

The Never Ending Story:

The Database as Facilitator of Evolving Multi-user Online Narratives

Stefan Schutt

Victoria University, Melbourne: *Hybrid Initiative,
Institute for Community Engagement and Policy Alternatives (ICEPA)*.
RMIT University, Melbourne: *Centre for Animation and Interactive Media*
E-mail: stefan.schutt@vu.edu.au

BIOGRAPHICAL NOTE

Stefan Schutt is a teacher and project manager in the Department for Visual Art, Design and Multimedia at Victoria University TAFE. His background is in professional writing and the Internet industry, where he worked as an interface designer, web developer and content producer. He is currently undertaking his Master of Arts in the Animation and Interactive Media Centre at RMIT.

ABSTRACT

People are increasingly turning to the Internet to store and share their personal information. User-friendly, database-powered 'social software'¹ such as weblogs (or "blogs"), wikis², upload sites and social networking hubs are transforming the way Web-connected people exchange and publish information, find each other and store the digital artifacts of their lives.

This paper will investigate the potential of online systems like these to foster open-ended, multi-user narrative spaces that evolve over time. It will refer to my Master of Arts research project *Small Histories*, a database-driven website for the uploading, storage and comparative publishing of multiple individuals' life histories.

KEYWORDS:

Web 2.0, social software, social networking, Internet narrative, online narrative, hypertext, cybertext

INTRODUCTION

The label *Web 2.0* is a popular but hazy term coined by media companies O'Reilly Media and MediaLive International during a series of 2004 conferences³. It resists conclusive definition but is generally used to describe the proliferation on the Internet of website systems that are easy to use and promote communication and data sharing instead of one-way information delivery.

Much of the current hype around Web 2.0 involves what is known as 'social software', systems that facilitate the exchange of information between people via the Internet, and whose popularity is growing at a phenomenal rate. This includes social networking sites *MySpace* (<http://www.myspace.com/>) and *Friends United* (<http://www.schoolfriends.com.au/>), photo storage and sharing sites like *Flickr* (<http://www.flickr.com/>), editable multi-user information sites such as *Wikipedia* (<http://www.wikipedia.org/>) or *Writeboard* (<http://www.writeboard.com/>), and personal diary 'weblogs' like *Blogger* (<http://www.blogger.com/>).

These sites are powered by databases connected to website interfaces, with scripting languages passing data back and forth between the database and website. They are designed to be easy for novices to use at the interface level, but 'under the hood' employ increasingly sophisticated use of existing coding technologies.⁴

Such developments, combined with factors such as the popular adoption of data sharing standards such as Really Simple Syndication (RSS)⁵ and increasing bandwidth capabilities, have fuelled the rapid evolution of the Internet into a facilitator of communication by many instead of the disseminator of one-way information that it was until and during the 'dot com' boom of the late 1990s.

MEANING-MAKING THROUGH ORDERING

Much of what is currently being uploaded and shared using social software can be described as narrative of one kind or another. These may be complete narratives in themselves (Podcasts, videos) or they may be groups of individual items that collectively make up narratives when uploaded and arranged or sorted (eg photo collections, serial blog entries, forum threads). This paper focuses on the latter form of narrative, which involve the use of Web-based tools to dynamically mould narratives from individual constituent items. It revolves around a definition of narrative as *related elements arranged into an order or sequence*.

The concept of *ordering to create meaning* implies that narrative is a journey from one point to another (or others), a sequential, time-based course of action: in other words, a *process*. This understanding of narrative is implicit in the idea of *story*. The Oxford Dictionary of English (pg 1169) defines narrative thus, as: *a spoken or written account of connected events; a story*.⁶ I will take the liberty of expanding this definition to include not only written or spoken events, but also any forms of media that can be combined into a sequence meaningful to readers/listeners/viewers.

The principle of sequencing elements to create a time-based narrative is something with which film makers and musicians are familiar. For new media theorist Lev Manovich this form of narrative is, in Rune Daalgard's words, the "dominant cultural form of print and cinema"⁷. This principle is also at the heart of much musical production including the ordering of movements into a symphony, the combining

of verses, choruses and ‘middle eights’ to create songs, or the appropriation and ordering of sounds and samples to construct new tracks via the use of a device known, aptly, as a *sequencer*.

TIME AND SPACE

Visual artists, however, may see narrative differently: as the juxtaposition or association of items within a space. It is important that the spatial aspects of narrative creation and display are also examined when looking at Web-based narratives. The Web is a visual as well as textual medium; at the very least, the level of the interface needs to be considered closely since this will play a large part in what is called the ‘user experience’ – how the audience will experience the work.

Some narratives in fact gain their power from a combination of both space-based and time-based elements. One pre-Internet example is frequently quoted as an ancestor or parallel to hypertexts⁸: the Jewish Talmud. At the heart of the Talmud is the Mishnah, described by Wikipedia as “the first recording of the oral law of the Jewish people”.⁹ The printed Talmud arranges text visually on a page to create a narrative of layered conversation and debate about Biblical passages. This body of commentary makes up the “Oral Law”, the exposition of the Jewish Written Law as relayed by the scholarly and other religious leaders of each generation.”¹⁰ Within the Talmud’s pages, the core Oral Law text holds court in the centre of the page while the commentaries by Rabbinical scholars through the ages gather around it; the result is a narrative of proposition and response, an inter-generational dialogue of sorts.

The Internet offers the ability to undertake the visual delivery of narrative in forms more varied than that of the printed page. A browser screen is like the page of a book in that it presents a defined area of visual ‘real estate’ for the dissemination of information, and is often viewed as part of a sequential series of screens. One difference however is that browser windows have the ability to scroll down and across – a feature that can be used in creative ways, although many interface designers and usability experts would frown at the extensive use of the scrolling function¹¹. In particular the Internet offers expanded possibilities in its ability to accommodate rich visual, audio and other content, and through its linking function that allows for supplementary content display techniques such as pop up windows. This provides creators with many possibilities for the display of narrative elements.



Figure 1 – page from the Talmud

TEXT MACHINES AND THE INTERNET

A sequencer, or music creation program like ProTools or GarageBand, can be seen as a machine for the creation of time-based audio narratives. In *Cybertext: Perspectives on Ergodic Literature*, Espen Aarseth offers a parallel through what he calls *text machines* - “a mechanical device for the production and consumption of verbal signs” (21). Aarseth’s term resonates with Ted Nelson’s *literary machines* of the 1960s. But while Nelson pre-empted (and inspired) the Internet by envisaging a system to link together all writing by harnessing the world’s computers¹², Aarseth seeks to answer the question: can text machines, which may take the form of anything from a hypertext work to a multi-user online game, produce effects that might - or should - be called literature?

Like other machines, text machines are designed to produce outputs by way of mechanical processes. Aarseth calls this process the *traversal function*; it outputs readable strings of texts, which Aarseth defines as *scriptons*, by processing and organising constituent strings of texts, or *textons* in Aarseth’s terminology. This process, says Aarseth, has three elements: the *operator*, the *verbal sign* and the *medium*.

Using Aarseth’s model, a collection of holiday photos on *Flickr*, sequential entries on a weblog site and a thread on an online forum could all be seen as narratives or scriptons, although in these examples the part played by the *medium* (ie the machine) are of a lower order than some of those examined by Aarseth. In other words, the text machines above act less as generators of verbal signs and more as channellers of the operators’ meaning-making actions, and the means by which the results might be shared with others. Some elements of automatic, real-time generation may still be involved, such as ordering by date, theme or author, but a large part of meaning-making by users of social software is undertaken in the context of the text machine acting as the facilitator of narrative creation rather than as the narrative creator itself.

The Internet, when combined with databases and scripting technology, positively lends itself to facilitating meaning-making through ordering. One playful example of this is the Flash website *Bubblr*¹³ (<http://www.pimpampum.net/bubblr>) This site downloads photos from the *Flickr* photo sharing site based on the *Bubblr* user's search terms, then lets the user turn the photos into comic strips by ordering them and adding speech bubbles.

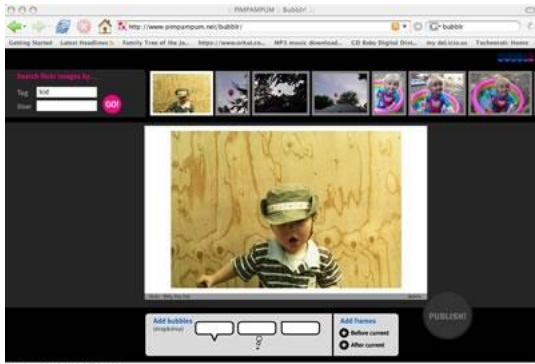


Figure 2 - Bubblr

This is one example of what databases do well, particularly the relational databases commonly used in online systems – the storage and retrieval of items and the creation and mapping of relationships between those items. This makes the database an eminently suitable vehicle for the creation of user-created narratives/scriptons. And, furthermore, because the Web is a distribution medium *par excellence*, the dissemination and juxtaposition of narratives uploaded by many people now becomes possible.

NARRATIVES, DATABASES AND COLLECTIONS

When does a collection of items become a narrative? When does it become *meaningful*? I propose that this occurs when a collection of items is consciously sorted and/or ordered – either sequentially or visually - by, in Espen Aarseth's terms, the *operator*. It is the difference between a shoebox full of random photos and a family photo album, although one could argue that the juxtaposition of photos in a shoebox may also reveal surprising narratives to the viewer when taken out and perused in order – a kind of accidental, Dadaist narrative dynamically created in the viewer's mind, much like the *Bubblr* site.

One also needs to add some other caveats. If all the photos in our shoebox related to one family or to a period of time, a level of classification or meaning-making can already be said to be embedded within such a collection; an example of this is Andy Warhol's *Time Capsules*¹⁴. And then, even individual personal artefacts can tell – or at least hint at – buried narratives. In some cases this sense of glimpsed meaning can be appropriated to create new meaning, such as the found photographs used in the novels of WG Sebald, where family snapshots orphaned in second-hand shops are metaphorically rescued by Sebald and placed with new families in his books – thereby evoking the uprooting and dispersal of Europeans during the tumultuous events of the 20th century. In both cases above, though, the element of conscious ordering or classification is still crucial to the meaning-making process.

So what about databases? New media theorist Lev Manovich's view of the database is somewhat like the shoebox of random photos. Manovich makes a sharp distinction between what he sees as the structured framework of narrative and the unstructured, random access model of the database, where

every item is seen to have the same value as any other. This view embodies the idea of conscious ordering creating a sense of meaning, but also has embedded within it a problematic view of what a database is and does.

As Rune Daalgard points out, Manovich's notion of the database is broad and encompasses everything from collections of links on websites to highly structured relational databases.¹⁵; these are in fact very different in their structure and function. Web-based groupings of links, text or images are created to be viewed directly; they contain as much or as little structure and order as their creators imbed into the site by design or by accident; they are more like collections in the sense of the shoebox rather than databases in their more formal sense. Databases are by definition ordered and are not designed to be viewed directly like the shoebox; the Oxford Dictionary of English defines them as "a structured set of data held in a computer, especially one that is accessible in various ways" (p 441). Databases often take the role of the *organisers* of collections; they are constructed with the intention of recording, cataloguing and making accessible collection data. This usually involves the creation of classification schemas, data relationships and/or hierarchies. On the Internet, databases are used as content creation and delivery engines to *facilitate* easy ordering and display of items in narrative form on web pages; they are not in opposition to narrative, but are frequently the mechanism by which narratives become embodied.

Furthermore, while the Internet may appear random and chaotic as users move through its nodes (as expounded by Manovich and commentaries like *The Internet is Shit*: <http://internetisshit.org>¹⁶), most web sites, as pointed out by Daalgard, possess at least some degree of internal ordering. And when we zoom out, we see that the Web is in fact a "network of collections¹⁷" (Pg 6).an overlapping, multiplicity of more-or-less ordered systems. There is an important difference between the clustered network structure of the Internet and the experience of someone traversing a part of it, a case of 'not seeing the forest for the trees'.

STUMBLING THROUGH THE WEB FOREST

Zooming down to the user's level, the growing trend towards user-driven content ordering and classification tools points to the need to eke out a sense of order, control and purpose in a chaotic and overwhelming online universe of 'stuff'. One example is the user-generated 'tags' or themes in social sites such as *Flickr* or *Technorati*. The increasing adoption of such forms of metadata by web users can be interpreted as a kind of narrative, meaning-making urge, and it is, on the web at least, powered by the database.

At the heart of Internet-based narrative lies the hyperlink. In his paper *When Hypertext Became Uncool*, Henning Ziegler defines the reading experience as 'strategically building many contradictive voices of a text into a mental whole'¹⁸ He states that, while reading Stuart Moulthrop's seminal *Victory Garden* hypertext, this result escaped him; he could not arrive at 'a mental model of the digital rhizome', the text 'stays fluid' and because his reading was only 'one among many' he felt distanced from the text and other readers. This, Ziegler states, is an explanation for why, instead of the renewal of writing promised by the hypertext evangelists of the early 1990s, hypertext failed to live up to the hype. Hypertext did not, as claimed, engage readers by mirroring the processes of the post-modern associative mind. Instead it only served to thwart the reader's 'desire for intimacy' (Pg 3)

This idea of the desire for intimacy can perhaps be stretched to include our response to the automated database-driven content that surrounds us in our everyday lives, such as canned voice-controlled phone

services and ‘personalised’ web content. On the web at least, it seems that only when databases are used to gather, sort and display narratives by real people, whatever the level of identity artifice involved, that others respond. One exception may be games and other performative text machines, the difference here being that the operator is actively involved in creating the narrative flow of textons, as opposed to navigating an inscrutable maze controlled by some distant hypertext author. As hinted at by Ziegler, a feeling of control is one of the important factors here: as museum¹⁹ and web usability research²⁰ has found, it’s empowering to have a map, and to know what you’re working with.

OPEN AND CLOSED NARRATIVES

In *Database as a Genre of New Media*²¹, Lev Manovich posits that narratives should possess a defined formal structure and that databases undermine narrative integrity because they allow for the formation of works whose content may change over time. This results in what he calls the “anti-narrative logic of the Web”²²:

*If new elements are being added over time, the result is a collection, not a story. Indeed, how can one keep a coherent narrative or any other development trajectory if it keeps changing?*²³

I would like to propose that it is indeed possible to retain a sense of coherence within open-ended narratives. Indeed, I would suggest that databases open up the potential for renewal and relevance in online stories that is not present in ‘closed’ or locked narratives. It should also be noted that open narratives predate the database in forms such as oral storytelling; a story or legend will evolve over time with every re-telling and in doing so will remain relevant to the needs of the society at that time.

It is the ability of databases to facilitate evolving online narratives that led to the initial impetus for my current database-driven research project. The project began as a web-based autobiographical account of my journey searching for, tracing, and living with my biological father in Israel. However I realised that my relationship to the subject matter kept changing as I - and the world - changed, and that any ‘closed’ account would only serve to lock in one version of the story, like an insect caught in amber.

A precedent for this can again be seen in the Talmud, which offers a hybrid model of authoritative reference points and fluid narrative dynamism. The Jewish Museum of Berlin expresses it thus in its exhibition text:

*The discussion of the content of the Written Law (the Five Books of Moses) and the oral law is a never-ending process. The commentaries are studied and newly interpreted from one generation to the next. As in other legal systems, the laws are discussed according to certain prescribed rules, while constant debate of the text keeps it alive. At the same time, the exchange of ideas with commentators living many centuries earlier assures that the interpretive tradition is carried forward.*²⁴

One interesting issue arising out of this is the question of authorial control. The way online works evolve depends heavily on who has access to the tools to affect the content – a political issue of access rights, ownership, context and the inbuilt hierarchy of software systems. Wikipedia’s relatively (but not absolute) model of openness differs, for instance, to a weblog where a single user generally controls the ‘core’ content but invites peripheral input via comments from other readers/viewers. This important variable of ‘level of user control’ is something I will investigate as part of my research project.

There are also related questions about control in the digital space that relate to the technology itself. Who controls the technology? Who can change it? Who constructs the inbuilt hierarchies and why? Victoria Vesna poses this question when she states, after examining the ongoing drive by corporations to “digitise all knowledge”:

...one truly begins to wonder what kind of role artists working with information and networks assume and indeed whether they will be able to effect coding or aesthetics in significant ways at all” (Pg 10)

EXAMPLE OF AN EVOLVING NARRATIVE

One example of an evolving narrative is the weblog attached to a website that became famous in 2005. The *Million Dollar Homepage* (<http://www.milliondollarhomepage.com/>) is the brainchild of a young UK business student who, wanting to pay off his university fees, devised a scheme where advertisers would pay \$1 a pixel for virtual ‘real estate’ on a one page website (there are roughly this many pixels on a standard browser screen) that would remain live for five years. The idea captured the public imagination, traffic to the site increased exponentially, advertisers flocked, and the site did indeed make a million dollars for its creator.

The weblog, or online diary, accompanying the Million Dollar Homepage, is ongoing. It captures, as diaries do, moments in time: beginning with the author’s initial exploration of his idea in 2005, moving through his excited reaction to his sale of the first 100 pixels, and so forth until the present. The diary-story is still unfolding and is likely to continue to do so over the next five years. It is a kind of evolving narrative whose power to engage is enhanced, not diminished, by the fact that it is open-ended. One might at this point make a comparison to other off-line evolving life stories such as the remarkable *Seven Up* series of documentaries, a Reality TV show or even an obviously fictitious ongoing serial like *The Bold and the Beautiful*. There is a sense of voyeuristic engagement in witnessing the unfolding of a life story, which appears to closely resemble the pleasure we experience in reading or watching the development of a character in a novel or film – we are taken on a journey along with the character. That there are no definitive elements of, wrapping-up or denouement in the ongoing online narrative does not seem to affect our sense of engagement in the narrative. As in reality TV, the sense of the online narrative’s ‘realness’, however constructed, may even add to this engagement.

Database-driven online narratives may be problematic for some with backgrounds in areas like cinema (like Manovich) because the trajectory and order of the narrative is rendered unstable; database-powered systems can be, and often are, set up in such a way to allow creators to edit and change their textons, or story elements. Even in the example quoted above, the author can go back and edit previous blog entries; history and narrative elements can be rewritten, tweaked and rearranged in a variety of ways depending on the system. This transient take on recorded history is part of life on the age of the Delete key; there is no longer a true ‘official’ version of the narrative with a set beginning, end and shape.

SINGLE USER VS MULTI USER SYSTEMS

The online diary accompanying the Million Dollar Homepage is one example of a weblog system typically set up for single users – individuals with the desire to say something to the world. Such systems are not exclusively single-user, since other people can typically comment on and respond to posts. However their focus is on facilitating communication from the central figure/author/uploader, with comments relegated, figuratively and sometimes literally, to the margins of the narrative. The comments

are designed to provide perspective and opinion on the core narrative, and are not able to shape the overall shape or content of this central narrative.

True multi-user environments have, of course, been around for as long as the Web – Multi User Domains, newsgroups and forum sites for example – but it is only recently that true multi-user environments have become as massively popular as they have. These range from peer-to-peer networks to *social software*, described in Wikipedia (itself an example of a popular multi-user environment) as software that ” enables people to rendezvous, connect or collaborate through computer-mediated communication and to form online communities.”

The Wikipedia article goes on to state that:

*Common to most definitions is the observation that some types of software seem to facilitate "bottom-up" community development, in which membership is voluntary, reputations are earned by winning the trust of other members, and the community's mission and governance are defined by the communities' members themselves. Communities formed by "bottom-up" processes are contrasted to the less vibrant collectivities formed by "top-down" software, in which users' roles are determined by an external authority and circumscribed by rigidly conceived software mechanisms*²⁵

Multi user systems are matchmakers. They connect, they facilitate, and they can serve to contrast opinions and viewpoints too. This offers the potential to counter the documented tendency of the Internet to act as a self-reinforcing mechanism for people who only seek out opinions that concur with their own, as network physicist Albert-László Barabási points out in his book *Linked: How Everything Is Connected to Everything Else and What It Means for Business, Science and Everyday Life*:

In June 2000 Cass Sustein, a law professor at the University of Chicago, conducted a random survey of sixty political sites, finding that only 15 percent of them have links to sites with opposite views. In contrast, as many as 60 percent have links to like-minded Webpages. A study focusing on democratic discourse on the Web arrived at a similar conclusion: Only about 15 percent of Webpages offer links to opposing viewpoints. Sustein fears that by limiting access to conflicting viewpoints, the merging online universe encourages segregation and social fragmentation (p. 170).

SMALL HISTORIES: WHAT IT'S ABOUT

In 1997 I traced my biological father to Israel and lived there for most of the next year, getting to know him, his family and the country. When I returned to Australia in 1998 I began to turn that event, and the events leading up to it and resulting from it, into a book. That book then turned into an online hypertext narrative after I concluded that the events needed to be presented within multiple different contexts or viewpoints, which suits a hypertext environment.

As time went on however, I realised that my views on the subject matter changed as I changed and world events came and went; the Middle East was and is constantly in the news and I found my views and reactions adjusting to every chapter of the other ‘never-ending story’ - the Middle East conflict.

I realised that I needed to reflect these changes in my project but that ‘closed’ memoirs in books and on the web are locked in a time bubble and do not change as their authors change. They are also, I observed, locked in another bubble – that of point of view. The closed personal story may discuss an event of wider

significance and interest, but is often self-referential; it does not tend to invite complementary or clashing viewpoints on the same events that could provide readers/viewers with increased depth of context and meaning.

This observation coincided with the growth of multi-user systems on the web in the early 2000s, and led to the development of the *Small Histories* site, the first prototype of which will soon be ready for testing. The site is nothing special technically. It functions the way a lot of other database-driven sites function, via a database and scripting languages. Users log in, upload items of text, images, audio, video or other documents, adding metadata as they do so:

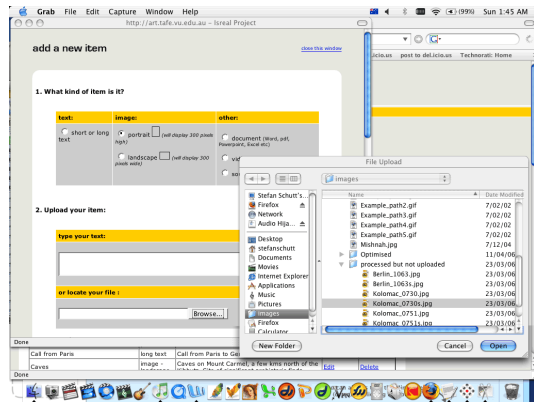


Figure 3 - *Small Histories*:uploading items

They then order these items – plus any others previously uploaded by other users - into a sequence to create a story: This story, and the items that make up that story, can be edited at any time:

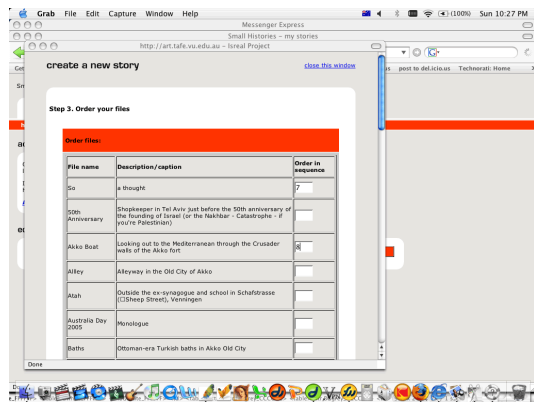


Figure 4 - *Small Histories*:uploading items

The resulting story is then presented in one of a range of formats on the Web for others to view. In the current site model, story creators can choose to display their stories as a narrative running down the page, a ‘scrapbook’ where items are juxtaposed on the screen or a scrolling gallery of images running across the page:

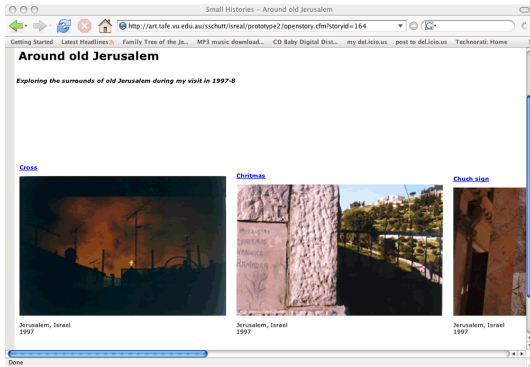


Figure 5 - Small Histories: gallery format

Each item name is a link that, when clicked, brings up a popup window with details of the other stories that the item is associated with. Future prototypes will experiment with other ways of presenting this information, including more visually sophisticated ones; a major benefit in working with databases is that the presentation layer is separate from the data layer so this kind of experimentation can be undertaken in multiple ways without affecting the data itself.

At the bottom and sides of these story display pages, a “make a comment” link encourages users to comment on items and stories in a way that is similar to the comments areas connected with news reports on Internet news sites. The comments are then displayed around the core story to provide ongoing and evolving dialogue, much like the pages of the Talmud.

Another requirement built into the site is that story creators will need to include at least one item in their stories that already exists in the database and has not been uploaded by them. It is intended to force the establishment of links across stories and thereby facilitate the creation of a network of items and stories where there is a small ‘degree of separation’ across the network. This feature, which will shortly be tested, is based on Albert-László Barabási’s observations on networks:²⁶

You start with a large number of isolated nodes. Then you randomly add links between the nodes...If you add only a few connections, the only consequence of your activity will be that some of the nodes will pair up. If you continue adding links, you will inevitably connect some of these pairs to each other, forming clusters of several nodes. But when you add enough links such that each node has an average of one link, a miracle happens: A unique giant cluster occurs. That is, most nodes will be part of a single cluster such that, starting from any node, we can get to any other by navigating along the links between the nodes...Sociologists would tell you that your subjects had just formed a community. (Pg 17 - 18)

*It requires **only one link** per node to stay connected...If nodes have less than one connection on average, then our network breaks into tiny noncommunicating clusters. If there is more than one connection per node, that danger becomes remote. (Pg 18)*

As the project progresses, I will experiment with the system’s variables (user interface elements, uploading rules, content display models, editorial intervention, automated processes) within the framework of Aarseth’s Cybertext typology of: *Dynamics; Determinability; Transiency; Perspective; Access; Linking and User Function.*²⁷ I then plan to evaluate the effectiveness, coherency, and engagement of the narratives generated through user testing and feedback.

The Small Histories site marks the beginning point of a study that I suspect will take years. It may even, like the open-ended narrative itself, never end. New aspects will no doubt unfold over time.

One of the areas of investigation that has already suggested itself is the site's status as an archive. Questions here include:

- Will the site be considered an archive? If so, how and for whom? And how will its archival function relate to its storytelling function? And how do these intersect with and affect the idea of *memoir or oral history*?
- Who should own the data and why?

Another is the role of the interface in determining the site's use and the shape of the stories uploaded to it. This is both on in terms of user input processes (instructional design) and display of content uploaded (interface design). Then there are the issues connected with privacy and copyright, including who has access to which data, what kinds of access levels and types should be built into the site and what kind of copyright options should be offered.

CONCLUSION

On April 24, 2006, I searched Google for family names associated with my German mother. Though I had undertaken a similar search a month or two before, this time Google brought up a new BBC site called The People's War²⁸, in which a German woman described the events surrounding the expulsion of the German population from Pomerania in 1945. Family members of mine were mentioned in this oral history, and I learned new details about this tumultuous time in their lives from a person who was there, via a matchmaker called the Internet.

The big events of the past, and particularly those of the last century, have uprooted and dispersed cultures, identities and histories, the pieces lost or scattered. We dig up and reassemble what we can, what's left of the wreckage, in order to find out where we come from and where we belong.

Through the Internet we can find things that help us to update and/or rewrite our histories and our lives. And we can use the Web to document our histories and leave traces for others to find, perhaps when on a whim they decide to undertake a Google keyword search.

1 *Wikipedia: Social Software*, Wikipedia article on Social Software, viewed 12 April 2006, <http://en.wikipedia.org/wiki/Social_Software>

2 *Wikipedia: Wiki*, Wikipedia article on Wikis, viewed 12 April 2006 <<http://en.wikipedia.org/wiki/Wiki>>

3 *Wikipedia: Web 2.0*, Wikipedia article on Web 2.0, viewed 12 April 2006, <http://en.wikipedia.org/wiki/Web_2.0>

4 *Wikipedia: AJAX*, Wikipedia article on AJAX Programming, viewed 12 April 2006, <http://en.wikipedia.org/wiki/Ajax_%28programming%29>

5 *Wikipedia: RSS*, Wikipedia article on RSS, viewed 9 June 2006, <[http://en.wikipedia.org/wiki/RSS_\(file_format\)](http://en.wikipedia.org/wiki/RSS_(file_format))>

6 Soanes, C., Stevenson, A. (ed) *Oxford Dictionary of English, Second Edition*, Oxford University Press, Oxford, 2003

7 Daalgard, Rune 2003, 'Spaces of Navigation on the Web' (final draft) <<http://imv.au.dk/~runed/pub/pub.html>> P 5

8 Porush, David, 'Talmud as Hypertext', *Kairos*, viewed 14 April 2006, <<http://english.ttu.edu/kairos/3.1/coverweb/porush/contra4.html>>

-
- ⁹Wikipedia: Mishnah, Wikipedia article on the Mishnah, viewed 13 April 2006, <<http://en.wikipedia.org/wiki/Mishnah>>
- ¹⁰ ibid
- ¹¹ Neilsen, Jakob 2005, 'Scrolling and Scrollbars', *Useit.com*, viewed 6 June 2006 <<http://www.useit.com/alertbox/20050711.html>>
- ¹² Nelson, Theodore 1974, pg 133, quoted in Vesna, Victoria, 'Database Aesthetics: Of Containers, Chronofiles, Time Capsules, Xanadu, Alexandria and the World Brain.' P 8
- ¹³ *Bubblr*, Bubblr website, viewed 14 April 2006, <<http://www.pimpampum.net/bubblr>>
- ¹⁴ *Andy Warhol's Time Capsules*, viewed 6 June 2006, <<http://www.warhol.org/tc21/>>
- ¹⁵ Daalgard P 5
- ¹⁶ *The Internet is Shit*, viewed 14 April 2006, < <http://internetisshit.org>>
- ¹⁸ Ziegler, Henning 2002, 'When Hypertext Became Uncool: Notes on Power, Politics, and the Interface', P 1
- ¹⁹ Moscardo, Gianna M & Pearce, Philip P 1985, 'Evaluation in Museums', Dept of Behavioural Sciences, James Cook University of Queensland
- ²⁰ Spool, Jared M et al 2004, *Designing for the Scent of Information: The Essentials Every Designer Needs to Know About How Users Navigate Through Large Web Sites*, User Interface Engineering, USA
- ²¹ *Database as a Genre of New Media* Manovich, pg 3
- ²² ibid.
- ²³ ibid.
- ²⁴ Jewish Museum of Berlin, exhibition text, viewed 26 July, 2005
- ²⁵ ibid
- ²⁶ Barabási, Albert-László 2002, *Linked: How Everything Is Connected to Everything Else and What It Means for Business, Science and Everyday Life*, Plume, USA
- ²⁷ Aarseth, Espen J 1997, *Cybertext: Perspectives on Ergodic Literature* , The Johns Hopkins University Press, USA
- ²⁸ BBC WWII People's War: The Von Thadden Family in Pomerania, viewed 24 April 2006, <<http://www.bbc.co.uk/ww2peopleswar/stories/31/a8676831.shtml>>