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Designing library tools. The (un)importance of employee involvement

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Abstract: The growing trend of public institutions to open up data and information to citizens encouraged archives and libraries to enhance the disclosure of their content towards end-users. This implies technical challenges as more and more information is exchanged not only between people, but also between different databases and applications which are consulted by different user groups through different devices and entry points. For libraries, the challenge lies in constructing a properly functioning catalogue which is able to combine a huge amount of information from various sources and is consultable by a large group of end-users in a user friendly manner. Based on the User Centred Design paradigm and Kaulio's (1998) degrees of user involvement in innovation, this paper wants to consider whether involving users during the creation of metadata tools can result in more motivated library co-workers and a more appreciated tool and (hopefully) in a permanent tagging tool.

Keywords: metadata; future library; user design; co-creation; user-centred design; user involvement; living lab research; participatory design;

1 Introduction

Several years ago it was impossible to imagine a library without a significantly massive collection in print. Now we cannot envision a future without the majority of scholarly content being digital. But this is not just about books, it is about libraries redefining what a collection is. Information is migrating to digital platforms, so imagine what will be next: Google-like search capabilities across millions of books, articles, and multimedia? An iTunes-like interface for quickly acquiring and accessing content anytime, anywhere, on any device? Facebook-like communities for students and scholars to discover, build, publish, and share new knowledge? Perhaps the future of libraries is not centred on access to content, but rather, the usage of it. Maybe there is a greater emphasis on

community building, connecting people, engaging students, assisting researchers, and advancing knowledge production? Change is going to be difficult, but the good news is that libraries (starting to) know it is necessary (Mathews, 2012).

In Flanders -the Dutch speaking region of Belgium- library membership has drastically reduced while lending figures increased since 2011, due to an increased number of loans of audio-visual material. Also the number of visits increased the past years. From 18.717.477 visits in 2010 to 19.104.299 in 2011 (www.locusnet.be). In other words, the part of the Flemish population that is a member of a public library erodes steadily, but this declining group uses the collection more intensively. Technological evolutions create alternatives for the former dominant position of libraries as providers of knowledge and culture. Websites such as Google, iTunes, Spotify or Bol.com are always available, offer a wide range of products and information, and have an international appeal and audience. Tablets are becoming an alternative for products which are traditionally popular in libraries, such as books, magazines or comics. Moreover, ethno cultural diversity increases, people live longer, new family patterns arise and more and more diverse lifestyles are maintained. The discourse of one common offer for everyone has become obsolete. Libraries blossomed in a period of scarcity and were intended to provide knowledge, education and culture in a time when these facilities were not available for the general public. Nowadays, libraries have to maintain themselves in a world of excess: an abundance of information, books, media (content), trends, opinions, activities,...

Libraries are evolving from a passive collection of books towards an active space where people can enjoy an experience and get inspired (Jochumsen, Rasmussen & Skot-Hansen, 2012). In addition, libraries function more and more as local meeting points (AabØ, Audunson and Vårheim, 2010; Jochumsen et al., 2012). Another trend towards the future library is being digital. The digital library is a place where annotations are not only feasible, but also may become important adjuncts to the primary text, a place where we may (and are welcome to) write in (digital) books (Marshall, 1997). Digital libraries have already achieved a role in our knowledge society. By making the wealth of material contained in libraries, museum, archives and any knowledge repository worldwide available they are giving citizens in every place of the world the opportunity to appreciate their global cultural heritage and use it for study, work or leisure. They are revolutionizing the whole knowledge management lifecycle (Candela et al., 2011). For libraries it is not easy to respond to these trends. Due to the digitizing of libraries, huge opportunities rise for libraries to become an inspiring active space. But how can librarians contribute? How can library workers get in touch with these trends and innovations? How can librarians and library workers cope with these digital innovations and tools? In this paper we compare different methods to (not) involve library workers to metadata operations, one of the most important trends in our digital society nowadays.

2 Methodology

So why involve users (library workers) during the development of a tool? Different design approaches tend to involve future users during (a part of) the product development. In this case, the product being developed is a tool where all library items are listed and labelled so they can be used for interactive activities. Imagine an iTunes-like interface for quickly acquiring and accessing content anytime, anywhere, on any

device or other futuristic possibilities (Mathews, 2012). Before these cross-media operations can become feasible, an efficient and well-functioning system of adding correct metadata to library content must be realized (Dawar, 2013). That is why we compare different cases whereby librarians were or were not involved to construct a tagging approach. These cases are based on different research methods.

From user-centred to participatory design approaches

User-centred design (UCD) is a broad term to describe these design processes in which end-users have an influence on how a design takes shape. Some types of UCD consult users about their needs and involve them at specific times during the design process, typically during requirements gatherings and usability testing. The role of the designer is to facilitate the task for the user and to make sure that the user is able to make use of the product as intended and with a minimum effort to learn how to use it (Abras et al., 2004). The user-centred design approach has been primarily a US-driven phenomenon. Increasingly, since the 70s, people have been given more influence and room for initiative in roles where they provide expertise, and participate in the informing, ideating, and conceptualizing activities in the early design phases (Sanders & Stappers, 2008). The user-centred design approach, which began in the 70's and became widespread by the 90's, proved to be most useful in the design and development of consumer products (Sanders, 1992).

The major advantage of the user-centred design approach is that a deeper understanding of the psychological, organizational, social and ergonomic factors that affect the use of computer technology emerges from the involvement of the users at every stage of the design and evaluation of the product. It also helps designers manage user's expectations about a new product (Abras et al., 2004). Design research and practice has often been influenced by concepts and methods borrowed from the social sciences. Techniques of user-centred design frequently include aspects of anthropological method and there have been important moments of exchange, particularly in the area of human-computer interaction (Ingram et al., 2007).

In the user-centred design process, the focus lays on “the thing being designed” in this case the library metadating tool, looking for ways to ensure that it meets the needs of the user. The social scientist/researcher serves as the interface between the user and the designer. In user-centred design, the roles of the researcher and the designer are distinct, yet interdependent. The user is not really a part of the team, but is spoken for by the researcher.

Participatory design: issues and concerns

Participatory experience is the belief that all people have something to offer to the design process and that they can be both articulate and creative when given appropriate tools with which to express themselves. According to Sanders & Stappers (2008) it has become apparent that the user-centred design approach cannot address the scale or the complexity of the challenges we face today. They prefer to invite users during the actual creation of products and services.

Since the early days of Participatory Design, computer-based systems have become more and more integral parts of people's work lives. Many design professionals and managers alike are realizing that the skills and experiences of workers need to be present in the design and organizational implementation of computer systems and the work they support. This, they argue, will help ensure a better fit between technology and the ways people (want to) perform their work. Increasingly, the results of Participatory Design research, in terms of an understanding of the relations between work and technology and the tools and techniques applied, are being integrated into design professionals' resources for action. Participatory Design researchers explore conditions for user participation in the design and introduction of computer-based systems at work. Participatory Design research began in the mid 1970's in reaction to the ways in which computer-based systems were introduced in the workplace and to the harmful effects these systems were having on workers (dislocations, deskilling, etc.) (Kensing & Blomberg, 1998).

Projects such as the Swedish DEMOS project (Ehn and Sandberg, 1979) and the Danish DUE project (Kyng, 1996; and Mathiassen, 1998), have shown that already in the 1970's, there was intention to involve workers with the technology intervention, but in reality workers found few ways to influence the course of this technological interference. In spite of the results of these early projects, workers continued to find it difficult to argue for alternative ways of using technology, in part, because management's goals and strategies often were built into the new systems and were reinforced by organizational distributions of power, making it difficult to alter the technology to fit workers' needs and interests (Kensing & Blomberg, 1998).

We find it useful to think about these issues in terms of Gärtner and Wagner's (1996) arenas for participation. They distinguish between three arenas:

1. Arena A: The individual project arena where specific systems are designed and new organizational forms are created

2. Arena B: The company arena where breakdowns or violations of agreements are diagnosed and hitherto stable patterns of organizational functioning questioned and redesigned

3. Arena C: The national arena where the general legal and political framework is negotiated which defines the relations between the various industrial partners and sets norms for a whole range of work-related issues

At various times in the history of Participatory Design research there have been differences in the emphasis placed on the three arenas of participation. Concerns have been voiced that too few Participatory Design projects are engaged at the organizational or company level (Arena B) (Gärtner, 1998; Kensing et al., 1999) and that the Participatory Design community may have lost sight of the importance of participating at the national legal and political level (Arena C) (Bjerknes and Bratteteig, 1995; Beck, 1996; Greenbaum, 1995).

Bødker (1996) already mentioned that the collective experiences of participation often are only for those directly involved in the project, and only while the process is running. While appropriate relations with other organizational members increase the likelihood that the influence of the project on technological and organizational change extends beyond the immediate project group and endures after the researchers leave. Until now,

managers rarely participated in Participatory Design projects. Some have worried that management's participation would silence the voices of workers and undermine the goal of increasing workers' say over their working conditions (BØdker, 1996). It is important to keep this in mind while inviting the workers to join the design process.

Co-creation and the new landscapes of design

In the area of participatory design, the notions of co-creation and co-design have been growing. The term co-creation was first used in the 80's by futurist Barbara Marx Hubbard. Since 2000 the term is used in the marketing world to describe interactive product development, whereby consumers are enabled to contribute to product development. Research demonstrated that these co-created and customized products or services yield added value for the end-users (Franke & von Hippel, 2003). Prahalad & Ramaswamy (2000) describe co-creation in the following way: "co-creation is collaborating as a company with a client or consumer on new products and services". An important basic idea is an equal dialogue and an exchange of ideas between companies and consumers. In this way co-creation is a way to add economic value to products and services. The importance of co-creation has increased because of the rise of new groups of consumers with new habits and that is where UCD enters.

We tend to follow Sanders & Stappers (2008) in their view on co-design which they indicate as collective creativity as it is applied across the whole span of a design process. They emphasize the remarkable the large and growing accentuation on "the front end". The front end is often referred to as "fuzzy" because of the ambiguity and chaotic nature that characterizes it. The goal of the explorations in the front end is to determine what is to be designed and sometimes what should not be designed and manufactured. The fuzzy front end is followed by the traditional design process where the resulting ideas for product, service, interface, etc. are developed first into concepts, and into prototypes that are refined on the basis of the feedback of future users (Sanders & Stappers, 2008).

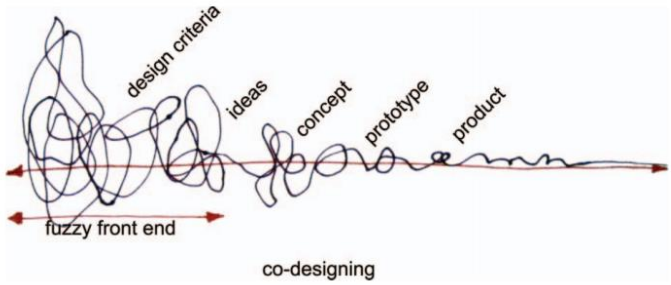

Figure 1 The front end of the design process has been growing as designers move closer to the future users of what they design (Sanders & Stappers, 2008)

Users can become part of the design team as 'experts of their experiences' (Sleeswijk Visser et al, 2009), but in order for them to take on this role, they must be given appropriate tools for expressing themselves. Over the past two decades, research groups within a number of academic institutions, practitioners in design research consultancies and design research groups within industrial institutes, have all explored co-designing tools and techniques and the processes by which they can be applied. The evolution in

design research from a user-centred approach to co-designing is changing the roles of the designer, the researcher and the person formerly known as the "user". The evolution in design research from a user-centred approach to co-designing changed the landscape of design practice as well and created new domains of collective creativity. Different approaches to inviting and involving future users into the design development process will be needed for the different levels of creativity (Sanders & Stappers, 2008).

Comparative case study

Nowadays, libraries not only provide books, they also offer more and more digital content. To create a clear overview of all these different content types, it is necessary to add metadata to the different sources. This metadata should be collected in a(n) (inter)national library catalogue. The process of adding metadata to this specific content is cumbersome. Libraries all over the world experimented with tagging software to enhance their catalogues. This appeared to be a demotivating task for library co-workers, while having good metadata generates added value for the library customers (Dawar, 2013). In this comparative case study of library metadata tools whereby cases without user involvement will be compared with one case with user involvement, we choose three use cases which represent three situations, but they are not exclusive. These specific projects were chosen based on the degrees of user involvement in innovation by Kaulio (1998): design for users, design with users and design by users:

Design for users denotes a product development approach where products are designed on behalf of the customers, in this case the libraries themselves. Data on users, general theories and models of customer behaviour are used for design and development.

Design with users refers to a product development approach that focuses on the customer and utilizes data on users' preferences and their needs and requirements. In addition, this also includes presenting different concepts to users, so they can react to different proposed design solutions.

Design by users allows for the highest degree of end-user freedom. It denotes a new product development approach which actively involves and includes users in the design and development. End-users are actually developing the products themselves. This holds out advantages not only for the quality of the technology, product or service, but also for the sales and marketing of the innovation (Almirall, 2008).

We decided to compare three library metadata cases, based on their degree in user involvement:

Table 1 Comparative case study within the framework of Kaulio (1998)

Degree of user involvement	*Description of the case*
Design without users	Online Computer Library Centre (OCLC) is a membership organization that runs WorldCat, a vast catalogue with records from 72.000 libraries in 171 countries, and it sells a variety of services to members, including a tracking system for interlibrary loans. We chose WorldCat to represent the top-down approach of

	software create by an external company.
Design for users	Mediargus (now GoPress) is an online platform offering newspapers and magazines in libraries. Library workers were paid to add tags to articles. In the end this method was stopped because library workers lost their enthusiasm to tag in an adequate way. We chose Mediargus as a representative for (failed) projects which involved library workers somehow but not during the design process of the metadata tool.
Design with users	Testbeeld is an online platform offering audio-visual material of broadcasters in libraries. Together with library workers they created a tool to add tags to the audio-visual material.

Source: Kaulio (1998)

We studied the library workers' opinion of these three cases based on the user-centred and participatory design paradigms. WorldCat is a union catalogue that itemizes the collections of 72,000 libraries in 170 countries and territories that participate in the Online Computer Library Centre (OCLC) global cooperative. It is operated by OCLC Online Computer Library Centre, Inc. while its data base is maintained collectively by the participating libraries. For WorldCat we rely on desk research to conclude that library workers see OCLC as a monopolistic institution.

> "OCLC! GRRRRR! You have such good data, but a monopoly is never a good thing (unless it's a board game of course). Since you swallowed up RLG, you have caused so many libraries a world of trouble and expense." - Anonymous user

Still, a lot of libraries use OCLC software to metadate their catalogue, because of their monopoly in library metadate software. This is software which was developed without the input of library workers.

To get informed about the Mediargus case, we read the report of Declercq et al. (2013) and interviewed officers from LOCUS (the Flemish support centre for libraries, cultural and community centres and local cultural government) and Bibnet (a Flemish organization which ensures that libraries create added value in a digital environment) about the current tagging systems in Flemish libraries. They also gave insights on the failed Mediargus experiment. The participating library co-workers received financial compensation for each theme they completed. Nevertheless, this project was unsuccessful because of the demotivation of library co-workers which resulted in low-quality tags. The library workers were able to give feedback on the manner of working. The interviewed co-workers of the library of Ghent were involved in the Mediargus project and made clear that there is a need for an optimized metadata system.

Testbeeld is the name of the case where library co-workers were involved in the co-design of a metadata tool. This project is part of a result of a Living Lab research in eight Flemish libraries. This Living Lab research was an explorative research on the exploitation of audio-visual material as a new type of library content. The lack of metadata became a clear issue and resulted in a project from February 2015 onwards. The library co-workers of the library of Ostend will add tags to a certain amount of audio-visual content, which is exploited in their library. During a preliminary co-creation session, the involved library co-workers gave insights on how their ideal tagging tool

would function. This co-creation session resulted in mock-ups of a potential tagging system. These mock-ups will be used by the developers of Testbeeld as a basic checklist to create the software for the metadating system on their platform. In September 2015 these coworkers will be interviewed on their experience with the tagging system on the platform. In the meanwhile they will be able to ask questions and give feedback on the system when they want.

We compared these cases on five aspects based on the literature about Participatory Design mentioned earlier (Bødker, 1996; Kensing & Blomberg, 1998; Sanders, 2002): content types, top down or bottom up approach, enthusiasm of library coworkers, involvement of library coworkers and still in use.

Table 2 Comparative case study summary

Research aspect	*Design without users*	*Design for users*	*Design with users*
	WorldCat	*Mediargus*	*Testbeeld*
Content types	A lot of libraries use this software worldwide so a lot of data is combined in one place. The content is mainly books.	This metadating system was limited to articles of newspapers and magazines available on the website. The content is mainly articles of newspapers and magazines.	This metadating system will also be limited to audiovisual material available on the website. The content is mainly audiovisual material.
Top down/bottom up	This system was created by an external company and implemented by libraries (=top down).	This system was implemented by the overarching library organization (=top down).	This system is created together with library workers, developers and researchers (=bottom up).
Enthusiasm of library co-workers	Library workers have to use this tool, but it wasn't always user-friendly so they lost enthusiasm.	By paying people to metadate, it is easy to create enthusiasm at the start of the project.	By involving library workers from the very beginning of the creation of the platform –even before the idea of a metadata tool- people are enthusiastic.
Involvement of library co-workers	No library workers involved during the creation of the software.	No library workers involved during the creation of the software/platform.	Library workers of different libraries were involved before and during the creation of the platform.
Still in use	Still in use because of the monopoly, but some promising competitors are	Mediargus no longer exists. The project now calls GoPress	Testbeeld is still in a testing mode, but already has more

	rising e.g. SkyRiver Technologies.	but the articles are no longer metadated by library workers.	than 1000 users.

Source: Bødker, 1996; Kensing & Blomberg, 1998; Sanders, 2002

The major issue for all three cases is that they each focus on a specific type of content. In an ideal world there would be one platform offering all content types. Despite the findings of Kensing & Blomberg in the 1990's, not all companies implement new IT elements from a bottom up perspective with their employers. In our comparative case study, only Testbeeld involved library coworkers before and during the co-creation of the platform. Also, it is more difficult to keep your users enthusiastic on working with a tool they not completely understand or like working with. These are the two main reasons why Mediargus stopped existing in its former operating form. A possible explanation for the declining enthusiasm with WorldCat and Mediargus can be the involvement of library workers during the creation of the platforms. Still WorldCat, which has a worldwide monopoly on library software, has a lot of users but this software is not very popular among its users.

This case raises the question, whether we should involve library coworkers in the creation of this metadating tool. When we look at other possible "futuristic" ways in which libraries can evolve, it becomes clear that it is important to involve library coworkers. As Mathews (2012) was asking himself: Maybe there should be a greater emphasis on community building, connecting people, engaging students, assisting researchers, and advancing knowledge production? By means of the living lab research, we found out that there are a lot of library coworkers with a lot of experience and knowledge about the current library content. Somehow they can be seen as the human form of an iTunes-like interface for quickly acquiring and accessing content anytime, anywhere, on any device. These people know their libraries. This is another reason to involve them during the setup of metadating systems.

3 Conclusion

Because of the digitization of (library) content, creating adequate metadata to describe and retrieve this content became increasingly important. The act of generating and implementing metadata is described as a heterogeneous, rich and complex matter, and various difficulties have been reported for this process within various societal areas (Sicilia, M.-A., 2014). Within this paper, we focused on these issues related to libraries.

We compared three cases that implemented library metadating tools based on the degrees of user involvement in innovation by Kaulio (1998). We compared these cases on five aspects derived from literature about Participatory Design (Bødker, 1996; Kensing & Blomberg, 1998; Sanders, 2002): content types, top down or bottom up approach, enthusiasm of library coworkers, involvement of library coworkers and still in use.

In the United States and Europe (no involvement for users), commercial software is being used but library coworkers became demotivated to keep on tagging their content using this software. In other European countries for users, including Belgium (Flanders), library coworkers were also imposed to add metadata with external software, also in an unsuccessful way (Declercq et al., 2013). A common element in these cases is the fact

that the library coworkers were not involved in the creation and implementation of these tagging software systems. This top-down approach contradicts the current trend of increased user involvement during the NPD process by companies. Research demonstrated that these co-created and customized products or services yield added value for the end-users (Franke & von Hippel, 2003), in these cases library coworkers. As the library cases illustrated, the practice of involving workers in the design of an IT application in the workplace seems to have become obsolete within (some part of) the Creative Industries (Cunningham, 2002). This seems rather paradoxical with the creativity that should be president within creative industries. Our case study research has shown that involving library workers during the implementation of a metadating tool, has better results. Within the framework of Kaulio (1998) we were able to detect cases of innovation without, for and with users. Future projects should try to focus on innovation by the library workers. A hackathon where library workers could create their own metadating system can be a good example.

If we want to create platforms were library workers (and visitors) will be able to find all the combined content of libraries, we need libraries to add metadata to their books, audio-visual and other materials. To realize this, we need all library workers on board but most of all, we need their experience and knowledge about the library content. Somehow they can be seen as the human form of an iTunes-like interface for quickly acquiring and accessing content anytime, anywhere, on any device. These people know their libraries and should be involved during the setup of metadating systems because perhaps the future of libraries is not centred on access to content, but rather, the usage of it.

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