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Article

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Library Hi Tech

Suggested Citation: Pianos, Tamara (2012) : EconBiz To Go: Mobile search options for business and economics – Developing a Library App for Researchers, Library Hi Tech, ISSN 0737-8831, Emerald, Bingley, Vol. 30, Iss. 3, pp. 436-448,
<https://doi.org/10.1108/07378831211266582>

This Version is available at:
<http://hdl.handle.net/11108/70>

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Original Publication:

Tamara Pianos, (2012) "EconBiz to go: Mobile search options for business and economics – developing a library app for researchers", Library Hi Tech, Vol. 30, Iss: 3, pp.436 - 448

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DOI: <http://dx.doi.org/10.1108/07378831211266582>

EconBiz To Go: Mobile search options for business and economics – developing a Library App for Researchers

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Introduction

One of the findings of M-Libraries, a report on a survey conducted early in 2009 was “Mobile phones are still viewed by the majority of people as devices for making phone calls and sending text messages, so they often don’t associate them with other activities as information seeking.” (Mills, 2010) A number of things changed since early 2009 as smart phones and tablets are dramatically more widely available now. Smart phones are used for a number of different purposes and using them for actually making phone calls becomes less important. The number of mobile devices and of the users of such devices grows rapidly each year. The Horizon Report 2011 says that by 2015 80 % of people accessing the internet will do so with mobile devices. As the number of users grows so does and will the number of library apps and special mobile library websites. In 2007, the first m-libraries-conference was held in Milton Keynes, followed by conferences every two years since. There is also an M-Libraries group on facebook.¹ So, there is obviously a lot of interest in this topic among librarians.

The German National Library of Economics, Leibniz Information Centre for Economics, ZBW², decided to develop a native app for EconBiz³, the subject portal for business and economics. The ZBW is the world’s largest library for Business and Economics. Its purpose is to serve researchers in Germany as well as in all other countries by making access to information easier. Improving access to information has many different aspects it can be done by supporting open access and by improving search tools and access to licensed material as well as making mobile access easier. The ZBW works in all of these fields, the focus of this paper, however, is to describe our efforts at making mobile usage of our major search portal more comfortable.

EconBiz.de is a portal that includes more than 8 million datasets relevant for business and economic studies. Since the users of EconBiz are not tied to a specific library and a huge percentage of the content is not freely available on the internet, this creates a number of challenges, especially when it comes to availability of books and journal articles. In many respects EconBiz offers the same services and faces the same challenges like any other academic library. In other respects it differs because, although the ZBW has actual users that use the library locations in Kiel and Hamburg, it also wants to serve library users with an interest in business and economics anywhere in the world. This paper presents our attempts at offering services that will meet users’ needs in a mobile environment.

Library Apps: An educated guess on numbers

The number of genuine library apps grows, so does the number of library websites that are optimized for mobile users. The same is true for database-apps and mobile interfaces. Many huge database-providers offer a mobile version of their services.

Klaus Ceynowa of the Bavarian State Library in Munich believes that, in the near future, large internet portals will lose importance. “There is at least a trend that they will be replaced by apps and app-like web service offers tailored to specific purposes and services [...]. (Ceynowa, 2011)

Actual numbers of library apps are hard to come by. Searches for library apps are difficult since “library” and “app” or “application” as well as “mobile” are used in more than one context and are often impossible to disambiguate for the purposes of a search. Searches in specific library and information science related databases and journals retrieve a handful of results that deal with actual library apps.

Ellyssa Kroski shares a list of the TOP 30 library apps in the iLibrarian-Blog. Part One presents genuine library apps available in March 2010. (Kroski, 2010)

Hans-Bodo Pohla took a closer look at 27 library apps in 2010. He found a total of 36 iPhone library apps, one Blackberry app and eleven Android apps in June 2010. (Pohla, 2011 a) Ten months later he found over 100 apps in April 2011 (Pohla, 2011 b) A Canadian study, conducted in 2010, revealed that only 14 % of the member institutions of the Association of Universities and Colleges of Canada advertised some kind of mobile web presence. (Canuel, 2011) If these studies were to be repeated today, the numbers would probably have multiplied in the meantime.

In the m-libraries wiki 127 mobile library interfaces are listed as of December 2011. In addition, there are 17 genuine library apps. Two years earlier, there were only 40 mobile interfaces and 3 apps listed. Even if some of the rise in numbers could be explained through a rise of popularity of the wiki, it seems pretty safe to assume that the actual number of mobile interfaces and apps grew dramatically in the last two years. There are also lists of mobile collections, mobile instructions, mobile SMS reference services and mobile tours in the wiki. Since this is a collaborative wiki, there is no guarantee for comprehensiveness.⁴ Pohla’s numbers seem to be the most exact and most recent numbers available today.

What Users Want – and what library apps offer

There have only been few studies of library users’ needs and expectations regarding library apps so far.

A very recent study looked at students’ attitudes towards mobile library services. (Paterson, 2011) The publication by Paterson and Low also includes a literature review on recent studies in this area. They refer to Speight (2009) and McCarthy and Wilson (2009) as well as Mills (2009/2010) and Walsh (2010).

The survey conducted at Cambridge University and The Open University (Mills 2009/2010) asked what users found most useful in mobile services. The survey was conducted in the form of a short online survey asking respondents about their current use of text alerts, SMS reference services and use of the mobile internet. There were 2,306 responses in total, including undergraduate and postgraduate students as well as associate lecturers and academic staff, representing between 1 and 13 % of the total population of the specific groups.

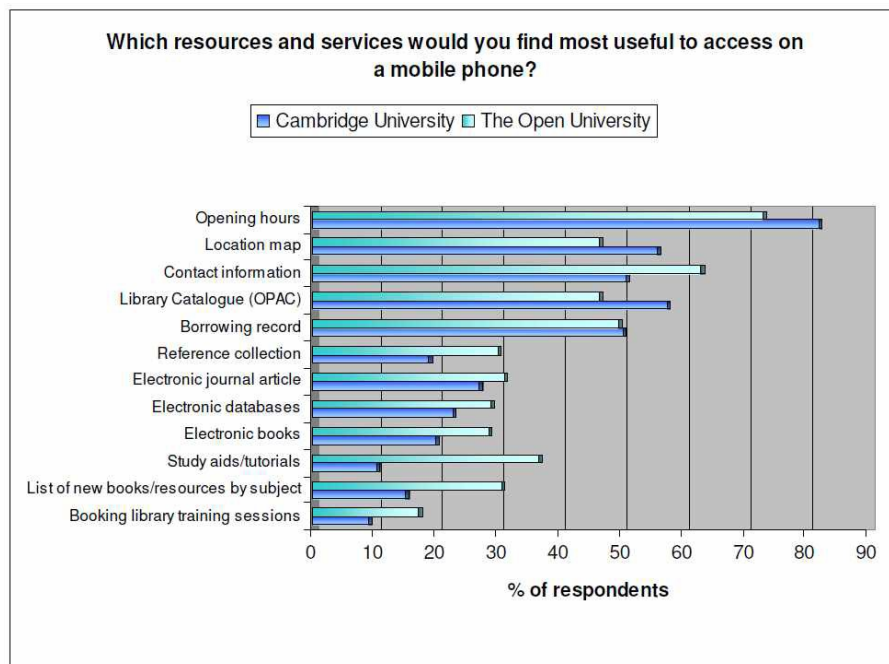


Fig.1: M-Libraries: Survey on useful mobile services, p.11

What the users in this study found most useful is pretty easy to fulfil: Information on opening hours. Other important features include a location map and contact information. This is information which is also easy to supply. Next in line are things that are more difficult to implement in a user-friendly manner: catalogue, borrowing record, reference collection, electronic journals, databases, books. Also, when asked about text-alerts, the wishes of the users are pretty basic like “let them know when items are ready for collection, when books are due for renewal or are overdue.” We have to keep in mind, though, that this study was conducted in 2009 which in terms of mobile devices development is light-years away. Expectations and needs may well be much higher and diversified today. Also data-flat rates are much more common, so that online time or download capacities should not be limiting factors anymore. The rapid changes in availability of smart phones and data-flat rates may be responsible for some shifts in the importance of services like e.g. SMS reference.

Kroski gave an overview over Library Mobile Initiatives in 2008. She mentions services like Mobile Library Websites and MOPACs (Mobile OPACs), Mobile Collections, Mobile Library Instruction, Mobile Databases, Mobile Audio Tours, Library SMS, Notifications, SMS Reference, Mobile Library Circulation, Library Mobile Resources & Reports. (Kroski, 2008)

Another study focuses on the OPAC in a mobile environment finding that it is important for libraries to provide mobile services. They can be stripped down to the basics and should be interconnected with other services but they should be made available since a high percentage of users would (potentially) use mobile devices to access the OPAC. (Cummings, 2010)

An overview at the University of Edinburgh on student attitudes towards mobile library services is based on an online-survey completed by 1,716 students with a follow-up of two focus groups conducted in January 2011. (Paterson, 2011) In March 2010, the University of Edinburgh had conducted another survey, so it was possible to discover rapid developments and dramatic growth rates in smart phone ownership.

Major findings of a combination of the studies mentioned above show the following basic needs and wishes of users:

- do a known-item search
- find quick pieces of information
- be able to transfer data between devices
- search the library catalogue
- search library databases
- find information on opening hours

- renew library items
- contradictory evidence on the perceived benefit of SMS reference

There are also, of course, countless studies on the information behaviour and needs of library users in general. Most of these studies show that users want an easy to use search interface that makes suggestions and tolerates typing mistakes; they want relevance-ranked search results and easy access to documents of their choice. They want instant gratification, e.g. instant access to full-text documents. Especially the young generation expects to find everything on the web and expects everything to be free of charge. (Chad, 2009; Havemann, 2006; JISC, 2008; OCLC, 2005; Sadeh, 2007) It seems not too farfetched to suppose that they want the same things in a mobile environment. Probably, they want to type even less on very small keyboards and probably, they do not want to read very long texts on a smart phone.

However, some of the features that would cater best to users' needs are not easy to implement, sometimes even harder to implement in a mobile environment. In addition to developing smart search features, the question of accessing content that is not freely available on the internet is pressing. As Mills writes correctly "The [...] challenge will be encouraging publishers to adopt authentication that is not limited by IP address, as that could prevent users from accessing content they have a right to from their mobile devices." (Mills, 2010)

Up to date, many mobile library services focus on the common needs of users of a university or college library like "find a book", "locate it", "borrow it" etc. There are also some apps that present old, rare and treasured books in new ways like the "Famous Books"- or the "Oriental Books"-apps by the Bavarian State Library⁵ or the "Treasures" and the "Royal Manuscripts"-app by the British Library⁶. The mobile services of the National Library of Norway include maps, photographs and location-based information. (Hoivik, 2011) Murray gives a good overview over mobile services and technologies in general. (Murray, 2010) A list of major features of 27 library apps can be found in Pohla's work. (Pohla, 2010).

Most common features are:

- a search of the library catalogue
- order the books at the library
- export the collected data.
- eight out of twenty-seven apps include a user account mostly with options to place reservations, a list of borrowed books and fees.

Sometimes, however, users feel a strong need for a specific functionality, and if they have programming skills, they might create their own app. Martin Kim Dung-Pham created an app that reminds users of books that are due to be returned and renews the lending time if necessary and possible.⁷

EconBiz: A search-engine/search portal for Business and Economics

In the late 1990s the German Research Foundation (DFG) started funding so-called virtual libraries. Virtual libraries were supposed to be independent of a particular location. The mission was to give users easy access to all relevant material whether it was printed and only available in libraries or whether it was online, whether it was licensed or open access. The goal was straightforward and simple but the realization is still difficult, mostly due to access rights that differ from library to library. To date over 40 individual German virtual libraries or subject portals offer access to information for a variety of subjects ranging from Asian Studies to Library Science, History, Politics, Medicine, Psychology and many more.

EconBiz started out in the year 2000 first offering a catalogue of interesting websites and links to databases relevant for the study of business and economics. Later a meta-search covering seven relevant databases was implemented, and finally, by the end of 2010, EconBiz switched to a Lucene/solr-search-engine-index of six databases. The main goal was to make searching easier and more user friendly, e.g. by offering "search-as-you-type", by offering suggestions if the spelling was wrong and by offering one result-list instead of a result-list sorted by databases. Availability information was supposed to make access to documents easy. In reality, access to licensed and printed

documents was and is often still difficult due to licence situations, rudimentary metadata or a variety of different library systems that need to be catered to. In order to grant access to licensed material a (German) service on library journal licences is included. Journals Online & Print by the Electronic Journals Library and the Zeitschriftendatenbank provides information on the journal holdings of (mostly) German libraries.⁸ However, this service only works well for German universities. The websites are available in German only, so that international users might easily be lost when they click on the links to these services.

In order to make the search experience more comfortable, especially for international users, EconBiz Open⁹ was started by the end of 2011. It offers most of the EconBiz functionalities but includes only open access material thus bypassing the accessibility hurdles.

Developing the Apps

When we decided to develop an app, there were already a number of library apps and special mobile-access webpages around. Most of the mobile webpages focussed on optimizing the presentation of basic needs of library usage for smaller screens. So did most of the apps that Pohla analysed. Some of the apps offered additional functions like featuring the capacity of workstations in certain library buildings or directions to shelves. (Pohla, 2011)

We asked the Know-Center in Graz, Austria, to develop first an iPad-app and then an iPhone-app for us because they had already gathered experience in programming apps in the knowledge management context. Their first suggestion for the layout was pretty close to what the app looks like now. They used the image of a book and a note-pad next to the book with bookmarks made of “fabric” and a map attached to a page in the book by adhesive tape. This layout looks much more playful than the layout used for the web-version of EconBiz. Most of our colleagues who saw the layout-suggestion immediately liked it and most of us assumed that people who use an iPad or iPhone (for research) might be inclined to like playful or rather not completely rational search environments. If this is actually the case has not yet been tested by us – but would be an interesting line of research.

Murray writes: “[...] library websites often contain more information and services than can easily be transcoded for mobile display – mobile-friendly web sites may need to operate as stripped down sites separate from the main site.” (Murray, 2010) In accordance with this line of thought we had the number of functions and services reduced. There is only a basic search-function, no advanced search, and the filter-options have been reduced.

Basic functions of the web-portal and the app

The entry page of the web-portal offers a number of links to different services; the app has four basic functions: Search, Favourites, Libraries and Options. The app includes links to the web-portal for specific services like help, imprint, and “About EconBiz”. On the other hand, the app offers features that the web-portal does not offer (yet).

	web-portal	app
Search all	x	x
Internet Sources	x	
Events	x	
Advanced Search	x	
Bookmarks/Favourites	x	x
Information Services	x	
News	x	
Helpdesk/reference chat	x	x
Libraries		x
Options		x
Barcode scanner		x

The libraries-function is a location based service. The barcode-scanner, of course can only be offered on devices that have a camera and can be held in front of a barcode. It is thus limited to the iPhone so far. Options or preferences that can be saved are only offered in the apps so far, since the web-portal does not offer a sign-in-option yet. This option will soon be implemented, though. Among the preferences that can be saved are the location of a “home library”, the number of results displayed, and the default for sorting the results (by year, by relevance).

Filter options in the web-portal as compared to the app.

	Filter options on the web	Filter options in the app
Year	x	x
Subjects	x	x
Online Availability	x	x
Type of publication	x	x
Genres	x	
Languages	x	x
Persons	x	x
Institutions	x	
Published in	x	
Databases	x	

While the web-portal offers additional options like searching full-texts as well as metadata, or clicking a box in order to search for related terms as well, the app is stripped of these options.

How it works behind the scenes

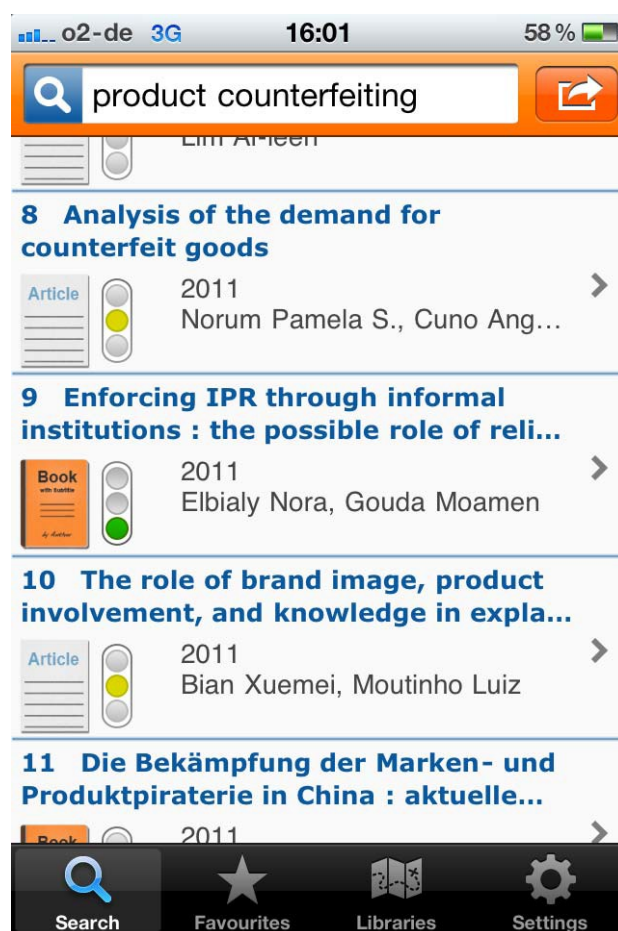
One of our colleagues at the ZBW programmed a metadata-framework that normalizes the data from the different databases in order to feed it into the solr-search-index as XML.

Right now, the app accesses the solr-interface directly in order to receive the data that is displayed in the result lists. In spring or summer 2012 an API will be made available. Access to the solr-index will then be granted through the API. In the future, the API could also be used by developers to create new features based on the EconBiz-index.

Information on Access and Availability of Documents

Next to the search- and filter-functions, access to documents is a key factor. The filters can be used to display free material only. Licence rights for German libraries are displayed by a traffic light-system. Green means open access (accessible from any place in the world, any time), yellow means this is licensed material but your institution bought a license, so you may access the material if you are currently located within a specific IP-range, red means you do not have access rights in your current institution or location.

For printed materials yellow means a copy of this item is in your local library, red means no copy in your library. When a Google-preview is available this will be displayed through a preview button.



Img. 1: Result list with access information.

If users click on the detailed view they can choose to access the documents by following the traffic-light links. However, the services embedded via the Safari-Browser are available only in German and are useful mostly for users located within a German university or library network. In the long run, it might be useful to offer an app for free online content only to avoid these hurdles. Alternatively, access information of the Worldcat could be used for the international display of availability.

Location-based information and other features

Since geo-location is an interesting feature, especially for mobile services, we implemented a map showing libraries with huge collections in business and economics. The first focus was on German libraries mostly but more and more libraries from other countries are included as well. Information on the libraries like opening hours and contact options – information that many users found most useful – is made available as well. Users choose a library by clicking on one of the pinheads or by entering a city name in the search box.



Img.2: Choose a library by clicking on a needle.

On the library info-card users have the option to set a home library in order to get accessibility information for their library. Actual rights may of course differ depending on the real location and access rights of the user. Also, this information is usually only available for German libraries.

The second version of the app includes the option to download a PDF. This means that a user who has access rights in one place may use them to access the full-text and download the paper into his or her favourites.

The iPhone- and Android-phone-versions also include a barcode-scanner. Users can scan the barcode of a publication in order to check if it is available in EconBiz.

Experiences

We have not yet conducted usability tests on the apps. If we look at recent findings on the usability of library apps (Pohla, 2011, b) many features in the EconBiz app were implemented in way that they should be easy to use for someone who is used to the basic functions of a mobile phone or tablet: Links are big enough for touch-screens and should be recognizable as such etc. Tests in the spring or summer of 2012 will show if users actually agree with that.

So far, we only asked individual researchers for their feedback on the apps. They said they would most likely use the app to look up certain publications while at a conference or otherwise away from home. Staff tests of the apps showed a couple of problems with integrated services. A number of services did not work well when opened through the integrated Safari-Browser. PDF-Links on publishers' websites sometimes did not work at all. Also, the chat widget for the reference service EconDesk sometimes did not open. Some of these problems disappeared after the first few weeks/months since information providers obviously grew more accustomed to mobile services and enhanced their services.

Usage of the Apps

So far, the apps have been installed well over 3,500 times since they were first released in March 2011. It is not easy to compare these numbers to the usage of other apps since a library app of an individual library with a certain amount of users differs in many ways from an app that serves several libraries and a huge amount of library users but only in a specific subject field.

For his survey of current library apps Pohla sent out a questionnaire including a question on usage. Some of the apps were downloaded between 500 and 1,000 times in the first three to four weeks, for others there was not data available. (Pohla, 2011, a)

Glimpse into the Future

An Android version was released in February 2012. At this point in time, it is hard to tell whether the future lies in mobile web apps or native apps.¹⁰ Right now apps seem to get more attention than mobile interfaces of library websites. (Brekel and Bauer, 2010) However, this may change in the near future as HTML 5 makes it easier to provide attractive Web apps.¹¹

A huge topic for mobile devices is geo-location. Some apps already offer rudimentary services that rely on geo-location. In the future, the (possibly) ubiquitous use of Radio Frequency Identification (RFID) and Near-Field-Communication (NFC) possibly combined with the social web will ease the way for countless new services.

One of the major challenges of the future will be to find a way of seamlessly integrating mobile and desktop-services. Documents saved in a favourite list on a phone or tablet need to be synchronized with favourites saved on the desktop.

There seems to be a huge difference between different subject areas. While the medical community has quite a long history of using and introducing mobile devices, social sciences seem to be lagging behind but they will probably catch up with the major trends in the near future. The creation of mobile apps or interfaces is just one topic. Generally making data available and information findable with the help of web 2.0, linked-data and semantic techniques will be the future challenges for scientific libraries. (Brekel, 2010)

While the web-portal will steadily be improved by including these techniques, the mobile versions will have to be improved, too. While some developments will be easily transferable others will be more difficult to adapt. Currently, one colleague works on improving the relevance ranking of the web-portal. Hopefully, once this is realized, it will be immediately visible in the apps as well.

Future tests with users will show us which features have the highest priority. Since we will not be able to implement all desired features by ourselves, the developments will heavily rely on progress in a number of external services. Even without further tests, we know that access to full texts has a high priority, so advancements in authentication features providing access to licensed material or a major breakthrough in Open Access would make working with apps more appealing. Down to earth improvements like features for easy renewal of lending periods or alerts that tell users when books are due will hopefully be easier to develop or integrate.

¹ <https://www.facebook.com/groups/7719700810/>

² <http://www.zbw.eu/index-e.html>

³ EconBiz-website: <http://www.econbiz.de/en/search/search/search-all/>
free EconBiz-App: <http://itunes.apple.com/gb/app/econbiz/id419108453?mt=8>

⁴ http://www.libsuccess.org/index.php?title=M-Libraries#Mobile_applications

⁵ <http://www.bsb-muenchen.de/Mobile-Apps.3027+M57d0acf4f16.0.html>

⁶ British Library, <http://www.bl.uk/app/>

⁷ Interview with Martin Kim Dung-Pham (in German): <http://www.zbw-mediatalk.eu/2011/03/interview-mit-dem-edsync-macher-die-idee-mobiler-anwendungen-ist-bei-vielen-bibliotheken-noch-nicht-angekommen/>

⁸ Description of Journals Online & Print (in German): <http://www.zeitschriftendatenbank.de/ueber-uns/projekte/>

⁹ EconBiz Open: <http://open.econbiz.de/>

¹⁰ Chris Cameron posted the question „Will Mobile Web Apps eventually replace native apps?“ in www.readwriteweb.com on July 5, 2010 and discussed the pros and cons of both options.

¹¹ <http://www.globalintelligence.com/insights-analysis/white-papers/native-or-Web-application-how-best-to-deliver-cont>

References:

- Benitez, B. et. al., The Handheld Library: Developments at the Rector Gabriel Ferraté Library, UPC, LIBER Quarterly 21 (1), November 2011, <http://liber.library.uu.nl/publish/articles/000523/article.pdf>
- Brekel, G. van den and Bauer, B. (2010) : Innovative information and communication systems for scientific libraries: 10 questions about practice and experience covering Web 2.0 to Emerging Technologies. An interview with Guus van den Brekel, information specialist for the medical library at Groningen University (Netherlands) by Bruno Bauer, URI: <http://hdl.handle.net/10760/3945>
- Canuel, R. and Crichton, C. (2011), „Canadian Academic libraries and the mobile web“, *New Library World*, Vol. 112 No. 3/4, 2011, pp. 107-120.
- Chad, K. (2009), Presentation at the IFLA Satellite Meeting in Florence, August 2009: Disrupting Libraries: the Potential for New Services: <http://www.slideshare.net/kenchad/ifla-satelliet-florence09-disrupting-libraries-potential-for-new-services> (accessed 5 October 2011)
- Ceynowa, K. (2011), Mobile Applications, Augmented Reality, Gesture-Based Computing and more – Innovative Information Services for the Internet of the Future: the Case of the Bavarian State Library, <http://conference.ifla.org/past/ifla77/122-ceynowa-en.pdf>
- Cummings, J. et al. (2010), “The use of handheld mobile devices: their impact and implications for library services”, *Library Hi Tech*, Vol. 28 No. 1, 2010, pp. 22-40.
- Global Intelligence Whitepaper Native or Web-App: <http://www.globalintelligence.com/insights-analysis/white-papers/native-or-Web-application-how-best-to-deliver-cont>
- Havemann, F. and Kaufmann, A. (2006), „Der Wandel des Benutzerverhaltens in Zeiten des Internet – Ergebnisse von Befragungen an 13 Bibliotheken“, in Umlauf, K. and Hauke, P. (Eds.) *Vom Wandel der Wissensorganisation im Informationszeitalter: Festschrift für Walther Umstätter zum 65. Geburtstag*, Berlin, pp. 65-89, <http://edoc.hu-berlin.de/miscellanies/vom-27533/65/PDF/65.pdf>
- Hoivik, J. (2011): “Mobile Digital Library in The National Library of Norway”, *Library Hi Tech News*, Vol. 28, No 2, 2011, pp. 1-8.
- Horizon Report 2011, <http://www.nmc.org/pdf/2011-Horizon-Report.pdf>,
- Kroski, E. (2008), On the Move with the Mobile Web: Libraries and Mobile Technologies, http://eprints.rclis.org/bitstream/10760/12463/1/mobile_web_ltr.pdf, (accessed 5 October 2011)
- Kroski, E. (2010): iLibrarian-Blog <http://oedb.org/blogs/ilibrarian/2010/top-30-library-iphone-apps-%E2%80%93-part-1/>, (accessed 5 October 2011)
- JISC: The information behaviour of the researcher of the future, 11 January 2008 Executive Summary: http://www.jisc.ac.uk/media/documents/programmes/reppres/gg_final_keynote_11012008.pdf (accessed 5 October 2011)
- Libsuccess-Wiki: http://www.libsuccess.org/index.php?title=M-Libraries#Mobile_applications, (accessed 5 October 2011)
- McCarthy, G. and Wilson, S. (2009), “The library’s place in a mobile space”, m-Libraries Conference, Vancouver BC, Canada, June 23, 2009, available at: http://digitalcommons.ryerson.ca/library_pres/2/ (accessed 25 October 2011)
- Mills, K., (2010): M-Libraries. Information on the move. http://arcadiaproject.lib.cam.ac.uk/docs/M-Libraries_report.pdf, (accessed 5 October 2011)
- Murray, L. (2010), “Libraries `like to move it, move it`”, *Reference Services Review*, Vol. 38, No 2, 2010, pp. 233-249.
- NEEO User Requirement Report, 2008 available at: http://www.neeoproject.eu/NEEO_UserStudy_1.pdf (accessed 5 October 2011)

-
- Noble, C. H. and Kumar, M. (2008), "Using product design strategically to create deeper consumer connections", *Business Horizons* (2008) 51, pp. 441—450.
- OCLC: Perceptions of Libraries and Information Resources: A Report to the OCLC Membership. Dublin, Ohio: 2005 available at: http://www.oclc.org/reports/pdfs/Percept_all.pdf (accessed 5 October 2011)
- Paterson, L. and Low, B. (2011): "Student attitudes towards mobile library services for smartphone", *Library Hi Tech*, Vol. 29, No 3, 2011, pp. 412-423.
- Pfeifenberger, R. (2010): Pocket Library. Bibliothekarische Dienstleistungen für Smartphones: Short version (in German) available at: http://www.b-i-t-online.de/daten/BIT_innovativ_27_Auszug.pdf; PPT: http://www.opus-bayern.de/bib-info/volltexte/2010/859/pdf/Pocket%20Library_Pfeifenberger.pdf (accessed 5 October 2011)
- Plieninger, J. (2011): „...wenigstens die App funktioniert!“ Über die Technik der Applikationen auf Smartphones und Tablets. *BuB* No 63 11-12, pp. 819-820.
- Pohla, H.-B. (2011a) Bibliothekarische Apps: Untersuchung bibliothekarischer Applikationen für Mobiltelefone hinsichtlich der technischen Realisierung und des Nutzens, Rolf Fuhlrott et.al. (Eds.) 2011 B.I.T. innovativ, Vol 34, available at: http://www.b-i-t-online.de/daten/BIT_Innovativ_34_Auszug.pdf (accessed 5 October 2011) and original thesis: http://opus.bibl.fh-koeln.de/volltexte/2010/271/pdf/Pohla_Hans_Bodo_Diplomarbeit.pdf (accessed 5 October 2011)
- Pohla, H.-B. (2011b): Die Usability bibliothekarischer Apps: in Benutzerorientierte Bibliotheken im Web, in Bekavac, B., et. al., (Eds.) Usability-Methoden, Umsetzung und Trends, pp. 203-216.
- Speight, S. (2009), "M-libraries: libraries on the move to provide virtual access", *Ariadne*, No. 61, October. Available at: <http://www.ariadne.ac.uk/issue61/speight-rvw/> (accessed 5 October 2011)
- Research Support Libraries Group: RSLG: Final Report 2003: <http://www.rslg.ac.uk/final/final.pdf>
- Sadeh, T. (2007): User-Centric Solutions for Scholarly Research in the Library. *LIBER Quarterly*, Vol. 17, 2007 (3/4). Available at: http://liber.library.uu.nl/publish/issues/2007-3_4/index.html?000215 (accessed 5 October 2011)
- Virtuelle Fachbibliotheken im System der überregionalen Literatur- und Informationsversorgung: Studie zu Angebot und Nutzung der Virtuellen Fachbibliotheken, Heinold, Spiller & Partner Unternehmensberatung, 2007, available at: http://www.zbw.eu/ueber_uns/projekte/vifasys/gutachten_vifasys_2007_3_5.pdf (accessed 5 October 2011)
- Vatter, A. (2011), Interview with Martin Kim Dung-Pham (in German), available at: <http://www.zbw-mediataalk.eu/2011/03/interview-mit-dem-edsync-macher-die-idee-mobiler-anwendungen-ist-bei-vielen-bibliotheken-noch-nicht-angekommen/> (accessed 5 October 2011)