

What is Library 2.0?

Abstract

Purpose The aim of this article is to both theoretically and empirically define the concept of Library 2.0.

Design/methodology/approach Written answers to question “What is Library 2.0?” given by practitioners and researchers (n=29) interested in Library 2.0 issues were analyzed by using co-word analysis to map the underlying elements of the concept.

Findings This study resulted in a model of Library 2.0, containing seven building blocks of the phenomenon: *interactivity, users, participation, libraries and library services, web and web 2.0, social aspects, and technology and tools.*

Research limitations/implications (if applicable) The model provides a basis for framing Library 2.0 as a research object and to map central themes of future research.

Practical implications (if applicable) A comprehensive model enables both researchers and practitioners to frame the phenomenon more clearly, evaluate existing and planned services and their proximity to what is Library 2.0.

Originality/value Unlike earlier proposals for a definition of the notion Library 2.0, the present study presents an empirical and consensual crowdsourcing approach of defining the concept. Library 2.0 and provides basis for discussing the future evolution of the notion and its implications to library and information science research and library practises.

Keywords Library 2.0, libraries, co-word analysis, concepts, definitions

Paper type Research paper

Introduction

Online activities are a growing part of many people’s lives, both engaging in interactive and social events on the Web and, increasingly become active partners creating new contents. Web 2.0 is the unifying term for these kinds of new technologies that enable users to interact and personalize web sites. Examples include social networking, blogging and wikis. There is a wide range of literature concerned with exploring the techniques (Miller, 2005; O’Reilly, 2005; Maness, 2006; Miller, 2006) and there are also a number of examples of how these techniques have been implemented in library context. Library 2.0 refers to a growing area of interactive and social tools on the Web with which to create and share dynamic content (Connor, 2007). There have been a number of suggestions as to what shapes the Library 2.0 phenomenon and the opinions are quite varied. This means there is no definitive definition of what constitutes the required components shaping Library 2.0. There is a clear need to establish an agreed definition of Library 2.0 in order to find a deeper stability in the development of information services connected to social and interactive tools. To this point little refereed research has been done related to this topic (Anderson, 2007a). The aim of this article is to both theoretically and empirically define the concept of Library 2.0. We will

discuss earlier definitions and suggestions of what Library 2.0 is and also analyze a new specifically collected set of definitions given by practitioners and researchers interested in Library 2.0 issues. These definitions have undergone a content analysis giving a clear definition of what Library 2.0 is in practice. Co-word analysis was chosen as the tool for analysis as it takes both the frequency of the studied objects and the relationships between the objects into account. Through this technique we were able to map the thematic contents of the phenomenon of Library 2.0 and define the underlying elements of the concept.

Background

Libraries have been around for a very long time and are traditionally seen as collections of information and services. Libraries have always played a significant role, enabling people to engage with all kinds of information and knowledge resources (Curran et al., 2006). Through the technological development of electronic resources the means to collect, store, manage, and use widely distributed knowledge resources have become more effective serving the library users even better (Griffin, 1998). Modern libraries are therefore being redefined as places to get wider access to information in many formats and from many sources. The technological development in libraries has affected both information space and information practice. Today we talk about libraries without walls being logical extensions to libraries (Fox and Urs, 2002). An important development in the second half of the 20th century was the introduction of integrated library systems and online catalogues giving access to information on library collections from anywhere with an internet connection. The idea of the library room changed when much of the visibility of the library environment was on the screen (Wallis, 2007). The distance between author and reader has been shortened while it gives a more direct involvement in the dissemination of information. Libraries provide access to an endless variety of information resources and opportunities for interactive communication. However, the fundamental mission has remained, to facilitate and give access to information and knowledge, but the processes, tools, and techniques have undergone big development.

At the same time the fact that the web is accessible from every corner of the world has meant that users are presented the same interface which is found problematic while it is difficult to design an interface that suits such a wide range of users (Frias-Martinez et al., 2007). Therefore the development has also included a shift towards personalization and initiatives like MyLibrary (Cohen et al., 2000) have emerged. These are a further development of digital libraries, which define personalized library services to Web users who expect customization and interactivity. Surprisingly for developers of these services, the adoption rates of these services have been very low (Gibbons, 2003) and therefore it is important to look deeper into the barriers to personalized service as this seems to be the future of the digital world. New trends concerning personalization, self service, and mobility have created a Web environment that is transforming how users are interacting with information (Benson and Favini, 2006; Bearman, 2007; Coombs, 2007). The user becomes a partner and a contributor to the work of the library which means the understanding of users becomes even more important.

One of the focal notions of digital world since 2004 has been Web 2.0, a term popularized by O'Reilly (2005) for an O'Reilly media web conference and thereafter explored somewhat further in a series of texts (O'Reilly, 2006a; 2006b; 2008). It is a controversial term laden with a multitude of different simultaneously similar and contradictory meanings and implications (Madden and Fox, 2006; Anderson, 2007b). Web 2.0 is about many different things at the same time: ideas, technologies, behavioural patterns, ideals, goals and cultures.

In practice, Web 2.0 is largely defined by a plethora of services quoted as being Web 2.0 (Anderson, 2007b). Typically quoted technologies include blogs and podcasting, RSS feeds, wikis, instant messaging, social networks, mashups and social tagging (O'Reilly, 2006a; Hinchcliffe, 2006; Anderson, 2007b; Hintikka, 2007). Various services such as Del.icio.us, Flickr, Youtube, MySpace, Facebook, Skype, Wikipedia and Digg have become almost synonymous to the phenomenon (Anderson, 2007b). Even though the technologies share characteristics such as focus on individual production and user-generated content, harnessing the wisdom of crowds, data on massive scale, participatory architecture, network effect and a degree openness (as connectivity) (Anderson, 2007a), they do not form a coherent group with same premisory assumptions of human behaviour or computer use. From a technological perspective, a focal point of Web 2.0 can be seen in promoting the role of data, agents and connectivity over individual applications.

Libraries and librarians began to discuss Web 2.0 services and their relevance in library context soon after the term was coined in 2005 (Chad and Miller, 2005). The background of the discussion can be seen in the context of the availability of new means to be present where the people are and to act how people have started to act in the work and everyday life (Farkas, 2007). The existence of Web 2.0 technologies made several librarians ask themselves, what these technologies could mean and do in the context of libraries and library services (Miller, 2005; Stephens, 2006) eventually leading to the formulation of a derivative notion library 2.0 (Casey & Savastinuk, 2007). Another notion underpinning both Web 2.0 and Library 2.0 was the concept Business 2.0 coined in the name of the Business 2.0 magazine. The concept was used to refer to a new, next version, economy (Casey & Savastinuk, 2-3) in much the same way as Web 2.0 and Library 2.0 refer to novelty in these two fields.

Definitions of Library 2.0

An established definition of Library 2.0 does not yet exist, despite numerous attempts to define it. Many views and comments on the notion have been published in blogs, articles and books. This is a short overview of some of the suggested definitions of Library 2.0.

In the blogs of library and information science professionals, also called the "biblioblogosphere", Library 2.0 has been hotly debated. There is some resistance to the concept; the Wikipedia article on Library 2.0 was even nominated for deletion in 2006. There are, however, many advocates of Library 2.0 who have tried to find a relevant definition. Brevik (2006), for example, states that "Library 2.0 is the natural evolution of library services to a level where the library user is in control of how and when she gets access to the services she needs and wants". Fichter (2006) provides the following formula: "Library 2.0 = (books 'n stuff + people + radical trust) x participation". Crawford (2006) gathered statements on Library 2.0 from blogposts and comments and found a total of seven definitions and sixty-two views. Some bloggers saw Library 2.0 as an evolution; others saw it as a revolution. Crawford summarizes his work by differentiating Library 2.0 and "Library 2.0", where library 2.0 includes both new and older software tools that are useful for providing improved and new library services. "Library 2.0", however, is a bandwagon and hype.

Casey & Savastinuk (2007, xxii) state that "Participatory service and change are the heart of Library 2.0, and technology is a tool that can help us get there". They speak for a broad definition of the concept including both physical and virtual library services (Casey & Savastinuk 2006, 2007) and that any definition of Library 2.0 should include three elements. These elements are Library 2.0 as a model of constant change, giving library users control

through participatory, user-driven services and implementing these to improve and reach out to both present and potential users.

Several definitions use Web 2.0 as a starting point. Habib (2006) defined in his master paper Library 2.0 as “a subset of library services designed to meet user needs caused by the direct and peripheral effects of Web 2.0”. Wallis (2007) defines Library 2.0 as the combination of Web 2.0 and libraries, together with the libraries’ traditions of serving users. Lankes, Silverstein & Nicholson (2007) defines the concept as an attempt to apply Web 2.0 technologies to the purpose of the library, together with goals for greater community involvement. They suggest, however, that the term Library 2.0 is limited and would rather see the term participatory networking being used instead. Stephens (2007), on the other hand, claims that Library 2.0 is much more than a set of Web 2.0 tools, according to him it is about applying open participation to library services. His viewpoint is similar to the broad definition advocated by Casey & Savastinuk (2006, 2007).

One of the more precise definitions comes from Maness (2006): “The application of interactive, collaborative, and multi-media web-based technologies to web-based library services and collections”. Wide definitions of the concept come from Curran et al (2007), who summarize Library 2.0 as user-driven and efficient and from Black (2007, 12), who concludes that Library 2.0 and Web 2.0 “are simply attempts to describe the changes the web has brought to society”. Shoniwa & Hall (2008) have researched the academic UK librarians’ views on Library 2.0. Their results showed that Library 2.0 is the selective application of Web 2.0 tools with focus on user service. Among these academic librarians, the perspective of Library 2.0 as a part of physical services has not been established.

These definitions focus on different parts of Library 2.0. Some chose to focus on Web 2.0 technologies, while others emphasize library services or user participation. A more complete definition is therefore needed that captures the different components and the essence of Library 2.0.

Methods

Before a workshop on Library 2.0, organized by researchers at the department of Information Studies at Åbo Akademi, 29 participants answered freely to an open ended question: What is Library 2.0? The respondents were given five minutes to answer the question and they were not allowed to discuss their answers with each other. The content of the workshop did not affect the answers as they were collected before the workshop started. The participants were library professionals from Finland with some interest in Library 2.0 because they participated in the workshop. Seven of the 29 respondents worked at a university library, eight at a library of a university of applied sciences, 12 worked at a public library, one of the respondents worked at the National Library of Finland and one worked at the Library of Parliament. Eleven of the 29 respondents were male. The group was very mixed when it comes to age and working experience. Some were just in the beginning of their careers while others had worked in libraries for several years. The answers comprised mainly of short sentences or bullet points and reflected what Library 2.0 meant to the participants. To prevent the ‘indexer problem’ (discussed later), four researchers indexed all answers separately. The results of this indexing were discussed and only those index terms or terms with the same intention that at least three researchers had used for the same answer were used in the co-word analysis. A total of 37 index terms were used by at least three researchers and these are the terms used in the analysis.

The BibExcel software (Persson, 2008) was used in the analysis and it was decided that multidimensional scaling (MDS) was used to visualize the data, following the methodology of earlier informetric studies (i.e. McCain, 1991; McCain, 1998; Ding et al., 2000; Tsay et al., 2003). Visualising the data with MDS places the used terms in a two-dimensional network where the relationships between the terms can be read and qualitatively interpreted.

Co-word analysis

Since Derek J. de Solla Price (1963) established the research field of scientometrics by suggesting that science should be studied with science, there have been many efforts to map science (Garfield, 1979; Small and Garfield, 1985; Leydesdorff, 1987; Cahlik, 2000; Boyack et al., 2005). Both co-word analysis and co-citation analysis have been used to create maps of science, both from slightly different perspectives. Co-citation analysis has focused on identifying networks and clusters of authors or references, while co-word analysis was developed to give a more thematic view on science through the content of publications.

Co-word analysis is a content analysis technique that uses both the frequency of objects and their relationship or existing connections between them (Courtial, 1994; He, 1999). The connections are extracted from the co-occurrences of pairs of words in e.g. selected texts or databases indexes and the frequencies of the co-occurrences are used to measure the strength of these connections. Based on these connections the objects or words are then clustered and drawn in network maps for more qualitative analysis. Network maps are often used to visualize large amounts of data and with that, help with the interpretation of the data.

Co-word analysis involves three steps: 1) the extraction of the key words from selected material, 2) the creation of the co-occurrence matrix and drawing the network maps and 3) interpreting the network maps and the data they represent (Courtial, 1994; He, 1999). The first step may be crucial for the outcome, as the indexer may influence the data a lot. When the indexing is done by the researcher it may be difficult to choose a proper level of generalization that would still have the fine-grained variations in the key terms. Using several indexers can resolve this problem, but it is not always possible to use several indexers in practice. The second step includes creation of the raw co-word matrix and conversion of the raw data to a correlation matrix. The creation of the matrices and the visualisation of the data in to network maps are typically done with computer software, like BibExcel (Persson, 2008) which is especially designed for this purpose. The maps are often drawn with multidimensional scaling, which is a statistical technique to visualise large data sets in order to analyse similarities or dissimilarities in the data or even between data sets. Another possibility is to use some algorithm to calculate the exact positions of the nodes or words in the map. A frequently used algorithm for visualisation of large data sets is the Kamada-Kawai (1989) algorithm that treats the links or the connections between the objects as springs that pull the nodes or words closer to each other as the springs are trying to find a balance in the system. The last and perhaps most important step is to analyse and interpret the network maps. Some measurements familiar from social network analysis are sometimes used to aid in the interpretation. With especially very large network maps measurements like density and centrality help in interpreting them (He, 1999).

Results

The density of the network map based on the co-word analysis is about 10 percent, which means that about 10 percent of all possible ties or connections are present in the map. Figure

participation or *interactivity* and they also represent very similar aspects. The same goes for the nodes or terms in the lower right corner of the graph. The term *user-created* is not directly connected to the other more technological terms in that area, but a connection exists through the term *interactivity*. The terms in this part of the graph were considered to represent *technology and tools*. The clusters drawn in figure 3 are overlapping in several places. Many of the terms could be placed in two or more clusters. The term *social software* for instance is in both *social aspects* and *technology*, as it clearly is a part of them both.

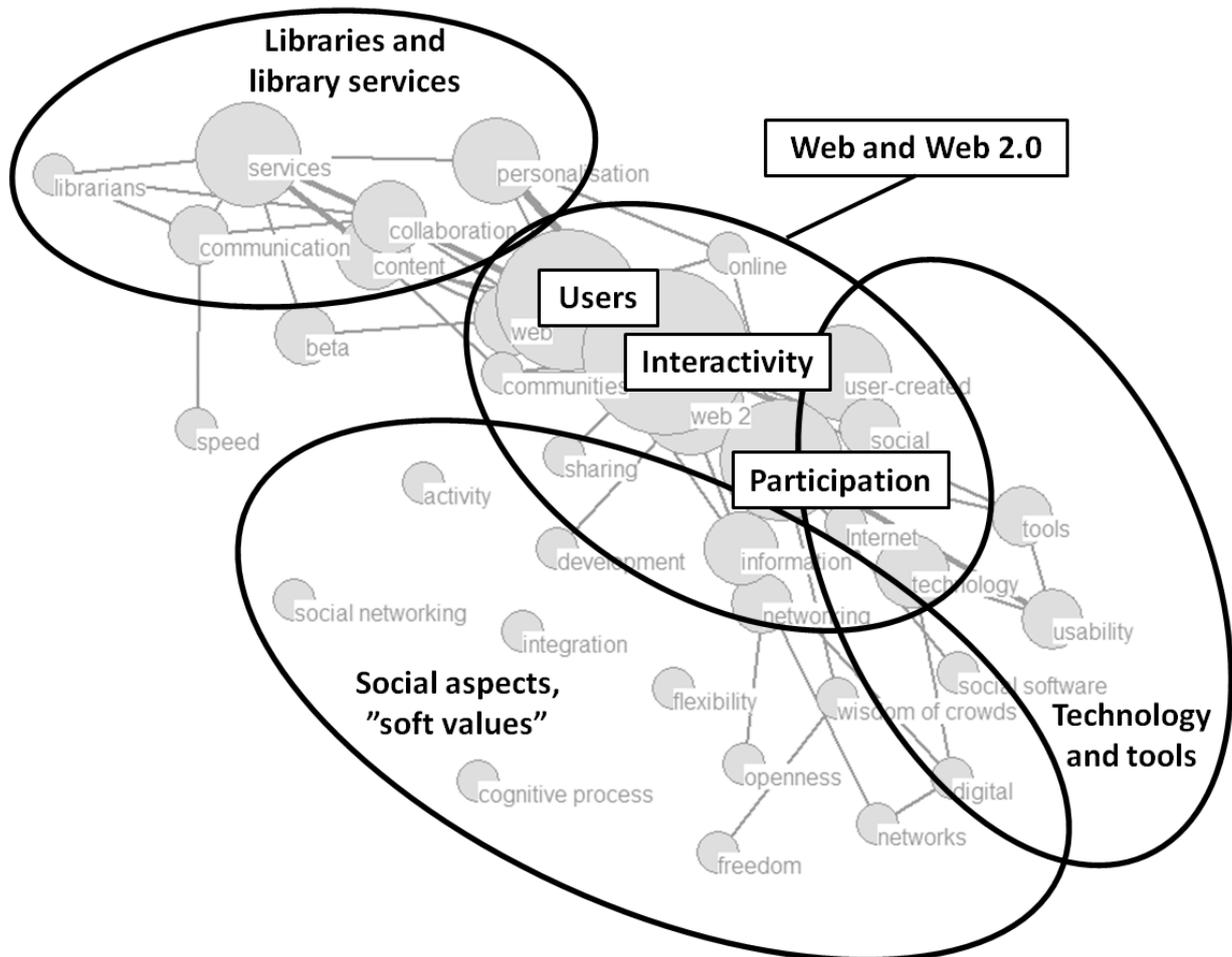


Figure 3. Qualitative study of the graph and clustering of related terms

By interpreting the network map and clustering terms into somewhat more general, describing terms or concepts, the seven core components of Library 2.0 were extracted: *interactivity*, *users*, *participation*, *libraries and library services*, *web and web 2.0*, *social aspects*, and *technology and tools*. These seven building blocks of Library 2.0 are visualised as circles in our model of Library 2.0 in figure 4.

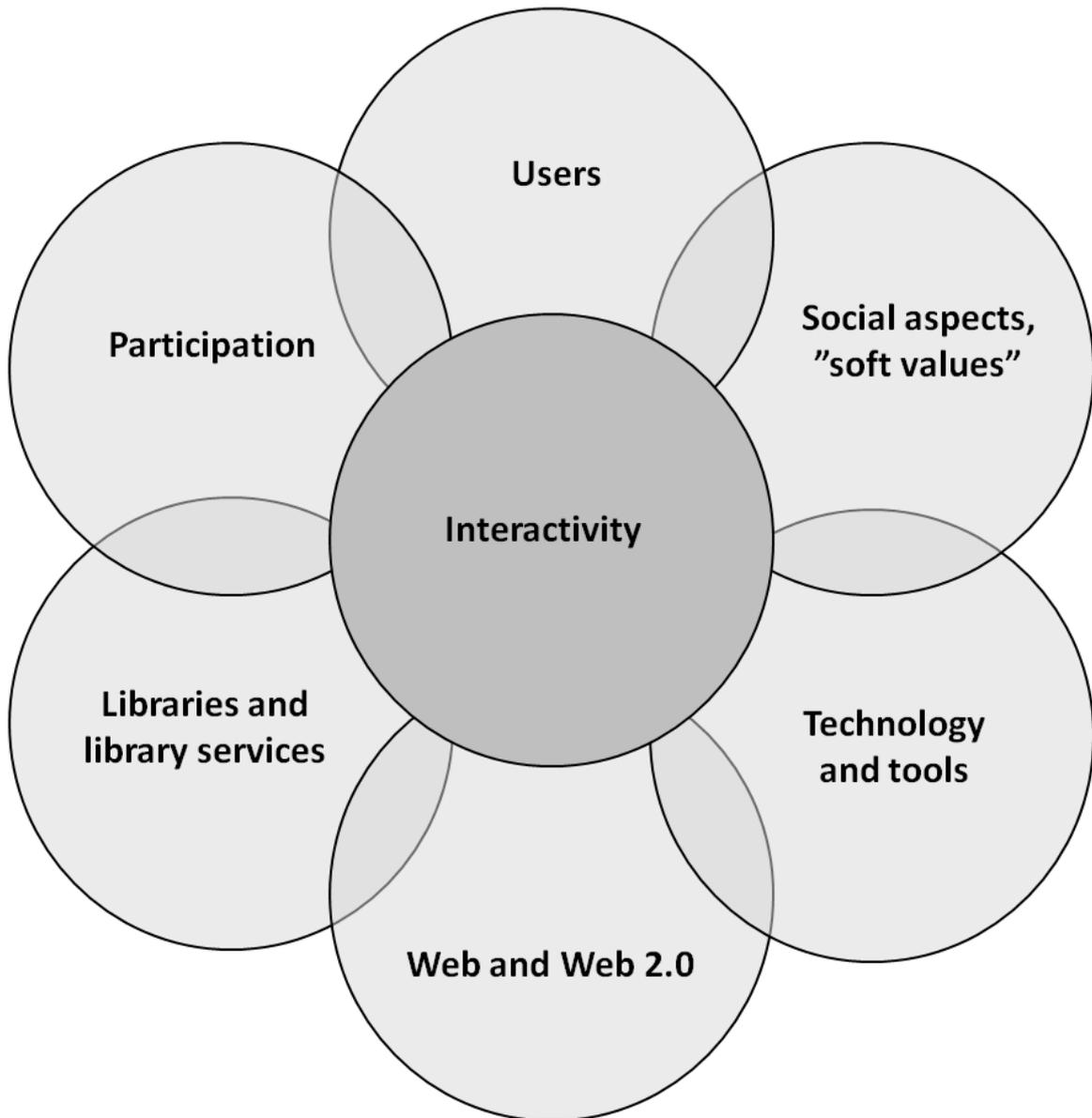


Figure 4. The building blocks of Library 2.0

Because several terms that could be included in one of the building blocks could also be part of another, this flexibility was visualised in our model by drawing the blocks to overlap with each other. For instance, the block *users* is closely connected with the block *participation*, and the block *web* is closely connected to the block *technology*, and so on. The term and block *interactivity* was considered as the most important component of Library 2.0 by the respondents and hence it is drawn in the centre of the model with a clear connection to all the other blocks.

Discussion

In this research co-word analysis was used to study the phenomenon of Library 2.0 and to map the underlying elements of the concept. This study resulted in a model of Library 2.0, containing seven building blocks of the phenomenon. The seven building blocks of Library

2.0 are *interactivity, users, participation, libraries and library services, web and web 2.0, social aspects, and technology and tools*. From these building blocks we can empirically define Library 2.0:

Library 2.0 is a change in interaction between users and libraries in a new culture of participation catalysed by social web technologies

As we have shown with various measures, interactivity is the most important part of Library 2.0 and it was interactivity that most of the respondents thought about when they were asked what Library 2.0 is. Interactivity can be interaction between the librarians and the customers or library users, but also between library staff or between users of the library services. This interaction enables participation where the users can contribute to the content of libraries and library services using new ways and new web-based tools or so called Web 2.0 tools. Web 2.0 is sometimes referred to as the social web (O'Reilly, 2005), as the term better describes what this "new web" is all about. Developments in technology have made the creation of more user-friendly web services and web-based tools possible. Users do not have to be aware of the technology anymore, instead they can concentrate on the content and on contributing by creating new content and editing old content. Web 2.0 is about social aspects on the web and web-based tools enabling social contacts between users on the web. These tools and this way of thinking are essential even in Library 2.0.

Earlier definitions and descriptions of Library 2.0 have focused on a number of issues, which become emphasized also in the present model. Emphases of the existing definitions can be broadly classified to library, technology, and user centric ones. In contrast, the proposed model places emphasis on that what essentially resides between these dimensions.

Library centric definitions comprise Brevik (2006), Habib (2006) and Maness (2006). Casey and Savastinuk (2007) represent a user centric approach to Library 2.0, although they underline the significance of technology in the process of developing library services. Of the Web 2.0 definitions of Library 2.0, Stephens (2007) represents a similar user perspective, which brings Library 2.0 out of the Web to the social and physical world. The most user centric approach is represented by Curran (2007), who equals Library 2.0 as a user-driven effort. Crawford (2006) represents in his review of Library 2.0 definitions an essentially technological point of view although he places emphasis on its use in library contexts. Wallis (2007) sees Library 2.0 equally technologically as a combination of libraries and technology.

By a specific emphasis on participation as the bridge between users and "books'n stuff", Fichter (2006) comes perhaps closest to the present model alongside with Black (2007), whose definition remains, however, rather unspecific.

The principal strength of the present model is that it represents an understanding of the Library 2.0 phenomenon and facets deemed to be significant by library professionals working in both academic libraries and public libraries. Besides the method of formulating the model, the focus on interaction instead of physical elements of library context has also theoretical and practical advantages. The multitude of definitions and attempts to define a vague phenomenon clearly shows that Library 2.0 cannot be a question of libraries, library services, users, technology or society alone. Even though Web 2.0 is crucial to many Library 2.0 ideas and ideals, there is a clear tendency not to accept that Library 2.0 would be a solely web based phenomenon (e.g. Casey and Savastinuk, 2007). The difficulties of establishing a significant physical elements of Library 2.0 shows that its focal aspect is not the tangible in technologies, libraries (both as spaces and organizations), librarians' competence or user-centrism, but rather in the aspects the tangibles can afford in activity.

We have empirically built a model of Library 2.0 which consists of seven building blocks: *interactivity, users, participation, libraries and library services, web and web 2.0, social aspects, and technology and tools*. None of these can be left away from a Library 2.0 compliant service and all of these should also be incorporated in a definition of Library 2.0, but different organizations may want to emphasize on different things. For organizations that wish to emphasize the change in interaction Library 2.0 is about a change in interaction between users and libraries in a culture of new social participation. For organizations that wish to emphasize the users and their role Library 2.0 is about users interacting and participating using social tools in library context. No matter which aspects we may want to emphasize, it is clear that Library 2.0 is about a change in interaction that has been made possible by technological developments in user-friendly social aspects in web-based services.

Conclusions

Even though using the concept “Library 2.0” has become rife in professional and academic library discussion, it lacks a clear definition. It has been an aggregate of ideas, ideologies, technologies, attitudes and services. Earlier attempts to describe the phenomenon have had both notable similarities and dissimilarities of emphasis, but there has been no clear consensus on the central elements of the notion.

Unlike the earlier proposals based on individual views and advocacies, the present study presents an empirical and consensual crowdsourcing approach of defining the concept. Responses (n=29) to question “What is Library 2.0?” by Finnish working librarians from both academic and public libraries were indexed by four researchers and the keywords were analysed using co-word analysis. The analysis of the occurrence and co-occurrence of keywords revealed seven focal components of Library 2.0 in a qualitative analysis of the co-word maps: interactivity, users, participation, libraries and library services, web and web 2.0, social aspects, and technology and tools. The interactivity component appeared to be the most central one, which connected most with the rest of the notions, which is reflected in the model constructed by the authors (Figure 5). It is suggested that none of the components may be left aside when considering whether a phenomenon belongs to Library 2.0 or not.

The primary implication of the model is that it represents a consensual and empirical approach to define the notion Library 2.0. A comprehensive model enables both researchers and practitioners to frame the phenomenon more clearly, evaluate existing and planned services and their proximity to what is Library 2.0. Further, the model provides a basis for discussing the future evolution of the notion and its implications to library and information science research and library practises.

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