

Enhancing the range of Service-Learning Opportunities in upper level Accounting Courses and overcoming the Professor “Band width” Constraint

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Abstract

Service learning (“SL”) in accounting has largely focused on the VITA tax program. The extant research has found this mode of learning to be effective and furthermore is tied to some of the directions espoused to help stem the decline in accounting concentrators nationally. This paper is designed to fit this literature context by demonstrating a wider range of SL applications in upper-level accounting courses as a means to increase the appeal of the SL modality. Additionally, this paper provides insights and suggestions to enable professors to be more impactful should they decide to integrate SL projects into their courses and to have some strategies in address the “band width” constraint implied by existing research. Finally, this paper provides some evidence of the learning impact of SL applications – based on the authors’ experience in having SL projects as an option for students – to inspire others to consider this approach to teaching.

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Abstract

Service learning ("SL") in accounting has largely focused on the VITA tax program. The extant research has found this mode of learning to be effective and furthermore is tied to some of the directions espoused to help stem the decline in accounting concentrators nationally. This paper is designed to fit this literature context by demonstrating a wider range of SL applications in upper-level accounting courses as a means to increase the appeal of the SL modality.

Additionally, this paper provides insights and suggestions to enable professors to be more impactful should they decide to integrate SL projects into their courses and to have some strategies in address the "band width" constraint implied by existing research. Finally, this paper provides some evidence of the learning impact of SL applications – based on the authors' experience in having SL projects as an option for students – to inspire others to consider this approach to teaching.

Service Learning (SL) is gaining prominence in higher education. Distinctly, SL is not just about volunteering; it ties the student's efforts directly to their classroom learning. Hence, there is an opportunity to leverage student learning through unstructured problem-based formats where both technical learning and soft skills can be developed while providing students an opportunity to “do good”.

There are several trends in accounting education - and the accounting career field generally - that dovetail with SL initiatives. Perhaps the most notable trend is the impact of technology and automation on eliminating and/or changing traditional roles in accounting and finance. Due to this, there is an emphasis on the need for accountants and related professional to provide a real value-added function to turn data and non-routine analysis into actionable insights. Hence, the ability to think and problem solve in an unstructured environment is increasingly important. The increasing role of the accountant as an advisor also places greater emphasis on students developing so called “soft” skills that are often intangible drivers of career success. Thus, SL is primed to be an effective learning approach yet the range of SL applications in the accounting curriculum has been limited and only certain aspects researched.

This paper seeks to broaden the appeal and applicability of SL in accounting education. In this paper, the authors share their experience of integrating SL projects in an Accounting Information Systems (AIS) based course, and provide lessons learned relative to overcoming certain constraints. The professor of the AIS course, a retired consulting partner at Ernst & Young, pivoted to academia in 2010 and began instructing AIS at the undergraduate level in a large university. The professor sought assistance from a graduate Computer Science student who served as the Teaching Assistant for the course. With prior work experiences in consulting and

knowledge of technology, the Teaching Assistant played a pivotal role in weaving SL projects into the course framework by leveraging skillsets in the application of technology to tackle various business challenges.

Literature review

Poston (2015) provide a salient overview of the historical development – both from trade association and academic research perspectives - of factors driving interest in SL as a pedagogical approach for accounting and finance students.

The AICPA (AICPA 2021) highlighted the importance of problem solving, personal ethics, effective communication and similar skills in its core competency framework. The Association to Advance Collegiate Schools of Business (AACSB213) articulates similar goals. There is significant literature – across many academic fields - validating the role that SL contributes to helping students develop a broader skill set as a complement to the traditional content often delivered through lecture formats. Additionally, there is also a growing interest among employers for this expanded skill set (Clovery 2008).

SL applications in accounting have been documented to be effective in increasing the appeal to students in selecting accounting as a concentration (Edmonds 2019), (Kahn 2002). Considering the widely reported national decline in students specializing in accounting, this is noteworthy. Kahn (2002) states that “stressing the good that accountants do for society, would help alleviate the decline in the quality and quantity of accounting majors”. Hurt (2010) suggests designing the entire undergraduate accounting core with an emphasis on fundamental skills - including SL as one of six focused modules - rather than pure technical content.

The Volunteer Income Tax Assistance (VITA) program serves as the primary SL opportunity for accounting students. In this nationwide program, students provide basic personal tax return preparation for low income and senior citizens. Typical research findings – largely based on student survey responses - indicate that the VITA program enables real life applications of classroom accounting instruction (Blanthorne 2016), (Christensen 2010), (Boneck 2014), (Christensen 2018) and enhances communication skills and provides for a deeper understanding of taxation principles (Aldrige 2015), (Balden 2011). Other researchers (e.g., Efrat 2020) find similar outcomes as well as report significant increases in “volunteering attitudes”, again based on student survey responses. An important characteristic of the VITA program is that clients are individuals (not organizations) and a local service organization (e.g., a branch library provides the meeting facilities and markets the program) facilitates the sourcing of clients. The tax services provided by the students are uniform and of a basic personal income tax level. Accordingly, the VITA program is practical to scale across an entire class of tax students or clubs (e.g., Beta Alpha Psi).

Other than the VITA program there are few SL published research pertaining to upper level accounting courses. There is a “classroom based”, SL themed cost accounting application (Lafond 2017 and Lafond 2022). The 2017 paper involved an in-class case for managerial accounting related to a local soup kitchen. Instead of direct client interaction, students watch a video about the soup kitchen and use provided data for their CVP analysis. This emphasis on a “classroom-based” method posits a wider question: considering the well-documented advantages of SL, why hasn't it been more extensively integrated into other advanced accounting courses?

The 2022 Lafond paper focusing on a classroom-based approach is motivated by an earlier paper (Chiang 2008). The Chiang paper involved students undertaking performance improvement type analysis for various local community service organizations. This effort involved actual student contact with the organizations. Chiang found that this type of SL offering required a fair amount of professor time to coordinate interactions between student teams and the receiving organizations. It is therefore reasoned in the Lafond paper that this extra burden may make SL less attractive to faculty to integrate SL as part of their courses.

As noted in a very recent paper (Bootsma 2021), most of the SL research in accounting has depended on student survey responses – reflective in nature – to judge the efficacy of the SL applications within a course. The Lafond 2022 paper used a pre/post test score framework involving control and treatment groups to find that the in-class SL case was effective both helping students understand core concepts (e.g., CVP analysis) and increasing awareness of their surrounding communities. Bootsma et al undertake a rigorous empirical test – based on outside observers scoring the students’ client interactions - of how the VITA program impacts student development as to tax concepts and “calibration” (i.e., students’ ability to “know what they don’t know”) when providing tax assistance. Based on the work of other researchers (Carr 1998), the Bootsma paper tests and generates results documenting increased effectiveness in students developing the following “soft” skill categories: communication, interpersonal skills and personal abilities (e.g., decision making, initiative, and attention to detail).

Additional papers in the accounting field describe efforts and lessons learned in designing SL experiences, again largely around the VITA program. Except for a few papers, the research is also limited relative to understanding the SL benefits from the client perspective (either in a

general or counterfactual sense). Nor are there many papers exploring delivering the SL experience in a team-based format or providing more specific insights into how to tie a SL project element to the specific learning content of the associated course.

This paper is designed to fit this literature context by demonstrating a wider range of SL applications in upper level accounting courses. Additionally, this paper provides insights and suggestions to enable professors to be more impactful should they decide to integrate SL projects into their courses and to have some strategies in address the “band width” constraint implied by the Chiang and Lafond papers. Finally, this paper provides some evidence of the learning impact of SL applications – based on the authors’ experience in having SL projects as an option for students – to inspire others to consider this approach to teaching.

As such, the following inquiry questions are motivated.

Inquiry questions

Inquiry 1: the experience of SL in accounting has been limited, is there opportunity for a wider set of applications in upper level accounting courses?

Inquiry 2: instructor constraints are real, are there ways to more efficiently increase the scale of the SL educational opportunity for a greater number of students given limits on instructor “band width”?

Inquiry 3: how important is actual community (student/client) engagement relative to the AICPA and AACSB articulated skills sets relative to SL opportunities? What other – or more

specific - soft skills (akin to the Bootsma focus on “calibration”) can be developed in a SL format?

Inquiry 4: are there additional ways to measure both student and client impacts from SL projects and are client impacts important to students?

Inquiry 5: What are some important lessons learned and what future directions might research take on this topic in the accounting education field.

Inquiry 1: Thinking expansively of SL accounting opportunities

Appendix Exhibit 1 profiles the SL applications that the professor of the course has undertaken as part of an Accounting Information Systems (AIS) course over the past ten years. Upon inspection, there is a wide range of community non-profits client organizations – land trusts, community health, local library systems, food rescue, offering up interesting and suitable SL project opportunities. While the focus in this article is on AIS, many of these projects would fit equally well with audit, data analytics, and upper level management accounting (e.g., impact analysis). Further, there is a large range in potential skill-based applications that can be undertaken by the typically two to four-person student teams. In the context of an Accounting Information Systems (AIS) course these applications include system and relational database platform development, impact analysis, process flowchart analysis, risk and controls analysis, choice of financial reporting platforms for different type of organizations, data analytics, and pricing/revenue model analysis.

While not a focus of this paper- like the VITA experience - many universities have student clubs offering financial literacy training to local community members (e.g. ,high school students).

This represents another opportunity, though one that may be constrained by a lack of a strong tie to specific course offering. With financial literacy, one can interpret that topic broadly. For example, one of the projects in the course's SL portfolio involved a student team constructing knowledge objects around the basics of financial reporting on QuickBooks – i.e., financial reporting platform selection being a direct tie to the AIS course content - for the local veteran's chamber of commerce (a nation-wide group with regional branches). Another opportunity at some universities is fashioning SL projects around student incubators of new businesses (i.e., start-ups). This provides peer to peer learning experiences and a specific example is discussed further below.

Drawing from the diverse service-learning applications within AIS, there's undeniable potential for broadening engagement in related fields, from audit to data analytics. Such multifaceted opportunities underscore the profound impact of integrating hands-on community projects into academic curriculums.

Inquiry 2: Scaling Student Learning Without Overburdening Professors

As noted, research (Lafond 2022) postulates that a reason for the limited use of SL formats in accounting classes is the time burden placed on professors. This is a legitimate concern.

One lesson learned on the QuickBooks project was the involvement of a local accounting practitioner (a university alumni) from a regional accounting firm. This significantly reduced the time commitment on the professor from a student mentoring perspective. Hence, this is one strategy that can be taken as would the involvement of a teaching or research assistant in this role as alumni are often interested in this type of real involvement with students.

In addition to involving outside practitioners, three additional approaches have been useful - in the authors' experience - in overcoming the "band width" constraint. The first is to structure the course so there is some type of class presentation by the SL student team made to the entire class each semester. In addition to trading off lecture time for project mentoring time this leverages the SL project teams presenting their work in some detail to a class of thirty-four other students. In the authors' experience for AIS courses, it is advisable to provide students with a list of potential project topics and then let them self-select into topics that are truly of interest. Towards the end of the semester, each team makes a class presentation. Appendix Exhibit 2 provides an example of the range of project choices from a recent AIS class with the SL projects designated in blue. A testament to the success of SL is that, over a ten-year period, when given a choice of roughly ten topics each semester, students consistently selected the one or two available SL projects. By offering only a few SL projects each term and presenting them to the entire class, the professor minimizes their workload while maximizing the learning impact for all students.

The second approach is to continue a SL project (for the same client) across semesters and different student teams. This mimics the work often found in professional accounting where annuity type projects are often "picked-up" by new teams each year (i.e., same client but with a new service provider team). As such, it reinforces the importance of properly documenting one's work relative to a "hand off" - a crucial skill in accounting around annuity type clients - and also reduces again some of the "band width" constraints on the professor as onboarding and vetting a new client is avoided.

The third is to use past projects in the current semester's teaching plan to benefit the entire class. As such, this is a good way to scale the educational content of many past SL engagements to a larger set of students. This is done in a stream-lined fashion during a lecture, targeted to the specific parts of the course. Exhibit 1 provides an example of how some of the projects referenced in Appendix Exhibit 1 were "slotted" via twenty-minute segments into an Accounting Information Systems course in otherwise standard course content. Table 1 again emphasizes that SL experiences need to be tied to concepts taught in the classroom Rama (1998). A particularly nice feature of this approach is that certain artifacts from the previous projects (e.g., the PowerPoint deck or a video recording used to present to the client) can be made available through the course learning management system. Experiencing a group presentation on a subject can ignite intellectual curiosity, prompting students to explore the topic more deeply. Additionally, current students often feel empowered when they see the accomplishments of students from previous semesters in the same course.

[Table 1]

Another important lesson learned relative to the professor "band width" issue is finding an efficient way to source potential non-profit clients. Relative to sourcing, many colleges and universities have extensive community outreach (often revolving around student volunteer opportunities) and this network can be an efficient source of opportunities. Additionally, many universities have student start-up incubators and there can be many accounting research related opportunities present in this realm. In the authors' experience, start-ups need accounting insights as to the choice of "best" corporate form, financial reporting platforms, risk and controls, and forecasting pro forma financial statements given the hoped-for progress of

start-ups scaling quickly through the “relevant range” of operations thereby having to plan for changing cost structures. Some university student incubators provide prototype funding so additional managerial accounting analyses around such topics as demand forecasting and break-even analysis are also relevant. Further, universities in larger metropolitan areas may have organizations such as Volunteer Lawyers for the Arts or the Arts and Business Council providing another potential source of project opportunity. Developing these channels requires an upfront investment of time but can greatly facilitate the pipeline of projects across semesters.

Another effective way to mitigate the burden that falls on professors with the integration of service-learning opportunities in the course is the appointing student mentors. These mentors need not be subject matter experts, but someone who can provide valuable guidance. These mentors are typically past students who have taken the course, or even students who have not taken the course but have had some internship or work experience in the field related to the assignment. Engaging student mentors broadens the learning circle, allowing students to gain varied insights. This structure gives teachers the room to delve deeper into topics, knowing there's additional support. Mentors also gain as teaching helps reinforce their own understanding. Plus, with their involvement, assignments can be more comprehensive and beneficial. However, this approach isn't without challenges. Matching the right mentor with the right project can be a puzzle. Given the voluntary nature of the role, maintaining mentor engagement might be challenging, especially if they've moved past the course stage. Also, the level of guidance might differ from one mentor to another, causing variability in student

experiences. Striking the right balance in mentor involvement and monitoring the entire setup for effectiveness is crucial.

Finally, proper vetting of the organization is very important to make sure both the data and the availability of client personnel are present to allow for meaningful analysis and student-client interactions and that the organization's needs fit with the contours of the associated course.

Additionally, establishing a common set of expectations is important. Again, time invested up front can save an appreciable amount of professor time over the course of the project.

Particularly important is determining how the student team can best interact with the client.

Many of the "soft" skills are developed in these client experiences (e.g., having the student team describe the planned approach and project deliverables, timing, data requests and then presentations of finding). This process can provide students with meaningful (client centered) project management experience beyond that team experience that may have taken place in an introductory accounting class case assignment. Further, the "client experience" is something that is not replicated in the pure classroom-based SL approach nor really achieved through intern type experiences.

Inquiry 3: Relevant skill development opportunities addressed by SL in accounting education

Bootsma (referencing Carr) details the soft skills that were researched as part of their SL efforts.

These skill sets fell into three categories: communication skills, interpersonal skills and personal abilities. This is a useful exhibit and research framework but can be further detailed – in the authors' experience - into more specific types of soft skills. For example, skills such as managing client expectations, design thinking, quality control, proper documentation of work

product, thinking through how the client will use the analysis in an ongoing manner and what the client's capacity is to actually implement the findings are all illustrative of a deeper set of skills that SL opportunities involve. These are skills to which professional firms are looking for in their new hires.

Perhaps a unique feature of SL projects from the students' perspective is that these types of projects also provide a unique and interesting discussion topic in job interviews and/or in LinkedIn profiles. Greater specificity as to these soft skills also adds more heft to the motivations behind the AICPA and AACSB recommendations relative to the importance of these attributes.

Inquiry 4: Assessing Student and Community Impact from SL Projects

While most of the literature focuses on measuring student outcomes from reflection type surveys, actual client/community impacts are important for at least two reasons. First, if there is an actual impact this can make a meaningful difference for the student (both in recall and the ability to document real world experience) and it may be useful to the university for Diversity, Equity and Inclusion. Research (Driscoll 2017) indicates that universities reap direct benefits from both volunteer and SL based community engagement.

Integrating technology, especially in fields like AIS, has the potential to ameliorate the impact of SL endeavors. For example, let's consider a project where students work on a pricing strategy for a non-profit. Instead of merely doing theoretical analysis on the project, they build a practical application, such as building a flexible pricing model for the client using tools like Excel macros. By building a practical and usable deliverable, the students can help the non-profit to modify

their pricing strategy over time, without the need for external support. The principle here is to create projects that allow students to build tools that yield enduring benefits, and not merely a one-off analysis. In general, most scalable solutions inevitably will require use of some technology. As students undertake the mission of producing a technology-centric solution, their academic journey becomes more immersive. Not only are the students bolstering their understanding of the core subject matter, but they're also navigating real-life constraints to find an optimal solution. However, it's vital to ensure that this technological addition complements, rather than dominates, the fundamental spirit of the course. The goal is to marry practical application with theoretical concepts of the course without drifting from the learning objectives.

Appendix Exhibit 3A showcases sample student reflections from the professor's SL portfolio on their project experiences. Further highlighting a point from Inquiry 2, Appendix Exhibit 3B demonstrates how the impact of SL projects isn't confined just to the team members but also resonates with other students attending the SL team's presentation. This is exemplified through a data analytics project executed for the JED Foundation, a prominent organization for college campus mental health awareness, and includes reactions from both a student who attended the presentation and a response from one of the presenting team members.

Appendix Exhibit 4 provides brief reflections from the executive directors at the "client" non-profits benefitting from the work of the assigned student team. It is worth noting that a number of these clients have asked for similar engagements with new teams in subsequent semesters and this can be taken as a further indication of the efficacy of SL efforts. Block (2019) is one of the few papers that evaluates client impact. The authors of the paper

researched thirty-international service-learning (graduate) projects with a focus on direct and indirect client (or “partner”) value generated.

Reflecting on the need for efficacy assessments beyond student reflections and surveys there are some other indicators that can be relied upon. Table 2 provides a tally for each of the SL projects in Appendix Exhibit 1 the number of repeat projects for the same client. “Repeat business” is always an objective indicator of value provided. Additionally, a tally is provided for each client detailing the number of students who either a) went above the project's requirements, motivated by an intrinsic desire to exceed client expectations, or b) volunteered in a subsequent semester either to continue working with the client or mentor another student team on a related project. These actions act as tangible "revealed preference" indicators, reflecting the perceived value students gain from the SL experience and offer insights beyond survey/reflection results, which may have inherent biases. Notably, multiple projects have been recognized with conference awards by an independent academic panel, further emphasizing the significance of SL in accounting education from an educators' perspective.

[Table 2]

Inquiry 5: Additional Learnings and Prospects for Upcoming Research

In addition to some of the lessons learned previously expressed, additional lessons from the authors' experience include:

- Local, non-profit organizations make very suitable candidate organizations for SL because they are often of a scale where students can quickly grasp the big picture of the organization and how their specific project fits into that mission. Also, the gratitude

expressed by these organizations – to get something they really need but do not have the funds or bandwidth themselves or fresh insights/expertise to tackle themselves – further enhances the student learning experience as both positive reinforcement and that something of real value was delivered in a counterfactual sense. This may further enhance the ability of the student to recall the learning attributes of the project years later. Additionally, it's vital for professors to recognize that these organizations can offer distinctive and nuanced ethical insights. A notable instance is a food rescue (pantry) project where students designed a system on the Airtable platform, enabling impoverished clients to indicate their food preferences and allergy restrictions. Through this endeavor, the student team grasped that granting individuals the ability to voice their preferences, even in dire circumstances, embodies a sense of dignity. Their work on the Airtable platform effectively facilitated this realization.

- The role of the professor is a mentor to the student team on an as needed basis. The student team leads the client interactions, sets the project work plan and relies on the professor for direction only when they get stuck. This is effectively a good way to build the “calibration” skill discussed in Bootsma.
- Having a “real” client experience where the students are leading the client discussion is important to students, a fact often expressed by students in end of semester surveys. Even on good internships, if the student is fortunate enough to be invited to the client meeting then typically their role is that of a passive observer. Therefore, the opportunity to engage and think on one’s feet is not developed.

- The impact of having these projects brought into the classroom through live presentations and/or having the professor take and integrate a past project to illustrate a lecture base concept is very important because students can be empowered to observe relevance and what their peers in the same class were able to accomplish. Additionally, most business curriculum does not afford the opportunity for students to learn of the non-profit sector.
- As noted, properly vetting the client is important to the success of the project. Like Block's (2019) findings that partner readiness, project design and project execution are necessary conditions for the project to provide "direct" value to the client. This cannot be over emphasized.
- Ensuring that student teams recognize from the outset that the project has a relatively open-ended structure fosters the development and application of genuine project management skills. Engaging with a real client and meeting their specific expectations reinforces the significance of mastering project management objectives.
- It's crucial to set realistic expectations with the client regarding the project's scope achievable within a semester. Ensuring a balanced workload across all project teams and employing a consistent grading rubric for all group project types is essential for maintaining fairness. Furthermore, SL projects pave the way for comprehensive feedback, sourced both from the professor and directly from the client.
- Looking ahead to future considerations and research avenues, a pressing need—and indeed a challenge—is to dissect the unique facets of SL. Specifically, what knowledge and skills do students gain from SL that they might not acquire from other collegiate

learning modalities, such as executive boards on clubs, classroom instruction, study abroad programs, or other experiential opportunities inherent to a campus setting? While student perceptions of the SL experience hold value, there's a clear advantage in developing more detailed survey tools that span various SL projects, particularly focusing on the specific attributes outlined in Table 2. Lastly, it is particularly challenging to test in a pre/post treatment versus control group setting the incremental concept/content learning when students none the less have access to the same lectures, textbooks and other supplemental resources. However, to the extent that group project choices are specifically tied to parts of a semester long curriculum it may well be possible to test for exam score differentials should similar group project topics be used semester to semester.

A repository of shared “sanitized” student project deliverables would be a good knowledge object type learning resources should a larger cohort of accounting faculty develop this interest. Samples are readily available from the list of past projects.

Conclusions

SL offers a real opportunity to accounting educators, one that is particularly important given trends in automation and students self-selecting into accounting concentrations. SL projects enable instructors to interweave and emphasize the importance of unstructured and problem-based learning as well as soft skill development into the course. Further, there are proven strategies to overcome the “band width” constraints if they travel this path. Finally, a much more meaningful level of engagement can be developed with SL students between students

and faculty. This is evidenced in the ability to draft much more impactful student reference and application letters. In addition, recommendation letters for students involved in SL projects, compared to traditional case-based projects, provide a unique and detailed portrayal that can set them apart.

While incorporating SL modalities into accounting instruction might initially demand a higher investment of time and resources, the authors contend that the enriched learning experience, deeper student engagement, and real-world application make the trade-off invaluable. The tangible benefits and long-term impact on students' understanding and skill-set are well worth the initial effort.

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Appendix Exhibit 1: Portfolio of Projects

Land Trusts

- Drone mapping of a feature property to audit, and value, the environmental assets (e.g., tree canopies as a carbon sink, marsh grasses as a nitrogen sink, and habitat attributes of a 20-acre property) to help enable the subject land trust to articulate the value of conservation.
- Design and implementation of an app/relational database (Air Table) to improve the reporting/auditing process of the annual volunteer property evaluation process.
- Documentation of the internal controls around donations, segregated funds, and the presence of Separation of Duty controls.

Natural Resources

- Estimated the economic value of six large coastal ponds in Rhode Island, with a regression model focus on house value premiums for pond access/proximity.

Climate Change/Property Tax impacts

- Big Data project involving data visualization, Python coding and other data analytic skills to assist the town in estimating the future impact on property tax revenue streams from climate change (sea level rise and increased frequency/intensity of severe coastal storms).

Food Rescue

- Developed and tested a data methodology to allow a large food pantry to more reasonably estimate the number of unique “clients” touched by their food rescue operations, helping to facilitate grant making needs.
- Developed a digital platform (Airtable) for low- income clients to express food category preferences and constraints (e.g., allergies) relative to certain non-profit pantry sites shifting from an in-person “shopping” experience to a “grab and go” model.
- Analysis of the multi-dimensional impacts of Food Rescue (Community Plates) as an organizational model to aid in the national expansion of the organization.
- Audit of the client’s existing methodology relative to estimates of pounds rescued to reveal a systematic over-estimate.

Mental Health (JED Foundation)/Data Analytics

- Data analytics (hypothesis testing, ANOVA and regression) to help enable the foundation to assess - for a variety of outcomes (e.g., campus counseling center visits) - the impact of various independent variables (large versus small, urban versus rural) associated with different colleges and universities.

Public Library/Data Analytics

- Multidimensional impact measurement for feature programs (e.g., English as a Second language) across the branch network of the Boston Public Library.
- Development of a digital dashboard to monitor specific branch program performance given local demographic characteristics in micro census areas.

Financial/Impact metric reporting platforms

- Construction of a digital knowledge object (video to help train veterans on financial reporting features of QuickBooks) on behalf of the New England Veteran's Chamber of Commerce to help veterans launch new businesses
- Design and build of a digital dashboard (Tableau) to benefit the Strategic Advisory Committee of the Faculty Senate at a large university. Dashboard design encompasses **Inputs** (e.g., faculty college representations by standing committee), **Outputs** (e.g., relative rates of "charges" turning into approved "resolutions" and **Outcomes** (i.e., do enacted resolutions actually lead to significant change).
- Multiple projects on pro forma financial projections, tax analysis, financial reporting platforms, and internal controls for a variety of student start-up ventures at Northeastern University

Revenue Model and Pricing Studies

- Developed a digital revenue model to help the organization structure their value propositions to both nonprofits in the San Francisco area needing corporate volunteerism and the corporations themselves.
- Developed a pricing model and Excel template to enable the executive director optimize pricing on storytelling projects aimed at the corporate sector in the wake of the Black Lives Matter movement.

Community Health care and other system design and build

- Complete build-out (process flowcharting, Microsoft Access relational database and extensive forms/reports with associated controls) to digitalize a manual community nursing/education process for the Latino community in East Providence, RI.
- Developed a ratio- based model to enable the membership of a Boston giving circle to better evaluate the financial and operational capacities of grantees.
- Student project to process map the collection/repurposing/delivery process of a nonprofit – Flower Again - recovering high quality flowers from weddings and corporate events for distribution to senior centers and low-income housing. Process maps led to the design and creation (AirTable and Arc GIS) of a digital platform to improve the efficiency and scale possibilities of the organization

Appendix Exhibit 2: Sample of Group Project Choices from a typical AIS course

Student Selection “Menu” of Group Project Topics FALL 2022 (with project mentor identifications).....[items in Blue are live/real consulting projects this term](#)

_____ **Process Improvement/BPM case study** – traditional case study where you are given a narrative and then do some mapping (the professor will supply a suggested template) and undertake quite a detailed assessment of where improvements could be made.

_____ **International Tax/ Transfer Pricing project** – if you are going into Intl Tax a project here can be designed in consultation with the professor. You will understand the basics of Transfer Pricing and conduct an analysis using one or two of the traditional economic methods employed by advisors servicing multinational clients.

_____ **Forensic Acctg/regression case** – take facts and data of a customer fraud case involving sales “channel stuffing” and conduct a damages set of calculations using regression analysis.

_____ **Monte Carlo DCF analysis (systems’ acquisition) case** – use Excel to do the model of a simulation of a ERP system investment decision (last topic or two in the course) that the professor has constructed. Part of the project will involve assessing how Excel and/or Crystal Ball can be used to add more sophistication given the presence of probabilities for certain key variables in the model (and the use of Real Options) as a further DCF add on. You will have the ability on this team to Zoom once or twice with an outside expert familiar with the case for guidance and connect w me on Real Options. This project is a fan favorite of Finance concentrators

_____ **Data Visualization project** – Topic “A”: take actual student response data from the SAIL program and seek to evaluate the “best” way to portray the data visually to a department chair. This project provides some nice creative thinking opportunities and a way to explore data visualization beyond the usual bar charts. Students can use Excel or Tableau. Also, does the data lend itself to a digital dashboard? OR [using current data create a dashboard \(input/outputs/outcomes\) for a prototype NU Faculty Senate comm \(data already constructed so really design thinking/some interviews/constructing & documenting a dashboard on Excel or Tableau\)](#)

_____ **XBRL simulation** – this custom project is useful for finance managers as you will seek to pull financial ratio data digitally using XBRL techniques to do comparable company, equity analyst style analysis. Suitable for a two-person Finance concentrator team having an interest in equity research. A former student from the class is available to help mentor this project.

_____ **Master Budget simulation for a digital retail company** - this is a custom case where you will be provided data and will need to draw on your managerial accounting knowledge to

develop a budget and associated forecasts of product/supply chain needs. A good choice if you are interested in “data into knowledge” topics for supply chain or corporate FP&A/business analyst roles. . A former student from the class is available to help mentor this project.

_____ **Python introduction project** to build a template gather data and build a monitoring template of performance. Edwin (former student in the course, CS concentrator) will serve as the project mentor. . A former student from the class is available to help mentor this project.

_____ **Process Mining** – the team will be given access to an EY tool set to demonstrate and visualize how process mining and variant analysis works across a large transaction data set. A former student from the class is available to help mentor this project

_____ **ESG and financial statement impact**...the professor has a keen interest in this topic and is motivated to design a project delving into this topic. In recent semesters, the teams have down work using Tesla’s extensive ESG impact statement AND LAST SEMESTER WORK WAS DONE ON THIS TOPIC USING THE BLOOMBERG TERMINAL

Unstructured/” Real” project Choices involving non-profit organizations

_____ - **JED Foundation** – JED is the leading foundation to help college campuses fight depression and mental illness on college campuses. They have a wealth of data and are interested in testing the efficacy of certain programs. I expect this to be a challenging project, with a focus on regression analysis and hypothesis testing techniques a la what we are covering in our Data Analytics section of the course. There may also be an aspect on advising the client to shift from Excel based surveys to a relational database platform w/ dashboard capability.

_____ **Flower Again** This is a non profit organization in New Canaan CT who recycles flower arrangement from high-end weddings and corporate events, rearranges their weekly collection with volunteers in a barn on Sundays and then delivers to people in hospitals and assisted living facilities. Much like the project done for the Person to Person food bank, FA needs help flowcharting and designing a basic information system (Airtable) to better manage their efforts. The professor and a student from last Fall who did the food bank project to mentor. This could involve an actual Sunday trip by train to observe the organization in action and to present the prototype platform.

Appendix Exhibit 3A: Recent Student testimonials

I have officially accepted a full-time position as a Strategy Analyst for Deloitte in NYC! I just wanted to thank you for all the help and support over the past year or two. AIS was a very influential course for me, but more importantly I had a lot of passion for the projects I worked on. I hope to stay in touch!

I felt that our JED Foundation presentation was a good attempt and synthesizing a large amount of complex information and making it palatable for an audience that was unfamiliar with the topic.

With the semester wrapping up and our project with Flower Again finished I wanted to thank you for a fantastic class. I've genuinely never been so interested and integrated in a class before, and it has spurred on a whole new career path for me as I now want to go into some sort of supply chain consulting rather than a traditional supply chain role. This project has easily been the most memorable project I've worked on,

Whenever I tell friends about what I'm doing they all think it's an awesome project

I would be more than happy to help as an informal advisor for new project. The Food Rescue project was one of the highlights of my year and I would love to have the opportunity to work with you again on a similar project

The SL experience allowed me to start from nothing and build a product in conjunction with a client. I had the opportunity to work with the client in order to determine what the narrative was, because it was not given. In class we were usually already given the completed diagram and we had to interpret it, but it was beneficial to see how to work with a narrative to create one. Similarly, creating a BPMN with a narrative that was gaining more detail as the mapping progressed was an experience that would difficult to replicate in a class.

I am glad to hear the course and the unstructured projects are going strong! It was definitely one of my favorites, and it is fantastic that it has evolved into a non CPA concentration

Glad to hear the project went well! It was definitely one of my favorites I did at Northeastern

Appendix Exhibit 3B: Example of a survey question response from a student listening to one of the SL presentations (JED Foundation team) and the reaction of a member of that team

Survey question to the entire class: *Other than the topic that you were involved in presenting to the class...what other topic really stood out as being interesting and a good application of some of the themes in the class?*

Sample student response: The JED Foundation team was very influential and important to me. As we all know, Covid 19 has sparked mental health troubles across the globe, especially in college students. and I was extremely impressed by the data and solutions they gave, as well as the way they presented. Presenting on mental health can be depressing and sad, but they had a great balance between their arguments and positivity. This class prepares students to creatively think to solve problems. Although the JED team did not have much accounting or audit work, they creatively solved a problem much bigger than most accounting issues.

JED team member reaction to the above student response: *What a thrill! Until now I hadn't thought about the impact our presentation might have on our colleagues, but if at least one of them has felt this way, I think it's the best possible reward! Thanks for letting us know*

Appendix Exhibit 4: Client testimonials

Thank you so much for another successful project completion for WFC! **Rose Cavanagh, Executive Director Weekapaug Foundation for Conservation**

I just want to let you know that I am reading and digesting your report. There is a lot there and I think it is great. When will your next crop of students pick this project up again? I'm glad to meet anytime. **Art Ganz, Chief Scientist, Salt Ponds Coalition**

The client preference project your students complete for us was such a great help. Thank you again! We ended up taking the content and instead of using Air Table, inserting into a Formsite form, which is the program we use that interfaces with Salesforce. At first we didn't think it would work, but our Stamford Food Manager was able to use all the work your students did to get it up and running.

I'd love to work with you on a future project if one arises... please keep in touch! And thank you again! **Nancy Coughlin, Chief Executive Officer Person-to-Person** Over 50 Years of Transforming Lives

Message to Food Rescue volunteers **"Smart Lbs.** Based on our research and past rescue data from the app, we have collected data that will help us better calculate the pounds of food rescued based on food and unit type. It's called "Smart Lbs." because the app's data will continue to become smarter as we collect more data. This means that the smart lbs weight will fluctuate as a result of lbs provided to create an ongoing accurate average. As a SD you'll still be able to override this data on the past rescues screen if the rescuer entered an incorrect amount of rescued food".

The above might have happened eventually, but you definitely shed light on and sped up the process. We are very lucky to have had the attention of your students on this **Laney Lloyd**
New Volunteer Coordinator Food Rescue US

Thank you for your comprehensive data analysis and thoughtful presentation of results. Your analyses and prepared approaches will be incredibly helpful to us as we collect more data over time. Your findings were actionable for recruitment and "selling" JED Campus to new schools, by helping us understand where we are best suited to make an impact with schools. I appreciate your technical expertise as well as ability to explain the analytics in a relatable way.

Thank you for choosing us as your project for the semester and we're happy to hear that it was a good learning experience for you as well! **Kamla Modi, PhD Director Learning and Evaluation The JED Foundation**

Bottom line, the overall data analysis was spot on, logical, thorough, and detailed. The depiction of the work performed was well articulated, as was the rationale. The presentation of the information was solid, but the flow could have been more user friendly. Overall a well-executed project and good presentation at the University level. **Jim Torres, Chair, Westerly Economic Development Commission**

We have partnered in the past on mostly analytics related projects that a professor runs with his students. They have done a really great job. **Kurt Mansperger Chief Technology Officer Boston Public Library**

Good evening, thank you, this is right on target. Ed is easy to follow, and your students' questions were on target. I especially like how user friendly they made QuickBooks look so easy to use and explained why people it's important to know information in the financial statements. I love the challenge questions, they were perfect, I never thought about "who is my biggest customer", and looking at the profit/loss report. I forwarded the link to my board for their review and to a couple of my veteran businesses for their input. In my opinion this exceeded my expectation!

Thank you so much! **Lisa Duchame, Executive Director, NE Veterans Chamber of Commerce**

Wanted to say thank you so much again for your generosity with your time and expertise. I really appreciate all of your insight and guidance and will put it to good use! **Jessi Greenlee**
CEO & Founder Good Impact Network

Thank you so much! It was a really good meeting; they were energized by what you and Sidd put together. It's going to be very helpful as we move into a strategic retreat at the end of this month. **Cara Solomon Executive Director Everyday Boston**

This will really be impactful as it will improve accuracy and reduce cycle time ...basically, it will enable the nurses to devote more time to providing patient care rather than manual reporting and will improve the tie between patient reporting cycles and the financial systems of the clinic. **Laura Clifford, COO Clinica Esperanza**

We've been using the data collection process that Angela and Robert built for us to great success! Currently we are at the point where we have reached out to a number of area nonprofits to fill in our online surveys. We've had good feedback so far on the ease of use & the data has been easy for us to view using the sharepoint site. **Carrie Greenway, controller She Gives**