Student Internship Final Paper

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Old Dominion University's Information Technology and Systems department offered me a great opportunity to intern for their Network Services Department as a student worker. I decided to accept this position because it was a great opportunity and offered flexibility with my school schedule. This opportunity provided me with a great introduction and foundation to all thing’s technology, as well as, working in a professional tech like setting that can assist me in what it is like to work in this career field after graduating. Throughout my college career I have been told by professors, peers, and other colleagues that are in the field that the foundation of Cybersecurity starts with Networking and understanding end-user problems.

Network services at Old Dominion University falls under their Information Technology and Systems department. We deal with all thing’s technology from hardware to software. We collaborate with different departments like facilities management, client services, desktop support, and the ITS help desk to find solutions for end-users. The major products our department operates on are computers, printers, security cameras, key-boxes, controllers/circuit boards, panic buttons, and doors. We provide electronic access control services, security services, and simple break-fix services. Network Services is responsible for routing hardware to Wi-Fi to ensure security and operational functions are up to standards via ODU’s SLA (Service Level Agreements).

My initial orientation involved meeting fellow student workers, as well as, the full-time staff and learned what roles everyone in our office has. The different roles are senior network engineers, senior communications engineers, and computer operation technicians. I was tasked with watching workplace readiness and safety modules and completing my certification to operate ODU’s state vehicles. During my orientation I could not do much simply because it took a few days for my admin access to certain accounts to be approved. I was given a work login, email, and explained the schedule and the different type of tickets via Service Now that I would be assigned to which was printing services, security cameras, and electronic access controls. I was also able to shadow some employees while they demonstrated how to navigate through the service now dashboard to access tickets that needed attention and how to properly handle them.

The management in the Network Services office was overall great as everyone was open to teaching me different things aside from the day-to-day tasks we are assigned to. What I enjoyed most about working here is the ability to experience a little bit of everything from software tasks to more hands-on field services tasks. Once I learned something new, management allowed me to be part of different projects which is what I also appreciated greatly. They do a great job at making sure I am well versed in the duties we

are assigned to complete daily as well as providing the proper communication and documentation skills needed. Management was very flexible with my school schedule. For instance, during the midterm period or even final exam periods, they understood that school comes first, and it was acceptable if we needed to take off a little earlier than planned to complete projects, assignments, or study accordingly. I appreciate how management was able to let me shadow on certain projects and took the time to explain what was happening despite how busy they are handling other things. They also did a great job at including all student workers to provide feedback or solutions to better normal operating procedures and office dynamic to better efficiency.

As mentioned in a previous reflection paper. I came across a problem with a full-time staff member that resulted in management stepping in to further understand and solve the problem. For perspective, I was handling an electronic access control ticket and did not realize that the end-user's account was not active which will result in access not being granted even if it was provided. A manager came to me with hostility expressing that I granted access to a user that was not active. I understood the problem right away and revoked the access immediately. From realization, I do understand this mistake as if a user was not active it could have been a user trying to impersonate someone or even do physical damage the part of campus they were requesting access to. My supervisor, Naomi was aware of the situation and expressed that everyone makes mistakes, and this one only called for constructive criticism due to me being a student worker and not an hourly or full-time employee. Essentially, I am new and still learning how to properly execute electronic access control tickets. Although it was not a great deal to me at the time as I owned up for my mistake, I appreciate my supervisor for vouching for me.

Prior to this internship, my knowledge of IT and Cybersecurity was limited to basic troubleshooting of routers, laptops, or desktop computers. Through this internship, I have significantly increased my knowledge and experience in this field. One of the most important skills I have developed was advanced troubleshooting, as this internship required me to use this skill to solve break-fix issues daily. I learned to think critically and effectively communicate with end-users to resolve technical hardware problems especially with multi-function printers. I have learned that printers often face issues due to high usage and the root cause are factors like low ink or connectivity errors. Furthermore, printers face critical errors which need to be serviced by issuing a service call to the manufacturer. Additionally, I have gained a great amount of hands-on experience with wiring, a skill I lacked knowledge of. I now understand how to wire power to basic hardware such as door strikes, circuit boards, and the back end of electronic assets. This has improved by understanding of electrical systems and their practical applications, even outside of the workplace. I have also acquired knowledge in enterprise-level software platforms like Microsoft Teams, ServiceNow, and

Cs Gold. I now use Teams not only for communication but also for accessing training materials, job guides, and scheduling tools that enhance workplace efficiency and knowledge. Through ServiceNow, I have learned how to manage IT support tickets, understand end-user requests, and properly document and resolve the steps used to achieve these solutions. The skills learned in this internship has shifted by understanding of cybersecurity and IT operations displaying how essential software systems are with tracking issues, securing environments, and ensuring user satisfactions. All these new skills acquired from this internship has given me confidence in pursuing future roles in IT and cybersecurity.

During my time here interning I played part in many different tasks/projects to achieve efficiency and security around all parts of campus. This includes electronic access requests, printing services, troubleshooting and fixing key-boxes, configuring panic buttons, troubleshooting and fixing the operation of doors, configuring/troubleshooting security cameras, and supply management for equipment all around campus.

Firstly, I have demonstrated skills under the learning objective: Electronic Access Control. ODU ITS utilizes a software called "Service Now", as well as CS Gold to further specify problems and configure solutions for end users. Electronic Access Control for ODU consists of technical aspects and/or physical aspects depending on the situation. I have been tasked with a plethora of electronic access control tickets that allowed me to grant access, remove access, and assist in authorization for end users as an administrator. I was tasked with working different Directors and their specific department. These directors each have their management staff, and the employees under them either student, part-time or full-time staff. For instance, the Jim Jarrett athletic administration building has full-time staff, part-time staff, student workers, and a list of athletes that need access to this building. Each of these criteria of people need specific access to certain locations on campus like full-time staff may need access to the sports facilities with 24-hour access and part-time, student workers, and athletes just need access to buildings with regular access which means their access will not work past 5pm unless special permissions are requested. Also, since ODU has merged with EVMS, we are also required to give access to employees or students who are EVMS students/staff but need access to any of ODU’s buildings/facilities. For example, an EVMS staff member was working at EVMS but because of the merge their office has moved to ODU. With that being said, I was to guide this employee on how to get her ODU card activated via the card center and then grant her access to the specific location to verify that she will be able to successfully enter the room. My specific job is to grant access to the specified rooms they are required access to for work or guiding them through the authorization process. This information must be handled properly using a standard procedure of steps, as if there is any wrong authorization of any kind, physical or even technical damage may be done. Every day I worked with a team of 3-4 people with

oversight from supervisors and senior engineers allowing me to properly learn and follow protocol for all access and authorization for end users. The protocol is as follows: Read and understand what the user is requesting, locate student in the system, find the approver for the location they are requesting, then, with admin rights, grant them access under their ODU account to have privileges for specified rooms, buildings, and even specified times for these locations, then document through service now to the end-user that the access was granted and required verification from the user that it was successful. Once successful, I would then solve the ticket and assign it to myself to make sure all staff knows I was the one who handled the ticket just in case it needs further investigation in the future. See Appendix A for a sample Electronic Access Control Ticket I resolved using ServiceNow.

Furthermore, I am highly involved with printing services. From supply management to service calls. Universities tend to be very busy all year round utilizing their printers for documents for students and management. With that being said, supply management is important and is one of first tasks I handle daily. As an administrator, I utilize a software called Pinnacle along with SharePoint. Pinnacle is used to create tickets for inventory management to keep track of the amount of paper we need to supply to different departments all over campus. I also utilize this software to check the supply status of over 300 printers on our campus. Once I locate the printers that are low, I utilize SharePoint to find the IP address and model # of the printer and input the information into service now and Pinnacle to create a ticket to keep track of the amount of inventory needed for each job. Documenting everything in the process through excel and sending the documentation in a group chat on Microsoft Teams so everyone knows what is being done. After this, I then collect the number of supplies from the inventory department (toner, ink, and paper) and utilize our state vehicle to take the supplies to the printer that needs it. The supplies can range from 1-2 boxes of paper to sometimes over 30. With that being said, it is usually a 2-person job. This task is usually handled in the morning; however, we can get the same type of tickets from other departments and this task can be done at any time of day not just limited to the morning.

Additionally, I was trained and can move a printer to a new location. This happens from time to time if new professors get assigned a new office or if we need to replace an old printer with a newer one if Konica Minolta doesn’t replace it. To do this, we are to use our state vehicle with proper procedures to secure them for transfer. We are to follow a specific procedure provided by management that includes heavy duty rhino straps and our separate state vehicle which is a truck. We are to utilize at least 2 people for proper transfer if the printer is large. We are to carefully load the printer into the truck utilizing its hydraulic truck bed features for loading and secure the printer using the heavy-duty rhino straps to secure the printer to 2 anchor points for smaller printers and 3 anchor points for bigger ones. Although this does not happen often, I am confident in being able to handle this task and

being able to properly train any new student workers in how to safely secure and transport them.

In addition to supply management, I also have the responsibility to put in service call tickets to ODU's printer manufacturer – Konica Minolta. This is a simpler process as service calls are only necessary if there is a critical error. For example, if there is a critical error on a printer the screen will output an error code. This usually comes in form of a ticket from a user through service now. To handle this, I would ask the end user for printer name/ID number, Serial ID, IP address, and location. I would then put this information into submitting a service call to Konica Minolta and updating the user with a service call reference number to keep track of when the printer will be serviced or replaced completely if needed.

Another task my department handles is making sure doors are operating properly. We work in collaboration with facilities management. Facilities management configure/route the doors into our software, CS Gold. Within CS Gold we are able to verify if the door strikes are working properly, logs of who has entered the doors, and the capability to control the functions remotely. Although this is a significant job in my department, I was only included in a couple projects that has to do with this. For example, earlier in the year the Dominion House East wing doors were experiencing problems repeatedly. I was tasked to support a full-time staff member to find the problem and possibly fix it. To do this the door strike needs to be tested via CS gold to see if it properly unlocks and locks. Once we found out that it did not lock and unlock remotely, we then needed to remove the actual strike from the door. After this, I would test the voltage of the door strike with a voltage meter. The voltage meter was outputting no power, so I rewired a new door strike. After trying to remotely unlock and lock the door for the second time, we were still faced with the problem of no response. My coworker then took me to the control room where the circuit boards are located and explained how to look for a blown fuse. We then came to find that were no blown fuses. Furthermore, we compared the wiring that was in the ceiling to the West Wing doors of the same location and noticed that the wiring was completely different. We then communicated this issue to our management and found out that a third-party company was working on the door and never finished their job. Overall, I understood the importance of documentation and communication. For this project, there was nothing further we could do as we needed to wait for the 3rd party company to finish their job. See appendix C for the faulty wiring we discovered done by the third party company.

I also assisted with the management of over 2300 security cameras on campus. We utilize Orchid software for configuration of security cameras and IPVS Axis VM to manage/view them. Although my part on this was only surface level, part of my daily tasks is to take note that all cameras provided adequate visibility and to notify staff if the cameras are down. If certain

cameras were blurry or were not facing the appropriate area, I would then locate the camera and either adjust it or clean it if it was easily accessible. The most recent aspect of security cameras that I learned was to upload it into Orchid using a specific IP address and view them through IPVS Axis. Although I did not play a great role in this, I was able to shadow and understand it for the most part. It provided a great foundation if I were to ever get assigned to configure a security camera on my own if any full-time staff workers do not have the time for it.

Panic buttons at ODU are an essential part of any professor's classroom and/or office. My department works hand in hand with ODU's police department in configuring, removing, and arming/disarming these buttons. I have been tasked to install, remove, and replace panic buttons throughout the duration of my internship. Panic buttons are needed in professors' desks in their office or lecture halls due to there being an emergency that can be a danger to the professor or class in general like a mass shooting. The reasons for installing or replacing these are if a professor wants a new desk or is issued a new desk, if the old button was faulty and needs a replacement, or if a vacant office gets assigned to a new employee. To install these panic buttons, there are only two wires – power and sound. They are connected with two wires and require two screws to mount it at the bottom of the desk. After installation, I am to let my senior network engineer know so he can activate and arm it into the system. I am not able to do this part of the process as only full-time employees have access to this. The removal/replacement process is the same just backwards. First, I am to notify the engineer to disarm the panic button. Following that I am to dismount the whole panic button and repeat the installation process for a new one.

The most recent skill I have learned at this internship is troubleshooting key boxes. Key boxes are where master keys to each building are located. Housekeeping, administrators, security, and the IT department are all people that have use for these key boxes. To access them, I must find the location and use an admin account under CS Gold to remotely unlock it to further identify the issue. I have only done this process about four times. However, the major problem that arises is a user-error which is not putting the keys back in their designated position. Usually, this fixes the problem. However, if the front end of the key boxes operates correctly and there is a network issue, that is when you usually replace the network interface card. To replace the network interface card, I contact the head of the Networking department for the specific key to unlock the back-end portion of the key box to further solve the problem. As of late, the only solution I have done was replace the network interface card which is also issued by the head of the Networking department and returning the keys to their designated position. See appendix B for key box demonstration and how the keys should be placed back to their designated position.

During my internship at ODU ITS Network Services, I played a significant role in maintaining the university's technological infrastructure, which directly supports operations, safety, and access for thousands of end users. With my part in the daily tasks and assistance with projects demonstrates compliance with ODU's service level agreements (SLA). Each of my responsibilities align directly into ODU's mission to maintain a secure, efficient, and responsive environment. My work displayed that all students, faculty, and staff could focus on education and operations without technical interruptions and/or failures.

ODU's curriculum provided foundational service level knowledge for my internship. It taught me what an IP address is and how to obtain computer information via the command line terminal of computers. Other than that, it did not aid in my training at this internship. My Cybersecurity course curriculum offers a more technical and operation approach to technology for example vulnerabilities and mitigation techniques and cybersecurity frame works like NIST and ISO 27001. The student worker position does not go in depth into these cybersecurity topics learned in school as it is a very basic entry level position. The experiences in troubleshooting, customer service, and resolving help desk tickets revealed new skills that I have not yet encountered in school.

Network Services is a very break-fix type of job that calls for quick thinking and response when something breaks in order to efficiently and effectively satisfy the end user. I now understand user-end problems, how they may arise, and how to efficiently communicate the reasons for these problems and offer solutions for them. For example, printers usually experience technical difficulties when there is a high volume of printing jobs resulting in spotty printing and/or loss of connection. In order to fix this, something as simple as restarting the printer almost always solves the problem.

The most motivating part or exciting part of my internship was the ability to learn new skills that can assist with obtaining an entry level job in either Cybersecurity or IT after graduation. Also, almost all of the student workers are eager and proactive to be successful in the field as we are all either Cybersecurity majors or IT majors. With working with a group of like-minded individuals, it helped me stay motivated not only with work but also with obtaining certifications within the field. There are quite a few student workers who have interned at other places and even obtained their entry level CompTIA certifications like Network+ and Security+. With this being said, outside of our job, the ones who don't have these certifications usually study together so we can be on the same track when it comes to obtaining a job in the future. It's nice having others on the same journey as you because it makes the journey after college seem more motivating. I like how workers collaborate with each other on how to format a resume specifically towards certain roles. For example, we have a couple students who are graduating

this semester, and they have helped me and other student workers simplify searching for jobs. DOD and DOJ companies often use a specific software within their workflow like EMASS. A fellow student worker gave me free resources on how to learn this software and apply it on my resume to give me an advantage in the future. Overall, the most exciting aspect of this internship is learning, whether it's about the job or the different pathways you can go into in the future.

On the other hand, there were only a few challenging and/or discouraging aspects of this internship. Like mentioned previously, supply management is a physically demanding task as we can deliver over twenty or thirty boxes of paper a day. These boxes of paper each weigh about 20 pounds. Furthermore, at the beginning of my internship the workload was considerably slow before it started to pick up. This can be discouraging if you are like me and like to be busy for the whole duration of your shift. Typically, a slow day at this internship involves doing tickets via service now as they come. There are some days where there are not many tickets to do at all and considering that there are 3 to 4 student workers in the office at one time, that puts it into perspective. Also, there are many things to learn at his job. However, executing these tasks could take a while because we are only to fix things as the problem arises. There are times where my entire shift is electronic access control tickets. For example, I learned how to wire power and sound very early in my internship and did not do it again until about a month later. Having a gap between utilizing these skills especially when you are new at it will make you sometimes forget as in an IT/Cybersecurity environment the more repetition or exposure you get to something, the better you are at it. As normally being a fully online student, I was already rarely on campus prior to this job. In the beginning of my internship supply management was challenging due to not knowing where some locations are and how the parking situation may be. Nevertheless, after a month of working this internship, I have almost been to every building on campus, and it truly feels rewarding considering that almost all my classes are online, and I was barely on campus prior to this job.

My future advice to future interns that are looking to work with ODU's Network Services department is to be teachable. Within any type of field there will always be people who think they know everything and the people who are teachable. Being teachable at this internship allows you to be well versed in every part of the department and it shows that you are able to follow instructions and execute tasks efficiently. Also, ask questions. Asking questions is significant as it can help you learn more things and be assigned to more tasks/projects. Overall, asking questions shows that you are learning and that you care about the work you do. The last piece of advice is to network. The network service department works alongside many different departments under the Information Technology and Systems umbrella. Networking allows you to move laterally to a different department if desired, gives you options for jobs as if people you work with get great jobs after

interning – they can also help you. Networking with colleagues and people you meet in the workplace is important because in this field of work it is about who you know. Aside from advice, to prepare for interviewing at this internship it would be great to understand what IP addresses are used for other than connecting to Wi-fi. Familiarize yourself with troubleshooting things at home whether it is your parents' computer, resetting the Wi-Fi, or fixing connection issues with devices. As an intern here, troubleshooting is something you will do almost every day, and it is not as complicated as most people make it out to be. Think simple first like checking power supply and then work from there. All this advice and foundational knowledge mentioned will make you a well-rounded candidate for this job.

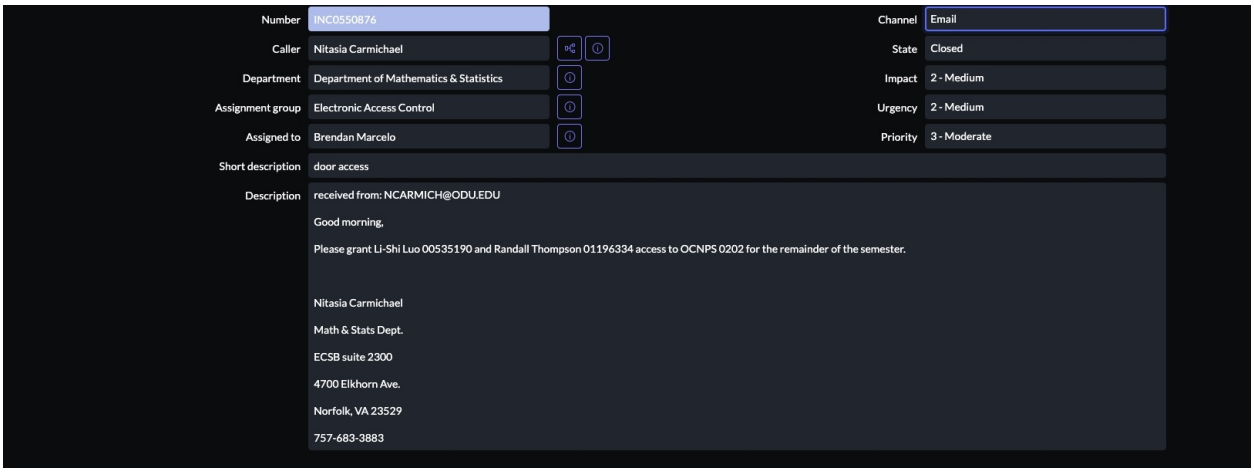
My internship with ODU ITS Network Services Department has been an eye-opening experience. The main takeaway from this opportunity is the value hands-on learning and the significance of being able to adapt, teachable, and open to learning/collaborating. I've developed skills in advanced troubleshooting, assisting end-users at a tier 2 level within compliance of ODU's Service Level Agreements (SLAs), gained experience with enterprise-level tools like ServiceNow, and obtained real-world experience of hardware installations, wiring, management, and IT support ticket operations – all of which I did not have before. The experiences here have not only increased my confidence in this field, but also expanded my understanding of how networking and understanding end-user problems serve as a foundational element in Cybersecurity and IT.

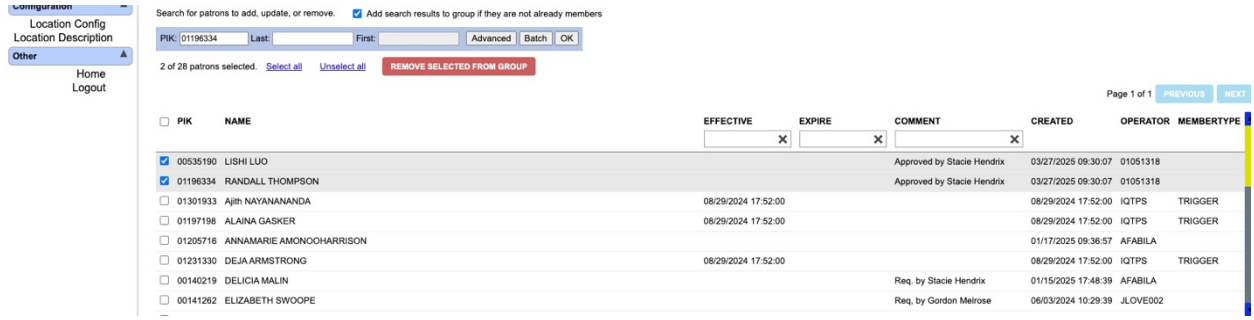
This internship will continue to shape the remainder of my time here at ODU. It has motivated me to seek greater opportunities and engage more with campus resources and peers, especially the ones with a similar career path. It has made me passionate about securing digital environments through problem-solving and continuous learning.

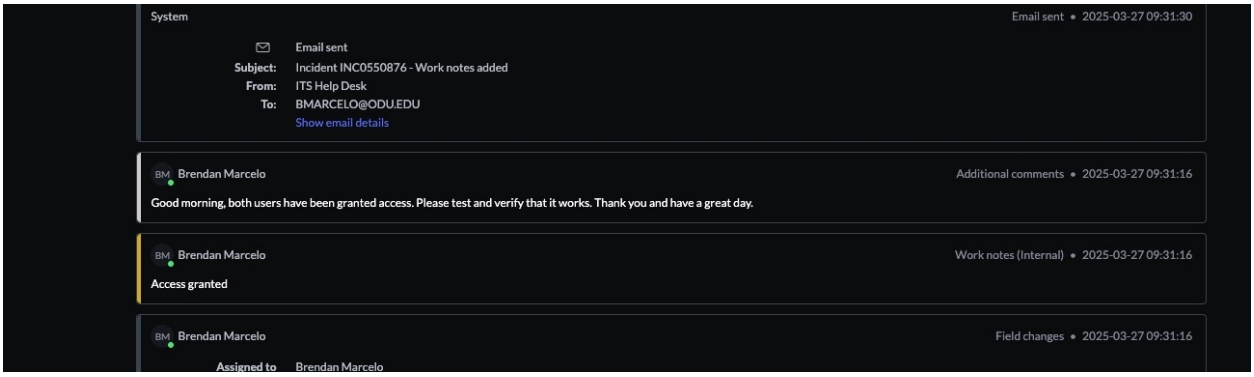
Moving forward, my experience gained has solidified by desire to pursue further roles in cybersecurity and has helped me create a perspective of where I believe my skills can take me. I now understand the value or networking, both technical and professional and how important it is continuously further my education and stay involved in a professional community. This internship has been more than just a job, but rather a foundation for my career, providing me with the confidence, skills, and insight I will continue to incorporate into any role I pursue after graduation.

APPENDICES

Appendix A – Sample shows an Electronic Access Control Ticket via ServiceNow, how I completed the task, and the proper documentation to the end-user that it was completed







Appendix B – Sample displays the guide for checking Keys in and out of a key box and how they should be returned to their designated positions (most common error)

Keybox Key Check In and Check Out How-To Guide:

Please start by creating an ITS Help Desk or ServiceNow ticket requesting access to a key box (757-683-3189, itshelp@odu.edu, or https://oduprod.service-now.com/sp). In your ticket, please give us your first and last name, UIN, MIDAS, and ODU email address.

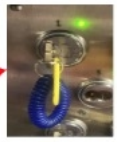
Checking Out Keys:

1. Make sure that the keybox says "PIN" before you type in your credentials:

2. Type in your pin number (UIN)
3. The screen will say next "FP Ready":

4. Place your finger on the scanner and wait for it to say "FP Verified":

5. Then lift the latch then pull it back to open the keybox door,
6. When you scan your finger in, the lights on the top of the key should flash green showing that you can turn the key left and check it out:



7. Turn the key to the left to make the key horizontal to pull and check out the key.

Returning Keys:

1. Make sure that the key is turned VERTICALLY and not HORIZONTALLY for it to be registered as checked in,
2. This key has been turned vertically and has been returned successfully to the key box:

3. This key is still been logged as checked out by a user (the key must be turned horizontal be be checked in):

For help: 757-683-3189, or itshelp@odu.edu

Appendix C – the sample shows the faulty wire job I discovered above the door in the ceiling located above the Dominion House east wing doors. This job was done by a third-party company and not my department.