Turn Out the Stars When You Leave:
Twin Cities Movie Theaters in the Sound Transition

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Abstract

The majority of the research in hypertext and hypermedia focuses on hypermedia fiction and educational uses, while the potential for hypertext and hypermedia narrative in academic contexts has been largely unexplored. There is certainly some overlap between the subjects, but how can hypermedia be used to further the twin goals of academic research—the presentation of new research and the facilitation of further new research—*differently* than standard texts? This project examines the possibilities and potential of academic, non-fiction, narrative hypermedia as a research tool by offering a model for how such narratives can be designed and written to better fulfill those dual goals. A review of relevant works and literature informs the design and construction of a prototype for *Turn Out the Stars When You Leave,* an academic hypermedia website centered around key events in the Twin Cities movie theater industry during the transition from silent to sound cinema (roughly 1926–1931). An iterative design methodology for the creation of the site is explained, including usability testing to evaluate the site's design and functionality. Multiple avenues for future development and research are identified. The project and its methodology's implications for future academic hypermedia works are described.

Keywords: *academic hypermedia, digital collections*

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Chapter 1: Introduction

European Organization for Nuclear Research (CERN) software engineer Tim Berners-Lee first proposed the creation of the World Wide Web in 1989. Reflecting on its origins a few years later, Berners-Lee described the Web as "an easy but powerful global information system, (started) with the philosophy that much academic information should be freely available to anyone" (1991). The Web brought hypertext and hypermedia to the masses, linking users to text and multimedia pages on servers across the world via the Internet. Yet, in spite of all the advances in access to the Internet and in Web technologies in the years since its debut, academic information published via the Web remains largely rooted in very "traditional," print-centric formats, with little—if any—of the enrichment that an interactive presentation can afford.

A survey of dozens of "electronic journals" revealed that many are simply journal articles available electronically, often simply as PDF or DOC files. Articles published by JSTOR.org and tandfonline.com (Taylor & Francis) are formatted identically to their print counterparts, offering little more than a few hyperlinks on a cover page and the ability to copy and paste text. The Journal of Interactive Media in Education does little in its Web-published articles beyond including citations via a mouse-hover activated tooltip and DOI links to the articles elsewhere on the Web (or Digital Object Identifier, a unique serial code used to identify electronic documents). These features are undeniably useful, but do little more than offer access to research via the Web—the most basic application of its capabilities.

In 2009, Andrew Jakubowicz suggested two key contributing factors for academic publishers' apparent disinterest in exploiting hypermedia. First, the political economies of academic publishing limit the ability of journals to innovate with hypermedia. Second, "the industrial technologies… have not yet been brought together, because the problem is usually conceived of as being one either of data collection and storage on the one hand and therefore an issue for museums or galleries, or on the other one of dissemination of completed research findings being the responsibility of publishers and libraries" (Jakubowicz, 2009, p. 373).

The climate does appear to be shifting. In recent years, Elsevier's *Article of the Future* project, an initiative aiming to redefine "the article format, for an optimal exchange of formal scientific research between researchers," introduced a three-pane view—since incorporated into many of Elsevier's Science Direct articles. This viewing mode features an article outline, the main article, and "context & added value" (sidebar) content. Cited articles appear in a sidebar on the right of the reader's browser window. Clicking on a hyperlinked citation reveals, where available, bibliographic information; citations of articles will also display an abstract and offer a downloadable PDF or links to a listing for the article in Scopus, an online database of abstracts and citation information for peer-reviewed literature. Yet the ambitions of *Article of the Future*'s prototypes seem modest: animated graphics, embedded video, and a handful of "article extras" (mostly interactive graphics, maps, and plates)—many essentially supplemental to the text ("The Article of the Future," n.d.; Stephenson et al., 2008; Mulvenna et al., 2010; Gardner, Lowe, Moss, Mahoney, & Cogliser, 2010).

The purpose of my MFA thesis project, *Turn Out the Stars When You Leave,* was to design and build a modern, academic, narrative experience that explores the Web's potential in presenting the arguments of new research and in facilitating the creation of further new knowledge in art, design, and the humanities. This approach aims to achieve both of these goals more effectively than in "traditional" print and existing hypertext examples through an integration of a digital collection and original research.

The original research presented is an examination of various forces contributing to a 1927 strike by motion picture theater employees in the Twin Cities, titled *Turn Out the Stars When You Leave: Twin Cities Movie Theaters in the Sound Transition.* The prototype for the *Turn Out the Stars* site was developed with an iterative design methodology, a cyclical process of ideation, prototyping, and evaluation, which continually refines and improves a project over the course of several versions (iterations). The first prototype for the *Turn Out the Stars* website was informed by a review of the literature on hypermedia theory, electronic narratives, and other related fields, as well as of a variety of hypermedia projects. The prototype was evaluated and refined through two rounds of user testing, which assesses a site's design and functionality by presenting it to representative users for identification of any usability concerns or other areas for refinement. Future avenues for development and further experimentation or research are identified. Besides presenting a substantive contribution to the history of the Twin Cities movie theater industry, this project and the methodology used to create it can be used as models for future academic hypermedia projects, whether on the Web, in interactive eBooks, or in some entirely new form that is yet to be invented.

Chapter 2: Contextual and Literature Review

Exact definitions of "hypertext" and "hypermedia" are still hotly debated, but for my purposes, "hypertext" refers to electronically linked blocks of text, and "hypermedia" simply extends that concept to include other media types, such as images, video, and other interactive elements. Whatever the precise definition, that hypermedia is different from traditional texts seems undeniable (Fitzgibbons, 2008; Baehr & Lang, 2012), and therefore hypermedia offers different mechanisms for presenting information than traditional texts. But exactly how academic writers can harness these differences is much less clear. There is a great deal of research into hypertext fiction, but far less into hypertext non-fiction or the creation of academic hypermedia. Often, the research into academic hypermedia examines the utility of hypermedia as an educational tool. But while learning or teaching are undeniably commendable goals, this project is interested in hypermedia as a research tool.

To determine an appropriate format for this project, several examples of non-linear projects were reviewed—narrative-driven and not, academic and not. Seven historically significant or influential works will be discussed. Not all of these were direct influences for this project. For instance, I only discovered "Hearsay of the Sun," after my initial content analysis—long after the dynamic prototype for this project had been started, so its formal and conceptual similarities are coincidental to my own design. It is included here, both as a precursor to my own approach and because our separate arrivals at similar conclusions underscores the validity of these ideas.

The works described here represent a range of approaches to digital collections and non-linear narratives:

- *The Victorian Web* by George P. Landow, et al. (1988–Present)

- Various exhibitions on *Inventing Europ*e by the Foundation for the History of Technology (unknown date–Present)

- *Building Stories* by Chris Ware (2012)

- The *Ken Burns* iOS app by Ken Burns Media, LLC (2014)

- "Public Secrets" by Sharon Daniel, with designer Erik Loyer (2007)

- *Los Angeles and the Problem of Urban Historical Knowledge* by Philip J. Ethington (2000)

- "Hearsay of the Sun: Photography, Identity, and the Law of Evidence in Nineteenth-Century American Courts" by Thomas Thurston (1999–2001)

- *Lantern,* an open access co-production of the Media History Digital Library and the University of Wisconsin–Madison Department of Communication Arts (2013–Present)

Of these works, all but *Building* Stories are Web-based hypermedia projects. These were reviewed on a MacBook Pro running OS X 10.11 and an iPad running iOS 9.1, both in Safari 9.0.1. After reviewing the projects, their key features, themes, and issues were identified for each. Because of the size of the projects, a complete exploration of many of them would be impractical; as such, I explored each project until I felt I had achieved a strong understanding of the project, its interface, and its underlying structure

—in other words, when saturation was achieved. The key findings from this qualitative content analysis are summarized in the Discussion section of this chapter.

I also reviewed some of the literature on hypertext theory, hypertext narratives, and other related topics. Marie-Laure Ryan's *Avatars of Story,* in particular, provided invaluable insight into how to design the structure of a hypermedia narrative. Ryan was discussing hypertext fiction, but many of her insights on are equally applicable to non-fiction narratives. *Avatars of Story* and other writings on hypertext theory and practice will be discussed where relevant, in reference to the reviewed projects, also in the Discussion section of this chapter and throughout this paper.

After reviewing the findings from the content analysis of the seven projects, their impact on the project will be discussed.

The Victorian Web

George P. Landow is a Professor Emeritus of English and Art History at Brown University, an expert on Victorian literature and culture, and a key figure in hypertext and hypermedia criticism and theory. His books, *Hypertext: The Convergence of Conemporary Critical Theory and Technology* (1992) and *Hypermedia and Literary Studies* (1994) were key works of theory in the early days of the World Wide Web. *The Victorian Web*, in fact, pre-dates the World Wide Web, having been developed initially in the Intermedia and Storyspace hypermedia environments. The Web-based incarnation of the project was launched in 1993. The *Web* continues to be expanded with new pages and works, but its interface has changed little. Older versions of the site used a radial "web"

interface on its homepage, which deftly avoided the suggestion of sequence to visitors (see Figure 1), however the front page is now organized in a list format (see Figure 2).

In the site's Introduction, the *Web* is described as "a fundamentally different approach to finding and using information (than) search-based Internet projects. Internet archives and invaluable Internet tools, such as Google, treat bodies of information as a chaotic swamp that one searches—one can't say 'negotiates'—with a wonderful laser-like tool that penetrates the fog and darkness. If we find what we're looking for, we leave immediately." Instead, the *Web*'s structure encourages—one might say "requires"—exploration.

The design of the site is woefully out of step with modern Web interface standards. Many destinations for links are unclear. Throughout the site, many (not all) links are simply displayed as black text, with the "hand" cursor and an underline hover state indicating that more content can be found. This makes them visually indistinguishable from any non-linked black text sometimes found in the same menu.

A header graphic with the name of the site is not linked to the homepage, as a visitor might expect; instead, a right-aligned breadcrumb element visualizes the visitor's location in the *Web*, but the right alignment of this element makes the *Home* link appear in a different position on almost every page. The title of the page appears twice, yet is often different from the name of the link, or the label in the breadcrumbs navigation aid. The inconsistencies are frustrating

After wrestling with the interface, visitors will find the individual elements or artifacts collected within the *Web* illuminating, but the site as a whole feels no different

from any online encyclopedia, aside from the occasional non-traditional formatting of some entries—a "Wages, the Cost of Living, Contemporary Equivalents to Victorian Money" page by George Landow and Jim Skipper is written in a Q&A format, for instance.

The presentation of entire works is more helpful, although again, the interface frequently gets in the way. When viewing Chapter 6 of *Victorian Types, Victorian Shadows* (found by navigating through "Authors" / "Religion" / "Typological Interpretation of the Bible"), the only way to find the first chapter of the book is via a link to the Preface some distance down the left sidebar. Text works are included as standard text (as opposed to facsimile images), with occasional illustrations of indeterminate origin; these may be from the original work or not.

Many of the included texts have hyperlinks and occasional sidenotes added, with hyperlinks from the reference marker to the note, but no easy way to return to where you left off. A number of broken links frustrated me as I explored the site, as well.

Inventing Europe: European Digital Museum for Science & Technology

The *Inventing Europe* site houses a collection of "1000+ objects"—artifacts from the last 160 years of technology in Europe. Founded by the Foundation for the History of Technology, the site features Tours, each organizing a series of six objects accompanied by text written by various historians and museum professionals (called "curators") which guide the visitor through subjects like "The Home Economics Movement: Remastering the European Home" and "Media and Revolutions." Also featured are Exhibitions (sets of thematically related tours). The text for the Tours explains the object and how it relates to

the subject of the tour. The relatively text pieces include citations in footnotes, where applicable.

An "About This Tour" block along the right-hand side of the Tour pages could have been more prominently positioned (see Figure 3). A more visible position—such as prior to displaying the first object of the Tour—would help users better understand the context with several of the Tours. Granted, however, visitors with a strong knowledge of European history may understand the context adequately with the existing design. Once accustomed to reading the sidebar first, however, the narratives are enjoyable. Each story in the Tour flows linearly into the next, although the stories do not always seem to relate directly to the featured object.

The individual objects' pages provides additional information, including information about the artifact and, where available, a link to the same artifact on its source collection's website (see Figure 4); interactivity was not always discernable, however, with the standard "hand" cursor state occasionally the only indication that line of text is a link or that a − icon collapses a block in the sidebar.

An alternate navigation method is found in the Objects page (see Figure 5). This page displays images (or thumbnails, in the case of videos) on the first level of the Objects page, loading as you scroll down using a Javascript-dependent method called "lazy loading." This method saves on bandwidth at the expense of introducing a lag between scrolling down and viewing the new content). Without Javascript, the images don't load at all on that page. The apparently random and fixed order seems affords a great deal of prominence to the eight or so images that (seemingly) just-so-happened to

be at the top of the page seemed peculiar. It seems that there is no apparent rational for the order and no ability to sort it; listing the results randomly may be a better approach to encourage exploration.

Building Stories

Chris Ware's *Building Stories* (2012) is generally described as a graphic novel, likely for lack of a better word. *Building Stories* is interactive in a sense, but not hypermedia (by many definitions of the word, at least), because it is—and can only exist as—a collection of physical objects. Specifically, *Building Stories* is a collection of fourteen discrete comics narratives in a variety of trim sizes and lengths—"Books, Booklets, Magazines, Newspapers, and Pamphlets," as the back of the box calls them. Some of the pieces have their own covers, naturally, but none has a title page or credits; there is only one the box itself. The inside of the box lid displays the copyright information. These details seem to underscore the fact that the *collection* is the work, not any of its discrete elements. The title seems like a clear nod to this: the reader "builds" the story from the fourteen chapters. (It is also a reference to a central apartment building figuring into many of the chapters.)

The two shortest pieces are two-sided strips of paper with a comic strip on each side. Either side can be read first. Although the "key" on the back cover displays only one side of each, the first panel of which also corresponds to the outward-facing side as it is folded up inside the box, implying an easily ignored or forgotten (and possibly unintentional) "first" side for each (see Figure 6). The variation in trim size and materiality across the discrete pieces—as well as the very fact that they *are* discrete, is

something unique to print: with electronic hypermedia, the only materiality is that of the device used to read them. While Ware's intention for using different paper stocks and bindings is (arguably) inscrutable, it's undeniable that the "newspaper" and a Golden Book-style hardcover produce a distinct experience for the reader. Simply the act of unfolding a 15¾ ″ x 22″ newspaper is an experience that an iPad can not replicate, even if a digital edition were available, and surely any reader who grew up reading actual Golden Books will reminisce for a moment or two when first handling the book.

Moreover, the physically discrete chapters leave the author's intended sequence unclear (if there is one at all), making the order in which the chapters are read up to the reader. When reading any narrative, readers make connections between "past" and present events. By allowing the reading order to vary, the connections each reader is able to make between each of the chapters also varies.

Ken Burns iOS app

In film and video, the arrangement of images or clips into a sequence is called editing or montage. Early Soviet filmmakers such as Sergei Eisenstein, Lev Kuleshov and Dziga Vertov had a more specific idea of montage, however—cutting used to create, in Eisenstein's words, "an idea… from the collision of independent shots" (1969). The classic example is from Lev Kuleshov's experiments demonstrating that the juxtaposition of an identical image of a man with either a bowl of soup, a child in a coffin, or a seated woman produced different effects in viewers: they thought, respectively, that the man looked hungry, sad, or… "intrigued." Known as the Kuleshov Effect, it is widely regarded as one of the fundamental techniques in film editing; audiences form meaning

by inferring connections between shots that may or may not be intended by the filmmaker (Moura, n.d.).

The *Ken Burns* iOS application (Ken Burns Media, 2014) demonstrates how the Kuleshov Effect holds true with the juxtaposition of longer sequences. The app takes clips from twenty-three separate documentaries produced by Ken Burns and repackages them into six timelines or playlists, one of which is included free with the app; the others are available as separate in-app purchases (or all together as a discounted bundle). The home screen of the app displays all of the clips in one large timeline, and the user can select clips individually to view them in any order or a specific Theme/timeline to isolate just those clips from the larger timeline (see Figures 7 and 8). The Innovation timeline, for instance, incorporates thirteen "scenes" (plus a new introduction) from nine different documentaries, to illustrate "how innovation shaped American history."

Burns explains in his introduction to the app that this resequencing allows us "to see the way in which the collisions of a scene from this film and a scene from that film made twenty years apart suddenly interrelate in a new way. What this allows us to do is to see the ways in which the warp and woof of history has meaning today."

It is telling, in some ways, that Burns has recorded new introductions for many clips. In some of the playlists, the connections he's making are (arguably) not always very strong, so a bit of explanation is helpful. This is likely a result of the repurposing of existing clips for this new context. Certainly, a work comprised of original clips—created with this resequencing in mind from the start—could achieve similar effects more seamlessly.

"Public Secrets"

The online multimedia journal *Vectors* is published by the University of Southern California, and in each of its irregularly published issues, presents a selection of interactive projects. "Public Secrets" by Sharon Daniel, with designer Erik Loyer (2007), appeared in the fourth issue of *Vectors*. The Flash-based project describes itself as "an interactive testimonial [about] women incarcerated in the California State Prison System."

All projects on *Vectors* include an editor's introduction, usually accompanied by author's and/or designer's statements (see Figure 9). Upon launching the project, the reader sees a second text introduction (see Figure 10). Then, entering the project plays a third, audio introduction (with some animation), and finally the visitor is presented with a number of interviews. These are broken up across various pages, each presenting a thematic dichotomy: *The Public Secret / Utopia, Bare-Life / Human-Life, and Inside / Outside*. On each page, six quotes—three "inside," three "outside"—cycle in and out of visibility. This is rather frustrating, because clips are only accessible while the designer has chosen for them to be visible. Only after clicking through to a "More" page for each section does the visitor reach all of the available clips for that dichotomy (see Figure 11), which in turn link to additional themed connections.

When selecting a clip, the user can listen to other clips by the same interviewee, learn more about the interviewee, or navigate to a different page to view more from that same category. Users can listen to the introduction and a handful of interviews then move on—or, they can systematically crawl through every single interview to experience the

whole site, if they are able to find all of it. As with the *Ken Burns* app, giving control over sequence to the user allows for serendipitous connections. By allowing the user more agency in the sequence of clips—and thereby a role in the formation of meaning —"Public Secrets" is engaging without being didactic. Yet at times, there is little beyond serendipity to draw connections with, and the result can be frustrating, even confusing. The site comes across not a coherent argument, but simply a collection of thematically connected audio clips.

The app's interface has a few minor issues, as well. Various animated segues between sections are occasionally slow and cannot be skipped. After the novelty of the animations wears off, this becomes increasingly annoying, actively discouraging deeper exploration of the site.

While presentation is undeniably creative and the content is often engrossing, this lack of a coherent argument gives me grave doubts about whether the presentation seems "academic" enough—a misgiving I have with many of *Vectors'* projects.

Los Angeles and the Problem of Urban Historical Knowledge

University of Southern California Associate Professor of History (now Professor of History and Political Science) Philip Ethington created *Los Angeles and the Problem of Urban Historical Knowledge* as a "multimedia essay" accompanying the History Cooperative's *American Historical Review* in December 2000. Most of Ethington's essays are above my head, and the relative large, white reversed type with short line-heights used throughout the site certainly doesn't encourage me to stick with it. But his discussion of Los Angeles as a "quintessential site of postmodernity" and of

"fundamental epistemological questions… which rapidly turn into ontological ones" are of less interest to me than to how Ethington displays his arguments.

He explains its format in the Preface:

> This website—composed of images (still, panoramic, moving, and sequential), maps, short essays (epistemological, bibliographic, methodological, and conceptual)—is written as a totality; the verbal text and other media are meant to be encountered as a whole. It is "panoramic" in both a figurative and literal sense.… The "Essay" explores the hypothesis that the key concept in the search for historical certainty should be "mapping" in a literal, not a metaphoric, sense.… But readers can also disregard the Essay altogether, because it is not essential to the site—only one of its elements.…

> The best analogy to "reading" this site is that of a newspaper: the reader's eye wanders between articles and images, relatively free from linear narrative. Readers should feel free to skip around from any starting point, using the omnipresent menu buttons on the top and left-hand side of each page (2000).

Ethington was instructed not to use HTML frames for navigation by the editors of the *American Historical Review*, which he described as "a major limitation," yet at the same time he adds that, "I am glad that this stricture was imposed, because it makes the site more simple and elegant." As a workaround, he includes a repeating series of links along the left side of the site. These appear to set a fix minimum height for every page of several thousand pixels, often resulting in a huge expanse of black space below the last actual content of the page. I frequently "flick" my mouse's scroll wheel down to get to the bottom of a Web page while getting my bearings with a site, and this inability to

quickly navigate to the actual bottom of the content was annoying to me. I don't know how common this behavior is, however.

Los Angeles forgoes any form of search functionality, often making artifacts on the site very difficult to find again. The Genres section was most useful in exploring the artifacts in the site, but the interface often proved inscrutable; I was often confused by why an image link took me to a particular page, or whether an image was or was not a link, because no visual indication was provided to the user other than a "hand" cursor state. Other links were broken and forwarded me to USC's History Department website's front page.

Technical issues plagued the website, as well. The site's "virtual reality panoramas" use Java applets which, despite having Java installed, would not run in my browser due to vague errors. Quicktime videos required me to install an older version of Quicktime plugins to, and then still did not display correctly. (They displayed as black.)

The site includes a Bibliographic Essay page, as well as bold, white reference marks that, when clicked, create small pop-up windows to display his citations (see Figure 13). On an iPad, these fill an entire tab, hiding the essay from view. Granted, Internet-connected mobile devices barely existed when this site was published.

"Hearsay of the Sun: Photography, Identity, and the Law of Evidence in Nineteenth-Century American Courts"

Of the hypermedia narratives I have seen, the one that comes closest to presenting a truly innovative, interactive presentation of an academic essay is Thomas Thurston's "Hearsay of the Sun." Originally published in *American Quarterly*'s *Hypertext*

Scholarship in American Studies online issue in 1999, the site featured four hypermedia articles in varying formats. "Hearsay of the Sun" examined "the legal reception of photography as a type of evidence in the appellate cases, legal treatises, and legal journals of the last half of the nineteenth century" (1999).

In traditional (print) journal articles, citations are used to list bibliographical information for a writer's sources, but these citations actually serve as a cognitive link:

> Scholarly articles situate themselves within a network of textual relations, most of which the print medium keeps out of sight and relatively difficult to follow—because the referenced (or linked) materials lie spatially distant from the reference mark (Landow & Delany, 1991, p. 5).

Electronic hypertext facilitates such connections through hyperlinks, yet most online versions of scholarly articles even today are content with simply reproducing dead text on web pages or in PDFs. But hyperlinks to other articles are just the most basic mechanism for hypertext to facilitate scholarly inquiry. "Hearsay of the Sun" also includes access to many of the articles and cases it cites within a frame, offering a more seamless integration of the information into the hypermedia work. I was not convinced that the frames helped much, either, because I could easily open the articles in new tabs. (In 1999, tabs had only been incorporated into a handful of minor Web browsers.)

Despite separating the site into sections labeled Essay, Sources, Footnotes, etc., Thurston treats his primary sources as part of the work itself, rather than supplemental to the text (see Figure 16). In his Introduction, he states, "The primary documents *used in* this hypertextual essay" (emphasis added), not "presented with"; under the Navigation subhead of the About This Project page, he explains, "This essay divides the browser

screen into a menu, a footnote, source and essay space." Like *Los Angeles,* the "Hearsay" site as a whole—its totality—is "the essay," not just the Essay (see Figures 16–19).

"Hearsay's" extensive use of frames to present its footnotes and sources is anathema to today's Web designers due to poor indexability by search engines and a problematic relationship with bookmarks and the Back button. Much of the rest of the design for "Hearsay of the Sun" is a reflection of Web design in 1999, as well. It has precious few images (about 50), and those images are mostly very small, likely due to bandwidth constraints of the time. It uses Comic Sans. Additionally, the site's search functionality relied on a web service called PicoSearch, which ended on July 1, 2014, leaving the site without a working search function.

Despite these issues, the ability to dig into Thurston's sources within the site is truly innovative. If a passage piques the reader's interest, the entire source article is just a click away: the ultimate footnote.

Lantern: Search, Visualize & Explore the Medial History Digital Library

Lantern was developed and produced by Eric Hoyt, Co-Director of the Media History Digital Library and Assistant Professor of Communication Arts, UW–Madison (see Figure 20). It is not exactly a digital collection in its own right, but rather a search tool for the Media History Digital Library (founded by David Pierce), which digitizes collections of public domain periodicals, books, catalogs, and other artifacts. Publications in the MHDL are hosted by the Internet Archive, making the Media History Digital Library itself something of a finding aid for these same artifacts; Lantern is more fine-grained, allowing visitors to find results for specific pages, not just wade through the

occasionally overwhelming mass of Internet Archive results, with its inconsistent and often confusing naming systems.

Lantern allows visitors to search through MHDL documents by date, title (publication), collection, format or language, and to sort the results by Date (ascending or descending) and Relevance (see Figure 21). Search results in Lantern display an image of the page alongside bibliographical information, archival information (i.e. the sponsor of the scanning or the library whose physical copy of the magazine was scanned), and—must usefully—"Read in Context" hyperlinks to view the same page within the Internet Archive's file for the entire magazine.

Lantern's search results, to be clear, are *pages*, not articles (see Figure 22). Transcriptions for many of its results are only partially viewable on Lantern. Because the MHDL relies on optical character recognition (OCR) software for its transcriptions, they are, on occasion, woefully inaccurate. For instance, in the transcription of page 34 of *Film Daily*'s July 8, 1927, issue, the word "production" becomes "pi-orluction." While many transcriptions generated from clean scans are accurate, others are absolute trainwrecks. Poorer quality transcriptions obviously hamper readability and can impact the quality of a site's search functionality, as well.

Discussion of the analyzed sites

Review of these works yielded two major categories of findings: insights into how to build the *narrative* for the project, and insights into how to build the *presentation* of the narrative, or the website itself.

Discussion of the Narrative

Some of the reviewed projects are compendia: collections of artifacts, stuck on the World Wide Web. With no sequence, all artifacts hold equal significance. Lev Manovich described this form as a "database" or network structure, opposing it to a narrative, which "creates a cause-and-effect trajectory of seemingly unordered items (events). Therefore, database and narrative are natural enemies" (Manovich, 2001, p. 199).

Marie-Laure Ryan contests this, arguing that "narrative texts do more than chronicle actions and events; they also provide background information that situates these events within a concrete environment," and that if a database is well-designed, "the unpredictable probes and always incomplete exploration of the reader will not prevent the emergence of narrative meaning." Ryan explains that database and narrative can be reconciled in four ways: (1) through a narrative that is already familiar to the readers; (2) through a modular narrative, made up of "more or less autonomous" sections; (3) through a narrative that "foregrounds… setting, so that learning about the world in which the story takes place is at least as important to the reader" as the events of the narrative; and (4) through "a database design and a linking philosophy… transparent enough to enable readers to aim with precision at the elements of the story that they want to expand" (2006, p. 148).

How, then, can one design apply these insights to the construction of an academic "narrative database"?

While narratives have an intended beginning, middle, and end, they do not need to be presented in that order. As far back as Homer's *Odyssey,* writers have dropped audiences into stories *in medias res*—"in the middle of things"—then cut back to the beginning to explain how the protagonist got there, once the audience's interest has been piqued.

Christopher Nolan's *Memento* (2000) performs a functionally similar trick—repeatedly—by intercutting its primary (color) narrative in *reverse* chronological sequence with black and white sequences shown in chronological order. Over the course of the film, the two timelines race toward each other until they converge at the ending… or beginning, as it were. The film is often described as a "nonlinear" narrative, but there are two kinds of linearity at play in any story: what Russian formalism calls the *syuzhet* (the way the story is organized and presented to the reader) and the *fabula* (the chronological order of events within the story). In *Memento,* the *fabula* is still linear and fixed by authorial intent and by the nature of a narrative feature film as a format. In a chronological alternate edit included on one DVD edition, the *fabula* is identical to the theatrical cuts; Nolan has only shuffled around its *syuzhet*.

With historical hypermedia narratives, the *fabula* is necessarily fixed and constant; it doesn't allow for a reader to alter the events of the story through their choice, as in some interactive fiction. The reader may only affect the *syuzhet*. But as we have seen in *Building Stories* and the *Ken Burns* app, in particular, reader- or user-determined sequence can have meaningful effects on the reception of a collection's discrete elements.

Since sequence is used so heavily to form meaning, surrendering too much control over the sequence of a work can be tantamount to surrendering meaning of the work. "Public Secrets" comes dangerously close to simply being a collection of separate clips that read *as* separate clips, *without* creating a *tertium quid,* a Latin term for the "third thing" that arises from the combination of two other things (Eisenstein, 1969). For meaning to emerge, the parts must be in place so that the reader or viewer can recognize the connections between them.

A narrative experience is necessarily a designed experience: the application of structure to a group of events or ideas to create such a *tertium quid:* a feeling, an idea, or a larger narrative or metanarrative element. In other words, for the curation of a collection to simultaneously work as narrative, the collection and its presentation must be more than aggregation: it must produce something greater than the sum of its parts.

Borrowing two terms used most frequently in video game theory may be useful here. In video games, *embedded narratives* rely on limiting player choice. *Emergent narratives* are built around a huge range of choices. In the PC strategy game *Civilization*, the player plays a historical figure, and their actions over the course of a game—and the actions of their opponents—add up to the rise or fall of the player's empire. The game itself tells no story, but the narrative that arises from the gameplay is: "My Civilization conquered the world" (on a good day, at any rate). Embedded and emergent narratives are not binary, however; they exist on a continuum (Juul, 2002; Jenkins, 2004).

In most prose literature or narrative cinema, narrative is primarily embedded and features a prescribed sequence. The act of interpretation, including inferences and

assumptions, though, still results in a degree of narrative emergence. Was Teddy lying to Leonard at the end of *Memento?* Each viewer has his or her own answer. The inferences that audiences make from the information presented to them can be intended by the author or not, numerous or few, large or small. Audiences familiar with similar narrative devices (tropes) are able to make more and larger leaps than novice audiences—but relying on the audience to make too many or too large of leaps risks the authorial intent being obscured or lost. Certainly, not all writers would mind this.

Similarly, Amadieu, Tricot, and Mariné have shown that "constructing meaning from digital documents can be facilitated by designs that both foster relational processes (i.e. germane cognitive load) between different formats, representations or parts of information, and assist these processes by reducing the cognitive cost imposed by processes ineffective for learning (i.e. extraneous cognitive load)." They have found that readers with a high degree of knowledge about the subject of a hypertext are "able to cope with these semantic elaborations and can even benefit from coherence gaps imposed by hypertexts by triggering deep inferential activity"; that is, readers familiar with the subject are better able to make connections between implicitly connected nodes (blocks of text) than are readers unfamiliar with the subject (2015).

These findings suggest a challenge, then: to present a hypermedia narrative in a way that can be read flexibly, either as an *embedded* narrative—as linear text read straight through, ignoring all links and side notes, in whatever sequence the reader chooses—*or* as a compendia of essays, primary sources, images, etc.—from which a narrative can *emerge*. This suggests that integrating a collection of artifacts (e.g. primary

sources and images) with a relatively limited, modular narrative (e.g. a small set of essays or chapters) would address the needs of both novice and expert readers simultaneously. Novices will depend on the embedded narrative to understand the story, while expert readers may skip the essays entirely and jump straight into the digital collection.

Marie-Laure Ryan's first two conditions, in light of Amadieu, Tricot, and Mariné's findings and my own responses to the reviewed narrative hypermedia works, suggest that offering an introduction that presents the broadest strokes of the narrative could offer a framework or scaffold for "novice" readers to flesh out while exploring a site. Modular chunks of story would allow the reader to digest each section and giving them the option of exploring its sources *before* moving onto the next section. Keeping these "chunks of story" simple by not overburdening it with hyperlinks tangential to what they're currently reading will help keep novice readers focused until they choose to go off exploring. Don't get too hyper with the links, so to speak.

Technical and Content Considerations for the Website

This figurative database structure to the narrative suggests that the website should be constructed with a literal database—that is, a database-driven content management system. *The Victorian Web,* "Hearsay," and *Los Angeles* are products of "Web 1.0": generally static pages that supported interactivity beyond the hyperlink or an e-mail based HTML form. With the advent of "Web 2.0," Web content became "more data-driven, multi-platform, multi-purpose, collaborative, and socially mediated" (Baehr & Lang, 2012, p. 47). Not all of these features are beneficial to an academic project; a journal article by a single author or small team does not benefit from being openly editable to

absolutely everyone, like Wikipedia. But certainly, *The Victorian Web,* "Hearsay of the Sun," and *Los Angeles* could all be much improved with the use of a database-driven content management system—or, at the very least, the use of a database and a web template system—to standardize the site designs and facilitate the addition of new features or content to the site. These advantages in turn streamline the production process, reducing the time and cost to develop the sites substantially.

Aside from simply building the site using modern Web technologies, the reviewed works and literature suggest two less obvious necessities for an academic hypermedia narrative.

Accessibility, both short- and long-term. If the dissemination of new research is one of the goals for this (or any) academic hypermedia narrative project, *extensibility* and *accessibility* of the site are key concerns. The *longevity* of a site is a contributing factor to its continued accessibility. No website can be completely safe from the obsolescence of Web technologies, but based on the review of the above hypermedia works, there are a few ways to improve the longevity of a site.

One common pitfall for these older sites was a dependency on external assets, such as "Hearsay's" use of Picosearch's search hosting service or *Los Angeles'*s reliance on outdated versions of Java and Quicktime. With the continuous decline in usage for the Adobe Flash plug-in and the presumed corresponding decline in its install base, as well as its limited support on mobile device platforms, it is easy to imagine how public access to "Public Secrets" will decrease over the next several years (W3Techs.com, n.d.). Electronic publication is unavoidably ephemeral due to the ever-changing environment of

harwdare and software, but relying chiefly on ubiquitous technologies like HTML, CSS, and Javascript can reach the widest possible audience while also ensuring the longevity the site from inaccessibility due to obsolete or abandoned technologies. Server-side technologies such as PHP or MySQL are safe to use, because the developer has control over them—unlike visitors' operating systems, browsers, and any plug-ins they may or may not have installed.

Any kind of external dependencies open up a site for problems. To ensure longevity, a site should rely on as few externally hosted images, videos, webfonts, or scripts as possible—at least for critical functionality. Externally hosted assets should be extraneous, and externally hosted scripts should degrade gracefully in their absence. Links to external sites should not be necessary for basic comprehension of how an artifact relates to the site. *Inventing Europe*'s Object pages typically duplicate most of the metadata from the source collections' page for the same artifact; if the source institution's website were to disappear, or the URL changes, the consequences for the *Inventing Europe* site would be minimal.

Robust search functionality. The utility of "Hearsay of the Sun," *Los Angeles,* and *The Victorian Web* are significantly impacted by their broken, nonexistent, or poorly integrated search functionality. If a user cannot find something on the website, it may as well not exist. A capacity for exploration and "wonderful laser-like tools" (Landow, 1987) need not be mutually exclusive. In fact, search functionality—in conjunction with a tagging system—should facilitate exploration and meaning construction by enabling users to easily collect sets of artifacts. The popular "tag cloud" feature of many blog sites

has been shown to facilitate visual exploration, although some tag cloud layouts are less effective for finding specific information than others (Lohmann, Ziegler, & Tetzlaff, 2009).

Incorporating a digital collection with a robust search engine and richly interconnected artifacts/sources could satisfy Ryan's third and fourth conditions, too, fleshing out the time and place of the work (the Twin Cities in the late 1920s and early 30s) while allowing the user to wander through the sources to expand upon the parts of the narrative that interest them most or even discover their own stories.

Chapter 3: *Turn Out the Stars When You Leave*

The initial concept for what turned into this thesis project was to build an interactive image catalog focused on historic movie theaters. In a preliminary pilot study to gather information and opinions from knowledgeable participants to inform an evidence-based, user-centered approach to building such a website, I interviewed two participants chosen based on their use of image catalogs for two very different kinds of research. One was a professional cartoonist who has illustrated several non-fiction graphic novels, and the other was a Research Fellow and lecturer in Architecture at the University of Minnesota–Twin Cities. The participants' responses revealed three things they considered important in image catalogs: *efficiency, credibility* of (or confidence in) the content of the site, and a *social component:* that is, acknowledgment of the physical, historical, and social context for the search results/images.

Despite the small sample size, this social component convinced me to expand the scope of the project from a digital image catalog to a site that would include stories about the buildings and, perhaps more importantly, the people who inhabited them. This blend of image catalog and historical narrative struck me as significantly more novel and eventually evolved into the concept for *Turn Out the Stars When You Leave:* a hypermedia essay (or set of mini-essays) about Twin Cities movie theaters in the transition from silent to sound cinema, with a particular emphasis on the often overlooked role of labor.

The following steps were taken to design and produce the *Turn Out the Stars* site and are presented as a methodology for producing a similar website (or, really, any database-driven website or application):

1. Determine the scope and requirements for the project.

2. Design a static prototype.

3. Determine an appropriate content management system and identify other required technologies.

4. Develop the information architecture.

5. Build a dynamic prototype.

6. Conduct user testing.

As with any iterative design process, each of these steps involves four stages—evaluation (research), design (prototyping), testing, and refinement. This cyclical process should be repeated as many times as necessary before proceeding to the next step.

After completing user testing and finalizing the design, the website should be ready for deployment/launch. In the following sections, I describe my design process for *Turn Out the Stars* in terms of the above methodology.

1. Determine the scope and requirements for the project

Research and other data collection should be done at the beginning of every step of the design process. While this thesis paper is intended to facilitate such contextual and literature reviews by helping to establish standards for the creation of academic websites, thereby obviating some of the broadest levels of design research for such projects, the general design that I have used likely will be best suited for history projects and media

studies. Even where the generalities of my project are well suited for a given website, every subject will have different design requirements. I have already outlined my contextual and literature review in the previous chapter, so I will only discuss this step here in terms of how the appropriate format and techniques to use for the *Turn Out the Stars* website were determined.

The twin goals of scholarly research were constant touchstones, informing every significant design decision. First, how can an academic hypermedia narrative better present the findings of original research? Second, how can the design of such a website better facilitate further new research on the same subject?

My starting point for the design was the academic journal article, with its key features being text and citations. But this introduces some drawbacks. As writer and typographer Mark Butterick notes, "nearly 25 years into the age of digital typesetting," many of the rules for academic document layout remain essentially unchanged, despite their origins as necessities (or affectations) of the use of mechanical typewriters (2010). The very format of this MFA thesis paper is dictated by American Psychological Association format, used solely because it is required by the University of Minnesota's College of Design, despite its many shortcomings.

Surely, the discussion of the reviewed hypermedia works' design could be more easily and thoroughly described if pictures could be included on the same page. But APA style requires all figures to be included after the text of the paper, despite the obvious inefficiency of separating the image from the text discussing said image. Because this project revolves around redefining the standards of academic works for digital

publication, I was free to break from some of these standards. Yet I did not want to reinvent the wheel, either.

Echoing the participants of my preliminary study's desire for quickly establishing the *credibility* of an image or source, Cohen and Rosenzweig raise "*quality* and authenticity" (emphasis original) as key concerns in the production of digital histories (2005). Toward this end, collaboration—or, rather, public collaboration—was immediately ruled out. The information on this site must be credible; its content should not be editable by just anyone, as Wikipedia's is. In order to present a singular argument, there must be one authorial voice responsible for all of the content, for better or for worse: my own.

The Narrative. I developed the content for the website concurrently with the design of the website. A *Minnesota History* article by Robert Schultz, "More Than Wages: Twin Cities Theater Workers' Control Struggles" (1993) described the 1927 and 1931 movie theater strikes in the Twin Cities, but while looking further into the events, I uncovered some additional continuities that contributed to the 1927 strike, such as a move to cut salaries taking place across the entire movie industry that year (producers, distributors, and exhibitors alike) and the expansion of the theater exhibition chains that was going on at this time. I developed this into a seminar paper for a Historiography of the Moving Image course with Dr. Alice Lovejoy, relying heavily on articles from a number of archival sources.

Minneapolis Tribune, Minneapolis Labor Review, Minnesota Union Advocate, and the *Saint Paul Pioneer Press* offered a local perspective. The *Minneapolis Labor Review*

and the *Union Advocate* are available online through the Labor Review Archive Project and the Union Advocate Digital Archives, respectively. Both sites are powered by Arcasearch, a digital archiving service with a Flash-based interface. The local newspapers were found primarily through the Lucile M. Kane and John Alley Dougherty motion picture research files at the Minnesota Historical Society.

For national perspective, I relied on *The Film Daily* and *Motion Picture News,* which are available via the Internet Archive. I used *Lantern* frequently, but paged through every late 1927 issue of both publications because of the unreliable quality of the search results (due to the OCR text). From that research, I developed what would become the central narrative of *Turn Out the Stars When You Leave.*

Citations. Because *Turn Out the Stars* is a work of media history, I opted to use that field's standard citation style as my starting point. The Chicago Manual of Style's notes and bibliography system specifies the use of footnotes, which I prefer to the APA style's obtrusive in-text citations used in this paper. But whereas on a printed page, a footnote only takes a split-second glance to review, on a screen, the "foot" of the page is often a great distance from the reference marker. A print page and a web page are not analogous.

In *Slate,* writer Tyler Lopez suggested one alternative: "attributing credit to an original work by formatting hyperlinks directly into the text of an academic paper or assignment. No footnotes, no parentheses, no dates, and no page numbers" (2014). This goes too far by not being informative enough—hardly appropriate for an academic text. Lopez explains that "when formatting a hyperlink, writers need only enter a ScreenTip

[tooltips] with the author's name, article title, and publication name, if applicable" to include relevant bibliographical information. But tooltips are inaccessible to touch-based devices, because they rely on mouse hover states. While the small screens of smartphones make them unlikely choices for a close reading of any academic text, let alone an academic hypermedia site, tablets are a perfectly suitable size for lengthy reading sessions. With over 40% of American adults now owning a tablet and 60% of all Internet use being spent on mobile devices, touch-based devices are too large of a segment to ignore (Zickuhr & Rainie, 2014; Lella & Lipsman, 2014).

Edward Tufte's seminal books on data visualization suggest a solution: the use of sidenotes to present citations and other comments. Positioning these notes alongside their related content offers a much more accessible and user-friendly solution for scrollable screens than footnotes. Hyperlinked reference marks help users to find side notes where they cannot be aligned (e.g. when longer sidenotes earlier in the text push them down). Since the notes and markers tend to be in relatively close proximity, this is of greater utility to users when Javascript is disabled. In the absence of Javascript, the sidenotes simply fall one after another at the top of the sidebar column.

Primary Sources. With as direct access as possible to my sources, visitors can verify or refute any of my assertions with just a click or two, much like "Hearsay of the Sun" did fifteen years ago. But where "Hearsay" included only the text of Thurston's sources, that the visual component of the primary sources was not something to be removed—or at least not in a work of media history.

Where possible, article were not cropped out of the page, because the context is often interesting; the other articles on the page or even the advertisements may provide context for a reader. Instead, the other articles on the page were a grayed out with an overlay applied in Adobe Illustrator. This makes locating the article easier—particularly on labor newspaper pages with as many as seven densely packed columns—without rendering the surrounding articles illegible. The unaltered pages can still be easily viewed through a link to the source collections' page for the same resource.

The benefits of including a text transcription are obvious: text can be searched, as well as copied and pasted for citation purposes. Images, on the other hand, are less accommodating. Therefore, both a transcript and a reproduction of the pages on the Primary Source pages were included. All bibliographical information was crucial to include in the site. The link to the source collection provides access to non-essential additional information about the artifact (i.e. information about licensing a photo or a collection number). It was not important to duplicate every bit of metadata; the site's purpose is to present original research, after all, not to replace the digital collections that already exist.

Books were not included on the site, because of the huge numbers of pages that could require and, with more modern sources, copyright concerns. Where digital versions are available (as with Harold B. Franklin's *The Motion Picture Industry*, which is available on the Internet Archive), rather than embedding them, the site offers links to the resource on the external digital archive. Otherwise, links to WorldCat are provided so researchers can quickly locate the title in the collections of their local libraries. The one

exception to this exclusion of "books" was for excerpts from *The Film Daily Year Books*, which seemed more akin to an annual trade journal supplement.

Images. While only a limited number of images can be inserted into the essays (and at relatively small sizes), including as many relevant images as possible in the Collection could help enrich the narrative by providing visual context for visitors. On Figures pages (like the Primary Sources pages), the largest possible reproduction was included, as well as bibliographical information.

Some images were cropped for use in headers and menus, or color corrected a few menu thumbnails for visual balance. Otherwise, no color correction, cropping, straightening, or stylization of photographic artifacts was performed on any images. This decision was based on the assumption that all of the photographic artifacts were manipulated already by the source institution to produce as accurate of a representation of the original artifact as possible. In any case, it would be inappropriate to further "correct" images without direct physical access to. Doing so would only degrade the image.

A handful of images for articles from trade journals and labor newspapers, however, would be adjusted for better legibility (i.e. increasing contrast). As opposed to the photographic elements, these images are already significantly degraded from their conversion with optical character recognition (OCR) software or image compression and unlikely to display great color fidelity to the original publications. It is assumed that these degradations are the result of prioritizing the scannability of text in these publications over image fidelity.

2. Design a static prototype.

Developing a static prototype before determining how the site would be built ensured that the choice of content management system would not dictate the format for the site. The integration of the necessary elements of the site (the narrative with citations, sources, and images) was informed by the findings of the content analysis and the literature review.

Ryan's first condition and Amadieu, Tricot, and Mariné's findings suggest that the use of the narrative as a backbone for the site would help readers make sense of the contents of the database (the primary sources and photographs) by familiarizing them with some of the themes found within them before they explore the digital collection more freely. As in "Hearsay of the Sun," *Los Angeles,* and the various exhibitions in *Inventing Europe* or timelines in the *Ken Burns* app (and unlike *The Victorian Web*), a coherent narrative would bring order to an intimidating mass of articles and photographs.

Ryan's second condition for reconciling database and narrative suggested breaking the narrative apart into shorter essays, so that readers could pause to interrogate the sources or further explore some moments from the story at the leisure without losing track of their progress. This modularity should also allow for the reader's explorations to feel like expansions of the central narrative, rather than digressions from it.

Finally, Ryan's fourth condition and the difficulties exploring "Hearsay of the Sun" independent of its narrative, suggested the need for a site structure that allows readers to find any of the site's sources and photographs. Discrete pages for every source and photograph and a robust search engine should allow for the "precision" Ryan calls

for—and, again after Amadieu, Tricot, and Mariné's findings, should let readers who already possess a high degree of knowledge of the site's themes skip past the narrative entirely and explore the collection freely.

See *Appendix B:* Design Document for a breakdown of the static prototype, including notes for the data model.

General Design Specifications. To better support iPads and other tablets, the site width was set to 980 pixels. Since all websites in iOS can be saved as Web apps with the "Add to Home Screen" option in the Safari's Action panel, the site includes custom icons for iOS to use should a user decide to do this. Essentially, the site itself is an extensible, interactive eBook that runs in your browser. Large, easy to read typeface with generous line lengths (if not quite double-spaced) would facilitate longer reading sessions.

Home Page Design/Table of Contents. The initial, static prototype of the site featured a "cover"/splash screen and a separate table of contents. Prior to user testing, the Table of Contents was essentially redundant and combined it with the home page.

The home page, like the title of this project, was inspired by a passage from Maggie Valentine's *The Show Starts on the Sidewalk.* While discussing atmospheric style movie theaters, which have domed ceilings featuring blinking "stars" and clouds projected on the canopies. Valentine mentioned a theater in Faribault, Minn., which posted a sign for its workers saying, "Please do not turn on the clouds until the show starts. Be sure the stars are turned off when leaving" (Valentine, 1994). The white silhouette against dark blue is inspired by Wedgwood ceramic ware. Some of Wedgwood's most iconic designs feature a soothing light blue jasper with white

ornaments, dubbed "Wedgwood Blue" ("The Story of Wedgwood," n.d.). The stark white silhouette of Minneapolis's Granada Theater (now the vacant Suburban World Theater) signifies absence—of the many theater buildings that feature into the site's narrative that are now vacant or demolished, and of the labor unions from today's movie theater industry. The deep blue hue and the cloud animation of the *Turn Out the Stars* home page are intended to produce a calm, sort of hypnotic or meditative state in the viewer.

Essay Page Design. On *Turn Out the Stars*, the WordPress plug-in Link Indicator automatically adds an *offsitelink* CSS class to any links directed off-site. This appends an icon (⬈) after each external hyperlink, so that readers are aware that the link will take them off of the *Turn Out the Stars* site, so long as they either read the About This Project page or are otherwise familiar with this design pattern from Wikipedia and other sites. This could be accomplished by adding the *offsitelink* class to each link manually, but automating it ensures consistency. Because usability research indicates that opening links in new tabs or windows presents usability issues, all links on the site open in the current window, as the user would expect (Nielsen, 2011).

Source Page Design. How to display the wildly variable page images was longstanding issue. Initially, the page images were displayed at the top of the source page, above the bibliographic information, but this proved impractical for multiple reasons. First, some articles would require more than one image, pushing the bibliographic information farther down the page. Second, pages from labor newspapers would be illegible at even 880 px wide—the widest the site design allows.

By the time user testing was conducted, articles were presented with bibliographic information most prominent, as if they were an expansion of the footnote citation, and images were included as thumbnails off to the side. Image lightboxes (often Javascript "plugins") are widely used on the Web to display images outside of a website's standard design, but they are often inflexible. Some don't allow you zoom into an image, which, for the enormous labor newspapers, was did not solve the issue of small type on the labor newspaper articles. Others perform sluggishly, particularly on mobile devices.

Ultimately, a low-tech solution proved best: plopping the image into the middle of an otherwise blank page. This technique proved ideal, because the standard zoom keys on a desktop browser and pinch-to-zoom gestures on touch devices work absolutely smoothly with no additional coding or no Javascript dependency.

Tags and Tag Pages. Tags for related subjects, events, or people are featured on the source pages. Tagging (or not tagging) articles as related to certain subjects unavoidably introduces some degree of bias. For instance, while individual bombings (including stink bombs) in late 1927 were variously blamed on the striking labor unions and on anti-labor forces, they were never conclusively connected to the strike. As such, it was more appropriate to tag these articles with a "bombings" tag and only added the "1927 Twin Cities theater strike" tag where the article specifically discusses the strike. The golden hue for tags was inspired by the faded, tan of the old paper in many of the photographs and articles found in the collection and selected to visually distinguish them from the blue links used elsewhere.

Tag pages feature a short description of their subject and display all of the posts with the same tag applied at the bottom of the page in chronological order, as well as a link to begin a site search from the same results.

Search page design. Because of the significance of the search page, I reviewed several archival sites' search functions for insights into what categories users would be interested in. The Minnesota Historical Society's Collections search page proved particularly helpful. I also referred back to my preliminary interviews about image catalogs for guidance.

3. Determine an appropriate content management system and identify other required technologies.

After building the prototype, I needed to build it. I am not an expert coder; I am good with HTML, competent with CSS, and only vaguely familiar with Javascript and PHP, so building a solution from scratch was not an option. Fortunately, there are numerous content management systems that would do the majority of what I needed. After a review of the available systems, two systems looked like the most suitable options: Omeka, which was developed by the Roy Rosenzweig Center for History and New Media and George Mason University, and WordPress, which is the most widely used blogging system on the Web (BuiltWith, n.d.).

WordPress is generally geared toward blogging. It features pages generally used for static content, hierarchically categorizable posts, and a tagging system. Omeka, on the other hand, is specifically built to provide scholars with the tools to publish standards-driven, collections-based research and online exhibits. It is built around items, with

collections (groups of items) and exhibits (pages that showcase specific items), and also features a tagging system.

I compared multiple projects created using each system, as well as the plug-ins available for each, and ultimately decided to use WordPress, because of its enormous library of plug-ins and extensive online resources. Based on previous experience building a handful of blogs in WordPress, I knew it could be customized to accommodate the design of the prototype, and I was confident that I could easily find online help for any issues I might run into. Omeka, on the other hand, seemed best suited for more a image-focused digital collection than my prototype.

Having settled on WordPress, I identified a selection of WordPress plug-ins that would help customize its built-in functionality for my purposes. Additional, less critical plug-ins would be identified when I began to build the dynamic prototype, but the following plug-ins addressed the major functionality needed for the site:

Side Matter by Christopher Setzer. Side Matter uses Javascript to adjust the positioning so that notes are automatically aligned with the corresponding reference mark. This alone is simple enough (I created a similar script for my static prototype), but Side Matter also detects where citations overlap and push the later notes down to prevent this. Ultimately, this plug-in was too inflexible for styling the display of the citations, so I customized it slightly and baked it directly into my theme. (Side Matter was released under a General Public License permitting for such reuse of Setzer's code.)

WP Custom Post Template by Dotsquares. WP Custom Post Template simplifies the template creation process by allowing different post templates for different

kinds of entries in a WordPress site. This let me easily create different templates for displaying the Figures, Books, and Primary Sources.

Advanced Custom Fields Pro by Elliot Condon. WordPress has limited custom metadata support—only an index (name) and a text string (value), but Advanced Custom Fields allows the creation of fields for images or arrays of images, as well as sets of metadata that can be automatically added to a post when a specific Post Template is applied, streamlining the process of adding artifact entries to the Collection.

Search & Filter Pro by Designs & Code. WordPress's built-in search functionality is fairly basic and complicated to customize; it also doesn't automatically search metadata fields, which would significantly diminish its utility for the site. With Search & Filter Pro, I could easily generate (and update) a flexible, accurate search form.

4. Develop the information architecture.

Information architecture is a means of describing a site's data elements and how they relate to each other. This informs the website's structure to an extent, as well. Because I am unfamiliar with MySQL, I relied on WordPress and Advanced Custom Fields to store the site's data, therefore the site relies on the existing database model. But a conceptual data model could help refine the static prototype into an efficient, producible dynamic site.

From the static prototype, I knew what information each Source or Figures page needed to include. (Again, see *Appendix B:* Design Document, for the static prototype and my notes on the data model.) Sources, for example, needed the headline, a transcript, a subhead (where applicable), the publication name, authors (where known), the image or

images, volume number, issue number, date, place of publication, page number, source collection ("archive"), a URL to link to the article in context, plus a list of any relevant tags, such as people or places figuring into the story or image. I later added a Citation item for each source, so visitors could cite an article or image in their own research. (These citations link to the source collections, not the *Turn Out the Stars* website.)

I reviewed this list and identified fields that could use standard WordPress fields: Title (article headline), the Transcript (body copy), Post Tags (post tags), Categories (artifact type), and Date (publication date). In some cases, the Search function would impose some requirements. For instance, a custom taxonomy called Locations was needed to allow users to filter sources by geographic locations. Search also requires a month and day for all dates, which are not always available, particularly for figures or monthly periodicals or photos with no exact date. For these cases, I used a text field for the "visible date" the standard WordPress date as a "sort date" (January 1, 1933, for "1933"; July 1, 1927, for "July 1927"; etc.).

With the necessary information identified, I set up the field groups required to construct each page dynamically from the available data. Most of the fields are stored as text; the exceptions are the sort date, the image or image array, and the Read In Context URL.

As with any iterative design, refining the model is crucial. Before proceeding, I reviewed the data model and identified any redundant data or data that could be displayed dynamically (e.g. inferred or combined) from other fields in order to use the fewest

custom fields possible? For instance, the Citation listing was built in the page's PHP code from the other available fields.

5. Build a dynamic prototype.

In order to effectively build a dynamic prototype, there must be some sample data: a handful of pages and posts (including a few sources and images), to start. I added one of the essays to the site and added its sources.

Once all of the functionality and styles were working as desired, I finished all of the essays and filled out the database with all of the cited sources, as well as other thematically related articles and images that I found interesting (and at least semi-relevant). The process of adding new sources to the collection—correcting transcriptions (or typing them from scratch), descriptions (for photos), and preparing the article images for hundreds of results—was the most time-consuming part of the entire process, and this continued throughout the user testing stage, but the amount of time involved would have been exponentially greater were I not building on the work of the Media History Digital Library, the Lucile M. Kane and John Alley Dougherty motion picture research files at the Minnesota Historical Society, and others. This part of the process would likely be of less concern to organizations and individuals with better funding than myself, who could afford to enlist the help for this amount of data entry. Official collaborations, such as with *Inventing Europe,* could streamline this process further through the use of APIs (application programming interface) or other automated methods of transferring data from one digital collection to another.

The search function was the hardest to implement. My initial design, which featured a separate search bar from the filters in the sidebar, was not producible with the Search and Filter Pro plug-in that powers the site functions. Merging it into the sidebar was one of the few design concessions I would be forced to make. (It is likely that a better coder than myself could have figured out a workaround.)

The "Index" page was added at this stage. On occasion, the lack of any complete list of sources or tags made finding specific pages on the site difficult. Rather than using a standard tag cloud layout, with its random positioning and larger type sizes for more frequently used tags, I used an unweighted alphabetical list because users can scan them more quickly for the tag they are looking for (Lohmann et al., 2009).

6. Process and results of the user testing.

The design and functionality of the prototype website was evaluated through user testing, a process in which participants review a site and note their opinions of the site and any issues that they had in order to guide the refinement of the existing prototype. The Nielsen Norman Group has found that at least fifteen participants will find nearly all usability concerns with a design, recommending three rounds of testing with five users (Nielsen, 2000). As of this writing, I have conducted two rounds of five participants each, which should have revealed the majority of usability problems.

Participants were selected by a convenience sample, consisting primarily of undergraduate and graduate students at the College of Design, as well as one recent graduate of the MFA program. Participants were recruited largely through a convenience sample, via e-mail and Facebook. Users provided their own devices in order to minimize

any issues that could arise from being unfamiliar with constant testing environment (i.e. an unfamiliar operating system or browser). Four of the five tests in the first round of testing were conducted in person. The remaining tests (including all of round two) were completed online.

With the in-person tests, I observed and recorded notes and comments as the participants tested the site in general and were instructed to a handful of specific tasks. I was also able to follow up on comments as they were made in order to better understand their concerns. In the online tests, users were instructed to perform the same tasks but responded with text. In both cases, participants also filled out a series Agree/Disagree scales for a variety of statements about the design and functionality of various parts of the site (i.e. the Essay pages, Source and Figure pages, and Tag pages). The full survey and responses for Round 1 are included in Appendix C, with notes from the in-person tests in Appendix D. The full survey and responses for Round 2 are included in Appendix E. I acknowledge that several of the participants were familiar to varying degrees with the underlying concept of my thesis project prior to testing, making the validity of their responses for the first question (evaluating the design of the homepage and what kind of site it suggested to visitors) unreliable.

A number of comments and criticisms lead to minor refinements to the site design. For example, some participants identified errors or inconsistencies in the content or design, suggested edits to make the "About This Project" page more scannable, adjustments to the line height, or expressed confusion about certain elements (such as unclear labels on the Search page). Many of these were fairly straightforward, so some of

the comments from Round 1's participants were implemented prior to Round 2. One larger structural adjustment, based on a few participants' comments, involved highlighting the "Introduction" section more effectively, by moving it out of the radial navigation menu and into the top left-most position on the site navigation.

Some insights, such as a desire for more images in some of the essay pages, were already planned. But, based on the two rounds of user testing, the design of the site still has a few areas for refinement:

- Some users indicated that they would like the date-based tags separated from the rest of the tags. This would require changing them from WordPress tags to a custom taxonomy, much like I did for Locations. I would then be able to create a separate filter for them on the Search page.

- Some users indicated that the Tag pages could be more robust in terms of displaying biographical about tagged people. At present, tags are implemented as WordPress tags, which have limited functionality; WordPress does not treat tags as posts, so they cannot show up in search results and featured images cannot easily be added to Tag pages. But changing them to categorized posts would allow distinct templates for various subcategories to be applied (e.g. people or buildings) with additional metadata (e.g. biographical or architectural data) or featured images, where available.

- The experiments with non-sequentiality did not appear entirely successful. Several participants felt confused about where they what they were "supposed" to read next, despite efforts to make it clear that there was no set order. Having no

intended sequence may also undermine the clarity of the site's argument. With the final prototype, I have assigned an explicit, linear table of contents on the homepage, which may be preferable to some users.

The participants generally agreed that the design encouraged them to explore the content of the site further and the site felt (appropriately) like an academic publication. One participant who disagreed, however, said that, "The page did not look like an academic publication but a credible news source. It is what an academic publication should look like."

Another participant stated, "It'd be great if you forced people to make things this way for heavily referenced material. It's really refreshing. I can read it straight through, and I can choose to back up (or) validate your information immediately with a source." The same participant was even more excited by the site on the iPad, adding, "This feels perfect for this. This looks a lot better here than it did up there [on the desktop]."

The participants' responses validate the underlying concept of the site and confirm the utility of the specific design and functionality, while providing guidance for how to continue developing the *Turn Out the Stars When You Leave* site. But in its current state, the site appears to be a substantial improvement from existing academic hypermedia narratives.

Chapter 4: Conclusion

Even before the prototype or user testing was completed, I was confident that the site, which can be seen at http://www.turnoutthestars.org, could successfully achieve its goal of facilitating new research, because as soon as I began filling out the database with more than just an initial sample data, I was able to search the sources in the site's database to research portions of the essays for the site. While there are still several significant areas for improvement, as a Web-based project built on a database-driven content management system, both the content and the design can be easily and continually improved. As Landow and Delany noted, "Hypertext materials are by definition open-ended, expandable, and incomplete" (1991, p. 13).

Additional essays and sources could be added to help readers discover connections more easily, or to expand the scope of the narrative. For instance, when I conducted the bulk of my archival research in 2014, the 1927 issues of *Variety* were only available online behind an expensive paywall on its own Variety Ultimate site. These have since been added to the Internet Archive (by the Media Digital History Library), and so I have added a handful of relevant articles from it to the *Turn Out the Stars* collection, but a more thorough scouring of the relevant issues could provide additional perspective. I hope to secure funding in the next year that will help me flesh the narrative out, as well as to continue refining the design, either through grants or crowdfunding. Provided the new artifacts are at least tangentially related, the site's narrative coherence should be maintained.

The most significant benefit of this project is its ability to be used as a model/ reference for the presentation of future academic narratives. The modern Web technologies used to build the *Turn Out the Stars* represent a huge leap forward from the techniques used in *Los Angeles* or "Hearsay of the Sun" and an incremental improvement from present-day academic hypermedia projects. Using WordPress, academics who are not coding experts can quickly and easily develop interactive presentations of academic essays that incorporate primary sources into their sites. I will release a stripped-down "Academia" theme to Github in the near future (incorporating my adaptation of Christopher Setzer's Side Matter and only the barebones site structure), to make this process even simpler for non-designers.

Further research into or experimentation with the use of Web-based content management systems as a publishing platform for original research could develop these ideas even further. For instance, WordPress allows for multiple users with access to the back-end, at varying levels of access. While *Turn Out the Stars* was a one-person operation, a team of researcher-developers could streamline their collaboration in the same ways that it is already used for collaborative blogging and other publishing endeavors. Similarly, one of the great blessings and curses of Web 2.0 is the democratization of expression through commenting. While I removed WordPress's commenting system from the site to prevent inaccurate or otherwise unwelcome "contributions" to the site (i.e. spam, off-topic conversations, abuse), it is easy to imagine how vetted users could offer corrections and clarifications to any of the content or point

toward valuable information or resources elsewhere on the web through a commenting system or improve the accuracy of the tagging or transcriptions throughout the site.

The development of standards in academic hypermedia is not merely a question of formatting and access; it is also one of economics. Academic journal publishing today perpetuates a system where large publishers have little incentive to exploit the benefits of hypermedia and individual researchers are poorly equipped to do so financially (Jakubowicz, 2009)—at least, not without piggybacking off the collective work of existing digital collections, as this project does. The lack of standards in academic hypermedia means that every researcher interested in creating an academic hypermedia project essentially starts from scratch and risks choosing inefficient or outright ineffective technologies and formats. The technological and methodological model presented here is built primarily on free, open-source technologies with relatively basic coding requirements; this allows researchers interested in producing academic hypermedia products to spend more time conducting research and less time designing and building websites. As the technological barriers for Web publication of academic works are lowered, so are the economic barriers.

It is possible that a standardized format for academic hypermedia will never arrive. New technologies (both hardware and software) will continue to enable new possibilities and disrupt the status quo. But the advances made with digital collections and libraries have been long overdue for integration with original, academic research—to move beyond simply providing access to materials, toward more fully realizing the potential of electronic academic publication to do more than print. It is my belief that

Turn Out the Stars When You Leave represents a small but significant step forward in the

ongoing manifestation of that potential.

Bibliography

Amadieu, F., Lemarié, J., & Tricot, A. (2015). How may multimedia and hypertext
documents support deep processing for learning? *Psychologie Française*, *In
Press*. http://doi.org/10.1016/j.psfr.2015.04.002

Baehr, C., & Lang, S. M. (2012). Hypertext Theory: Rethinking and Reformulating What
We Know, Web 2.0. *Journal of Technical Writing and Communication*, *42*(1), 39–
56. http://doi.org/10.2190/TW.42.1.d

Berners-Lee, T. (1991, August 6). WorldWideWeb: Summary. *alt.hypertext*. Retrieved
from https://groups.google.com/forum/#!msg/alt.hypertext/eCTkkOoWTAY/
bJGhZyooXzkJ

BuiltWith. (n.d.). CMS Usage Statistics (week beginning Nov 23rd 2015). Retrieved
November 27, 2015, from http://trends.builtwith.com/cms

Butterick, M. (2010). *Butterick's Practical Typography*. Retrieved from http://
practicaltypography.com/index.html

Cohen, D. J., & Rosenzweig, R. (2005). Introduction: Promises and Perils of Digital
History. Retrieved November 28, 2015, from http://chnm.gmu.edu/digitalhistory/
introduction/

Daniel, S. (2007). Public Secrets. *Vectors*, *2*(2). Retrieved from http://vectorsjournal.org/
issues/index.php?issue=4

Eisenstein, S. (1969). *Film Form: Essays in Film Theory*. New York, NY: Harcourt Brace
& Company.

Ethington, P. J. (2000, December). Los Angeles and the Problem of Urban Historical

Knowledge. Retrieved November 21, 2015, from http://cwis.usc.edu/dept/LAS/

history/historylab/LAPUHK/index.html

Fitzgibbons, M. (2008). Implications of Hypertext Theory for the Reading, Organization,

and Retrieval of Information. *Library Philosophy and Practice*. Retrieved from

http://digitalcommons.unl.edu/cgi/viewcontent.cgi?

article=1173&context=libphilprac

Gardner, W. L., Lowe, K. B., Moss, T. W., Mahoney, K. T., & Cogliser, C. C. (2010).

Scholarly leadership of the study of leadership: A review of The Leadership

Quarterly's second decade, 2000–2009. *The Leadership Quarterly*, *21*(6), 922–

958. http://doi.org/10.1016/j.leaqua.2010.10.003

Jakubowicz, A. (2009). Beyond the static text: multimedia interactivity in academic

journal publishing in the humanities and social sciences (not). *The Future of the

Academic Journal*, 361–376. http://doi.org/dx.doi.org/10.1016/

B978-1-84334-416-2.50018-5

Jenkins, H. (2004). Game Design as Narrative Architecture. In N. Wardrip-Fuin & P.

Harrigan (Eds.), *First Person: New Media as Story, Performance, and Game* (pp.

118–130). Cambridge: MIT Press.

Juul, J. (2002). The Open and the Closed: Games of Emergence and Games of

Progression. In F. Mäyrä (Ed.), *Computer Games and Digital Cultures

Conference Proceedings* (pp. 323–329). Tampere: Tampere University Press.

Retrieved from http://www.jesperjuul.net/text/openandtheclosed.html

Ken Burns Media. (2014). *Ken Burns* [IOS]. Ken Burns Media, LLC. Retrieved from

    https://itunes.apple.com/us/app/ken-burns/id723854283

Landow, G. P. (1987, 2012). What is the Victorian Web? Retrieved October 16, 2015,

    from http://www.victorianweb.org/misc/vwintro.html

Landow, G. P., & Delany, P. (1991). Hypertext, Hypermedia and Literary Studies: the

    State of the Art. In *Hypermedia and Literary Studies* (pp. 3–50). Cambridge, MA:

    The MIT Press.

Lella, A., & Lipsman, A. (2014, August 21). The U.S. Mobile App Report. comScore.

    Retrieved from http://www.comscore.com/Insights/Presentations-and-

    Whitepapers/2014/The-US-Mobile-App-Report

Lohmann, S., Ziegler, J., & Tetzlaff, L. (2009). Comparison of Tag Cloud Layouts: Task-

    related Performance and Visual Exploration. In *INTERACT '09 Proceedings of the*

    12th IFIP TC 13 International Conference on Human-Computer Interaction: Part

    I. Berlin: Springer-Verlag. http://doi.org/10.1007/978-3-642-03655-2_43

Luxury Craftsmanship to Ravish the Senses: The Story of Wedgwood. (n.d.). Retrieved

    December 1, 2015, from http://www.wedgwood.co.uk/history

Manovich, L. (2001). *The Language of New Media*. Cambridge, MA: MIT Press.

Moura, G. (n.d.). The Kuleshov Experiment. Retrieved from http://

    www.elementsofcinema.com/editing/kuleshov-effect.html

Mulvenna, J., Moertel, L., Jones, M. K., Nawaratna, S., Lovas, E. M., Gobert, G. N., …

    McManus, D. P. (2010). Exposed proteins of the Schistosoma japonicum

tegument. *International Journal for Parasitology*, *40*(5), 543–554. http://doi.org/
10.1016/j.ijpara.2009.10.002

Nielsen, J. (2000, March 19). Why You Only Need to Test with 5 Users. Retrieved from
http://www.nngroup.com/articles/why-you-only-need-to-test-with-5-users/

Ryan, M.-L. (2006). *Avatars of Story*. University of Minnesota Press.

Schulz, R. (1993). More Than Wages: Twin Cities Theater Workers' Control Struggles.
Minnesota History, *53*(8), 323–333.

Stephenson, M. H., Angiolini, L., Leng, M. J., Brewer, T. S., Berra, F., Jadoul, F., … Al
Beloushi, B. (2008). Abrupt environmental and climatic change during the
deposition of the Early Permian Haushi limestone, Oman. *Palaeogeography,
Palaeoclimatology, Palaeoecology*, *270*(1–2), 1–18. http://doi.org/10.1016/
j.palaeo.2008.08.008

The Article of the Future. (n.d.). Retrieved November 30, 2015, from http://
www.articleofthefuture.com

Thurston, T. (1999). Hearsay of the Sun: Photography, Identity, and the Law of Evidence
in Nineteenth-Century American Courts. *Hypertext Scholarship in American
Studies, American Quarterly*. Retrieved from http://chnm.gmu.edu/aq/photos/
index.htm

Valentine, M. (1994). *The Show Starts on the Sidewalk: An Architectural History of the
Movie Theatre*. New Haven, CT: Yale University Press. Retrieved from http://
www.worldcat.org/title/show-starts-on-the-sidewalk-an-architectural-history-of-
the-movie-theatre-starring-s-charles-lee/oclc/28181021

W3Techs.com. (n.d.). Usage of Flash for websites. Retrieved November 26, 2015, from

  http://w3techs.com/technologies/details/cp-flash/all/all

Zickuhr, K., & Rainie, L. (2014, January 16). E-Reading Rises as Device Ownership

  Jumps. Retrieved from http://www.pewinternet.org/2014/01/16/e-reading-rises-as-

  device-ownership-jumps/