GAINING A PAST, LOSING A FUTURE: WEB 2.0 AND INTERNET HISTORICITY

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Abstract

This paper considers the emergence of the historicity of the Internet – that is, the explicit sense with practical consequences that the Internet has a history, and that it exists within a history which, through our use of it, also defines us as beings in time. For many years, the Internet existed as a kind of cultural future-in-the-present. For example in the 1990s, talk of the 'Internet frontier' was a metaphor to give cultural substance to this new and inexplicable space called cyberspace. But it was also a temporal metaphor: the frontier was the future, as much as it was a place. The alterity of the Internet, where people found freedoms not imaginable in 'the real world' was also an alternative time, a world of future possibilities, made real through the magic of networked computing. The Internet might have had a history, but it had no historicity. That has changed because of Web 2.0, and the effects of Tim O'Reilly's creative marketing of that label. What can we make of the last decade of the web, which has in popular commentary, clever marketing, and actual socio-technological development, become a second version of the web we had in the 1990s? What are the consequences of coming into history for the Internet? How might Web 2.0 inform us of the way the Internet is culturally constructed through changing patterns of relations of past, present and future?

Introduction: on historicity and history (750)

History is best understood as the process by which the past becomes 'written' into the present. Taking many forms, composed in many ways, history is always the outcome of the impossibility of being in two times at once: one can never be in the past *and* present simultaneously but humans are, perhaps constitutively, always aware of the relationship between these two temporal states. Indeed humanity most often understands itself *through* the created notion of a journey in time by which we first come to locate experiences as past and present. Lowenthal (1986) famously considered the past as "a foreign country" to metaphorically capture the strangeness which might be experienced visiting a time other than our own. Yet, as in the spatial journeys from one country to another, it is the way that our journey brings into close alignment the then and now which creates our sense of

differentiation. Travel, whether temporal or spatial, makes humans (and all our interpretive tools) the *vector* along which near and far approach and intersect.

Historians (most commonly working in a post-structuralist manner) have, as a result, been able to use their 'travels' to shed light on the 'now' by reference to the 'then', demonstrating how things which seem timeless are created within a particular social context and thus are not as 'natural' as we might assume. Others chronicle the journey in such a manner as to explain the manner by which the present has come to be, revealing origins and destinations that produce continuities, even to the point of implying certain futures. In both cases historians travel with baggage and we always are left wondering just which past might have been visited. We can ask: how might that past have been rendered to serve the purposes of the present? How might the present have already implied a kind of history which limits our access to the past? Essinger and Danser write:

> ...history is not directly dependent on what happened in the past but on how it is remembered or...how it is repeated recreated in the present... Only in retrospect is what actually happened seen as 'inevitable'. The past was once the indeterminate future... (2005: 44).

And thus, in asking the questions of how the present shapes the past-as-history, we are also made acutely aware of the relationship between our present experienced and the future we imagine and seek to shape.

Furthermore, as Healy (1997) has explored in relation to the memorialisation and celebration of history, history must also be experienced in the present if it is to be meaningful. Healy, citing Jameson, noted that a significant presumed quality of the postmodern era is the loss of the past, as societies become alienated from a sense of how they have developed over time (1997: 8). Healy therefore investigated how a society might "act out" its memory, creating "in-between moments when we cease to live in time and space in order to reflect on ... our sense of historicity, our being-in-history" (5). From this perspective, history is not 'present' in our lives except as a potential: history, the past written into the present, affords certain possibilities by which our current place in time might be articulated with the past and those possibilities must be enacted through history work. The traces of the past on which and through which history is written become, in Healy's words, part of social memory "not through the authenticity of being in historical space but through the tactical transformation of historical space" (1997: 36).

Healy's interest was in public, collective history work (museums, commemorations, popular mediated stories) performed many years after the events being remembered (or indeed forgotten: see Allen, 1996). This paper concerns another kind of history work: the discursive development of a 'history' from something so recent that it is largely experienced in the social world as if it was new, without a past. Such historical production, while quite different in its methods, is nevertheless the same in its outcomes: to constitute the present and how that present might develop in future in such a manner that it is based in social memory. I will explore how the Internet 'got a history'. Getting a history meant that its public existence was explicitly framed by reference to a narrative locating the current Internet in relationship

with a past Internet. This relationship not only legitimated the Internet as a normal developing technology, but also structured the correct path of future developments in accordance with the lessons to be learned from that past. And, as will be explored in this paper, the 'future' of the Internet was as much at stake in writing the Internet into the present as the past from which it might plausibly have been thought to come.

The Internet was born 'as the future' (710)

Digital computer network technologies are now, most often and most widely, referred to as 'the Internet'. It is an abbreviation which both conceals and thereby points out a complex process of development over time which might have led to very different outcomes. It explains why some insist on the lower-case i, for internet, to assist in distinguishing a multi-dimensional, evolving socio-technological phenomenon from a particular and historically specific technology, the capitalised Internet. This question of how the 'Internet' came to stand in for a diverse and complicated set of developments will continue to haunt this paper. But, for the moment, I will persist in considering the Internet in the way it now is normatively understood and consider what its origins might be.

The Internet has no true origin (for nothing ever can); it has no singular history of development. But its past origins, various as they are and now understood in the present, do reveal for us the complex relationship with the future that this technological formation has. Put simply, the Internet was born 'in the future'. By this, I mean not only was it explicitly created in terms of what it might become, and how it might change the world, but also that it fully and most fundamentally occupied the place within the meta-narrative of technological progress which has defined the modern era. In the discourse of the Internet, its origin is most often held to be the inventive musings of Vannevar Bush, the USA's chief scientific advisor during the Second World War and author of 'As We May Think', published first in 1945, famous for its description of the Memex, a machine of dubious technology but redolent with meanings (Bush: 1945).

The pseudo-technology of the Memex has often inspired computing developments since that time (for example Schneidermann, 1998) and certainly played a key role in the thinking of Licklider who, if one wishes to assign paternity, might be considered the father of the Internet (Nyce and Kahn, 1991; also Licklider, 1968). As Johnson (2008) has recently argued, the importance of the Memex is often missed because, rather than being "a material contribution to the then future history of the internet ... Bush's ideas can be seen "as a vital first step in what Winston calls the 'ideation stage of the Internet' because it makes possible the conceptual shift from computational machine to textual machine". The Memex is, in effect, the origin of the Internet for the manner in which it presages the relationship between data, machines and humans for the production of new effects in the spatial and temporal organisation of knowledge.

Bush, when imagining the Memex, did so as a projection of how scientific work might be performed in the future. Yet his short and powerful article is more significant for its invention of a new future for science: one in which the efforts of scientists and inventors

would be turned away from the destruction so recently in evidence during the Second World War, and towards the creation of a world worth living in, a world whose progressive and peaceful nature could be guaranteed by knowledge work rather than threatened by it 'As we may think' was apparently concerned with the question of how humans might undertake cognitive work in future. It thereby attempted to solve a key problem which Bush foretold with uncanny accuracy – the future would see excessive information, and would need more interscientific collaboration than then-traditional scientific methods might permit. But, ultimately, Bush's desire was to re-assert the primacy of the scientific project *as* the answer to the problems which science had itself created, most evidently seen in the war of which he had been a central scientific protagonist (Hauben 2004 for a discussion of Bush's scientific idealism; also see Beniger, 1986 for control questions).

Ultimately then, while the Memex was just one fragmentary and passing symbol of a way of thinking, it has become, for better or worse, the origin of the Internet. As such, the Internet can be said to have come into being as 'the future': not a prescription for how to arrive at that point distant from some past now, but an vision of how knowledge might make the world better. Such utopianism elides the developmental trajectories from now to then in favour of an idealistic unity of past, present and future.

The Internet arrives 'from the future' (1440)

I noted above that the Internet is a superficial term which, while gathering together many diverse developments in ways that make sense *now*, ignores the fractures between those developments as they occurred. The *origin* of the Internet is mythic, deployed (as above) for particular arguments about our current state of affairs; so too the very *object* whose past we seek, has only now come to exist, to be labelled in this way. The Internet is, if you like, the winner of the past battles over the right way in which networked computing might come to be and writes its history from that victorious stance. This point helps us to understand how, as I explain in this section, the Internet first came into substantive popular existence as a kind of cultural future-in-the-present – a disruption not only of the way in which things were done, but the historicity of human affairs.

From the late 1960s, gathering momentum in the next decade towards realisation in the 1980s, several different sectors in advanced industrialised society were working on different aspects and versions of networked computing, all with an eye to the future but with very different present circumstances. While most often the focus lies with the computing researchers within a small number of universities and research centres (ref), of equal significance was the work of telecommunications corporations (government monopolies at that time). Sometimes working in partnership with the telecommunications sector were the media industries, principally print-based new but also television. Governments were also heavily influenced by the views and perspectives of the telecommunications sector, in developing policies and proposals for future possible networking arrangements.

The world view of the companies was a curious mix of research inventiveness and orderly, managed deployment. It would be wrong to think that the companies were solely interested

in profit: their innovation approach was more governed by the particular kind of paternalism which government monopoly produces. Technology was a serious business, to be carefully managed for the good of all, and only introduced in ways that embodied a known future. In other words, technological innovation was to come slowly and with due regard to having worked out consequences, as best they could be known, ahead of time. Such innovation was to be marked by strong, centralised control with the decisions that shaped its public release being made by the expert technocrats within the telecommunications industry. That said, in the later phases of development, especially the late 1980s and early 1990s, privatisation and corporate restructuring made financial concerns far more significant, suggesting also that the future would need to be both known *and* profitable before technologies could be widely deployed. While media organisations were more directly interested in future profits than phone companies, they too sought a deliberate, orderly and above all centrally controlled innovation process so as to avoid threatening the success of their old media forms. As evidenced by the fraught relationship between media and telecommunications companies, especially in the USA where the rapid development of cable television produced competitive pressures not known elsewhere, media corporations vacillated between embracing these innovations and seeking to stifle them (Bagdikian, 2004; Boczkowski, 2004; Gitelman, 2006; Newman et al., 1999)

At the same time, private companies were making rapid if sometimes accidental strides forward in the provision of networked computing services while amateur and public service providers were also becoming common, if only with marginal effect on everyday life. The Genie network is the best example: offered by General Electric corporation with limited knowledge of what it might be for aside from a few enthusiasts within the company, and simply because GE's large computer installation existed and was underutilised. Telecommunications companies profited from these developments (unless hacked, in the traditional sense of the word); nor did not such developments appear particularly threatening from the telecommunications corporate perspective, because of their marginal utility (Kyrish, 1996). The world of computer networking was largely confined to a very select sub-cultural group of (mostly American) computer professionals and hobbyists, with an emphasis towards gaming and role-playing, and also a small number of expert information professionals willing to invest in what were then expensive services (see Pavlik, 1996). From the telecommunications perspective only that sector had the authority and importance to bring networking to more general popular consciousness, offering the services and forms determined to be appropriate to such an audience. These services, however, largely defined the way in which computer networked services were understood through the 1980s because telecommunications and news media providers were still largely absent from this field of work, despite the plans and preparations they were making (see Pavlik, 1996)

The 1990s was the decade for the arrival of the Internet into public consciousness, signalled by many markers. The National Information Infrastructure legislation was passed in the US Congress; it saw the development of the World Wide Web and the Mosaic browser. Microsoft shifted its emphasis away from a proprietary network (MSN) almost at the very last minute towards public networking. The then-largest proprietary network, AOL, interconnected with the Internet. Most importantly, there was the general deployment in

society of computers with the Windows operating system with in-built networking features, and famously marketed with the slogan 'Where do you want to go today?' Looking back it all seems quite natural and inevitable: but of course, from the perspective of governments, media corporations and telecommunications providers, the Internet did not, in any way, fit the script which they had been preparing, principally because it ceded control of networking away from centralised authority. Moreover, it seemed to spring to life everywhere at once, because of the ground already prepared in the 1980s by the early developments that had already created a sufficiently large population already capable of determining their own approaches to this technology.

For this reason, I would argue, the Internet comes into popular widespread existence as a future-in-the-present, arriving, we might say, before its time is due. In the 1980s two developmental pathways of innovation had emerged. The dominant one, controlled and authorised by telecommunications providers, at times in concert with media corporations, firmly fixed the Internet in 'the future' which would be reached when it was appropriate and when society was ready for it. The historicity of the Internet was enacted through the correlation of the past processes of orderly development and the future possibilities which would only become present at the right time. The repressed or marginalised pathway was that the future had already arrived, in the hands of the hobbyists, enthusiasts, and researchers already living in a computer-networked world: this future was, in Gibson's famous words "already here ... just not very evenly distributed" (1999). Living in a world where the discourse of the information revolution, with its portents of radically different futures, abounded, the eruption of the future into the present was already very clear. For these early adopters, as much social pioneers as anything, the orderly developmental pathway made no sense and, for them, the historicity of the Internet was couched in terms of where it was *going* not where it was *from*. Thus historicity was inverted, breaking with the past because – it seemed – developments had arrived from the future. Moreover, when each new person connected they found a pre-existing world, already populated and full of strange norms and customs. It was as if the future was already there, waiting to be found. The disorderly, distributed, largely unknown nature of the internet contributed to this sensibility in a world where, in every other respect, novelty was presented in a neatly packaged and well organised manner. The Internet was not like that in the 1990s.

Winston writes, in his excellent account of the long history of communications technology of the interplay of political and economic forces which, at the same time, "created today's world [but are] also trying to create tomorrow's world". He also suggests that society generally, while embracing "the inevitability of progress" nevertheless seeks to make novelty conform, in some ways at least, "to pre-existing social patterns". Thus, in his wonderful metaphor, technological "progress is made while going down the up escalator" leading to a "jerky advance into the future" (1998: 11). Yet for all the force of the metaphor, I think that the Internet makes us think differently about this relationship of past, present and future. From the perspective of most everyday users of the Internet, there was no journey into a new time in the 1990s: the Internet was simply there. And those technology managers on the escalator of progress looked down to see that many more people than they could have imagined had taken the lift instead and beaten them to it.

The Internet gains a past (1400)

Of course, it is foolish to say that the 'gained' a past after the time in which that occurred. Yet it is precisely the counter-factual notion that things can be without a past which best describes the intensely future-in-the-present culture which marked the Internet of the 1990s. Indeed the emergence of popular and academic work describing that past, bringing it as history into the present, serves to show how the Internet 'came from nowhere' (or perhaps more precisely 'nowhen') and thus demanded a rapid process of assimilation such that it might make sense. It was, effectively, at this time that the Internet colonised and submerged within itself all the other past computer networking developments which might have led in different directions but which now, looking back (as in many histories) appear to have led only to the Internet. That, technically, the Internet was capable of doing this because of its open architecture reveals perhaps the reason why it was indeed successful.

The key intervention by which the Internet moved from being mainly or predominantly a 'future in the present' to being something more clearly associated with its own time was the rapid dissemination and uptake of the idea of Web 2.0, principally emanating from the computer training and publishing corporation O'Reilly Group led by Tim O'Reilly, and first becoming noticeable in 2005-2006. O'Reilly was heavily invested in the future success of the computing industry, as distinct from media and design, and had already been involved in the memetic development of open-source software as a 'brand' under which to promote the work of programmers (ref). Web 2.0 was not a new term – it had been used at least as early as 1999 to label a future kind of web-based interactivity (DiNucci), had entitled a book on the future of e-commerce (McCormack, 2002), and had emerged in commercial use in another form with Yahoo's efforts to create novelty and renewed interest in its search services under the label MyWeb 2.0 in during 2005 (Allen, 2009; see also Allen, 2012 forthcoming). However, Web 2.0 is now ineluctably associated with O'Reilly because of the business investment he made in securing the rights to both control the term and also promote its diverse interpretation according to certain specific ideas which he or his close colleagues advanced.

Web 2.0 was, for O'Reilly, a delineation not *just* of the next version of Internet development but also (and essentially) a conceptualisation of what had already happened. O'Reilly first of all explicitly defined Web 2.0 in terms of lessons from the past – principally looking to those businesses which had survived the dot.com crash and thus gave the lie to claims that the Internet had, after the crash, started to become insignificant (O'Reilly, 2005). In other words, O'Reilly historicised what has previously been a time of futuricity – of trades and technologies that depended only on the promise of what was to come – and thereby rendered the current Internet, mid-2000s, as explicable as the outcome of these past events. Indeed, he welcomed the crash for, in O'Reilly's view, it demonstrated to investors where they might best place their capital for long-term gain. These investment opportunities were not, contrary to the then wisdom in Internet companies which modelled media, but in effective software-based companies which continued to challenge the notion

that media and telecommunications uses similar to old formats were the future potential of the Internet (Allen, 2010).

The historicising quality of Web 2.0 rapidly led to the post-facto creation of Web 1.0, the version which this new form of the Internet was replacing. More than anything, the way that some commentators and critics happily adopted this term demonstrates the work of historicisation: in the 1990s no one knew they were in version 1 nor did they did not care but after the fact, it became easy to explain what happened then because it was now known that version 2 had been about to happen. Thus, as well as a lesson in history, Web 2.0 becomes a lesson in historiography, enabling the Internet to be reset upon a proper course of controlled development from then, through now, to the future. The rapid emergence of talk of Web 3.0 (at least as early as 2007, even before most people had become familiar with Web 2.0!) further emphasises that once the contemporary is described as a version, then so too do the past and future become known through the allocation of preceding or succeeding version numbers. Indeed I have myself contributed to this by considering the extent to which the 1980s and early 1990s might be considered Web version 0, the originating state of human computer networking against which the valence and meaning of Web 2.0 might be measured compared to 1.0 (Allen, forthcoming 2012). Yet in doing so we ignore that, for many users, the web-infused form of the Internet which spread rapidly from 1995 onwards *was* the first version and it is only those who experienced the transition who might see it as different. Equally, many Internet users continued to use the web in ways that pay little heed to the developments so breathlessly supposed to have transformed it (see for example Madden and Fox, 2006). Yet more, especially in developing nations, have connected only recently and see nothing before them but the web as it now stands. The historicity of the web must be understood cautiously: as discursive rendering which influences but does not necessarily determine each individual experience online.

The effects of versions, thought to be vectors for the rediscovery of lost potential, are particularly evident in the claims for the liberatory potential of Web 2.0 through participation. To be clear, Web 2.0 does not invent this potential, or even the basic technologies for participation. Yet, Web 2.0 provides the moment when they are given renewed force.. As Roberts noted:

> The read/write web, encompassing weblogs, social bookmarking, wikis and other technologies, is often seen as a key aspect of what is understood by Web 2.0, marking a distinctive shift from earlier, supposedly less participatory, web technologies. Leaving to one side, for the moment, the question of whether the participatory transformations ascribed to Web 2.0 are actually meaningful, there is no question that these technological changes have been accompanied by an increasingly strident optimism on the part of media commentators about their transformative potential. (2009)

Web 2.0 makes empowerment and liberation historicised ideals from an earlier time that are now re-activated and given force precisely because they come from an earlier, less sophisticated time and only now become possible. Yet these ideas are also memorials to what is lost in this new version. However ill-founded and internally contradictory (think for example of the denial of race and gender) the hopes for liberty that marked the 'frontier' of

the Internet have, in large part now been reduced to a sunny overlay on an otherwise dark terrain of data and algorithms.

Versions work to create particular histories that so explicitly align the past and future in ways suitable to those who might control or manage the history in the present. Bassett (2008), writing of the general fascination with things "2.0", makes a telling point:

> [2.0] operates with some force, tending to occlude certain characteristics of contemporary techno-cultural forms and practices whilst foregrounding others, and tending also to produce a particular assessment of past and future convergence trajectories (what is to be corrected, what is to be realized).

So it was for the origin of the 2.0 enthusiasm. The creation of a 'past' for the Internet signalled the end of the Internet-as-future. It was no longer out of time, but very specifically 'in time', in synchronicity with an entirely new path of technological development which originated in the 1990s and diverged dramatically from what had been anticipated in the 1980s. Furthermore, that pathway of development was – within the discourse of Web 2.0 – the province of the computer experts, as they refashioned the world into one marked by the interaction of humans and data to create a new social phenomenon unable to be remediated into the traditions and traditional power structure of the media or indeed of governments.

Conclusion (980)

In the formation of Web 2.0, the past was written into the present of the Internet so as to create an historical terrain on which to map the potentials of future development and to fight the political economic battles for who might, in the present, benefit most from and control the development of that future (Fuchs, 2008; Gehl, 2010; also Langlois et al. 2009). A necessary component of this, marked out in the original diagrammatic representation of development in O'Reilly Group's 'brainstorming' session to define the term, was the creation of Web 1.0 (O'Reilly, 2005) so as to have a past which might serve the purposes for appreciating the present.

Web 1.0 was created, within the new discourse of Web 2.0, as a radical discontinuity brought about by its very novelty – it was *not* the Internet first experienced in the 1980s. Web 1.0 was the failure of an Internet scaled up and widespread, unable to hold true to the conditions which had first produced it. The futuricity of the Internet had, in effect, derailed its potential for transformation because the institutions which had sought to make Web 1.0 did not yet understand the radical change which it brought. Only by reconnecting, through versions, to an earlier time by both accommodating Web 1.0 but now moving on from it, might the future be relocated to its proper place (what is to come, rather than what is already here). The temporal disorder of the 1990s could be made good again, with particular benefit to those corporations most likely to be at the forefront of its advancement.

Equally Web 3.0 was always implied within Web 2.0, despite the early efforts of O'Reilly in particular to avoid linking the two together (O'Reilly, 2006). As soon as the ahistorical emergence of the Internet into popular social consciousness began to be resettled into a new historical pattern by which its particular origins and futures could be explained, so too that future needed to be imagined as yet another version, coming to replace the part-completed, not-quite-right version we now have, in the same manner that Web 2.0 ascended to importance in the late 2000s. A history told in versions is always one in which what we have is fragile, impermanent and potentially out of date. Web 2.0, for all its novelty and claims to determine the future, can also be read as implying that its innovations are already, or soon to be, obsolete, almost turning the present into a past awaiting a new future. If the Internet was, before we knew it through Web 2.0, the future in the present, then Web 2.0 firmly established that the future was indeed yet to come, not least because it thereby authorised those 'in charge' of Web 2.0 (in whatever fields of operation) to usher that future into the present at a time of their choosing.

Web 3.0 now regularly appears to be used to label the 'next thing'. At times it appears mainly to be a term designed, within late capitalism, to exploit consumers' desire to own the future before anyone else can. With equal if opposite force, others insist that Web 3.0 describes the coming into being of the long-promised Semantic Web (itself predating Web 2.0). As one recent computing science paper has it: "the focal aim of the Web 3.0 technology is to assist the web users to contribute information in ways that computers can understand, process and exchange". (Dwivedi et al. 2011). Theorists of culture see this willing embrace of new versions in more stark terms. Web 2.0 is, according to one,

> so forward-looking that it already risks being leapfrogged. Those who embrace the insistent futurity of the digital are keen to usher in the next increment even before we have realized the imminent upgrade. Web 3.0 hovers in the middle distance, obscured by the singularity that must precede it, in all of its eschatological finality (Evans, 2009)

However, I would conclude by cautioning against the assumption that Web 3.0 will ever arrive in any meaningful way. Web 3.0 will always be the 'future' for Web 2.0, not replacing it, but sensible only as that which will (not does) comes next Should, or when, we move beyond the language of Web 2.0, it will actually be a move beyond the language of versions altogether. As one recent commentator put it:

> If Web 1.0 was the basic bogs of the internet, and Web 2.0 was the launch of user-generated content ... then Web 3.0 is the moment when you forget you're doing any of this stuff. In other words, it's when using the internet becomes so casual, so much as part of your natural life, that you don't think about it anymore. ... the truly revolutionary aspect of Web 3.0 may be that we don't even notice it. And if that's the case, then maybe we won't have to bother discussing Web 4.0 in a few years (Gideon, 2011).

Web 3.0 provides an endlessly deferred future, counterpoint to Web 1.0's re-invented past. Between these two poles lies the contemporary web. We might know this web as Web 2.0

because it is term which first historicised the Internet as the widespread phenomenon of human-computer connectivity: but its work is probably done. Our sense of the past, present and future of computer networking has been re-organised through the application of versions to the Internet, historicising it in a manner amenable to the central corporate capitalist forces which make it work. But history, and the historicity it engenders, is always being remade and, while the future is not Web 3.0 and Web 4.0, it is almost certainly again going to involve the remediation of what we *thought* digital technologies were, so as to produce the conditions by which we might next choose, or be required, to adopt another kind of future to that which currently makes sense of our present circumstances.

REFERENCES

Abate inventing the internet 2000 MIT press

Bagdikian, Ben H. *The New Media Monopoly.* Boston: Beacon Press, 2004.

Bassett, C (2008) New Maps for Old?: The Cultural Stakes of '2.0'. *The Fibreculture Journal* 13 (accessed 2 May 2011) http://thirteen.fibreculturejournal.org/fcj-088-new-maps-for-old-the-cultural-stakes-of-2-0/

Beniger, James R. *The Control Revolution: Technological and Economic Origins of the Information Society.* Cambridge: Harvard University Press, 1986.

Boczkowski, Pablo J. *Digitizing the News: Innovation in Online Newspapers*. Cambridge: The MIT Press, 2004.

V. Bush, "As we may think", The Atlantic Monthly, Vol. 176, No. 1, 1945, pp.101-108. http://www.theatlantic.com/unbound/flashbks/computer/bushf.htm

DiNucci, D (1999) Fragmented Future. *Print*. (32): 221–222. Available at: http://tothepoint.com/fragmented_future.pdf

Dwivedi et al. 2011 UNDERSTANDING ADVANCES IN WEB TECHNOLOGIES: EVOLUTION FROM WEB 2.0 TO WEB 3.0 ECIS 2011 Proceedings

http://aisel.aisnet.org/ecis2011/257/

Dreams of a New Medium Aden Evans 2009 FC 14 http://fourteen.fibreculturejournal.org/fcj-092-dreams-of-a-new-medium/

Gibson "The Science in Science Fiction" on *Talk of the Nation*, NPR (30 November 1999, Timecode 11:55) (poss 1993 – acc. To Wikipedia)

Gideon, 2011. Web 2.0 is dead. Long live Web 3.0! 100gf: Politics and computers http://100gf.wordpress.com/2011/03/15/web-2-0-is-dead-long-live-web-3-0/

Gitelman, Lisa. *Always Already New: Media, History and the Data of Culture.* Cambridge, MA: MIT Press, 2006.

Jay Hauben (2004) Vannevar Bush and JCR Licklider: M 1 arch 27, 2004 at the "Wissensmanagement in der Wissenschaft" conference in the Institute for Library Science of Humboldt University in Berlin, co-sponsored by the Institute for Library Science and the Society for Science Research.

http://www.ais.org/~jrh/acn/acn15-2.articles/jhauben.pdf

Johnson, Laurie (2008) *Rape and the Memex.* Refractory: a Journal of Entertainment Media, 13 . ISSN 1447-4905 http://blogs.arts.unimelb.edu.au/refractory/2008/05/22/rape-and-the-memex-laurence-johnson/

Kyrish, Sandy. "From Videotext to the Internet: Lessons from Online Services 1981-1996." *Research Report No. 1,* La Trobe University Online Media Program, August 1996: 1-31.

Mapping Commercial Web 2.0 Worlds: Towards a New Critical Ontogenesis Ganaele Langlois, Fenwick McKelvey, Greg Elmer, and Kenneth Werbin Fibreculture 14 http://www.journal.fibreculture.org/issue14/issue14_langlois_et_al_print.html

J.C.R. Licklider, Libraries of the future. Cambridge, MA: MIT Press 1968.

Madden and Fox 2006 Riding the Waves of "Web 2.0" More than a buzzword, but still not easily defined Madden and Fox 2006 http://pewresearch.org/pubs/71/riding-the-waves-of-web-20

McCormack, Dermot (2002), *Web 2.0: The Resurgence of the Internet and E-Commerce*, Boston, Aspatore.

W. Russell Neuman (Author), Richard Jay Solomon (Author), Marengo Research Llc (Author), Lee Mcknight (Author) The Gordian Knot: Political Gridlock on the Information Highway 1999 MIT PRESS

Nyce and Kahn (1991) From Memex To Hypertext

O'Reilly, Tim (2005), *What Is Web 2.0: Design Patterns and Business Models for the Next Generation of Software*. O'Reilly Group http://www.oreilly.com/pub/a/oreilly/tim/news/2005/09/30/what-is-web-20.html vi

O'Reilly, Tim (2006a), 'Web 3.0? Maybe when we get there' November 13 2006, *O'Reilly Radar* http://radar.oreilly.com/archives/2006/11/web_30_maybe_wh.html

J V Pavlik 1995 New Media Technology and the Information Superhighway: Cultural and Commercial Perspectives . Allyn and Bacon

Roberts, Beyond the 'Networked Public Sphere': Politics, Participation and Technics in Web 2.0 http://fourteen.fibreculturejournal.org/fcj-093-beyond-the-networked-public-sphere-politics-participation-and-technics-in-web-2-0/

Shneiderman, B. (1998) INTERNATIONAL JOURNAL OF HUMAN COMPUTER INTERACTION

1998, VOL 10; NUMBER 2, pages 87-106v

Winston, Brian, 1998, Media technology and society: a history : from the telegraph to the Internet Routledge