

My General Motors Internship

The “ACE” Project

By Edward M. Cruz

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There were many people who went into making this internship possible and a success. There is the apprentice committee at General Motors who allowed me to take on this internship on my job while also putting time to my electrical apprenticeship. There are those at YSU, such as Professor Tom Bodnovich and Gwen Clark, who guided me through the internship process. They were very helpful and encouraging. And then there is Kurt Droese and Cynthia Smit at General Motors from the Information Systems & Services department who took me under their wing and taught me a lot. Everyone here that I mentioned are great people, friendly and intelligent, with a passion for teaching and guiding. For that I am truly grateful.

“ACE”

The first few days of my internship were spent getting to know everyone and being introduced to the IT processes at GM. With a place this big, there is a lot to be seen. The normal day-to-day tasks that everyone does are a lot, but also, a new project was about to kickoff. I will call this project “ACE.” For proprietary reasons, I cannot get into the specifics of what this project was about, but I can tell you about the responsibilities that I was given without sharing any GM specific information.

I was given 3 days to get familiar with everything and everyone. On day one, I was given a desk, a computer, a desk phone, and a Nextel. I spent the day being introduced to people and getting settled in to my cubicle. I had to setup some of the software that I would be using, email setup, passwords, and other very general things.

On day two, my boss felt I was ready to take on some responsibility. ACE was now being introduced to our plant, the staff, and management. A team from the corporate office in Detroit as well as support from other companies came to

our plant to introduce this new software system that would directly affect the entire production process. I sat in on a meeting for the launch of ACE and immediately was given an assignment. My job was to go throughout the entire complex (*3 buildings covering almost 5 million square feet*) and find every piece of equipment that communicates over the network directly with the current version of ACE. This included PC's, Program Logic Controllers (*PLC's*), and other specialized computer equipment used for the production process. I was handed a spreadsheet and CAD drawings to help me, and upon finding a piece of equipment, my job was to label it with the IP address, the hostname, and where the electrical power source was fed. This power source could be a simple duplex receptacle, a bus plug, or anything in between. I was to then make a new spreadsheet with the updated equipment and update the CAD drawings as well.

Since different members of the staff were responsible for different pieces of equipment and since the information that I was given was not totally up to date, many of my days for the next 3 weeks, were spent walking around the plant floor trying to locate the right equipment. Meeting with staff to pinpoint the exact location was also a big part of my investigation. I used the network to "ping" equipment and used various prompt commands at my computer to lookup equipment information as well. Many of the staff members that I met were other IT people as well as engineers and management. They were all very friendly, knowledgeable, and a great help.

It may be difficult to help you understand how large these buildings are and how much equipment is used in the production of these cars without visually seeing this for yourself. It is truly amazing. To find what I was looking for among many other processes and equipment all at the same time in order to build cars was not easy at all. But it went a long way into teaching me how networks at such a large scale are actually implemented, how networks and network devices communicate with one another, all the components of a network (hardware and software), and the support that is needed to ensure that information is passed properly and in a timely manner.

Each day that I would verify equipment, I would update my spreadsheet, and update the CAD drawings. As I got a better understanding of the system, I started finding new equipment that was not added to the original list. I also found that some of the equipment on the list was no longer in use on the floor. With approval, changes were made to delete the item from the list.

Since ACE is a new system, it requires some new equipment. Therefore, my job was also to add new ACE equipment to the list. See, ACE is not just a software upgrade. It is a new and improved way of implementing an old process. This new system provides a cost savings to the company, and a better interface to the plant floor workers by way of new software, the use of existing equipment, and the installation of new equipment.

I was also given the responsibility to install new equipment on the plant floor. This is where I cannot get into too much detail, but some of the general use pieces of equipment that I installed were PC's, printers, and scanners. All were then added to the network through a direct LAN line or a PLC.

Throughout this process, many of my peers were spending their days testing and debugging the system, setting up new equipment, and installing software. I was privileged to sit in on nearly every meeting for the launch of ACE, while leaders were getting daily status updates, checking off tasks that were done, making note of critical issues and working through those issues. People from all over the country, not just from our company but others as well, were sitting in remotely on conferences. It was a major production. Everyone whether present or remote were able to see the same computer screen and listen in over a conference call adding their input when needed.

One of the things needed for this project was a strategy for handling the failure of ACE if there ever was a problem. In other words, what would be the plan of attack on the plant floor to keep producing cars if ACE were to go down? Manual operating procedures were to be written in the form of flow charts at each critical area on the plant floor to either bypass a process or manually handle the process, and the job was given to me to create those documents. More meetings with management and engineering were made to gather information and come

up with a plan. Once a plan for each of these critical areas was approved I wrote the flow charts.

One day, leaders from Detroit made a visit to visually check on the status of this project. One of the things on the agenda for the day was a presentation detailing the work we had done up to that point. My boss, Cindy, was to give the presentation, but she instead asked me to do it. I presented to them the layout of the floor and all the equipment critical to ACE, and then I presented to them the manual operating procedures. Each procedure was explained in detail allowing them to get a full understanding of how we would manage this new system. The presentation went so well that they responded by telling us we were the most prepared plant in the organization thus far implementing ACE. They were impressed with the CAD drawings and the clarity of the flow charts among other things. A leader from GM headquarters in Detroit and one from another company, who were at the presentation, inquired about my resume. I felt very good about that.

After all testing and debugging was done, and all equipment was put into place and ready for production, ACE “went live” on the floor and the new system went into full use. That day was very busy. Word got out about how well our team was doing with our launch of ACE that many people from other plants, heads of the Information Systems and Services department at GM Headquarters, and other companies were present for the launch of ACE. I was given the assignment to make documents for the day and helped assign people to different areas of the plant floor to observe the equipment in action during the launch.

At this point, all the work that everyone had done to get ACE up and running was put to a real live test. With very few minor issues, ACE was a success. Production went on through the day without a hiccup. We went about our day checking equipment and making sure it was doing its job as it should. There were no major issues. Some of our local team was asked to come along with the core group of people going from plant to plant launching ACE throughout the corporation.

OTHER RESPONSIBILITIES

Among the launch of ACE were the day-to-day responsibilities of administering the network. This involved adding new account users and deleting old ones, giving users specific rights, making requests for phone lines, while troubleshooting issues that users had with the network. We setup new PC's with different configurations and installed them on the floor. There is so much equipment that what is in use is constantly in need of being verified as still in use or retired. Equipment information such as the owner of the equipment and where it is located is always updated. That was part of my responsibility.

CONCLUSION

I am still here in the IT department and my boss, Cindy, will be taking some time off through December. I have been asked to stay on board and help cover her job. To me, that is an accomplishment in itself and makes me feel very good that she would entrust such a responsibility to me. Everyone here is great and it really feels like we are a team. I enjoy that part. The Information Systems & Services department is so critical to the process here and everyone seems to be motivated to make it the best. Every question or need that I have had has been met by a friendly face that did not seem bothered by my asking for time out of his or her busy schedule. While at the same time, I have been given the freedom to take on a significant amount of responsibility. I owe Kurt Droese, Cynthia Smit, and Professor Tom Bodnovich a lot of thanks for this excellent experience.