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Information Technology Intern

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Course: CYSE 368

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Introduction

I chose to intern at Atlantic Bay Mortgage Group as their Information Technology intern because of their unique culture. Information Technology can be dull and dry, so I knew I would need an exciting and welcoming environment to have an enjoyable experience. I knew my learning would only get so far if I worked alone in my cubicle all day without excitement or motivation. Atlantic Bay focuses on three key mottos: "***We Genuinely Care, We Inspire Growth, We Have Fun***." This is very evident the first day I walked inside the office, as everyone was friendly during my onboarding. Another key aspect of why I chose Atlantic Bay was because of its influence in our local area. I am sure many of us see their big branding at Old Dominion University's Stadium, but they play a significant role in supporting families pursuing their dreams home in the local community. Even through dips in the market, Atlantic Bay prioritizes their customers and bolsters its Net Promoter Score being over a 96% customer satisfaction rate (*Facts & figures, n.d.*). Not only here in Virginia Beach, but Atlantic Bay has numerous branch offices pushing the same core values to families across the nation. It may sound strange doing IT work at the headquarters of a mortgage company, but my experience felt just as in-depth as any other IT internship, and I made great connections along the way.

As an intern, I onboarded like a normal employee and did numerous training modules about the loan process, mortgage regulations, and professional conduct inside the office. From my pieces of training, it was clear that Atlantic Bay operates in an extremely regulated industry. Although I do not interact directly with the loan process of mortgages, these regulations structure how the IT department operates. For example, the Real Estate Settlement Procedures Act is a federal law that "requires lenders, mortgage brokers, or servicers of home loans to provide borrowers with pertinent and timely disclosures about the nature and costs of the real estate settlement process."(*Real Estate Settlement Procedures Act*, 2023) In this regulation, RESPA also mandates mortgage companies to retain loan records for a certain period of time. For closing disclosure forms, companies like Atlantic Bay retain records for five years. Loan estimate forms need to be retained for three years. Escrow cancellation and partial payment notices need to be retrained for two years. IT takes regulations like this into consideration when planning out critical processes like disaster recovery or data backups. In the event of a disaster or an annual audit, it is IT's job to store and maintain the integrity of this data to comply with the federal government.

The management environment was traditional. In the IT department, I worked as a long side Junior IT personnel and directly reported to a senior, or supervisor, which managed that area of IT. Then, each subset of the different areas reported to one Manager who represents all of IT for Atlantic Bay. That Manager then works directly under the Executive Leadership Team (CSO, VP, CEO, COO, etc.). For example, on the Networking team I worked alongside Junior Network Administrators. I reported to the IT Network Infrastructure Supervisor who then reported to the Manager of IT. While technically each supervisor does manage me, since I joined their team temporarily, I did have my own manager who oversaw my whole internship experience. Robert Rang, Atlantic Bay's Internal Employee Support Program Manager, was my direct supervisor who collaborated with me alongside my internship. Robert focuses on the interpersonal aspects

of individuals and ensures that the IT internal environment is exciting, fulfilling, and encouraging to everyone, no matter their position.

My internship dealt with Information Technology, however, many of the Cybersecurity ideologies and methodologies did apply to many situations during my internship. While I do want to pursue Cybersecurity as my career, IT is the first steppingstone. Coming from ODU's Cybersecurity program, this internship filled a lot of gaps I had. Not only from the information but also the social factor. Previously, I worked six years at Target as a customer service representative that was fast paced and physically demanding. Transitioning from retail to an office was challenging at first. Staring into a computer screen all day sounds easy enough, but it definitely can be mentally exhausting. From red t-shirts and khaki pants, I now had to wear business casual clothes every day. As I slowly adjusted environments, I had three main learning outcomes I hoped to achieve during my experience at Atlantic Bay. Firstly, I hoped to acquire hands-on experience with technologies inside real environments. In the technology industry, experience is king and having this hands-on opportunity will prepare me for my career. Secondly, I wanted this internship to reinforce my learnings towards my CompTIA Security+ certification. A big steppingstone in Cybersecurity is getting certifications and I wanted this opportunity to reinforce those ideas from the hands-on experience. Personally, I can only retain so much information from reading a book and I need real-life examples for me to fully understand a topic. Finally, I wanted to get comfortable networking and being social inside the office environment. Working in the technology industry is not only about looking at a computer screen, but it requires individuals to socialize and communicate as a team to complete their goal. This was something I knew I lacked, and I was hoping that this experience would push me out of my shell.

As previously mentioned, IT does not directly interact with the loan process. Instead, we support other departments that do. In the first of its kind, I floated around three critical areas of IT while interning at Atlantic Bay: Infrastructure Team, Customer Service Team, and Networking Team.

Build/Infrastructure Team

For my first five weeks of my internship, I worked with the infrastructure team to complete four main objectives: New Hires, Departures, On-Site/Remote support, and Inventory.

New Hires focuses on building out technology equipment for newly hired employees at Atlantic Bay. In this process, we supply the adequate equipment and work inside our internal systems to enable access to our platform. On the hardware side, we supply monitors, cables, laptops, and docking stations depending on if the employee is on-site or remote. On the backend, our team creates a new user object in the Active Directory, edits their attributes, and delegates them access to distinct groups on a need-to-know basis. These groups are all set up to give the user access to different applications in our environment. For example, the Okta group is given to all user objects in our domain and gives employees the ability to set up MFA on their account. This provisioning process is important, as we want to give the user their needed applications or permissions to complete their job without giving them too much access to our infrastructure. There are numerous checklists and documents that need to be completed as Atlantic Bay onboards new employees with their equipment.

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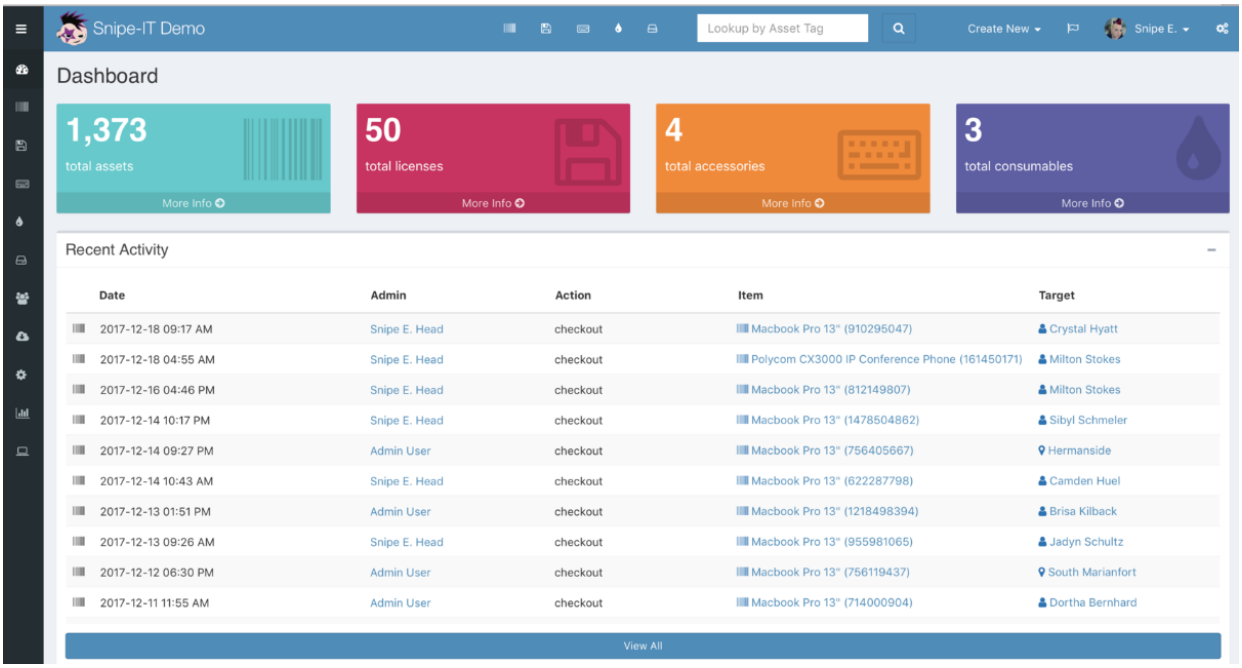
Departures are the exact opposite of “New Hires” as it focuses on employees leaving the company. Depending on the type of departure depends on the actions needed. An employee who gets fired immediately requires more urgent tasks to be completed, as the likelihood of a disgruntled employee causing a revenge attack may increase. In this case, Atlantic Bay prioritizes these urgent tasks to revoke the appropriate access from the employee. On more positive departures, we organize the return of equipment that was given to the employee and plan out their departure per their two-week notice.

While over 90% of employees work remote from home, a handful of employees still work on-site at the office. In this case, equipment may fail or need to be replaced. Our job focuses on troubleshooting, diagnosing, and repairing equipment as needed to support on-site operations. Through a ticketing system, requests come in and alert our team about the issue. Our team then goes to their office and troubleshoots their problem in-person. Since most employees are remote, a big process involves packaging and shipping equipment directly to the employee’s house. There is a constant flow of packages that come and go all day, every day, to retrieve and give equipment as needed.

Inventory is also a big part of the team, as we want to ensure that we have the necessary equipment on demand. Through a custom application called SnipeIT, we track all of our technology through our own asset tags, serial numbers, and model numbers.



SnipeIT is an open-source and vendor neutral application that can operate in different availability zones (*Open source SnipeIT, n.d.)* through AWS. In terms of Asset Management, this platform ensures clear ownership and classification of assets with integrated monitoring capabilities. It is important to note that the inventory is constantly being updated in each objective I did on the Infrastructure team. Without our inventory, we would not be able to process new hires, departures, or service requests.

As I got familiarized with the environment, I began doing more independent tasks by myself such as on-site requests, help desk tickets, and shipping out technology from our headquarters. One important aspect, no matter the objective, focused on imaging and setting up new computers for internal use. Every day we get requests by numerous different departments to build out new computers. For new hires, we build-out a whole new setup with their needed programs depending on their roles. For existing hires that needed a new computer, we utilize OneDrive to backup and restore their files on a newly imaged computer. There are countless other tasks that I did on a daily basis, however, it would be difficult to describe everything in detail. As I slowly found my place at Atlantic Bay, I tried to keep a positive attitude and took every opportunity I could to improve myself.

Customer Support Team

Customer service is something I was already familiar with; however, this time it focused on the technical side of things. IT customer support focuses on our internal environment for all employees throughout the company. Staying consistent with our Windows Environment (AD, PowerBI, Azure, etc.) Atlantic Bay utilizes Microsoft's CRM (Customer Relationship Management) application called Dynamics. Dynamics allows IT to collect, track, and resolve issues from internal employees through tickets. Tickets are objects that contain tons of different attributes tied to them. Each ticket has a unique identifier, a point of contact, a progress status, notes, and much more that provides information about the specific issue. The process on how tickets are created are as follows:

- Employees reach out to our internal IT support email address whenever they have any problems. This includes a wide variety of issues from hardware to proprietary software.
- This email system creates a new ticket from the initial email and forwards them to our IT CS Dynamics dashboard.
- Then, a coordinator funnels those IT tickets down to a specific IT professional for them to resolve.
- During this process, IT CS will contact those individuals through e-mail or Microsoft Teams to gather more information and troubleshoot the problem.
- Once the problem is resolved and we ask the ***Magic Question***, tickets become closed, and the process continues.

While the majority of the help desk tickets come in through our email system, many individuals do contact us directly through Microsoft Teams. At the end of the day, it is not just about our technical abilities, it is also about our customer service we provide to our peers. Our service directly affects the image of Atlantic Bay, so creating rapport with our peers is our number one priority. As we strengthen our relationships with our peers, we build trust and show that ***we genuinely care*** about the people we serve. This is where our Magic Question ties in. As we resolved tickets, we asked everyone this: "*Thanks for allowing me to resolve your issue, is there anything else I can assist you with today?*" While this may sound simple enough, our Magic Question shows that IT CS wants to help the individual. Even for simple password resets, asking the Magic Question sometimes allows us to resolve more complicated problems our peers may be having and that affects their productivity. If we can increase their productivity and efficiency of their work, we increase Atlantic Bay's ability to produce mortgage loans. Thus, helping out families across the nation.

It is a little difficult to fully describe what objectives I completed during my five weeks on the CS team, as there were a wide variety of issues I helped resolve. Some were simple password resets and others were challenging problems that took me days to complete. However, I think the most eye-opening experience I had was realizing how important emails, printers, and faxes are in the mortgage industry. I found these areas to be the most troubling for me to troubleshoot, as I have not had much intricate experience with these services. This may be due to my age or lack of corporate experience, but a lot of these tickets deal with printers. Let me tell you, printers are IT's worst enemy. With many of these printers being "Cloud Printers" (printers at different branch locations) printer tickets can be exceedingly difficult to troubleshoot. I do not have physical access to them, they cannot use the BeyondTrust platform to remote into, and the range of issues can easily be because the printer tray is not aligned properly. In addition, most of our printers are proprietary. Meaning if a printer needs to be fixed, IT CS must contact the manufacturer to schedule a service date. Due to the vast array of tickets that come in, it has been difficult for me to remember what I should do in each situation. Inside our department, we have notes for us to reference while we troubleshoot. This has helped me in many situations. After my final week at IT CS, I was relieved and transferred to our networking team for the remainder of my internship. Thus, I was away from clients, customer service, and printers themselves.

Networking Team

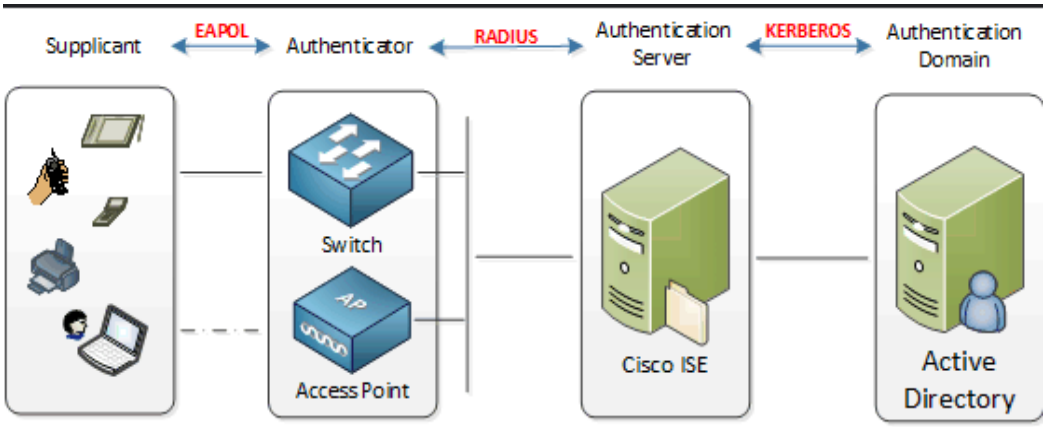
In terms of technical ability, the networking team were considered “super-admins” that have overarching insight in all areas of IT. This team focuses on the actual network infrastructure of Atlantic Bay’s operations. While the networking team does focus on issues surrounding networking, they are considered “super-admins” because of their in-depth knowledge in IT. They resolve problems other teams cannot solve and collaborate directly with the Manager of IT. From my experience, there is no structure of their daily responsibilities. Instead, they work on projects, help other IT personnel, and monitor our networking infrastructure to ensure no downtime occurs. On a daily basis, they are thrown into unfamiliar problems and are constantly running around as needed. This face paced-environment was extremely difficult to understand. I can only speak from my perspective on how operations occurred, what technologies were utilized, how my contributions affected Atlantic Bay.

Atlantic Bay utilizes a hybrid cloud solution that operates in AWS, Azure, and our On-premises data center to upkeep our critical systems. In both environments, they host most of the same technologies that include VPN concentrators, EDR/SIEM servers, Disaster Recovery or Failover servers, and much more. If the cloud environments go offline, they have the capability to replicate their infrastructure to their on-premises servers. If their headquarters goes offline, they could move their internal banking applications to the cloud and restore their on-premises operations from cloud backups. No matter if it is in AWS, Azure, or on-site, there are failover technologies on every end to keep operations running no matter what. To manage the different environments, they utilize a SD-WAN application called Meraki to control each device within every branch or cloud solution. This allows Atlantic Bay to quickly deploy products using pre-defined templates and easy configurations depending on our needs.

One of my first mini-projects I did on the networking team was installing a new Cisco Access Point inside the IT office. I installed a Cisco Catalyst 9117AXI Wi-Fi 6 access point using a custom CAT6e cable I made. The overall goal of the project was to slowly migrate their office APs to use Wi-Fi 6 technology and update their older products. In Meraki, I claimed the

new Cisco product so other organizations cannot use the AP. Then, I used the pre-defined template and configured the AP to use Wi-Fi 6 technology. This setup was fairly easy, and the only hard part was using the metal bracket to install it on the ceiling. Even making the custom CAT6e cable was easy, as I had previous experience from ODU on creating ethernet cables. Nevertheless, this mini project made me realize how helpful Meraki is within the networking team and how easy it is to deploy new products.

Another project I did focused on labeling ports and MAC addresses on each switch Atlantic Bay manages. In other words, at each branch network in Meraki, I labeled printers, APs, desk phones, and other devices inside a big excel spreadsheet with over 40+ locations. The overall goal is to implement 802.1x port-based authentication using EAP-PEAP to secure our internal network. Using a RADIUS server, users are authenticated to our internal network through their Active Directory account information. This ensures that bad faith actors cannot just walk into a branch location and plug-in an ethernet cord right into our network. In addition, Atlantic Bay utilizes RADIUS for wireless authentication for Wi-Fi access. For example, a mortgage banker may want to connect their iPhone to the Wi-Fi while they are in the office. In this case, we hard coded the device's MAC addresses and a unique shared secret key to the RADIUS server. Therefore, this unique password only works with that device and cannot be shared. (*Semperboni, 2020*)



Not only that, but we also segmented these devices inside a separate VLAN, we refer to as the 'GuestNet,' to separate them from our critical VLANs. Since many of the devices do not have an AD object entry (printers, phones, etc.), my project allowed the team to create special entries for these unique devices using their MAC address and the specific port they operated on. Unfortunately, I cannot provide any references of our network environment, as Atlantic Bay does not want this information public. Also, I did numerous different tasks in this fast-paced environment, and I cannot describe everything I did in detail. Yet, this team proved to be the most challenging and provided me with a deep understanding of networking that I have not experienced before.

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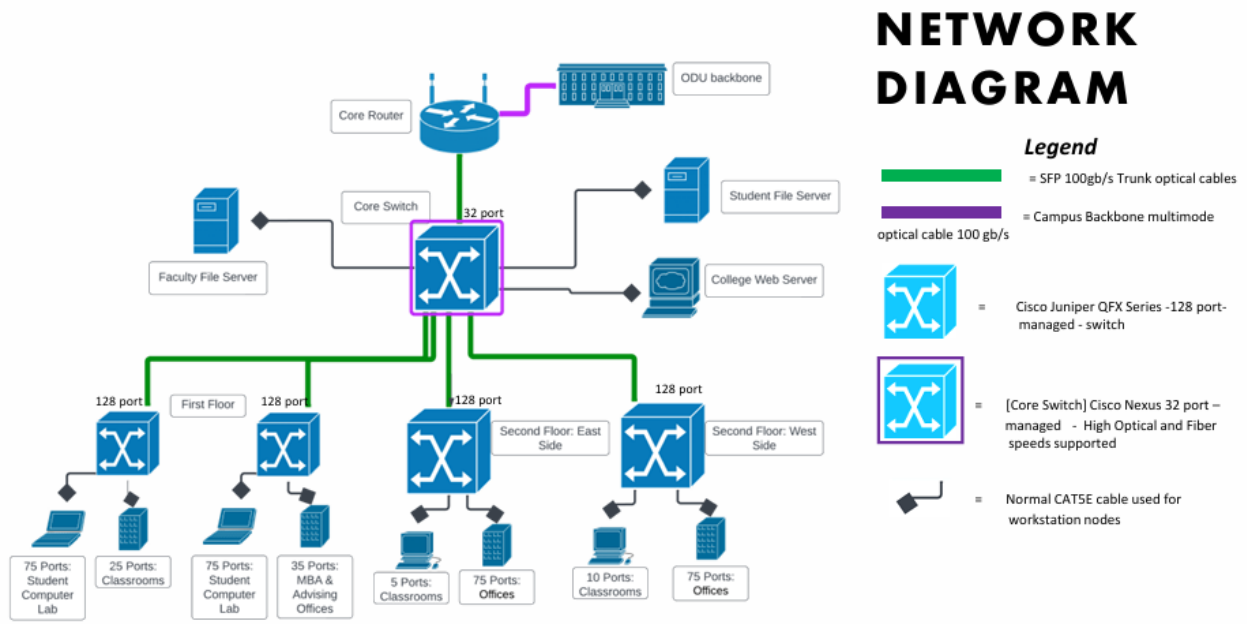
Old Dominion University Contributions

Old Dominion University provided a remarkable foundation of knowledge I needed to be successful at my internship. The concepts, theories, and methodologies I learned from the Cybersecurity curriculum directly reflected the technologies I utilized during my time at Atlantic Bay. In particular, IT 315 – Introduction to Networking and Security equipped me with the most information that paralleled my experience at Atlantic Bay. When I worked on the networking team, my understanding of the OSI model and networking concepts helped me understand the network infrastructure Atlantic Bay employs. Furthermore, the collaborative projects and group assignments I did in that class allowed me to understand the importance of presentations. I vividly remember from my IT 315 class doing a lot of presentations that simulate bona fide business examples. In one of those presentations, we simulated a scenario where we presented a new networking diagram to upper management that needed to be visualized by non-IT professionals. As shown below, this is one of the diagrams that we created in the class.



This directly represented what IT does at Atlantic Bay, as we had a lot of meetings that required us to visualize and present some of our ideas to the Executive Leadership Team. We had to understand that not everyone is an IT professional and required us to convey our ideas to a lower level. Therefore, this part really helped me understand that concept when working at Atlantic Bay. The only thing I think ODU did not prepare me for were the social factors. In my early college years, I had the idea that I did not need to network with other people, and I could solely use my technical skills to acquire any job. However, this is far from the case. No matter what position you work, it requires you to push yourself outside your comfort zone and socialize inside the industry. It goes back to that ancient quote: "*It's not what you know, it's who you know*." While ODU does provide an excellent education program, I do not think ODU emphasizes the social factors needed to network and acquire a Cybersecurity job.

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Internship Outcomes

In my declared outcomes, I can safely say that all my hoped objectives were achieved during my internship at Atlantic Bay. I gained an incredible hands-on experience with different technologies that I could not have gained at ODU. For an intern, I was pleasantly surprised how involved I was in each department. I had an initial assumption that I would mostly be shadowing individuals than working independently, but this was not the case. In each department, I worked directly with the actual systems and worked as if I was a normal employee. In terms of my CompTIA Security+ studies, I took any free time I had and studied as much as possible. When I had questions about any topic, I did not hesitate to ask other professionals and they broke it down in simpler terms for me. Everyone was incredibly supportive and gave me exceptional advice about acquiring certifications like the Security +. Combining the hands-on experience aspect as well, this internship reinforced my studies and I plan to take my exam within the next month. Finally, this internship experience increased my social skills. When first getting into Cybersecurity, I had this motto: "*I want to work with computers, not people*." As I grew older, I realized this is not realistic and I needed to mature. At Atlantic Bay, I gained better soft skills in networking with others and created precious connections.

The most motivating and exciting aspects of the internship was working hands-on with technologies and learning from other IT professionals. To ODU's credit, I did learn most of my Cybersecurity principles from their program, but having hands-on experience like this was priceless. For me, I grasped another level of understanding seeing these technologies in-action rather than reading it from a book. Let us take Meraki for an example. I would never have understood the importance of their SD-WAN platform just by reading their definition online. I needed to collaborate directly with it to fully understand why that technology exists.

The most discouraging aspect of the internship has been assisting with the customer service team. In any customer service role, the work objectives are fairly easy, but dealing with people is the hardest part. Even though we IT CS works solely with internal employees, occasionally there were individuals who made the job tiring. Having years of previous customer service experience, I was hopeful that this internship would negate me from any front-end service and give me a break. However, this was not the case. Five weeks of my internship focused on the IT CS team and required me to answer incoming phone calls, reply to help desk emails, and answer Microsoft Teams messages to resolve issues. While I will say, I do prefer this type of customer service compared to my previous job. I still felt drained working in this area since I had been doing it for so long.

For me, there were three challenging aspects of the internship I encountered: Adjusting to office life, attending a lot of meetings, and getting comfortable presenting to leadership. I believe at the point I am in my early career; my challenges were not technical. ODU Cybersecurity's program prepared me for a lot of situations. A lot of the terminology and ideologies followed over and the challenges for me were social based. As previously mentioned, I lacked these social factors, and I felt these challenges the most overwhelming. Nonetheless, I slowly got comfortable at Atlantic Bay and strengthened my soft skills that made those challenges go away.

My recommendations are very few, as the foundation of the internship process is enjoyable and knowledgeable for new students starting in the industry. The one strong critic I have deals with the application portion. When applying for the IT position, I did not know what I

was getting into. The listed objectives on the job posting were incredibly vague and unclear on their outcomes. Also, it did not describe how interns were going to rotate to different areas. As shown below, some objectives were unclear and did not align with what I did as their IT intern.

What you'll be doing

- Being exposed to all facets of an IT Department, Networking, Server, Customer Support and Build.
- Learning about computer network types (LAN, WAN)
- Assisting with cloud networking
- Performing profile transfers
- Shipping and packaging equipment
- Decrypting computers
- Assisting in and eventually working independently in the following tasks:
  - Troubleshooting and repairing simple network problems
  - Troubleshooting and repairing Microsoft Windows operating system problems
  - Using Microsoft Active Directory in password resets and group memberships
  - Troubleshooting and repairing common personal computer hardware problems
  - Eradicating malware on personal computers
- Performing other miscellaneous IT duties as needed

I think the rotation process of moving interns around to each department is incredibly helpful, as IT is a vast area of discipline. However, there needs to be some sort of foundation or baseline of knowledge established in the application process. A lot of the terminologies, ideologies, and methodologies are assumed on the student when working. For example, a lot of my operations deal with Active Directory. Active Directory can be complex and overwhelming to individuals who have never heard of the platform or how it functions. With the vague objectives listed in the job description, I could see super premature students joining the internship program and becoming lost due to the knowledge gap. Even in the interviewing process, the most puzzling question was ***"If you had to describe RAM to your grandma, how would you describe it?"*** This easy question does not accurately relate to the outcomes that are expected with either the customer support team or the networking team. This question could be related to the infrastructure team since they deal with hardware, however, this still would still be a stretch. Also, another critic I have for Atlantic Bay deals with the provisioning process. As I moved around to different facets of IT, I needed to be given access to different platforms to complete my objectives. A lot of the time, I needed to reach out to numerous people to be given access. Some people gave me access right away, some took a while, and others did not respond at all. In some cases, I became less effective at my job because I simply could not access what was needed and had to get my trainers to complete my duties for me.

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Conclusion

Not every internship opportunity provides such a welcoming and enriching experience as Atlantic Bay Mortgage Group. This company stands out for its culture and its commitment to provide a true "*Lending Piece of Mind*" (*Ab cares, n.d.*) for its customers. For their employees, they provide a fulfilling environment that genuinely cares about its individuals. As I advance in my career, I recognize that encountering a company like Atlantic Bay is rare. My time at Atlantic Bay has been marked by the chance to forge connections with seasoned professionals and acquire insights that are truly priceless. During my time with the infrastructure team, I gained hands-on experience in troubleshooting and resolving hardware-related issues. This role allowed me to understand the intricacies of hardware systems and enhance my problem-solving skills. Transitioning to the customer service team, I was able to leverage my prior customer service experience and integrate it with my technical knowledge to solve tickets. This role provided me with a deeper understanding of the cross section between customer service and technical support. In my time with the networking team, I was exposed to advanced networking concepts and worked on mini projects to support Atlantic Bay's IT operations. Each team uniquely contributed to my professional growth, and it marked a new journey working within Cybersecurity. Like most things in life, all good things must end. This experience has not only enhanced my understanding and my skills, but also solidified my passion for Cybersecurity with a sense of gratitude and accomplishment.

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