Old Dominion University

Hartford Steam Boiler IoT Internship Final Paper

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Introduction

I started my search for an internship last year, hoping to procure one for winter break, but I had no success. While I went through interview after interview, I consistently got the same response: "You are an excellent candidate, but we are looking for someone with previous experience in the field." It was the classic internship struggle of needing an internship to get experience but needing the experience to get an internship. Winter break came and went without success, so I doubled my efforts to find one for the summer. At one point, I interviewed with Munich RE of America. They had an excellent cyber internship program, and I was told I did well in the interviews, but they lost funding for the position I had interviewed for. However, I found the company very interesting and thought the opportunity to work at an international company would provide some unique experience. Eventually, an opportunity came to interview with a subsidiary of Munich, Hartford Steam Boiler. They didn't have any more cybersecurity internships available, but they had a Data IoT internship and said they could work on some unique cybersecurity experiences to improve my learning. This offer sounded too good to pass up, so by the end of the summer, when I had three offers, I decided to go with HSB.

Of my three learning objectives, the most important was getting hands-on experience in the field. I hadn't worked a real office job before this, and I knew it would be essential to learn the differences, strengths, and weaknesses of office jobs before I fully joined the field. I also knew that there exists a specific office etiquette that would be difficult to pick up and learn without first working in an office. Beyond experience in an office, I was also eager to learn how to use various IoT tools throughout the company. While I know these types of tools differ from company to company, I still believe that understanding these tools will give me a strong foundation for how other tools will work in the future and give me a feel for general data management in a real-world situation. My third objective was to meet and gain insights from the Senior Leadership Team and other leaders and professionals in the organization to develop lasting professional relationships. Beyond just building these connections, I wanted to see if I could identify any common characteristics that stood out among all these successful individuals.

The Beginning of My Internship

I am interning for Hartford Steam Boiler, a specialized global insurance company focusing on equipment breakdown insurance. Founded in 1866, HSB was established in response to the frequent boiler explosions during the Industrial Revolution. The goal of HSB was to combine boiler inspections with insurance to cover these losses and prevent them from happening in the first place. This idea has carried forward into the modern day. Now a subsidiary of Munich Re, one of the world's leading risk managers and reinsurance providers, HSB can reach even more customers.

HSB stays at the cutting edge of the industry, offering specialty insurance ranging from data and cyber risks to identity theft insurance. The company prides itself on providing unique insurance solutions for a technologically advancing world and IoT solutions to help catch

potential severe losses. Another primary product HSB provides is its IoT sensor programs, a system of multiple sensor types covering many use cases, constantly monitoring and sending live updates to alert customers of potential water leaks, freezing pipes, faulty refrigeration units, mold conditions, and more! We work with other large insurance companies to bundle this sensor coverage into policies for at-risk locations such as churches, schools, and restaurants. We provide a valuable service to the insured and the insurer that saves all involved from high costs and hassle.

My initial orientation was filled with excitement and the typical bumps in the road that come with the corporate onboarding process. It took me and my fellow interns at the Valley Forge office a few days to get all of the permissions required to complete the tasks planned for us. Still, during this downtime, we were given numerous tasks and assignments to help familiarize us with the department we would be working in and aspects of the company overall. My first week was filled with orientation presentations from higher-ups at the Hartford main office, Munich Re, shadowing sessions with members of the IoT team, and an in-person meeting with many of the department heads at the Valley Forge office. While it was a lot to take in all at once, it provided a great idea of the fast-paced day-to-day operations at the company and allowed me to make some excellent connections.

HSB Management Environment

Internally, HSB is divided into departments spread across numerous offices in the country. While everyone in a department reports to a supervisor, I personally have not been in a situation where you have to go through your supervisor for approval to talk to or work with another department, as I know some workplaces require. I've also noticed a real effort from all the supervisors to make sure they get to know the employees at all levels, not just those they directly supervise. We have biweekly huddles in my department. Higher-up supervisors or supervisors from different departments will sometimes jump in to talk to everyone and see how everything is going while also making it known that they are available if anyone ever needs anything. This creates an environment for personal growth and allows people to try new things in their careers. A big push of Munich Re and all of its subsidiaries, like HSB, is allowing people to explore other career paths within the company. I've spoken with people who have moved from customer service to IoT technical support, claims adjustment to professional equipment installation, and even an actuary becoming the head of the HR department at Munich. I genuinely feel that a lot of this comes from the more open management of HSB and the support of supervisors who actively encourage work in other departments when possible. I reported directly to Alexis Hall, the supervisor for the IoT Sensor Support department. Although she only recently took on the head of Sensor Support role just before my internship started, she has been doing a fantastic job and is one of the best supervisors I have ever worked for. She always makes time for everyone on the team, checking in daily, actively speaking to the team in our Microsoft Teams chat throughout the day, and quickly responding whenever anyone has a question for her, all while having frequent meetings. It is also clear that she cares about her team, motivating us with praise and sometimes even doughnuts when the team does exceptionally well during the

week, as well as helping set up meetings so that people such as myself have the opportunity to learn from others whether that be in my department or getting to talk to team members in other departments to get a feel how different roles in the company work. She also frequently checks in and provides as much help as possible for the intern projects we are assigned. HSB has an excellent management environment supported by effective supervisors and open communication.

My Duties at HSB

I was given a wide range of duties, projects, and assignments to work on during my internship so that I could get a full view of all the different aspects of my department. Upon starting my internship, my first assignment was shadowing an employee who is set to retire soon and documenting in depth all the tasks she has to complete in her role. This was important to the business as the documentation was given to the training team so they would have everything they needed to train whoever got her position after retirement.

Very soon after this, we also began to move into many projects and duties related directly to the Sensor Support call center. The team uses a combination of a customer relationship management system, or CRM, and enterprise resource planning software, or ERP, to catalog all of their daily interactions over the phone line and events resulting from these calls. These range from simply recording what was discussed on the phone and entries for when new equipment has to be ordered to scheduling a team of pro installers to set up the equipment for the client. These cases also need to be closed once they are completed so there isn't an abundance of open cases that appear as if they are still active, clogging up the system and taking up time when they're already complete, but this doesn't happen. Our task was to review a long list of open service orders that had not changed in activity in the past half a year, note that they are being suppressed in the CRM, and then close them in the ERP. This helped to clear out a large part of the system's backlog, making it easier for the team to navigate.

One of the first major projects that we were able to work on from the ground up involved our lists of accounts with the most inactive or faulty equipment. The team has been looking to tackle this for a while, but their current method is inefficient. Every couple of weeks, the team gets a report emailed to them based on the internal database of all the accounts and their equipment. The 50 accounts with the most equipment offline are added to this report, along with all of the information about these accounts. The problem is that this list can only use data from a database; it had no way of noting who was working on that account if they had already been assisted, but the list hadn't been updated yet, how long they had been offline, and if they were responding to any of our attempts to contact them, and if they had been on the list before but had shown up again suggesting that we would need a new solution to help them. This was the idea behind our assignment. We were tasked with seeing if there were viable solutions that we could use to turn the weekly reports into a living document that everyone could work on without all of the information needing to be hand-entered. As it quickly became apparent in our research that no free application could handle everything we hoped to accomplish, I began to lead our new solution. With an extensive background in computer programming, I felt that I would be able to construct something that could accomplish this for us. Still, the issue was that we didn't have system permissions to freely write code for the systems at work for obvious security reasons. My next best option was Excel in Power query since we already worked with tables. My partner in this project didn't know anything about Excel queries or programs, so I worked on this on my own while he continued to research other possible solutions. I worked on this singular task constantly for nearly two weeks, and every time I would come up with a solution for one problem, an old solution either stopped working or became harder to solve a different issue. I was trying to automate aspects of the project with Power BI, but that also required a long process of acquiring different permissions. After significant research, writing my scripts for power query, and a lot of trial and error, it became clear that the program could not complete everything we were looking for. Still, I was proud of the work I had completed. We made a table that could combine the previous report with the new one to create a lot of the new data we were missing and record who was assigned to work on which account and how much work was already completed for that account.

After completing this project, we got to what became one of the primary duties of the internship: helping support the IoT Sensor Support Center by joining them in taking incoming calls. Around the time we started the internship, the Sensor Support team was going through significant changes all in a short time. They were moved to a new location in the office, under new management, and one of the team members was leaving for a new position at the company. With an already small team, this shrinking of the team was impactful. Additionally, after my fellow intern and I completed our training, one team member left for paternity leave, and another went on a month-long vacation. This led to a build-up of calls, longer wait times, specific times of the day when there wasn't coverage of lines and a lot of missed calls. To help with this, we were quickly trained to help take calls on the sensor support line and solve simple issues or take down important information so that someone on the team could help them as soon as they were available. However, while we were helping in the short term, we were also given more training to assist better and solve more calls ourselves. Instead of being trained by the training team, we were taught by different members of the Sensor Support team themselves, which led to a unique and very insightful experience that provided a more in-depth understanding of the role. This would become the central aspect of our internship while working on other projects during our downtime between calls. I have been told that our assistance on the lines has been incredibly helpful, drastically reducing the back-up of calls, number of missed calls, and wait time of callers. We have also continued to improve as we take more calls, to the point where I don't have to record information to have a different member of the team handle my cases and only ever have to ask for assistance on the unique cases that we weren't trained for. Of everything I did in my internship, I am most proud of all the people I could help when working as part of the Sensor Support team.

Around the ninth week of my internship, the team faced a serious problem that we would soon be addressing, as we expected to get a lot of calls about it. There had been an issue during the production of a recent batch of our sensors, and many sensors shipped out wouldn't be able to connect to users' accounts as they were not correctly labeled. This issue would not cause serious long-term problems for anyone, and we ensured everyone affected was quickly informed. They would have to wait another week or two to receive their shipment of replacement sensors that would work properly. What made it serious for us was working as diligently as possible to ensure we entered the replacement orders for every affected customer as quickly as possible. My fellow intern and I were assigned to take the list of all the shipments that were impacted, record all of the shipping information, ensure that the customer was sent the email letting them know what had happened and that we would be sending them replacements, and then create the replacement order case, fill it out, and submit it to the orders team for approval. This task was doubly stressful as the rest of the team was also very busy that day, so I found myself answering call after call on the support lines with little to no downtime. I spoke with my manager and got some dedicated time to work on the replacement cases. We managed to get all of the cases done and submitted before the end of the day, helping to quickly remedy the original error and get all the customers their new sensors.

While it was only a one-day occurrence, an exciting task we were assigned was shadowing and assisting one of our pro-installers out in the field during one of his installs. I got up early and drove to Media, PA. Once there, I met with the installer, and we spent the first part of the morning observing. I noted how he explained the installation process to the customer, provided them with suggestions of typical places for sensor placement, and helped navigate setting up her user account to access the sensors. These are all things I have done over the phone, but they worked very differently in person. The installer we worked with, Keyon Smith, was very kind and informative, frequently showing us essential things we would need to know about setting up the equipment, entering the details, and tricks that he had picked up on from working on installs for so long. After a while, he let us start turning on and placing the sensors. Eventually, we completed the activation process, entering all the sensors' information, taking photos for easy location, and checking signals. We also talked to Keyon about the job and heard about how he flies nationwide to do sensor installations anywhere and everywhere. It sounded like an excellent career for traveling and something I wished I had gotten to do more of during the internship. I also helped during the installation process by answering any questions the customer had so that she could understand how her new sensors worked and how to operate the app so she would get proper alerts from the sensors.

My internship extends into the second week of August. Currently, we are working on our capstone project, but I will not be able to share the results of its completion as I won't have them in time for when this paper is due. I plan to return to the paper and update it for my E-Portfolio. Also of note is that I will not be there to see the impact of my capstone project, but I hope to keep in touch to see how it turns out. The IoT team has been moved around the floor recently, and while our current location is fine, we are helping to plan a more permanent location that will be much more beneficial for the team. My capstone project is to create graphics to use on the TVs in this new permanent area as well as ideas for the displays that will hold our sensor equipment around this new area so that the team will be able to use the equipment for learning

purposes, and more importantly, convey information about the sensors both informatively and interestingly in case anyone from other departments or outside companies to learn more about the sensors. I'm working on creating stylized infographics for each of the current models for our sensors. This involves showing how they work, how to replace the batteries, critical parts of the sensors, how to reset them, and what the different colors on the indicator light mean. I'm striving to create something appealing and understandable so that new team members can learn more quickly about the sensors than I had when I was first starting. I also plan to create a new design for the large posterboard to hold all the latest equipment and explain how they all work together. These graphics will make it easy for anyone to understand how our equipment works, and hopefully, they will interest more people in signing up for the program when they see it. I plan to attach these graphics to my E-Portfolio upon my supervisors' approval to share them publicly.

Aspects of Cybersecurity at my Internship

My internship provided me with many fantastic opportunities to use what I knew in Cybersecurity and greatly expanded my knowledge and understanding of cyber in the field. While the internship was not cybersecurity-focused, there were still plenty of ways to use my cyber knowledge and, more importantly, improve upon it. Starting early in my internship, we had to complete multiple cyber hygiene and awareness courses as we would be working with a lot of confidential information. These courses were long, but they included an option to take the quiz portions at the end immediately if you believe you already knew the content. I passed all of these without needing to go through the courses. One of the most valuable resources for improving my cybersecurity knowledge that I discovered early on was the company's internal e-learning platform. Once I started to play around with this, I quickly found an extensive number of courses on different programming languages, specific types of roles within cybersecurity, and more particular courses about tools within cyber. When I discovered these courses on the e-learning platform, I was actively studying for my upcoming Blue Team Level 1 certification test. I realized that the platform could be a valuable studying tool, so I used keyword searches to find the specific tools I would use in the exam and further my learning about them beyond the BTL1 course. The e-learning platform helped me improve my knowledge of Wireshark, Splunk, and Autopsy. With help from these tools, I believe that my company's e-learning platform was incredibly helpful in passing my certification exam.

Beyond learning new tools and skills for cybersecurity, I also used some of my existing skills at my internship. We weren't informed beforehand, but the company likes to send out fake phishing emails internally to see if their employees are well-trained in good cyber hygiene. This is a common cyber practice, so I was expecting it at some point, but there were a couple of emails, some very obvious and some pretty well disguised. Still, I used my previous knowledge of this practice and the phishing analysis I have learned to recognize and report these emails as phishing, upon which I was presented with a screen congratulating me on identifying the phishing email. Since I don't get to work with the cyber department but still wanted to see how this system worked, I reported an email that I knew was not phishing as a phishing email just to see what would happen as a result. I learned about the process and emails they send out, as they

test the email to see whether it is a phishing scam. It was a very cool process and something I wished I had gotten to see more of in person, along with the other daily actions of the phishing team.

I was very grateful to get the chance to talk to members of the HSB cybersecurity team. It was dedicated time in which I could learn about team members' daily operations, what kind of tools the company employed, important things to consider as I moved towards a similar career and I also got a lot of advice to take into consideration when picking a specific role in cybersecurity. We even discussed some potential future opportunities within the cyber department at HSB that I was encouraged to apply for. Beyond aspects of cybersecurity specific to HSB, I also asked many questions to help me learn more about cyber in my everyday life. I was recommended some excellent newsletters, podcasts, and, in particular, a great cybersecurity news website called Dark Reading, all of which I am using all the time to stay up to date on news in the cyber industry. These have all been incredibly helpful in improving my cyber knowledge. Overall, the experience gave me a much deeper understanding of the field and presented me with fantastic future opportunities.

With HSB being a leader in cyber insurance, there were also a lot of opportunities to learn more about how being a cyber insurance company works and what is required for them to do so effectively. There was a speaker series of events where the interns would all tune in to learn about different topics, and the most interesting to me was the presentation on AI and its future in the insurance industry. This one specifically stood out to me as, beyond analytics, the insurance industry looks to the history of cybersecurity insurance to better inform them on the future of AI insurance. With a better understanding of cyber insurance's past, I get an idea of why it is so important and all of its benefits. Unsurprisingly, cyber insurance is still relatively new in the field. However, what surprised me was that small things covered by cyber insurance initially used to be bundled into other common, more significant types of policies. However, naturally, as cyber threats evolved and people needed more and more coverage, cyber could not be contained in these unrelated policies and would soon grow into its own rapidly expanding set of policies, much like what has been happening recently with AI. Beyond what I have learned from all of these presentations, I have a meeting coming up this week with members of the cyber underwriting team. I feel this field of cybersecurity was never really touched on in school. Because of this, I know very little about it, but this involves using an in-depth knowledge of cybersecurity systems and cyber threats to conduct risk analysis on a company's security measures and then make decisions about its cyber insurance policy. I had never really considered these roles to fall under the umbrella of cybersecurity, but I am very intrigued and excited to learn more as the idea sounds interesting to me.

How the ODU Curriculum Prepared Me

While I have already touched on a few ways that the ODU curriculum helped to prepare me for this job, there were a vast number of tasks I had in which one or more of my courses provided direct help. With the beginning of my internship involving a lot of professional not taking and later presentation of what I had taken, I found that both my technical writing classes and my public speaking classes had prepared me to provide both notes and presentations that were of high quality and proper formality for the business world. As I also read many of the internal papers revolving around cybersecurity, my information literacy for cybersecurity class directly impacted what I took from these papers and articles. These and most other classes I took at ODU also improved my ability to work on group projects, which is a very beneficial skill in the corporate world.

As mentioned earlier, I wrote a lot of my own code when working on creating the living Excel document for our top 50 accounts, and this expertise was directly a result of all of the classes I have taken where I continue to improve upon my coding such as Basic Cyber Programming and Networking, Windows System Management, and Security, and Cyber Techniques and Operations. While I may not have been coding the same types of things, these classes boosted my programming knowledge to the point where I can comfortably write code for most situations and easily understand the new coding languages I encounter.

I also want to make a special note about Mr. Kirkpatrick's Cybersecurity, Technology, and Society class. Mr. Kirkpatrick liked to start many of his classes with current events articles about promising innovations in cybersecurity or significant cyber attacks that had recently occurred. Cases like this are precisely what HSB looks to cover with their cybersecurity policies, so having already been exposed to a lot of them, I instantly had a better understanding of what we covered that let me not get caught up learning about the cases we covered and focus more specifically on the insurance itself. The ODU curriculum gave me the foundational skills I either required or built upon during my internship.

The only skills I had not learned at ODU were related to specifics that vary from job to job and would be impractical to learn during a college course. Concepts like what are CRMs and ERPs and how they work. As I previously mentioned, one thing that surprised me most was learning about roles like cyber underwriters. I feel that in many of my introductory cybersecurity classes, we go over all the different cybersecurity jobs. For one reason or another, I don't remember being exposed to it before.

The Fulfillment of my Learning Objects

I don't believe I could have asked for a better internship to get hands-on experience in the corporate world. With all the different projects I got to work on, I got a feeling for many roles. I also had numerous opportunities to talk to all the people around me and hear first-hand accounts of what they felt about their jobs, what they did day to day, and how their careers had changed over time. I also felt that working in the sensor support center provided me with the exact experience of acclimating into a technology-based role and working in an IT center, something that, depending on the size of the company, would be handled by the cyber team. It also showed me what it would be like to talk to members of other departments about complicated topics.

My second learning objective of learning about numerous IoT/cyber tools was covered more extensively than I could have imagined. From the very beginning of my internship, when I

learned all about our case logging systems, which were very similar to cyber dashboards that I have been taught on cyber certification courses, and our phone systems, something I had never given much thought to, it was clear that I would learn a great many tools. The company's e-learning platform taught me about many cyber-specific tools I had never learned before. It was an invaluable resource and one of the things I will miss most after my internship ends.

I wasn't sure how many people I would connect with and learn from during my internship, but looking back, I am blown away by just how many people I met. From learning from members of numerous teams, befriending plenty of people around the office, meeting and learning from many department heads, and meeting with coworkers whose jobs aligned with my major, I learned so much from all the people I worked with. Whether it be excellent opportunities, good friendships, or even a familiar face, I think the connections I made during my internship are the most valuable thing I'm taking away from it.

The Most Motivating and Exciting Aspects of my Internship

I am always very motivated when working on a team, but I felt incredibly motivated to do so during my internship. We use an analytics system to see who is doing what while we work the sensor support call center, such as who is handling a call, who is available, who is in a meeting, and who is working on a project. This always motivated me to handle my calls as efficiently as possible so the analytics would never display that no one was available to take calls so as not to disrupt my coworkers working on other works. Of course, there were a lot of exciting aspects of my internship, such as team bonding activities like Musical Bingo, which I won, and a free lunch once a week. All of this combined made me work my hardest so that I had time to enjoy the additional motivators that were provided.

The Most Discouraging Aspect of my Internship

The most discouraging aspect of my internship was realizing that not every problem has a realistic solution. I learned this early on when working on the living Excel document project. I'm used to this sort of thinking where there must be a definite answer for everything, between most classes I've taken and all of my previous teaching jobs. When working on my Excel table project, I was given a complete list of everything that was hoped to be accomplished, and I was even informed ahead of time that they had tried to figure it out before and couldn't, so it would be ok if we couldn't solve it. At the time, I believed they hadn't been able to figure it out because they didn't have much time to devote to it; however, as solving each problem became more and more complex, I realized this was not the case. While discouraging for a while, I was later told by my supervisors that it was good work and still very beneficial while also providing a great foundation that they could attempt to work on later, and that gave me the motivation to do my best on every project even if it can't be fully completed.

The Most Challenging Aspect of my Internship

My internship's most challenging aspect was when we began working at the Sensor Support Center. Before this job I was not a fan of talking to people on the phone, to the point where I actively avoided it. Even FaceTime with friends, I was always opposed to using the phone; I preferred to email or text. So, when our supervisor told us we would join the call center team within the week, I was nervous. Not only would I have to talk to strangers on the phone, but I would also have to quickly help solve their problems and document everything happening simultaneously. Still, I believe that one of the best ways to learn is when you are thrown into a situation, so I was optimistic that it would go well. The first few days working the phones were stressful, and I was constantly worried that I would be making serious mistakes, but it slowly became less challenging and stressful, to the point where now it's not as tricky, and I even find myself using the phone in my personal life more than ever before.

Recommendations for Future IoT Interns

For any future HSB interns, I recommend taking full advantage of every opportunity. I learned so much about the company and the cyber insurance field from some optional meetings we were not required to attend. The e-learning platform was not heavily focused on during our orientation, but it became one of my favorite benefits of the job. Even events such as musical bingo, which may sound more fun than beneficial, helped me make fantastic connections.

I'd also encourage any interns to advocate for themselves. When applying for my internship, I was told that I would have a lot of opportunities to meet with the cyber team and learn from them, but a few weeks into my internship, I realized that this wasn't really happening. As soon as I reached out and got the ball rolling on setting these up, I had a meeting within a week. I feel that I got many of my most beneficial meetings and projects by advocating for myself and making it known when I wanted to learn more. The worst anyone can ever say is no, and personally, I never met anyone who wasn't willing to take some time to talk to me.

Conclusion

My internship at Hartford Steam Boiler was one of the most impactful events in my career. I made some fantastic connections, learned what it was like to work for a global corporate company, and gained so much insight into what it's like to have a cybersecurity career in insurance. I feel that my time at HSB has dramatically improved my communication skills, multi-tasking, and the quality of work I will continue to produce for school. It also taught me both corporate etiquette and IoT skills, all of which I think will improve how I do in my cybersecurity courses at school. Of course, I still need to experience other companies, but this internship has convinced me that I want to work at a company like HSB. This global company cares about its employees, creating a comfortable work environment that offers fantastic benefits and opportunities for everyone to continue to grow. I'm beyond grateful that I was able to work for HSB. This internship will help me greatly in my future career, and I'm glad I could make meaningful contributions to the company and work with a fantastic group of people. I never considered what industry I wanted to do cybersecurity in, but I know now that I would be lucky to continue to work in insurance.

Work Cited

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