Wegmans and RIT: A Case Study in industrial/Academic Collaboration and the Resulting Benefits

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ABSTRACT

It is common for academic units engaged either research or developing career paths for graduating students to develop relationships with industry. The goals of the relationship include donations (financial and equipment), coop and full time positions for students and scholarship through solving real world problems. The Networking Security and Systems Administration department at Rochester Institute of Technology is no different. The department enjoys a fairly active industrial advisory board and engages in professional dialog with local companies for the advancement of educational goals and to provide employers with highly qualified new blood. In cases where the interaction between academia and industry is treated most carefully and attention is paid to the expectations of all involved, the benefits can far exceed the imaginations of the architects. One might say that these expectations are every bit as important as the original reasons for establishing the association.

This paper will analyze one such relationship in terms of its' establishment, maintenance, mutual benefits and future projects. Subsequent sections will describe the details of the affiliation, the components that have featured prominently over the last three years, its' successes and areas requiring some improvement.

Keywords: training, industry partners, relationships, benefits

1. INTRODUCTION

In May of 2005, the Networking, Security and Systems Administration (NSSA) department at Rochester Institute of Technology was developing coursework in the areas of voice over IP. To this end, a mini-summit was organized that was largely a round table discussion of the issues. This continued for three years and in 2007, we reached out to companies contemplating a switch to VoIP technologies. Two managers from a local company agreed to serve as our speakers and it was at that point that we began to develop a close association with Wegmans. Wegmans is a company running a large chain of supermarkets, covering many states on the eastern seaboard. With more than seventy interconnected locations, they have tremendous infrastructure challenges. As a collection of supermarkets, they have the additional challenges of supply chain management and the sheer logistics involved in moving so much product and managing a huge amount of information. At the time, they were evaluating solutions from several vendors and so were excellent as speakers for the conference. It also happened that they were investigating methods of ensuring that their technical staff was well trained.

Once on campus and after receiving a tour, our speakers began to realize the extent of our capabilities. The possibilities for collaboration were quickly apparent, but it was our job to turn the possibilities into an actual success story.

2. INDUSTRY CONNECTION

The lifeblood of an educational department or degree program is, in part, its' relationship with industry. Certainly there are many other aspects, but with tight budgets, the desire for scholarly outlets and with limited control on advertising, these connections can be critical. Many organizations and grant solicitations tout this importance. One of the most cited works on the subject shows us that not only do many faculty members engage in activities with industry, but encourage others to do the same [4]. One reason for this might be the lack, perceived or otherwise, of available resources. The NSSA department is no stranger to limited resources having started a networking lab by purchasing components from our local hardware store before reaching our current level of infrastructure [5]. A very strong argument for working with industry, particularly in technical areas, is the simple need to keep up. Faculty members that are not engaged risk falling behind in their own knowledge and expertise. They may also wind up teaching content that is outdated or ineffective. In a recent discussion at RIT, a trustee voicing strong support for graduates that can actually change or create new methods for communication, stated that while theory is important, theory alone can make a graduate nearly useless to industry. However, many faculty members continue to reject or fail to see the benefits of these relationships.

3. RELATIONSHIPS

Industrial/faculty interactions can take many forms but they are always best served when both the industry partner and the educational department have shared respect and clearly communicated expectations. Too often, the needs or desires of the educational department become the focus of the relationship and when this occurs, failure can result.

Why does industry come to academia? Obviously there are quite a few reasons but the desire to simply give away money usually doesn't top the list. The industry partner may want a source of qualified talent, a laboratory environment for testing, help solving problems or they may wish to be more competitive. Whatever the objective, if it gets down to the college department level, it is going to be something tangible rather than a plaque on the wall or a name on a building. On the academic side, the goals are typically quite different. Many colleges and universities maintain a permanent staff of development officers whose role is to obtain financial or equipment support from industry. These officers are often given significant donation goals to achieve and so their motivation is clear. One does not have to search very long to hear tales of irritated industry partners balking at giving this year because nothing came of the donation last year. This is particularly true in an economic downturn. This "monetary" motivation may actually do additional harm if they are not careful about ensuring that the needs of the industry partner are an equal part of any negotiation. To paraphrase the literature on the subject;

> *There are three aspects of partnering relationships; trust, compatibility and commitment. Of the three, trust is the most important.* [3]

Thus, it is critical to ensure that the college or university staff understands the nature and expectations of the relationship before asking for money, equipment or even time. The Golisano College at RIT has been fortunate in this regard because the development officers learned and even used this to their advantage. In addition, they work directly with faculty members. After all, the faculty develops projects that can aid or be aided by industry partners. It is also important to refrain from saying "yes" to things that are not needed. This is another technique faculty members use to disappoint companies because upon receipt of the equipment, the faculty member is either ill-prepared, has little time, little interest or lacks the knowledge necessary to use it. They rely on a "good idea" to get them through. In the end this often fails because the good idea never really had a chance to become a reality. Partners often desire a tour or visit to see how the gift or donation is used.

4. FROM THE BEGINNING

These were guiding principles in moving forward with Wegmans. We wanted to ensure that they knew that they were not simply a gift giving source. Perhaps more to the point was that the NSSA department also made sure that Wegmans knew that *we* knew (and believed) that this was the case. The truth is that we did want things from them and they wanted things from us. But we all recognized that the relationship would bear much more fruit if treated properly and that "fruit migration" would be bidirectional.

The relationship that began several years ago with an invitation to a conference has now expanded to include training programs, employment for students, scholarship opportunities for the faculty and the aforementioned donations. As can been seen, these include very tangible "ledger sheet" items, but also less tangible, but no less important things such as feedback into processes and insight into the real needs of industry.

4.1 The Question that Started it All – Training Program
During the aforementioned tour, the director of the Wegmans IT group said that it appeared many of the training programs they were currently using might be recreated within our department. We possessed equipment and expertise, and it didn't seem like much of a stretch to say that lab work might be retooled into a training program. I seem to recall saying "yes."

The stated goal for Wegmans was to bring their employees to a base standard. This standard might be used as a measurement tool and internal projects would be staffed more appropriately. Over the following six months we met either in person or via the telephone in order to nail down the components of the training program. We started with two lists; the first was a collection of topics that they would like covered and the second was a list of labs/topics that we had as part of our coursework. With the constant mantra that this was a custom training program targeting exactly what the *partner* wanted but with our expert recommendations as to what should also be included, we narrowed this down to one list. Topics are a straight-forward collection of networking ideas such as;

- Layers and models
- IP, subnets, CIDR
- ARP
- ICMP
- Routing and routing protocols
- Switching
- Packet Capture
- VLANs and trunks
- Basic Security

Each of the topics has an associated lab activity or component. With the list created, other details regarding the actual running of the training sessions had to be addressed. This as an opportunity to work in an approach that would improve any training program. The first of which was the format. Most training programs require that companies send employees to some distant location, pay for hotels, travel, food and perhaps a rental vehicle. Training typically runs over a couple of days and eight hours each day. The negative aspects of this approach are obvious;

- Separation from family
- Disconnected from the office
- Additional expenses (food, lodging, rental)

- The effect of travel

Simply running the training sessions at RIT mitigated all of these. In addition we went with a start time of 9am and an end time of 4pm. This shorter training session allowed time to check in at the office for those that needed it.

With the training topics selected and the format ironed out there was still one major issue to address – information retention. There are two aspects of this that were of concern; how to get the information to stick and how best to prevent information overload. There were a couple of central ideas here. The first was the simple project management mantra of a good meeting. Specifically, meetings should not go beyond about 45 minutes if you wish to keep everyone's attention [2]. Academia regularly violates this rule for faculty, but it was to be avoided in this program. Active learning was also embraced, particularly the ideas espoused by Bonwell and Eison (also Chickering and Gamson).

> *Analysis of the research literature however, suggests that students must do more than just listen: They must read, write, discuss, or be engaged in solving problems. Most important, to be actively involved, students must engage in such higher-order thinking tasks as analysis, synthesis, and evaluation.* [1]

The first thing was to remove the program from the classroom entirely by using a lab. While one might assert that active learning is easy in a lab environment, the goal was to integrate the instruction with smaller exercises rather than simply giving the participants a large collection of activities to complete. So, lecture topics were 30-45 minutes maximum with smaller integrated lab experiences.

I was also concerned with long range retention. Though many of the participants would have immediate use of the information, several were transitioning positions or locations. So, the information had to stick for some period of time without reinforcement from work. For this reason, we made sure that lab and lecture topics were pyramidal, each building on the previous from start to finish. In most cases, very similar topologies were constructed but with minor additions or new techniques.

Lastly I was worried about "soak time." It is generally accepted that students can only take in and retain a certain amount of information per unit time. Additionally, it is beneficial to have to time to process the new information. Many of the attendees had been out of formal courses for quite some time. When this is combined with the nature of the material, the object was to keep the cognitive load as low as possible [6]. So, the training program was built, not on the 5 days, 8 hrs a day model, but rather on a once a week time frame. In between training sessions, students would be given a quiz and a discussion board where they could go over material and ask questions.

4.2 Evaluation

Like most programs and classes, we did complete an evaluation at the time in the form of a survey. We also incorporated some basic feedback from the managers. The obvious concern was that Wegmans was getting what they expected out of the training and felt that the money was well spent.

The survey results were typical of a good class in that the students had few negative comments and for the most part saw the benefit of and appreciated the opportunity to go through the training. This was true for the content and especially for the format. Similar comments came from the managers at Wegmans. However, we recognize that this is very much an "in the moment" set of replies and because of this, future work involves following the employees as they return to work and have an opportunity to use (or not use) their new knowledge.

Not all of the programs were a resounding success. There was one training session that was developed targeting systems administration. Only a single class was run because the expectations were not met. Evaluations for this class were lukewarm and so it is being rewritten.

5. THE BENEFITS

At first glance, developing a training program might seem like a good way to provide some visibility for a program, provide a service for industry and perhaps generate some cash for those directly involved. It has been the experience of the principle investigator that many faculty members turn away from opportunities such as this because they are not perceived as having much value in terms of scholarship or professional development. They can also be a lot of work with small reward. In this particular case, nothing could be farther from the truth. In fact, this paper asserts that if relationships are managed correctly, almost every project could be of great benefit to the individual faculty members, the program and the college.

The initial direct benefits to Wegmans are straight-forward. Within the IT group, most members were able to run through the training program and they are directly responsible for a wide variety of equipment and tasks. In receiving training, their employees would be more productive and have greater skill. This appears to be the case. The same can be said of the benefits for RIT; initially our program received some publicity, we were pleased with the state of the relationship with Wegmans and instructors received compensation.

5.1 Secondary Benefits

What was not obvious was that because we worked so hard to make the program a success, there were a number of other benefits that followed on the heels of the first generation. The custom training program that was piloted by the Wegmans' networking group was to include several other

units within the company. In the second year, .NET training ran concurrently with the Network Level I sessions. In fact, more students (employees) were run through this program than the original. This growth continues as we are discussing the possibility of developing two more programs. Program visibility created another mutual benefit as Wegmans began hiring more and more of their talent from our programs. With seventy five stores they are able to keep up a fairly steady demand. In addition, Wegmans hires an increasing number of students from the co-op program and many of these turn into full time opportunities upon graduation. But perhaps the two greatest secondary benefits were the donations and scholarship opportunities.

5.2 Donations

One of the temptations for academic programs is to immediately ask for donations. It is very tempting to make the grab for money or equipment and then move on. After all, there are so many companies from which gifts can be solicited. We were no different except that after realizing that the projects thus far had been so successful, *we simply decided not to ask*. In fact we took it off the table entirely because we wanted a longer term relationship. In addition, the secondary benefits were making themselves known.

However, about a year after we started the programs, Wegmans decided to upgrade much of their networking equipment. It is common when working with a vendor to get a discount off of new equipment as long as the old equipment is not then resold. Often, older but still functional equipment finds its' way into the dumpster or is crushed. We asked Wegmans about the possibility of *NOT* destroying the equipment and donating it to us. As an academic program, we are often at the mercy of a lower than hoped for budget and this would be a great boon for the department even if it was just a couple of switches. After some deliberations it was discovered that this would not violate their agreement with the vendor and so they decided to send the older equipment our way. What is important to realize here is that *they didn't have to*. The research and time necessary to push through a donation like this is not insignificant especially in light of the size of the final gift. I believe that it was because we worked so hard on the trust between the organizations that the individuals were willing to work on our behalf.

So what is the nature of a donation from a company that upgrades a number of large grocery stores? In actuality we have been the recipients of two donations and the equipment came in on nine pallets. There were hundreds of devices including access points, wireless bridges, hubs, routers, switches and even some processors. The total donation is valued at more than $500,000. Perhaps one of the most rewarding aspects of this donation is that not only are we well supplied with equipment for regular classes and research projects, but we have been able to assist other programs and groups outside of RIT.

5.3 Scholarship

The scholarship developing from the interaction, like many of the components of this paper, can be viewed as mutually beneficial. There are two activities in this direction; projects and presentations. The projects are largely on paper although we have had opportunity to consult on some small problems voiced by technical staff. The largest of these projects is the possibility of building what we have termed as an "enterprise center." The goal would be to create a lab that closely emulates the production environment at Wegmans. The center could be used to help solve real world problems and provide network and security training on devices currently deployed. It would also give our students a chance to work on equipment specific to an industry.

This paper is an example of a presentation opportunity afforded by the relationship. The dissemination of information and sharing of ideas is certainly a part of any academic career and this helps fulfill that requirement. There is another investigation that follows this paper and this is detailed in the next section.

6. FUTURE WORK

As discussed previously, there are several components within the industrial relationship outlined here. Work with Wegmans largely follows the ebb and flow of their industry. For example, when a new store is to be opened, the group essentially disappears only to reemerge later with new projects and ideas. The enterprise center is a project that continues on in discussions and there are 1-2 training programs that are likely to be developed.

This paper is to be followed by another that seeks to evaluate the training program. Like many courses, participants took a survey about the course as it came to a conclusion. The research seeks to follow up on the employees after they have been back on the job and have had a chance to evaluate the real world value of the training program. We will also attempt to evaluate whether or not the managers actually believe that the program had a positive effect on the business unit and if it had an acceptable return on investment.

7. CONCLUSION

Often faculty members find themselves presented with an opportunity for what might appear to be rather mundane activities. Seen in the correct light, these may open many doors that might not be obvious at first glance. This can be especially true when working with industry partners like Wegmans. In order to ensure the best possible outcome, faculty and development officers should take special care when managing interactions. Perhaps the most important point to be made was our desire to stay on task and resist the temptation to turn things into a "What can Wegmans do for RIT?" sort of connection.

This paper covered one such relationship, describing its' genesis, benefits and future. Also covered were techniques to create favorable conditions with other industrial partners, followed by future directions. It is hoped that this case study will serve as an example of how to find opportunities, create successful, long standing relationships and leverage the alliance for the betterment of both partners.

8. REFERENCES

[1] Bonwell, Charles C. – Eison, James A. "Active Learning: Creating Excitement in the Classroom", ERIC Clearinghouse on Higher Education, September 1991.

[2] Ghattas, R.G. – McKee, Sandra L., "Practical Project Management", p19, Prentice Hall, 2001.

[3] Hutt, M.D., E.R. Stafford, B.A. Walker, P.H. Reingen. "Case Study Defining the Social Network of a Strategic Alliance", Sloan Management Review, Vol. 41, No. 2, 2000.

[4] Lee, Yong. "'Technology transfer' and the research university: a search for the boundaries of university-industry collaboration", Research Policy, September 1996.

[5] Leone, Jim et al. "A Networking and System Administration Laboratory Infrastructure To Support High Traffic Environments", CITC3, 2002.

[6] Sweller J. "Cognitive load theory, learning difficulty, and instructional design", Learning and Instruction, 4 (4), 1994, pp. 295-312.