

## Linked Knowledge: Rheingold, Weinberger, and the Challenges of the Web

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Recently two well-known authors in the field of digital media studies have addressed the issue of online knowledge from different points of view. They are Howard Rheingold, with *Net Smart: How to Thrive Online* (Rheingold, 2012), and David Weinberger, with *Too Big to Know: Rethinking Knowledge Now That the Facts Are not the Facts, Experts Are Everywhere, and the Smartest Person in the Room is the Room* (Weinberger, 2012). Since the two works were written almost at the same time, they do not contain references to each other. Nevertheless, both are apologies of the Internet, that are meant to defend it from increasing criticism coming from both scholars and common people.

The criticism of the way of acquiring knowledge in the age of the Internet is summarized very effectively by Nicholas Carr in his famous essay *The Shallows: What the Internet Is Doing to Our Brains* (Carr, 2010). This book, which extends the themes of Carr's article *Is Google Making Us Stupid?*, published in *The Atlantic* magazine in 2008, is in fact the starting point of Weinberger's and Rheingold's works. Carr has collected and strengthened many concerns from social scientists, neurobiologists and educators about the transformation of the mode of learning caused by the wide spread of the Web in our daily life. It is no coincidence that both authors introduce in the title of their books the word "smart", as opposed to Carr's provocative term "stupid". At the end of the day, is the Internet making us more intelligent or stupid?

Before I launch into the comparison, I will show in summary the position of Nicholas Carr. Carr starts from the thought of one of the founders of new media sociology, Marshall McLuhan, to actualize the core of his work. In his complex and controversial essay *Understanding Media: The Extensions of Man*, the author argues that technology, continuously, hiddenly and often unexpectedly, changes the way we think and act (McLuhan, 1964). The content of a medium, his message like a news story, a narrative, a reflection, a work of art, is conditioned by the medium to the point that the medium represents the real meaning of the communication. A popular technology shapes what we see and how we see it, and over time, if we use it constantly, it changes who we are as individuals and as a society. Users of new media are attracted by the richness and relevance of contents that media convey, but in order to obtain these contents they must come to terms with the medium itself, adapting their minds to its features. To emphasize this idea, Carr quotes a significant similarity by McLuhan: as the thief which throws the guard dog a juicy piece of meat to distract it and rob the house undisturbed, every new medium seduces his audience with new possibilities (richer contents, a more immediate or convenient way to use information, better privacy, etc.), but at the cost of a gradual alteration of its sensory reactions and its forms of perception (Carr, 2010, p. 4). From this standpoint the Internet has been the most powerful medium in human history after print. The wealth of contents the web offers us is unmatched, as well as the speed and ubiquity in information retrieval. Probably no one would want to give it up, even knowing the price to pay. The price is a decrease of our ability to think in depth, to focus our attention for a long period of time, and to internalize knowledge, all skills typical of the linear learning. In order not to get lost in the huge amount of documents on the Internet, users must employ a technological tool, the search engine, which allows them to sort documents on the basis of a predetermined criterion. In response to some keywords which seem relevant to our information need, search engines like Google provide us with a list of thousands or millions of documents sorted by

relevance and popularity, which contain links to other thousands of documents and so on. The hypertext system and the Google search lead us to a disorganized use of textual fragments, without providing a conceptual framework for interpreting them organically, as in the case of a complete work like an essay or a novel. «What we're experiencing is, in a metaphorical sense, a reversal of the early trajectory of civilization: we are evolving from being cultivators of personal knowledge to being hunters and gatherers in the electronic data forest.» (Carr, 2010, p. 138).

Howard Rheingold doesn't deny that the modifications of human brain highlighted by Carr are in fact happening, nor he underestimates dangers, but accuses the author of *The Shallows* of some "technological determinism". For Rheingold, humans have freedom of action in countering the negative effects of technology, they are not entirely helpless.

In academic circles, the attitude taken by Carr and other critics I consider here is called "technological determinism," and in my opinion it can be as dangerous as a lack of awareness of technology-enabled pitfalls. Humans have agency. The Web wouldn't have existed without that agency, even given the technical medium of the Internet. I believe Carr is right to sound the alarm, however, about the potentially harmful effects of (the unmindful use of) digital, networked media. (Rheingold, 2012, p. 52)

Moreover, even in the transition from oral to written culture, as predicted by Socrates more than two thousand years ago, men accepted to lose something in order to gain something else. They lost the ability to provide a unique interpretation of thought (the one originally intended by the author), and gained the ability to provide a thousand different interpretations, depending on reader's point of view. But not for this reason humans have fallen prey to a complete relativism, they have developed defense mechanisms (education first of all) to make it sure that the intent of an author could be preserved as much as possible. If a medium replaces another one, it doesn't happen for a predetermined plan: the new medium is more effective to meet the human need for communication and sociability. «If I had to reduce the essence of Homo sapiens to one sentence, I'd propose: "People create new ways to communicate, then use their new media to do complicated things together."» (Rheingold, 2012, p. 19-20). The Internet, along with social networks, blogs, wikis, search engines, is an extraordinarily powerful instrument for creating and sharing information. It may allow forms of collaboration and promote collective intelligence. As in the transition from orality to literacy, there's something that gets lost, or rather weaker. It's our ability to maintain attention, to filter information and to get a proper idea of a topic. However, following some "best practices" in everyday life, everyone can learn to counter these negative trends of the Internet. We can gradually learn to pay attention without being distracted, to detect false information ("crap detection"), or to put together the scattered pieces of information into an overall picture.

To accomplish these tasks, Rheingold explains, the Internet itself comes to our aid, thanks to their tools. A conscious use of social networks helps us discern useful information from superfluous "noise". Tags, bookmarks, forums, self-managed rankings are the weapons which Internet users have against information overload. Choosing who to follow on Twitter, because he has proven to be a reliable and updated source of information, or knowing how to collaborate in an online community through a wiki, they are ways to maximize the network potential, without being passively overwhelmed by the ongoing changes. It's not enough to be connected, we have to learn the five basic alphabets that allow us to be active citizens of the web:

1. Attention. Internet in general, and social media in particular, favor distraction, but we can learn how to stay focused through exercise (self-control, breathing, meditation, etc.). In order to make informed decisions about how to allocate our attention, we have to first

realize that we will never take advantage of all the exciting opportunities offered by the Internet, because our mental resources are limited and they should be used sparingly.

2. Critical consumption of information. If you know how to search, the web can give a correct answer for each question. It is important, however, to doubt any information found on the web and think like a detective to investigate its veracity (Rheingold, 2012, p. 79). It may be useful for this purpose to always seek additional information about authors, in order to discover if their points of view are biased or they are known to be spammers. Separating sources of reliable information from "crap spreaders" starts with our daily activity on website like Facebook and Twitter.
3. Participation. The architecture of participation that characterizes the web (O'Reilly, 2004) allows us to act according to our personal interests while creating a shared value. Learning the rules and boundaries of a cultural environment is the first step of participation, both in virtual communities and in real life human groups.
4. Collaboration. A fundamental feature of human beings is to use communication to organize collective action. Social media can amplify collective action, becoming means of economic production and distribution on the basis of shared objectives. Projects like Wikipedia and Linux show that people can contribute to social production not necessarily driven by market logic. Their motivations can also be learning, earning reputation, meeting others, and feeling accepted within a community (Rheingold, 2012, p. 151).
5. Network smarts. The "small-world networks" (Milgram, 1967) allow information to move quickly among large groups of people. You need only a small number of random and distant connections to ensure that your message reaches a wide audience. "Net smarts" means that we are able to use connections to carry our message up to the periphery of the network, we know how to identify the most relevant hubs of our social network and understand which communication mode should be adopted in networks of weak or strong ties.

Weinberger's standpoint is slightly different. The main topic of *Too Big To Know* is human knowledge and how it has changed in the transition from traditional publishing systems (print first of all, but also radio and television, both characterized by the same principle of careful content filtering) to the universe of the World Wide Web. What mostly interests the author is not whether the Internet infrastructure is worsening or bettering the way we know the world, because this evaluation would imply a unique concept of knowledge, probably impossible to achieve. Weinberger tries to understand how this infrastructure can be improved in order to strengthen the merits of the Internet and at the same time to limit the defects in relation to knowledge acquisition.

The distinguishing features of the web, compared to other media, are essentially five: information abundance, large number of links, freedom of expression, public access, and unresolved knowledge (Weinberger, 2012, p. 174). These features bring out as a fundamental trend of the web its "inclusiveness", where traditional media, beginning with the press, favor "exclusiveness". In the print world, the exclusion of information resources originates from economic reasons: the economic effort behind the publication of a hardcover book is in fact significant and must be repaid by the earnings of its sale. Editors filter out publication proposals which cannot assure adequate profits, as well as bookshops and libraries expose in the limited space of their shelves the only volumes their users can be most interested to. Television and radio adopt the same filtering system to fill their schedules, since they are subject to the rules of audience and competition. On the contrary, the web does not interpose any material barrier to the publication of information resources, except owning a computer

with Internet access. For this reason the size of the web has increased at a frenetic pace over time, rising from about 26 million pages indexed in 1998 to about 1000 billion pages in 2008 (Alpert et al., 2008).

The dark side of information abundance, according to Weinberger, is information overload: the inability to understand and effectively use information because of its excessive amount. Information overload is related to another problem grown out of online freedom of expression: the lack of authority and reliability of information. In traditional publishing systems, authority is guaranteed both by the author himself (through his role or his reputation as an expert in some area) and by the publisher. Articles published in a prestigious scientific journal or novels which are part of a successful series of publications are often considered a guarantee of quality by the audience, regardless of author's name. Publishing a document on the Internet, on the contrary, says nothing about the quality of the document. It becomes necessary to make explicit some authority information that was previously guaranteed by the medium.

The difference between the sentence "Birds descended from dinosaurs" when it comes from some anonymous stranger on the Internet and when it comes from Nature is the metadata that says Nature is reliable. It used to be that the authority metadata was implicit in how the knowledge was distributed: it came from Nature, or from your physician's mouth. The mere existence of a book from a reputable publisher was metadata that established that at least some authorities thought it was worthwhile. Since simply being posted in a permission-free world conveys zero metadata about authority, that metadata now has to be made far more explicit. (Weinberger, 2011, p. 179)

Today most of online information includes no effective source attribution. The current architecture of the web makes the source attribution process quite difficult, mainly because of the absence of unique identifiers for real objects, which on the other hand are the basis of the Semantic Web. In most cases the source is given implicitly (e.g. identified with the website copyright) or, where it is explicit, it appears as simple string or link to a "user profile page" of a commercial platform (such as in forums and social networks).

If we try to design a new knowledge infrastructure for the web, we should keep intact the characteristic features of this medium, which determined its success on a global level, while limiting the possible drawbacks that the medium inevitably causes. Linked Data are undoubtedly a useful choice in this direction. «The solution to the information overload problem», explains Weinberger, «is to create more information: metadata» (Weinberger, 2012, p. 185). The Semantic Web is primarily seen by Weinberger as an attempt to identify web contents through unambiguous metadata. If topics in a web page are uniquely identified by URIs rather than simple tags, it becomes easier for a search engine to respond to our needs, to trace back synonyms to the same concept or to eliminate the ambiguity of a word. Even more important are those metadata which link a web document to its source, because they respond to the need of authority and reliability that allowed traditional publishing systems to work so fine.

Metadata helps with the second problem inherent in an open superabundant system: most of what's posted will be crap. So, we need ways to evaluate and filter which can be especially difficult since what is crap for one effort may be gold for another. [...] Indeed, a little metadata can go a very long way. This is important because in the Net of abundance we need more metadata about the authority of works that credentialed institution can provide. (Weinberger, 2011, p. 185)

It seems evident that the approach of these two authors towards the problem of online knowledge is quite different. While Rheingold emphasizes the need for Internet users to learn

more about the medium, reacting in their daily life in order to use the Internet in a more conscious and powerful way, Weinberger suggests a modification of the infrastructure of the web to eliminate or at least mitigate the shortcomings of the medium itself. Weinberger's perspective is more technological, whereas Rheingold's is more sociological and pedagogical. The author of *Too Big To Know* is aware that the web as we know it is not something static, but it is continuously modified by technological innovation. Back in 2001 Tim Berners-Lee recognized that the web made of documents and hyperlinks was only the first phase of the Internet and had to evolve into something different (Berners-Lee et al., 2001). The structural limits of the web appear evident in information search and in source attribution. Given that HTML pages do not show any clear indication about their meaning, the semantic layer must be built over the existing one, as an "overlay" of information resources. Search engines immediately had great success on the Internet because they made up for the lack of semantics of the WWW. They provide it with an "implicit" semantic layer, algorithmically built on top of textual contents and users' searches. Despite meaning and classification of Internet pages are not specified, Google is able to respond to our information need with hundreds or thousands of documents.

According to Berners-Lee's vision, the aim of the Semantic Web (or web of data) is to allow information retrieval based on the accurate understanding of documents semantics. The Semantic Web adds structure to online resources, so that they are not only accessible by humans but also easily processable by software agents. Adopting the Linked Data approach, legal entities such as institutions, companies, foundations, research institutes, and individuals too, become in the virtual space "URIs" which we can unambiguously refer to. They can be linked to all digital contents they produce, by means of special RDF attributes which indicate them as information sources (Prud'hommeaux, 2012). Facilitating the inclusion of additional information about the meaning and the source of online documents (unambiguously attributed through URIs in domains of certified bodies), is indeed an important step to improve the new knowledge infrastructure on the Internet. More and more public bodies, companies, research organizations are publishing their data as Linked Open Data: whether this will be a solution to many problems of the existing Web, only the future will tell.

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