

Information literacy 2.0¹

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The nature of information is changing towards more dynamic and fluid but also ephemeral and unstable document formats and genres. This socio-technical change transforms information practices and leads to the erosion of information contexts. That is why we should re-evaluate and redefine what we mean by information literacy (IL). As library and information professionals, we should find socio-technical ways to make the context of born-digital information more visible by creating information filtering systems. In addition, we should educate our users to think, reflect and act in current and emerging information environments.

Buzz words and realities

”What does Library 2.0 mean and how should we develop new kinds of library and information infrastructures and services?” This seems to be a popular question among library professionals nowadays. Library 2.0 is both a practical and a philosophical issue. In the present paper, I will take a philosophical and critical approach. However, I also try to illustrate my points with practical examples.

The goal of this paper is to outline a picture on what it really means to live in this brand new 2.0 world. During the recent year we have heard and read at least about Learning 2.0, Knowledge 2.0, Enterprise 2.0, Web 2.0, Library 2.0, and Librarian 2.0. Of course, these kinds of terms could just be seen as new buzz words, and I do not want to disagree with this characterisation.

However, I think that these terms or phrases also try to depict something more – something taking place right now, something out there. In fact, I see them as indications that something is profoundly changing in the ways in which we

create and use information.

New kinds of literacies are needed in dealing with the various born-digital document types and genres – like sms messages, emails, blogs, wikis, podcasts and RSS feeds – that are forming an increasingly larger part of our present-day and future information environments. Mobile technological tools and increasingly smarter PDAs (personal digital assistants) are used for receiving, downloading, viewing, listening and creating digital documents. In addition, we are wit-

¹ Article is based on author's keynote address at *Making a difference: moving towards Library 2.0*

nessing the rise of new kind of collaboration infrastructures and services as well as 3-D synthetic worlds like SecondLife.

IL 2.0 will become something performed by groups and organizations as well as by individuals (c.f., Tuominen, Savolainen & Talja 2005). This means that information literate practices are done today, and will in the future increasingly be done collectively by using various kinds of *sociotechnical filtering systems*. The basic goal of these systems is to recreate or reconstruct the social context of information we have almost completely lost during the recent changes.

For the purposes of this paper, I define IL as a collective or individual competency or skill to assess the quality, accuracy, authenticity, originality, reliability and trustworthiness of the encountered information. According to Patrick Wilson (1983), most of what we know we get second-hand from others. Less and less of our knowledge is based on direct observation or empirical experiences and that is why our central task is to decide on whom or what we base our trust, i.e., who to believe and why.

Ambient findability

The nature of information is changing. In his seminal book, *Ambient Findability*, Peter Morville (2005) describes and analyses an emerging world where one can find almost anyone or anything from anywhere at anytime. As stated by Morville, “we are not there yet, but we are heading in this direction”.

In the world of ambient findability we will have developed *pull mechanisms* like mobile search. However, there will be new kinds of *push mechanisms* as well. One might, for example, view the day’s weather forecast displayed in the bathroom mirror or receive an electronic discount coupon every time one walks near McDonald’s. We can have many kinds of devices and applications for using information, and the received information might dynamically vary according to where we are and what we are doing. Thus, informa-

tion will become diffused into our environment. (Morville 2005)

This is at least how the new information utopia looks like. I guess that ambient findability would also mean that we will receive more and more documents and (commercial) messages that are detached from all contexts, i.e., documents that are completely meaningless to us.

As stated by Morville (2005), wealth of information becomes noise if one can not make sense of it. This brave new world of ambient findability might make our previous experiences of information anxiety to feel like child’s play. The ubiquitous nature of information might be both a blessing and a curse in the future.

In essence, IL is all about recreating or reconstructing the lost sense, the lost context. IL becomes not less but more important when we have almost all of the ever published information at our fingertips.

Erosion of information contexts

An illustrative example of erosion information contexts is my own way to utilize the XML-based “really simple syndication” format RSS. I go through over one hundred RSS feeds daily by using at least five different RSS aggregators. These aggregators are the kind of powerful Web 2.0 search tools that are based on deep linking and content sampling. RSS allows us to subscribe to many types of dynamic web content and to “turn the sources we find into services that find us” (Morville 2005).

Picture 1 is an authentic screen capture from Netvibes, which is one of the aggregators I use. All the little boxes on the picture contain RSS feeds from various blogs as well as from traditional or mainstream media. Recently, I have noticed that RSS feeds provide surprisingly few contextual clues to determine cognitive authority, validity and reliability of the messages I receive.

It is possible to read most of the new posts directly from the RSS aggregator. This means that I do not have to go to the original sites in which



Picture 1: Screen capture from Netvibes RSS Aggregator

the posts are published. This is of course a very handy and effective way to deal with feeds but it means also that these feeds are detached from their primary context.

Many of the blogs I read through my aggregator are written by people I am not familiar with. Even if I took the trouble to check who originally published a certain piece of new information I might find out that I am unable to identify the writer of the blog because he or she is using a pseudonym.

What we see in Netvibes, Google Reader, Protopage and many other RSS aggregators are authorless versions of Web pages that are stripped of cognitive authority clues. Through our aggregators, we receive mostly anonymous information that seems to be collectively created by the blogosphere, not by individual experts.

Problems with Wikipedia and SecondLife

Anonymity is problematic with Wikipedia as well. Most people write to Wikipedia by using pseudonyms and when their identity is not known they can easily use, for instance, false credentials to back up their cognitive authority. They can claim to have a PhD, but how can one check if this claim is true?

There is no easy way to determine the cognitive authority of anonymously or collectively created digital information. Therefore, untruths, rumours and fallacies often disseminate on the Web as quickly as valid and true knowledge. This is what is meant when the blogosphere is called “an echo chamber”.

There are, of course, good sides or features in anonymity as well as in collective creation of

knowledge. For example, anonymity is sometimes important for the freedom of speech. However, the present-day 2.0 information ecology might lead to awkward situations where no one is accountable for the information created.

From the cognitive authority point of view, I just get the information but little contextual clues about the identity of its author or authors. Therefore, the answer to the question on who is ultimately responsible for specific information content becomes less and less clear.

Another example of erosion of information contexts comes from the relatively new synthetic world called SecondLife that nowadays has over eight million inhabitants. I once met an avatar in SecondLife who claimed to be Dick Cheney. Even if the avatar resembled the current vice president of the United States, his opinions about US foreign policy did not correspond with those that Mr. Cheney has expressed in his public speeches. In fact, I am sure that my avatar did not meet Mr Cheney himself. I am very sceptical of the authenticity of information I received and I doubt its cognitive authority.

We can see from this and previous examples that because of erosion of information contexts, it becomes extremely easy to falsify digital information and to blur its authenticity. There is a Reuters news office actually functioning in SecondLife. I wonder how the journalists can be sure that the avatar they interview is what he or she claims to be.

Print vs. digital culture

Fundamental aspects of the erosion of information contexts become visible by comparing traditional print culture and this 2.0 world of ambient findability. When people try to decide whom to believe or what to trust they evaluate the visible, sensible and audible characteristics of information objects. They do not only analyze content but also context.

In the era of print culture we had concrete and stable books that were not just information car-

riers but also material items or things. For example, the printed version of Encyclopaedia Britannica delivered something more than just information. It had a physical outfit that showed why it is held in high regard.

As information artefacts, books had textual permanence and unity as well as identifiable authors and editors. Books could be reproduced and copied mechanically and we were sure that every copy of a specific edition was similar. Previously, stability and concreteness of a book as an information artefact helped us to make credibility judgments (Treddinick 2006). Nowadays, everything looks, feels and even smells similar on flat computer screens.

This stabilisation of print is something we do not have in the present-day information environment that is characterized by the ease with which digital information can be modified, copied, duplicated and redeployed in different contexts. The collaborative model of knowledge production is working in wikis and in the ideology of Free Software movement, open source and Copyleft licences. This collective and dialogical model complicates authenticity and cognitive authority issues. (Treddinick 2006)

The most stable document format is, of course, stone, which literally carries with it heavy cognitive authority. When we compare words carved in stone, like the Ten Commandments, to dynamically changing pages of Wikipedia, the differences between bits and atoms become evident. You can not touch, hold or smell Wikipedia. You never step twice into the same Wikipedia – as Heraclites would say. Our information environment is not dead matter anymore but more like liquid protoplasm.

In the present age of born-digital and digitalized documents we see just search windows and everything is flat. Google, Wikipedia, Encyclopaedia Britannica, Oxford English Dictionary and Wiktionary have almost identical look and feel. Thus, they do not carry the kind of essential clues of social importance, authority and

credibility we are used to with material document forms. Because of the lack of material context, it is difficult to determine the cognitive authority of digital documents like MP3's, e-books and web videos.

Generation Y and university students

When I have talked with teenagers – the representatives of the so called generation Y – I have noticed that they do not even care about dissimilarities between different forms of encyclopaedia. For them, videos in Youtube are similar to educational videos on DVD. They do not seem to notice much difference between a biographical reference like “The International Who is Who” and profile pages in Myspace or its Finnish equivalent IRC Galleria.

University librarians have observed that even many academic students do not care about these kinds of nuances. They refer in their papers as eagerly to an article in Wikipedia as to a refereed scientific article or a blog post published by an anonymous author. What they are missing is a frame of reference to discern a scholarly publication and discourse from other kinds of documents and argumentation styles. In a long run, this kind of blind ignorance might do damage to the pursuit of scientific knowledge and to the quality of knowledge work more generally.

If the world of research literature is as flat as the computer screen to the average student, it becomes extremely hard to make cognitive authority decisions without any frame of reference. For example, when the student uses metasearch and arrives directly at a fulltext of a paper that has appeared in a journal whose name he or she is not familiar with, what can he or she do? The context of journal issues and volumes is almost completely lost in digital information environments.

Digital information flatness is an acute problem and we should search for new and innovative ways to overcome it. The main question is how to assess quality, credibility, and accuracy in present

day digital information environments. Our goal should be to recreate or reconstruct the lost context of digital documents so that it becomes possible to find enough clues about cognitive authority and authenticity of information.

Socio-technical filtering solutions

Partial but also somewhat problematic solution to the erosion of information contexts is filtering. As can be seen in Table 1, there are two main categories of socio-technical filtering solutions: positive and negative ones.

Content filtering functions the other way around on the Internet than on the traditional media. Traditional media uses mostly negative filtering; every book published has gone through a very tight filter and it is very hard to get your paper accepted to major scientific journals and conferences. On the other hand, it is very easy to publish something on the Internet, e.g., to present new claims and arguments on your own blog.

Most interesting from the filtering and quality control point of view is the right hand column of Table 1. Various social software applications enable users to do grass roots positive and negative filtering processes not alone but together with other users. They allow us to utilize the wisdom of the groups or swarm intelligence in defining, e.g., top-quality sites, most interesting links and top podcasts.

On the Web, positive and negative collective filtering processes start after someone has written and published new claims or arguments. Very quickly this new information starts to get comments on other blogs and, if the published document is considered informative or interesting, it gets recommendations from authoritative and central sites. If you publish an important piece of technology news, it might gain hundreds of votes in a participatory news site like Digg.com and thus get accepted to its front page.

Proponents of social filtering say that poor information is often forgotten quickly. According to them, only quality information gets more

	Automatic	Individual	Collective
positive (<i>bringing something up, recommending, highlighting, post-filtering</i>)	search engines (relevance ranking algorithms), automatic news aggregators (e.g., <i>Google News</i>)	personal bookmarks, interest profiles, RSS feed aggregators (e.g., <i>Netvibes, iTunes, Protopage, Google Reader</i>)	social bookmarks (e.g., <i>Del.icio.us, Flickr</i>), directories (e.g., <i>Open Directory</i>), wikis, recommendation and voting systems, participatory news sites (e.g., <i>Newsvine</i>), quality links chosen for children
negative (<i>blocking something, pre-filtering, warning users of poor information quality</i>)	spam filters, blocking software, offensive content filters (e.g. <i>Yahoo's safe search</i> , security toolbars (e.g., <i>Trustwatch</i>), Great Firewall of China	lists of email addresses to be blocked (determined by a specific user)	lists of parodies and spoof sites, lists of counterfeit and phishing sites (e.g., specific categories in <i>Open Directory, Internet Fraud Watch</i>)

Table 1: A Classification of socio-technical filtering solutions²

votes, more recommendations and more visibility in the knowledge evolution taking place on the Internet, i.e., the cream will float to the top.

The inherent problem in collective filtering systems – like voting and rating applications – is that they easily mix quality and cognitive authority with popularity. As you know, even million flies can be wrong and million monkeys can not write Shakespeare's plays even if they were equipped with most up-to-date computers, networks and mobile devices.

Redefining information literacy

New information technologies inevitably require new skills in deciding whom and what to believe. Technology changes things and ambient findability and Web 2.0 changes what it means to be an information literate person or an information literate organization or group in the future.

Nowadays, information literate practices are closely entwined with social filtering solutions and services. They form an emerging social information ecosystem that is a precondition for practicing IL effectively in the future. Therefore, we information professionals should be active in developing this ecosystem.

Furthermore, we should allow the users to help us in this huge task. Reviews, commentary, tagging, ratings, etc. – they all will help us and those that follow to make new connections and new senses. In essence, they will help us to rank and prioritise the usefulness of the things we have found and to put information in a more sensible context.

Because information literacy has so many faces or aspects it is difficult to give a watertight definition of IL 2.0. What is sure is that IL 2.0 is not a monolithic whole that could be standard-

² Table 1, with all the links included, can be found from the author's slides at <http://lib.eduskunta.fi/Resource.phx/library/organization/publications.htx>.

ized and objectively measured. There is not just one “right and correct” IL 2.0 but many kinds of literacies that can be practiced both collectively and individually.

The publishing and information culture of a certain discipline, like law, is not domain-independent but domain-specific. There is no one correct way to practice information skills and only the most general IL “rules” apply equally well to all knowledge domains. IL 2.0 is both a group phenomenon and something taking place in the mind. Web 2.0 technologies give us new means to practice and educate collective and dialogical information creating, seeking and managing skills.

How to teach information literacy?

We should raise users’ abilities to critically deal with new kinds of information infrastructures and document genres, e.g., by informing them about the nature of each information repository that can be accessed with a metasearch application. Users should be able to classify and make distinctions between various document types. They should be aware of the problems and benefits that are caused by anonymity and collectivity of knowledge creation in wiki environments and in the blogosphere.

What would information literate practices be like in the future? Let us take an example. In determining the quality and cognitive authority of a specific Wikipedia article, we should examine log and discussion pages of this article as well as compare various versions of it (historical versions and versions written in different languages), perform quick webliometric analyses (who is link-

ing to the article and why? what kinds of tags are used?), try to find out as much information as possible about the authors of this article, etc. The practices will be quite complicated and only some of them can be performed automatically.

However, the most important goal of IL education should be to increase users’ conceptual understandings of their information environment. In this sense, the tricks of information retrieval like truncation or Boolean logics are not so significant. Who even uses Boolean searches anymore?

Conclusion

Collective quality control practices and technologies as well as new kinds of literacies are needed to recreate the paradise lost or the context that has disappeared during digitalization of information. We should give our users frames of references to think, reflect and act in current and emerging information environments. 📖

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