Abstract

Growth in the global marketplace has intensified the need for companies to distinguish themselves as being competitive, progressive and innovative. Advancing the profile of any company can be challenging. Researching and learning new processes, strategizing and planning then implementing improvements can be time consuming and resource draining, however each of these steps are necessary when building that competitive edge. “Successfully growing a business is often dependent upon a strong competitive edge that gradually builds a core of loyal customers, which can be expanded over time.” (Ehmke, 2008) Project directors and managers want to implement improvements however they scramble to address workforce resource issues as well as a lack of internal knowledge of the latest processes and technologies necessary for proper project implementation. One solution to help bridge the resource and knowledge needs is to establish research project collaborative relationships with local colleges and universities. “Managers see working with academia as beneficial only to the extent that it advances the company toward its goals.” (Pertuze, et al, 2010)

Collaborative relationships are beneficial to both businesses in that they address the special project workforce and knowledge resource issue and to the university partners, giving faculty and students the opportunity to apply their knowledge and research in real-world situations. This paper will examine two collaborative partnership projects between regional businesses and university faculty and students. Also, the management approach taken with each of these projects will be described and an overview of the project outcomes and benefits to the companies and the university team discussed.

Introduction

Collaborative relationships between business and university’s can be both challenging and rewarding for a team of committed partners. These relationships potentially lead to practical business solutions, cost savings and process improvements that save time and resources. In addition, such collaborations provide invaluable opportunities for students and faculty to engage in real-world, hands-on business experiences.

“Both universities and industry can derive benefits from partnerships. For universities, these partnerships provide financial support for the educational, research, and service missions; broaden the experience of students and faculty; identify significant, interesting, and relevant problems; enhance regional economic development; and increase employment opportunities for students. For industry, such partnerships provide access to expertise they did not have; aid in the renewal and expansion of technology; improve access to students as potential...
employees; expand precompetitive research; and leverage internal research capabilities (Prigge 2005).”

Company leadership is faced with constant challenges embedded in running the day-to-day operating activities. Managing people, processes and profits, meeting schedules and looking for new business opportunities, causes efforts to identify problems and implement improvements to be placed on the business back burner. Employee improvement and reward programs are sometimes used to encourage ideas and recommendations however even the good ideas are not implemented due to a lack of resources and time. Partnerships with university faculty and students can bridge the gap between ideas and implementation. “Collaborative projects, when run effectively, can serve to give immediate feedback from industry to a program.” (O’Kane, 2010)

In addition, such partnerships bring resources, current research and fresh ideas in specialized knowledge areas together to solve the problems that companies do not have time to manage. At there best these partnerships are a win-win for all of those involved. “It has been shown that the undergraduate learning experience can be greatly enhanced from being put in a situation which more closely simulates the industrial environment than a non-collaborative project.” (O’Kane, 2010)

When a team is able to construct an effective working synergistic relationships the benefits include process improvements, new creative experiences, and sometimes, financial win-falls.

This article will summarize the each of the projects as well as the processes used to establish and maintain research relationships between two mid-sized companies and a team of faculty and graduate students from a tier-one research institution. This article will also discuss the different skill sets, process methodologies and management relationship approaches used for each of the projects.

Research Projects

The effective integration of process tools and technologies is important to maintaining a vibrant and competitive business environment. “University researchers help industrial scientists identify current research that might be useful for the design and development of innovative processes and potential products.” (Jones, u.k.) Examples of research collaborative projects include working on process improvements, software development, and product development. Research projects can be bridge the gap between resources and available personnel, ideas and solutions. “Collaborations between university researchers and companies can result in project outcomes that have a major impact on a company’s competitiveness or productivity.” (Pertuze et.al, 2010)

Figure 1: Business-University Relationship

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When the right collaborations are formed, companies and universities can make good things happen.

Recently faculty and students from a mid-west university was approached with an opportunity to enter into a collaborative research projects with two mid-size businesses. Each of the projects, one driven to solve a technology problem and the other process improvement issues, integrated the best process tools and technologies to solve the problems. The following will provide a brief overview of the scope of work for each of these projects and the outcome of the partnership.

**Project One Work-Team and Project Scope of Work**

The research work team for the first project consisted of two faculty and three graduate students with significant computer coding and analysis backgrounds. These faculty and graduate students were teamed with IT and engineering stakeholders from the partner company who were challenged to find upgrade solutions part-configuration capabilities aimed at improved customer service. The collaborative partners were located approximately four hours apart making regular and effective communication between the partners challenging. An article published in the MIT Sloan Management Review, (Pertuze, et.al, 2010) seven keys to collaboration success were identified. “Establishing strong communication linkage with the university team” was one of these keys.

Recognizing the importance of communication to the success of the project, the team began with a face-to-face meeting to establish the relationship. At the initial meeting the team identified the goals and objective, set responsibility boundaries for project tasks, and the partnership. It was also important to develop a practical plan and method for future communications and meetings. As mentioned, the distance between the university and the business complicated the collaborative relationship, therefore effective integration of various communication technology and media tools including telecommunication and computer sources. It was agreed that during these remote communication meetings the team would provide a project status update, discuss problems and solutions, review schedules and identify next steps.

The project was conducted in three phases with the end goal of creating an automated drawing process and 2D customized drawing website upload capabilities. The three phases or deliverables consisted of: (1) delivering a 3D image of a part provided by the customer, (2) delivering a 2D drawing of the actual part configured based on the 3D model, and (3) a 2D drawing of the actual part configured with no or limited use of the base models.

![Figure 2: Project Phases](image)

Drawings were collected and arranged by product configuration codes and linked to existing
catalog items. Once coded, a single part with sufficient variation and complexity to be representative of a typical configuration code with limited in configuration options was identified as the test product. The objective in this phase of the project was to develop and prove a new tool that would allow customers to customize and order their parts online.

This project was technology driven requiring specific technical expertise and knowledge from the customer and the academic team. The academic team began with research into Visual Basic (VB) coding, a review of the 3D CAD Inventor which is mechanical design software, Epicor: Enterprise Resource Planning (ERP) software and other drawing and configuration tools. Understanding these and other related products was critical to the team’s ability to design and end product that might complement and support the final product conversion.

Project Two Work Team and Project Scope of Work

The second project team was composed of two professors and one graduate student. The graduate student’s expertise was in the area of process improvement, production forecasting and scheduling making him the ideal candidate for the project. The faculty member’s expertise covered operations and supply chain management.

The first focus for this project was to improve the overall scheduling of the shop floor, identify appropriate measurement tools and methods for production scheduling, and improve inventory maintenance. The second focus for the project involved the development of a better forecasting tool. The primary objectives of this project were to:

1. Create a model that enhances the customer’s ability to remain a demand-based company with the ability to remain responsive to their customers.

2. Develop a forecasting tool that will improve the customers’ current manufacturing and purchasing processes.

3. Document the process and design for future use by the customer.

As with first project described in this paper, there was an initial face-to-face visit to the facility to meet the team, tour the facility and confirm the scope of work and project deliverables. This project was different than the first project in that it required a great deal of in-plant observation and engagement making it necessary for the graduate student to take weekly trips to the facility to collect data. While in the plant the graduate student was able to meet with company management, gaining insight in to the company culture and provide status reports on consistent bases. Faculty members consulted with both the graduate student and the company and managed the project as required.

Conclusion

While these projects vary in focus in their stated goals, objective and general approach, each of them were focused on improving the way they conducted business. Each of these projects resulted in collection of useful data, technology enhancement and process improvement. In the case of each of the projects it was generally agreed that most of the outcomes were achieved. Both projects are currently in the final review and approval stages before implementation.
The importance of establishing an effective communication process cannot be overstated. Whether by distance or close proximity, it was clear that maintaining open communication lines, sharing information and working together to solve problems was a pivotal part of a successful partnership.

References


BIOGRAPHICAL INFORMATION

Dr. Regena Scott is currently an Assistant Professor in the Technology, Leadership and Innovation (TLI) Department at Purdue University. Dr. Scott received her Ph.D. and M.S. degrees in Industrial Technology at Purdue. In addition to her Ph.D., Dr. Scott holds a B.A. degree in Communication Studies from the California State University Long Beach. Prior to earning her Ph.D., Dr. Scott spent 20+ years in the aerospace industry working in procurement, contracts, training and education, executive administration, and small business administration. Her research focus includes supply chain management, sustainability, product lifecycle management and supply chain management education and training.

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