GeoStoryteller: Taking grey literature to the streets of New York

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I. Brief description

In this paper, we briefly describe the design and implementation of the GeoStoryteller project, with particular emphasis on the resources used to create the digital narratives that are the core of the application. GeoStoryteller is a project where learners engage with archival photos and multimedia narratives in historically relevant places using a combination of augmented reality technology and web-based delivery via mobile devices. The initial application of GeoStoryteller is in partnership with the Goethe-Institut New York, the worldwide cultural organization of Germany. In this partnership, learners—particularly German language students in the United States—engage with content that details the historical events and makes use of real places related to German immigration to New York City (1840-1945). Second, based on the design and implementation of this project, we offer a framework for creating location-based mobile learning projects that could be used by others interested in implementing similar projects. Lastly, we profile the sources used to create the digital narratives, the majority of which (76%) were grey literature materials.

II. Designing GeoStoryteller

GeoStoryteller builds upon recent research and development from the emerging subfield of the Digital Humanities known as GeoHumanities, which is a term that highlights the growing interconnections between geography and the humanities. GeoStoryteller strengthens this connection specifically by layering historic narratives on a specific location and by making it available to learners' Internet-enabled mobile device. In the case of the application of GeoStoryteller with the Goethe-Institut—named German Traces NYC—learners can view location-sensitive maps and lists of historic sites related to German immigration to New York. Once a learner arrives at a physical site, he or she can see historic photos layered against the imagery visible through the camera's phone (also known as augmented reality), as well as watch videos about that particular site that include historic narratives and archival photos. Users can also play short trivia games

that answers can only be found from being on physical location and post their accomplishments to Facebook or Twitter.

For developing the videos—which we also refer to as GeoStories—we turned to published, non-published, digital and non-digital sources available from cultural and memory institutions (libraries, archives, museums and historical societies). Using these sources we developed historical narratives as text, and set those to audio recordings that were augmented with archival photos.

We then used geotechnologies to deliver the narratives to users' mobile devices (smart phones, such as iPhone, Android, Blackberry, and tablets such as iPad) at the places where these events occurred. Geotechnologies used include global positioning systems (GPS), digital mapping services (available through Google) and Layar, an augmented-reality browser for mobile devices.

For example, users can find such sites as the Ottendorfer Library, the oldest public library in Manhattan, opened originally to support the German immigrant community in Kleindeutschland—or Little Germany (today known as the East Village; see Figure 1). While on site, learners can learn about the people who crated the physical site, why they created the site (e.g., philosophies that motivated their action) and how that site has changed over time to reflect cultural and world events (e.g., anti-German sentiment during both world wars).

Figure 1. Augmented-reality interface for retrieving multimedia stories.

III. Framework for creating location-based mobile learning projects

From our experience developing GeoStoryteller, we offer a framework that can be used in the planning and implementation of similar projects.

At the core (the inner section) of this framework is traditional humanities research and development (see Figure 2). In the case of the GeoStoryteller project, this included print, non-print, digital, digitized, non-digital, archival, and published sources, all used to construct historical narratives of German immigration in New York. Placing humanities research and development at the core of the framework highlights what distinguishes a digital humanities project from other digital projects. Additionally, this type of research and development could be done with other fields of the humanities, including philosophy, literature, and the arts.

Next, we proceed to the “Theory and Interface Development” ring. At this stage, researchers must consider the theory that will inform their project, and how this theory will be reflected in the user interface available to the learner. For example, some of the theoretical questions we asked were, how does situating historical content in physically relevant locations affect learner engagement? And does making augmented-reality

content available to learners further enhance engagement? Such questions necessarily lead to decisions about how to present the content within a digital interface.

In the third ring, learners engage with the socio-technical environment created by the researchers. In the case of GeoStoryteller, this includes not simply a user interface, but also the physically relevant locations that the interface prompts the user to explore. Additionally, social interactions may occur during this stage among multiple others in the environment (e.g. a librarian in the Ottendorfer library). It cannot be assumed that the best learning experience comes from the digital device, but could result from the serendipitous interaction in the real environment.

From this stage, we proceed to the fourth ring, which is the formal user research. In this stage, we use traditional (e.g., surveys and interviews) and digital (e.g., tags, hits, time stamps) social science research methods to uncover the working of the interface, address the theoretical questions, and evaluate the learning outcomes and user engagement. These studies can then influence any earlier stages (e.g., specific areas of content that did not engage the interest of learners could be revised, confirming or refuting the learning theory, or requiring changes to the user interface).

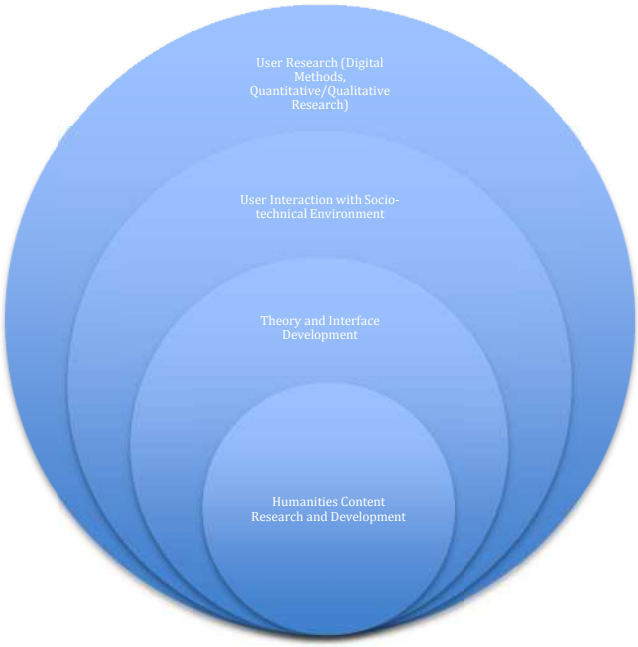

Figure 2: A Process for Digital Humanities Research and Development

IV. Source materials

Sources of evidence used in humanities research are mostly records that are found in newspapers, photographs, articles, oral histories or other “records of human experience” (Borgman, 2009, paragraph 33). These sources come from a multitude of institutions, in multiple formats, and with many—and often unclear—usage rights and policies. Records used in humanities research are often reinterpreted as new contexts emerge. The multiplicity of tools used to create the GeoStories was quite wide. We were informed by our knowledge of local history and bibliographic sources and searched collection we anticipated would have materials of relevance, such as public libraries, historical societies, and local press dating back to the mid 19th century. In addition, we searched for other period sources such as travel guides, restaurant menus and store catalogs. More targeted searches included hobbyists websites and business and personal archives.

GermanTracesNYC includes a total of forty GeoStories. One of the guiding principles for the researchers was to include only visual materials that are in the public domain, licensed under Creative Commons licenses, or were given to the researchers with permission to use by the holders of the original copyrighted materials. This is keeping in the spirit of GeoStoryteller, which is a Creative Commons open-source platform, and within the contractual agreement between Pratt Institute and the Goethe Institut, which specified that GermanTracesNYC will be maintained in the public domain. On average, twenty hours of research was required to assemble sources materials for each GeoStory. Source materials for creating both the narratives and the accompanying slideshows included monographs, newspapers articles, photographs and other visual materials (illustrations, drawings, etc.). Most of the materials were digitized by public institutions such as the New York Public library and are in the public domain. Other materials, digitized by commercial interests such as Google Books, were used for visual materials only if they were in the public domain, and otherwise were used as bibliographic sources. In all, approximately 400 unique items were used in the project, an average of 10 items per GeoStory, although some sources were used more then once. Figure 3 provides a snapshot of the number and types of sources used to create the first five GeoStories. The total number of sources used for each story was between 12 to 22, with an average of 15.6 per story.

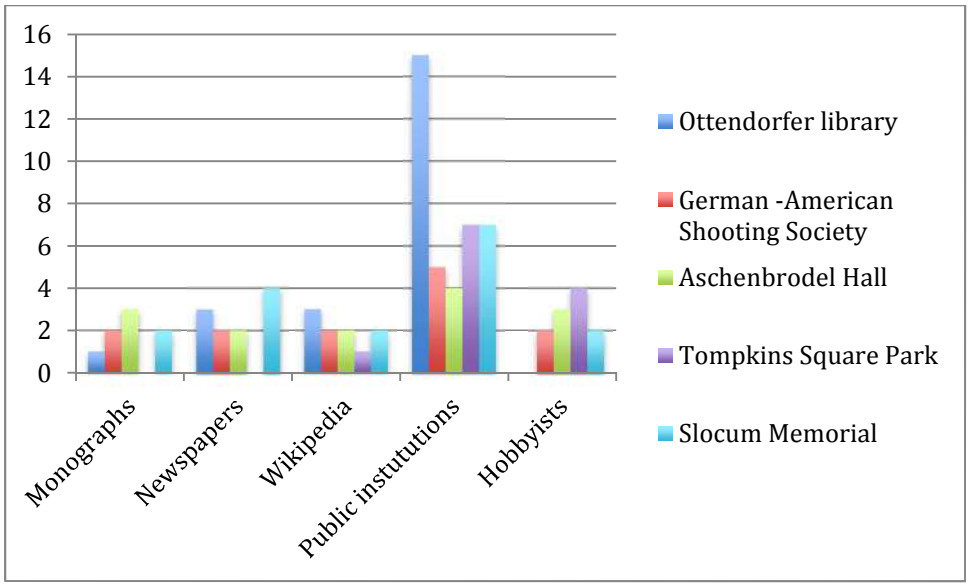

Figure 3: Sources used in five stories

Public institutions provided many of the sources, particularly the visual sources, used in creating the GeoStories. Institutions such as the New York Public Libraries or the Library of Congress have made enormous efforts in recent years to digitize their historic collection and make the digitized items available to the public. The public institutions used most frequently in the project were The New York Public Library, the Museum of the City of New York, the Library of Congress and the New York City Landmark Preservation Commission. Figure 4 provides a breakdown of the public institutions used in five GeoStories.

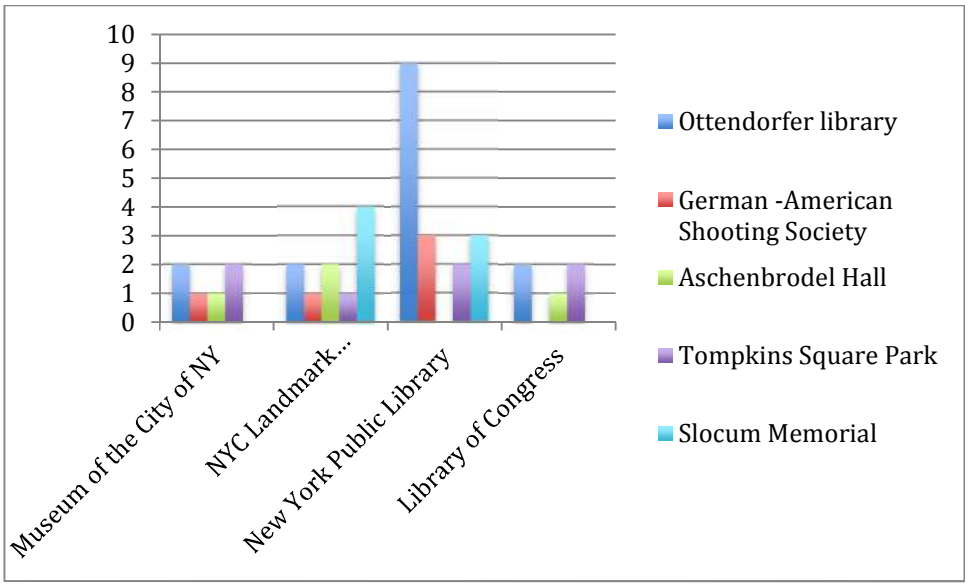

Figure 4: Public institutions used in five stories

It order to determine the how significantly grey sources featured in the materials used to create the GeoStories, one must first return to the definition of grey literature. Schöpfel (2011) provides an overview of the changes that occurred over time to the definition of grey literature but acknowledges that the definition that prevails in the one formalized during the 3rd International Conference on Grey Literature in 1997, and included in the *Encyclopedia of Library and Information Sciences* (Schöpfel and Farace 2010). According to this definition, grey literature is "that which is produced on all levels of government, academics, business and industry in print and electronic formats, but which is not controlled by commercial publishers". Working with this definition we established a series of questions that served as a checklist in determining whether a source should be considered grey or white literature.

1. Who is the original publisher of the source?
2. What was the original source of publication?
3. Who digitized the source?
4. Where is the source currently held?
5. Is the source discoverable in traditional findings aids (catalogs or indices)?

Using this checklist, we established that the majority of sources used as source materials for the GeoStories, meet the definition or grey literature. Figure 5 depicts the

use of sources for five stories. All stories used significantly more grey materials then other types and one story used only grey literature.

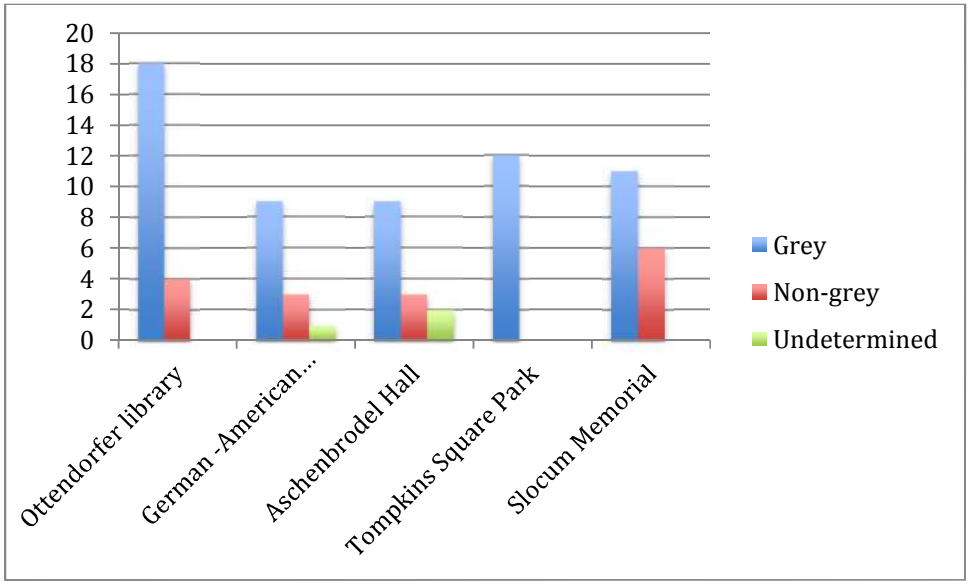

Figure 5: Grey literature used in five stories

When looking at the combined sources used to create the five stories, we see the 76% of the sources used were grey literature, 21% were white literature and 4% were undetermined. While the list of questions we developed was helpful is determining whether a source was grey or not, arguments can be made to the contrary, depending on how broadly or narrowly one defines discovery tools. Articles from the New York Times are considered to be white literature since the New York Times in available through several indexes, including Gale U.S. History In Context, InfoTrac Custom Newspapers, ProQuest Historical newspapers. Monographic materials discoverable through library catalogs such as WorldCat or the New York Public Library catalog, such as *King's Handbook of New York City* (King 1892) were considered white, but other monographic materials, such as the 1919 edition of *Childhood's Favorites and Fairy Stories,* available from Project Gutenberg, presented more of a challenge and ultimately ended up in the 'undetermined' column. The overwhelming majority, 76%, were identified as grey literature. These included items such as the 1874 illustration digitized by the Library of Congress (Library of Congress 1874).

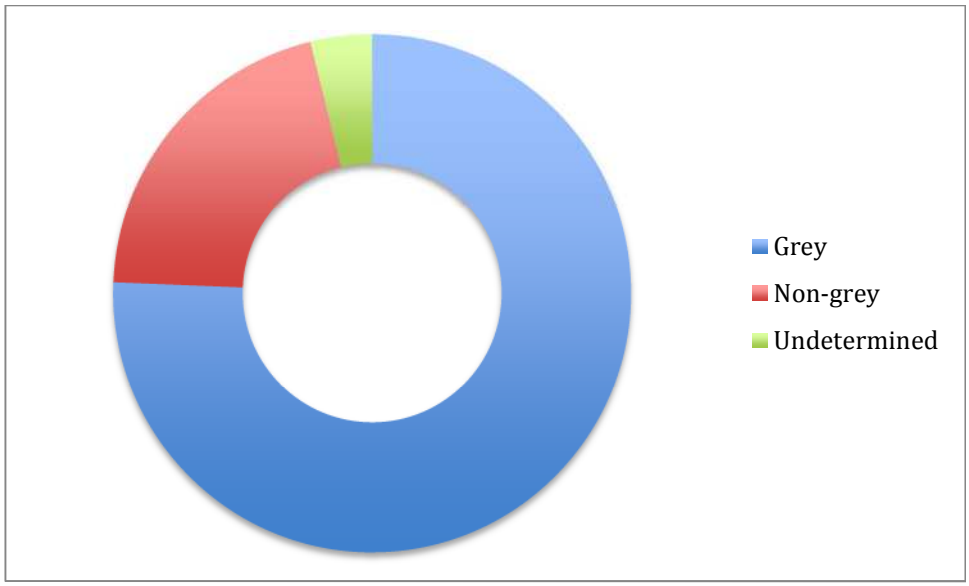

Figure 6: Overall use of grey literature in five stories

Conclusion

A number of trends made possible by the Internet converged to allow the creation of the GeoStories of GermanTracesNYC. First, digitization of legacy collections in libraries and cultural institutions provided a substantial corpus of sources that the researchers could use. Second, the ability to bypass traditional finding tools such as catalogs and indices to search directly in the collections of choice and through the aid of search engines, make the digitized collections discoverable. Lastly, the available of materials that can be used without permission, either through Creative Commons licenses or from the public domain. Grey literature constitutes the majority of digitized materials that were used in the project and supported the core of the model (figure 1) used for the development of this project.

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