Cognizant

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INTRODUCTION

I decided to do an externship with Cognizant because it was definitely my top choice when applying for internships. Throughout the course of my externship, I hoped to learn more about Generative AI, learn more things about Python in AI that I may not have already had knowledge in, and incorporating into actual projects and utilizing it. Overall, this paper will discuss things such as who I worked for, how they managed the externship, my work duties, the skills I used and obtained, how Old Dominion University prepared me, my goals, exciting aspects of the externship, discouraging aspects of the externship, challenges I faced, recommendations for future externs, and a conclusion. Python is a crucial coding language required in the field of cybersecurity and it is something utilized in the basics of coding. Generative AI is a bit newer to me, but has been slowly emerging into our world with things such as Gemini on Google or even ChatGPT. In this first part of my paper, I will first discuss the company that I worked with.

COGNIZANT

I began my externship at Cognizant, a leading multinational corporation that provides IT services, including digital technology, consulting, and operation services. Cognizant was founded in 1994 as a technology development arm of The Dun and Bradstreet Corporation, but then later spun off as an independent company two years later, in 1996. It is based out of Teaneck, New Jersey and it has continued to grow rapidly as it has become one of the world's top IT service firms. Obtained through their website, I have acquired all of the countries that Cognizant has offices in. This includes: Argentina, Brazil, Canada, Costa Rica, El Salvador, Mexico, the United States, Belgium, Denmark, Finland, France, Germany, Hungary, Italy, Latvia, Lithuania, Norway, Poland, Portugal, Romania, Spain, Sweden, Switzerland, The Netherlands, United Kingdom, Ireland, the Middle East, Copenhagen, South Africa, Riyadh, and Saudi Arabia.

While Cognizant's major services involve digital business and digital operations, the company provides a wide variety of industries that include healthcare, financial services, retail, manufacturing, consulting, and technology.

While, Cognizant is based out of New Jersey, a good majority of the employees are able to work from home. With that being said, my first introduction to orientation was a few weeks prior to the start of the externship. The orientation call was through Zoom and included advisors, mentors, and the other individuals from my cohort. We got a brief overview of the company's history, their mission and values, and their goals for us. We also learned very briefly about some of Cognizant's major clients and the diverse industries that they serve.

After all of this, we were split into smaller groups to meet with our session leads and to meet some individuals in our cohort to learn more about each other.

Overall, I was quite impressed by Cognizant's professionalism and their very welcoming environment (even though the externship was fully online). Their commitment to innovation was evident throughout the orientation and through their leadership team. My initial impression of the company left me super excited and motivated to be able to be a part of something bigger than myself and to help contribute to their projects to help me grow both personally and professionally.

MANAGEMENT ENVIRONMENT

Throughout the entirety of my externship at Cognizant, the supervision environment was structured yet very flexible. This allowed me to work independently, but also allowed for guidance if I needed it. Each of the externs were assigned mentors that were able to help give us guidance, support, and even feedback. Mentors were made available so that we could have help when navigating our tasks and they helped set clear expectations. Furthermore, we also had project managers that helped oversee us when working on our projects. This helped to review the process of our projects and to ensure that we were meeting our deadlines when it came to these projects.

In my personal opinion, I liked being able to work more independently as it gave me an idea of what it would be like working in the real world. It allowed me to strengthen my communication skills if I needed help. However, overall Cognizant allowed its externs to take ownership of their work and to enable continuous learning and development. Overall, like I said before, the company allowed me to grow personally and professionally while still valuing my contributions that I was making to Cognizant.

WORK DUTIES AND RESPONSIBILITIES

Throughout the initial phase of my externship at Cognizant, I focused on utilizing my knowledge in Python with an emphasis on AI applications. This included working with various topics such as data types and operators, data structures, control flow, functions, scripting, and object-oriented programming. Being proficient in Python is fundamental for working with AI solutions. My work ensured the efficacy, in regards to writing and understanding the code needed for implementation. I worked with various scripts demonstrating control flow and object-oriented programming principles. Additionally, I utilized code examples that helped in managing and manipulating data by using Python's built-in data structures.

I worked on a project that involved utilizing a pre-trained image classifier to identify different dog breeds. This project required applying my Python skills to work with image classification models. This helped enhance my understanding of practical AI applications. This project helped to utilize theoretical knowledge to a real-world problem. By working with a pre-trained model, this allowed me to gain experience in fine-tuning, which is essential to creating effective solutions for Cognizant and its clients. I used Python code to implement and test the image classifier. I provided detailed explanations of the methods that were used, as well as the results obtained.

In the weeks following, I was focusing more upon the fundamentals of Generative AI. This included using tools like PyTorch and Hugging Face. I learned about deep learning concepts, foundation models, prompt tuning, full-fine tuning, and parameter-efficient fine-tuning (PEFT). Because Generative AI is such a rapidly evolving field it was essential for me

to learn more about it. My work in this field helped me to learn more about the latest advancements and tools. I coded and documented from experiments with these tools, which helped me to showcase what I was learning and how I was applying my Generative AI techniques. I provided insights on algorithms used for text and image generation.

My second project involved applying lightweight fine-tuning to a foundation model. This included loading and customizing a Hugging Face model and using parameter-efficient fine-tuning. This allowed me to adapt my pre-trained model to a specific task.

All of the duties and projects that I discussed has helped me to play a significant role in my development as a Generative AI extern at Cognizant. I started with mastering Python in AI to exploring advanced Generative AI techniques and applying them to real-world projects.

SKILLS AND KNOWLEDGE

Before starting my externship at Cognizant, I had a foundational understanding of cybersecurity that was gained both throughout my four-year education at Old Dominion University, as well as, my previous coursework in high school. My prior knowledge consisted of the basic fundamental principles such as the CIA triad (confidentiality, integrity, and availability), knowledge of firewalls, VPNs, and basic network protocols, familiarity with cyber threats (including phishing, malware, DDoS attacks, and SQL injection), and familiarity with Python, JavaScript, C, C++.

On the job, I had the opportunity to expand my cybersecurity knowledge and was able to apply it to practical scenarios. I certainly gained a lot more knowledge in Generative AI which deemed beneficial as I was using tools such as PyTorch and Hugging Face. My on-the-job experience significantly deepened my previous understanding of cybersecurity, particularly in the areas of AI and data science. I got to see and learn a lot more about how AI and cybersecurity intersect, especially in protecting AI models. Additionally, the intersection occurs through secure data handling and processing. Furthermore, I learned the importance of secure coding from the developmental process is vital in preventing the chance of vulnerabilities, which was something I already knew about before, but certainly got to experience. The hands-on projects prepared me for a future career in the field of cybersecurity.

OLD DOMINION'S ROLE

The Old Dominion University curriculum helped to provide me a solid foundation for my externship, especially in my technical skills and my theoretical knowledge. More specifically, the courses I have taken in cybersecurity gave me a strong understanding and development in Python. My knowledge in Python was directly applied when I used Python extensively for my two projects, pre-trained image classifier and fine-tuning foundation models.

Additionally, my courses at Old Dominion University in the fundamentals and basic cybersecurity practices benefited me when completing this externship. This was knowledge was applied when I needed to ensure secure coding practices and the protection of data integrity in AI applications at Cognizant.

Old Dominion University has helped me to grow to be an amazing student and individual and one of the biggest things that helped prepare me for my externship at Cognizant was all of the assignments and projects that I have completed over the past four years, they have helped to build on my analytical and problem-solving skills.

Many of the experiences I had during my externship reinforced topics I have learned at Old Dominion: writing secure code, this was used when implementing Python in my projects; how to handle and store data securely, handling sensitive data in my AI projects reinforced the need for secure data practices and the adherence to any regulations.

As previously mentioned all throughout this paper, I learned a lot more about Generative AI Tools, I used PyTorch and Hugging Face. This helped to expand my skill set, but also helped better my understanding of the amazing work that AI can perform. I also

learned more in depth about parameter-efficient fine-tuning, otherwise known as PEFT, the

project helped me to learn about advanced techniques in model customization.

Ultimately, the Old Dominion curriculum prepared me very well for my externship at

Cognizant by providing me a strong foundation in all of the following topics mentioned.

While I already knew a good majority of what I was doing and working with, the externship

allowed me to learn knew things and to enhance my skill set, which is something I am very

grateful for.

THE GOAL

In my summer externship at Cognizant, I had three primary goals: learning more about Generative AI, expanding my knowledge of Python in AI, and incorporating this knowledge into real projects. I will now discuss how the externship fulfilled each and every single one of these goals.

The externship provided extensive training on the fundamentals of Generative AI. This training covered not only the foundations, but also popular algorithms, and architectures for text and image generation. Since I was able to work on a project in fine-tuning to foundation models I go the hands-on experience I needed to fulfill that goal.

My second goal was learning about Python in the context of AI. I received more training on Python topics that are essential for AI development including but not limited to: data types and operators, control flow, functions, scripting, and object-oriented programming. I applied this in my pre-trained image classifier to identify dog breeds project. This helped me to integrate Python into AI models. This goal was also met because it enhanced my Python programming skills through my structured trainings and my work in my AI project.

The last and final goal that I wished to achieve and accomplish was incorporating all my new knowledge and using it in actual projects. My hope for all there goals to be achieved came true when I was able to integrate my knowledge into my projects. While the projects at times could be challenging I used my troubleshooting skills and problem-solving skills which are great things to have especially in this field.

All in all, the experience not only reinforced my existing skills, but also helped introduce me to any new concepts and techniques that I did not already know about, which better prepares me for my future.

EXCITING ASPECTS OF EXTERNSHIP

The most exciting and motivating factors of the externship was that I was working with one of the best state-of-the-art companies that there is to work with. Cognizant is recognized as a state-of-the-art company in the IT and consulting industry, because they are known for their innovative solutions and their advanced technological abilities. To be a part of such as big company like Cognizant's was one of the most exciting aspects of the externship. It provided a unique learning opportunity for not only me, but many others because we were able to learn from industry leaders and work on projects that are using the latest advancements in AI and other technologies. The environment overall, instilled a sense of pride and excitement for me as I knew that my work contributed to the groundbreaking solutions in the industry.

Another exciting aspect of the externship was that everyday presented a new learning opportunity for me. Starting with mastering Python for AI to understanding the intricacies of Generative AI. Because I was learning something new everyday it kept me interested and eager to keep coming back each day for more.

Having such a great back bone from the company also really helped. Being able to have constant access to mentors and support groups was invaluable. The ability to have guidance from experienced professionals helped me to overcome any challenges that I were to face. It provided me with a safety net that helped me to continue the work that I was doing and I never felt like I was alone in what I was doing which also goes back to how amazing of a company Cognizant truly is.

While there were many very exciting and motivating factors to the externship, the next thing that I will be discussing are the more discouraging aspects of the externship. I cannot say there were a lot of these factors for myself, but I can get an idea of what might be discouraging to others.

DISCOURAGING ASPECT OF THE EXTERNSHIP

I think the only really discouraging factor of the externship was my very limited knowledge in the topic of Generative AI. Despite me having a quite strong background in Python, my limited prior experience in Generative AI meant that I was initially less confident than my peers, as this was a completely new area for me. This lack of familiarity made me feel like my work was inadequate to that of my peers who may have had even slightly more experience in the topic than I did. While it at times was disheartening to feel behind it pushed me to do my best work and kept me eager to master the topic.

While this was not a particular factor that was discouraging to myself it may have been to others. Like any assignment in school or even in the work world there were time constraints. Tight deadlines may have been a more difficult aspect for others, but for myself I have been in school for so long now that working with tight time constraints is not a big worry.

Overall, I cannot say that I really had any discouraging aspects because while I did not have knowledge in Generative AI it did not set me back as I had amazing trainings in the topic and learned a lot. As someone that has been learning about cybersecurity for the past five years, I have learned a lot and gained an amazing skill set that really benefited me. Some of my peers were experiencing their first time even using Python or learning about cybersecurity so I feel that I honestly had nothing to be super worried about because I was constantly learning new things like my peers.

CHALLENGES

The most challenging aspect of this externship was understanding advanced Generative AI concepts. Like I said, this topic was completely new to me and being able to grasp these complex theories and advanced techniques was vital to my work. I had to understand exactly how they fit into real-world applications. While there was a steep learning curve and the need to quickly learn and adapt, I was able to do so on top of everything else I was doing.

I did face a challenge when applying the pre-trained models and customizing them for specific tasks. The challenge was that I had to ensure that the customized models performed effectively, but that they also met all the project requirements. Fine-tuning models and integrating them into projects is not the easiest thing as it demands a very high level of precision, as well as, experimentation. This often times can be time-consuming and technically demanding.

Overall, like I said on the page before on the discouraging aspects of the externship, I did not really have a hard time when faced with any problems as I was able to use my problem-solving skills and was able to keep my open for new things I was learning. However, if I were to have had more challenges that came my way, mentors and support groups were always available to me and all of my peers that were in my cohort.

RECOMMENDATIONS

Based on my experience as a Generative AI extern at Cognizant, here are my recommendations for future externs and preparations they should consider before starting the externship: they should build a strong foundation in Python, gain some familiarity with AI concepts, learn about Generative AI, prepare for project management, and seek help from mentors and support groups when needed, and most importantly cultivate a growth mindset.

Ensuring a strong foundation in Python is crucial to ensure a solid understanding of Python programming, including data types, control flow, functions, scripting, and object-oriented programming. Being proficient in Python is essential for working on AI projects. Individuals can prepare by taking cybersecurity courses, completing courses in Python or even tutorials, working on Python projects to practice their coding skills.

Gaining some familiarity with AI concepts is important so that individuals have a basic understanding of artificial intelligence, machine learning, and even deep learning principles. Individuals can prepare themselves for this by studying introductory AI and machine learning courses and exploring any and all online resources that are available online whether it be textbooks or other readings.

Learning about Generative AI is advice that I would have given myself prior to completing this externship. My recommendation for this is familiarize yourself in the topics such foundation models, text and image generation, and tools such as PyTorch or Hugging Face - or both! Learning these concepts can help you learn much faster how to integrate these things into your externship. You can take online courses or even experiment with basic projects using the tools I previously listed.

Preparing for project management includes being ready to manage your projects and deadlines. Effective time management is crucial not only in the work world, but in all aspects of your life.

Seeking help when you need it is something that some people are scared of. Being proactive when it comes to seeking help from mentors and support groups is crucial because it allows you to learn and gain valuable insight and assistance from those are experienced in the field. You can do so by reaching out advisors prior to beginning the externship or you can even join any online communities or forums pertaining to AI and cybersecurity.

My biggest piece of advice is to cultivate a growth mindset. Being able to adopt a growth mindset and being open to continuous learning is something that is so crucial in life and in work. The externship presents opportunities for challenges and growth. To prepare individuals can reflect on past experiences and how to approach new challenges. Setting goals for yourself is important for growth and development before, during, and after the externship.

CONCLUSION

My main takeaways from my externship experience included practical application of knowledge, the importance of continuous learning, and value of mentorship and collaboration. The externship provided an invaluable opportunity to apply theoretical knowledge in real-world scenarios. Furthermore, working with advanced tools and concepts in Generative AI reinforced the importance of hands-on experience in deepening understanding and mastering new skills. The rapidly evolving field of AI emphasized the need for continuous learning and adaptability. Staying current with the latest advancements and being open to new technologies and methodologies is crucial for success in the tech industry. The support and guidance from mentors, as well as collaboration with peers, were instrumental in overcoming challenges and achieving goals. Building strong professional relationships and leveraging collective expertise significantly enhanced the externship experience.

The externship emphasized the importance of integrating practical skills with my prior academic learning. I can apply this to my last semester at Old Dominion by prioritizing my assignments and coursework that allows me to apply my knowledge in real-world contexts, bridging the gap between theory and practice. The experience highlighted my areas for further growth, such as advanced AI techniques and project management. In my last semester, I am going to seek projects that align with these skill sets. Lastly, I will actively engage with industry professionals and seek any mentorship opportunities offered at Old Dominion University. Building a network and gaining insights from experienced professionals will be a priority for me to help prepare me for my future career.

The externship clarified my interest in specializing in Generative AI and cybersecurity. I will focus on pursuing career opportunities and further education in these areas, aiming to contribute to innovative projects and solutions - maybe even at Cognizant! The skills and knowledge gained during the externship will help guide my career development. I plan to continue building the skills I have attained throughout the externship as I understand that this field remains quite competitive. The experience has reinforced my desire to work for a leading tech company like Cognizant. I will aim to align my career goals with companies known for their innovation and industry leadership, and will seek roles that allow me to grow and make an impact, but also challenge me.

REFERENCES

https://www.cognizant.com/us/en/locations