

A Genealogical Archive of Design and Technology for Augmenting Cross-cultural Mining

Bell, Geoffrey

University of Ulsan, Department of Digital Contents Design¹

geoffmbell@yahoo.com

Abstract: This paper addresses a new vision for the development of an open-source software application that creates an on-going genealogical archive of design and technology. In the spirit of Vannevar Bush and Ted Nelson, whose publications outlined new visions for the future of new media, this paper attempts to describe a vision that encompasses the many changes that are taking place technologically and within the broad shifting landscape of globalization. We are now seeing a different phase in information technology where the synthesis of information is becoming of higher priority. The abundance of information is out there. The organization of this information has just begun. How can we develop an application that not only creates a genealogical archive of design and technology but also augments cross-cultural mining in the field of design for the purpose of fostering innovation? First, this paper proposes new ways of creating genealogical structures for organizing the history of technology that is non-linear and primarily image-based. Secondly, this research outlines how collaborative models such as Wiki technologies can be combined with cutting edge technologies that revolutionize the notion of web browser real-estate and fluid usability. Finally, this paper addresses how this software could foster the notion of lateral thinking and generate an endless array of design solutions from around the globe.

Keywords: Genealogy, Wiki, Cross-cultural Mining, Software, Archive

¹ This research was supported by the MIC(Ministry of Information and Communication), Korea, Under the ITFSIP(IT Foreign Specialist Inviting Program) supervised by the IITA(Institute of Information Technology Advancement, 苞力包府□□ : C1012-0000-0000)

1. Introduction

1.1 Digital Media in the Age of the Remix Culture

The role of digital media and IT has been pushed into the forefront as a critical tool for enhancing cultural transmission. Clearly, it is common knowledge that Information technology is progressively maturing in a way in which the accessibility of information including data, news, statistics, and knowledge is readily available in almost every corner of the globe through the use of personal computers, cellular devices and various PDAs. One of the most prominent topics that has been discussed at length in relationship to this paradigm, is the realization and acceptance of a remix culture, one in which information is inevitably shared, appropriated and remixed. Post –modern thinkers were quite prescient in understanding this new paradigm. With the advent of the information technology age maturing, we are seeing new media technologies evolving to become more multi-functional and organized.

1.2 The Great Compression: Developing Design Efficiency

If there would be a need to create a new school of thought or department at a university in our day and age then it would have to surround the notion of efficiency. Few people are looking at efficiency from a holistic perspective, one in which we can harness trends of efficiency across disciplines. Certainly, efficiency has become a dominant theme within the information design industry. A clear example is Apple's iPhone, a product whose value is based on its streamlined functionality. The essence of Steve Job's eloquent pitch during the 2006 Mac Conference was the compression of three functions into one device, the killer app of killer apps that connected people to the world through the use of the Internet, cellular technology, and an MP3 player. We also see efficiency as a bold theme in the green revolution, one that encourages conservation and energy efficiency. The behemoth company, Google, spends almost all of their time researching ways to make information processes more efficient. Even the mission statement on Google's website states, "Google's mission is to organize the world's information and make it universally accessible and useful." Accessible and useful seem to be the operative words in this statement. One of the reasons why efficiency is rarely singled out is because most people assume this is happening naturally as technology progresses. There is some truth to this idea since the evolution of technology happens at such a rapid rate. In most disciplines of technology, whether it be computer hardware or software programs, the progression is exponential. Ray Kurzweil, in his article, The Law of Accelerating Returns, talks about the acceleration of technology happening in multiple trends. It is commonly understood that Moore's Law, which states that the number of transistors that can be placed on a circuit is increased exponentially, doubling roughly every two years, does not only apply to transistors but to many other trends in technology. So while efficiency is

assumed to happen naturally, it also needs to be a higher priority for hardware and software developers in the IT industry. One of the ways to achieve this is by creating GUI software that merges the collaborative powers of Wiki technology and the dynamic scalability of data visualization tools into a single program that is prominently image-based with supplemented text. It is through the playful exploration of online maps and visualization tools that enable people to be better synthesizers of information. The vision of this type of software will not only create a genealogical archive of design and technology, but will foster design and technological innovation through cross cultural mining.

2. From an Information Culture to a Synthesis Culture

The Internet is becoming increasingly daunting as the amount of information floods cyberspace. Knowledge workers will need to be better at connecting information in a way that fosters innovation through the ability to synthesize. In his book, *A Whole New Mind*, Daniel Pink eloquently explains that, "Symphony, as I call this aptitude, is the ability to put together the pieces; to see relationships between seemingly unrelated fields; to detect broad patterns rather than to deliver specific answers; and to invent something new by combining elements nobody else thought to pair." The need for a holistic approach to understanding systems such as the fields of design and technology is much needed on a global scale, where the benefits of crowd-sourcing² encourages innovation.

2.1 Cross Cultural Mining

One of virtues of traveling from country to country is that one truly gets to see the unique qualities and characteristics of a specific country or culture. From a design standpoint, there is no better way to observe different solutions to design problems than by physically being in a different culture than your own. There is a virtue to proximity and being physically present in a place that the Internet cannot encompass. One of the next great challenges of the Internet in the age of globalization is the ability to mine and explore design and technology cross-culturally. Although it is important to point out that not all cultures will likely use the same kind of design artifacts and processes, it can only strengthen a designer's palette by knowing what exists in the world already. Cultural Anthropologist, Clotaire Rapaille, author of *Culture Code*, argues that foreign products can only be introduced to cultures by gradually introducing them in combination with that country's cultural archetypes. For example, he claims that coffee has different meanings depending on the culture that uses it. It comes down to a matter of understanding the culture code. A problem that interferes with systems thinking and cultural assimilation (or accommodation) within the design community is the inability for one culture to

² Crowdsourcing is when an employee or contractor outsources tasks to a large group of people, usually in the form of collaborative software.

recognize efficient design solutions used by another. There are endless examples that illustrate this disconnect. We can look at two prominent designs from Asia that has yet to reach the rest of the world on a significant basis. One design, is the toilet called a Washlet by Toto ltd in Japan. This sophisticated toilet has multiple functions that not only washes and cleans various orifices but also air-dries and flushes automatically. Some of these toilets even have sensors that lift the lid and flush automatically. The future design trajectory of these toilets appears to be in the field of medicinal use where individuals can use their toilets to measure various bodily functions for preventative healthcare. Another design artifact in South Korea that is extremely simple yet effective, is the doorbell mechanism at most restaurants. Instead of trying desperately hard to get the attention of your waiter, the customer simply pushes a doorbell at the table that signals for help. Although this wouldn't be effective at some higher end restaurants in Western culture, it would possibly be effective at diners and low budget restaurants for greater efficiency, something that is of the utmost importance within busy restaurants. These are a few examples of design that are surprisingly non-existent in Western culture. It would be extremely beneficial to use software that makes cross-cultural mining of design solutions more accessible and exploratory.



[Fig. 3] Modern Asian Toilet

3. Towards a New Genealogy of Design and Technology

3.1. A New Paradigm for Genealogical practices

Developing new processes for understanding relationships between design, science and technology has changed quite drastically in the last 20 years. Contrary to the conventional historical practices, which attempt to categorize history linearly, scholars have begun to look at relationships in entirely new ways. An influential essay that substantiates a new genealogical approach can be traced back to Michel Foucault's Essay titled, Nietzsche, Genealogy, History from 1977. Foucault lays out a convincing argument that emphasizes Nietzsche's challenge to the pursuit of origins in historical discourse and values the relationships that can be extrapolated from history cultivated by accidents that accompany every beginning. Siegfried Zielinski, Chair of Media Theory Institute for Time Based

Media in Berlin is one of the first scholars to develop his own field in media archeology. Zielinski takes Foucault's notion of genealogy one step further by investigating deep time relations in experimental ways. Zielinski even wrote a manifesto on Investigations of Deep Time Relations of Art, Science and Technology denies the question of what came first and explores tensional deep time relations through cross disciplinary processes. In one Lecture, Zielinski examines a genealogy of telecommunications, linking the relationship of messenger and receiver to the invention of the electric guitar, an instrument that simultaneously codified and separated message and reception through electricity. Important to Zielinski's process is the attempt to create poetical relationships between technologies and media from different periods of time that seem to give rise to new sets of relationships. What he realized was that the more he seemed to want to predict the future of technology, the more he looked towards the past for possible answers. Software needs to be developed that utilizes new ways for visualizing relationships between technologies and design artifacts across the globe.

3.2. A Structure for Visualizing a Genealogy of Design and Technology

Although it is optimistic to think of new ways of loosely organizing a genealogy of technology that is nonlinear, a structural design for a software tool is still needed to support this kind of ambitious project. One idea is to organize a visual genealogy similar to the evolution of species. Technology specialist and Executive editor of Wired magazine, Kevin Kelly, claims that technology can be included as the 7 kingdom of life, an inclusion next to the animal, plant, fungi, protists, Archaeobacteria, and Eubacteria kingdoms. Based on a shared set of characteristics including diversity, specialization, Ubiquity, complexity and socialization, Kelly cleverly points out that technology has had an evolution of its own. In this context, we have a way to visual map out technology that is organized through categorical systems. Most importantly, Kelly uses visualizations that do not promote a hierarchical means of looking at the history of life and technology. Instead, he develops a circular motif that treats the complexity, diversification of species equally. This must be an important structural element if we were to design software for organizing technology from an evolutionary perspective. A solution that upholds the nonhierarchical aspect of Kelly's visualization while simultaneously celebrates Zielinski's genealogical poetics is to create a mapping system similar to Google Earth that maps out technologies and design based on cultural origin. This way, we preserve the touristic character of Google Earth while sustaining some kind of organization of where the design comes from. Craig Venture, maverick biologist who developed the Human Genome project claims that the best way to search for new life is to randomly select a point on the Earth and search. If we can adopt this model by creating a genealogical archive of technology in the context of Google Earth,

then people can more easily find poetic relationships between technologies, thus, developing more creative ways of developing and adapting new technologies into cultures.

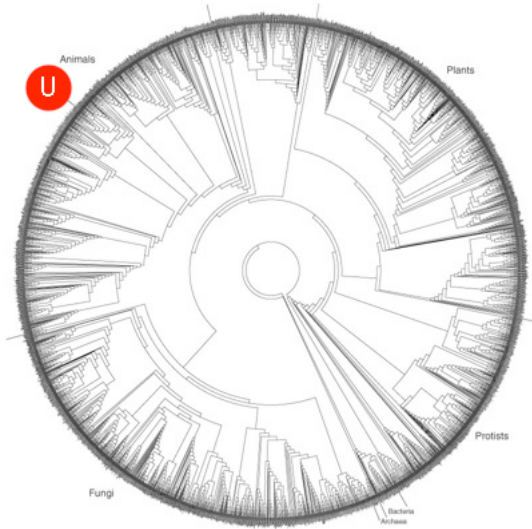


Fig 1. Kevin Kelly's non-linear genealogical chart of all life on Earth - All of life is represented as equally evolved.

4. Power Browsing On The Internet

Recent evidence suggests that the Internet is changing the way we are thinking and reading. Some scientists point out that society in general is suffering from various attentive deficiencies. The Atlantic magazine just published an article by Nicholas Carr, which is aptly titled, "Is Google Making Us Stupid?" At the heart of his essay, Carr sites many studies that suggest web surfers have become power browsers with a staccato-like attentive ability. Scientists have also developed studies to suggest that people who read ideographically like the Chinese, use different parts of their neural circuitry. In fact, the language of pictures and ideograms in mass culture has become increasingly adapted into various modes of communication. Email messages are increasingly infused with emoticons while Manga (a type of illustrative graphic novel) comics have become popular around the world. What started in Japan has grown into a phenomenon in India and is currently seeping its way into the western world. Bill Thompson from The BBC notes in a recent article titled "Changing The Way We Think", that "Today's interest presents information in bite-sized chunks, linked together into a rich tapestry where the connections often carry as much meaning as the words themselves."

Neuroscientists suggest that the way in which cognition is being shaped tends to form new aptitudes.

It is the job of designers and software engineers to take advantage of this new capability for achieving greater efficiency for mining information.

5. Introduction to Memetics: Understanding Design Memes

From as far back as Ancient Greece, cultures have embraced the notion of imitation or what the ancient Greeks knew as *Mimetes*, meaning imitator or pretender. In the second half of the 19th century, at the dawn of modernism, many philosophers and scientists were considering new paradigms for understanding cultural transmission. Ralph Waldo Emerson wrote a semi-obscure essay called *Originality and Quotation* which hypothesized culture's natural instinct to imitate and borrow. One passage from Emerson communicates this quite clearly when he writes, "Our Knowledge is the amasses thought and experience of innumerable minds; our language, our science, our religion, our opinions, our fancies, we inherited." It was quite clear to Emerson that the very notion of originality should be called into questioning itself. Later in the 20th century there are clear hints that allude towards memetics. William Burroughs famously claimed that "Language is a virus"³ and John Cage along with an array of other artists and musicians started to create pieces that revolved around self-replication or generative art.

Memetics (or the study of memes), is gaining momentum as an explicit way to understand patterns and behaviors of cultural transmission. Richard Dawkins, an evolutionary biologist who wrote the infamous book, *The Selfish Gene* in 1976, first introduced Memes formally. Dawkins argued evolution from a gene-centered view of evolution; a theory that claims that natural selection is a process through which genes compete for survival. Later in the book, Dawkins introduces the meme in relation to cultural evolution. Just as the gene acts as the biological unit for biological evolution, the meme is the cultural unit for cultural evolution. The meme consists of any unit of cultural information, such as a practice or idea that gets transmitted verbally or by repeated action from one mind to another. There are behavioral memes, such as cultural forms of greeting or eating. There are visual memes, which include fashion, icons, design styles ect. There are audible memes such as pop music, advertising jingles, movie quotes and slang words. Probably the most important memes derive from language, something that some argue to be the sole responsibility for cultural evolution. Although the 'blogosphere' implicitly reflects the exchange of cultural transmission, the design community needs to make the act of tracking memes, a more explicit practice.

6. The Software Components

³ This quote is an assertion widely known to be made by William Burroughs, though it remains unsourced.

6.1. Temes (Technological Memes)

An underlying theme of this paper is concerned with memes in relationship to design. Memeticists like Susan Blackmore has taken the notion of the meme a step further by observing a third type of replicator⁴ called a teme, or technological meme. Seen as an extension of viral marketing and various advertising techniques that have been channeled through various media such as television and print, we now see a new memetic transmission happening through temes, memes that are produced from a complete lack of human intervention. Developed through a set of computer programming paradigms, temes such as web crawlers⁵ or bots are constantly used on The Internet to provide up-to-date data analysis for search engines. A recent invention that explicitly uses the notion of the meme is something called a meme tracker, a tool for analyzing the migration and transmission of memes on The Internet. It also tracks the most popular web pages that are being discussed on The World Wide Web. Meme-trackers can be a powerful tool for supplying statistics about the replication of information; a tactful device for discharging extraneous and repetitive searches and file transfers in collaborative software. Meme-trackers could also improve RSS feeders that constantly publish meta-data and summarized text. Some people criticize RSS feeders for behaving like junk drawers of information. A collaborative application used for developing an archive of images would have to include software that not only organizes information more efficiently but also sets up unique statistical relationships between information and images.

6.2. Data Visualization Tools

Data visualization has gained momentum as a powerful tool used to visualize data, statistics, and various forms of information. One of the most powerful strengths of data visualization tools is its ability to re-contextualize and reframe information so that people gain new and different perspectives for looking at information holistically. It also can augment the way we see abstract data and large data sets such as the Human Genome Project, which includes 3.1 billion base pairs. A powerful web log that documents these visualization tools and applications can be found at infosthetics.com, a leading site whose motto is "Form follows data". The emergence of these new sets of tools suggests that the way in which we analyze information is rapidly changing. One critical component of this new software is the emphasis on visual information as opposed to textual information. Until recently, the Internet has been a text-privileged medium. We need to harness the virtues of image-based systems to create a calligraphic encyclopedia of design and technology with textual supplements. One

⁴ Susan Blackmore discusses three forms of replicators: biological replication through DNA, cultural replication through language, and technological replication through machines.

⁵ Web crawlers are programs that provide up-to-date data on the Web. They can also be used for automating maintenance and validating HTML code.

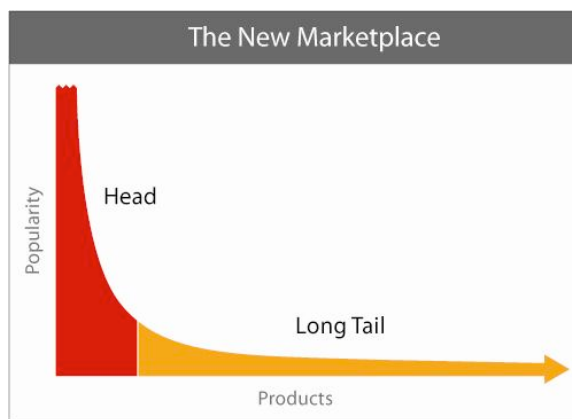
of the problems that we currently face with image-privileged systems online is that we do not have the bandwidth to transmit images smoothly. Secondly, we have limited screen capacity that inhibits a smooth navigation across broad browser landscapes. Currently we have a multiple tab and pop-up window system that ruptures optical flow. One tool that has yet to be released, gives a promising solution to all these problems. Microsoft Labs is developing a powerful new tool called Seadragon, a cutting edge browser that changes the way we use screens. The Microsoft team promises several design utilities. First, Seadragon provides fast navigation, regardless of the size or number of visual objects. Secondly, the software performance “depends only on the ratio of bandwidth to pixels on the screen.” Third, the transitions promise to be “smooth as butter.” Finally, Seadragon ensures that the “scaling is near perfect and rapid for screens of any resolution.” With this type of software, designers will not be limited to text-based websites and can harness the benefits of browsing design images more smoothly from around the world.



[Fig. 4] Screen-shot of Seadragon, new software in development by Microsoft Labs that expands screen real-estate and eliminates pop-up windows.

6.3. Collaborative Tools

A critical component to this encyclopedic software has to include a heavy set of collaborative tools. Open source technologies such as Linux, Wikipedia, Napster, MMORPG⁶ communities and Flickr have been extremely successful models for organizational infrastructure that is changing the foundation of institutions. It is becoming increasingly clear that a large part of developing efficiency is through the use of open source collaborative software technology. This is one of the only ways that this project could work primarily because the diversification and ubiquitous nature of design and technology is so awesome. By incorporating a scalable global component such that Google Earth employs, people from across the globe can upload images that are localized, thus adding to the larger picture. As Clay Shirky, philosopher and scholar of the social and economic effects of Internet technologies points out, sites such as Flickr “supplies cooperative infrastructure answers to classification.” That is, Flickr gives users the privilege of organizing photos rather than relying on an institution to do so. Shirky also emphasizes the strength in the power law distribution model otherwise known as The Long Tail⁷. The Long Tail describes a business model used by Amazo, which sells a large number of unique items, each in relatively small quantities. If we apply this to collaborative distribution models on the Internet, we see a large groups of people each contributing one or two unique items, adding up to an massively large collection. Whether the software would use a peer-to-peer relationship like Wiki technology or some other form of collaborative technology, what is important is that this open source collaborative software needs to be developed so that the interactive components are intuitive and easy to use for the user.



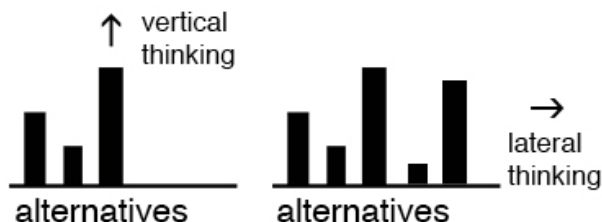
[Fig. 5] Chris Anderson’s model of The Long Tail, a graph that describes a shift from purchasing popular, mainstream products towards a demand for a huge number of niche products.

⁶ MMORPG stands for Massively Multiplayer Online Role-Playing Game

⁷ The Long Tail was first described by Chris Anderson, editor-in-chief of Wired Magazine

7. Lateral Thinking

One of the most important aspects of this software will be its capability to foster design innovation. It is necessary to develop new tools that augment the way we synthesize information and form relationships from a holistic perspective on a global scale. In an age of globalization we have several forces working against the accessibility of cultural influences. Alisa Miller from Public Radio International reveals discouraging statistics surrounding news coverage in her talk titled, *Why We Know Less Than Ever About The World*. Her reconfigured maps of the globe illustrate how the combined news coverage of Russia, India, and China only cover one percent of the total news coverage in the U.S. There are two strengths for developing this open source archive of design and technology in relation to the expansion of cultural exchange. First, it will be mainly image-based, a medium that transcends the barriers of language. Secondly, similar to the way Google maps works, users can seamlessly zoom into countries and glide across an endless array of design artifacts and processes that are culturally linked to each respective country. Furthermore, The process of learning through a relative set of chance operations is closely linked to Edward De Bono's Book, *Lateral Thinking*. In his book, De Bono outlines several differences between vertical think and lateral thinking. Let us look at some of the more poignant examples. First, "Vertical thinking is selective, lateral thinking is generative." Secondly, Vertical thinking is analytical, lateral thinking is provocative." Third, "Vertical thinking follows the most likely paths, lateral thinking explores the least likely." Finally, "With vertical thinking one concentrates and excludes what is irrelevant, with lateral thinking one welcomes chance intrusions." These notions of alternative ways of thinking can be applied in this new software for the sole purpose of stimulating attitudes and habits, which actually encourage creativity.



[Fig.5] Edward Debono's graph comparing the selective nature of vertical thinking versus the generative nature of lateral thinking



[Fig.6] Alisa Miller’s reconfigured map of the World illustrates the percentage of U.S. news coverage

8. Conclusion

With the advent of more sophisticated browser technologies, data visualization tools and increased Internet bandwidth, we can come closer towards developing a collaborative software application that creates an evolving genealogical archive of design and technology. This study argues for an application that not only creates an encyclopedic library of design and technology but also fosters design innovation and creativity. Furthermore, we have concluded that Internet surfing behaviors are rapidly changing in the way that users scan and read information. We argue for advancement in experimental software technologies that privilege image over text for stimulating cross-cultural collaboration and participation. We also understand that the role of the institution is changing as more online communities build infrastructure for collaborative practices. By creating software that combines the collaborative powers of Wiki technologies with the strengths of data visualization tools, we can create an efficient system that stimulates creativity and builds poetic relationships across disciplines.

References

Agueara y Arcas, Blaise, 2008, Seadragon: Microsoft Live Labs, <http://livelabs.com/seadragon/>

Blackmore, Susan, Dawkins, Richard, (2000). *The Meme Machine*, Oxford University Press

Burroughs, William, "Language is a virus", Unsourced

Carr, Nicholas, (2008). *Is Google Making Us Stupid*, The Atlantic.com, <http://www.theatlantic.com/doc/200807/google>

Dawkins, Richard, (1976). *The Selfish Gene*. Oxford University Press

De Bono, Edward, (1970). *Lateral Thinking: Creativity Step By Step*, Harper and Row Publishers, p.p. 39-44

Emerson, Ralph Waldo, (1876). *The Complete Works of Ralph Waldo Emerson – Volume VIII – Letters and Scoal Aims, Quoatation and Originality*

Foucault, Michel, (1984). *The Foucault Reader, Nietzsche, Genealogy, History*, Pantheon

Jobs, Steve, (January 9, 2007). *Macworld Conference & Expo*

Kelly, Kevin, (2006). *How Does Technology Evolve? Like We Did*, TED Conference, http://www.ted.com/index.php/talks/kevin_kelly_on_how_technology_evolves.html

Kurzweil, Ray, (2001). *The Law of Accelerating Returns*, <http://www.kurzweilai.net/articles/art0134.html?printable=1>

Pink, Daniel, (2005). *A Whole New Mind*. Riverhead Books, a member of Penguin Group (USA), pp.126

Rapaille, Clotaire, (2007), *The Culture Code: An Ingenious Way to Understand Why People Around the World Live and Buy as They Do*, Broadway Publishing

Shirky, Clay, (2005). *Institutions vs. Collaboration*, TED Conference, http://www.ted.com/index.php/talks/clay_shirky_on_institutions_versus_collaboration.html

Thompson, Bill, (2008). *Changing The Way We Think*, BBC News Online, <http://news.bbc.co.uk/2/hi/technology/7459182.stm>

Vande Moere, Andrew, (2008). www.infosthetics.com

Wolf, Gary, (2008). *Futurist Ray Kurzweil Pulls Out All the Stops (and Pills) to Live to Witness the Singularity*, Wired Magazine, Issue 16.04

Zielinski, Siegfried, (2007). *Manifesto Re:place Berlin, Investigations of Art, Science and Technology After The Media*.

