Collaborative Timeline:
Toward the Next Generation of History Learning

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Abstract

In order to learn history, it ought to be a lifelong learning experience, an engaging one, we strive to build a site that engages people into history and helps them navigate across history with advanced technology. A Collaborative Timeline helps people to be more engaged in history learning through effectively managing and sharing history knowledge with friends and fostering collaboration and in-depth discussion among timeline editors. Our timeline makes history fun to learn and easy to illustrate, allows references between historical events and news in present time, enables users to view historical events through different perspectives and facilitates community formation and collaborative learning around history topics. The site achieves these goals by presenting the content using multimedia, offering an intuitive user interface, aggregating different viewpoints and opinions of historical events, enabling a wide range of social features and gamified evaluation mechanisms.

Keywords: collaborative learning, history learning, timelines

Introduction

"Study the past if you would define the future." as Confucius, a Chinese thinker and philosopher, remarked 3000 years ago. A curious nature and the fear of uncertainty drives humans to get a better understanding of why things happen, and what things will happen throughout their own life. Therefore, studying the past and its relations with the future destined to be a lifelong learning process. However, from interviews with potential users, we found that a significant proportion of users consider the process of learning history somewhat boring, neither fun nor vivid at all. Through their description of their individual learning process, there is a breakdown in users' workflow of reading current news and referring to historical events. In addition, these input are scattered; therefore, users are in need of a better organizing tool to manage their pool of history knowledge and electronic artifacts. Furthermore, though users are intrigued by the hidden connections and different perspectives on historical events, they are not equipped with a tool to do this.

Motivation

We have conducted user research with 5 users before moving into the system design phase. The potential users we interviewed are from different age groups with different professional backgrounds. What they share in common are their interests in history and eagerness to learn history in a more effective way. From those interviews, we found that a significant proportion of the users consider the

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process of learning history is somewhat boring and inefficient. Through their descriptions of their individual learning process, there are difficulties and obstacles in understanding the bigger picture of a specific history period and recalling historical facts. In addition, these input are scattered; therefore users are in need of a more engaging way to learn history facts, a more intuitive method to explore history knowledge, and a better organizing tool to manage their pool of history knowledge and electronic artifacts. Furthermore, though the hidden connections and different perspectives on historical events intrigue users a great deal, they are not equipped with a tool to do this. Our system functions will fulfill their needs of an intuitive, immersive, and novel way to learn history.

Related Work

Current history learning resources are primarily individual, and searching-based. We carefully examined two representatives of them: History.com and Wikipedia.

History.com: An educational website contains shows, videos, news, topics and games resources related to history learning. It originated from a cable TV channel formerly known as The History Channel, which broadcasts a variety of fictional and non-fictional historical content, together with speculation about the future.[1] This site uses multimedia to present history knowledge in a vivid way. However, the information is organized poorly and supports passive learning only. In contrast, our system supports timeline folder as a powerful tool to help users manage their history knowledge and utilizes the advantages of social network characteristics to provide a positive learning experience.

Wikipedia: It is a free encyclopedia that anyone can edit.[2] Admittedly, Wikipedia is a quick and efficient way to search for history knowledge. However, since most of the content is generated by users, it doesn't provide users with comprehensive and accurate history information. In addition, Wikipedia doesn't support the capability of comparing different perspectives of one history fact and a collaborative learning environment to engage users, which is exactly what our system supports.

System Description

The core experience we envision for our users is to create collaborative timelines with friends, collect events as well as deploy discussions with them. Features such as compare lists, explore network, and jeopardy games, and so on, are designed to enhance both individual and collaborative learning experience. Users find historical events through browsing and searching. Since users' learning activities are performed around *timelines*, any timeline creation or updates will be posted in the news feed

Timeline Feature

The current way of learning history is not reflected in how well people manage their history knowledge and share it with others in certain ways. We borrowed the word "timeline," reshaping it into a personal or collaborative documents managing tool. Users can create as many timelines as they like, area of where they would be able to collect historical events on a given topic, time period or simply an interest. Users can add any event they find on the site to their timeline. In addition, multiple users can edit one timeline. For instance, a user can create a timeline for World War II, and share with another two friends (Figure 1). By doing so, the user enables his two friends to edit the timeline with him simultaneously. They could add events about the war into the timeline, as they wish. In addition to this timeline, the user is allowed to create others; for example, a timeline named "movie camera" to collect an historical timeline of how movie camera have evolved.

On the homepage, to better serve this function, we provide fast access to the user's timelines. By enabling them to do this, users will be able to drag the events showed in the news feed to their timelines. In addition to this way of creating a timeline all by oneself, a user can copy an existing timeline that their friends own.
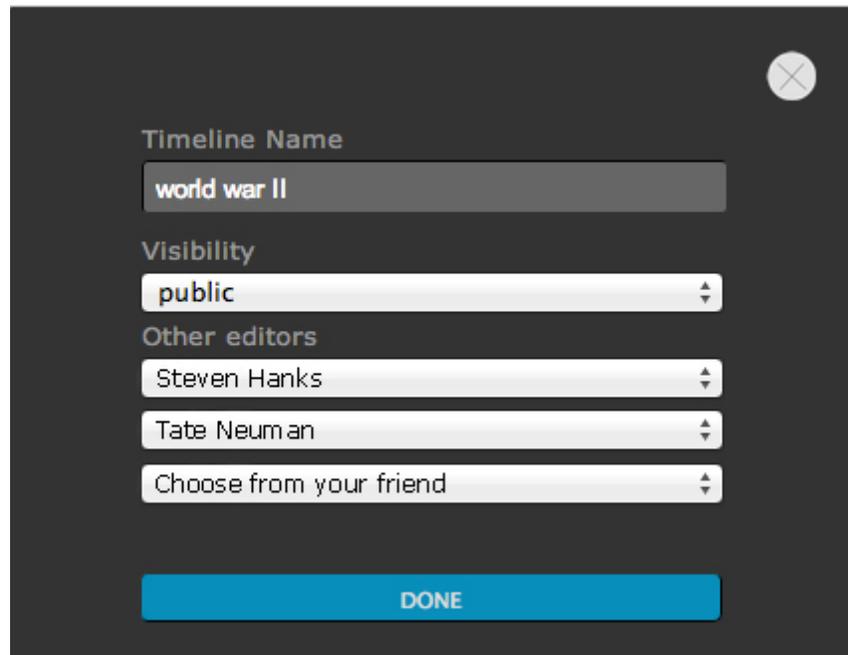
Figure 1. Add new timeline pop-up

Compare List Feature

The Compare list empowers users to explore the intersection areas between timelines. Users can set up two timelines concurrently; the purpose is to see interesting events that could have occurred at the same time. The timelines being added to the list could be the ones that users created, or those owned by others. Users can generate some thoughts about the comparison, and put them into the news feed. For example, a user might want to know the European economy in World War II. Using the compare list, they can simply add his timeline "European Economy" and the timeline "World War II" into his compare list and see what interesting results could be derived from the comparison (Figure 2). The way it works helps users to find out hidden connections between history events what other users put together. In addition, the compare lists can be saved if users wish to use them at a later date.

Explore Feature

For each keyword or topic users search, they can utilize the explore feature to find out more relevant content around the given topic. For instance, the event page is about WW II. When the user clicks explore, an infographic would be generated around this topic—WW II surrounded by concept bubble of Japan, China, General Eisenhower, Germany and so on (Figure 3). The connection and relevance between different concepts are captured in the distance between the concepts bubble and the thickness of the connection lines between the bubbles. Each bubble is clickable and may be placed as the center topic to refresh the infographic. Furthermore, in the concepts pool above the infographic, users can also refine their infographic by editing the concepts they wish to explore, either selecting from the recommended concepts or adding their own. By clicking each bubble, users could see a short description of the topic; while by clicking the edge between bubbles, they could see the explanation for the connections. Current system classified all the entities into three categories: people, locations, and events while the connections are briefly explained in text.

Figure 2. Generate compare list

Gamification

As a way to evaluate the learning performance of users, our system provides a space where users could play Jeopardy-style games. The game offers two modes, one for individual players competing with each other and one for groups competing against other groups. The questions for group mode might be more complex than individual mode since they need collaboration within the group because each group member may only know one factor of the problem but they could come up with an answer working together. For example, a question might be asking about the world economy development in World War II. Someone might be only mastered of European economy, while someone knows the Asian economy. The best way to figure this problem out needs the collaboration of both of them. The group mode encourages users to find other users who are interested in the same topic, and learn from each other.
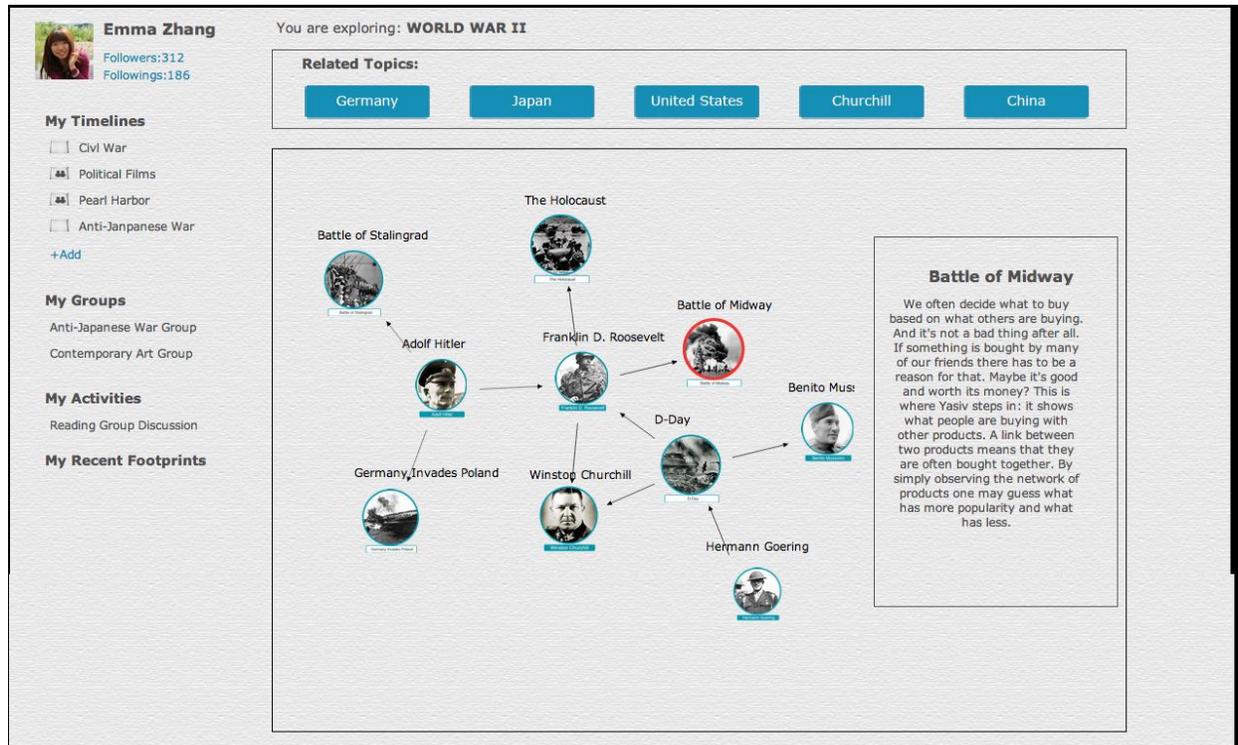
Figure 3. Explore connections

Search Function

To meet the users' needs of searching a specific concept, we provide a powerful searching functionality. First, the search results are listed by relevance. Next to that, we put an "Explore" button which could pop out a window that shows the connections between other concepts and this concept. More details about this function will be further discussed in the following section. Below that, there is an advanced searching tool provided to refine the search results (Figure 4). Users can check off any category they want to apply such as events, timelines, group activities, comments, people, etc. In addition, we enable search by location and time which are two key attributes in historical event exploration. Users can set the location either in the global map and or in the search box and set a time frame with up and down arrows in time axis and change the time interval. For example, as we selected Germany as our searching criteria, the searching results will be events about WWII that happened in Germany.

Evaluation

We conducted a preliminary study of our system with five users who took part in our user testing on our hi-fi prototype. We randomly selected five students in University of Michigan Hatcher Graduate Library. To test whether our system is user friendly, encourages collaboratively history learning and offers an interesting learning process, we designed several tasks, including creating timelines, adding events to a timeline, comparing two timelines, and exploring an event related to a given event. We chose to focus on the qualitative performance of the subjects in the tests. All of the five participants completed these tasks successfully. In the post-test questionnaire, they reflected that compared to the current history learning resources (e.g. Wikipedia), the timeline feature did provide a better and more interesting way for them to manage the historical facts they like and collaboratively study history with friends. Jeopardy game, as one of the main social learning features, stood out as an attractive feature that users wanted to play around. They would like to play the game to compete with their friends. A higher score could make them feel proud. Therefore, our collaborative learning method was proved to be effective. However, more research is needed on the gamification because users could not actually play the game in the current

version prototype. In addition, two users indicated that the concepts of "timeline" and "event" were a little confusing because of the use of them to represent news feed in social network sites. In general, all the participants reflected that they would use our system and they liked the features.

Figure 4. Advanced search

Discussion and Future Work

Though our history learning site helps users collaboratively learn history effectively, it does have some limitations. The point mechanism is not a seamless way for evaluating the learning performance. Since points can be accumulated through posting comments, editing timeline and other social actions, it is possible that a user keeps leaving dummy or nonsense comments to increase points. Then the evaluation based on the points would be biased. In addition, our data have not been proved to be completely reliable and our database is not complete. Currently, all of our data of historical facts is gathered from Wikipedia.

According to the interviews conducted in the research stage, some interviewees reflected sometimes the information from Wikipedia is not sufficient and trustable. Also, our system evaluation is limited. We only interviewed and tested our main targeted users aged from 18 to 28. It is likely that other types of users like children and older adults hold different opinions from the interviewed users. In our future work, we need to enrich our database. We plan to cooperate with libraries and try to have librarians help us transform the historical records in the library to the electronic format, which then can be used as our data source. In this way, we can collect more reliable data so that users can find whatever they want to learn and trust them as well. In addition, we will gather more feedback from different kinds of users and improve our system based on their responses.

Conclusion

We introduce Timeline as a personal or collaborative documents managing tool, with which users can compare different timelines to explore the intersection areas and hidden connections. The multi-user editing will greatly influence the way people learn history. In addition, group activity and social games within group feature encourages users to discuss with others, share opinions, and merge ideas, etc. Furthermore, we develop the Explore feature, which generates an infographic to display the connection between different concepts, which enriches users' personal learning experience to some extent. We also enable advanced search capabilities to help users to navigate a large collection of events, timelines, group activities, comments, people and more on our site, as well as recommendations based on the items. The social features at our site go beyond the sharing and commenting on the post, to allowing users to collaboratively create timelines and participate in a joint Jeopardy game.

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