

Department of Computer Science & Engineering
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Knowledge Acquisition Essay

CSE 4317: Senior Design II

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Encrypted SMS

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During my Senior Design courses, I was placed on the Encrypted SMS project; ESMS for short. My teammates and I decided to develop ESMS on the Android operating system due to its ease of access. Over the course of my Senior Design classes, my teammates and I planned, designed, and authored many documents outlining the requirements, use cases, architectural design, etc. for ESMS. After the documentation stage, we started development quickly over winter break, and focused on bug fixing and overall polish during the semester. I learned many skills over the course of the development of ESMS that will be applicable to my professional life after I graduate.

First and foremost, I learned how to take a co-lead role in the development cycle of ESMS. Learning this skill focused on my inter-team communication and time management with teammates. This includes assigning sections of work for each member according to their talents, understanding time conflicts and planning around them, and project organization to reduce overhead. I acquired these skills by reinforcing the communication techniques I learned from my internship at Paycom. At my internship, it was highly encouraged to ask questions if you are unsure about a topic. This is because not everyone can know every part of a project. Because I was a co-lead member of the ESMS project, I made sure to clarify any points that others might be unsure about to keep everyone in the loop. I focused on making sure other members of the team had the tools and information to be able to do efficient work. Lastly, we met up on a weekly basis to facilitate meaningful communication. Focusing on all these leadership skills reinforced much of what I already knew, but inter-team communication and planning is such a vital skill that the opportunity to practice it should never be ignored.

Another skill that I reinforced was that of clean code practices. ESMS was a software focused project and thus requires multiple team members to read and develop a shared codebase. A vital source for learning this skill was the book *Clean Code* by Robert Martin. I acquired this book last summer and read parts of it but didn't soak in all its lessons. Over the development of ESMS I referenced the *Clean Code* book to keep development difficulty down for other members. I applied this skill by being the initial developer for ESMS so that others could quickly develop larger features later. I created the GitHub

repository and initialized it with a blank Android Studio project. Because of my new skill with cleaner code, I chose to develop slowly, and make sure to make any code I wrote as human readable as possible. This includes making a logical file structure with outlines for what each directory does, as well as creating a simple but very readable Jetpack Compose navigation system. Clean Code allowed me to make a skeleton framework such that feature development was easy to structure and collaborate between team-members.

Lastly, another skill I learned was git. I have used git in a primitive sense over the years by just committing, pushing, and pulling to a single main branch between my desktop and laptop, but have not had the opportunity to exercise the features meant for collaboration. My primary source to learn the outline of this skill was my internship at Paycom last summer. Paycom, along with many other companies, use git to its maximum potential. From my internship, I was taught and guided on how to use git in a team environment, but this environment was controlled and didn't put as much responsibility on myself. Over the course of developing ESMS, a teammate and I decided to implement a strict and robust GitHub repository outline. This included requiring multiple feature branches, a required number of approvals to pull to our develop or main branches along with creating GitHub issues to assign to team members to tasks. All these practices let me learn how to use git in such a way that it now feels like the back of my hand.

Much of the skills I have learned over the course of the project, I already had a basic knowledge about, but really got to enforce and learn these skills in a much deeper way. By applying these skills and trying out new practices for each, the development of ESMS was made easier, smoother, and better overall. The skills I learned are applicable in every software development scenario and will be used in my professional career.