CS 3240 Project: Web Application Assignment and Note Organizer
(Technical Paper)

Analyzing the Actions Companies with Voice Recognition Products Can Take to Protect Users' Personal Information and Privacy
(STS Paper)

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On my honor as a University Student, I have neither given nor received unauthorized aid on this assignment as defined by the Honor Guidelines for Thesis-Related Assignments

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Introduction

Data protection has always been an important topic in this century. People fear what will happen eventually if customer data is not protected properly. With the increasing attention of technology updates, companies pushed multiple new features to accommodate customer's needs. One of the features that is new but still growing is voice recognition. Controversies have grown since this feature was introduced to the world. The main concern is what do companies do with that stored input and who can access that data. According to Dani Cherkassky (Cherkassky, n.d.), CEO of Kardome, product users “filed thousands of complaints against Google, Amazon, and Apple for improperly recording and conducting analysis on voice recordings for targeted advertising or software improvement”. With those concerns on the table, companies were forced to make a response regarding this matter. Later, the companies claimed that their sole purpose is to satisfy customer needs and bring new to the world. Specifically, Google responded with a statement “We want our policies to be simple and easy for users to understand. These changes will give people even greater clarity and are based on feedback we've received over the last few months” (Goodale, 2014). To alleviate customer's concerns, companies then tried to take several actions to upgrade their security systems to better secure customer's personal data, but the actions were not enough.

For my STS paper, I will discuss the actions companies with voice recognition products can take to protect users' personal information and privacy. To incorporate ethics into my STS topic, customers have the right to be informed of their personal information being stored. Companies and designs should think about the bigger picture and protect the customers. Like the famous quote "putting yourself in someone else's shoes" derived from the poem, Judge Softly. According to multiple sources like TermsFeed (2020) and Martin (2017), being transparent with

the users is significant to effectively communicate with the users. This research will identify ways the companies with voice recognition features can protect their users' personal information and privacy. The result of this research would benefit the public and bring equality for those who don't understand the structure behind such technology.

My technical paper will be based on a group project that designs a web application about assignments organizing. With the world still recovering from the transition to in-person interactions, students are having a hard time adjusting to the system. One of the difficulties they are facing is time management. To help alleviate the stress, this group project is about designing a web application that organizes students' materials including class notes, deadlines, and agenda. This project is significant since the conducted survey showed that students are having a hard time locating one organizing application that satisfies their needs. This project helps most of the students or the public to organize materials and improve time management.

Technical Topic

At the beginning of the project, each member of the team is assigned a team role. Team roles include Scrum Master, Requirements Manager, Testing Manager, DevOps Manager, and UX designer. Members are then required to complete their individual assignments along with the project's assignments. My role is requirements manager, and my individual assignment is requirements elicitation report which is due at the beginning of the project after requirements elicitation.

Besides the individual documents, the first main step of the project is requirements elicitation. Every member is required to participate in this step to collect more data from the students. Assignment organizing is crucial for most of the students having higher education.

Based on student responses, partial requirements were elicited to have a general idea of the features this application will contain. In addition, the course requires this project to meet other specific requirements. That includes having the user login to the system using Google login, join classes with other students in the system, and upload PDFs of notes that are associated with each class. The most troubling feature is uploading and downloading pdf files. Adding to that, the team is only given limited information and resources. Most of the time, members are required to search through the internet to figure out how to implement the features.

After completing the above components, the project has to have two more major features. Most of the work would be done in this step. Finally, the beta version of the application would be distributed to other students to test the system. After every completion of about three steps, team members are required to fill out an evaluation form to evaluate other members. The evaluation results would be considered when deciding the final project and the course grade.

STS Topic

Certain users claim that companies are using the voice recognition feature as a tapping device. For example, Siri on iPhones and other Apple products. As known to the public, Siri is "a built-in, voice-controlled personal assistant available for Apple users" (O'Boyle, 2020). Several months after the feature was released, Apple users realized that when a conversation about a product or service took place, they would encounter corresponding advertisements about that certain product. Most importantly, some languages were not in Apple's database for voice recognition.

Since the issue did not settle for a long time, companies have tried to make efforts towards resolving this issue. One of the actions they took was to add an option in the settings for

users to select if they wanted to have personalized advertisements that would show up based on their recent search. The key is that they did not make any changes to the voice recognition feature. It still listens to its surroundings to check if the user has said "Hey, Siri!". That requires constant voice recording to understand and compare the recording to "Hey, Siri!". As stated in the system architecture of voice controlled personal assistants, "the data is collected in the form of speech and stored as an input for the next phase for processing" (Dekate et al., 2016).

I will discuss and investigate the legal obligations under privacy and data protection law, and contractual obligations under the Terms and Conditions of third parties like Google or Amazon (TermsFeed, 2020). According to this article, privacy law in the United States is fairly patchy compared to the world's most comprehensive and powerful data protection law of the European Union. One specific case is that we only have California Consumer Privacy Act (CCPA) that has long been a path leader in protecting its residents' privacy and Children's Online Privacy Protection Act (COPPA) that has been suggested that voice assistant technology itself is in fundamental violation of COPPA due to US's effort in protecting children. On the other hand, the European Union has a General Data Protection Regulation (GDPR) that covers almost all commercial activity in the EU that involves the processing of people's personal data. However, third-party developers and manufacturers must agree with the Terms and Conditions such as collecting any personal information requires a Privacy Policy. For instance, Apple requires all iOS apps hosted in the App Store to be accompanied by a Privacy Policy that must be accessible from within the app itself (TermsFeed, 2020). Apple's reputation for respecting customer privacy depends on third-party developers obeying its rules.

Methodologies

My research will answer the question: what action should companies with voice recognition products like Apple take to protect users' personal information and privacy? To answer this research question, I will use the Questionnaires and Interviews methodology. I will interview users of virtual assistant products and collect information on their thoughts on actions taken by the companies so far and their opinion. Questionnaires will also be sent out to ask the users what actions they would like to see from the companies to enhance their data security. To be rational and unbiased, I will collect data from both sides of the controversy. I will search for companies' responses online about data security to collect their opinions on this matter. After collecting the data, I will summarize and get the general idea of what the public and companies think respectively.

For the technical paper, I will use the Experiments, Surveys, Questionnaires, and Interviews methodologies. Questionnaires and Interviews are used for requirements elicitation. Surveys are used at the end to collect information about the result of beta testing. Experiments are used for completing the project and having a normal functioning application. As discussed above, our team will use GitHub, Django, Python, and Heroku to complete most parts of the project. GitHub allows team members to have a shared repository that contains the main project. Members can then clone the code to work on the project themselves. The python code is added to a set of files created with Django which is basically a framework for developing web applications. After adding a little code, we will integrate our codes into GitHub and test it. This step specifically requires team communication. After we have the required files, we can then deploy that repository through Heroku to get a working application. At each step, I will search the internet to learn how to implement the required features. Since this is a team project, I will discuss my findings at each step with my members to ensure that we are all on the same page.

Conclusion

My STS topic is significant as it involves the interaction between the customers and corporations. As of now, about 500 million people use voice-controlled virtual assistants, with 1.8 billion people expected to do so by 2021, according to a study done by iProspect (Martin, 2017). Based on this information, the related parties are identified as the general public and companies with voice recognition products. This STS paper will be focused on the actions companies took and other actions they could take to enhance data security and calm the product users.

For the technical project, I learned the importance of effective communication with team members. The project allowed every member to experience different roles to prepare for the real-world opportunity. It introduced us to software development and allowed us to experience software engineer's weekly assignments. I did learn more by exploring through the internet rather than relying on the limited sources given by the professor. I also realized that everything is easy at first, but it gets harder as you dive into it. At that critical point, you have two options: go forward or give up. Ethically speaking, we should always go forward and challenge ourselves to the impossible. That way, we can truly bring change to the world.

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