# The Interactive Library as a Virtual Working Space

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## Abstract

The internet and new digital media are challenging the traditional business model of academic libraries and they enable new capabilities of information provisioning and new shapes of collaborations between the librarians and the users. To pick up the demands and the expectations of the many users, whose information behaviour is heavily influenced by the internet, a new business model for academic libraries has to be designed urgently. The present paper tries to analyse the requisites of such design and to develop a framework for setting up a pilot study for identifying the organizational and technical requirements of a business model for the future library, which is based on the potential of the internet and new media. The result should be a pilot study about the interactive, multi-user driven library as the future business model for libraries.

**Key Words:** digital libraries; scholarly makerspaces; virtual working environment; digital transformation

## 1. Introduction

The logistic of printed books and journals is influencing all the processes and structures of libraries since the age of Gutenberg. Our core processes are linear: acquisition, cataloguing, short- and long term availability and usage. By the implementation of IT driven library systems and collections of e-books and e-journals in PDF the former analogue processes and printed materials

have been transferred and transformed in a digital environment – in other words: They are emulated! This is part of the transformation process, but not the main part of the development. Because components of the logistic of digital materials are: Interaction, collaboration, multimedia end and global networking – do we identify these items in libraries, which we call or define as digital libraries (Degkwitz, 2015)?

The organization and workflows of libraries are still influenced by the traditional patterns. Are there any networked structures beyond the cooperation between libraries – e.g. with patrons and users? The roles of librarians and users did not change for many years. Where are the collaborative approaches, which the internet and new media are offering? Print oriented e-books and e-journals (emulations of printed patterns) are focusing the library collections and services. What about the integration of research data and multimedia objects in research publications and scholarly communication (Burpee, Glushko, Goddard, Kehoe, & Moore, 2015; Dempsey, Malpas & Lavoie, 2014)? Local IP-based licenses of electronic books and journals are the main path of accessibility. Do we have really global access to research results and data? There are many "gaps" between the options of the academic support and the researchers' demands and needs. Do we really aim at appropriate shapes of deep exchange and strong interaction?

## 2. Which Changes are Happening?

A number of changes show that internet driven change has started, like the examples below may demonstrate:

- Patron driven acquisition models: Users are choosing the materials that they demand and need.
- Digital resources like e-book and e-journal packages don't have to be recorded by librarians in a traditional way. Moreover the related metadata delivered by the publishers were prepared technically and loaded in the index of the discovery system.
- E-books, e-journals and databases of commercial publishers are in general already in the WEB. There aren't any bigger transaction costs, but just the costs for activating the license.
- The numbers of scholarly materials and objects outside the familiar scope of books and journals are permanently increasing. More and

more libraries are dealing with so-called "enhanced publications," which cover data and objects beyond the text.
- Users and researchers are providing repositories or information hubs by themselves. These resources could and should be harvested and indexed by the library's search engine as part of its collection.

The interactive, multi-user driven library: From that background we are in the situation to exploit the digital potential of the internet and new media by much more efforts. As a result we should allow and enable more interaction and collaboration between librarians and users. Therefore we have to reshape and open up the roles of the librarians and the users in an explicitly collaborative way (Moravec & Killorn, 2015). Why do we distinguish so formally between the librarians and the users? We better talk about "multi-users": "multi-user driven acquisition," "multi-user driven collection building," "multi-user driven indexing," "multi-user driven funding," "multi-user driven availability." Such an approach could move us forward and should be done as follows:

- Acquiring and collecting: Librarians and users are allowed to acquire or to transmit materials and objects in the collection of the libraries by different rights and/or in their particular repositories. The scope of materials and material types covers everything related to scholarly communication: books, journals, digitized items, research data, software tools, audios, pictures, videos, simulations, etc.
- Cataloguing and enriching: Librarians and users are allowed to create and/or to enrich the metadata of scholarly materials and objects for loading them in the index of the (central) search engine by different competencies and rights. Enrichments may be done by name authorities, classifications, subject headings up to semantic relationships. In this way more user-oriented access and search facilities can be established.
- Usage and availability: Librarians and users are allowed to define operation and usage of acquired/collected materials and objects up to the time limits of their availability. The overhanded rights and roles have to conform to the governance rules of the library policy. The principles of open access are generally applied.
- Funding and sourcing: Librarians and users own different funds for paying acquisitions and licenses of materials. Contrary to the practice of today these sources have to cover the material's "maintenance"

too – that means: cataloguing, indexing, availability, operation, preservation, etc., unless this will be done by the users themselves. Long term archiving is a basic option, which is free to a certain extent.

## 3. Creating a Virtual Working Space

Digital technologies are influencing scholarly scholarship and scholarly communication and include immediate and essential requirements to the academic support and to the service portfolios of the libraries. Academic and research libraries – especially in the fields of the humanities and the social sciences – play a crucial role as the laboratories of these disciplines.

The specific impact of the digitalization concerning the researchers' methodologies and working pattern is based on the dynamic capabilities of linking, operating and processing of digital objects like pictures, texts and further datasets (Fowler, Stanley, Murray, Jones, & McNamara, 2013). The masses of digitized resources are increasing permanently by digitizing materials or by digital born data and texts. These materials are findable and accessible in a systematic way. Hence we are in the situation to assume that digital scholarship will increase significantly in cultural studies and humanities during the next years.

This development will entail that digital materials and resources won't be collected, recorded and made available from the traditional background as "local" collections. Moreover these materials and resources must be curated and prepared for researchers' purposes and scholarly use. Therefore academic and research libraries are more and more in the situation to liaise and to offer appropriate services and tools actively, which is what digital scholars need and will expect increasingly. The library as the conventional intermediary is more and more challenged to meet these requirements and to deliver services enabling easy access and use.

The interactive – multi-user driven – library is proving to be a virtual working space as an ongoing result of the collaboration between librarians and users. The Digital Public Library of America, the German Digital Library, the Europeana, the HathiTrust, the Internet Archive, and many other hubs and platforms like Google Scholar, Mendeley and Wikipedia are not in particular interactive libraries. But these information hubs and platforms demonstrate

collaborative and interactive approaches, components and procedures of virtual working spaces, into which digital libraries are determined to be developed. Facing the potential and the opportunities of the internet and new digital media, the shape of libraries has to be re-designed and re-organized. In our times the library has to integrate and to include the users in its developments. From that point of view we will create and provide an appropriate and heavily needed virtual working space, which is the future business model for libraries based on the capabilities of the internet and new media. But how can we implement and establish this?

## 4. Scholarly Makerspaces

For creating interactive, virtual working spaces libraries are in the situation to take up the approach of the scholarly makerspaces. Following the idea of the internationally known approach of "makerspaces" in public libraries scholarly makerspaces are digital working environments, where digital resources and tools are combined and made available. The service portfolios of scholarly makerspaces are provided and supported by academic libraries collaborating and interacting with researchers and third party providers of digital data, materials and tools according to the disciplinary needs. The virtual environments of the scholarly makerspaces is hosted on a work station or – and even better and more often – on a web based platform for enabling as comfortable access as possible (Dellot, 2015; Goldenson & Hill, 2013; Willett, 2016; Willingham & de Boer, 2015).

What can we do in scholarly makerspaces? What does really happen in them? For example records of aggregated objects can be searched and the related objects transferred in an environment making text and data mining possible. The operated data can be processed further on a quality level, which significantly exceeds the regular bibliographical level. A deep findability of data and objects can be achieved, which is impossible by traditional methods of the libraries' cataloguing.

Moreover further tools will be made available corresponding to the research approaches and projects of the single disciplines. These tools are used for annotations, encoding procedures, mapping and measurement, visualization, publishing, etc. Good reasons exist to establish cooperation with

partners inside and outside of the universities to offer services and tools (Hilf & Severiens, 2013; Kaden, 2016).

We expect that scholarly makerspaces cover a basic set of tools like XML editors and/or annotation tools for digital humanists. For more complex and high level tools the library should act as an intermediary or a broker between external services and tool providers like associations as CLARIN[1] or DARIAH[2] on the humanities' field. In these scenarios the library is liaising local groups with external experts or networks of expertise in concern of expertise, content, resources and tools.

To sum it up: Libraries should be providing and supporting virtual scholarly makerspaces as an open, dynamic and interactive infrastructure oriented to the disciplinary demands. The purposes of the necessary redesign of library services are as following:

- To meet the demands and requirements of digitally working scholars and students by local services providing expertise, infrastructures, resources, training and tools,
- To enable researchers an enhanced access and overview of existing methods and resources concerning e-research,
- To share digital procedures and tools with students and the young researcher generation,
- To complete and to gain expertise about new technologies as well as what the disciplines are demanding and claiming for,
- To get deeper insights and immediate impetus for the further development of academic support.

## 5. The Framework of the Pilot Study

By the outline of the virtual scholarly makerspaces the key issues of the further development of academic libraries are identified. Now the framework of the pilot study can be described, to explore a valid concept of an organization and process model including cost calculations for realizing scholarly makerspaces. From the impact of this new working environment and the resulting services the aimed business model will influence the entire library as well. The study should prepare the development of the virtual makerspaces, but

not the prototype itself. This will be done, if the study can demonstrate a viable implementation for reasonable costs. The study will outline the framework for the implementation and the production plant of the makerspaces. The implementation is influenced by:

| Materials, services, tools | Organisation | Cooperation with providers | Communication/Interaction with users |
|---|---|---|---|
| • Provisioning of content and resources<br>• Infrastructure support<br>• Tools<br>• Sharing and training competencies | • Business or organizational models<br>• Costs<br>• Skills<br>• Legal matters | • Networks of competence<br>• Exchange of procedures and services | • Motivation<br>• Feedback<br>• Service developments |

To meet disciplinary requirements in practice we cooperate with researchers of the Humboldt University in the field of German literature, cultural studies and social anthropology as well as with representatives of CLARIN, DARIAH and the university library of Mainz. All the colleagues are familiar with digital environments and according working patterns (Süptitz, Weis, & Eymann, 2013).

The tasks of the libraries providing scholarly makerspaces are covering the acquisition, preparation and dissemination of content resources and tools as well as to analyse and to communicate acceptance, demands and use. The library as a scholarly makerspace will be established as an active broker or intermediary between researchers and the providers of content and services. During the period of transformation to digital scholarship the training on information and media competence plays a crucial role. Embedding these skills in appropriate courses and curricula will make a big difference. The configuration of scholarly makerspaces will include the following components (Kaden & Rieger, 2015):

- Availability of tools (on platforms) or software (on work stations) dedicated to e-research and digital publishing ("enhanced publications"),
- Providing content for digital scholarship by libraries and information hubs,
- Sharing expertise and training in the necessary competencies,

- Creating real and virtual spaces for experiments,
- Low-threshold communication facilities by blogs, wikis, repositories, etc. and building communities,
- Standardized procedures of monitoring user experience and needs,
- Permanently enlarging and improving the service portfolios.

As the aim of the pilot study the requirements for scholarly makerspaces will be identified in specific modules and details. The legal and technical prerequisites of brokering and reusing existing services and tools play an important role and have to be clarified. At the same time the offered infrastructures and services must be evaluated in concern of low-threshold usability and intuitive operation. The traditional organizational patterns of libraries focusing mainly on information provisioning has to be changed to an organizational model, which is enhancing the libraries' mission of providing information by the services of scholarly makerspaces. Digital content and materials will be made available and embedded in the virtual working environment of the makerspaces to integrate resources in the researchers' processes for analysing and operating. For building up and upgrading the scholarly makerspaces the existing structures of libraries' organization have to be re-designed and oriented to the enhanced and extended mission of libraries to support the research and the education life cycles and to meet the requirements, which are needed for this. Interactive procedures between digital scholars and librarians as well as professionally conducted collaboration work in the scholarly makerspaces will improve the capabilities of libraries and optimize the processes and the results of research activities (Gold & Klein, 2016).

## 6. Conclusions

An analysis of the current state of libraries clearly shows that the impact of the internet and new media is not taken into account by the organisational patterns of libraries at a sufficient scale. The outline of the scholarly makerspaces shows, that the basic procedures of the librarians' business have to be changed in depth. By the described framework of the intended pilot study the key issues of this development should be explored. As a result a new shape of libraries will be aimed and designed exploiting the potentials of the internet and digital media. Establishing libraries as virtual working spaces by the scholarly makerspaces' approach is a great opportunity and

the right place of libraries in the digital world. Of course, the library staff members have to be skilled and trained for the challenges and tasks related to the new mission and the new shape of the library. Librarians must be prepared for their new roles as liaisons and partners of scholarly collaboration and interaction. Digital scholars and researchers must be enabled to act as knowledge workers and to take over library tasks at a certain extent. Both parts of the library world are required to work together at eye level. The new relations between librarians and users must be ruled and established even legally.

The importance and roles of third party cooperation are crucial for setting up the new library model, because the libraries will not just deliver their own or the campus' resources and tools, but also materials and services from outside of the campus or the local host will be liaised and procured by the library. Libraries act primarily as intermediaries or interfaces in these new service scenarios. This concerns the support by expertise and competences as well. Regarding the implementation of scholarly makerspaces under these aspects the calculation of costs plays an important role of the pilot study as well. If the pilot study will be completed successfully the new comprehensive library model will have a big impact for the digitalization of research and education.

## Acknowledgement

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## Notes

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1 https://www.clarin.eu.

2 www.dariah.eu/ and https://de.dariah.eu/.