# Risks of Moving to the Cloud: The Human Factor

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**Abstract:**

*As libraries join other business sectors in moving their operations to the cloud, advantages never before possible can now be achieved. However, there is a significant and decidedly non-technical risk to successfully adopting a cloud system. Ineffectively managing the human aspects of change remains the single greatest risk to achieving a successful migration. This paper describes the best practices of managing the human aspects of change that accompany the adoption of a cloud solution. The authors draw on both research in the field as well as practical experience managing the implementations of hundreds of libraries to a cloud solution.*

**Keywords:** change management; cloud; best practices.

## 1 Cloud technology for libraries

Before discussing the benefits of cloud technology for libraries, it is worth beginning one level higher by discussing the benefits of cloud technology for any organization.

The benefits of adopting cloud technology can be divided into two types:

1. Industry-agnostic (IT) benefits
2. Industry-specific (business) benefits

Industry-agnostic (IT) benefits
There are IT benefits of moving from a deployed environment to the cloud. Because these benefits stem from the technological leap forward, not any functionality specific to the business the technology supports, these benefits can be called industry-agnostic. Benefits such as no longer needing to manage hardware, nor software upgrades, are realized by virtually every industry moving to the cloud. Other industry-agnostic benefits revolve around scale. Cloud providers are able to invest in architecture, failover redundancies, and infinitely extensible capacity that most individual businesses simply could not afford to fund on their own.

Architecturally, cloud technologies tend to be more 'open' technologies, meaning that the cloud provider often enables third parties and/or customers to extend its technology's utility through the use of APIs, or by building applications on the provider's platform. Apple's iOS platform is a popular example of a cloud technology provider enabling and encouraging third parties to build and share applications on their platform.

Many cloud-based services create a network effect, or an increased value based on the number of people using a service. User-generated review sites such as Yelp or TripAdvisor grow in value based on the number of users who contribute content. In this way they create a gravitational pull that grows exponentially stronger as more users join.

Finally, there are support benefits that come from cohabitating a particular cloud technology with other customers. Problems impacting one customer often impact all customers. In practical terms, this is an advantage to customers. First, the fact that hundreds or thousands of other customers are using the same cloud technology means that a problem will often be discovered and reported by another institution and resolved by the provider before it impacts your institution. Second, nothing is more motivating to a cloud technology provider than resolving an issue impacting *all* of its customers. Because so much is at stake, one can be assured that the issue will be resolved as quickly as possible.

Industry-specific (business) benefits
Beyond the industry-agnostic IT benefits of moving from a locally deployed environment to the cloud are benefits unique to the industry the cloud technology supports. In the library industry, the greatest benefits realized to date from cloud technology are increased workflow efficiencies and improved services to patrons. Of great promise, but not yet realized, is the potential insight to be gained from analyzing big data sets representing the activities of thousands of libraries and hundreds of thousands of patrons.

Some workflow efficiencies *cannot* be attributed to the technology being in the cloud. By definition, cloud technologies are new technologies, and some of the workflow efficiencies they deliver are the result of newer, smarter design. For example, many legacy library management systems were built in an era of librarianship that revolved, predominantly, around print materials. These legacy systems tend to reflect that orientation in their design and workflows, which are generally adequate in managing print resources, but inadequate in managing e-resources. Any new library management system today would be built with the management of e-resources squarely in mind, whether that system be built in the cloud or not.

That said, several workflow efficiencies *are* a direct result of the technology being built in the cloud. Using cloud-based library management systems as an example, one begins to appreciate what a shared platform and database can make possible.

**Some workflow benefits** enabled by the cloud include:

- **A shared, instantly updated union catalog**, allowing community metadata creation, enhancement and curation. While union catalogs have been utilized for decades, each participating library was required to download new or updated records, or in some cases wait for a schedule synchronization process to complete. In a cloud-based system, changes are instantaneous and require no mediation.
- **A shared vendor database**, which saves acquisitions staff from duplicating effort adding and updating information about the same set of vendors in each of their local databases.
- **Real-time serials fulfillment information**, which uses information entered by the first library to receive a serial issue to alert other libraries subscribing to that serial that their copy should have arrived. This replaces the need for traditional and unreliable serials prediction patterns.
- **Real-time holds notification**, which alerts all appropriate libraries that a title they own has been requested and then removes the alert in real-time once the requested item has been fulfilled by any of the alerted libraries. This replaces single-threaded lending strings (or ROTAs), thereby increasing the speed of fulfillment for patrons.
- **More distributed employee/employer arrangements.** Because cloud technologies can be accessed virtually anywhere, libraries that have been confined by geography in hiring staff members can now broaden their search. The potential impact of this is significant in Area Studies, where finding a librarian with the needed language expertise and skills in a particular geography can be daunting. With a cloud-based library management system, a library in the United States with a world-renowned Afghanistan collection, for example, could hire a librarian living in Afghanistan to acquire and catalog titles in-country.

Improved **patron services** enabled by the cloud include:

- **The network effect of a community beyond your library's local community.** An example of this network effect can be seen in patron reviews of library materials; in a cloud-computing solution, a review written by a patron of library X is viewable by all libraries owning that item and can help a patron of library Y decide whether or not the item is of interest.
- **Recommender service for patrons.** Having a collective pool of data about which materials are being used, and by whom, allows the cloud-provider to algorithmically analyze the relationships between items and patrons and then make informed suggestions to patrons about other materials at the library that may be of interest.
- **Serving patron needs from anywhere.** Because cloud-computing systems are accessible anywhere there is connectivity to the Internet, libraries are beginning to serve patrons in nontraditional locales. Some libraries are stationing reference staff members in the campus cafeteria during lunch to help students who may otherwise not use the physical library. Subject liaisons are consulting with teaching faculty in their offices. Some libraries are even sending reference staff members to the professional conferences that key teaching faculty members are attending so as to meet their information needs in real-time, as the faculty members learn about research paths of interest. When access to your library management system is ubiquitous, library services can be ubiquitous as well.

As mentioned, there are several areas of potential insight to be gained from **analyzing large data** sets representing library activities. Some potential areas of insight include:

- **Data-driven collection development.** Knowing what materials are owned (or not owned) and being used (or not used) across hundreds or thousands of institutions will inform librarians responsible for curating their collections. Similarly, libraries will be able to work more closely with other libraries participating in cooperative collection development by having access to acquisitions data as far upstream as data about items being *considered* for purchase.
- **Partnership recommender service.** When many libraries' collections and acquisitions history are aggregated, it will be possible to recommend library partnerships based on specific criteria (e.g. a library with a growing biophysics collection that is also located within 200 kilometers). This will allow libraries to form more targeted, mutually beneficial partnerships to help offset the increased cost of content.

## 2      Change Management to support major change projects

Major or deliberate large-scale changes can be defined as changes that need extensive action and affect most parts of the library. They are characterized by complexity and challenge (Krummaker / Vogel, 2012). They are, for example, the merger of two libraries, the implementation of a library RFID management system or a library's migration to the cloud. To execute these kinds of projects successfully, effective Change Management is required. Best practices in Change Management suggest that the change project should be planned carefully in advance before it is initiated. Once realized, the change effort should be followed by a process of reflection and stabilization. Beside the library's parent institution and patrons, there are five different groups of staff, top management, leaders at all management levels, change managers, and members of staff affected by the major change as well as those not directly affected by it, that need to be considered in major change projects (Düren, 2013).

One of the central issues of each change project and, with this, the Change Management process, relates to the personal barriers of those affected by the change (Krüger, 2009b). The introduction of new ideas and major changes very often leads to anxieties and uncertainties which often turn into resistance from the library's staff. Resistance to any kind of change is common for individuals and comes from their natural reaction to protect their self-interests and self-determination (Yukl, 2010). However resistance results not only from self-interests, but also from the staff's doubts, fears and worries (Höfler et al., 2012).

Major change projects in libraries show that, to be able to manage these kind of projects, everyone affected by the change needs to be kept informed about everything concerning the upcoming as well as the ongoing change. They also should be integrated into the process and given the possibility to participate in this change project (Düren, 2013). Hence information, communication and participation are the three critical success factors of Change Management of each major change project.

Especially for balancing the traditions of the library profession and the need to manage change – as is required in a change project to migrate a library to the cloud – leadership is a critical issue (O'Connor, 2014). Particularly since innovation is only possible if there is a strong will to break with the past (Krummaker / Vogel, 2012).


## 3      Practical experiences in migrating libraries to the cloud

The most widely adopted cloud-based library management system is OCLC's WorldShare Management Services (WMS). Over 230 libraries in nine countries are currently using WMS as their library management system and another 100+ are currently implementing WMS. Based on OCLC's experience working with these libraries, it is clear that the greatest risks to implementing a cloud technology are not technical, but human. We have found that the statistic often cited in

change management literature – that nearly three quarters of all change efforts fail due to two non-technical issues, staff resistance and ineffective change management behavior – holds true for libraries (Keller / Aiken, 2009).

It is tempting for IT professionals to interpret this statistic as a source of relief. For once, no one will blame the technology if things go wrong! Unfortunately, quite the opposite is true: The technology will only be successful if the library staff members who will use it see its value, are willing to work differently, can let go of old practices, and can clearly see how *they* will be successful using it. These *human aspects* of change will, primarily, determine the success of moving to the cloud. And should the move to the cloud fail due to these human aspects of change, the most convenient target for blame will be the technology itself.

We have found that the following are some of the most common behaviors that put the adoption of a cloud technology at risk:

**Shopper's syndrome.** Buying a library management system is easy and fun; selling it to staff members is hard and generally not fun. Library directors usually purchase a new technology for good reasons, but often fail to then effectively 'sell' its benefits to library staff members. At OCLC, we often work with library staff members who have received little to no communication about *why* their library director chose to adopt WMS. As one can imagine, these staff members are anxious about a change they had not anticipated which will significantly impact their daily activities. While this initial anxiety can be overcome, we strongly encourage library directors to fulfill their executive sponsorship role in a change effort like adopting a new, cloud-computing system by communicating broadly and frequently about why a particular technology was chosen, what it means to the library, its patrons, and the library staff members, and why the change was needed. Articulating the reasons for adopting a new technology can dramatically reduce the anxiety that staff members will inevitably experience.

**Conflicting roles: Librarians as custodians of the past versus pioneers of the future.** During a change effort as significant as moving from a legacy library management system to a cloud-based library management system, library staff are often caught between two seemingly opposing responsibilities: Librarians feel compelled to preserve the past, which might consist of legacy workflows, metadata schema, policies, etc., while they also know that they have to be pioneers of the future. Because the decisions librarians make during the migration will shape the library's operations for years to come, carefully considering not only the current state of the library and its patrons' needs, but also the future library and its future patrons' needs, is critical. In our experience, librarians tend to need more help than they are given letting go of the past. In order to realize the vision of the future library, it is necessary to let go of some past practices. Libraries that cling too tightly to past practices tend to reduce their return-on-investment in adopting a cloud technology.

**What does the change mean to me?** Staff members need to understand how they fit into, and will be successful in, the future state. Cloud-based library systems are generally disruptive by design, and this disruption impacts staff roles, workflows and even business values. Past priorities may be devalued while new priorities take their place. Assuming that staff members take personal pride in their work, it is common for them to feel a sense of loss or anxiety when informed of these changes. These feelings will quickly turn into resistance to change if the staff member's supervisor fails to clearly define a transitional path for him or her. This transitional path may include a new role, new workflows, or new priorities, and it will definitely include a multitude of training opportunities to help the staff member acquire the skills and knowledge needed to be successful in the future state.

**An environment of openness and honesty.** Library leaders often do not solicit opposing views during the change process, preferring to assume that opposing views will go away with the passage of time. It may seem counterintuitive, but getting opposing views out in the open will increase the chances of a successful change effort. With objections out in the open, staff members feel – and are – heard, potential pitfalls are identified, solutions can be found, or concessions reached. If not allowed to be voiced, these objections fester and can lead to staff members becoming entrenched in their opposition.

## 4      Critical success factors when adopting a cloud technology

In a May 2014 survey of libraries that had implemented WMS, respondents were asked to rank the following change management activities from most important contributor to least important contributor to their success in adopting this new cloud technology. The results (Figure 1) indicate that the *three most important* change management activities to their success were:

1. Clearly articulating a vision or value proposition for adopting WMS.
2. Frequent communication to library staff members about the status of the implementation.
3. Holding regular meetings internally to discuss the project.

The high ranking of 'clearly articulating a vision or value proposition for the change' underscores how critical to success the executive sponsor's involvement is in the process of adopting a new, cloud technology. Library staff want to hear and understand the 'why' behind the change initiative and the appropriate person to deliver that message is the executive sponsor, most likely the library director or dean. The ranking of 'frequent communication' and 'regular meetings to discuss the project' indicate the relative importance placed on regular and ongoing communications in the change process. Library staff want to be kept informed of the status of the change, and to have frequent opportunities to share their thoughts and concerns about the change.
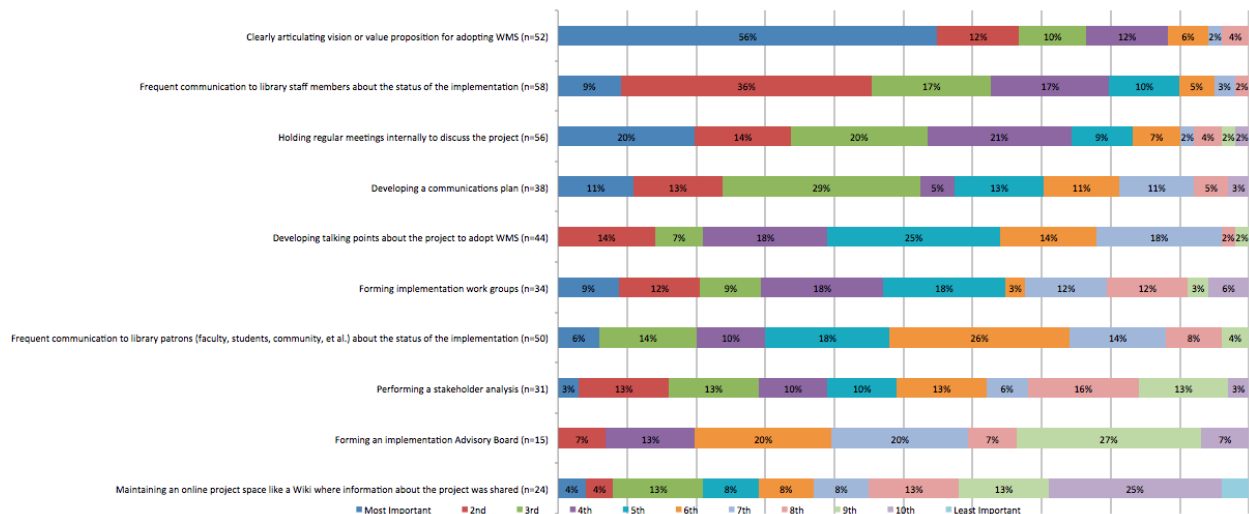
**Figure 1 Ranking of change management activities from more important to success, to least important to success (Ross, 2014)**

Some additional change management activities that increase a project's likelihood of success include:

- Conduct a stakeholder analysis.
- Tailor communications about the change differently for different audiences (e.g. teaching faculty; internal library staff; patrons; etc.).
- Nominate one person to disseminate communications about the change.
- Develop and disseminate talking points to all staff members so that they can speak about the change in a consistent manner.
- Reinforce the change after the project is over to help the change 'stick.'

To avoid the above-mentioned common behaviors that put the adoption of the new cloud technology at risk, change should always be based on the library's strategy and not in isolation (e.g. the 'Shopper's syndrome' above). So if being innovative and interested in adopting new technologies as well as aiming the library's services to meet the users' new needs and wishes are not included in the strategy of a change project, it is difficult to achieve success.

'Leadership is always important but is especially important at times of rapid and even fundamental change' (O'Connor, 2014). As those who are initiating and implementing change, leaders are crucial to successfully performing and completing large-scale change projects (Krummaker / Vogel, 2012). A representative study in Germany showed that one of the top 5 reasons for the failure of change processes is the lack of adequate support through the middle and lower management (Houben, 2008).

There are always staff members who feel like winners or losers based on the real or expected impacts of the change (Krüger, 2009b). Change Management requires that leaders are able to

identify supporters of the change, and especially those who oppose it. To integrate and win the latter, as much communication as possible, especially emphasizing the benefits of this change project, is required. Leaders should be mentors for their team members, organize training courses for them if needed, and try to avoid micromanaging everyone. Also, they shouldn't get angry if something doesn't work out as planned and be capable to bear any resentment from team members that might arise (Düren, 2013). Krummaker and Vogel found that 'when leaders […] explain reasons and goals for change, subordinates find more meaning in their work despite the increased workload' (Krummaker / Vogel, 2012).

Not every leader will welcome change, but leaders will accept change when there is a need for new methods or technologies and if there are no other alternatives (Voß / Röttger, 2008). 'Perhaps the first step in Change Management is for managers to change themselves' (Pugh, 2007). The top management has the duty to motivate the leaders of the middle and lower management throughout the whole change process and to empower them through information and participation in the process to act as change promoters (Houben, 2008).

Leaders need to become change managers or change agents themselves to be able to behave in the way they ask of their staff and to be capable of convincing, motivating and inspiring them through trust, support and regular interaction with those members of staff affected by such a major change as the adoption of a cloud technology. These leadership traits have been codified in the transformational leadership style (Düren, 2013; Düren, 2009). Aspects of this leadership style in relation to the three phases of a change project can be seen in Figure 2.
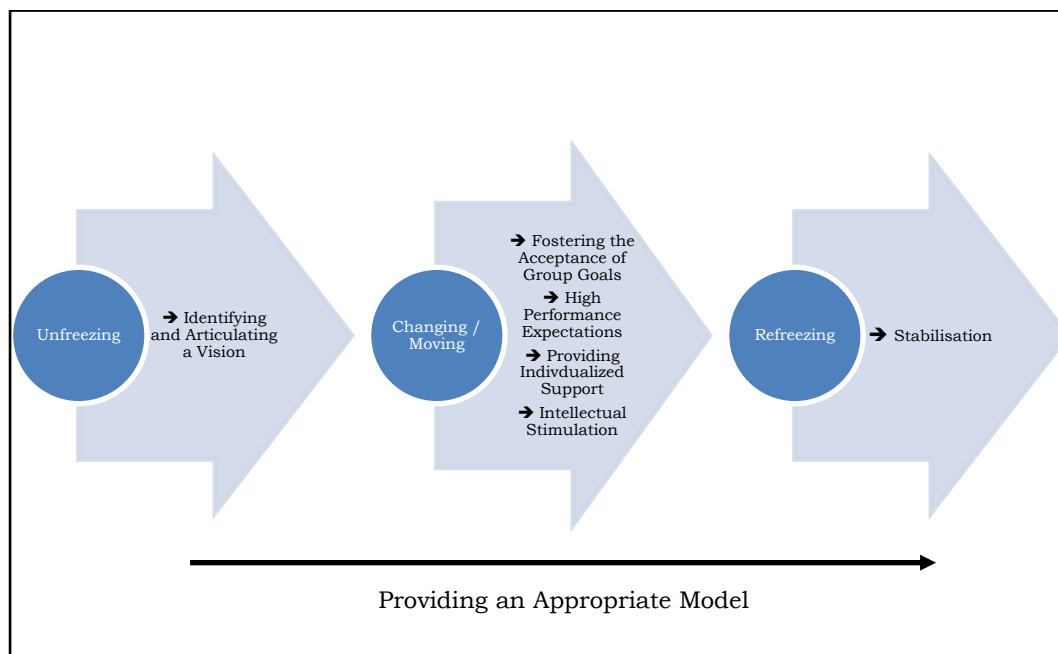


**Figure 2 Aspects of transformational leadership during a change process (Düren, 2013, p. 169)**

Leaders should have a vision (for this also see Figure 1 Ranking of Change Management activities from more important to success, to least important to success), a strategy, goals and initial ideas for each major change in their library or their team. They should communicate and discuss these with their team members, others working in the library, external experts as well as colleagues in other libraries that are also adopting a Cloud technology (Düren, 2013).

'The greatest challenge has been to manage library staff fears and expectations' (Nussbaumer / Merkley, 2010). Members of staff concerned by change processes often feel ambivalent about a change and see change processes as risky and full of discrepancy (Houben, 2008). But those not directly affected by the change, whose situation is not altered by the change project, also need clarity about the change, its goals and effects, as well as encouragement (Krüger, 2009b).

Because the recognition of resistance in due time and the appropriate reaction to it are essential for the progress of each change project (Doppler / Lauterburg, 2008), leaders should be able to notice their staff's worries and anxieties. For this leaders need to feel and show empathy and they should be able to communicate openly about these anxieties and concerns and help their team members express them (Düren, 2013). The Empathic Change Communication Style (ECCo-Style) with its seven components:

- expressing empathy,
- being aware of one's own verbal communication,
- being aware of one's own nonverbal communication,
- developing reliability and safeness,
- using anger and anxieties as stimuli for alterations,
- praising good work, and
- being a role model

can help leaders manage the staff's worries and anxieties (Düren, 2014).


## 5        Conclusions

As has been shown, moving to the cloud has many benefits for libraries. However such a major change, especially as it means that members of staff need to perform new tasks and serve in new roles afterwards, has to be planned carefully in advance and has to take into account human needs and anxieties. To achieve this, an increased emphasis on change management is critical. The best technology in the world will not succeed if the staff members meant to use it do not embrace it. The path to successfully migrating to the cloud is through the hearts and minds of library staff members on all levels.

Because the challenges of each major change lie not only in acquiring new knowledge and competences, but in the alteration of the team members' attitude, their values as well as their behavioral patterns (Krüger, 2009a), attention should be aimed at leaders of all levels. 'Leaders

across companies initiate and implement change and thus are crucial for successful organizations' (Krummaker / Vogel, 2012). 'Critically different to today's roles [of leaders] is that they will need to be solid communicators, strategic thinkers and listeners working where the users are located and able to analyse the new ways in which they are working and using information' (O'Connor, 2014).

## References

DOPPLER, Claus / Lauterburg, Christoph (2008)
  *Change Management: Den Unternehmenswandel gestalten.* 12th Edition. Frankfurt/New York: Campus Verlag, 2008. ISBN 978-3-593-38707-9
DÜREN, Petra (2014)
  *Change communication can be so simple!* Presentation at the QQML2014 6th International Conference on Qualitative and Quantitative Methods in Libraries. Not yet published.
DÜREN, Petra (2013)
  *Leadership in Academic and Public Libraries: A time of change.* Oxford: Chandos Publishing, 2013. ISBN 978-1-84334-690-6
DÜREN, Petra (2009)
  *Einfluss von Führungsverhalten und Unternehmenskultur auf die Steuerung öffentlicher Einrichtungen: Modellentwicklung, Empirie und Gestaltungsempfehlungen für eine Balanced Scorecard-Einführung.* München und Mering: Rainer Hampp Verlag, 2009. ISBN 978-3-86618-321-6
HÖFLER, Manfred et al. (2012)
  *Abenteuer Change Management: Handfeste Tipps aus der Praxis für alle, die etwas bewegen wollen.* 3rd Edition. Frankfurt am Main: Frankfurter Allgemeine Buch, 2012. ISBN 978-3-89981-242-8
HOUBEN, Anabel (2008)
  *Men in the Middle.* In: *Personal,* 07-08/2008, pp. 18-19
KELLER, Scott / Aiken, Carolyn (2009)
  *The Inconvenient Truth About Change Management – Why it isn't working and what to do about it.* In: *The McKinsey Quarterly,* 2009, URL: http://www.mckinsey.com/app_media/reports/financial_services/the_inconvenient_truth_about_change_management.pdf
KRÜGER, Wilfried (2009a)
  *Das 3W-Modell: Bezugsrahmen für das Wandlungsmanagement.* In: Krüger, Wilfried (Ed.). *Excellence in Change: Wege zur strategischen Erneuerung.* 4th Edition. Wiesbaden: Gabler Verlag, 2009, pp. 19-44. ISBN 978-3-8349-1253-4
KRÜGER, Wilfried (2009b)
  *Topmanager als Promotoren und Enabler des Wandels.* In: Krüger, Wilfried (Ed.). *Excellence in Change: Wege zur strategischen Erneuerung.* 4th Edition. Wiesbaden: Gabler Verlag, 2009, pp. 143-191. ISBN 978-3-8349-1253-4

KRUMMAKER, Stefan / Vogel, Bernd (2012)

*An In-Depth View of the Facets, Antecedents, and Effects of Leaders' Change Competency: Lessons From A Case Study*. In: *The Journal of Applied Behavioral Science,* 2012, 49(3), pp. 279-307

NUSSBAUMER, Alison / Merkley, Wendy (2010)

*The path of transformational change.* In: *Library Management*, 2010, Vol. 31, No. 8/9, pp. 678-689. DOI: 10.1108/01435121011093441

O'CONNOR, Steve (2014)

*Leadership for future libraries*. In: *Library Management*, 2014, Vol. 35, No. 1/2, pp. 78-87. DOI 10.1108/LM-06-2013-0047

PUGH, Lyndon (2007)

*Change Management in Information Services*. 2nd Edition. Aldershot: Ashgate, 2007. ISBN 978-0754646655

ROSS, Rob (2014)

*Change Management survey.* May, 2014.
http://www5.oclc.org/downloads/presentations/changemgmt_surveyresults_may2014.xls

VOß, Andreas / Röttger, Ulrike (2008)

*Individuenorientierte Veränderungskommunikation.* In: *prmagazin*, 4/2008, pp. 61-68

YUKL, Gary (2010)

*Leadership in Organizations.* 7th Edition. Upper Saddle River, NJ: Pearson Education, 2010. ISBN 978-0-13-815714-2