

Reshaping Organizations with Social Networks and Collaboration

Marc Augier and Lapo Mola

1 Introduction

According to the coordination mechanism chosen and used, organizations can adopt different structures, business processes, and relations between actors. For instance, coordination could help to harmonize the various activities that a company pursues and the interdependencies among its members, which should contribute to the competitiveness of the organization [1]. The ability of organizations to create coordination mechanisms that can sustain and increase the efficiency and effectiveness of relationships across business units is particularly critical in a competitive context [2–4].

With greater support for decision-making and its decentralization, as well as greater communication and knowledge sharing, coordination mechanisms should be more efficient, allowing the actors in the organization to better perform their tasks and complete their processes.

The digital revolution is impacting many aspects of the society and organizations are not the least. This is a time for a stronger pressure from both the competition and the consumers because of pervasive computers, connected devices and collaboration tools that give to anyone anywhere almost the same opportunities for business development. Definitely, in order to take advantage and to adapt to this new situation, the enterprise needs to switch and set up new business and management processes, activity that we want to refer to as “*Organization Design and Engineering*” (ODE). Interestingly, the same acronym can be used for “*Organization for the*

M. Augier (✉) · L. Mola

SKEMA Business School, BP 85, 06902 Sophia Antipolis Cedex, France
e-mail: marc.augier@skema.edu

L. Mola

e-mail: lapo.mola@skema.edu

Digital Enterprise” and this is the proposition for a new organization that we would like to propose in this study.

We already mentioned the competition and the customers, but the employees are also taking advantage of this new digital environment and the traditional hierarchical model is challenged by new organization designs that we will develop further.

The CEO of 2022 will have to manage a complex business of far-flung inputs from customers’ and employees’ tweets (or the 2022 equivalent) to all kinds of data persistently emitted from billions of phones, sensors, and other connected machines. Companies that can manage and mine all those bits and bytes stand to make a killing [5].

In most situations, organizations operate in a changing environment that adds complexity to an already tense competition environment. In such situation, organization design can be an essential element for success because it allows to improve the way the organizations operate by providing an holistic thinking about the organization and the way the whole operates, and the rules of interaction by defining the relationships among people who assume the roles prescribed by the organization and the relationships of organizational groups or units to which they belong [6, 7].

2 Challenges and Opportunities for Digital Transformation

Organizations today are facing unprecedented challenges, the most important being rapidly accelerating pace of change and complexity. These new challenges are the result of the extensive usage of digital devices and shared resources linked together on the Web 2.0, the people-centric Web or participative Web [8]. Web 2.0 technologies provide a more interactive and collaborative environment, emphasizing peers’ social interaction and collective intelligence, allowing users to engage more effectively [9].

Combining the progresses made on the hardware with the progresses made in software development, the Web is one of the many examples of disruptive technologies that are also pervasive, allowing mass collaboration across the planet and letting some people think it is flat [10], a view that is may be exaggerated [11] because much of this connectivity occurs inside the borders of a country. But what is not yet true for globalization is already true for the organizations and they require to take advantage of this new level of connectivity and agility in order to become Enterprise 2.0 [12–14]. The corporations are both trying to take advantage of the vast amount of information at their disposition, now referred as “Big Data” [15] and at the same time build more efficient infrastructures by using “Cloud services” [16–18].

The effort to improve human cognition started by collecting knowledge (Encyclopedists) and developing classification [19, 20] to reproduce the way our

brain is working by creating associations and linking ideas together. With the introduction of Digital Technology, this progressed a big step further by reshaping the way we work and live, moving from a single user perspective to improve their cognitive capacity to a group perspective and thus allow the development of collective intelligence. This journey started with an article in The Atlantic monthly “*As we may think*” [21] where Vannevar Bush describes a mechanical apparatus (“MemEx” for Memory Expander) designed to help scientists collect and share information. This article was an inspiring source to many, like Theodor Holm (Ted) Nelson who coined the word “hypertext” in an article for Dream Machine and started the “Xanadu project” in order to investigate and develop an hypertext system to link not only documents but ideas [22–24]. This was the beginning of a long quest to develop tools to augment human intellectual capacity, and even if the MemEx as designed by Bush was never built, it is still a source of creativeness and even recently a research project at Microsoft “MyLifeBits” [25] started to develop a system that could manage and store all the digital documents individuals are now producing.

To summarize, hypertext systems are used to improve collaboration with a human-machine interface tailored to our way of thinking and part of their success comes from a dumb device that is also the symbol of the pervasive computer era, the mouse that appeared for the first time at the Stanford Research Institute in Menlo Park, California when Douglas Engelbart ran the “*mother of all presentations*” [26]. That was the first appearance of a new pointing device, the mouse and also of a personal working environment where the documents are displayed in different windows and can be shared with several persons connected on the same local network. Because the main ambition of Douglas Engelbart was augmenting the human intellect, and if we consider all that was developed from his inventions, that goal is more than achieved. The hypertext can really be taken as a foundation from which we can develop a cognitive model for different situations. Because it works with a single person and it works also between different brains, when people work together, their brains not only create links inside themselves but also from one to another. It is perhaps too easy to see the correlation with the links in a hypertext system and the links between neurons, but this allows to think that the more brains you are able to link together, the more ideas you get, creating a common single super brain, a collective brain [27] of people connected together via their computers on the internet.

The combination of these technologies leads to a future where corporations will have virtually unlimited capacity, both in storage and in computing power. This cannot be done following the old hierarchical ways of organizing and executing work, “*the old hardwired ‘plan and push’ mentality is rapidly giving way to a new, dynamic engage and co-create’ economy*” [28]. Instead, with the help of information systems they can build new forms of organizational design through a host of new capabilities in the coordination and control of organizational processes [29–31], competence management [32, 33] strategic alignment [34] or boundary spanning mechanisms [35, 36].

The importance for the organizations to change and develop new relationships with their partners and employees is displayed in a recent study from IBM (IBM Global CEO, Leading Through Connections, produced through interviews with almost 2,000 CEOs across the globe and from multiple industry sectors). It also indicates that the most effective enterprises are able to access and use customer data through a collaborative organization, making them what we already called "*Enterprises 2.0*" to refer to their capability at managing their business via the collaborative platforms offered by the Web 2.0. To take advantage of this new business environment, it is not enough to use new tools inside old fashioned organization models, a more complex deep transformation based on innovation is required and for over 50 % of CEO's from the IBM Global CEO study this remains a top priority. Because sometimes it is not about creating new services or products, it is in fact about creating new industries or moving into existing ones. Still according to the same study, CEO's are placing greater focus on open and collaborative business, responding to the phenomenal growth of our networked society, 75 % of CEO's see developing an open and collaborative culture as critical to matching the complexity of business today. Collaboration and social learning are seen as the key traits for adapting to change. More than half of them expect that social channels will become the primary method of communicating with customers.

For the first time since 2004, technology is the top priority for CEO's and seen as key to future success, more precisely they are planning investment in internal social technologies to facilitate grater and broader collaboration with partners and between employees. These CEO should however take into account that technology is not the only answer, it is the main driver and the foundation on top of which to build the change. The main challenge is not to implement technology but to adapt our management practices, because a fundamental change of traditional practices is needed. If we only look to communication, there have been dramatic improvements. In the last 20 years we saw appear and almost totally disappear the fax, made obsolete by the email, which is now an ubiquitous communication tool. But the email may now suffer from its success and this is why some are already thinking about replacing that with social services. Our mailboxes are bloated with hundred of messages everyday, some are just a couple of lines, some are essentials for our business and some are spam. Each and every message falls into the same bucket and we spend a lot of time, too much time, to read and sort those out. The younger generations have understood the email is no longer an efficient communication tool and prefer to use instant messaging and social networks, were their messages keep sorted in different "conversations". Several companies are already thinking to move in this direction, some are giving more importance to their social network, some ask their employees to refrain for a systematic usage of the mail and prefer phone calls or instant messaging for simple messages and some are taking a step further and have announced their decision to forbid the usage of email for internal communication, as for instance did Thierry Breton, CEO of Atos Origin in February 2011. The email may follow the same path as the fax or the regular mail, disappear or kept for very formal communication.

3 Digital Revolution

During the industrial revolution, muscle power from animals or men was replaced by technology: steam power, then gas or electrical engines, in order to produce goods and cultivate more efficiently. We are at the beginning of a big change, that can be summarized through its name “digital revolution” or “knowledge revolution” [37], we can now increase our brainpower by using computers, databases, networks, etc. Improving the brainpower is not enough; it leaves apart the great advantages that can be unleashed by using it more efficiently. To use a new device does not make a revolution and in order to better understand the transformation to overcome we can make a parallel with the evolution of the transportation industry. Obviously we don’t use a plane like a car but there is more than that because the invention of the plane did not make the car obsolete. We continue to use them, upgrading the roads infrastructure and improving the traffic code, to take full advantage of the benefits of using them. In the same way, in order to make the digital devices more efficient we need to improve the communication links, that same image was used by the then-senator Al Gore in the 80s calling for an “information superhighway” in order to foster education in America for all citizens regardless of their income. With the digital revolution, we have developed new cars (computers) and new roads (Internet) to communicate faster, but we are still in the process of learning how to drive and developing new rules for driving faster and better. There is much more than technology, it is another way to understand the world, which leads to a new paradigm for doing business.

Translated in management opportunities, we have to develop new organization models that take advantage of the new opportunities offered by worldwide omnipresent connected computers. At this point, realizing we are in the middle of the digital revolution, with many connected devices available to enhance the way human beings think, we should see enterprises taking advantage of the new situation and develop innovative and more effective organization [38].

It may be exaggerated to talk about a revolution, because during the evolution of the devices created across the time in order to manage information or knowledge, there are few technological disruptions. We can identify clearly only two: the introduction of electric power and the invention of the semiconductor microchip. In fact, the disruption initiated by the transition from an analog world to a digital one does not come from technology but from a switch of mindset, from closed hierarchical structures to more open ones. Technology was not enough to create digital knowledge as we know it today. For that, we had to have the Internet and the spirit of knowledge sharing behind it that supported its development. It is important to notice for instance that more than 50 % of the Web servers in service all around the world are using the Apache software,¹ those development is performed as an open source project managed by a not for profit foundation. If we add to this figure the

¹The NetCraft services company provides a monthly review of the different Web Server softwares in use around the world at <http://www.netcraft.com/internet-data-mining/hosting-analysis/>.

15 % using the nginx server, another Open Source server, we will figure out that quite 70 % of world wide web sites are relying on an Open Source engine, in other words by a software developed collaboratively by thousands, may be million of programmers dispatched around the globe and that barely meet each others.

Nothing would have been possible if young MIT programmer Richard Stallman upset by a bad printer and the collapse of his community of programmers [39], decided to start the GNU project in 1985 with the aim to maintain the freedom of sharing software and ideas about software. That was the first step for the Free Software Foundation that developed the legal infrastructure to host thousands of software development projects, the most famous being the Apache web server already mentioned, the Mozilla Firefox web browser and the GNU/Linux operating system.

Because in the digital world the tools and the documents they manipulate are closely bound, the same rules had to be set in order to provide the community with open standards for storing and retrieving information, like for instance the extensible markup language (XML) [40] that is part of the technical roots of the semantic Web [41]. When using the appropriate open standards, digital documents, like the source code of the program allow remixing: copy, adapt, improve and publish again. From technical documents to any sort of digital document, the step was easily crossed, and the sharing philosophy developed by the FSF was extended to other types of documents, text, music, pictures, video, etc. In 1995 Ward Cunningham created the Portland Pattern Wiki [42] in order to help people share their best practices in software development, he coined the name Wiki from the Hawaiian words that mean “fast”, because he was looking for something fast and easy to use. The wiki technology was reused eventually by others to create much more ambitious knowledge sharing projects like the Wikimedia foundation and its collection of encyclopedias and dictionaries, it started from the Wikipedia encyclopedia launched in 2001 by Jimmy Wales and Larry Sanger. At the same time, with the same spirit but a different background Lawrence Lessig, Stanford University Law School professor, applied the same philosophy to cultural goods and started the Free Culture movement [43, 44] and created the Creative Commons to provide a legal framework for this new way of working and help artists share and remix their work on the Internet.

Today all these different projects are used together and for instance the Wikipedia encyclopedia technology is based on the MediaWiki free software and the contents are contributed via a Creative Commons License.

4 From Digital to Open in Organization Design

We can think that we have arrived at the end of our digital journey, but we could also think that the move from software to culture is only the first step. The digital revolution or the simple evolution our society is actually living through widespread usage of Web 2.0 technologies and initiatives like the free culture movement,

crowdsourcing could have deeper implication in the way it is organized and structured. This is more or less what the Free Culture movement started while different organizations worked out on creating new models, like the Creative Commons one which aim is to give a legal framework to the new economy that is now developing online, most of it being based on the “remix”.

The remix means that you can take one’s work and replay it adding your own interpretation, like it was possible with the oral tradition. But there is a problem with this model. The intellectual property rights are very difficult to maintain in a world where every act on the Web is a copy and at the same time the laws are expecting to regulate copies [45]. Before we use digital documents and the Web, things were very clear. There were authors going through publishers to address their audience or readers, which was at the same time customers of the publishers. Now anyone can be author and self-publish her work on the Web.

With the industrial revolution, the manufacturing industry was able to move from muscle to engine powered machines, which gave huge improvements and benefits. Then, slowly these businesses realized that they need to get more from their machines and they developed industrialization processes in order to be more efficient. The utmost benefits were achieved during the second part of the XXth century, when performance improvements were still made possible through automation and mechanization. But since then, it was difficult to get great benefits and the industry concerns moved from the manual worker in manufacturing to the knowledge worker [46], because this is where the biggest paybacks can be achieved now. In fact, it seems that their productivity remained steady for different reasons, the most important one being that the knowledge workers should not be managed, in any way, like the manual worker.

They have to have autonomy and motivation, continuing innovation, learning and teaching, developing and assimilating knowledge management practices. Then, if their productivity is not as good as expected, the main reason to blame is outdated management practices from the XXth century based on a strong hierarchical structure with control mindset, bureaucratic processes and standardization. This approach worked well for driving productivity in manufacturing but is harmful for innovation and engagement, which are the key ingredients for success of modern organizations. Knowledge workers needs are very similar to those of the Y generation, and we will not debate who originated them, but there is an obvious link between the two because most students from the Y generation and after will become knowledge workers. They tend to ignore or even challenge corporate hierarchy and instead give respect to skilled people, whatever is their rank in the corporation. For them “*the world is flat*” [10], they have a global mindset and they are very mobile, always connected to their social network. They expect to be treated as peers rather than subordinates. When managed inappropriately, in an organization designed to automate and optimize work, they become less engaged and will collaborate less, leading them to operate below their full potential [47–51]. The traditional organizations no longer provide them with the proper tools to perform their task and usually most of the solutions they develop daily come from their social network outside the entity, sometimes even using their own devices usually smartphones or

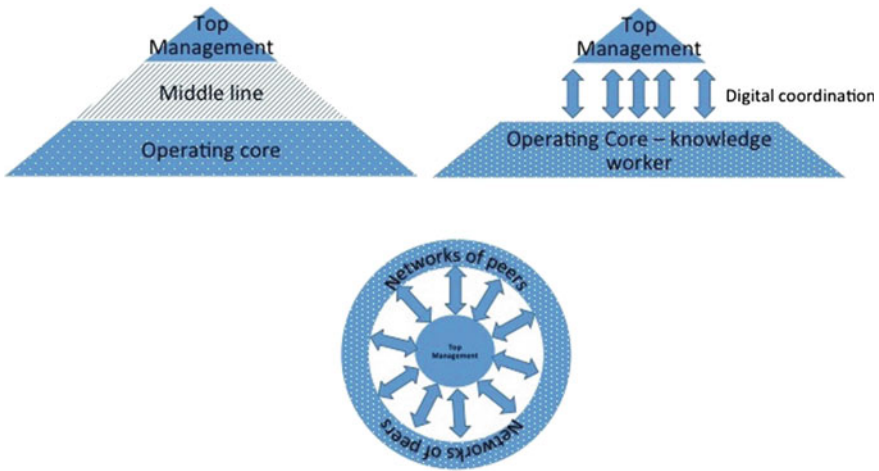


Fig. 1 Three steps evolution process

tablets they bring in the workplace contributing to put the organization infrastructure under pressure [52]. As a result, conventional organizations are increasingly suboptimal, because these do not really own what creates value but they only rent it from their knowledge workers.

We need agile corporations that can adapt easily to new markets and customers, this involves to achieve several engagements, concerning the enterprise infrastructure, the management processes and that may go up to rethinking the nature of employment in an increasingly automated, borderless and highly mobile global economy. To summarize the situation we depicted from different perspectives, we can say that we are in the middle of a great shift from industrial to cultural production. Figure 1 shows three main steps from the hierarchical organization to a flat organization using ICT as main coordination mechanism and then to social network based organization, where top management becomes the focal point rather than the top of the organization.

This evolution is reinforced by the diffusion of cloud computing [17, 18], the most advanced representation of the commoditization of ICT, even if it is far from being the only one. Many IS services are more and more externalized in the form of subscribed online services also known as software as a service, SaaS [53]. It is interesting to note that once the organization ICT is externalized and accessible anywhere, it is much easier to break the physical borders of the enterprise to allow workers to access the corporate data from anywhere. This is not only necessary to take advantage of teleworking in some specific situations but compulsory in order to create a new organization framework. The *office* is wherever the knowledge worker is sitting, be it a formal space like the physical office at the company's building or informal spaces, at home, at the coffee shop or even commuting, in the train, at the airport, etc. We need to redefine what is attached to the office concept.

This is no longer an image, a building owned by someone else where you wear a suit and smile at the boss's jokes, today, the office has to be understood in terms of service, it is a place where the knowledge worker is able to perform his job, and mainly that means wherever she or he is online [54, 55].

The loss of boundaries has positive factors because we can now work without constraints about time, location [56, 57] but on the negative side the fuzzy line between professional and private life can also generate problems. Another concern is the alteration of human interaction because they engage with devices, less and less computers since the rise of the smart phone and tablets, but that makes even easier to engage in a conversation online rather than in real life.

All these factors make the enterprise 2.0 a place where people sharing the same project would work together, as independent workers. The only thing that would make people prefer working in large corporations would be stability and security, but as far as business is concerned, they no longer need to have these large hierarchical based organizations. This is the second evolution transforming deeply our enterprises, it is preparing on top of the increasing role of social networks. These allow implementing totally new ways of distributing roles within an organization and we may see this evolve until the hierarchical systems we used to see in the past totally disappear. The information is able to flow more easily between people, from different departments, and even from different companies, because more and more deep expertise is needed in very heterogeneous disciplines, organization are requesting experts to manage these areas.

5 Conclusion

For several reasons, the current system of corporate governance is under pressure, ICT and the Web 2.0 have empowered employees and customers, those can communicate faster and better, sharing ideas and information. In order to face competition enterprises are focusing on innovation, research and development, and they take advantage of ICT to help employees extend their traditional function to a wide-ranging role of experts participating in communities of practice. Moreover, the digital economy made distribution and marginal costs disappear, thus allowing producers to get direct access to billions of customers; open source communities and free culture are showing that flattened hierarchies are possible; and last but not least, the Y Generation is expecting these changes. The traditional corporations, with hierarchies that are exceedingly wasteful of human talent and energies are losing ground and a form of post-capitalist, decentralized corporation is about to emerge. The prolongation of this evolution would be to imagine an organization where the employees are no longer employees but freelance specialists, sharing their expertise between several companies, according to the projects they find interesting and in which they want to participate. This would definitely pose several problems such as the trade-off between hierarchical control and peer-to-peer collaboration.

Currently a first pattern of organization for the digital enterprise can be proposed with the employees freely organized in communities of practice according to their personal skills and objectives. Even if it is difficult to conceive that workers on a production line can participate or not to the different steps of the assembly of the products, we can imagine for instance a quota of required time for production and some allocated “creative” time where the workers can experiment different roles and positions. Looking backward, the implementation of quality circles in the late 80s looks like a small experiment in this direction, but they were set up according to the traditional formal structure, the communities of practice at the end of the 90s were another step towards giving more autonomy to the employees but these were still lacking the complete autonomy. These examples demonstrated limitations after several years of experimentation. However, some organizations are now experimenting positive effects of this transformation, like FAVI in France and Steam in the USA. Therefore, we are aiming at investigating the mechanisms that enable such evolution. So far, the most challenging phase of this new organization model seems to be the absolute “let it go” from management. It requires to demonstrate a strong trust-behavior relationship between the various components of the organization and also to put in place recollection processes that do not interfere with their autonomy but allow harmonizing the different contributions in order to achieve the organization objectives.

References

1. Thompson, J.D.: *Organization in Action. Social Science Based of Administrative Theory*. McGraw-Hill, New York (1967)
2. Markus, M.L., Robey, D.: Information technology and organizational change: causal structure in theory and research. *Manage. Sci.* **34**(5), 583–598 (1988)
3. Lucas, H.C., Baroudi, J.: The role of information technology in organization design. In: *Journal of Management Information Systems* 10.4, pp. 9–23. ISSN: 07421222. <http://www.jstor.org/stable/40398092> (1994)
4. Bailey, D.E., Leonardi, P.M., Chong, J.: Minding the gaps: understanding technology interdependence and coordination in knowledge work. *Organ. Sci.* **21**(3), 713–730 (2010)
5. Tapscott, D., Williams, A.D.: *Macrowikinomics: Rebooting Business and the World*, vol. BIF-5, p. 336. ISBN: 1591843561 (2010)
6. Hatch, M.J., Cunliffe, A.L.: *Organization Theory: Modern, Symbolic and Postmodern Perspectives*. Oxford University Press, Oxford (2006)
7. Stanford, N.: *Guide to Organisation Design: Creating High Performing and Adaptable Enterprises*, vol. 10. Wiley (2007)
8. O'Reilly, T.: *What Is Web 2.0*. O'Reilly Media (2005)
9. Murugesan, S.: *Understanding Web 2.0*. IT Professional, vol. 9 (2007)
10. Freidman, T.: *The World is Flat*. Farrar, Straus and Giroux, New York (2005)
11. Ghemawat, P.: Why the world isn't flat. *Foreign Policy*, 54–60 (2007)
12. Sambamurthy, V., Bharadwaj, A., Grover, V.: Shaping agility through digital options: reconceptualizing the role of information technology in contemporary firms. *MIS quarterly*, 237–263 (2003)
13. McAfee, A.P.: Enterprise 2.0: the dawn of emergent collaboration. *Manage. Technol. Innov.* **47**(3) (2006)

14. McAfee, A.: *Enterprise 2.0: New Collaborative Tools for Your Organization's Toughest Challenges*. Harvard Business Press (2009)
15. Manyika, J. et al.: *Big data: the next frontier for innovation, competition, and productivity* (2011)
16. Vaquero, L.M., et al.: A break in the clouds: towards a cloud definition. *ACM SIGCOMM Comput. Commun. Rev.* **39**(1), 50–55 (2008)
17. Armbrust, M., et al.: A view of cloud computing. *Commun. ACM* **53**(4), 50–58 (2010)
18. Mell, P., Grance, T.: *The NIST definition of cloud computing (draft)*. NIST Spec. Publ. **800** (145), 7 (2011)
19. Dewey, J.: *How We Think*. Courier Dover Publications (1997)
20. Otlet, P.: *Traité de documentation: le livre sur le livre, théorie et pratique*. Editions Mundaneum (1934)
21. Bush, V.: *As we may think*. Atlantic Monthly (1945)
22. Nelson, T.H.: Complex information processing: a file structure for the complex, the changing and the indeterminate. In: *Proceedings of the 1965 20th National Conference*, pp. 84–100. ACM, New York, NY, USA (1965)
23. Nelson, T.H.: *As we will think*. In: *From Memex to hypertext*, pp. 245–260. Academic Press Professional, Inc. (1991)
24. Lowes, J.L., Coleridge, S.T.: *The Road to Xanadu: A Study in the Ways of the Imagination*. Houghton Mifflin (1964)
25. Gemmell, J. et al.: MyLifeBits: fulfilling the Memex vision. In: *Proceedings of the Tenth ACM International Conference on Multimedia*, pp. 235–238. ACM (2002)
26. Engelbart, D.C.: *Augmenting human intellect: a conceptual framework* (1962). (2001)
27. Levy, P.: *L'intelligence collective* (1994)
28. Tapscott, D., Williams, A.D.: *Wikinomics*. Atlantic Books, London (2008)
29. De Sanctis, G., Fulk, J.: *Shaping Organization Form: Communication, Connection and Community*. Sage, Thousand Oaks, CA (1999)
30. Weick, K.E.: *Making Sense of the Organization*. Blackwell Publishing, Malden, MA (2001)
31. Malone, T.W., Crowston, K., Herman, G.A. (eds): *Organizing Business Knowledge: The MIT Process Handbook*. MIT Press, Cambridge, MA (2003)
32. Hoogervorst, J., Koopman, P.L., Van Der Flier, H.: Human resource strategy for the new ICT-driven business context. *Int. J. Hum. Resour. Manage.* **13**(8), 1245–1265 (2002)
33. Lindgren, R., Henfridsson, O., Schultz, U.: Design principles for competence management systems: a synthesis of an action research study. *MIS Q.* **28**(3), 435–472 (2004)
34. Chan, Y.E.: Why haven't we mastered alignment? The importance of informal organizational structure. *MIS Q. Executive* **1**(2), 97–112 (2002)
35. Pawlowski, S.D., Robey, D.: Bridging user organizations: knowledge brokering and the work of information technology professionals. *MIS Q.* **28**(4), 645–672 (2004)
36. Levina, N., Vaast, E.: The emergence of boundary spanning competence in practice: implications for implementation and use of information systems. *MIS Q.* **29**(2), 335–363 (2005)
37. Kotkin, J.: *The New Geography: How the Digital Revolution is Reshaping the American Landscape*. Random House Digital, Inc (2002)
38. Orlikowski, W.J., Barley, W.R.: Technology and institutions: what can research on information technology and research on organizations learn from each other? *MIS Q.* **25**(2), 145–165 (2001)
39. Stallman, R.: *Free software, free society* (2002)
40. Bray, T., et al.: Extensible markup language (XML). *World Wide Web J.* **2**(4), 27–66 (1997)
41. Decker, S., et al.: The semantic web: the roles of XML and RDF. *Internet Comput. IEEE* **4**(5), 63–73 (2000)
42. Leuf, B., Cunningham, W.: *The Wiki way: quick collaboration on the Web* (2001)
43. Lessig, L.: *The future of ideas, the fate of the commons in a connected world* (2001)
44. Lessig, L.: *Free Culture* (2004a)
45. Lessig, L.: *Free (ing) culture for remix*. *Utah Law Rev.* 961 (2004b)

46. Drucker, P.F.: *Management Challenges for the 21st Century*. Butterworth-Heinemann, Oxford (1999)
47. Armour, S.: Generation Y: they've arrived at work with a new attitude. *USA Today*, **6** (2005)
48. Eisner, S.P.: Managing generation Y. *IEEE Eng. Manage. Rev.* **39**(2), 6–18 (2005)
49. Rothwell, J.D.: *In mixed company: communicating in small groups and teams*. CengageBrain.com (2011)
50. Shaw, S., Fairhurst, D.: Engaging a new generation of graduates. In: *Education + Training* 50.5, pp. 366–378 (2008)
51. Weiler, A.: Information-seeking behavior in Generation Y students: motivation, critical thinking, and learning theory. *J. Acad. Librarianship* **31**(1) 46–53 (2005)
52. Thomson, G.: BYOD: enabling the chaos. *Netw. Secur.* **2012**(2), 5–8 (2012)
53. Benlian, A., Hess, T., Buxmann, P.: Drivers of SaaS-adoption—an empirical study of different application types. *Bus. Inf. Syst. Eng.* **1**(5), 357–369 (2009)
54. Hiltz, S.R.: *Online Communities: A Case Study of the Office of the Future*, vol. 2. Intellect Books (1985)
55. Ramírez, Y.W., Nembhard, D.A.: Measuring knowledge worker productivity: a taxonomy. *J. Intellect. capital* **5**(4), 602–628 (2004)
56. Barrett, S., Konsynski, B.: Inter-organization information sharing systems. *MIS Q.* 93–105 (1982)
57. Johnston, H.R., Vitale, M.R.: Creating competitive advantage with interorganizational information systems. *MIS Q.* 153–165 (1988)

Blurring the Boundaries Through Digital Innovation
Individual, Organizational, and Societal Challenges
D'Ascenzo, F.; Magni, M.; Lazazzara, A.; Za, S. (Eds.)
2016, IX, 320 p. 36 illus., Softcover
ISBN: 978-3-319-38973-8