

# Doing More with Less for the Good of All

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## ABSTRACT

As with all of you, Instructional and Informational Technologies (IIT) at Penn State Schuylkill have been hit with budget cuts and limited staffing, while our request for services and support have grown. The response no one wants to hear to his or her request is NO, so this has called for some resourceful times. We only have a full-time staff of 4 on our campus to support approximately 1,100 students and 250 faculty and staff. This has resulted in us successfully turning to our educational departments for assistance. We have been able to turn our request and challenges into projects for our Information Science & Technology (IST) students. We have utilized them for small LAN design projects, Software Applications, testing of security on a wireless LAN and several minor projects. IST student interns are also used to supplement our staff when we know we have a large volume of work to be done. This summer we are looking at a campus wide wireless rollout, possible assumption of our ResCom network, re-cabling projects as well as our annual recycling of computers in the labs. These will all have a high utilization of student labor. These students have come away with a greater knowledge than they would normally get in a classroom environment by actually getting to do what they are learning about and we essentially double our staff size and accomplish more than we would normally be able to do. The faculty loves the idea of the hands on practice and them actually putting something into a production environment.

## Categories and Subject Descriptors

K.6.1 [Project and People Management]: Staffing, Management Techniques

K.6.0 [General]: Economics

**General Terms:** add here

## Keywords

Collaboration, partnership, interns, students, projects.

## 1. INTRODUCTION

This paper describes the working relationship we have developed on our campus, between the Information Science & Technology

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department and the IIT department. In the following sections, I would like to explain about this collaboration and the benefits to both departments and the University as a whole. Further sections will discuss the quality review process and procedures for implementation of approved projects.

## 2. AN IDEA IS BORN

During a semester, one of our faculty members from the School of Electrical Engineering came and said he would like to have a LAN set up for his classroom. The request was simple enough; they didn't need internet connectivity, but needed a printer and the ability to share files. We had older computers and monitors that would meet his needs. However we were busy at that time with our normal workload and the projects we had already taken on. So the canned response was "We could do it, but it will be low on our list and take some time for us to get to." While returning to my office from this discussion I passed the office of Dr. Madigan, who teaches the Networking classes in our IST program. I proceeded to her office and declared "I have a great project for your Network Administration class this semester!" At this point I had her attention, when I explained the project she thought it was an excellent idea, this set this whole concept in motion. She presented the idea to her class and the rest is history.

## 3. BACKGROUND INFORMATION

Prior to this project being taken on by the IST students, we have in the past brought in students as interns in the IIT department. These students usually worked with us during the semesters to help with Residence Hall issues. They also handled other problems that we felt their particular strengths enabled them to deal with. Some were strong in networking, some in programming and unfortunately some in hacking and creating their own processes. Most have been very effective workers and maintained a professional image in their work. To date Student workers have completed 18.4% of the hours spent on Work Orders and 30.5% of the completed work orders. These students were from our IST program, so in implementing the current process we are actually reaching a large group of these students earlier and giving them more hands-on experience before bringing some in as interns or as Help Desk employees.

Our support structure on campus is trying to emulate a model that has proven to be very effective in both problem resolution effectiveness and in the efficient use of our staff. It is a 3-tiered approach to support. Tier 1 support is meant to resolve more trivial request for information, user education and minor technical problems. This level also receives all incoming calls and request resolving what they can and passing to tier 2 what they cannot fix. Tier 2 takes on problems that are more technical in nature but do

not require an expert to resolve. They also work on projects when not involved in problem ticket work. Tier 3 support is considered the experts in the specific problem areas. Unless the problem cannot be resolved at the previous tiers or is triaged by the Help Desk to be Critical it should not make it to this level. Our current system has tiers 1 & 2 staffed entirely by student workers. Tier 3 is composed of our IIT staff. This system has worked quite well for us as far as efficiency of service. There are always exceptions to the plan certain faculty or high-ranking staff members do not want students working on their computers. This is understandable, due to confidentiality, in most cases and we try to accommodate these request.

#### **4. THE PROCESS**

The procedure that we have gone through for these student projects involves several stages of development. The student must follow the processes and document the various stages of their projects.

##### **4.1 Initial Request**

Faculty or staff call or come to our office with a request for service. One of the IIT staff meets with them and discusses the project to discover what level of detail and depth the project involves. If the request requires more expertise or security than we feel is appropriate, then the work order is entered into our Help Desk system for the Staff to handle. Otherwise, we would look at it and discuss whether this might be a candidate for an IST class project. If it is I then meet with Dr. Madigan to discuss the project and see if she feels that it is suitable. If so then it is presented to the class.

##### **4.2 Class Process**

After deciding it is acceptable for the class to work on Dr. Madigan addresses the staff or faculty member requesting the service to gain their approval for the students to perform the work. Once gaining this approval the class is broken up into teams and the assignment is given to them to develop a detailed project plan documenting all work to be done. Often times this process involves them going to the requestor and interviewing them to do a needs assessment. Each team works independently to develop their plan. Once all teams have completed their plans they must do a presentation on the project as though they were presenting to a customer. A voting process is then held to decide which project was the most practical and functional. An overall team leader is then selected for the project and all plans are reviewed to find the best solution for each phase of the project. The students must then coordinate the performing of the work with the requestor so as not to interrupt existing schedule. They must also coordinate the work with our department to verify that any software needed will be appropriately licensed.

##### **4.3 Final Approval of the Plan**

Once a final plan is set forth it is brought to the IIT department for our sign-off that it looks like a valid plan and that all current Penn State policies are being upheld. Suggestions by our staff are then made at this time and also and quirks we may know of are also revealed to the students.

#### **4.4 Work Performance**

All of the work is done under the supervision of Dr. Madigan. She monitors their progress and cracks the whip to make sure they complete the project on time. After completion both an IST faculty member and one of the IIT staff do verification of functionality. Follow-up is also done with the department requesting the work to verify that the request was fulfilled to their satisfaction. Every project undertaken thus far has met with full satisfaction.

#### **5. PROJECTS**

We have thus far utilized the services of these students for several projects under the direction of the IST faculty. The initial project was to have them create a LAN for the EET program. This was followed by a test of our initial wireless LAN. The students created their own hack device a laptop; wireless card and a coffee can antenna. Their goal was to try to crack our Wireless LAN. If successful, they were to document the process they followed to accomplish their goal and provide that documentation to me, to allow us to shore up the weakness. They did succeed in hacking into the LAN using inside information and provided to me the required documents. They also took their mission a step further by going to the residence halls and locating several rogue Access Points.

The most recent project the students accomplished was the creation of a Work Order system for the Physical Plant department. The students developed the system utilizing Microsoft Access and a web interface with ASP scripting. This will replace the current paper trail system.

One of the greatest gains we've gotten out of the student workers though is their productivity in staffing our Help Desk and as technical workers when the new Resident students arrive on campus. The delays for students getting connected have dropped dramatically since we've started implementing student workers.

#### **6. BENEFITS**

The benefits of this program have been far reaching. The IIT department has gained the equivalent of an extra employee year round at a fraction of the cost and with great results. The various departments on campus have seen quicker results to having their projects and problems completed. They have also gained a greater respect for the students in our IST program when they see first hand the things they can accomplish. The IST department has seen several benefits from the process. As mentioned earlier, the gain in respect for the program. Also, being able to turn the classes offered into more than just a lecture and controlled environment labs format. Being able to give the students practical real life scenarios and projects enhances the appeal of the classes to the student body. The greatest gains I believe are for the students themselves. The students get to see first hand what is involved in understanding a project and then defining the project and then seeing it through to completion. They get involved in all phases of project management and also the get hands on experience that they normally would not get in a live production environment.

## **7. STUDENT EMPLOYEES**

As mentioned earlier student employees have been filling the Tiers 1 & 2 of our support model. At Tier 1, we have the Help Desk employees these are mostly IST majors that have just started the program or have been working for us in prior semesters. They do not have to be IST majors, however they are the ones usually interested in the position. We generally give these students training on some of the issues they will most likely face printing, MS Office, disk errors and others. We also give them training on maintaining the printers and to make it easier we run a program that notifies them when a printer is out of paper or low on toner. Track-IT! is our Help Desk software package and the students are shown the essentials for recording, triaging and assigning a problem to the appropriate personnel. Trying to get the campus trained to use the Help Desk, as their central contact for our department has been effective for the most part. Some personnel are still insistent on calling the last person to help them or their favorite staff member. These students are also responsible of the monitoring of our computer labs and are located in a central location visible to all rooms.

1 student working approximately 20 hours per week accomplishes tier 2 support. This student along with any interns we may have at the time are responsible for more technical support as well as project & maintenance work. We have trained the students working this slot in using Ghost, software installations, IP Addressing schemes, network topology and other higher-level items. This is the position that frees up the most time for our staff to work on research and projects. Without these students the staff would have to run to every call that was not resolved at the Help Desk. We have really set no limits on this position as far as what they can and can't do. The only limit is the individual's skill level. Training on new items is done whenever the opportunity affords itself, usually by shadowing and then hands-on.

## **8. CURRENT & FUTURE PROJECTS**

Currently, we have 1 student intern and 1 Tier 2 student employee. Projects that we have them involved with are numerous this year.

We are converting a classroom to a wireless writing lab for our English program. This project is tied tightly to our wireless networking initiative. Room A-106 in our Administration building will be getting 26 wireless laptop hand-me-downs configured for use there. The students are formatting the drives performing clean installs of the Operating System and necessary software. They are also setting up the wireless cards and the VPN client software for them to connect to the network.

The wireless initiative mentioned above entails complete coverage in our 4 main buildings on campus this summer. We will be at that time involving the students in configuring and installing the access points, as well as testing connectivity from all areas to verify functionality. Another aspect of wireless we are going to visit this year is wireless bridging. Our Physical Plant department still dials into the network. They are too far away for a copper connection, fiber cost not feasible so we will tie them into the network using a wireless bridge.

Our annual computer shuffle is soon taking place. We will be receiving 29 computers to replace those in lab C4. These machines must have the most recent image ghosted to them. The DHCP server will need the MAC addresses for the reservations updated and the old machines from this room will need to be re-allocated to other locations.

Minor redesigns are being done to our network this summer to increase the backbone speed locally. The students with supervision will do this.

Last year we held our first Technology Expo on campus and had great reviews of it. We utilized the students for that project also and will be expanding their role in planning, setup and tear down.

## **9. FINAL NOTE**

Some of the success of our IST program and that the students are learning showed at our Technology Expo. Four of our former students we here as exhibitors for the companies they are employed at and three others were there as representatives of their companies. We feel like we have already accomplished much for our students.