

# **MISSION ECOSYSTEM MODEL GENERATION AND DISPLAY**

**Customer: Viz**

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## **OVERVIEW**

When we had first started, our point of contact, being both an educator and a General Dynamics/Viz Data Scientist, explained that his approach to this semester-long Capstone project was going to be as educational as possible. He was very interested in following the Agile-Scrum methodology; so much so that he wanted to only provide us with a set of user-stories at a time. After implementing preliminary stages and functionality, he wanted to see the version of software we had developed and based on that, extend it. Therefore, due to his great interest and accessibility, we have been able to have a strong customer-developer relationship.

However, by adhering strictly to this approach, we were never really given any initial insight into what our final product should be capable of doing. From our first meeting, we took away that our immediate goal was to begin to implement natural language processing (NLP) on a set of documents as a means to begin contextually defining relationships between words and concepts. Once we had accomplished this task, about 3 sprints in, our POC informed us that we were not at all implementing what he wanted. While we were under the impression that we should be focusing on the back-end side of text annotation, our POC informed us that he was more interested in the front-end visualizing the output from the NLP. During our first meeting he had shown us a text annotation web application that he had built. While we thought that we were tasked to build a similar application with more functionality, we were actually allowed to use the code from his app as our backend to implement our own method for visualizing both historical and live data dynamically, in a way that was interactive and customizable and focused on human data-processing abilities.

Without having updated our POC on our progress we would have not realized that the product was not meeting his needs until the very end, because of this we have started this current sprint from scratch focusing on building a front end that better meets the customer's needs. It also put us ahead of where we thought we were we realized that we were allowed to reuse code that our POC wrote, instead of having to rewrite it in Python using NLTK to handle the language processing ourselves.

## **WHERE WE ARE AT NOW**

While we were initially writing out application using Python with the NLTK framework, we are currently building a new application to focus on how the user interacts with text using a web application based on: HTML, JavaScript, and CSS. When we talked at the end of the end of the last sprint we discussed how we can build an application that highlights how words and concepts connect throughout a document. We decided to really highlight relevant text we should use a black background with light colored text to highlight the most relevant words and concepts in the document being processed. Since the main focus of our project is on visualizing the connections in text the light coloured text allows the user to see the concepts that algorithm decides matters the most, while still providing a readable background for them the interact with any text the user feels is essential for the processing of a given document.

While we did have code a new project from scratch, the initial work we did on NLP allowed us to reach a better understanding of the task at hand for the final project. Since by building a NLP backend in Python we were able to gain a better understanding of how the text in a given document is all related, and this is knowledge that we can use to build a better front end to present this information to the user.

## **TEAM DYNAMIC**

When we started the project, we chose to communicate via the popular team messaging system Slack, and this has been extremely effective for us. We each check the message boards regularly and are therefore all kept up to speed. We have separate slack channels for different purposes, such as one strictly for file sharing, which has helped us stay organized over the course of the project thus far. At this point in our project, after gaining a completely different perspective on what our tasks are frequent communication is vital.

While Slack is where the bulk of our communications takes place, we also meet for a few minutes after class every Friday. This allows us talk about anything that may have happened throughout the week, or just talk about the project with each other and ensure everyone is on the same page. These meetings also allow us to ensure that everyone has the same level of understanding about what is going on, and help each other get on the same level of understanding about the overall project.

## **WHAT WE NEED TO IMPROVE ON**

While our communication as a group has been extremely effective, we want to try and have not only stronger but also clearer communication with our POC. While in his mind, his overall vision for the project may be clear, our understandings of it have shown to be skewed up until this point. We want to try to have more regular in-person meetings with him to show updated working versions of our software. Getting more customer feedback will help us keep our focus during development on the customer's needs and help ensure that we do not head down a wrong path again. To this end, we have established two times per week that it will be possible for any group members and our POC to meet, formally or informally, to ensure that as we move forward we're all on the same page.

## **GITHUB**

Initial repository, python backend:

<https://github.com/jspodnar/MissionEcosystemModel>

Current repository:

<https://github.com/Ramonywangziyao/Viz>