Software Demonstration, "Emergent Time" timeline tool

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Emergent Time is a prototype collaboration tool for humanists and social scientists working with timelines—narrative arrangements of events. In Emergent Time, timelines are owned by particular users, and represent the user's interpretive reading of a series of events. While an individual timeline "belongs" to a user, many of the events it interprets may be shared by other users and interpreted differently in their timelines. Users construct timelines individually, using a single form to build on events others created before them, or to create new events from scratch. The application thus balances personal expression and argument (in the form of individual timelines) with collaboration and shared work (in the form of raw events).

Throughout the prototype, clicking on an event in a timeline will show how other users have interpreted that particular incident. Thus, one can read horizontally to follow the argument of a given timeline, or depth-wise to jump between different timelines that interpret the same event from different perspectives.

1. Overview timelines

The prototype's salient feature is a set of overview timelines, built by analyzing the network of links between timelines and events within the community. These links indicate the most important events for a given topic. For example, a search for "John F Kennedy" might show the most highly-cited events in his life: birth, election, and assassination. To accomplish this, the prototype uses a proprietary implementation of Page & Brin's PageRank algorithm. Events that are linked to in many timelines are likely to be important to the community, and receive a high rank; conversely, timelines that interpret many important events receive a boost in rank. Emergent Time uses these ranks to indicate which event entries are regarded as most authoritative by the general populace of users, and displays them when given a matching topic.

2. Collaboration strategy

In Emergent Time only the author of a given event can revise it, but the community at large can add source critique comments and propose alternate versions of the event. The design intention was to spark general discussion about whether a given event's description is well-supported by the primary sources cited. Because many versions of a given event may exist, this encourages users to link to the version that is factually best-supported in their own timelines, while passing over those with poor evidentiary support or badly-formulated descriptions. Hence, using an event in one's own timeline constitutes both a signal of interest in the historical incident and a vote of confidence in the event author's scholarship. The collaboration workflow thus serves as a macrocosm of the scholarly publication process, allowing authors and readers to evaluate the evidence in support of a given interpretation, and to "vote with their feet" by citing it rather than another in their own work.

As a result the overview timelines will come to reflect not only which events are most important for the interpretive community, but also which versions of a particular event are most authoritative. This allows overview timelines to present the most influential event entries for a given topic, and to accommodate shifts in communal knowledge as new evidence is found and new interpretations of a given incident become normative.

3. In contrast to other tools

This collaborative strategy is intended to capture established conventions for historical analysis and source critique, and use the resulting citation networks to construct overview timelines that accurately reflect the community's current normative views.

By distributing small bits of knowledge among many event entries, promoting general discussion of the veracity of each, and then allowing users to "vote" for a given version of the facts by including the event in their timeline, it addresses shortcomings in other collaborative digital humanities approaches:

- *Open-revision wiki.* An open wiki implements what might be called "last man standing" collaboration. The last person to edit an article has license to revise and amend all the others' work, potentially reshaping it to his own ends. Of course, wiki history allows others to revise it back, but this encourages "squatting," or continually monitoring an article in order to control its contents.

- *Moderated wiki.* Some wikis establish an editorial bureaucracy to address these issues. However, this in effect defers interpretation to an appointed "expert," much after the fashion of a traditional encyclopedia (with the proviso that the general public can submit material for editorial consideration).

- *Voting systems.* Finally, simple voting systems that ask users to "rate this article" suffer from known problems with blind polling. Anonymity encourages arbitrary voting; users might vote multiple times or use incomparable rankings; and the population of elective voters is self-selecting. By contrast, Emergent Time's collaboration model is designed to circumvent such problems, since users "vote with their feet" by citing one formulation of an event rather than another in their timelines, and no one user can dominate interpretation by being the last to revise. While this model is relatively new to digital collaboration tools, it is quite similar to traditional humanities footnote and endnote citations. It clearly marks authorship and source material for a given interpretation, encourages communal discussion of the adequacy of an author's evidence, and holds authors accountable for their votes by embedding the citations within their work.

Even with a sparse demo data set, it is clear that the Emergent Time prototype achieves a successful balance between individual work (seen when viewing a particular timeline) and community connections (via the interpretation comparison popup, and the related timelines and related users links). It encourages users to focus on developing their own ideas, while still suggesting points of contact with the wide community — for example, in the event editor, which shows possible base events as the user enters information. The opening page's list of recent community activity is well-suited to draw users into other work and give a sense of liveliness. Most importantly, even for small data sets, it's clear that the overview timelines do actually reflect the community's current notion of the "most important" events.