

Final Reflection:

2024 Busch Vacuum Solutions Summer Internship

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CYSE 368: Summer Cybersecurity Internship

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Introduction

My major is Cybersecurity with a minor in Cybercrime at Old Dominion University. However, I chose to complete an internship in Information Technology at Busch Vacuum Solutions located in Virginia Beach, Virginia. Although the two fields vary, I love working with technology and welcome the change of pace. My passion for technology and hands-on work persuaded me to apply for the position, and I was excited about the opportunity.

My first impression of Busch Vacuum Solutions was formed during the interview, which was arranged as a meet-and-greet event. Many applicants met with the managers of each department in timed sessions. The IT manager, rather than strictly adhering to a scripted set of questions, took the time to understand my work ethic and personality beyond my resume. This approach had an impact on me and my willingness to accept the offer if it was extended.

During the interview, I asked whether the internship was designed to provide knowledge and hands-on experience or to boost the company's reputation. In interviews with other companies, I had been informed of roles that consisted mostly of busy work without mentorship or guidance. The IT manager assured me that this internship was beneficial to the team, with him serving as my mentor. He explained that each department chooses whether they want an intern, indicating a need and interest in becoming a mentor.

Together with my mentor, we outlined three main objectives for my internship: end-of-life hardware replacements, inventory, and asset management. These objectives aligned with my academic background and aspirations, providing experience, and enhancing my skills in IT management. These tasks would teach me about various applications such as Asset Tiger, Azure, Realm Join, and remote systems. Asset Tiger is an asset management tracker that logs devices, inventory, and assigns devices based on serial numbers. Realm Join and Azure are the active

domain directories used by the company across its global locations, ensuring centralized information. Remote systems like Team Viewer and Remote Desktop Communication (RDC) allow IT to manage the devices and configurations from a distance, crucial for supporting all the locations.

Start of the Internship

Busch Vacuum Solutions is a global company, originally founded in Germany, and operates in 44 countries with 19 production sites (Busch Vacuum Solutions United States | #1 for Vacuum Pumps, n.d.). The United States headquarters is in Virginia Beach, where the IT team manages all U.S. IT-related tickets and issues. This team works closely with the global service center in Europe to address tickets and resolve issues promptly. The team handles device malfunctions, problem-solving/troubleshooting, remote connections, and ensures the stability of the systems and operations.

“Busch Vacuum Solutions, Pfeiffer Vacuum, and Centrotherm Clean Solutions are now united under the umbrella of the new Busch Group. Together, they offer an extensive product portfolio and improved customer experience. Headquartered in Germany’s Black Forest, the Busch Group is one of the world’s largest manufacturers of comprehensive vacuum solutions, including vacuum pumps, vacuum systems, blowers, compressors, and gas abatement systems” (Busch Vacuum Solutions United States | #1 for Vacuum Pumps, n.d.).

On the first day of the internship, orientation was the sole focus. This orientation involved other managers and employees who had started as interns and those who showed diversity in their heritage. According to the Busch website, over 8,000 people are employed by the company (Busch Vacuum Solutions United States | #1 for Vacuum Pumps, n.d.). My initial impression was that the company genuinely cared about its employees, demonstrated through in-depth safety videos, speakers, and the provision of funding for steel-toe shoes for warehouse employees and prescription safety glasses if needed.

It was evident that the company invested in its interns, as many current employees had started as interns. This was also reflected in the detailed schedule provided for the internship, which included regular check-ins to assess how everyone felt in the environment and ensure they were given the opportunity to learn. A total of thirteen interns were hired for the summer of 2024, all reporting to various departments ranging from production and engineering to legal and marketing. At the end of the first day, the managers from each department gathered their interns, showed them around the area, and introduced them to the rest of their team members.

While first impressions on the first day could be challenging due to training and mandatory videos taking most of the day, it was clear that the company took pride in its intern program. HR funds the interns' participation from their department budget, displaying their belief in investing in up-and-coming graduates and providing a standard workplace environment and opportunities for growth within the company. This statement is also featured in an interview with the HR department at the company under “Reflective Journal 3”.

Environment

The structure of the program was unique in that HR led the program, but each intern reported to their own managerial department. This provided a safe space for addressing issues such as being assigned menial tasks or having no work at all. In my department, the office consisted of only three people besides the manager and myself. The other three employees worked off-site or remotely as consultants or network engineers.

I was introduced to Mark Rushing, the head of the U.S. IT department, and Ray Clark, my mentor and interviewer. It was interesting to learn that each department personally interviewed the interns who would join their team, unlike many jobs I have previously pursued where a recruiter or HR conducted the interview without ever meeting the manager beforehand.

The IT department welcomed me and mentioned that they had not had an intern, or a female team member, in years. This was not due to any malicious reasons, but it was a result of the department's budget confinements, which limited the number of employees they could hire. While my major and job role varied in the title and other aspects, there was still significant overlap in the field.

My supervisor, Ray Clark, adopted a hands-on supervision style. He guided projects and ensured I had the necessary resources, but also encouraged independence by allowing me to take ownership of my projects. The team dynamics were collaborative, with biweekly virtual meetings to ensure remote and on-site employees stayed aligned on project goals. Ray conducted regular check-ins to discuss my progress and provided constructive feedback, which was crucial for my development. Additionally, there were weekly discussions to assess my performance and areas for improvement.

Overall, the management structure was effective in providing a supportive and productive environment. The communication and emphasis on both guidance and freedom contributed to a positive experience.

Learning different applications and systems for a new company can seem overwhelming, especially since policies and procedures vary from company to company. In technology, there is no specific procedure for every scenario as the field is always evolving. This added to the challenge but also provided a lucrative learning experience.

Projects and Assignments

During my internship at Busch Vacuum Solutions, I was responsible for a variety of tasks that contributed to the smooth operation of the IT department. My major work duties included end-of-life hardware replacements, inventory management, asset management, and providing remote support. The objective provided me with hands-on experience in project management and problem-solving, as I had to coordinate between different teams and ensure minimal disruption to the work of others throughout the process.

For the object of 'end-of-life hardware replacements,' my primary duty was to replace outdated hardware. This involved identifying devices that were reaching the end of their warranty, gathering a new device, and ensuring a seamless transition for users. This task was crucial because outdated hardware can lead to security vulnerabilities and could decrease their everyday work. By ensuring that all hardware was up to date, I helped maintain the efficiency and security of the company's IT infrastructure.

I managed the inventory of IT equipment using Asset Tiger. This involved keeping a log of all devices, tracking their locations throughout the facility, and monitoring the status. Accurate inventory management is essential for budgeting, planning, and ensuring that resources are available when needed. It also helps in quickly resolving issues related to lost or misplaced equipment. I developed an inventory dashboard in Asset Tiger that provided real-time updates on the status and location of all IT assets, significantly improving inventory accuracy and accessibility.

In addition to inventory, I was responsible for managing assets using Azure and Realm Join. This involved maintaining the active domain directories and ensuring that all devices were properly configured and documented.

Proper management is vital for confirming that all devices are secure, compliant with company policies, and easily manageable. I created an in-depth asset management report that included all device configurations, user assignments, and compliance status. The report was used for audits and strategic planning to further the company's long-term goals.

Providing remote support was another key responsibility. Using tools like Team Viewer and Remote Desktop Communication (RDC), I assisted users with troubleshooting issues, configuring systems, and resolving technical problems. Remote support is essential for maintaining productivity, especially for employees working off-site or in various locations. I documented all remote support sessions, taking note of the issues encountered, what steps were taken to resolve them, and any feedback from the individual. This documentation was used to improve the remote support processes and training materials.

Each of these duties was critical to the business operations at Busch Vacuum Solutions. By replacing outdated hardware, managing inventory and assets, and providing remote support, I helped ensure that the infrastructure remained reliable, secure, and steady. These tasks not only supported daily operations but also contributed to the long-term goals of the company by increasing capabilities and readiness.

Applied Knowledge

Before starting my internship at Busch, I had a solid foundation in cybersecurity through my coursework at Old Dominion University. This foundation consisted of the knowledge of network security, threat detection, and data protection. I was familiar with the concepts such as firewalls, encryption, and intrusion detection systems. These skills were developed through various academic projects and labs that provided an understanding of cybersecurity principles and practices.

During my internship, I applied these skills in a real-world IT environment. I was involved in managing end-of-life hardware replacements, which included ensuring that decommissioned devices were securely wiped to prevent data breaches. This task required me to apply my knowledge of data security and understand the importance of proper data disposal procedures. I also worked on asset management, where I needed to ensure that all devices were set up correctly and followed the security policies. This involved the application of security protocols and configurations, which increased my understanding of creating a secure environment.

Additionally, providing remote support required me to use cybersecurity knowledge in real-world scenarios. I had to ensure that remote connections were secure and that user credentials were protected during the sessions. This objective enhanced me in applying my skills in securing remote access and managing user permissions, which are critical for preventing unauthorized access and maintaining the integrity of the system. I learned to apply theoretical concepts to situations, such as securing remote desktop connections and ensuring compliance with company security directives.

Overall, the direct experience I gained during the internship significantly changed my understanding of cybersecurity. I realized the complexities that can come with implementing and maintaining security measures in a live environment, which often involves addressing unforeseen issues and adapting theoretical knowledge to practical challenges. This experience highlighted the importance of continuing to learn and adapt in cybersecurity, as real-world scenarios present unique challenges that require both technical experience and critical thinking.

Learned Knowledge

The classes I took at Old Dominion University gave me a good base in cybersecurity that helped a lot during my internship at Busch Vacuum Solutions. My courses on network security and data protection taught me the basics, which were useful when working on things like replacing old hardware and making sure data was securely disposed of.

However, there were some things that my classes didn't cover. For example, even though I learned about remote access security in class, I found that actually securing remote support sessions and managing permissions was more in depth than I expected. Using tools like Team Viewer and Remote Desktop Communication (RDC) showed me new challenges that weren't fully explained in my classes.

The internship also helped me build on what I learned in class. For instance, managing assets with Azure and Realm Join was similar to what I studied about network administration. Seeing these concepts firsthand helped me understand their use better. The focus on security and compliance during the internship matched what I learned in my cybersecurity classes, connecting theory to practice.

I also learned new techniques and tools that weren't covered in my courses. For example, working with Asset Tiger and handling remote support gave me new skills and knowledge that I had already learned in school. This experience showed me how important it is to gain experience along with coursework.

Objective Outcomes

The internship at Busch Vacuum Solutions met the objective of gaining hands-on experience with all of the projects I have engaged in. I actively participated in the process allowing me to increase my knowledge in more than one area. Although I gained valuable skills, the variety of hardware involved was limited. A bigger variety of equipment would have offered a deeper understanding of the processes to enhance my coursework. Overall, the objective was achieved, but there is always a need for more experience. Improving my skills was another key objective that I had set for myself which I believe I have in more than one aspect.

The internship at Busch Vacuum Solutions met my objectives by providing hands-on experience and opportunities for skill development. Each goal was addressed through practical application, though some aspects provided added learning opportunities beyond the original expectations. The experience deepened my understanding of IT practices and cybersecurity, which matched with my initial objectives and highlighted areas to where I can grow in the future.

Motivational Aspects

One of the most exciting parts of the internship was working on real projects that actually mattered to the team. I got to be involved in important tasks like replacing old hardware and managing assets, which made me feel like I was making a real difference. The supportive team and the friendly work environment made it easy to learn and ask questions. It was thrilling to see how my work contributed to the team's goals and to learn from experienced professionals. This hands-on experience made the internship very rewarding and increased my enthusiasm for my field.

Another exciting aspect was getting to work with the latest technologies and tools used by the company. Handling advanced systems and seeing how they help improve the company's operations was both fascinating and inspiring. Solving complex problems and seeing the results of my work directly impact system performance was very satisfying. The guidance from skilled professionals also gave me useful insights into best practices and career advice. All of these experiences made me even more motivated and eager to succeed in my role.

Another exciting part of the internship was seeing how my work made a difference right away. When I fixed problems or helped with tasks, I could see the results quickly, which was really satisfying. Getting positive feedback from my team and feeling like I was doing a good job kept me motivated. It was great to be part of a team that appreciated my work and wanted me to grow. These things made the internship really exciting and made me eager to keep doing well.

Discouraging Aspects

While my internship has been valuable and enlightening, one of the most discouraging aspects has been the 29-hour weekly limit. This restriction, though essential for balancing the internship with academics, often felt limiting given the nature of the work and the learning opportunities available. The reduced hours meant that I sometimes had to rush through tasks or miss out on engaging fully with long-term projects that required more time to complete. This limitation affected my ability to contribute more and gain a deeper understanding of the field.

Additionally, the hours impacted my ability to build a strong rapport with team members and integrate more into the environment. Being present for less each week sometimes meant missing out on important team meetings or collaboration, which affected my connection to the team's dynamics. This was discouraging, as it limited my chances to engage in discussions to observe and learn from the team's interactions. Despite this, the overall experience has been positive, and I have made the most of the time I was given to contribute and grow.

Challenges

One of the most challenging parts of my internship at Busch Vacuum Solutions was adjusting to the fast pace of the environment. The technology was constantly changing, and I had to solve problems quickly. Keeping up with new updates and learning to use new tools on the fly was tough and sometimes felt overwhelming. Balancing multiple tasks while staying updated with the latest changes was a significant hurdle. This fast pace required me to be flexible and adapt quickly.

Another difficulty was fitting into a team that already had its own established routines. It took time to understand their methods and learn how to work without disrupting their workflow. I had to quickly get up to speed with the company's processes and show my skills in a short period. This added pressure made it challenging to prove myself right away. Learning to navigate these dynamics was an important part of the experience.

Finally, dealing with complex technical issues was also a challenge. Each problem required a thorough look and a good understanding of various systems, which sometimes meant long hours to troubleshoot. Accomplishing these issues needed drive and the ability to learn new skills quickly. Despite these difficulties, these challenges contributed to my personal and professional growth. Overall, these experiences helped me develop valuable problem-solving skills.

Advice

Future interns at Busch Vacuum Solutions should start by familiarizing themselves with the company's technology and systems. Understanding the basics of IT management, asset tracking, and remote support tools will be very helpful. Reviewing the software and systems used, like Asset Tiger and remote support platforms, can make the learning process easier. This knowledge will give interns a solid starting point and help them adapt quicker to their roles.

Developing strong problem-solving skills is also crucial. The internship involves troubleshooting and resolving various issues, so becoming good at finding solutions is important. Practicing problem-solving techniques before starting can make it easier to handle real-world challenges. A ready approach to learning and problem-solving will be beneficial throughout the internship.

Good communication and teamwork are essential for a successful internship. Interns need to work closely with others, so being able to communicate clearly and integrate well into the team is important. Building these soft skills will help in collaborating and contributing to team projects. It's helpful to practice working with others and sharing ideas before starting the internship.

Finally, managing time effectively and handling multiple tasks is important in a fast-paced environment. Interns should be prepared to prioritize tasks and stay organized to perform well. Being able to adapt to changing priorities and manage responsibilities efficiently will improve overall performance. Preparing to balance various tasks and adjust to a busy schedule will help interns succeed.

Take Away

My internship at Busch Vacuum Solutions provided valuable insights and hands-on experience that was incredible. I learned how to tackle real IT issues and saw firsthand how the theories I studied in school apply in a professional setting. This practical experience not only reinforced my interest in technology but also helped me understand the challenges and solutions within the field. It shined a light on my career goals and gave me a clearer picture of what working in IT is really like. Overall, the experience has been very educational and motivating.

This internship will influence the rest of my time at Old Dominion University by helping me focus on the areas of technology that I found most interesting. I now have a better idea of which subjects and projects to pursue based on what I enjoyed during my internship. The knowledge gained will guide me in my classes, making my remaining time at university more meaningful. I plan to dive deeper into tech-related topics and seek opportunities that align with my career interests.

Looking ahead, the skills and experience from the internship will shape my future career plans. I now feel more confident about the types of jobs I want to pursue and the skills I need to develop further. The insight gained has altered my career direction and motivated me to continue learning and growing in the field of technology. Overall, this internship has been crucial in preparing for my future career and has given me a solid foundation for the professional world.

References

Busch Vacuum Solutions United States | #1 for vacuum pumps. (n.d.). Busch Vacuum Solutions United States | #1 for Vacuum Pumps. <https://www.buschvacuum.com/us/en/>