet realized the recent advancements in technology. The project mentor and CEO of Clarke Industrial Engineering, has patented a “shutter valve” technology that provides significant performance improvements over traditional valves. This team researched the valve industry, identified potential high-growth opportunities and created a business model for a venture (Poseidon Sensors) based on Clark’s shutter valve technology. Poseidon provides a smart water leak detection system for residential and commercial property owners employing ultrasonic flow sensors. Tapping a $500M market, the system identifies abnormal water flow in seconds triggering a valve to shut off the main water line, averting catastrophic damage. The spring semester included the development of a prototype system (mechanical and electrical) to provide “proof of concept” for the technology.

Entrepreneurship and Technology Management Track Projects (Fall & Spring Semester)

Each team works with a mentor company to create a startup venture that will bring a technology to market. Fall semester focuses on becoming expert in a technology, identifying potential markets and defining a product or service. The spring semester involves prototype development and crafting a business plan to bring the product or service.

Sponsor: Clarke Industrial Engineering, Kingston, R.I.
Mentor: Kyle Daniels, President and CEO
Project Advisor: Steve Petteruti

Team members:
Alexander Anderson, Eric DuBois, Tom Hale, Stephen Hudak, Daniel Jones (Fall semester only) and Daniel MacDonald Meteer

*Poseidon Sensors
Technology Applications in Controlled-Environment Farming - FungEye*

Significant problems remain in developing optimal systems and architecture for controlled environment agriculture. These problems can be grouped into regional (right crops for the right climate and farmer) and technical (artificial intelligence, computer vision) categories. This capstone project team worked with their start up mentor to develop a “24/7” mold detection system based on multi-spectral imaging and machine learning technologies. The team looks to enter a nearly $15B market with a solution that is affordable and scalable for indoor growing environments. The team conducted numerous mold detection tests using their proprietary filter swapping technology to enhance accuracy and early detection.

Sponsor: Siddhant Agarwal
Project Advisor: Steve Petteruti

Team members:
Clarissa Allen, Alyza Benotto (Fall semester only), Greg Carlin, David Katzevich, Michael Snower and Riley Springman

*Accolades - Capstone projects can serve as incubators in which students grow ideas and businesses beyond BEO. This year both ETCM capstone teams developed business plans, germinated from their Capstone project, that placed them as semi-finalists in the R.I. Business Plan Competition in the student category. FungEye made it to the final round, winning over $15,000 in cash and in-kind services.
Deconstructing a Corporation’s Capital Structure

Textron is an international diversified holding company based in Providence, R.I. that owns companies in aerospace, financial services, commercial lawn/golf equipment and defense related systems. Its pension fund, valued at over $10B supports 28,000 pensioners. The mentor tasked the project team to analyze, model, and describe the relationship between stock prices and credit spreads for two publicly traded companies at opposite ends of a volatility continuum. Delving deeply into the financial performances of Caterpillar (cyclical, heavy equipment manufacturer) and Dominion (stable, energy utility), the team examined debt and equity investment options and how investment type correlates with the earnings volatility of that company. Dispelling the misconception that investments in debt are always less risky than investments in equity, the team found evidence that it is more important to analyze both the company and its industry to understand an investment’s risk profile.
Creating and Incubating a Hybrid Active/Passive Retail ETF Product

Fidelity’s motto is “Take intelligent risk and don’t follow the crowd.” In this spirit of innovation, the BEO team applied the knowledge they learned in investment courses to work with their mentor to analyze and design an new investable ETF (exchange-traded fund) product that will contain components of active and passive investing. After extensive team research and modeling, the team recommended a product that includes “smart-beta” strategies, a mix of international and emerging market assets and an emphasis on the technology sector.

Creating and Pricing a Marketing Strategy

tauPay is an early-stage, text-based service that allows users to transfer and spend money, even if they do not have a bank account. Unlike other C2C or B2C electronic payment solutions, tauPay™ has three key advantages: it is fungible, it requires no special app, and it removes banks from the middle of transactions. The BEO students worked as part of the venture’s marketing and strategy team analyzing tauPay™’s potential markets, customers, and competitors. In addition to performing a competitive analysis, the capstone team made recommendations for product pricing and roll-out strategies on college campuses.
Evaluating Hedge Fund Managers

Aberdeen Asset Management is a full-service, asset management group, focused on meeting the worldwide investment needs of institutions, private investors and financial advisors. The BEO team undertook the challenge of analyzing the performance of hedge fund managers who partner with Aberdeen. The team identified appropriate financial metrics and then calculated and analyzed various returns-based performance data on real hedge fund managers. Investment metrics ratios that were incorporated in the research consisted of Sharpe, Treynor, and Sortino, as well as correlations and portfolio construction exercises.

Assessing Hedge Fund Governance Models

Raytheon is a global leader in defense, civil and cyber-security markets. Working within Raytheon’s investment division, this project focused on examining the current hedge fund compensation landscape with a specific focus on the evolution and rapidly changing dynamics of the economic proposition between asset allocator and hedge fund manager. The team identified key drivers of behavior, implicit incentives, areas of potential conflict of interest, and the general economic proposition of the industry standard, “2/20” fee model. The capstone team

Sponsor: Aberdeen Asset Management, Edinburgh, Scotland
Mentors: Greg Strassberg, Senior Investment Manager & Risk, and Darren Wolf, Head of Hedge Funds
Project Advisor: Tim Nguyen

Team members:
Charles Corcoran, Daniel Hull-Fossas, Thomas Lappin, Miodrag Ljubojć and Joshua McArdle
analyzed other alternative fee structures and ultimately recommended a fee structure and profit sharing arrangement designed to address the many drawbacks of historical fee arrangements. Developing quantitative proofs of concept and fee models were a key requirement for defending the team's recommendations.

Constructing and Modeling a Public Equity Portfolio

This team of students assisted the Rhode Island State Treasury Chief Investment Officer and senior investment staff in reviewing the public equity exposure of the Employees Retirement Fund of Rhode Island. Rhode Island's $8 billion retirement system covers pension funds for state employees, teachers, municipal employees, police and fire personnel, correctional officers, nurses, state police officers, and judges. The capstone project goal was to construct and model a new public equity investment strategy that would outperform its current strategy without incurring significant additional risk or volatility. The team reviewed the historical performance of portfolios, analyzed actively managed quantitative approaches and assessed regional performance differences across the strategies. The team's analysis assisted the CIO and staff in making a final portfolio recommendation to the State Investment Commission for the public equity portfolio.

Team members:
Grant Greeno, Katherine Kallergis, Terrell Smith and Samantha Swanstrom
Enhancing the Impact of R.I.’s College Savings Products

The Rhode Island State Treasury office is custodian of state funds, overseeing the state’s financial and investment accounts. Treasury has been very active in recent years developing a variety of initiatives to help families increase savings for education and retirement, including CollegeBound, R.I.’s 529 college savings plan and CollegeBaby, an investment account established for newborns. To increase enrollment in these products, the state provides $100 to all newborns when parents “opt in.” The BEO team worked with Treasury professionals to better understand who is taking advantage of these products and how to improve their enrollment. Analyzing state demographics and the characteristics of current participants, the team identified an opportunity to target financially naive, new parents with novel communication strategies (e.g. doctors offices, schools). The team also included recommendations based on best practices in other states to improve the impact of R.I.’s savings products.

Analyzing a Private Equity Investments

Superior Private Equity, LLC (SPE) is a Connecticut-based advisory & investment firm founded in 2013 to generate outstanding risk-adjusted returns while maintaining strict adherence to fiduciary care principles. The BEO students effectively functioned as part of SPE’s team of analysts by evaluating and providing investment recommendations on specific deals in industries including pet food.
and healthcare IT. The team conducted industry analysis, researched firm valuations, and analyzed the optimal investment positions (direct, secondary and co-investment) in order to make recommendations. Additionally, the team provided recommendations to improve marketing materials for SPE’s potential partner investors.

Cataloging New Sustainable Investment Options

As more individual and institutional investors consider sustainable investment options, there is a growing demand for strategies, tools and portfolio design to meet sustainability and financial goals. Cary Krosinsky, educator, author and consultant, is expert in sustainable investment and teaches a class in the subject at Brown. He mentored the capstone project team that researched and analyzed sustainable investment strategies for U.S. public equities. Students used Krosinsky’s seven tribes of sustainable investing and his earlier research data as a framework to categorize investment options that have exploded in recent years. The team evaluated the performance (against industry benchmarks) of over 100 mutual funds with sustainable investment characteristics over one, three, five and ten years. The team identified a number of promising sustainable investment strategies that significantly outperform benchmarks.

Sponsor: Superior Private Equity, Weston, C.T.
Mentor: Andy Kripke, President
Project Advisor: Tim Nguyen

Team members:
Mary Campbell, Jonathan Famery, Tristan MacAneney, Connor Maher and Grant Sholem

Landscape Sponsor: Cary Krosinsky
Mentor: Cary Krosinsky
Project Advisor: Brendan McNally

Team members:
Sarah Cobb, Matthew Jenkins, Dana Le, Katrina Nicole Lee, Alexandra Scala and Maxwell Willman