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## **Road map: From Web 2.0 to Altmetrics**

### **Introduction**

This chapter aims to give the reader a better understanding of why altmetrics and other aligned social technologies have evolved with the potential to change academia, the library and information world. The purpose is to explain that this change has not happened overnight and that it is part of a much bigger shift that is taking place. There have been several opportunities afforded by Web 2.0 technologies over the last decade for academia and only now are we starting to take advantage of them. Much of the academic and library community have been slow to embrace technologies focused around scholarly communication and measurement. This chapter explains the continual evolving process and that in reality there is still some way to go before we see academics using what we would previously have referred to as Web 2.0 tools fluently within their workflow. The chapter explains how past and present technologies have developed and been exploited within the library community. Given the ascendancy of social media and Web 2.0 in academia and libraries that it was only a matter of time before alternative metrics in whatever form would appear.

### **The beginning of the Web**

For anyone under the age of 35 it will be hard to imagine a life without the internet, whilst anyone over that age who regularly uses it will probably feel like it has been around most of their working life. This is a testament to the impact and importance of such an invention; it has changed the world beyond recognition. We cannot touch it, smell it or taste it, yet the World Wide Web has become an essential part of billions of people's existence. Academia has been part of the Web since day one, so much so that it was a computer scientist, Sir Tim Berners-Lee who put a proposal to his employers at CERN for an information management system in 1989. Within the first few years of the Web's existence various notable academic websites were established. These included the pre-print archive arXiv.org in 1991 and the bioinformatics resource portal ExPASy two years later.

Academia was an early adopter to utilise the many technologies that came pre and post the development of the Web interface to carry out a multitude of tasks. This included email for communication, networking for data transfer, forums for topic discussion, public facing websites for promotion and intranets for private and sensitive information. Yet it was slow to explore the benefits of the web's younger sibling Web 2.0 which appeared around 2004. Fifteen years after Sir Tim Berners-Lee had refined and revealed to the world his own project that we came to know as the web, an iteration appeared that was quickly tagged as Web 2.0. The term started to be popularised around the Internet within certain communities, primarily the tech and academic ones. Originally documented by Darcy Dinucci (DiNucci 1999) some five years earlier, it was popularised by Dale Dougherty (O'Reilly 2005) of O'Reilly Media. O'Reilly and his associates were well versed by this time about the web and had also drove the popularity of the term 'open source' back in 1998.

### **What Web 2.0 changed**

The core elements of Web 2.0 was that it changed how we interacted with the Web. Instead of a one way relationship between the web host and visitor where they were limited to viewing web content in the form of text, images and video they could now interact with it and create their own similar content. The web could now be manipulated by wider audiences without the need for web authoring and publishing skills such as HTML. This new era opened up the possibility for anyone to publish, catalogue, communicate, share and network on the web, including academia. In the decade or so since little has changed in some areas of academia, to some extent much of it still operates in a Web 1.0 world. Email remains dominant, academic websites are mostly still static and social media remains outside of the comfort zone of most academics. Research still operates on a platform where it is often conducted in private and findings are published in journals and presented at conferences. There is very little sign of the long tail (Miller 2005) that Web 2.0 brought us through the likes of Amazon book search. Whilst it is important to note that naturally much research requires secrecy and privacy, academia has still been slow to take up on the merits of Web 2.0 when disseminating that research post publication. There are several possible reasons for this with the first being that such as change may have happened and we did not quite realise it. The web to some extent had always been interactive, we could post topics on discussion forums, write emails, follow RSS feeds and leave comments on such as blogs. Yet the uploading of content, curation of news and information, creation of web sites and blogs without the need for HTML was not realised by the majority within academia. This was perhaps because editing on the web was something a web designer did, but also because there was very little support and evidence why taking your research onto the web was a good idea. For a start, where would you begin, who would be interested in it, and how much time would this take. As discussed earlier the model of academia is one where rigorous research takes place within the lab, office, workshop or out in the field, for the most part the dissemination happened via journals, books and conference proceedings. Web 2.0 and later social media began to change that on a bigger scale. The transition from Web 1.0 to Web 2.0 happened without many from outside the computing and information world taking real note, yet the impact was widespread.

### **Early examples of how the libraries and academia embraced Web 2.0**

Web 2.0 and social media facilitate two things above anything else, empowerment and connections. Web 2.0 allows anyone connected to the internet to be empowered to manipulate and interact with the web without technical knowledge. Prior to 2005 the majority of content on the web was created and directed by a small minority. Web 2.0 open the doors for anyone to create and share content, libraries and academics being two communities to do that. As a result it has connected the world in a way that it had not done before. Despite this, embracing the second wave of web technologies was not universal. (Boxen 2008) noted that librarians have often been ridiculed for either hating new technology or jumping on every new program that happens along their path. The idea that we all could now create web content, from video to blogs, from wikis to websites was quickly embraced by hobbyists, artists, commerce and activists. For the library and information profession this too opened up many opportunities. Blogs (Blair & Cranston 2006) could be used to share library news, updates and resources. Video (Kroski 2007) aided promotion and support delivered by librarians whilst portals such as PageFlakes and Netvibes (Tattersall et al. 2011) could be employed to create bespoke library portals that were of useful automatic web resources and news feeds. In a wider academic setting, Web 2.0 opened up the possibility of self-publishing, research dissemination, communication and collaboration. A good example of

what the transition from Web 1.0 – Web 2.0 meant to society was created by Associate Professor Mike Wesch. Wesch's area of research is that of cultural anthropology and his 2007 video 'Web 2.0... The Machine is Us/ing Us' explained this paradigm shift. Not only was it a way to explain the transition, it was also a platform for Wesch to showcase his own area of research and in turn picked up over 11 million views on YouTube, an early altmetric and indicator of Wesch's work if ever there was one. A year later the two major academic social networks ResearchGate and academia.edu appeared and have since built up a combined customer base in excess of 34 million users with eight on ResearchGate and 24 on Academia.edu. Naturally many users will be on both platforms.

### **Library 2.0**

As with Apple and its 'i' prefix, the 2.0 suffix started to transcend Web 2.0 so that we had science 2.0, health 2.0 and library 2.0 (Maness 2006). Library 2.0 was the idea that libraries offered a user-centric experience but was not accepted universally by libraries due to a variety of factors (Tattersall 2011). For example the use of Web 2.0 platforms such as Netvibes (Tattersall et al. 2011) could offer visitors niche collections of information pooled in from external locations. It was automated, free, easy to set up and worked very well. About the same time the term mashup became more commonplace within libraries and universities as users combined various Web 2.0 tools to create a new resource. For example an organisation could go beyond just embedding a Google Map of their library location into their website but could use photographs of their libraries and embed them into a Google Map at their locations to provide a new resource for visitors. It was simple, effective and cheap, but for the most part was not taken advantage of by most large organisations.

### **The battle between open platforms and closed organisations**

Web 2.0 offered much promise for libraries, academic institutions and other large organisations such as the NHS. The technology was cheap if not free and often was an improvement on existing off the shelf technologies that organisations paid large amounts of money for. Alternatives to established academic tools started to appear with examples such as Prezi for PowerPoint, Mendeley for Endnote and Google Docs for Microsoft Word. With that came an air of caution by IT departments and senior management. Organisations such as the NHS were deeply embedding in a culture of paying for off the shelf packages from large technology companies. Many of the post Web 2.0 start ups were small, often very niche and did not have the power to break into the bigger markets. Even established platforms such as Google and their Chrome browser, Drive and Blogger were locked out by IT keen to maintain stability with such as SharePoint and Internet Explorer.

In academia there is often a greater freedom when choosing new platforms and tools which librarians and academics can use. This meant tools such as Mendeley, Prezi, Google Apps, Wordpress, RSS and Netvibes could be utilised by individuals and groups. Some of those who began to leverage Web 2.0 tools regarded the process as a state of mind or an attitude (Birdsall 2007). This meaning that the user employed these new tools fluently in collaboration with each other all as part of one organic process. As social media started to emerge, this process was extended naturally with many librarians and academics able to adapt to the new open platforms in new and inventive ways.

### **Digital Natives and Immigrants**

Whether you subscribe to the premise of digital natives and digital immigrants (insert citation) is irrelevant. What we can say is that many of the new academic and altmetric

technologies that have surfaced in the last five years have been created by early career academics who would describe themselves as natives. A combination of their joint understanding of academia and the new web have combined with the intention of changing how we communicate, collaborate and measure research. The changes we are seeing, despite not yet being widespread are being led by many starting out on their careers within research. For example Mendeley was set up by three German PhD students in London, Impactstory from a post-doc research student and PhD student. Naturally not all tools begin life like this, some are created by journal publishers, others by mid-career researchers. Nevertheless there are several academic-focused tools that have been the brain child of individuals rather than large groups, including Figshare, WriteLatex, The Winnower and Altmetric.com to name but a few.

## **Conclusion**

The interesting thing to note about how social media and other forms of web technologies within academia is how slow they have been to take hold. Universities were early adopters in embracing the internet and web and for many by developing their own online presences. Yet when the first major iteration of the web, that being Web 2.0 appeared they were cautious in embracing its potential. We have had social media platforms such as Twitter and Facebook with us for a decade and specialist academic versions Academia.edu and ResearchGate follow very shortly after. The uptake of the latter two may be in the millions, yet many using them are still unsure of their full purpose. Even a useful tool such as Twitter is only used on a meaningful way by the minority of academics. Academia's slowness to embrace the social web and technologies afforded by Web 2.0 in comparison to such as commerce and pornography is perhaps more indicative to a history of inwardly facing. The view that academia operates within ivory towers or certainly on a silo level are not without some justification. Yet things are changing within academia, most notably through open access, MOOCs and the importance of demonstrating impact. All of these changes and others are connected to a more open and connected academia. This can be achieved by a greater understanding of the opportunities in using the tools that are the legacy of Web 2.0. It also requires an understanding of the issues and pitfalls with such new ways of working. At present it is not a prerequisite to use social media, networks and altmetrics as part of a researcher's role. It may never be, but certainly the early adopters of these technologies as part of their research have helped identify and iron out some of the issues within a web-based academic landscape. By their very nature researcher's demand evidence as to their decision making processes. Developments like the web and email were obvious additions to the academic's arsenal, but since Web 2.0, social media and further on such as altmetrics it is not so clear. The biggest issue academics face in relation to a post Web 2.0 world is the sheer amount of technologies and platforms. To some extent they can be forgiven for feeling even more bewildered by the breadth of choice. Many academics will claim to have benefitted from adopting these technologies early, some no doubt will have fallen by the wayside or had negative experiences. Those that established good online presences and how the web can be leveraged as a communication tool as well as employ altmetrics as a measurement of that communication are in a better position than their peers. We are in a state of flux and whether we will see a paradigm shift in how academics work using the web and in particular academic-specific tools only time will tell.

## **Key Points**

- Academia was quick to employ the web and email as forms of communication

- They have been less so successful in adapting to the changes afforded them by Web 2.0 and social media
- Early adopters of Web 2.0 and social media have benefitted by being able to network and communicate their research on potentially a global scale

### Web Resources

Library 2.0 – The Future of Libraries in the Digital Age. <http://www.library20.com/>

Mike Wesch – Web 2.0 ... The Machine is Us/ing Us  
<https://www.youtube.com/watch?v=6gmP4nk0EOE>

### Further Reading

Diffusion of Innovations

<http://www.amazon.co.uk/Diffusion-Innovations-Edition-Everett-Rogers/dp/0743222091>

Managing Social Media in Libraries

<http://store.elsevier.com/product.jsp?isbn=9781843347118&pagename=search>

Social Media for Creative Libraries

<http://www.facetpublishing.co.uk/title.php?id=047135#.VpaPRfmLRhE>

The Future of Scholarly Communication

<http://www.facetpublishing.co.uk/title.php?id=048170#.VpaPevmLRhE>

What is Web 2.0 (e-book)

<http://www.amazon.com/What-Web-2-0-Tim-OReilly-ebook/dp/B008EQ0ZE8>

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