

## **RESEARCH AGENDA**

My primary focus of research activity is the Payment Scheduling Problem in project management. To date the main contribution of my research has been to consider the effect on the client when the contractor behaves in his own best interest rather than cooperating with the client. In contrast to other models, I have found that in the self-interested setting the client should use a large number of payments to attract the contractor to the project while keeping retention high to promote his own interests. This continues in two directions of research. The first is to develop project scheduling algorithms to understand how the contractor behaves to maximize his own net-gain. Given the contractor's behavior, the second is to development managerial rules and guidelines for the client in establishing a payment schedule which entices the contractor to behave in the client's best interest in addition to his own. My current efforts are focused on accounting for multiple modes in processing activities, resource constraints in processing activities and uncertainties in project costs.

As Alien Technology Faculty Fellow I have also begun a research stream related to supply chain management and wireless technology. My work in supply chain management deals with advertising costs and contractual approaches for the manufacturer to subsidize retailer advertising. Interestingly, to date we have observed that varying the wholesale price is more effective for the manufacturer than subsidizing advertising and the optimal solution, when the manufacturer is the leader in a Stackelberg game, results in no shared advertising cost. My wireless research seeks to avoid the detailed implementation of the technology and instead emphasize the broader high level managerial potential of the operational capabilities that wireless technology offers. The first topic to be addressed is the impact of contractual agreements in vendor managed inventory systems. In most reports on RFID technology the majority of the benefits are observed at the retail stage and the majority of the costs are observed at the manufacturing stage. However, under vendor managed inventory, the retailer does not better manage his inventory but, rather, better manages the manufacturer's inventory. This should completely change the dynamic of what is commonly being reported. I am also working on a white paper for Pedigree Technologies, a company based in Fargo, ND, which implements M2M mesh networks.

I am also working on merging my research in complex systems with my work in project management. My previous work on complex systems has considered functional specialization and establishing the appropriate level of control for a team. For example, we were able to identify systems where the appropriate level of control included a significant amount of deviant behavior from the agents. This occurred not only because of the costs associated with increased control but also because of the agents providing a different perspective on system needs than the leader or controller held. I plan on taking an agent based view of project management where the agents who perform the work act according to individual behavior patterns as opposed to the dictates of a single project manager. This approach should be useful in considering how projects develop internally as well as externally where outsiders are contracted to perform the work.

Finally, I am engaging in a number of cross-functional research efforts in the areas of human resource management, finance and strategy.