

Defining Social Technologies

Aelita Skaržauskienė, Mykolas Romeris University, Lithuania,
aelita@mruni.eu

Rūta Tamošiūnaitė, Mykolas Romeris University, Lithuania,
tamosiunaite.ruta@mruni.eu

Inga Žalėnienė, Mykolas Romeris University, Lithuania,
izaleniene@mruni.eu

The popularity of social technologies continues to grow in the society. The term ‘social technology’ is often referred to digital social networks such as Facebook, Twitter, LinkedIn, etc. In order to this a redefinition of this concept based on the original definition is needed. Nowadays the concept of social technologies has several aspects which destabilize the dominant status of technology. It emphasizes social sciences and the humanities as society shapers, reconsiders the strength of social dimension in technological sciences. The aim of this paper is to provide insight into the concept of social technologies, to develop its meaning in information and knowledge society by analyzing new needs and application forms.

Design/methodology/approach – The research results have contributed to the knowledge of the concept of social technologies. Based on the analysis of scientific literature and results of empirical research in the Focus group as well as Content analysis, theoretical framework for defining the concept of social technologies was developed.

Research limitations/implications – The research is limited in a few aspects. To understand the concept of social technologies more deeply and to develop technological perspectives in social sciences a broader theoretical and empirical research is necessary. In order to generalise the research findings, it is recommended that further research includes different dimensions from the perspective of other fields of science.

Keywords: social technologies, social engineering, social media, Millennial Generation

Introduction

In today's world, when the time cost is substantial and competition is fierce, the importance of new technologies is increasing. Surveys conducted by analysts such as Forrester Research demonstrate that popularity of social technologies continues to grow in the society from politics to personal communication, from production of building materials to state management. The term ‘technology’ could no longer be understood in its narrow sense as manufacturing processes and equipment necessary for production. Technical definition of social space is a broader concept and can be modified to the next level of technology that can be defined as a social problem in search for and implementation of the decision theory approach (Derksen et al, 2012). The concept of social technologies became established in different fields of science in recent decades. It includes a new research area for interdisciplinary research practitioners as well as major practical application and the potential to make a real impact on social reality.

Social technologies – “the computer code and the services that enable online social interaction – are, essentially, the product of 40 years of technology evolution and the fulfilment of a long-held vision of what computers and digital technology could do” (Chui et al, 2012). In their research authors also state “that the Web’s growth in reach and capability, and as a medium for interaction, set the stage for the explosive growth of social technologies”. Social technologies unleash creative forces among users and enable new relationships and group dynamics. In the hyperactive world

people can feel immediate benefits in connecting with the right peers, getting answers to questions and finding information. The Millennials, also known as the Millennial Generation (Generation Y), are people born between 1980 and 2000 (Alberghini, et al., 2010). They are now entering the workplace and have different habits and communication forms than the older generation. According to McKinsey Global Survey “Americans spend approximately 11 hours a day communicating or consuming messages in various ways, including in-person, watching TV, reading, and using e-mail” (Chui et al, 2012). Just as email and instant messaging replaced the phone call, social technologies could have a similar effect in changing communication dynamics (De Gennaro, 2010). “Freed from the limitations of the physical world, people are able to use social technologies to connect across geographies and time zones and multiply their influence beyond the number of people they could otherwise reach” (Bughin et al, 2011).

Koo et al (2011) emphasized, that “even though the term ‘social communication technologies’ is most commonly used to refer to new social media such as Twitter and Facebook, a redefinition of this concept based on the original definition is needed”. Nowadays the concept of social technology has several aspects which destabilize the dominant image of technology. It emphasizes social sciences and the humanities as society shapers, reconsiders the strength of ‘soft technologies’, and restores focus to human actors. It means that social technology is increasingly salient as an object of study for social sciences: sociality is more and more something that people create technically (Derksen et al, 2012). “The instrumental, techno-scientific approach to social life is not the exclusive province of social scientists any more, it demands all the more attention as an object of study” (Mayer, 2009).

The purpose of this research paper is to provide insight to the concept of ‘social technologies’, and to develop the role of social technologies in information and knowledge society by analyzing new needs and application forms of social technologies. The theoretical framework for defining the concept of ‘social technologies’ was developed based on the analysis of the scientific literature and the results of empirical study in the Focus group and content analysis.

Theoretical Insights to the Concept of Social Technologies

The term ‘social technology’ was first mentioned at the University of Chicago by A. W. Small and Ch. R. Henderson around the end of the 19th century (Wikipedia, 2012). Henderson (1895) had used the term ‘social art’ for methods by which improvements to society are and may be introduced; “social scientists are the ones who make predictions and social art is what gives directions”. The term ‘social technology’ has dual meaning (Li and Bernoff, 2011): as a term from its introduction was related to ‘social engineering’ (Schotter, 1981; Sugden, 1989; North and Wallis, 1994; Nelson and Sampat, 2001; Nelson, 2002; Pelikan, 2003, Leichteris, 2011), and since 21st century it gained another meaning as a ‘social software’ (Johannessen et al., 2001; Andersen, 2011; Duarte, 2011; Leibetseder, 2011; Bugin et al, 2011; Derksen et al, 2012).

In modern understanding of social technology, it could be applied for various purposes, such as decision making, knowledge sharing, etc. Social technologies can be defined as any technologies used for goals of socium or with any social basis, including social hardware (traditional communication media), social software (computer mediated media), and social media (social networking tools) (Alberghini, et al., 2010). Chui et al (2012) defines social technologies “as digital technologies used by people to interact socially and together to create, enhance, and exchange content”. Social technologies distinguish themselves through the following three characteristics (Bugin et al, 2011):

- they “are enabled by information technology”;
- they “provide distributed rights to create, add, and/or modify content and communications”;
- they “enable distributed access to consume content and communications”.

Social technologies include a wide range of various technological instruments that can be used by people, private or public sector organizations, or as an interaction tool between them. They include many of the technologies that are classified as “social media”, “Web 3.0”, and “collaboration tools” (see fig. 1).



Source: developed by authors

Figure 1. Social Collaboration Tools and Technologies

All these types of social technologies can be described in terms of three dimensions (Johannessen et al., 2001):

- Richness: “the ability to convey verbal and nonverbal cues, and facilitate shared meaning in a timely manner”;
- Interactivity: “the extent to which rapid feedback is allowed”;
- Social presence: “the degree to which virtual team members feel close to one another”.

Different technologies may be better applicable for conveying data-information-knowledge, while others are better suited for convergence-related tasks such as making decisions. For example, “e-mail facilitates well the fine-tuning and re-examination of messages, but richer synchronous technologies (such as videoconferencing) are needed to resolve differing viewpoints among team members and to develop a consensus for decision making” (Montoya-Weiss et al, 2001).

The definition of social technology is characterized by multiplicity and the concept is not defined unambiguously. The term ‘social technology’ is defined as a set of potentially arbitrary effective social challenges refillable solution, ways to achieve the intended results, doing social impact of human, social groups, different social structures' behaviour (Alberghini, et al., 2010; Bugin et al, 2011; Chui et al , 2012). The empirical research for supporting theoretical insights and developing concept of social technologies were planned.

Empirical Interdisciplinary Approach to Analysis of the Concept of ‘Social Technology’

A Focus group method and content analysis were chosen for an empirical research. The research group established the workshop “Defining Social Technologies” during the International conference on Social Technologies at Mykolas Romeris University, Lithuania, in October, 2012.

During the workshop the selection procedure for Focus group representatives was made. The results received in the Focus group were supported with the results of virtual brainstorming using social technologies developed by MRU Faculty of Social Informatics. In the context of interdisciplinary understanding of Social technologies concept mix of Field (natural) and Nominal (also known as Delphi technique) types of Focus groups were used (expert choosing is reasoned in table 1 below). In total, 13 experts from 9 research fields and 10 countries participated in discussions via three sessions. All sessions were organized in the period of 8 month during the year of 2012. Focus group method was chosen for its following features according Kimel (2003): “(a) it provides rich depth of understanding of the phenomenon of interest; (b) it is valid used in isolation from other research methods (might be used to support quantitative research as well); (c) it is as useful and as strong as its link to the underlying research question and the rigor with which it is applied; (d) it provides concentrated amounts of rich data, in participants’ own words, on precisely the topic of interest; (e) it provides critical information in development of hypotheses or interpretation of quantitative data”. As Social technologies is a phenomenon missing clear definition the Focus group method was chosen as appropriate according to the goals and the object of the research.

Table 1. Analysis of Experts’ Relevant Characteristics

	Main research field	Research work in ST¹ field experience (in years)	Research work experience (total in years)	Country of affiliated research institution
Expert 1	Communication	6	17	The Netherlands
Expert 2	Economics	3	14	Denmark
Expert 3	Economics	5	5	Spain
Expert 4	Education	2	9	Norway
Expert 5	IT ²	7	21	Portugal
Expert 6	IT	6	11	Finland
Expert 7	IT	6	8	Germany
Expert 8	Law	2	5	Lithuania
Expert 9	Management	3	13	Poland
Expert 10	Management	6	8	United Kingdom
Expert 11	Mathematics	5	19	Lithuania
Expert 12	Politics	2	17	Finland
Expert 13	Sociology	2	8	Lithuania

According to Grudens-Schuck et al. (2004) composing Focus group with highly different characteristics (such as status, income, education, personal features, etc.) will decrease the quality of the data. Interdisciplinary research requires different characteristics. In order the data not to decrease in quality Focus group members were unfamiliar with each other and kept away from direct contact in sessions 1 and 3. Session 2 was conducted in natural environment with careful monitoring of the process. Anonymity among experts does not lower validity of collected data and is appropriate characteristic for this type of empirical research (Tidikis, 2003). Focus group method has some limitations (challenges) as according to Kimel (2003) they are as follows: (a) small number of participants; (b) limited generalizability, (c) group dynamics can be a challenge, (d) time consuming interpretation, (e) requires experienced analysts. Challenges of the method were overcome with experience of and thorough analysis executed by researchers.

Outcomes of the content analysis revealed that essence of Social technology is seen in 7 different sub-fields (grouped in to major fields) and is close in characterization to the content of concept descriptions found in scientific literature (see table 2 below, keywords are in bald shrift).

¹ Social Technologies

² Information technologies

Table 2. Essence of Social Technologies

Field	Sub-Field	Quotes
Social engineering	Public policy creation means	"<...> ways in decision making process for community needs <...>"
		"<...> social structures are defined"
		"<...> with determination of social order <...>"
		"<...> society aims are in the heart of the process of effective public governance<...> those aims are set with intention of social shaping"
		"<...> only when societal effect is made"
	Group behaviour pattern creation methods/means	"<...> a certain class/group/(or whatever we call it) is allowed<...> and in this way in a long-term behaviour code is formed."
		"<...> people act on codes (civil, moral, and other)<...> the manner of design of those codes"
	Individual behaviour shaping means	"<...> citizen is obliged to obey the official rules of society"
		"When environment forces on to act in a particular direction <...>"
		"<...> social structure sets you into a pattern <...>"
Social software	Collaboration tools	"<...> wiki type online platforms enable users <...> to work with each other with no restrictions of time or space. Socially friendly cooperation"
		"One of them is Google Docs work space <...>"
		"<...> in work places which are not geographically concentrated <...>"
	Information aggregation tools	"<...> as business information systems or IT in electronic public services <...>"
		"<...> distant ICT based learning systems<...>"
	Knowledge aggregation tools	"<...> wiki type online platforms enable users to compile their knowledge on one topic <...>"
		"Web 3.0 basically covers the topic."
	Social networking tools	"It is all about social networking sites as Twitter, Facebook, Pinterest and others, which basically means IT for social interactions."
		"<...> one of the elements would be social sites."
		"<...> social sites currently reveal the core of social technology <...> networks as societal structure and ICT as main interaction tool"
		"<...> in contemporary practice it is modern social media"
		"IT, mobile or other communication technologies <...> (e.g. various apps) of those technologies are eligible for social effect if properly used"

Another outcome relevant to scientific literature analysis became evident from the main segregation of historically developed definition of social technologies as social engineering (first) and social software (later). Focus group data analyses showed that both conceptions of social technologies are still vivid though gradually compiling to one. As social technology with the aspect of social engineering is to be understood as (a) public policy creation means; (b) group behaviour pattern creation methods/means; (c) individual behaviour shaping means; in the social software field of social technology the subfield of social networking tools those two seemingly different aspects are starting to combine. Other sub-fields (collaboration tools, information aggregation tools, knowledge aggregation tools) in social software field are more of a separate sphere more oriented

not to changing current structures or forming new ones, but more related to the collective of the community/society.

Social technologies is a possible solutions to a problem when any event a combination of tools and techniques (technology) support is replaced by the more socially desirable. It is practically any activity which is replaced by the object. As a counterbalance to this general concept of social technologies, in research lays another concept, simplifying previously defined from the theoretical approach on the study of innovative technical device. At its most narrow sense social technologies can be understood as information and communication tools that have a range of economic, social, cultural or other public life processes available to each person: computers, smart phones, social networks, etc. Thus, the analysed object is called an instrument through which members of the public relevant information just become available. Both general and as most narrow concept of social technologies gives out the same keywords - social technology is what is innovative, efficient, and changes us past the usual social processes.

Additional notices, relevant to a deeper understanding of the concept of social technologies, were abstracted from the ideas presented in Focus group discussion (see table 3 below, keywords are in bold shrift).

Table 3. Evaluation of Social technologies' effects

Effect direction	Sphere	Quotes
Positive	Innovation encouragement	"<...> they might bring society to the next level"
		"<...> new types of social interaction tools are being created, new trends and lifestyle"
	Collective intelligence	"<...> synergy in wisdom of crowds <...>"
		"<...> crowd sourcing economic effect<...>"
	Time management	"<...> exact time losses meaning <...>"
		"<...> activities may be bonded with interconnection sequence with final deadlines and not with office hours <...>"
		"<...> occupational activities stop being determined by specific timeframe <...>"
"<...> work possible at anytime<...>"		
Negative	User generated content quality	"<...> everyone can post everything on open source content platforms <...>"
		"<...> mass copy pasting <...>"
	Safety	"<...> high level of personal date exposure <...>"
		"<...> hacking <...>"
	Satisfaction in interpersonal communication	"<...> online communication overtakes eye-to-eye contact <...>"
		"<...> ability to choose way of communication is decreasing <...>"
		"<...> children social communication skills are not being developed <...>"

Experts in line with the discussion of the content of social technology concept suggested possible negative or positive effects of this phenomenon. Positive effects were mostly related to social technology as a collaboration or information/knowledge aggregation tool, as in this case it was taken as tool helping to assure efficiency of the processes in collaboration, while negatives rose from social technology as social networking tool with the agenda of personal data privacy or face-to-face communication skills. No strong opinions were given on positive or negative effects of social technology as social engineering.

Conclusions and Discussion: The Potential and Risks of Social Technologies

Summarizing theoretical insights, results from the Focus group research and content analysis the following conclusion and questions for further research on the potential and risks of social technologies can be formulated:

1. It can be concluded that the current function of social technology is for social purposes via digital means. The real power of social technologies is only started to be understood. Its power stems from the innate appeal of interacting socially, pleasure and intellectual stimulation that people drive from sharing what they know, expressing opinions, and learning what other know and think (Bugin et al, 2011). Despite rapid application of social technologies, much more lies ahead. Today, more than 80 percent of the world's online population is interacting via social networks on a regular basis, but 65 percent of the world population-4,6 billion people-still lacks internet access (McKinsey research, 2012). As has been seen in early use of social technologies, when these ways of interacting are applied to commercial and professional activities (e.g. developing and selling products, working together to solve a business problem), the resulting value creation is impressive (Chui et al, 2012).

2. Social technologies have the potential to affect positive change in communities and governments. Social technologies can be disruptive to existing power structures (corporate and governmental) as happened, for instance, during the Arab Spring 2011. Social technologies allow people to connect at a different scale and create a unified, powerful voice – as consumer groups or entire societies – that can have significant impact on the ways in which dialogues are shaped and policy is made (Bugin et al, 2011). According to Norvaišas et al (2011) „<...> a multitude of business, administration, communication and other processes are digitalized thus placing them in a huge network, organizations need a system which would enable analysing people's opinion and finding the best solution regarding the development of new products and services”. Social interaction via technologies is a powerful way to efficiently organizing knowledge. The same effect is valid to culture, economics, and political power.

3. Social technologies are becoming the preferred method of communication of new generations and communication styles are evolving into a more collaborative approach (Alberghini, et al., 2010). According with Forrester analysts as De Gennaro and Fenwick (2010), there are key trends that will make the inclusion of social technology in society life a necessity. These trends are the physical distance between teams and the entrance of Millennials into the workforce (De Gennaro, 2010). These new employees bring very different needs, experiences, and expectations to the job and often meet a seasoned workforce that has very different work styles (Schooley, 2009). New technologies allow people to raise questions, share knowledge and ideas, and discover people skills regardless of hierarchy. According to Koplowitz and Owens (2010) such tools help “to break down organizational and cultural barriers such as time differences”.

4. The application of social technologies in organisational management has become crucial for success in network society. Nevertheless, over the next few years the emerging “social technologies” of Web 2.0 and Web 0.3 are likely to transform the management. Social technologies enable organisational interactions to take place online with the scale, speed, and economics of the Internet. Virtual networked teams have made management more efficient, because they are reducing the costs of communication, collaboration and coordination. McKinsey's fifth annual survey on

social tools and technologies shows that when integrated into the daily work of employees and adopted on a large scale throughout a new kind of business—the networked enterprise—they can improve operations, financial performance, and market share (Chui et al, 2012).

5. Social networking capabilities are providing vital information in a way that is adaptive and user-driven. However, all these technologies have limitations that can easily lead to misinterpretation, as with the lack of non verbal communication, they are not capable of providing the same quality of communication as eye-to-eye interaction. “Because of delays in transmission and the lack of social and nonverbal cues, communication technologies can interfere with open communication, knowledge sharing, and the ability of teams to identify and resolve misunderstandings” (Cohen, Gibson, 2012). Old generations tend to be sceptical about social technologies. Therefore, it is important to implement something useful, to monitor the user engagement and to educate the community for using social technologies (Allberghini et al, 2010). Online collaboration, in its current state, is not a very good substitute for the sort of unscripted, face-to-face interactions that are critical to producing genuine breakthroughs. And complex coordination tasks, like those involved in the design of a new aircraft, still require a dense matrix of “strong ties” among critical contributors, rather than the “weak ties” that are typical of web-based communities (McKinsy Global Survey, 2012).

6. The use of social technologies can also carry risks. Chui et al (2012) and other also researchers from McKinsy Global Institute, working in the field of social technologies identified several risk group: “employee time spent ‘chatting’ about not work-related topics on internal or external social networks or using social media to attack fellow employees or management”, different risks related to consumer privacy, information security and data security. These risks could limit the ways in which social technologies can be applied. Also “censorship and restrictions on Internet use stand in the way of value creation by companies that hope to enable consumer to interact with them and that wish to harvest deep insights from social data” (Chui et al, 2012).

7. Social technologies enable more and more users to become a part of global conversation, creating their own content rather than just consuming it. However, the quality of user-generated content varies dramatically – from excellent works of journalism to spam and even abuse. Bauerlein (2008) critics have argued that the very disintermediating power of social technologies has reduced the overall quality of discourse. Carr (2010) have argued that the short-form content made me available through social technologies is making people less able to digest large and complex amounts of information. The opposing view is that even our existing means of content selection didn't ever assure quality, that the diversity of opinions is healthy, and that if people can learn social media literacy, access to a broader set of opinions can actually promote critical thinking.

Discussion about social technologies potential ought to be a possibility to address the following question for future research, through fundamental conceptual reflections and empirically-oriented contributions: which social technologies are most important in current social environment? How can we study them? What is the future of social technologies and network society?

References

Alberghini E., Cricelli L., Grimaldi M. (2010). Implementing knowledge management through IT opportunities: definition of a theoretical model based on tools and processes classification, *The Proceedings of the 2nd European Conference on Intellectual Capital*, Lisbon, Portugal, 29-30 March, 2010, pp. 22-33.

Andersen, K. N. (2011). Social Technologies and Health Care: Public Sector Receding, Patients at the Steering Wheel?, Conference proceedings „Social Technologies '11: ICT for Social transformations“, 17-18 November, 2011, Vilnius-Net.

Bauerlein, M. (2008). *The Dumbest Generation*, New York: Penguin Group.

- Bughin, J., Byers, A. H., Chui, M. (2011). How business uses social technologies, *McKinsey Quarterly*, November 2011, access online 16 Sep. 2012, url: http://www.mckinseyquarterly.com/newsletters/chartfocus/2012_05.html
- Carr, N. (2010). *The shallows: What the Internet is doing to our brains*, New York: W.W.Norton.
- Chui, M., Manyika, J., Bughin, J., Dobbs, R., Roxburgh, Ch., Sarrazin, H., Sands, G., Westergren, M. (2012). *The Social Economy: Unlocking Value and Productivity Through Social Technologies*, McKinsey Global Institute Report.
- Cohen, S.G., Gibson, Ch.B. (2012) Virtual teams effective, *General Management review*, reached at: <http://www.etgmr.com/GMRjan-mar04/art1.html>
- De Gennaro T. (2010). Social Technologies Will Penetrate IT Management Tools, Forrester Research.
- Derksen, M., Vikkelsø, S., Beaulieu, A. (2012). Social technologies: Cross-disciplinary reflections on technologies in and from the social sciences, *Theory Psychology*, vol. 22, no. 2, p. 139-147.
- Duarte, A. T. (2011). Privacy and Health System Solution Case, Conference proceedings „Social Technologies '11: ICT for Social transformations“, 17-18 November, 2011, Vilnius-Net.
- Forrester Research. (2009). *Global IT Market Outlook: 2009*. Cambridge: Forrester Research, Inc.
- Grudens-Schuck, N., Lundy Allen, B., Larson, K. (2004). Focus Group Fundamentals. Iowa State University Methodology Brief. Access online 7 Sep. 2012, url: <http://wwwstatic.kern.org/gems/region4/FocusGroupFundamentalsRobert.pdf>
- Henderson, C. R. (1895). Review. *Journal of Political Economy*, 3(2), p. 236-238.
- Johannessen, J. A., Olsen, B., Olaisen, J. (2001). Mismanagement of tacit knowledge: the importance of tacit knowledge, the danger of information technology, and what to do about it, *International Journal of Information Management*, Vol. 21, Iss. 1, p. 3-20.
- Kimel, Bar-Din M. (2003). Focus group methodology. The FDA Drug Safety & Risk Management Advisory Committee Meeting, Gaithersburg, Maryland, December 4, 2003.
- Koo, Ch., Wati, Y., Jung, J.J. (2011). Examination of how social aspects moderate the relationship between task characteristics and usage of social communication technologies (SCTs) in organizations, *International Journal of Information Management*, Vol 31, Iss.5, p. 445-459.
- Koplowitz R., Owens L. (2010). Disciplined Social Innovation, Forrester Research.
- Leibetseder, B. (2011). A Critical Review on the Concept of Social Technology. *Social Technologies*, 1(1), p 7–24.
- Leichteris, R. (2011). Mokslo ir technologijų parkai socialinių technologijų kontekste. *Social Technologies*, 1(1), p 139–150.
- Li, Ch. and Bernoff, J. (2012). *Groundswell, Expanded and Revised Edition: Winning in a World Transformed by Social Technologies*. Harvard Business School Press Books, 352 p.
- Mayer, K. (2009). Who produces social technologies? access online 16 Sep. 2012, url: <http://socialtechnology.wordpress.com/2009/10/23/who-produces-social-technologies/>
- McKinsey Global Survey. (2012). McKinsey Global Survey results, access online 16 Sep. 2012, url: http://www.mckinseyquarterly.com/Business_Technology/BT_Strategy/Minding_your_digital_business_McKinsey_Global_Survey_results_2975
- Montoya-Weiss, M., Massey, A.P., Song, M. (2001). Getting It Together: Temporal Coordination and Conflict Management in Global Virtual Teams, *Academy of Management Journal*, 44(6), 1251–1262.
- Nelson, R. R. (2002). Bringing institutions into evolutionary growth theory. *Journal of Evolutionary Economics*, Vol. 12, p. 17–28.
- Nelson, R. R. and Sampat, B. N. (2001). Making Sense of Institutions as a Factor Shaping Economic Performance, *Journal of Economic Behavior and Organization*, iss. 44, p. 31–54.

North, D. and Wallis, J. (1994). Integrating institutional change and technological change in economic history: a transaction cost approach, *Journal of Institutional and Theoretical Economics*, Vol. 150, p. 609–624.

Norvaišas, S., Mažeika, A., Paražinskaitė, G., Skaržauskienė, A., Šiugždaitė, R., Tamošiūnaitė, R. (2011). Įtinklintos vadybos studijos. Vilnius: Mykolo Romerio universiteto Leidybos centras.

Pelikan, P. (2003). Bringing institutions into evolutionary economics: another view with links to changes in physical and social technologies, *Journal of Evolutionary Economy*, Vol. 13, p. 237–258.

Schooley C. (2009). The Millenials are here! Are you prepared?, Forrester Research.

Schotter, A. (1981). *The economic theory of social institutions*. Cambridge: Cambridge University Press.

Sugden, R. (1989). Spontaneous order. *Journal of Economic Perspectives*, Vol. 3: p. 85–97.

Tidikis, R. (2003). Socialinių tyrimų mokslo metodologija, Vilnius: Mykolo Romerio universitetas, p. 474–518.

Wikipedia (Wikipedia, the free Encyclopedia). (2012). Social technology, access online 16 Sep. 2012, url: en.wikipedia.org/wiki/Social_technology#cite_note-1