Quantitative Management Consulting Projects

Daniel Haight will supervise Operations Management 468 – “Analytical Techniques for Management Consulting,” a course taught at the undergraduate level during the second term (Jan.-Apr.). The course consists of consulting projects completed for local clients.

The goal is to give students hands-on experience with all phases of a consulting project and to offer participating companies competent and low-cost help with business problems. The focus of the course is on real business projects, for which students will propose structured analysis, a decision support tool, spreadsheet based code, and/or other deliverables dictated by the client firm in their terms of reference with the students.

The schedule is as follows:

**Early December:** Client firms prepare a half-page write-up of their proposed project that includes a short description of the problem, the nature of the expected solution, and the data available to conduct the analysis.

**Week 1:** Client firms describe projects on which student teams will bid. (Typically first Thursday in January)

**Week 3:** Student teams present proposals to clients. There are generally two proposals per project. (Typically third Thursday in January)

**Week 3:** Client firms choose a student team, contracts are signed, and work begins (typically the Monday after the third Thursday in January).

**Week 9:** Oral progress reports to client firms from student teams (Typically the first Thursday in March).

**Week 14:** Final deliverables presented to firms, firms evaluate the project, and pay as per the terms of the contract. (Typically the second Thursday in April)

What advantages can such an involvement bring you?

- You receive quality consulting from our students (with supervision from professors) at a much lower fee than the consulting market demands. These students are quantitatively focused and each team has strong expertise in modeling, computers, and information technology. In previous years, each student spent an average of 100 hours on the projects. Groups have two to four students with a broad range of expertise. They can also use the professors’ as well as our doctoral students’ expertise.
- You have an opportunity to evaluate our students for possible employment.
- You contribute significantly to the educational experience of our business students.

What types of projects are eligible?

We prefer clearly-defined projects which require students to use their quantitative and analytical skills. Typically, these involve developing a computer model that will quantify and compare the cost and benefit of several different scenarios. In the past, students have been very successful at forecasting, scheduling, location analysis, inventory planning, queue (lineup) modeling, risk analysis, and simulation. We list examples of past projects at the end of this document.
What is the cost to you?
Students will submit proposals highlighting their deliverables and fees. Historically, project fees ranged from $5000 to $7000 (including GST) and each project received two proposals. This includes a $1,000 administration fee that we use to convert some of the projects into cases. Client firms selected the winning proposal based on their preferences (cost, quality of proposal, quality of team, etc.). Client firms also delegated a manager who met with the students during the term (the number and length of meetings depended on the proposal, the teams, and the manager). We do require student (and request client) attendance on the Thursday evenings listed above. Of course, we can make alternative arrangements to fit the client’s schedule.

Other Requirements
In order to ensure a successful project, students will need regular contact with the client. We find it beneficial to have a single client contact who will furnish data, answer questions, and provide direction to the student team. We encourage students to contact the clients on a weekly basis – typically in the form of an email – and to visit and present to the client as necessary.

A second factor critical to the success of the project is timely access to necessary data. Often the first dataset the team receives will necessitate an additional data pull to be fully useful. If this process begins too late in the project, the quality of the final product will suffer. We suggest that data collection arrangements begin even before the teams are chosen.

Examples of past projects:
We have run this course with success for several years now. Here is a sample list of projects from past years. Many were presented and well received at the Student Conference on Operations (held at the Universities of Alberta and Calgary in alternate years) and some won best student paper prizes at national conferences.

- Killing Plant Product Mix Optimization (Lilydale)
- Retail Store Location (The Brick)
- Vehicle Routing (The Brick)
- Managing Congestion in the Emergency Department (University of Alberta Hospital).
- Locating Service Vehicles (TransAlta Utilities).
- Locating Field Resources (TransAlta Utilities).
- Forecasting Natural Gas Demand, Supply, and Prices (Epcor).
- Building a Database Tracking System for the Needle Exchange Program (Boyle St. Coop).
- Cost Management and Allocation in a Non-Profit Environment (Boyle St. Coop)
- Real-time Silo Inventory Management (Lafarge Canada).
- Rail Car Fleet Sizing and Scheduling (Lafarge Canada).
- Scheduling Cement Grinding Mills (Inland).
- Annual Demand Forecasting for Cement (Inland).
- Pilot Scheduling (Canadian Helicopters).
- Production Planning (Finning)
- Reducing Inventory Costs (TransAlta)
- Optimal Staff Sizing (TransAlta)
- Predicting Demand for Cremation (City of Edmonton)
- Technological Demand Forecasting (Westaim)
• Inbound Logistics Scheduling (All Weather Windows)
• Production Line Inventory Planning (All Weather Windows)
• Diagnostic Imaging Demand Forecasting (Capital Health)
• Customer Service Performance Tracking (ETS)
• Greenhouse Gas Estimation (ETS)
• Lean Manufacturing Assembly Line Design (Manufacturing Company)
• Inbound Logistics Scheduling (Manufacturing Company)
• Production Facility Location (Industrial company)
• Demand Management and Fleet Sizing (Edmonton Transit System)
• Demand Forecasting and Staffing Analysis (EHS)
• Workforce Requirements Modeling and Staffing (Industrial company)
• Call Centre Staff Scheduling (Alberta Health Services)
• Outpatient Clinic Facility Layout and Queue Management (Alberta Health Services)
• Patient Length-of-stay Analysis (Alberta Health Services)
• Diagnostic Imaging Demand Analysis (Alberta Health Services)
• Inventory Management (Strathcona County Emergency Services)
• ER Doctor Schedule Optimization (Department of Emergency Medicine)

Should you have projects you think may fit within this structure, please contact Daniel Haight (phone: (780) 952-6794, e-mail: dan.haight@ualberta.ca).