

Final Paper

Jonathon Clark



Rockbridge Area Health Center

CYSE 368

Spring 2023

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1. **Introduction**

 Instead of doing a traditional internship, I sought out employment opportunities for a full-time position. In November of 2022, I found a job listing seeking a candidate for an Information Technology Representative at the Rockbridge Area Health Center in Lexington, Virginia. I was excited to find such an opportunity because information technology jobs are few and far in between in Rockbridge County. Most organizations outsource their information technology needs to companies based in Roanoke or Harrisonburg. I was also more than qualified for the position since I possessed a CompTIA Security+ CE certification and an Associates of Science degree from Virginia Western Community College. I wanted this job because it was for an entry level information technology position in healthcare. I knew that a lot of the cyber security topics I had studied about both at Old Dominion University and for the CompTIA Security+ CE would translate well for the position. After my first interview, I was also very confident I would be able to handle the workload based on the expectations that they had. Overall, the job seemed like a great fit and I was already working full time while completing my studies at Old Dominion University.

 Before I started my orientation at the Rockbridge Area Health Center, I had a few weeks to wrap up my work at my previous, non-information technology related job. During this time, I thought about how different and exciting it would be to begin working for an organization doing tasks that I was genuinely interested in. I began to think about what topics I absolutely wanted to learn more about at the Rockbridge Area Health Center and what goals I wanted to set for myself. There were a lot of things that came to mind. However, there were three areas of the job that I specifically wanted to learn and eventually master to the best of my abilities. The first area was managing a small to medium-sized group of users. The Rockbridge Area Health Center, at the time, had roughly 125 users with at least as many machines. I wanted to practice managing network accounts, Microsoft 365 accounts, and other accounts on a small scale to be better prepared for larger organizations in the future. My second goal was to get more hands-on experience with networking. Through my course studies at Old Dominion University, I learned many networking concepts and was able to practice many aspects of networking through the use of virtual machines. However, I hadn’t had any experience working with these machines and components physically. I wanted to experience everything from creating patch cables and running data cables to managing Virtual Private Networks and configuring routers or firewalls. The final goal I had created for myself was learning more about network security in general. Since my major here at Old Dominion University is Cybersecurity, this area was a higher priority for me. By pursuing all three of these areas, I believed I would be able to become more well rounded in cybersecurity and information technology.

 This job opportunity at the Rockbridge Area Health Center was truly an opportunity that I couldn’t afford to pass up. Not only would I be able to start my career in cybersecurity and information technology, but I also would earn an hourly wage that was enough to pay my bills as well as my cost of living. I knew the endeavor would not be that easy and it would take a lot of hard work. Not only would I be working around 40 hours during the week, but I would also have to make time to complete my coursework. I am also the father of an amazing three-year-old daughter. Nonetheless, I was excited to get started and begin advancing my career.

1. **History, Orientation, and Initial Impressions**

 The Rockbridge Area Health center started out as the Rockbridge Area Free Clinic. The Rockbridge Area Free Clinic was started in 1992. Since most of Rockbridge County’s residents were involved in farming or other agricultural trades, the community had a strong need for affordable healthcare services. There was much poverty in Rockbridge County during this time. On December 17th, 1992, the Rockbridge Area Free Clinic began seeing patients. Shortly after, in 1993, the Rockbridge Area Health Center received its non-profit status from the Internal Revenue Service. Between the years 1994 and 1998, the Rockbridge Area Free clinic began filling important positions such as Nurse Practitioners, Patient Care Coordinators, and Executives. The Rockbridge Area Free Clinic was able to hire these individuals and continue to expand by applying for and receiving various types of grants. In 1999, the Rockbridge Area Health Center began receiving state funding for a pharmacy expansion and to establish dental services. Shortly after, in 2001, the Rockbridge Area Free Clinic began seeing patients to perform dental services. The Rockbridge Area Free Clinic kept expanding through grants and state funding all the way through 2014. In 2014 the Rockbridge Area Free Clinic reopened as a federally qualified health center. The Rockbridge Area Free Clinic then became the Rockbridge Area Health Center. In 2018, the Rockbridge Area Health Center finished construction on the current main office. Today, the Rockbridge Area has three locations in Lexington, and one location in Buena Vista. The main office in Lexington offers both full medical and full dental services. This office also offers behavioral health counseling. One of the other offices in Lexington is located in the Kendal retirement community and it offers full medical services. The final location in Lexington is an administration building where the finance department and referral coordinators are located. Finally, the location in Buena Vista offers both full medical and full dental services. Recently, the Rockbridge Area Health Center is preparing to launch their mobile units that will provide full medical and full dental services in remote areas around Rockbridge County. In the future, the Rockbridge Area Health Center plans to expand to Covington, Virginia.

 My initial orientation at the Rockbridge Area Health Center went smoothly and rather quickly. My initial orientation was only two days long. The first day of orientation consisted of filling out paperwork, gaining access to my organizational accounts, and meeting with various people within the organization. Some of the meetings were with the compliance officers, our manager of facilities, our chief financial officer, and our medical director. After lunch, I had the opportunity to meet with my supervisor and the Chief Operating Officer Mary Looney. The morning of the second day was very similar to the first day. I did more paperwork and began watching training videos. A lot of the training videos that I watched concerned safety practices in a healthcare environment and how to identify dangerous situations. Watching these videos and taking short quizzes took up most of the second day. It wasn’t until the third day that I began my training and was introduced to some of the systems within the Rockbridge Area Health Center. I was also introduced to the managed service provider that we have on contract. Vision Technology Group is a managed service provider who does most of our network and systems administration. The main person who I deal with from their company is Adil Bach. Adil was the one who showed me around all the different locations and explained the flows of certain tasks. Adil showed me how to check printer toner levels through a printer management software, he taught me how to access our servers, he explained our server rack layout to me, and much more. Adil was a huge help in getting me up to speed with everything. He also showed me how I should approach service request tickets and how to properly troubleshoot different issues. Overall, I was initially impressed by the Rockbridge Area Health Center and their systems. I was very excited to begin working in the environment.

1. **Management Environment**

At the Rockbridge Area Health Center there are tiers to the management structure. The person I report to directly is the Chief Operating Officer. The manager of facilities, patient access manager, and associate director of operations report to her as well. The only person higher in authority is the Chief Executive Officer, Suzanne Sheridan. My supervisor reports directly to her. For the other departments, there is a Medical Director, Director of Nursing, Director of Dental, Director of Behavioral Health, and the patient access manager. Underneath those positions are their perspective care providers (nurses, doctors, dentists, hygienists, etc...). I also have a responsibility to communicate with Vision Technology Group to make sure everyone is on the same page. Although I work for the Rockbridge Area Health Center and not for Vision Technology Group, I am a part of their ticketing system and I use their remote software to help out our users. In general, I have a lot of freedom to get the tasks done that I need to get done. She is also very helpful whenever I have questions or need advice on how to tackle various projects. We have bi-monthly meetings in which she asks me what things I need to be able to do my job better. She offers me things like paid training, more resources, or even opportunities to attend conferences and virtual meetings with other healthcare information technology professionals. Overall, I feel like the management at the Rockbridge Area Health center is very effective.

1. **Work Duties & Projects**

When I first started at the Rockbridge Area Health Center, I only had a few different duties and not really any projects. One of my initial duties included the task of monitoring our printers through a software known as XDA. This software was provided to me by the organization that services our printers. This organization is JustTech. They also send us new toners automatically based on the data from this software. The XDA software not only displays the toner levels, but also keeps track of the IP address, MAC address, and location of each printer at each of our locations. The software makes the task a lot easier. Another duty I was given early on at the Rockbridge Area Health Center was doing a daily, hardware-based back-up of our systems. I would do this by swapping out an external solid-state drive on our management computer at a specific time each day. This computer contained a PowerShell script that, at 7:30 AM and 3:00 PM, would take snapshots of the state of our systems and save them to the solid state drives. We also have a process by which Vision Technology Group does backups to their servers at their headquarters in Harrisonburg. The only other duty I had early on was to answer service calls. This duty mainly involved me answering Tier 1 support tickets (*fig. 1)*. These tickets involved issues like password resets, printer jams, troubleshooting some software issues, creating patch cables, and running new data cables at some of our newer locations. As my time at the Rockbridge Health Center went on, I began receiving more duties and started getting involved in some of the organization’s projects. I was eventually put in charge of setting up accounts and computers for our new users. Whenever the Rockbridge Area Health Center hires a new employee, I would receive an email from Human Resources containing the new hire’s name, position, and whether they would need a computer permanently or just for orientation. Certain positions like dental assistants or patient access representatives did not need computers permanently. This is because these positions typically worked at preexisting workstations. New hires need a few different accounts depending on whether they worked in the dental department or the medical department. Every new hire needed a new account in our network. I set these up through our on-premises Active Directory on our data server. I also had to set up accounts for the new hires in our Microsoft 365 tenant so they could access Outlook for their email and other items from the Office suite *(fig. 2)*. I would do this by logging into the administrator panel on the Microsoft 365 website and going to users. From there, I was able to enter their name and create them an email address with our domain (rockahc.org). I copy settings from other users with a similar position to more easily add new hires to mailing groups. Most of our staff also need accounts for our patient database inside eClinicalworks. To set up these accounts, I log into eClinicalworks through our web portal and follow a similar process to setting up Microsoft 365 accounts. If the new employee works in the dental department, I also set them accounts in both OpenDental and Patterson Imaging. OpenDental is our dental patient database and Patterson Imaging is our image viewing software. After setting up these accounts for a few months, my supervisor asked me if I would start signing up for a time slot during new hire’s orientation to speak with them. I would instruct the new employees on how to access our shared network drives, their email accounts, and our email safety policies. I would also help them set up their email signature. Eventually, I was tasked with managing our users within these systems as well as others. I currently manage our email spam filter through AppRiver (*fig. 3*). AppRiver is a great tool that provides strong email filtering as well as the ability to set mailing rules. I now also manage our cybersecurity training system through KnowBe4 (*fig. 4*). KnowBe4 is a great tool for educating our users on security practices and testing our email security posture by launching internal phishing campaigns. I have thoroughly enjoyed taking on new duties and expanding my knowledge range.

 Not only was I able to tackle new regular duties, but I was also given various opportunities to take on new projects. One of the first projects I was involved with at the Rockbridge Area Health Center was running new data cables at our new medical facility in Buena Vista, Virginia. The contractors who did the renovations to the building only ran one line to each room. The health center wanted at least two live ethernet jacks in each room. I spent a lot of time in the ceiling hanging the cable from the rafters and fishing the lines through the walls. After that, I terminated the lines and crimped them. I learned a lot through this experience. I went on later to run more cables in our new administration building and our newly renovated dental facility in Buena, Vista, Virginia. Another project that I had the privilege to work on was implementing Duo Multi-Factor authentication into our Microsoft 365 tenant. I was able to do this through the use of Microsoft Azure Active Directory and creating a security group. Once Duo was implemented, I added the users to the security group. They would then be prompted to sign up for Duo Mobile the next time they logged into their Microsoft 365 account. I rolled Duo out one department at a time to ensure there were not any issues or incompatibilities. This was one of the projects I enjoyed the most. More recently, I have been involved in a project concerning two mobile units that we received from a company in Ohio. One of the units is a medical unit and the other is a dental unit. Both of these units are capable of providing full services to patients. The units themselves are installed with Cradle Points that provide internet connectivity through cellular data. The Cradle Points are connected to a patch panel that connects to a number of ethernet jacks on the units. I had the privilege of setting up two workstations on the dental mobile unit and configuring the panoramic machine to communicate with one of the workstations. For the medical mobile unit, I had to set up a few laboratory devices and a label printer. I am currently in talks with JustTech about acquiring portable printers for these mobile units. The mobile units are set to launch at the beginning of May. I am excited to see these units in action. I already have a few projects lined up for the future as well. The biggest project I have coming up is needed by quarter three of this year. I have been asked by our Risk Management Officer to come up with some internal information technology policies for our company. I plan on using HIPPA compliance and some other frameworks to get started with this project. Overall, I have been very satisfied with each project I have worked on.

1. **Use of Skills & Knowledge of Cybersecurity**

Throughout my time at the Rockbridge Area Health Center, I have had many opportunities to showcase and improve my knowledge of various cybersecurity concepts. An example would be helping users with potential phishing emails. Oftentimes, users will receive phishing emails from outside our organizations or as part of a phishing campaign from the contracted cybersecurity training KnowBe4. They will send me screenshots of the emails when they are especially concerned or if they’ve opened a link or an attachment from the email. I know, through the cybersecurity knowledge I possess, that the header of an email can be examined to find out more information. Most of the emails I examine have knowbe4 in their headers. For the ones that do not, I know if they could possibly be a legitimate phishing attempt. I have come across quite a few legitimate threats. These emails are usually sent to higher up executives at our company such as our Chief Executive Officer, our Chief of Finance, our Chief Operations Officer, and our Associate Director of Marketing. Through my knowledge of cybersecurity, I know that this technique is known as whaling. Another instance in which I am able to showcase my cybersecurity knowledge through analyzing the monthly reports we get from KnowBe4. KnowBe4 sends us monthly reports with data on our users during phishing campaigns. I can see how many times our users clicked phishing links, what their risk score is, and how much risk our organization is at overall. Through analyzing these reports, I can determine which of our users need more help with email security and congratulate the ones who haven’t opened a single phishing email. I have learned that creating incentives for users who practice proper email security techniques incentivizes them to stay on guard. It also incentivizes the users who are prone to phishing techniques to proper these techniques as well. One other example of an opportunity to showcase my cybersecurity knowledge is having to set up VPN profiles for our remote users. Currently, the only way to access our shared network drive is to connect to our network through a VPN connection to our firewall. In the future, we plan on migrating the data from this shared drive over to SharePoint to increase the ease of access for our users. The biggest example of showcasing my cybersecurity knowledge comes from my current project. As previously mentioned, I am currently working on information security policies for the Rockbridge Area Health Center. This requires not only knowledge of general information security practices, but also knowledge of HIPAA compliance. Overall, I have been very satisfied with my work on these projects.

1. **Preparedness for Employment Opportunity**

Old Dominion University has done a great job preparing me for entry into the information technology field. I have not only obtained the technical skills that are required to succeed from my time at Old Dominion University, but also the skills necessary to succeed professionally. One of the examples that the coursework I have completed translates to the workforce comes from my Windows System Management and Security class I took this semester. During this course, I learned how to create PowerShell scripts to automate certain time-consuming tasks. I have been able to create PowerShell scripts to automate the process of creating new users in Active Directory and disabling user accounts. I have also learned how to manage Windows Servers from this course. I get the opportunity to use the Remote Desktop Protocol to access our data servers on a daily basis. Another class I took that directly translates to my current job is the Introduction to Networking class I took during my first year at Old Dominion University. I learned how to make patch cables and terminate the ends during this course. I ended up doing this a lot for the Rockbridge Area Health Center since I started working here.

 There are a few concepts that I learned working at the Rockbridge Area Health Center that I did not come across during my time at Old Dominion University. One of these concepts is how to troubleshoot printers and how to configure them with a network. I understand that this is a relatively low-level issue someone might have to deal with and that is possibly why it’s overlooked. However, these machines are a part of an organization’s network and sometimes require a lot of time to troubleshoot. Users also rely on these machines just as much as their computers. The only other concept I learned from my job and not from Old Dominion University is just how different networks can be. For the majority of my courses here at Old Dominion University, the virtual networks I have worked with have been the same. The virtual networks don’t take into consideration multiple locations relying on the same network or networks that are connected by putting a router into pass through mode. I believe it would advantageous if students were able to interact with networks with a more diverse composition. Other than those two concepts, the information I have learned from Old Dominion University has prepared me tremendously for this job.

1. **Achieved Learning Goals**

Out of my three original learning goals, I have accomplished all three of them. The first goal that I accomplished was gaining experience managing a medium sized group of users. Currently, the Rockbridge Area Health Center has roughly 125 employees working on site and remotely. The organization is constantly growing and hiring new employees. I have created, deactivated, and managed multiple accounts for all of these users. I have responded to these user’s support tickets and have resolved their issues. I have also set up multiple workstations across various locations. I am at the point now where I feel comfortable and confident in this type of environment. In the future, I would like to manage even larger numbers of users and systems to become a Systems Administrator. Another goal that I accomplished was to gain experience networking with actual networks. I have been able to do that at the Rockbridge Area Health Center. I am frequently accessing our various servers and mapping network drives to our user’s computers. I am currently working on a project in which we are bridging our data server to eCW Dental. The final goal that I accomplished at the Rockbridge Area Health Center was learning more about information and network security. During my time at the Rockbridge Area Health Center, I have gotten the opportunities to work with our Fortinet firewall. I have assisted in creating rules for the firewall, creating VPN connections for our remote users, and whitelisting IP ranges. I have also had the opportunity to configure Ubiquity wireless access points. I am very pleased that I have accomplished these objectives.

1. **Motivating Aspects**

 There are many motivating aspects of my current job. It is very exciting to see the look on user’s faces when you are able to help them with a problem. It is also extremely satisfying to be able to troubleshoot problems and eventually fix them. By doing this, it motivates me to learn more to troubleshoot more difficult issues. It is also exciting to be able to work with so many types of technology. I have had the opportunity to work with various medical and dental devices. I have worked with mobile intraoral sensors and x-ray guns. I have had the opportunity to work with panoramic machines and laboratory equipment as well. Another exciting thing is that I have been told the Rockbridge Area Health Center will reimburse me for acquiring new certifications as long as they are related to my job. This motivates me to go for the CySA+ certification or the CASP+ in the future.

1. **Discouraging Aspects**

 As with many occupations, there can be bad days. I have certainly encountered some discouraging aspects while working for the Rockbridge Area Health Center and in the information technology field in general. One thing that bothers me is being unable to fix a problem. For every five issues that I have resolved, there is usually one or two issues I can’t resolve. Thankfully, I have Vision Technology Group to assist me in those times. They are very knowledgeable in many areas and always willing to lend a hand. This seems to be a part of the information technology field in general. I have gotten used to these situations as time has gone on. One other aspect that is a bit discouraging about this job is feeling burnt out by support tickets sometimes. I am the only information technology person on site all week. Adil comes to the office on Fridays sometimes, but for the most part, Vision Technology Group does most things remotely. I am constantly receiving tickets, emails, and phone calls from users needing assistance. I have gotten used to the workload as time has gone on. I have learned I need to pace myself better and focus on mission critical issues first. Other than those two points, I really don’t have many things to complain about.

1. **Challenging Aspects**

I have also encountered many challenging aspects during my time at the Rockbridge Area Health Center. The first aspect, as previously mentioned, is the fact that I am the only information technology person on site the majority of the days. I not only have to complete support tickets, but I must also work on projects for the Rockbridge Area Health Center as well. Because of this, most days at work are very busy. On the bright side, it makes the days go by faster. Another challenging aspect of my job is the fact that the Rockbridge Area Health Center is rapidly growing. Since I have been here, we have opened two new locations, renovated two locations, and are currently preparing to roll out two mobile units. With this rapid expansion, a lot of systems must be installed and configured. I have been able to handle these challenges relatively well so far. The biggest challenge has been working 40 hours a week at the Rockbridge Area Health Center and finding the time after work to complete my coursework, spend time with my family, and enjoy down time. I have truly enjoyed my time at Old Dominion University; however, I am looking forward to having free time after work.

1. **Recommendations**

I have a few recommendations for future students seeking internships for entry level healthcare information technology positions. The first recommendation is to look for an internship in places you would eventually like to work for. Securing internships at these places is a good way to get a foot in the door. Another recommendation I would give is to try not to get frustrated about progress or being unable to do certain things. Students are usually young and working with technology for the first time professionally. They are bound to make mistakes or run into problems that are over their head. The important thing is to know where and how to receive help with these issues. The final recommendation that I have for future students is to enjoy their internship. An internship should be enjoyable. It should not feel like too much work. It is a learning experience.

1. **Conclusion**

I have thoroughly enjoyed my time both at Old Dominion University and at the Rockbridge Area Health Center. I have enjoyed all of my courses and professors as well. I feel like I have learned a lot of the knowledge that I will need to be successful from Old Dominion University. I genuinely cannot think of anything I would change about my experience. After graduating, I plan to further my studies by preparing for various certifications such as the CompTIA Pentest+. I would like to transition into a cybersecurity analyst position once my time at the Rockbridge Area Health Center is done. Eventually, I would like to get into penetration testing and ethical hacking. I am looking forward to what the future has to offer.

1. **Appendices**

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Figure : Ticketing System



Figure : Microsoft 365 Admin Panel



Figure : AppRiver Admin Panel



Figure : KnowBe4 Admin Panel