Group 6 Chris Smith, Jack Liddy, Aniello Sabatino, Eain Kelton Spring 2021
CSC 315-01 - Database Systems
2/7/20

Stage IIa – Project Proposal Pitch and Specifications (initial draft)

Problem Statement

The data on the Trentoniana database is not well organized, and is difficult for the user to sort through and interpret. Specifically, it is difficult to view the data in chronological order and get a sense of what data corresponds to a certain era. It is also difficult for the user to view multiple kinds of data from a given era at once.

Objective of the module

A solution for this problem would be to implement a timeline organizing the data chronologically. This will give the user a sense of time when analyzing or searching for data. By doing this, the user's understanding of the data will improve, particularly to provide a proper framing of the data.

Description of the desired end product

The database as an end product would have an interactive, clean, and intuitive interface which organizes data in a reasonable way. The data would include tags which allow them to be categorized in a way that is readily understandable to the user, including time-stamps which will provide a sense of chronology. The interactive timeline will provide specifically chronological organization, allowing the user to have a visual representation of this aspect of the data.

Description of the importance and need for the module

The fact that the data are not organized chronologically means that it is hard to find data from a specific time period, and those listed near each other could be from different time periods. This may lead to difficulty for a user attempting to find or analyze data, in part due to the different speech mannerisms apparent across different time periods. By sorting data chronologically, users will have an easier time understanding what time period to expect before accessing the data directly. The interactive timeline will also allow them to easily progress through the different time periods in either direction.

Plan

We plan on downloading as much data as possible from the Trentoniana website, specifically audio files, noting the date referenced in each piece of data. We then plan on organizing the data and audio files into chronological order, and presenting a visual representation of the time period that each piece of data had occurred at. We plan to visualize the data in a timeline that will allow the user to put into perspective when each event took place, and where it stands relative to other pieces of data.

Other similar systems / approaches that exist

Another possible system that exists would be having a search engine feature. A user would be allowed to enter in a date, or range of dates, and all relevant information contained in the database. would be returned to them. Another approach would be to organize the audio files by categories and assign each audio file to at least one category.

Possible other applications of the system

Our system could contain several different functionalities such as the ability to filter by different criteria. This would allow us to organize our database in such a way that we store data based on these criteria, and users can pick what information would be relevant to them.

Performance

The database would have to be efficient at retrieving and searching for data. The algorithms that will be created in order to retrieve audio files should be efficient so that there will not be any noticeable delays when playing audio files.The database should be able to handle multiple users pulling data at the same time. There shouldn't be any crashes when data is being pulled for different requests. The timeline should also initially load, displaying icons representing each available record of data, then upon selecting the record, the complete piece of data should display.

Security

We plan to implement minimum password lengths in order to make user and admin accounts more secure. We can also eliminate the use of single quotation characters in order to prevent any SQL injection attacks. Furthermore, we're planning to monitor user logins to make sure there aren't any attempts at code injection into our website. User accounts will have less permissions than admin accounts. For example, they will not be able to change any data on the website, users will only be able to view and search through different audio files on the timeline.

Backup and recovery

Will be able to use the basebackup tool for PostgreSQL to provide a complete set of backup files for our database. This will ensure that we will have a base backup for all the essential data that is stored on our website. We plan to have at least one base backup, we may create more if needed.

Technologies and database concepts the team will need to learn

The team will need to learn how to properly create a database and store data in PostgreSQL. Also, team members will need to learn how to create a backup database in PostgreSQL. The database will ultimately be accessed through a web application, so the team must incorporate some sort of web interface to communicate with the database as well as implement our desired functionality. When implementing the timeline, we plan on using a javascript library, such as d3.js, which should simplify the creation of an interactive timeline based on our database's contents.

A diagrammatic representation of the system boundary
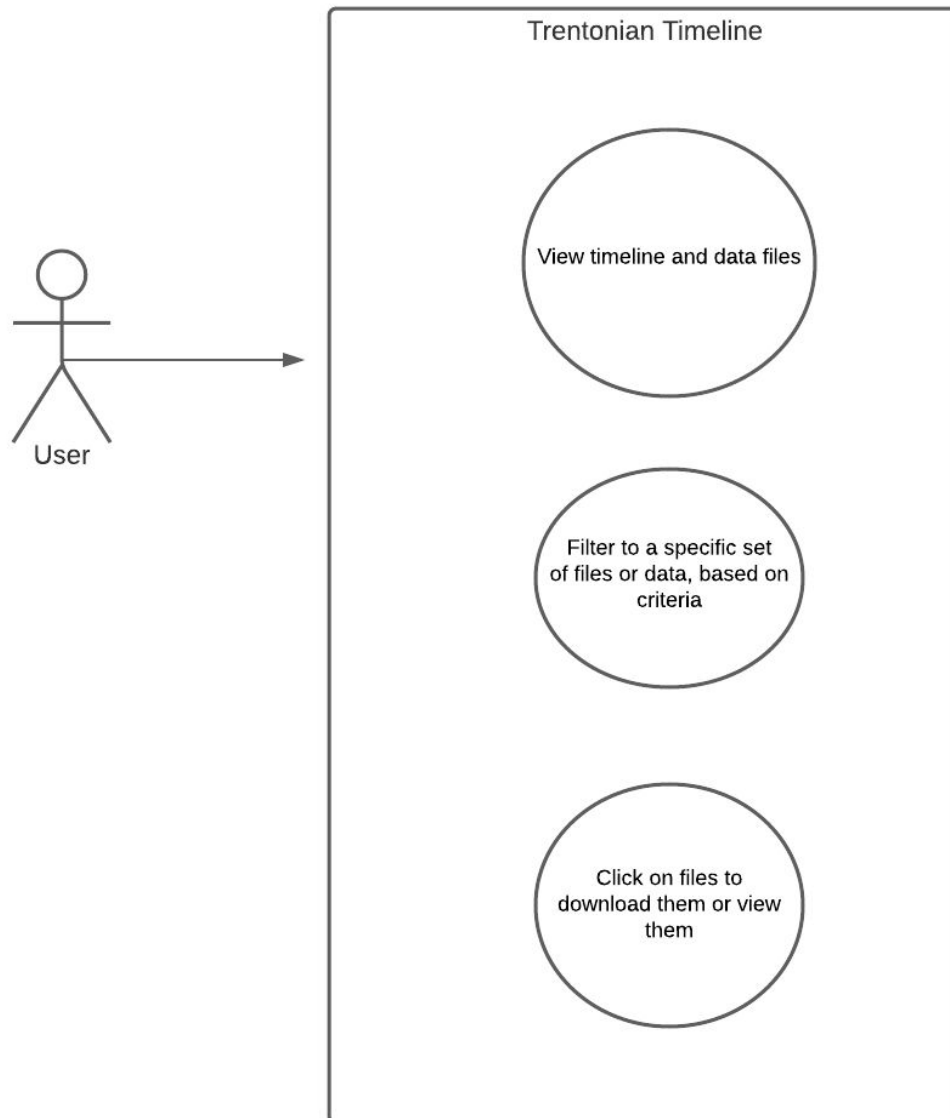
<u>Quad Chart</u>

Collaborative Project: Trentonian Timeline

Group 6: Jack Liddy, Aniello Sabatino, Chris Smith, Eain Kelton

<u>Need</u>

- Trentoniana database restructured into chronological order
- Images, audio recordings, and textual information will be easily accessible based on their associated date
- Various different data types should be accessible from single location

<u>Approach</u>

- Download content from trentonian website and label the date associated with the data
- Build database and populate with downloaded and labeled data
- Build web application that shows interactive timeline, marking available data instances on a timeline
- Users may select the marking on the timeline to display the full piece of data

<u>Benefit</u>

- The timeline offers a far more intuitive way to access records in a chronological order
- The timeline allows users to simultaneously view various categories of record(audio, photo, ect.)
- Allows for more exploratory and interactive usage of the site

<u>Competition</u>

- The only competition is the current state of the Trentoniana Library project
- The site is lacking in a way to view various types of record at once, which the project will address
- The site is lacking in a means to view some data in chronological order
- The timeline will add an interactive element that would make viewing records more enjoyable than the current site

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