

Project Proposal Invitation: Looking for Complex and Dynamic Problems

Introduction

Advanced modeling course in Virginia Tech develops the problem solving and modeling skills of bright engineering students by engaging them in solving real world problems. Interested individuals and organizations are encouraged to submit a project proposal to contribute to, and benefit from, these projects. Over the years these projects have proven to be very valuable for both the students and the client organization.

The projects are conducted as part of an advanced modeling course in Virginia Tech. The course uses system dynamics simulation technique to understand dynamic problems facing organizations and community groups. The three-member project teams meet with the client on a weekly basis and follow a standard modeling process to define the problem, explore alternative explanations for the observed issues, and build a simulation model to test some of these hypotheses and explore alternative policy options. The modeling process aims at gaining insights for both the client and the students into the problem at hand. These insights come at every stage of the process and are accompanied with other tangible outputs such as policy recommendations and simulation models for analyzing the issue.

Over the years many clients have been involved with different versions of this class at different institutions and a large fraction of them have returned with new proposals, which highlights the value generated for clients in these projects. A few of the clients who have joined these projects in the previous years include IBM, BP, Harley-Davidson, Nextel, CG&EY, General Motors, Ford, Intel, Swiss Reinsurance, Virginia Tech and many non profits. Most clients find the benefits generated to go beyond insights that emerge from the project: previous projects have resulted in continued relationship between the client, project team members, and the university in the form of research, consulting, and employment engagements.

The problems fitting for this class are typically unfolding over a long time horizon, sometimes with chronic symptoms, sometimes with pressing questions, and sometimes motivated by a desire to understanding some emerging changes in the environment. They are often complex and the issues cross the typical organizational boundaries. Some examples from previous years include deteriorating market share, fluctuations in demand for electronic equipments, increasing rates of poverty in a region, low adoption of alternative energy technologies, deteriorating personnel morale, environmental degradation, and delays and cost overruns in housing projects.

Ground Rules

- The client team can consist of one or more individuals from the client organization who are genuinely interested in the problem they propose. This team should be able to meet with the project group on a weekly basis (1-2 hour/week time commitment). Sometimes additional interviews with other members of the client organization are useful for the progress of the project.
- The course starts in mid January and continues to the beginning of May, 2009.
- Face to face meetings work better than online/over-the-phone meetings. The latter is feasible yet and we encourage people from distant locations to submit project proposals as well. The project teams are located in two campuses in Northern Virginia and Blacksburg areas.

- The projects often generate a lot of value and many insights for the client team. However, the projects should not be perceived as “free consulting”. The scope, process, and timing of the projects are determined by course requirements and the students need to follow these constraints. Therefore the clients need to trust the standard process followed in the course and avoid altering the process or requirements for the project team. If both parties desire further collaboration, they can follow an independent engagement after the end of the class.
- Project teams may sign non-disclosure agreement for the project. However, project teams are going to share the ongoing results of their projects with the other class participants. Therefore we encourage the client teams not to share sensitive data in interaction with client teams. Moreover, these projects often focus on aggregate trends and do not require sharing of sensitive data.
- The client organization is not charged for the projects. The client team and the project team are encouraged to reach a shared understanding in terms of sharing of costs of travel and communication (e.g. phone calls etc) at the first meeting.
- A final project presentation is planned for the last session of the class. All client team members are invited to join this session.
- Note that usually the number of project proposals exceeds the number of project teams for this class and therefore students have to choose between several alternatives, and a few proposals will not find a team to pursue them.

Proposal Submission

If your organization has a dynamic problem and is interested in submitting a project proposal, please write a short (1-2 page) project definition and send it to Professor Hazhir Rahmandad by January 10th 2009 (hazhir@vt.edu). The teams will choose their projects on January 20th and should have their first meeting with their clients before the second session on January 27th. The problem definition document should include the following information:

- **Client Organization Name**
- **Client Contact Information:** Contact information for the client organization member who is the main contact for the team. Please include both E-mail and phone number.
- **First meeting:** Instructions for setting up the first meeting between the project team and the client.
- **Background:** A brief note on the background of the problem at hand
- **Project description:** The problem that the client organization wants to be addressed by the project team. Feel free to include graphs or data pertinent to the problem.

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