

Beyond 2.0: Songs from the Geek Chorus

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The term web 2.0 (and its associated 2.0 threads) is used to describe a range of technologies, activities and approaches. This paper asks what Web 2.0 actually is, and interrogates its various implementations. By identifying key cultures and motivations surrounding “2.0”, it establishes the trends towards “3.0” and beyond.

Good morning. My name is Sherman Young and I’m a lecturer in the Media Department at Macquarie University in Sydney.

I’m not a librarian. I think I’m here because I’ve written a book called *The Book is Dead, Long Live the Book* (published by UNSW Press - www.thebookisdead.com) in which I explore the future of the book. But my research interests are not limited to books; I’m fascinated by the new media technologies, and the social, cultural - and political impact of those technologies. My job today, I believe, is to be provocative; to throw a few bombs (as they used to say in pre 9-11 times).

Those great Canadian philosophers Bachmann Turner Overdrive, once said “you ain’t seen nothin’ yet”; And they’re probably right - the journey that has taken us from 1.0 to 2.0 is but a prelude to what is to come.

But I won’t be blindly reciting the technology press, and the breathless promises of the latest computer trade show in its utopian fervour. Instead, what I want to do is to try and identify what is driving the adoption of the changes that surround us. That way we can make a more sensible analysis of technological trends, and get a sense of what the future might bring; a sense that transcends the marketing fluff and PR hype.

So this presentation will not sing from the geek chorus. It will not be about surface computing, RFID chips, wireless broadband or multi-touch interfaces per se. Rather, it will gesture towards geekdom, and suggest that the cacophony of the geeks is not definitive.

Instead, I want to think about the human approach to media and communications technologies, and the complex motivations driving us towards - and defining - web 3.0; and suggest that whatever lies beyond 2.0 is not inevitable but contested.

A bit of context. There are those who feel that technological developments drive social change; the technological determinists; and there are those who argue the opposite - that social and political contexts determine our choice of technologies.

I prefer to think of technologies as *assemblages*; as combinations of techniques and ideas, practices and implementations that emerge from competing motivations. Technological objects can be used for a variety of purposes, and the ideology which drives its usage is often as important as the technological object itself.

It's best to think of *systems*; and a widely adopted technological system is the result of a competition between various ideas; between designers, producers and users. What we end up using almost never emerges fully formed from some hi-tech incubator. Instead, a technological system is the end result of often long, continual, development; and ongoing tensions between different ideas and motivations.

Because it is *ideas* which shape the implementation of technological systems that matter. What otherwise incomprehensible French philosophers sometimes refer to as virtual machines.

And those virtual machines are shaped by capital, systems designers, engineers, the marketplace and end users; the competing demands of the various stakeholders result in a stable technological system which then tends to dominate the cultural space.¹

For example, consider the humble brick. As a technological object, a brick is pretty self-explanatory. But it's more useful to think of a brick as part of a system. A brick can be stacked, joined with mortar, used as a digging implement – or thrown through a plate glass window.

The technology of a brick is more usefully understood as a combination - an assemblage of both the artefact and, more importantly, the ideas that surround its usage.

The technological assemblage of **bricklaying** - informed by the virtual machine of construction, urban design, quantity surveying, design and aesthetics, with the brick as the key artefact - is very different from the technological assemblage of **vandalism**, with the brick as key artefact.

So it is best to think of a technology as a stable system; an assemblage of ideas and artefacts that has been massaged and moulded into a particular stable form by a myriad of influences, human, technical and cultural. Television might be a more relevant example. Suppose I asked you the simple question 'what is television'? If you really thought about it, you might be hard-pressed to answer.

Television is partly an idea, partly a cultural construction, partly an artefact of engineering. It is not the merely screen in the corner. Or even just the way we receive the pictures. It's more than that. It is a cultural product. It is a complex assemblage constructed of a number of ideas and motivations; Disassembling the virtual machine is quite hard work.

For example, there is programming. We watch a variety of television shows - covering a range of genres - that together make up that thing we call television. It wakes up with us in the morning, entertains us through the day, tells us about our world in the evening and puts us to sleep at night. Television to many is the comfort of the schedule, the news at 6 or 7 in the evening. We don't care how the picture is made, or gets there. As end users we are just

concerned with the fact that it is on, it is entertaining or informative and that it is there.

But hang on. Others - producers, directors, screenwriters - will be concerned about the act of television production - and surely this is part of the technology of television. As is the interwoven personal infrastructure of the networks, the production companies, the actors, the star-making vehicles.

Think about, for example, the business model of television - one that is shaped by the dominant philosophy of capital, and informed by an economic imperative that is the profit motive. Programming sits within a business model that commodifies audiences and sells eyeballs to advertisers. To that end, the measurement of audience figures has become institutionalised into a technology itself - one that has a direct impact on what we see on television.

And all of that is shaped by government regulation, by audience demand, by technical and economic limitation, by social circumstance. And importantly, the computing and electronics that make up the broadcast and reception of television itself - impacts all of that as well.

So obviously, the 'idea' of television is far broader than just the techniques of transmission and reception - although those techniques are important.

Which brings us to the Internet. The geek chorus defines the internet quite precisely. At a purely technical level it consists of a series of communications protocols that allow the world's computers to communicate; and the hardware and software to support that communication. And the geek songsheet almost always includes a refrain about the internet's openness, libertarian culture and inevitable future directions.

But the internet that we have ended up with didn't occur spontaneously; the various incarnations of web 1.0 or web 2.0 did not emerge fully formed from the primeval swamp. The net, in all of its glorious complexity, as we know it exists only in the aftermath of a battle of ideas; a battle of cultures.

The early history of the Internet is fascinating and has been well documented. The development of TCP/IP and its widespread adoption in military and academic worlds set the scene for what was to come. And people like Manuel Castells have written well argued accounts about the various cultures that informed its development. According to Castells:

"The Internet culture is characterized by a four-layer structure: the technomeritocratic culture, the hacker culture, the virtual communitarian culture and the entrepreneurial culture."²

In this understanding, the Internet as we know it could never have emerged from the corporate world - the detours that were required to ensure the workings of the network, and the decentralised understandings of communication and control were anathema to the profit-motive. But more importantly perhaps is that whilst those cultures that Castells identifies may have been critical to the earliest incarnations of the internet (the network of networks), as the internet emerged into wider media culture, they only prevailed after numerous contests with other paradigms that may have suggested different implementations.

Those of us who are old enough might remember the early days of the pre-world-web internet. A time of usenet, ftp and gopher. At the same time that universities (and libraries) were discovering the joys of networked computing, the business world was trying to create parallel online services for consumers.

Companies such as Prodigy, the Source, CompuServe, AOL and gEnie provided information services - connection and content - for a set fee. They were largely closed, or walled gardens. A CompuServe user, for example, could only access content from the CompuServe network and its content partners, and users were encouraged to remain within the confines of the service. For example, in its early days at least CompuServe users could only send and receive emails from other compuserve users. The supposed attraction was not connection, but content. CompuServe users were able to access encyclopedia, travel services, e-mail and stock market reports.

At one point, the idea of online information service provision was one which attracted a large amount of interest. Apple Computer launched eWorld in June 1994 about the same time that Microsoft (MSN) launched the Microsoft Network. In 1995, in this country, Telstra proudly announced a joint venture with Microsoft called onAustralia. But it was shortlived. The late 1990s saw a collapse in the market for proprietary online services. In short order, EWorld and other smaller services closed down - largely due to lack of subscriber numbers.

A key factor in the demise of proprietary online services was the opening up of the Internet to commercial traffic. The 1991 lifting of restrictions on commercial data traffic confirmed the new role for the network.

Another key driver was the ease of use introduced with the first graphically based browsers with the world wide web. All of a sudden, accessing the brave new world of information services became as easy as point and click. As it gained in popularity, with commercial Internet service providers connecting people to the net without enhancing - or inhibiting - their users access to content, the Net ceased to merely be a messy, chaotic, free alternative to the commercial service providers, instead playing an additional role as the meta-network which incorporated all of the other networks - albeit some which still had walled gardens of content to which only its subscribers or members had access.

One by one the proprietary online services found themselves in an unsustainable situation. The Internet consumed them - with those services largely having to reinvent themselves as ISPs. Netscape inventor, Marc Andressen commented in 1995:

“The tremendously exciting thing that's happening is that all of the online services are basically becoming TCP/IP services.”³

As the internet exploded, the online services essentially died. The user had spoken, and chosen open against closed, unlimited content over perceived ‘quality’ and ubiquitous connectivity over tightly controlled communications.

The geek chorus was ecstatic:—



The Broad Band, Internet Killed the Video Star (<http://www.youtube.com/watch?v=BiB0VgOKojg>)

All of a sudden, Web 1.0 emerged as a new platform for the distribution of media and information products; and sparked a rush of investment and hyperbole that led up to the great dotcom crash. We could have had a bunch of closed, walled-garden networks - which prohibited people from selecting from all the world's content, or talking to all the world's people. The online services we had could have mirrored the closeted regimes of cable television; or mobile telephony where service providers determined what users could or couldn't do on the network.

But I'd argue that the human desire for expansive connection won the day. When given the choice between being connected to everybody with a compuserve account; or being connected to everybody, it's not surprising what we chose. When given the choice between getting information from one approved information provider, or getting it from everywhere, again, it's little surprise what we chose. Of course, the internet exploded universally because of network effects; the fact that it became more and more useful as more and more people came to be users; and more and more information providers became connected.

Many years ago, Hans Magnus Enzensberger in "Constituents of a Theory of the Media" identified what he called a desire for 'mobility', expressed in the form of "tourism, private car ownership etc". In critiquing the rather pessimistic Frankfurt School of mass media analysis, he suggested that capital more readily recognised that desire for mobility than its opponents; in the media realm, he noted that such 'mobility' was expressed in user desires for "the need for new forms of interaction, for release from ignorance and tutelage;" or perhaps most relevant to this little chat: "the need for self-determination."⁴

This was web 1.0; the new media technologies placed new tools of "self-determination" in

the hands of media users - like it or not; and those tools created a very real tension between the control that media industries traditionally exercised; and the very real desires for mobility that media users have - and even expect. It would not be an overstatement to suggest that there was a cultural shift - the expectations of the media user changed.

The notion that media and information could be had anytime, anyplace for little cost became the default notion of web 1.0. The lesson from web 1.0 was that people wanted expansive connectivity. They wanted to be able to communicate with everybody on IRC; they wanted to get information from a million sources via google; rather than the less expansive directories of yahoo and looksmart.

It was accelerated with the creation of Napster, Grokster and Kazaa and before long users expected, demanding, that their information become totally mobile. I'd argue that this was, and continues to be the culture that drives much of what happens online.

And that mobility was provided by tools that emphasised connectivity. The desire for ubiquitous connectivity to people and information. The eventual success of web 1.0 came about because the technologies of the cheap computer, the ability to access a global network and easy to use software afforded us all new possibilities of connection. Connection between people and people; connection between people and information. All of a sudden, we could connect in all sorts of ways that weren't previously possible - and we loved it.

But the battle for which virtual machine would prevail over the web continues; arguments over open standards (most recently in debates over Internet Explore 8 and its compliance with W3C standards); the insistence of some ISPs to be content companies (such as Bigpond's exclusive deals with the AFL and v8 supercars) and policy debates over everything from net censorship to net neutrality suggest that the contest over "what the internet is - at a network level" is far from over. There are continuing arguments about who controls this thing we call the Internet.

But most of now inhabit a web culture, predicated on a sense of connection and mobility which we have embraced and accepted as second nature. In hindsight, as we sit at home with our broadband connections, living an online life, embracing that web culture, maybe there was something to that internet hype of a decade ago. Maybe the geeks were right way back then.

Which brings us to web 2.0. But before I explore some of the features of the new .0 release, I have to emphasise that there was probably no point at which a clear transition between web 1.0 and 2.0 occurred. Just as there will be no clear point at which web 2.0 becomes 3.0. The ongoing development of the web is a verb; and in some ways web 2.0 was not so much foreseen as happened in hindsight.

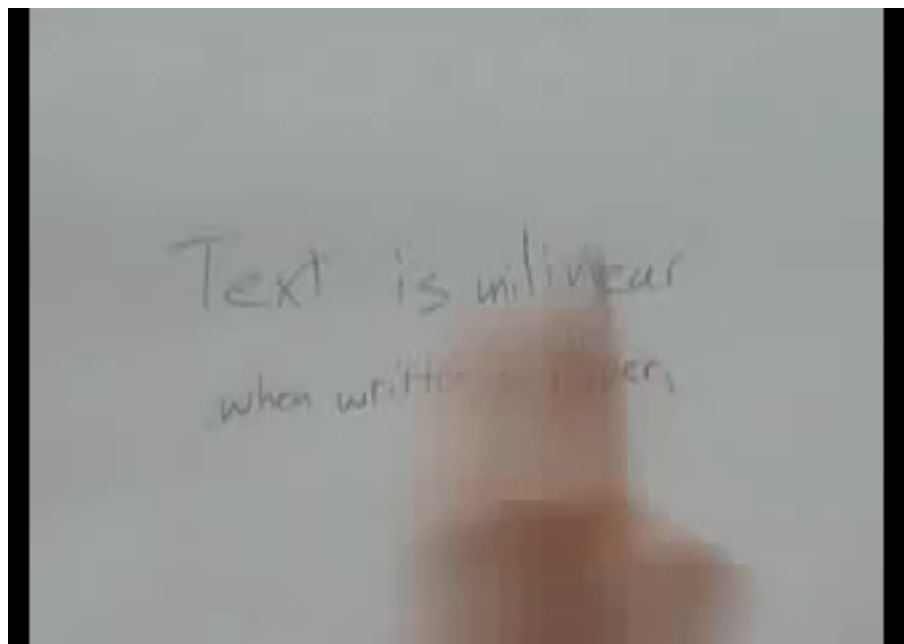
Understanding 2.0 can seem complex. On the one hand, there is the notion that web 2.0 is about particular tools and programming techniques - keen geeks argue that it's all about AJAX (Short for *Asynchronous JavaScript and XML*, it is a term that describes a new approach to using a number of existing technologies together, including: or XHTML, Cascading Style Sheets, JavaScript, the Document Object Model, XML, XSLT, and the XMLHttpRequest object. When these technologies are combined in the Ajax model, Web

applications are able to make quick, incremental updates to the user interface without reloading the entire browser page).⁵

Others argue that web 2.0 is about the user as content creator - sites such as *flickr* - which allows users to share their photos; *blogger* which allows them to share their thoughts; wikipedia which allows them to share their obsessions; and youtube which allows them to share their favourite TV shows. Axel Bruns calls this produsage; and it has further extensions in the idea of mashups - a culture of creativity predicated on the notion that everything is built on the shoulders of others. (And we'll think about that a little more later)

If the Web 2.0 meme can be simply summarised, it might be seen in the title of "We are the Web"; Kevin Kelly's 2005 article in Wired magazine⁶. In it, Kelly identifies a key theme in the Web 2.0 discussion- the idea that "the producers are the audience, the act of making is the act of watching, and every link is both a point of departure and destination." Or in Tim O'Reilly's progression, "publishing --> participation."⁷ Without engaging in a critique of the web 1.0/2.0 dichotomy, it is probably fair to suggest that the idea of web 2.0 is a contemporary expression of what world wide web creator Tim Berners Lee called intercreativity - "building together, being creative together."⁸

I'm sure many of you have seen this clip, but it does sum up the dominant web 2.0 meme.



Web 2.0, The Machine is Us, <http://www.youtube.com/watch?v=6gmP4nk0EOE>

So it might seem that whilst web 1.0 was about connectivity; web 2.0 is about creativity. And importantly, just as web 1.0 seemed to be about new, innovative forms of connection, web 2.0 seems to be about new, different forms of creativity. Humans have been creative for millennia, but just as web 1.0 provided new, easier ways to connect - resulting in new connections - web 2.0 provided innovative, simple ways to create - resulting in new creations.

For example, my colleague Graham Meikle points out that web 2.0 is perhaps less about

writing that about 'editing'. He cites John Hartley's thinking about interactivity - and his notion of "newly-interactive citizen-consumers". From an article published in 2000. What does "interactive" mean? "This term", says Hartley, "describes what in an older technology is called 'writing'."⁹ He argues that the definition of literacy has gradually expanded to include writing as well as reading, but that in public, mediated communication, hardly anyone gets to 'write'. Here's Hartley again: "This is where journalists have had the upper hand for so long: they can 'write' in public. But now, worryingly for them, anyone can join them; readers are transforming into writers in the interactive media."¹⁰

More than this, Hartley suggests that we're moving from a society that privileges *writing* to a society that privileges *editing*. Editing, re-arranging, re-contextualising existing media material — these are the hallmarks of our increasingly participatory culture. What we might think of as a *mash-up culture*. More and more of many people's daily media use can be thought of as processes of preparation, arrangement, editing, revision, shaping. More Hartley:

"Is it possible to tell a society by how it edits? Is [this] a symptom of the social? [...] *Are we in a period where it is not information, knowledge or culture as such that determine the age but how they are handled?*"¹¹

Think about the craze for re-mixing movie trailers. **The Shining** is a horror movie from 1980 based on a Stephen King novel. But what happens when WE get our hands on the trailer...



The Shining Trailer Mash-up, <http://www.youtube.com/watch?v=PMIpkQJt02g>

Or think about blogging — a whole new mediascape made up of people commenting on other material: posting links to news stories and deconstructing them in public. Blogs, we should

say, are not diaries (or at least, really good blogs are not diaries — or are not *just* diaries). Diaries point inwards, towards their author. Good blogs point outwards, towards other people, other resources, other materials online.

For example, Boing Boing¹², a "directory of wonderful things" is one of the world's most popular blogs. You can stop by pretty much every day and know they'll have found links to some diverting stuff online, which I'm going to want to look at. Now notice that it's not *just* a list of links — rather it's what we might call "value-added links". They set the links in a new context, and add annotations, commentary, elaborations — they take ready-made materials and create something new (and something very popular.)

And of course the most visible expression of the Web 2.0 meme is that of social networking. Just as blogging leveraged incremental improvements in implementation to suddenly enable technological neophytes to more easily publish online, the social networking sites have allowed the easy creation of community and social links. There are, of course, critiques of the value, implementations, ethics, usefulness and impact of the likes of MySpace and Facebook – not to mention long-term questions about their economic viability – but their current popularity is undeniable, and it appears that they play a large part in the life of a large section of web users.

And there is no doubt discussion to be had as to how myspace and facebook will intrude into the mediascape - an obvious example is how myspace has become a place where musicians can show off their creativity - and thus a defacto source of music for musiclovers worldwide; a focus for much discussion about the realm of something we might call music 2.0 which allows for a music industry without the need for major record labels.

Of course, we now have everything 2.0.

In that peculiar habit of humanity to jump on loud noisy bandwagons, we've happily appended 2.0 onto every noun. But if pushed, you'd have to argue that the motivation behind much of the web 2.0 activity is building on notions of connection, to allow new forms of creation.

And the "2.0" sites and tools that have succeeded; the ones which have been most widely adopted by hundreds of millions of users are those which make it **easier** to create. The early days of the internet demanded specialist skills to communicate or publish. Web 1.0 replaced hard core programming with simple e-mail clients, chat rooms and in terms of creativity introduced the much simpler approach of html - supplemented with graphic html editors such as Dreamweaver. Web 2.0 replaced coding of any sort with the even simpler act of **typing**.

But that's enough about web 2.0 - you know all this. What about web 3.0? Like our thinking about web 2.0, web 3.0 will probably be best understood when we wake up one day and realise that the paradigm for using the web has changed whilst we were sleeping. But there are already suggestions as to how it might evolve.

Eric Schmidt from google was asked about web 3.0 recently and answered with some geekspeak about new APIs and portable application implementation¹³. Which may be right, but is not that interesting from my point of view. Similarly in Businessweek, Stephen Baker

summarised a panel discussion on web 2.0 in which he suggested that it would be:

“(1) easier, cheaper and more persuasive and (2) always on. everywhere.”¹⁴

Which is probably a simpler way of saying what I’ve been trying to articulate all along with Enzenberger’s idea of mobility.

But the more intriguing idea seems to be the promise of what Tim Berners Lee has been talking about for some time - the notion of the semantic web. John Markhoff in the New York Times sums it up pretty clearly. As he describes it, Web 3.0 will be about mining "meaning," rather than just data, from the web by using software to discover associations among far-flung bits of information:

“the Holy Grail for developers of the semantic Web is to build a system that can give a reasonable and complete response to a simple question like: “I’m looking for a warm place to vacation and I have a budget of \$3,000. Oh, and I have an 11-year-old child.”¹⁵

Under today’s system, such a query can lead to hours of sifting — through lists of flights, hotel, car rentals — and the options are often at odds with one another. Under Web 3.0, the same search would ideally call up a complete vacation package that was planned as meticulously as if it had been assembled by a human travel agent. Which sounds like web 3.0 might be about collating or collecting; intelligently collecting specific sets of information that might fulfill particular purposes. The semantic web will do the work for us - effortlessly guiding us through the plethora of information currently at our disposal; taking all that data and using the power of the machines (rather than our time) to make it useful.

If web 2.0 is us teaching the machine; then web 3.0 is us using that machine- with everything that it has been taught... The recent ‘google generation’ report commissioned by the British Library reflects that notion. It suggests (with what it calls medium to high confidence) that:

“Our view is that the semantic web is a tool that will reach its tipping point fairly soon. In five years, 2013, there could be substantial developments that might allow a whole generation (of undergraduates) to begin to experience its potential.”¹⁶

There are, of course, contests about what a semantic web might be and how it might be implemented. It wouldn’t be technology if there weren’t (!). But here’s a suggestion, maybe we can think of the web’s evolution in this way:

- 1.0 connecting
- 2.0 creating
- 3.0 collecting

where each stage, obviously, builds on previous developments. So, the creativity that drives web 2.0 only happened because web 1.0 provided the connections which made that creativity visible and viable. And web 3.0 collecting will build upon both the creativity of 2.0 and the connections of 1.0.

Of course, all of these speculations demand the demise of the physical information object; in

an environment where information collections are dynamic, information objects become problematic; largely because they cannot be incorporated into those collections. Print makes little sense in a technological system which requires everything to exist in a ubiquitous data cloud. So a pre-requisite is comprehensive digital information; a world where all information is available and searchable.

In my book¹⁷, I suggest something that I call the heavenly library. It's a utopian dream in which every book ever published is available 'in the data cloud.' and is available for download at anytime, from anywhere. Need a copy of Crime and Punishment; it's there. Want to read the latest Alan Bennett novella; and you can have it instantly. Want to browse the crime lists to see what others may be reading. You can.

Of course, we're not there yet. You can buy ebooks online, but the comprehensiveness and ubiquity of the heavenly library are still a long way away. But libraries around the world are busy digitising their collections, sometimes with the helping hand of the big G; and publishers are slowly beginning to look at digital as more than just a curiosity. Arguably until all the world's content (including books) is available electronically on the network - then the semantic web will not happen.

As well, such a vision would require the tools to make building collections easy and useful for all of us; not just librarians. Tools that allow easy and comprehensive collection and collation. And key discussions around things like particular implementations of metadata schemes and tagging systems is something probably best left to information professionals like yourselves. I'm more interested in the big picture...

So what might innovative collecting look like? How might the 'machine' help us to sort through the masses of objectless information that already exists, and which will one day threaten to drown us.

Well, Markoff's travel agent example provides an insight. But there are perhaps other possibilities; as well as collecting information for one off queries in the consumer space, maybe the semantic web will be clever enough to allow for purpose built collections of useful information for specific needs.

I might, for example, want to create a dynamic 'presence' which provided links to academic papers which answered specific questions about web 3.0. So that instead of providing a 'suggested reading' list for my students, they could peruse - and return to a constantly evolving, and intelligently annotated resource that reflected a particular research question.

And whilst google might currently provide a bunch of unrelated links for information on say "the simpsons"; a web 3.0 implementation might provide a dynamic collection of resources on a specific bart simpson query - say "Itchy and Scratchy and their relationship to particular Tom and jerry episodes" ; and users could return to a particular collection to find a constantly updated, and sorted, set of responses to that query.

News aggregators might do something similar. Rather than the fairly crude collecting tools that currently exist (breaking news, top stories, international, world); users could create dynamic portals reflecting updated content relevant to key newsworthy interests. But with far

more sophisticated filtering mechanisms than rss feeds. Again, in Markoff's terms think 'meaning' rather than information. In short, maybe the semantic web will do some of the things that librarians do on a day to day basis; answer specific information requests.

All of this requires the use of those buzzwords, metadata and tagging; stuff which your average Joe just couldn't be bothered doing. (I know I can't). So Web 3.0 needs to provide tools which make tagging incredibly easy, or generates useful tags by itself. And there would be more. The semantic web might also allow new ways to connect people; imagine being introduced to strangers on your facebook not because you were accidentally in their address book, or had met briefly at a bucks night in 1992, but because there was useful metadata which suggested that you shared an interest in growing frangipani trees.

But most of all, imagine the things we can't imagine because some 14 year old kid will take the tools and create the web 3.0 equivalent of flickr or youtube. Or facebook.

All of these developments would happen in parallel with key advances in computing and communications hardware. That notion of mobility, which arguably has driven much successful web development has an additional meaning as devices become smaller, more portable, and more powerful. The geek chorus would argue that we are almost at a stage where we all had tiny devices; with ubiquitous connectivity to the cloud; allowing us to connect, create, and collect with all of humanity's information. The technology, they might say breathlessly at each year's Consumer Electronic Show, is here. And they're right about the device; it probably does exist. And it is, I already have such a device in my pocket; and whilst it doesn't yet do what these web 3.0 speculations suggest; it's pretty damn good at the web 1.0 and 2.0 stuff.

But the device is just the **brick** part of the system; we have to figure out the **bricklaying** bit, which I'd suggest is a whole lot harder. But if and when we do, the idea of a semantic web and an iphone style device suggests that not only might we have a library in our pockets, we may actually have a librarian as well.

Which leads me back to my initial reflections about technology. I think it's pretty safe to say that web 1.0 and web 2.0 are faits d'accompli - that the contests about what technology should be adopted are over - and that particular implementations of connectivity and creativity have prevailed. Although there is probably still that remaining battle being between myspace and facebook :-)

But web 3.0 does not yet exist; if the semantic web is to be the meme for the next iteration of the web, its particularities are still up for grabs; My ideas are just that - thought and idle speculation, part desire, part informed guess. If, indeed ideas about collecting; and their specificities are part of the what the web will become, then we are currently in the middle of that contest.

I am not a librarian. But I suspect that libraries and librarians could be central to debates and discourses about whatever web 3.0 is going to be about. Particularly if the semantic web is the holy grail; and metadata and innovations around collections involved in its implementation - then the skills and expertise of those who have worked in collecting,

collating and annotating information will be key.

Of course, capital will have its own ideas about what web 3.0 should be; the likes of google, amazon, microsoft, apple and others will present visions that they hope will entice users, and guarantee revenue streams; government will protect particular interests - probably with policy fiddles around intellectual property rights and access to the network, which will end up being the most important policy debates of the 21st century; And users will continue to be driven by that notion of mobility - the endless drive towards easier and more ubiquitous access to connectivity, creativity, and perhaps collecting. In the middle of all this, librarians and information professionals will bring to the discussion skills and ideas that could serve all and any of those stakeholders in technologies ongoing contest.

A long time ago, Alan Kay, a pioneer in the computing realm suggested that:

“The best way to predict the future is to invent it.”¹⁸

The reality is, the Internet Gods have given us incredible tools; we have the platforms of web 1.0 and web 2.0 with which to connect and create.

Now it's down to us to help invent web 3.0.

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