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Internship at Tech For Troops

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Internship Final Paper

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Introduction

As part of my degree, I wanted to complete an internship instead of the entrepreneurship class. I'm not much of a go-getter, so entrepreneurship doesn't fit my style. An internship would not only fulfill a degree requirement, but also give me much needed experience in the working world. Having an internship would put me one step ahead of others applying for the same position as me in the future.

I first started applying for internships the summer after my freshman year. I landed an interview with my local county government, but was unfortunately not the person they chose for the role. In the following summers I applied to a number of internships and only had the opportunity to go through one more interview. That led nowhere, leaving me a little discouraged.

Then, my older brother suggested that I intern at Tech For Troops (T4T), where he had interned last summer. I was still waiting to hear back from a couple places I applied to and hearing that it was more IT and not cybersecurity as well as being unpaid left me unsure of if I'd even want to intern there. As the add/drop day drew near, I committed to taking on the role. I emailed the President/CEO at Tech For Troops, as my brother had given me his business card, and arranged a tour of the place. The place seemed nice with plenty of different things to try. After the tour/interview I emailed back, did a background check, and was hired.

Tech For Troops is a non-profit focused on providing training, education and technology for veterans and their families in need. Tech For Troops was founded in 2013 in Richmond, Virginia by a mother and son. Currently they offer aid to veterans in the form of training and a computer, data destruction, electronics recycling, and hardware upcycling. They take donations of electronics at the door, refurbishing some and recycling others keeping e-waste out of landfills.

As an intern at T4T, I had hoped to learn how to: break down computers into their individual components for recycling purposes, sort those components into containers, refurbish recent enough computers to give to veterans, and the processes and precautions for data destruction. On my first day, I started tearing down desktops and laptops immediately. I mentioned that I worked some with computer hardware before and wasn't given any specific training for tear down. I was never really told who was my immediate supervisor, so I just talked to the important people around me. My work schedule was very flexible. I could leave early whenever I wanted, I could take longer than the 30 minute lunch break if needed, and I wasn't set to go to work on specific days of the week. It seemed like the internship was going to be a pretty low stress experience.

Management Environment

Tech For Troops is a pretty small place. I got to know most of the people there in my time over the summer. In the area I worked most of the time there were two people who managed other employees and two others who were in more senior positions doing their own thing. Because the team is rather small, there didn't seem to be a typical

management structure. There was a lot of cross-training and few clearly separate departments.

I did run into some issues when it came to this system. Like I said earlier, I never really got to know who was my immediate supervisor or if I even had one. Because of that, I didn't know who to ask to try new things in different departments. I thought of asking the person that managed my brother when he was an intern, but that person had retired before I had the chance. So I only ever got to work in that back room with the two managers that worked in there.

Major Work Duties

For the teardown side of things, I was tasked with taking mostly laptops and desktops apart. There were some interesting cases like taking apart a credit card reader, but that was not the norm. After taking all the components out, I would sort them into boxes on a shelf nearby. When those boxes filled up, someone would take it out to a larger box on a pallet. This process of placing components into larger and larger boxes prevented us from crowding our workspace or doing a lot of extra walking. Later these components would be sent off to be recycled for some of the raw materials that went into manufacturing them initially. Recycling them keeps e-waste out of landfills and allows for the raw materials to be sold and reused.

Another area that I tried working in was refurbishment. I was tasked with refurbishing 20 or so laptops. The first step was to clean them. I hadn't done so before and it seemed really strange to spray them with a foam. To clean the laptops I opened them, brushed out the fan, closed them, and used the spray foam to wipe every surface clean. Every laptop was given a paper with info to note down and a checklist of the steps to follow. The next step was to enter the BIOS, reset the settings to default, and then set the ones we wanted. Some of the laptops had issues in the form of RAM errors or the BIOS being locked with an unknown password. Then we would run a full diagnostic on the hardware to make sure it all worked fine. The next step was to install a drive with Windows 11 and some T4T utilities. We split the laptops I was doing into two groups, half with drives that already had the stuff on them and the other half with blank drives. Later on we used a program called Clonezilla to copy everything off of a master drive with the stuff on it to the blank ones. Once in Windows, we would do all sorts of updates and tests. The most important being a battery test to see if it needed to be replaced. Finally, I put a Tech For Troops sticker on top and a tag to be put into a database on the bottom. The refurbished laptops would later be donated or sold at a low price to veterans and their families.

Use of Cybersecurity

As this internship fell more under Information Technology (IT) work, I didn't do much that had to do with cybersecurity. The closest thing was dealing with drives holding peoples' data. Any drives that we found in the devices we were tearing down that were new enough would be saved to be wiped and used in refurbished computers. Otherwise, we would shred them after taking off a board from the bottom and putting it in a specific box. As far as data destruction goes, I knew that physical destruction of drives is the most secure. It would be impossible to get any data off a drive even if you

had all the pieces. Though, physical destruction has the downside of not being able to reuse the drive. I heard that for the drives that T4T would reuse, they did a pass of 0s. So it might have been possible for someone determined enough to read the data, but we would also soon overwrite it with the copy of Windows 11.

Then there were the certificate of destruction (COD) drives. One of the services Tech For Troops provided was getting rid of computers and drives that companies are no longer using. They would be sent a video and a certificate that all the drives included in the job were shredded. Drives arriving to us came in varying conditions. Some were neatly packed into a box, some still in caddies for insertion into a server, and some were still inside laptops or desktops. We would have to count them to make sure we had the same number the company said they sent us. Also keeping them separate from the general donation drives so that they could be shredded one after another on video. Those companies were putting their trust in T4T to ensure that any company information on those drives would not fall into the wrong hands.

ODU Curriculum Preparation

An IT internship, unsurprisingly, didn't have me apply knowledge from my cybersecurity curriculum. Knowing about the different ways to destroy data on drives from classes had me not need to ask questions about T4T's processes to deal with them. There was also a day that I talked a little about the OSI model with another employee while waiting for laptop updates. I have taken some IT classes though. I don't think any of them prepared me specifically for working with computer hardware and refurbishment, but general IT knowledge surely helped. I did also take some IT classes in high school, so I may be confusing some of them. I knew about most of the changes we were making in the BIOS. There was one drive-related setting that I didn't know about, but it's not like I was deciding which to choose, I just had a list of changes to make.

Learning Objective Status

My work at Tech For Troops had me learning exactly what my objectives were. They were telling me that they have had many interns over the years and knew exactly what I could help them with before starting. My first objective was to learn how to break down computers into their individual components for recycling purposes. I'd say that I spent most of my time at T4T doing this. Taking apart computers seemed to be the kind of thing that you cannot simply teach someone about, but instead it takes experience. There were so many little tricks that the makers of these computers used to hold their devices together, especially with the laptops. My second learning objective was to then sort those components into containers. I learned what T4T did to deal with dozens of parts in small boxes and thousands in larger ones. I figured out the purpose of placing them in smaller boxes before large ones to save on walking. Unfortunately, I never got to see the recycling process for full pallets of components.

The third objective set for me was to refurbish recent enough computers to give to veterans. I did refurbish about 20 laptops from start to finish. They had me go through the whole process with some guidance and even tested me on whether I remembered all the steps at some point. There were just two parts that I didn't get to do. One of them

was putting the information collected on the paper into the database. The other was setting up the Clonezilla host that sends the data being copied.

My last objective was to learn about the processes and precautions for data destruction. I shredded over 200 drives one day and was also shown the process for recording drive destruction for CODs. I didn't actually get to help out with the COD shredding as you only get one chance to shred a drive, thus full attention would be needed on the part of the person showing me, and we had little time. The drive shredding machine had two sets of gears for the actual destruction. One was larger with few ridges used for the hard disk drives (HDDs) and the other had many thinner ridges for solid state drives. Before shredding we would remove a board from the HDDs and any screws on the side to fit it into the machine. One drive would be put in, the lid closed, and the machine automatically shredded it, correcting for if it got stuck on its own. The scraps from the shredded drives were collected in plastic bins and later collected in a larger box. When dumping the shredded materials into the larger box, I wore a mask to prevent any metal dust from getting into my body.

Most Motivating Aspects

I would say that one of the most motivating aspects of my internship was the thought that I was helping veterans. This especially came through when I was refurbishing laptops for veterans to use later. I also found it quite motivating just working with computers. I have been interested in computers for as long as I can remember. I surprised myself by not getting bored of doing the same thing all day when taking apart computers. It was also a little motivating that my brother had previously worked at T4T and was working pretty much next-door.

Most Discouraging Aspects

The most discouraging aspect of my internship was that it was unpaid. It was unfortunate that I couldn't find a paid internship, but doing something with my time was definitely better than lazing around all summer. There were also other interns there and I heard that they had specific projects they were working on like a website. My experience at T4T was also pretty different from what my brother described as his experience. I'm sure that's due to a number of factors with one big one being that the person who was his supervisor was quite busy when I started and couldn't make time for me.

Most Challenging Aspects

One of the challenges interning at Tech For Troops that I faced was communication. I have Asperger's syndrome, so communication is already a challenge for me normally. Not having a direct supervisor to my knowledge made it difficult to communicate wanting to try something new. One day I was planning on asking someone high up about working in a different department, but they seemed busy when I passed by, and the next thing I knew they retired. Tearing down the laptops and other devices was a bit of a challenge as they were all different. I had to do a lot of problem solving on my own to find hidden screws or the order to take things apart.

Recommendations for Future Interns

Future interns at Tech For Troops would do well to ask to keep trying new things. There was plenty of different work to try at T4T, you just need to ask. This can also be a double-edged sword if you are not decisive enough to know where you would want to work next. Not being afraid to break things would also help. When doing the teardown, there would still be a lot of waste with things like the plastics, so it wouldn't matter if they are broken. While refurbishing laptops, there would usually be ones that were locked by a password or otherwise unusable. Those ones could then be used as a donor to fix broken parts. Even when installing updates, if something goes horribly wrong, they will always have the master copy of Windows 11 to reinstall from. A familiarization with common computer parts would help, but there would always be someone to ask if you are unfamiliar with what something is.

Conclusion

I learned a lot this summer interning at Tech For Troops. I learned to work in a bit of a different environment than I had previously. My love for technology has been reaffirmed and I definitely want to work with computers in the future. I'm now a lot more comfortable working with computer hardware than I was before. Communication is still something I need to work on to succeed in the future. Having one more degree requirement met and my last summer before graduating coming to an end sure does have me thinking about the future. I'm planning on taking three more IT classes, two of them working towards a minor in IT. With what I've heard about the cybersecurity job market, it's more mid-level positions that require years of experience that make up the demand. There probably aren't going to be many entry level positions available when I graduate. One way to break into the cybersecurity field might be to do some IT work. Having an IT internship and minor will surely help me get a leg up over other candidates if I find myself looking for IT work. I am grateful that Tech For Troops took me on as an intern and were so welcoming.