MyLine - An Interactive Timeline Creator

Internet Systems Programming Term Project by Orion Davis and Tim Snyder

Introduction

This project is a web application that will allow users to create interactive timelines for events. These events could be historical events, trip itineraries, or even conference schedules, it is up to the timeline editor in how they want to use this application. This document will outline the overall application architecture, business logic, database design, and individual features of the application along with who developed them.

Application Architecture

Technology

To implement this web application the team used a variety of web programming languages. With this application requiring data to be stored for different users it was decided there would need to be a database and server side programming. To communicate with the server PHP was the language chosen. Specific details of the database design will be outlined later in the document, but the database platform chosen was MySQL. All the webpages seen were written and formatted using HTML and CSS. The application is currently being developed on a WAMP servers local to developer machines. Amazon Web Services offer the capability to host WAMP applications on remote Windows servers. Though not typical for production level applications, for the team's uses, this could be the simplest solution for global access to the application.

User Experience

For a user to use this application they would start off on a home page and either request to pull up a current timeline, or create a new timeline. If continuing to edit a timeline the current timeline will be loaded for the user and they can then continue to make edits and view the timeline as they please. If starting from scratch, the user will have the same editing interface but with an empty canvas. At any point the user can view the timeline and a new window will be opened in which the user can view the timeline and see what

other viewers will experience. One production goal is to allow for the exportation and embedding of timelines into other external web pages.

Database Design

As stated earlier, the team used MySQL to maintain the database for this application. The information for a timeline will be stored in a table which will hold the following information, such as timeline id, owner, and data. The timeline data will be a table of its own containing the different events making up a timeline. Multiple approaches for data storage and retrieval are currently being considered. These include:

- Creating unique database tables for individual timelines with timeline data items being stored in table cells
- Storing whole XML or JSON files representing a timeline to a database table mapped to a unique user

The team's current design of the database would be as follows:

User table

- *Unique ID : Username : Hashed Password*

Timelines table

- *Unique ID : Timeline file*

Database design for the project is currently open-ended. Architecture will probably be modified as the application is developed to suit the needs of new features.

Business Logic

It is much easier to understand what is going to happen, or what has happened over a specific time period when you are looking at a timeline. It would be much harder to understand how the upcoming conference you are attending will flow if everything is written in a few large paragraphs. Our application would allow for a graphic representation of all the information that needs to be given out in an easily digestible manner.

This allows planning committees to have a tool to create an itinerary for their events where the most basic information is readily available. If a user wants more information

then are then able to either mouseover or click on the event on the timeline and get more specific information.

Additionally, news organizations can utilize this tool to present easily-digested representations of large, multi-year events such as global conflicts or court cases while maintaining the ability for the user to explore the detail of the event as they please.

This application will help timeline viewers quickly understand the most important items from a large event while giving them the ability to discover more details in an engaging and intuitive matter.

Application Features

This application is still in the planning phase, therefore, no lines of production code have been written yet. A small, proof-of-concept build has been developed.

Account Creation & Login

User will be prompted to login to their account on the homepage. Once logged in, they will be directed to a dashboard with various account settings and a list the timelines they've created. Usernames will be mapped to a unique key for the database and associated timelines will be mapped to the user with the same key.

Creating a Timeline

Editors will be able to create a new timeline for their event which will bring up the timeline editor. User will initially be asked for a timeline title.

Editing a Timeline

Editors will have options for adding new items, editing existing items, or removing items. When adding an item the editor will get to enter a title and time period. Then, the editor will be able to add additional information or content (text, links to other pages, media etc.)

- Initial goal: User edits XML/JSON file directly
- Main goal: Static button-control interface
- Production goal: Dynamic drag-and-drop interface

Example item/timeline node pseudo-structure:

Time: "11/13/17"
Title: "ISP Term Project Started"
Description: "Tim and Orion began work on their ISP term project"
Additional expandable info:

    item 1: Link to github page

    item 2: Image of work-in-progress ...

    item n: Video of prototype demo

Production goal: Allow users to use preexisting timeline themes or create their own unique themes.

Saving a Timeline

When an editor wants to save their timeline to come back and finish editing later they can save their work. This will store the timeline's current information in the database so it can be retrieved when they are ready to continue working on it

Implementation of Data Storage

- Serialize timeline into a JSON or XML file and save to a table containing other timelines unique to the user
- Decompose timeline data items into individual database cells and save to individual table, mapped to another table unique to the user... Could pose a problem given the nested nature and dynamic typing of timeline nodes

Exporting a Timeline

Portable version of app with accompanying XML/JSON representation of timeline

Roadmap

1. Create basic web application to parse and display (as HTML) a XML/JSON file describing structure of timeline
2. Add functionality to application to edit the XML/JSON file and save the changes to it
3. Couple application to a database to store XML/JSON files to retrieve and share later
4. Design more intuitive user-interface with Javascript and CSS
5. Add more comprehensive database system to accommodate multiple users that own multiple timelines

Progress

A prototype jointly developed by Tim and Orion.

Features:

- Ability to create a single timeline
- Timeline nodes dynamically added using PHP form
- Timeline node may contain
    - Title
    - Date
    - Up to three extra data items
- Timeline stored in single database with each node being a row in the table
- Timeline nodes able to be deleted sequentially
- CSS-styled front-end with dynamically expanded timeline nodes

Missing features:

- Intuitive editor
- Nodes of dynamic size and data item type
- Multiple users
- Multiple timelines
- Intermediate serialization into JSON or XML
- Global access to app