IT INTERNSHIP

Indel Power Group

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1. **Introduction**

Embarking on an internship journey within the realm of cybersecurity was a deliberate choice stemming from my passion for safeguarding digital landscapes against evolving threats. My decision to intern in this field was twofold: to immerse myself in practical experiences that complemented theoretical knowledge gained in academia and to contribute actively to an organization's mission in fortifying their digital infrastructure. In this internship I hoped to gain basic knowledge of networking, security, and business structure. Throughout this paper, I will portray the progression of my internship experience, explaining the specific learning goals, challenges met, and the transformative impact on my understanding of cybersecurity.

2. **Initial Impressions/Experiences**

Indel Power Group is the parent company or "corporate" to many different companies. These companies consist of solar, diesel, marine and generator businesses. There are more than thirty locations and there are plans for more to come online this year. One of many of the standout customers for this company is the Coast Guard. The many boats in the area are serviced by Western Diesel Branch

Not too long ago in 2019 this company came to be by two companies merging, Johnson and Towers and Western Branch Diesel. Both companies did the same thing, truck repair and truck sales. They joined together because they believed that this partnership would create something that would allow their companies to flourish. Over the past five years they have generated more money together than they ever did alone. Just recently, since this merger, they opened positions to start building their IT department. They brought in two system admins and two helpdesk employees. One of the helpdesks employes and one system admin moved on. The system admin is now my boss's boss, and the helpdesk employee is now a system admin and my boss. I was fortunate to get this position out of the fifty+ other applicants and I am also the IT department's third intern since coming to be.

Initially I thought that I was brought into the tedious and boring work that you can and need to do in IT. At first, I was doing very unthinkable tasks that I did not believe I should have been doing. These included sorting cables, throwing out trash in the data center, and shipping out packages that needed to be delivered to our customers.

Once I finished those tasks within the first week, I was bumped into answering the phone, emails, and tickets, where I was responding to people that were having problems with their tech. Many of the requests for help had me extremely stumped and I was doing everything I could to not go to my boss and ask for help, but there were many separate times that I absolutely had to. For example, a tech had a program on his laptop that he needed to work within the hour because he needed to get data from it to provide to their customer. The program was having issues synchronizing with our VPN, come to find out this was more of a job for my boss anyway. He had to authorize the program to allow the customer to use it while at the work site. This time had me feeling good because I did not want to act on a problem, I knew I could not fix it.

Though there were times that had me feeling like I should not be in the profession and made me question why I was getting a degree in tech. This was their way of training, taking an

approach of just throwing me in the deep end and figuring out way to stay afloat along the way. Company-wise this made me feel like they needed more people in the tech area to help manage the problem of not knowing everything we needed, even at a minimum. This internship to me felt like I would learn more in the time I was there than the time I was in school. This learning process from experience really matched up with the way I interpret things and digest information.

3.   Management Environment

Being that my boss was in my position only four years ago there is a lot of trust in what I am being told on a day-to-day basis. Every day something new is being learned, either from customer experience or even when he is teaching me something about the structure of our network compared to others. You can tell that he wants me to have the information that he has stored. Invertedly, the other system administrator has a way different knowledge background, and I am also able to learn an immense amount from him as well. He is more of an installer than a planner and knows it all like my boss does. He has shown me the entire process of running wire through building work, setting up phones for all our locations, and even how to crimp a cable the correct way. Overall, having this structure has allowed me to set myself up way better than before. Now I feel confident when learning information for certifications that what I know is being confirmed in these learning modules. Finally, it has provided me with a way to get out and really experience what is needed to be in their position.

4.   Major Work Duties

My main work duties start at troubleshooting technical hardware and software issues in person, remotely, and via telephone. It usually starts off with the request and learning about what the person is trying to ask and for me not to infer anything. If I do try to or attempt to, I instead call the person up and get the full details of what it is they need help with. Once I understand the request, I dive into whatever it is and try a couple different solutions that I know relate to the issue and would resolve the solution. Say this does not work and I am still scrambling to produce the right solution then I turn to the ole reliable, google. I describe what it is that is going on so that google understand what exactly I need and usually this works. If this happens to not work, then I make sure to turn to those around me and indicate that this is something that could be a problem.

In this time, I am updating the client and making sure that they are part of the process. You want to make them feel like you are working towards a solution and not putting them on the back burner. They only care about a solution so that they can get back to working as they did before with no changes. It is essential to be able to work under pressure in this situation. They could be on the phone, like many of the times that I am troubleshooting, and seem quite disturbed and angry that they are in this position. Being an inconvenience when you really are not part of this job.

Another main duty of mine is looking over logs in our firewall and ensuring everything is working as it should. This is more so a response duty, usually something comes across our

firewall asking for permission to enter and the rules that my boss set up tell you whatever is trying to enter to go to a place to be inspected. This is where I come in and make sure that what I am trying to enter is really supposed to be entering. Since there are so many rules set up with the firewall there are not any worries about anything being able to get into our network.

The one thing we are worried about is our customers clicking something they should and allowing someone to get a small entry way into our network. This leads into the next main duty of mine, which is to make up emails that seem like they are legit and send them to customer's emails. Those that do click the link are sent a link to a training they must do before continuing work. Those that do not are given a high five and told "thank you for reporting this as phishing, please continue doing this to strengthen our email filters." There has been a time when someone's email account got hacked because they clicked something they were not supposed to. From there someone got into the web version of their email account and made up a bunch of rules that did not allow them to receive any emails. What they were trying to do from here is a big question mark, but likely they got to a point where they could not gain any information and just set up rules to mess with the person instead and moved on to the next target.

One of the projects that I am currently working on is setting up an abundance of new iPhone 15s to relate to our mobile device manager (MDM) and making sure that the iPhones comply with the rules that we set up. Once they are I set up the apple IDs of the customers and log them into all the apps that are essential for them to complete their job. In a couple of days, me and my boss will be heading to Baltimore to set up the phones with them, so they also understand how everything works. Most of them are not tech savvy and need that extra attention. Sometimes when working within the IT world it is important that people really can understand what they need to do and how to work with tech.

4.   **Specific Skills/Knowledge**

Prior to this internship all the information that I had come from YouTube and school. Everything was theory, which in many cases can be very bland. I was really trying to understand it just by learning about it and hearing stories about it. I never understood how broad cybersecurity is. Really this internship was more like a system admin internship for me rather than a helpdesk internship. I have been more educated on how the OSI model is broken down into each category and what plays into those categories, which controls should be set on a firewall to not allow people to interfere with our network from an external level, how to manage our virtual servers, using and building scripts in PowerShell, establishing documentation of each process that we are doing and keeping everyone in the know, and continuously providing good customer service.

Cybersecurity is not what it is unless you are really experiencing it going down and in the mix. During this internship I have used everything from Linux with our SIEM server to creating diagrams about how to avoid malicious phishing attempts. There are risks every day when an email lands into our user's inbox and looks, sounds, and relates to what they are dealing with on a day-to-day business. Even at a more physical level with people trying to break into our building by hacking into our cameras and shutting them off. Currently we are not sure if

someone was able to hack into it or if it malfunctioned and shut itself off, but at the same time as it went out the security system also tripped. Did I ever think that I would be investigating a problem and figuring out how would this camera be hacked into and worse, was someone able to get into the building? This goes to show that cybersecurity is in and affects all levels of business.

The ODU curriculum did necessarily prepare me for the internship at all. What really prepared me was already having a computer and having built it alone gave me the essential knowledge needed to be on the helpdesk. I have also been good with tech things around the house, our network, networkable devices, and computers/iPhones. This drive to be able to configure, fix, and troubleshoot led me to be a good intern in IT. There were multiple connections that I was able to make, one being how to set up a virtual network and adding servers to that network that connect to each other and speak to one another. This is a big project that I have been working on for the company. The project is to create an SCCM server that allows us to deploy computers and manage all our devices like never before. You can directly script out what exactly we want the computer to be configured to and set provisions that align with company policy. Diving a bit deeper than this, I created a DHCP server, a DNS server, a SQL server, and a WSUS server. A lot of what I know from this came from a class I took at ODU that dealt with this. Not exactly how to do what I am doing but more so the information for each of these servers and how they work in conjunction.

All the network protocols like DNS, DHCP, FTP, HTTP/S and SMTP were all learned in school and used on the job. Though I only had theoretical knowledge this did help me picture what exactly the process was for each and where they connected to. At the job, this helped with gaining knowledge about why we used them and what are some deeper meanings to them like why we would not want to use them and how essential some of them are to keep the company's network flowing. Before I never thought these protocols would be so important to how networks run, but now I understand that these are what makes up all networks.

Experiences like using the print server and managing it as it goes down or does not process or receive a request would have never been experience while in school. When the print server goes down expect one hundred plus tickets of people telling us that their printers are not printing. Most of the time the case is that the print spooler needs to be reset which takes about two minutes. Other times the entire server needs a reset and updated to get going properly again. One of the assignments that I had with the print server was to reconfigure the way they are named so that they all have the same outline, for example Branch 201 with IP address ending in 225 would be 201PR225. This was a smaller task, but we do have multiple printers throughout each building so there were around one hundred printers to change. The last assignment of mine that deals with printing is setting up printers so that they can talk with our print server. The process went like this:

1. Plug in the printer, power it on, and connect it to our network.
2. Once it is connected, go to the network settings on the printer and find the IP address that the DHCP protocol created for it.
3. Once this number is obtained, I would insert it into a browser, and it would pull up the Embedded Web Server (EWS). This allows you to control everything dealing with the printer. More importantly, changing the IP address to match our policy.

4. Once the IP address has changed, you will log into the print server and set up a port and IP address of the printer as well as the naming of the printer.
5. Once that is done you can now evaluate whether the printer works as it should

5.   Internship Fulfillment

My internship thus far has surpassed what I introduced. Many things I expected to learn many things from this experience but there is far more that I never thought would be taught to me just by a helpdesk internship. Not only did it teach me about IT and Cybersecurity, but it also showed me how a company is run and how important the structure is, the correct way to document and manage all the different processes going on in a well-organized manner, and how to have great customer service. In the short amount of time that I have been here it has given me great courage that one day I can be tremendously successful in this field. Possibly also not having to worry about whether there will be jobs in the future can play a huge role. All I wanted from this internship in the beginning was just to gather as much information as I can. Instead, all the information was already there to pick up I just had to get it. This came from the way that I took on the role with a no fear mindset. Anything that I do, would not mess up too badly any one thing. So why worry? This went well with my boss because he wanted me to do as many tasks as possible because this is how he was taught. Being in highly stressful and time constraining situations was an everyday thing when there were projects, assignments, and duties every day.

6.   Motivating or Exciting Aspects of the Internship.

There were a couple of things that were exciting or motivating. Some of these consisted of getting more projects to do that seemed like it could possibly benefit my situation, there was also the satisfaction of completing a higher level ticket that took a good amount of time to troubleshoot, and also when something from my school work related to what I was doing on the job. Having more projects meant more weight to what it is I do. I do good on all those projects and tougher projects could come to surface that may help my career. Piling these projects and finishing in a swift time allowed for me to get more projects that I could add to my resume for future inquisitions. Tickets come in all levels, and you can have an idea of what level a ticket may be but really you could be in store for a low-level looking ticket that is high and may take a lot of your time. Dissecting these types of tickets where you do not really know how to fix it but may have an idea can cause some frustration. Staying calm, checking online, and possibly asking for some help and the ticket will be closed. No ticket has been that big of a problem. Lastly, when I can make connections to what it is I am studying it is satisfying. Teachers try their absolute best to give us information about the way they feel is best but sometimes what is best is experiencing it in person.

7.   Most Discouraging Aspects of the Internship.

The most discouraging part of this internship is even though it is a role where cybersecurity is needed, it is not exactly a cybersecurity role. So, if I were to get hired after this it would not be the most beneficial to what I want to do. I am worried that this internship will not have the biggest pull either. People looking to hire cybersecurity employees want people that know what they are doing and do not have time to train them. This makes me feel like I need a

certification to go along with some of this experience that I am gaining from the internship. If I were looking for a role without the internship, I would need to find a System Admin position or some sort of networking position that I can gain that experience and further progress. It is not where I want to be coming out of college, but it would be better than sitting on the helpdesk for a longer time than I need to.

8.   Most Challenging Aspects of the Internship.

The most challenging aspects to this internship was trying to figure out the IT department went about transferring data and recording data the way they do it. Each process had many processes in it. For example, a freshly bought computer needed to be set up, before being able to set it up you had to go into excel and put all the details of the computer. After that, you must go onto our ticketing software and pull the ticket with whose computer it is and what their credentials are going to be. Next, you would need to go in excel and put this information in. Depending on who the person is, depending on significance to the company, we would need to set this person up with the security levels that they need pertaining to which level they are at. Once the computer is set up, depending on the person, you would need to give them certain apps needed to complete their job as well as the accounts for these apps. This entire process can easily take the entire day to complete if you add in the updating and settings configuring. This is just one of many examples that are like this at the company.

9.   Recommendations for Future Interns in this internship.

Future interns preparing for this internship, which entails a helpdesk role combined with some sys admin tasks, should focus on enhancing their technical skills and knowledge in relevant areas. Firstly, they should familiarize themselves with operating systems commonly used in business environments, such as Windows and Linux, including basic troubleshooting techniques for each. Additionally, understanding networking fundamentals, such as TCP/IP, DNS, DHCP, and VPNs, will be invaluable. Familiarity with common office software suites and productivity tools, as well as remote desktop support applications, can also be beneficial. Moreover, gaining experience with ticketing systems and ITIL practices will provide a solid foundation for managing user requests efficiently. Finally, cultivating effective communication and problem-solving skills will be essential for effectively assisting users and addressing technical issues. By proactively acquiring these skills and knowledge, future interns can excel in their roles and contribute effectively to the team.

10.   Conclusion.

The journey through this internship has been transformative, providing a wealth of practical experience that exceeded initial expectations. Immersed within the realm of cybersecurity, I anticipated gaining insights into networking, security, and business structures, yet the depth of learning surpassed these boundaries. The environment at Indel Power Group, with its diverse businesses and dynamic challenges, provided a rich learning ground. Initially, tasks seemed mundane, but quickly evolved into troubleshooting technical issues and managing firewall logs, with a significant focus on customer service. Through guidance from experienced mentors, I delved into complex projects like setting up an SCCM server and configuring network protocols,

bridging the gap between theoretical knowledge and practical application. The internship underscored the multifaceted nature of cybersecurity, from combating phishing attempts to investigating physical security breaches, broadening my understanding of the field. While my college curriculum provided a foundational understanding, it was the hands-on experience that truly solidified concepts and prepared me for real-world scenarios. However, the internship also highlighted the need for certifications to complement this experience for future career aspirations in cybersecurity. Despite its challenges, the internship has equipped me with invaluable skills and confidence, setting a solid foundation for both my remaining time at ODU and my future professional journey.