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Computer Engineering

[SU22-IN-TECH-20010-10227](https://iu.instructure.com/courses/2073368)

Cummins Inc.

500 Jackson St, Columbus, IN

Start Date – 24 May 2022

End Date – 19 August 2022

Submission Date – 5August 2022

**Introduction**

I am currently a rising senior studying a Bachelor of Science in Computer Engineering with a minor in Math and Computer Science. Over the Summer of 2022, I had the opportunity to work for the world largest diesel engine manufacturing company names Cummins, Inc with its headquarters located in Columbus, Indiana and distribution headquarters in Indianapolis, Indiana.

I am interning with the Engine Business Unit in the field of Web and Business Intelligence which entails data analytics, data visualization and optimizations using various software’s. I reported to Varun Shetty, a senior Business Technical Analyst, who in turn reported to Manoj Abraham who was the manager who made sure, I received the support and resources to have a successful and enjoyable internship. I worked closely with Anthony Reno, who is the Project Manager of the team and multiple developer both located within the US and offshore.

This internship location was hybrid, and I had the opportunity to work both downtown Indianapolis and downtown Columbus, IN. It started on the 24th of May and is ending on the 19th of August. My job title was IT Intern in Web & BI Systems. I had multiple number of projects to work on that I will go in detail in this work report. This is included –

1) Creation of BCP Reports

2) Acting Project Manager for CMEP Reporting

3) Full Stack Development for a Web Application

4) Creation of traceability matrix

5) Creating of Access Control Security Document

**Discussion**

As I mentioned above in the introduction, Cummins is the worlds largest diesel engine manufacturing company that does everything from manufacturing engine parts to assembly of engines in house. It is the 149th company on the Fortune 500 companies list and celebrated its 100-year anniversary in 2019. It has their offices in about 190 countries and has network of above 500 distributers and 7500 dealer locations.

The company was founded in Columbus, Indiana in 1919 by three very important men namely [J. Irwin Miller](https://en.wikipedia.org/wiki/J._Irwin_Miller), William G. Irwin, and [Clessie Cummins](https://en.wikipedia.org/wiki/Clessie_Cummins). Cummins has an employee population of around 59000 all around the world and has a multitude of Business Units all around the world to perform specific tasks in business to cover many areas in the diesel manufacturing sector. This includes:

* Engine Business
  + This includes the manufacturing and assembly of the Midrange, Heavy-duty, high-power engines along with aftermarket support. The Engine business Unit contributes most of the profit that Cummins brings in due to their heavy activity. These engines are placed in automobiles, locomotives, semi-trucks, RAM trucks and so on. They can be engines for personal use including pick ups but also be shipped to the mines of Australia to be put in a mining truck that needs to be in extreme of temperatures and pressure. Some examples are the X12 and X15 engines that are assembled in Jamestown, NY.
* Power Systems or Power Generation
  + This is another unit that brings in a lot of money for the company. This includes Alternators, Generators, Power distribution units and so on. It was made by merging two divisions names Power Generation Unit and High Horsepower Sub-Division. Some examples include the backup power for Wrigley Field in Chicago or the Opera House in Sydney, Australia.
* Component Business Unit
  + This includes all areas of emissions, filtration, fuel systems, turbo technologies etc. A multitude of mechanical and chemical engineering students work in this area since it has a lot of manufacturing, propulsion analysis, and research involved.
* Distribution Business
  + This area is for the distribution for all the above including Service and parts. Since the engines go to places like Australia and Russia, distribution is an important factor in the daily work for Cummins.
* Other Business Units include Cummins Turbo Technologies, Cummins Power Systems, Cummins Emission Solutions

I worked in the Engine Business Unit in the subunit of Web & BI systems where I handled a multitude of operations including Technical Skills like creation of the Power BI reports using my logic and minimal coding knowledge. This included making of the Business Continuity Plan reports which were part of a huge project that thousands of developers and managers had been working on for the last year. It was a project where all systems at the Jamestown engine plant migrated from the Mainframe to Oracle Cloud. I came into play by creating the BCP reports as mentioned above which are nothing but the back up reports that the business uses incase some of the developed reports fail. This is huge since my internship work was used in an ongoing Go Live for the Application. To gain more managerial experience, I worked on shadowing my project manager in doing the Cummins Midrange Engine Plant Reporting which is for a similar migration application as the JEP one. I have assigned the offshore developers’ tasks, understood their requirements, and then communicated all the updates for the project to business which is the IT leaders at the CMEP Plant. I played some technical roles in creations of these reports by using the JEP reports as reference. Finally, I gained a large value of knowledge in the realm of Website Development including Full Stack understanding between Typescript code, Python and SQL Databases where I used most of my school learned knowledge.

The technologies I used were Oracle SQL Developer where I had to understand the language and framework, Power BI which is a Business Intelligence data visualization software that end customers use from us. Understanding Angular Framework and Python lambda language.

**Evaluation**

This experience with Cummins has been one of the most important elements of my career. It is my first ever office and corporate related job and has taught me so much in technical skills, managerial and most important people skills. I was skeptical about having an experience with a well-established company with such a huge population since I wanted to gain maximum experience from an internship. My greatest learning boost has been in Supply Chain and how a large-scale business works, every single element including transportation, purchase, sourcing, manufacturing, assembly and so on.

With respect to the increased understanding of my coursework, I would like to mention that I have received an immense intake of knowledge of multiple topics form each element of coursework I have completed in the last 3 years majority being in concepts of digital logic, software design, and discrete math. Other than that, many of my programming classes did help too with understanding the code easier than other would. The people who worked around me were majority Business analysts and technical analysts who used many concepts that I learnt in my Statistics and Math class along with some in Probabilistic Methods for Engineers class. The web development project I had was something that resonated with my research project with Dr. Christian Rogers when I was a summer researcher for Multidisciplinary Undergraduate Research Institute (MURI) in 2020 and 2021. I feel that getting some experience in business classes would allow me to go a long way in the industry since it is helpful to understand the end to end working of a company and knowing how to handle multiple people in a team is important. I feel that this internship has prepared me better for my last year at IUPUI since it gives me a different perspective on education of rather it being on the grades but now my interests lean towards innovation, project topics and making more connections at school.

With respect to challenges, I feel that the work given to me with detailed instructions was not too difficult but when it came to someone assigning me something I had no idea about, along came the baggage of understanding the previous versions, the software behind it, the different components that we going to change along with the input I had and so on. Another part of the internship that was challenging was getting more tasks than assigned. As we all here about internship experiences being experiences where managers give their interns most of their dirty work but for me, I was assigned many tasks that are included in the final version of the application. Majority of the tasks were simple and therefore there were times I would be free and doing nothing. In that case, I would ask for more work and due to the level of my expertise, it would be difficult for the managers to find stuff for me. Another challenging function was coming to company that is continuously growing and multiple divisions for different work so there was a learning curve when it came to understanding people’s positions, roles, work ethic and so on. This came with understanding the organization hierarchy and knowing where to go for resources and answers. Learning all the acronyms like EBU (Engine Business Unit), OCI (Oracle Cloud Integration), RMEP (Rocky Mount Engine Plant) and so on was a challenge. Overall, the experience was not too challenging since I took advantage of the multiple tasks that I received.

As mentioned below, my education has taught me something that many workers lack which is that when I am assigned a task, I will go beyond the call of duty or requirements of the task to get it done in a timely manner efficiently. I feel that that work ethic has allowed me to stay in the 4.0 GPA and has enabled many offers to come my way. My education has pushed me through challenges thereby my discovering areas that I have never step foot in and BI was a domain where I had never stepped in and turns out I am successful at it. This continues to my next point where my supervisor has acknowledged me and praised me for taking more tasks than the regular summer intern they have had. Due to this experience, I have taken initiatives to tour multiple plants including Cummins Midrange Engine Plant, Cummins Engine Plant, Seymour Engine Plant and most recently, importantly I was flown to New York to visit the Jamestown Engine plant which was a lifetime experience that many employees have not had the experience with. He also evaluates me thoroughly to allow me to understand that there are always avenues of improvement by assigning me multiple tasks and touching base with me to have status updates.

My favorite experience was the importance of my position and work in the day-to-day activities leading to the Go Live Application of CMEP ERP migration since I played a huge role in developing the reports. I was contact by multiple people at the company for status updates, knowledge transfers and advice on architectures. Other elements were the plant tours, the lunches with my coworkers, flying out to Jamestown, NY on business Cummins shuttle with all the executives.

In terms of improving the work experience, there were several changes in logistics with my manager not being in the country for the starting of the internship and the new manager having no idea I was being assigned to him. Thereby, I feel like half a month was taken for everyone to get adjusted to the addition on the team. I feel that the company did a great job welcoming the interns and were generous to fly out interns from other states thereby allowing us to network way more.

Overall, this experience has taught me so much about the industry and connected me such bright individuals who have helped me through the internship and had different experience in the past thereby allowing me to understand many different field experiences. I have made such a great name as an intern and hope to join the company in the future where my responsibilities are increased. I feel that everyone should have the opportunity to work with a big company and get as many experiences as possible and to truly juice the various advantages they have to have the best experience for the future.

**Documentation**

Cummins Shuttle to Jamestown

A person standing next to a large airplane

Description automatically generated with low confidenceA picture containing plane, sky, outdoor, ground

Description automatically generated

A sign outside of a building

Description automatically generated with medium confidence

Cummins Engine Plant

A picture containing text, grass, sky, outdoor

Description automatically generated A picture containing text, indoor, several

Description automatically generated

Cummins Workspaces

A room with tables and chairs

Description automatically generated with medium confidence

A picture containing building, indoor, furniture, area

Description automatically generatedA desk with a computer and a monitor on it

Description automatically generated with low confidence

Meeting the new and old CEO

A picture containing indoor, floor, building, ceiling

Description automatically generatedA group of people posing for a photo

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Table

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