Downing Applications for Spring 2023-Spring 2024 Awards

Joel Asay

Title: When does asking for donations become counterproductive?

"Every minute you continue not to pledge, you lengthen this station's pledge drive, keeping its precious news and information off the air. Nice work." – Alec Baldwin soliciting donations for National Public Radio

Numerous online media and social platforms including YouTube, TikTok, Instagram, and Twitch have adopted business models that rely on non-compulsory donations made by the users of the platform. Just as National Public Radio (NPR) solicits donations from their listeners, these internet media creators are likewise pausing their 'regularly scheduled content' to plead for donations, but at what cost? Listener-supported media such as these are not only monetized by donations, but also by advertising that relies on a robust listener base. Therefore, a complex and poorly understood balance must be struck; *how emphatically should listener-supported media solicit donations, knowing that doing so will provoke listeners into attrition, attenuating advertising strategy in the process?*

While the value of advertising to one additional listener is well understood thanks to public advertising markets, the cost in listenership of asking for donations is largely unknown and is the focus of this project. To study the effect fundraising activities have on listenership, the Downing student and I will be performing the following tasks over the three-semester duration of the project:

1. Formalizing hypotheses following a robust understanding of the literature and research question.
2. Collecting data via web scraping the active listener counts from internet radio metadata.
3. Collecting audio stream data from internet radio broadcasts.
4. Training a machine learning algorithm to identify and timestamp radio broadcasts identifying when fundraising activities are occurring.
5. Performing analysis to quantify the effect engaging in fundraising activities has on listenership.
6. Producing a literature review and contributing to a paper that can either be presented at a national conference or submitted for publication before completion of the scholarship timeline.

The ideal student will have a genuine interest in studying this topic and an enthusiastic willingness to learn. I am more than happy to train the student in all other skills necessary to complete the project, including:

- Scraping data from the web using a virtualized Linux server or Docker container.

- Training a machine learning algorithm.

- Performing statistical analysis in R.

- Authoring a literature review and contributing to an academic journal article.

Jin Alan

Title: Operations and Supply Chain Management in Law Firms – the Present and the Future

As we know, the legal service industry plays a critical role in modern economy. Businesses and societies cannot run without law firms and legal professionals. In the US, there are over 2 million active lawyers. In the Greater Cincinnati Area alone, there are numerous law firms, large or small. For a long time, law firms focused on law applications, instead of analyzing and improving their operations and supply chain strategies and processes to be more effective and efficient. However, law firms, like other business organizations in the service sector, need to address these issues and improvement opportunities. The productivity and quality of law firms not only determine their own competitiveness, but also substantially affect the competitiveness of the organizations and individuals those law firms serve. Although we do not have a hard number right now, the importance of law firms' operations is beyond we might think. This is partially due to the legal professionals' background. Most of them were from such majors as political science, history, philosophy, literature, language, etc. A very small number of them may be from engineering. Not surprisingly, operations-related knowledge and skills may not be the lawyers' biggest strength. Furthermore, the legal profession is oftentimes very stressful. Handling the legal cases alone is already challenging and time consuming enough for the legal professionals.

As a result, there lacks more in-depth, systematic research into the operations and supply chain management of law firms, although it has begun to receive more attention from both the law firm and law schools. Some of the law schools have begun to offer law practice management short courses, but for such a critical industry of modern economy and component of society, what has been done is far from enough.

This project taps into two main questions:

1. What is the current situation of law firms' operations and supply chain management? Besides their internal operations, law firms also need to deal with their partnering organizations. While they provide services to other organizations as suppliers, and also source (buy) services (e.g., information/research/documents/expertise) or physical products (e.g., technologies) from other organizations through supply chains. 2
2. What does the future of law firms' operations and supply chain management look like?

This project has two stages. The first stage is a thorough review of law firms' operations and supply chain management, which includes two parts. One part will be focused on literature review of academic journal/book publications on the above subject matters. The other part will be on other professional/industry publications (journals, newspapers, other media, etc.). The second stage is collecting data/thoughts directly from law firms, mostly local law firms, for their accessibility, regarding their views of the current situation and the future of their operations and supply chain management. This second stage adopts a case-based (using multiple cases) approach. The case studies will systematically investigate the following questions:

1. What is the current situation of your firm's operations/supply chain management, in general?

2. What areas (quality, capacity, scheduling, speed/efficiency, revenue, etc.) of operations and supply chain management have you been focused on? What are the outcomes, opportunities and challenges?

3. How has your operations/supply chain management been evolving? What does its future look like, in your opinion? Why?

Expected skills: Strong writing skills; Good communication skills; Interest in open-ended, exploratory study; Good work ethics; Good logical thinking skills; Good reading comprehension skills; Interested in co-authoring a journal publication (not required though).

Jagan Jacob

Title: How to use computer simulation to gain managerial insights?

How often should the traffic-signal change from red to green? How many check-out counters should be open at a local supermarket? What should be the length of a conveyor belt at a manufacturing plant? Discrete-event simulation can help answer these questions. Discrete event simulation allows you to quickly analyze a process or system's behavior over time, ask yourself "why" or "what if" questions, and design or change processes or systems without any financial implications. Companies across industries all over the world use simulation software such as ARENA to understand the potential impact of business process decisions before they are made. In the project I propose, the student will model real-world processes using simulation software (think of it as a digital LEGO set for managers) to address business problems and gain managerial insights. The student will choose a real-world system at their discretion (I can suggest sample topics but the student is free to choose their own business scenario). It could be a traffic intersection, a manufacturing plant, an airport baggage system, a hospital, an Amazon warehouse, etc. The student will identify a problem, collect data, and use discrete-event simulation to suggest solutions. Completing this project will boost the student's analytical, critical thinking, and computer simulation skills which are extremely sought after in the job market.

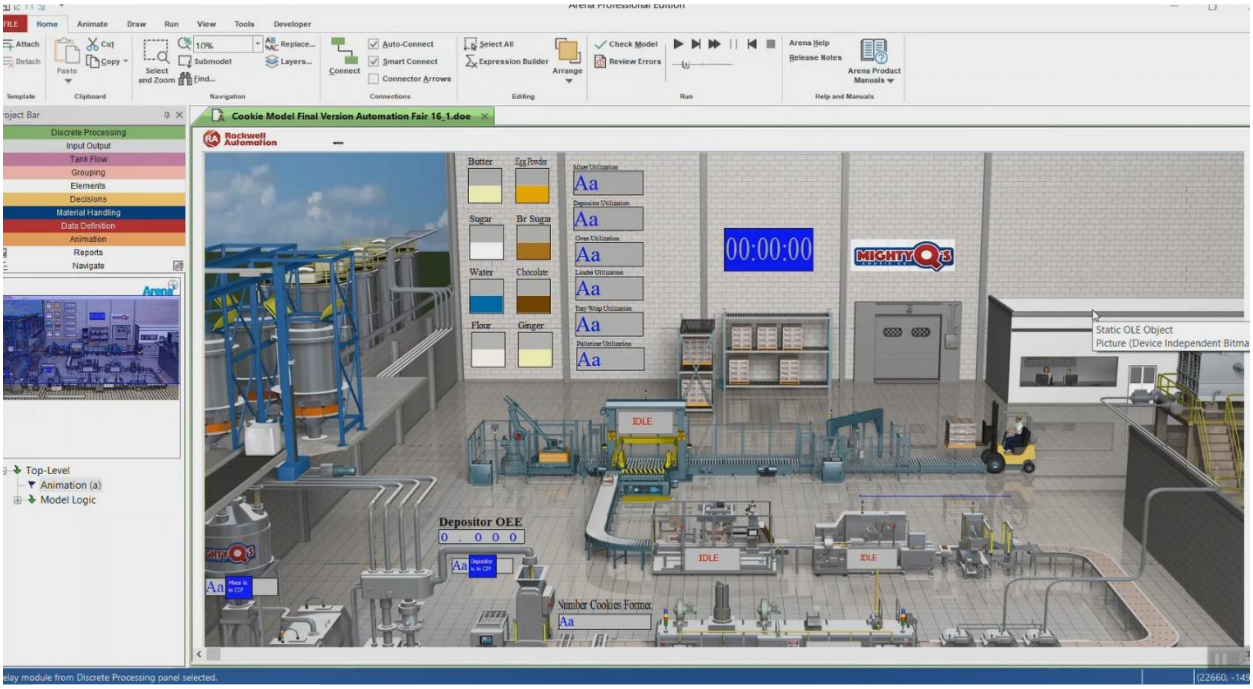

Figure: A 3-D model of a food-processing plant in ARENA

Lifang Wu

Title: Supply chain disruptions and resilience strategies

We have seen so many supply chain disruptions these years and businesses need appropriate strategies to handle the challenge. We will investigate supply chain disruptions and analyze/develop the relevant resilience strategies. Given the scope and scale of the topic, there are many possible directions of the research project. I believe that an initial qualitative study will be an appropriate starting point. Depending on the data gathered in that study and the student's personal preference/background, it may be appropriate to develop a conceptual framework, conduct a survey, develop a case study, or run a simulation model to advance the study. The open-ended direction of this research affords the student an opportunity to maximize the benefits of the research experience. There are no specific skills required for this project. The student will learn how to frame and answer a research question. This will include understanding what is currently understood in the existing literature and what should be critiqued/extended. Then, the student will help develop a plan of analysis and a project timeline. We will collectively select the appropriate research method to engage the student in the inquiry process. This gives student a tremendous advantage in developing their relevant problem-solving and critical thinking skills and improving their career potential.

Justin Roush

Title: An Experimental Economics Investigation of Risk-taking, Insurance, and Social Preferences

This project involves running economic experiments. We will study how risk-taking and insurance depend upon social influences. For example, how do the insurance decisions of my peers influence my likelihood of insuring? To do this, we will design an experiment, gain IRB approval, equip a computer lab, recruit students, and run economic games that allow us to study real, incentivized decision-making surrounding risk and insurance. The ideal student is an economics major or minor who has succeeded in Microeconomic Analysis and has an interest in behavioral economics, economic experiments, or psychology. The students must have taken or be taking stats (with regression) or econometrics.

Stefan Wuorinen

Title: Fair Pay to Play: Name, Image, and Likeness compensation and implications for teams

The success of teams can be determined by a number of factors, however, at its core, team success depends on the cooperative behavior and interpersonal interactions of team members. Using the name, image, and likeness deregulation of college sports in the United States as a natural experiment, this study will examine how changes in potential individual compensation influences team outcomes. The sample for this study will be division 1 men's and women's basketball. Further, this research also aims to incorporate interviews with coaches, players, and NCAA committee members if possible. Students would have the opportunity to gain a deeper understanding of team systems, compensation management, and social comparison theories. Further, experience in data collection, statistical analysis, results interpretations, and research presentations will also be offered. The successful student will have a passion for exploring interesting questions, a strong desire to learn new research skills, and good time-management skills.

Reginald Lee

Title: Designing a replacement for managerial accounting

Some scholars are calling for the end of the use of managerial accounting and using accounting cost information for managerial decision making. As a result, there is a need for a replacement method or at least measures and metrics that can be used as a replacement. This project will explore the measures and metrics of a replacement method.

The ideal candidate would be a highly creative and math-oriented student to design the replacement for managerial accounting. The student does not have to be an accounting student, but they should have a decent math background, as the justification for the elimination of managerial accounting is math-based and the replacement must have a strong mathematical foundation.