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An overview on strategic design for socio-technical innovation[1]

Pablo Marcel de Arruda Torres

pablo.marcel@gmail.com

Universidade Federal de Campina Grande. Rua Aprígio Veloso, 882, Bloco BO, Bairro Universitário, 58429-900, Campina Grande, PB, Brazil

ABSTRACT

Nowadays, we are living in an environment of uncertainties and constant transformation. The innovation process is reverted, thereby, from the top-down to the bottom-up logic, where the stakeholders are invited to participate in the process of creating innovation. In that sense, socio-technical innovation implies a process of systemic change, both in the productive structure and in the relations between actors inside the system, with technical and behavioral implications, which affects production, distribution and consumption. A model that may simplify the complexity of such processes is the Multi-Level-Perspective (MLP), which considers the interactions between niches (micro level), socio-technical regimes (meso level), and landscapes (macro level). The MLP shows that, in order to change the landscape effectively, we have to start from the bottom, in other words, the socio-technical regimes open opportunities to receive innovations from the niches, small social groups, and communities. This way, we propose a simple framework of four main steps for the strategic management of the design process to develop Sociotechnical Innovations. A key point is considering that technological development and the relations among the actors involved in innovation is the way to improve the performance of innovation, to increase the possibilities of adoption and to generate the desired impact.

Keywords: sociotechnical innovation, co-design, Multi-Level-Perspective, participatory design.

Introduction

The current reality leads us to a global, fluid, dynamic, networked and hyper-segmented scenario, which transforms the society and has consequences in innovative processes. Traditionally, innovation has always been linked to research and development centers (RandD) of large companies, with financed laboratories and researches who would lead their discoveries to the market and with no contact with ideas developed outside the organizational boundaries. This is the innovation known as top-down, which characterizes itself by the fact that people with decision-making power define the project goals/objectives and provide funding. The appropriate staff implements the innovation. A top-down innovation project is based on the knowledge of scientists and experts, without necessarily understanding the real user's needs (Stein, 2012). In addition to the top-down internal innovation, historically the path of innovation remained as a single vector: development of sophisticated products to the richer markets, such as US and Europe, and then simplified versions for emerging markets, removing resources considered expensive. "This strategy was logical and efficient for a long time, but it is less and less successful nowadays" (Aaker, 2011, p. 167).

The new global order placed all of these concepts upside down, inverting the way the traditional system of innovation has always worked. Researchers working alone in laboratories and in front of their computers can no longer carry out economically viable innovations. It is not possible to imagine that innovators at research centers in USA or Europe know people's needs in other countries; they would have to work in these places, learning to engage with people and listening to their needs, which they know very well because they have always lived the local reality.

This inversion process is termed by Govindarajan and Trimble (2012) and reinforced by Aaker (2011) as "Reverse Innovation", which means that a truly intelligent global strategy should include intelligent ways for both traditional and emerging economies. According to the author, adapting products does not work anymore; to gain strength in emerging markets it is necessary to innovate directly for them. For Govindarajan and Trimble (2012), reverse innovation not only implies rethinking markets, but remodeling

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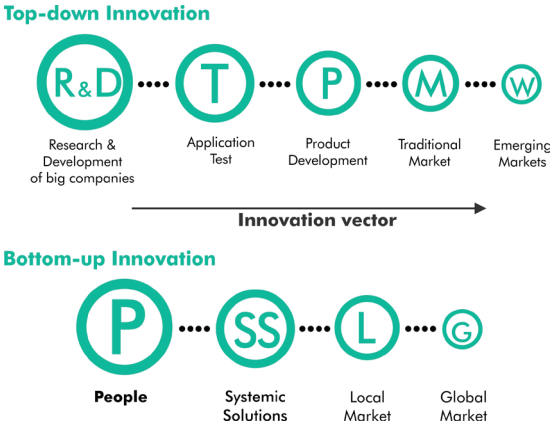

Figure 1. An overview about Top-down and Bottom-up innovation.

the very way to innovate. Most innovative processes start with a technology that has then explored their applications. In the case of reverse innovation, it all begins with a clear customer need. First, we have to understand better the important differences among people from one place to another. Secondly, we learn that a market want its culture, values and personal preferences reflected back in the products they choose to consume. Thirdly, we learn that, despite all their differences, people around the world still have some common desires.

The innovation process is reversed thereby from a top-down logic to a bottom-up logic (Figure 1), where all stakeholders are invited to participate in the process of creating innovation, because it is about understanding people's needs in order to design the project (Stein, 2012). Thus, successful innovation processes are not understood anymore as the results of an action taken by an individual inside a corporation, instead, they tend to be collective accomplishments (Howaldt and Schwarz, 2014). This model has an inherent advantage because it comes from a deeply rooted synthesis of a basic need and a performing capacity based on location. The ideas often designed at the time of need for those who experience the problem are mostly practical and low-cost. These ideas can move the market quite easily due to their inherent simplicity and affordability.

The rise of a new paradigm of innovation

The bottom-up movements and the integration of people in the innovation process, which depend on their participation and collaboration, reinforced by network connections and which was possible because of the communication technologies, are challenging the established traditional systems. The emergence of industry set new paradigms since the end of the 19th century and endured up to nowadays as a model of economic, scientific and financial world development. However, the global vision and the rise of the Internet, coupled with the global economic crisis enabled the diffusion of communication systems and mass production for all over the world, which, naturally, reinforced questions about the current models. The result is a paradigm shift in innovation, where the industrial thinking becomes obsolete and makes room for new post-industrial models to become increasingly noticeable. According to Manzini (2010, p. 8), this emerging scenario is based on three main trends: "the green revolution and the environmentally friendly systems"; "the spread of networks, and the distributed, open, peer-to-peer organizations it generates"; and finally, the diffuse creativity and the original responses to everyday problems conceived and implemented by diverse social actors.

It is possible to notice a paradigm shift from focus on pure economic growth to a more holistic approach to human well-being. An example supporting this statement is the Human Development Index (HDI), which provides a counterpoint to the Gross Domestic Product (GDP), which in turn focuses exclusively on economic factors. The rise of corporate business, the growing attention to the base of pyramid markets and greater awareness of climate change are other examples of this paradigm shift. However, scientific research and the wide public have neglected innovations that aim at increasing social value. Precisely, "these innovations focused on creating social value, create and improve our lives and our way of living together in society" (Lurtz *et al.*, 2013, p. 2).

Such profound changes in systems, which have already rooted in our daily lives, will only be possible with the active and joint participation of all sectors of society (institutions, companies, non-profit organizations and citizens). These social actors have proved that they are able to act outside traditional economic models, challenging dominant patterns of thought and behavior and reorganizing the way they live. These people or communities consider their own role, time and system of social relations in a different manner, seeking a welfare much less focused on products and more focused on common goods. On that point, Grimaldi (2014) affirms that we are living in a dimension in which promoting access to goods and services is more relevant than owning them, where experiences, relationships, emotions, culture and entertainment are more important than owning things.

These constant changes (which must remain in the future) made new models for economy, production, consumption and wellness, which may be strategies to overcome the challenges faced nowadays, to emerge.

A key point is that we are moving from an old techno-economic paradigm based on mass production. In this paradigm, the dominant concept of well-being is linked to artifacts that could work for people, facilitating the daily actions by minimizing personal interference (less physical effort, attention, time and need for capacity and ability), and we are moving to a new paradigm based on information, communication, collaboration and interaction (Manzini, 2007; Perez, 2010). The transition moment we are living should be seen as a large-scale social process, where many different resources, knowledge and organization should be valued in an open and flexible way.

The movement from an industrial society to a social economy based on networks and intangible values, in addition to the profound changes affecting the modern socio-economic structures, indicate a fundamental change in the concept of innovation. The government, the third sector, social enterprises and cooperatives, family economy, social networks, informal associations and social movements are

examples of the sectors that are part of the new social economy. Murray (2009) points out the digital technology (which makes possible new practices and ways of organization) and the increasing pressure of society around "intractable social issues" (for instance, poverty, inequalities, health care, climate change) as the main drivers of the social economy. These two points are not specific to a particular country or region, but are spread worldwide and the challenge is how to innovate in "the next wave of economic development" (Murray, 2009, p. 37).

According to Harrison *et al.* (2009, p. 1), "the social economy has become one of the most dynamic sectors of the world economy. There are about 800 million active people working on it in all continents". In fact, that new social phenomenon is spreading through organizations, associations, communities, territories and societies (Harrison *et al.*, 2009, p. 7) and it is considered a reaction to the economic and social crisis, making new social arrangements needed. "Civil society takes the lead through economic and social initiatives. Social innovations are result of a tension in the institutions and systems that support the development of individuals and communities" (Harrison *et al.,* 2009, p. 12). These initiatives can be considered a response of civil society to the greatest global dilemmas faced by contemporary society, making social innovation an important task for the future and affecting the national and regional economies by citizens that live in specific locations.

The emergence of social economy enables new economic and productive innovations based on the contemporary economy and society functioning, which common feature is on building and managing partnerships in a strategic manner (Boes and Trinks, 2007). This kind of fundamental change of the process can be interpreted as a new innovation paradigm development (Bullinger, 2006). Now, the innovation process is opened to everybody who can contribute for it, so not only companies, technical schools and research institutes are relevant agents to develop and make innovations work effectively (Howaldt and Schwarz, 2014). In that new reality, citizens and customers are not only providers of information about their needs, but they now contribute to the development process and to solving problems.

Because of this scenario of paradigm shift, the importance of Social Innovation is more and more evident, creating new possibilities for action. Designers can contribute to this new reality, modifying their expertise for a social innovation dynamic and optimizing their capacities to respond the new demands created by this scenario. That means "conceiving and developing solutions, considering and evaluating people's abilities in terms of sensibility, competence and entrepreneurship, and to design systems that enable them to realize their potential, using their own skills and abilities" (Manzini, 2007, p. 237). The solutions are devised and implemented primarily by the actors involved, often in unexpected forms. They can be understood as "social experiments of possible future and disseminate multi-located laboratories, where different movements towards a new society are tested" (Manzini, 2007, p. 244).

About socio-technical innovation

Considering not only the technological nature of innovation, but also its social aspects, leads us to consider the typological classification of innovation proposed by Brooks (1982). About the relationship between social and technical innovation, he states: "The thrust however, comes from the market, and the technology is usually incidental and rather mundane in technical terms though no less ingenious. The organizational invention comes first, and technical innovations are gradually introduced to improve it, rather than the reverse" (Brooks, 1982, p. 10). According to the author, when it comes to innovation, we can distinguish it in three types:

- Technical innovation, such as new materials and new production processes;
- Social innovations, such as market, management, policies and institutional innovations; and
- Socio-technical innovations, such as transportation, communication, housing and feeding.

In fact, the socio-technical typology of innovation considers the relational factors of the various actors involved with the innovation, related to the activities carried out and the knowledge generated during the innovation process

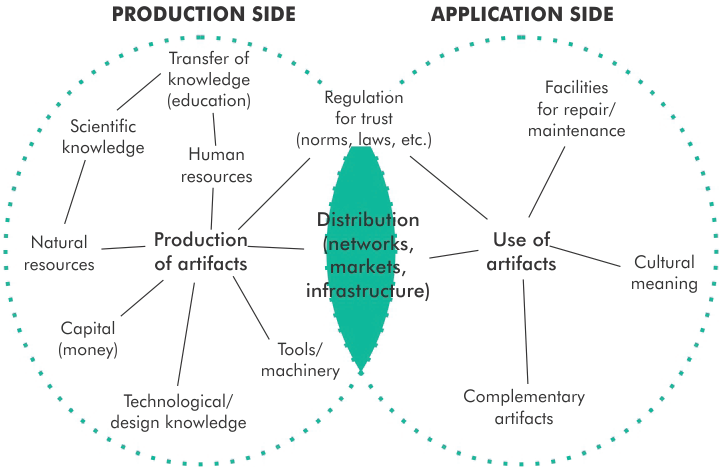

Figure 2. Change occurs in both structure of the system and relationships among the actors inside the system.

Source: Adapted from Geels (2004).

(Figure 2). In other words, socio-technical innovation is based on the premise that the technical and productive aspects have as much impact on the performance of innovation as on the social relations that are constituted among the different actors involved in the socio-technical systems. In turn, these socio-technical systems are composed of a variety of elements, including "artifacts, knowledge, user practices and markets, regulation, cultural meaning, infrastructure, maintenance networks and supply networks" (Geels, 2005, p. 445), as well as by the connections and relations between them.

It means that socio-technical innovation considers both technical (production, distribution, consumption) and social (relationships, behavior, culture) dimensions of a system. In turn, Geels (2004) presented some important characteristics of this type of innovation: Multi-actor (involving companies, governments, civil society, universities, research centers, NGOs, etc.). Another feature is that it is Multi-factor (the interplay of technical, regulatory, societal and behavioral factors influence each other). A third feature is the highly uncertainty (due to the complexity, it becomes difficult to predict and manage the highly degree of uncertainty in which these systems work). Also, this type of innovation is long-term process (it is needed long time to happen due to the multidimensional changes proposed).

About the potential changes in which socio-technical innovation may provide, Rotmans and Loorbach (2010) pointed out three:

- Changes in structure: physical (infrastructure, technologies, resources, materials), institutional (rules, regulations, power structures) or economical (market, financing, production, consumption);
- Changes in culture: thinking, mental models and perceptions of a common perspective;
- Changes in practices: work, routines, behaviors.

Multi-Level-Perspective (MLP)

For a better understanding of how changes can happen inside a socio-technical system, Geels (2004) proposes a conceptual model called Multi-Level-Perspective (MLP), in which, socio-technical systems are distinguished into three levels (Figure 3): niche (micro level), socio-technical regime (meso level) and socio-technical landscape (macro level).

The macro-level (landscape) represents the context that involves and interferes at the meso and micro levels, being constituted by cultural, demographic, political, natural, social, economic and legal factors that constitute the macro scenario. In the landscape level, disruption of established patterns is more difficult because windows of opportunity to change "are beyond the direct influence of actors and cannot be changed at will" (Geels, 2005, p. 451). Actors can change niches and regime, but it is more difficult to change the macro-level because this is beyond their direct influence (Ceschin, 2012).

The meso-level (socio-technical regime) is the main field for innovating, producing, distributing and consuming (Geels, 2004), "providing orientation and coordination to the activities of relevant social groups" (Geels, 2005, p. 450), determining the relatively stability and resistance to change of socio-technical systems. This resistance results in aligned trajectories and go towards similar directions, resulting in stability and resilience, which make it difficult to create radical innovations (Ceschin, 2012).

However, at the micro level (niches) is where opportunities for experimentation start and can generate radical and disruptive innovations. As they occur in small markets and in specific social groups, dynamic and adaptable experiments can take place in niches, capable of establishing themselves and maturing to the point of challenging and even modifying pre-established socio-technical systems. In summary, socio-technical regimes create growing innovations and niches create radical innovations (Ceschin, 2012).

The process of experimenting in niches is crucial for incubating radical innovations, however "single experiments do not result in regime changes; they require a long trajectory of many experiments and the emergence and stabilization of a niche level" (Ceschin, 2012, p. 83). Thus, we can conclude that the relationship between niches and their experiments reinforces both, in the sense that niches enable experiments to be performed, while experiments make niches more effective and consolidated.

One of the main features about the Multi-Level Perspective (MLP) is that conceptually a bottom-up transition among levels is possible, where radical changes created and implemented in niches can be brought to regime and later to landscape. According to the explanations of Ceschin (2012) and Geels (2005), the dynamics that make possible the transitions among levels happen into four phases. In the first phase, radical innovations are developed and experimented in niches. These new ways of thinking and performing can put pressure in the existing socio-technical regime, which combined with natural tensions inside the regime could create a misalignment and open "windows of opportunities for radical novelties" (Ceschin, 2012, p. 84). If these new ideas are used, tested, supported and accepted by small market, the second phase starts. Due to the uncertainty, that experimental moment leads us to a variety of different possibilities and solutions. In the third phase, adopted innovations intrude the socio-technical regime through the spaces generated by windows of opportunities, which is possible by continuous experimentation and interactions between actors. The regime then stabilizes and the innovations are adopted by "a broad community of actors who exchange experience, best practices and findings" (Ceschin, 2012, p. 85). In the last phase the innovations replace old practices and thinking of the regime, resulting

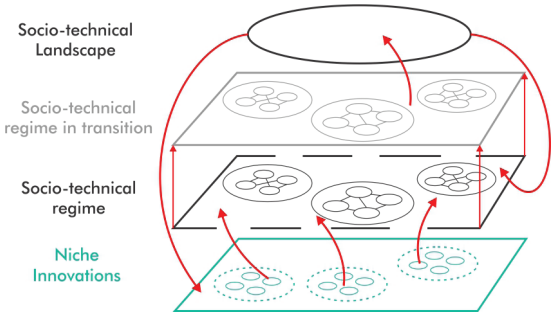

Figure 3. Dynamics within the Multi-Level Perspective.

Source: Adapted from Ceschin (2012).

in deeper socio-technical changes. This movement of replacement generates a new regime able to influence wider changes in the Landscape level (Figure 3).

Therefore, for the purposes of this research, we can synthesize that a socio-technical innovation brings together: technical skills, appropriate technology and expertise available locally, combined with an external complementary expertise; coupled with the understanding of the needs and aspirations of the people belonging to the community and, more specifically, their life contexts, histories and knowledge.

A framework to design socio-technical innovations

The Multi-Level Perspective shows us that in order to change the landscape, effectively, we have to start from the bottom, in other words the socio-technical regimes open opportunities to receive innovations from the niches, small social groups and communities. In a very simplistic way, niches innovation starts with design inputs, represented by problems, opportunities and design challenges identified inside the daily reality of the communities and social groups. Thus, those inputs are transformed into outputs through a design process focused in the development of solutions to respond the identified inputs. Moreover, that design process has two important features to be considered:

- Participatory process: "in a networked society, all design processes tend to become co-design processes" (Manzini, 2015, p. 48). In that point, co-design can be defined as development and creation processes where "creativity of designers and non-designers work together" (Sanders and Stappers, 2008, p. 6). Thus, co-design solutions with people inside communities is a way of using local knowledge to develop solutions that tend to be more adaptable to the community context, and they are more likely to adopt by its adaptation to the people's reality. Best (2012) points out that participatory co-design is an interesting practice when local knowledge is essential to the project, when solutions coming from 'outside' are not well received, or when community policy requires this kind of approach;
- Design intervention: about the term intervention, Nagy and Fawcett (2015) argue that it "might be a program, a change in policy, or a certain practice that becomes popular. What is particularly important about interventions, however, is what they do". Interventions have to do with changes in people's behavior in order to foster relationships and make better the conditions in which they live. Thus, the community members who are getting the intervention of design throughout all phases of the co-design process assume an active participation.

Taking into account the points and process characteristics highlighted above, we suggest here a simple framework for strategic management of the design process that may also be applied in operational terms:

Immersion and Definition: the participatory design intervention process within a community naturally gets started with the recognition of local people and their relationships with each other and with the territory where they live in, in order to identify their needs, desires and stories. It is time to interview, interact and talk with people, observing their behavior and understanding the context in which they live by experiencing it. In other words, engaging people in their own contexts in order to understand them at a deep level. The aim is to capture manifestations of people's experiences and identify what they think and feel, in order to interpret these clues into intangible meaning and uncover insights. Thereafter, it is time to synthesize and cluster the immersion findings, translating them into design insights. The last step is to define and specify a meaningful design challenge. In the Definition phase, information gathered turn into strategy directions, set out by defining the opportunities to be taken, and challenges to be faced and solved by the design intervention. By aggregating, editing and condensing the content learned, the definition phase aims to interpret data, establish new perspectives and identify opportunities for innovation. In that point, working with the community to establish the goals of the design intervention and how we might go about achieving them is an assumption to consider.

Ideate and Prototype: ideation is a transition time from identifying problems to exploring solutions. It is time to brainstorm design concepts, test out what works and discard what does not work. Thus, quantity leads to quality, when we talk about ideas, that is, we must first have several ideas, then choose the most promising ones and discard those that have no potential. This process of trial and error helps designers and non-designers to improve and refine ideas. It is also common to modify and mix them, bringing up new ideas. The challenge here is how to develop new promising ideas and how to make them real. After all, we only know if an idea will work, if we put it into practice. Prototyping means translating it into sketches, low-fidelity models, storyboards, post-it notes, role-playing activities, or interface simulations, for instance. Subsequently, the criticism and analysis of the generated ideas get started with the active participation of all stakeholders, with their points of view and opinions, in order to generate discussions that might lead to improve the proposed ideas.

Test and Feedback: Ideas generated and transformed into prototypes are now taken for real application environments, so they can be tested, evaluated and criticized by potential customers. Testing is the best way to get real feedback, opening up a valuable opportunity to improve solutions and continue to learn about the community members. It is an iterative step in which solutions are confronted with people's lives and the context that surrounds them. That is a transition step between creative and project implementation phases: it works closely with the creative phase, into a continuous and iterative cycle of building, testing and refining, in a loop movement that aims to improve and prepare the solutions to be implemented. By this way, testing and developing ideas is unlikely to be a linear process. Thereby, people are involved in that phase evaluating generated ideas and prototypes, giving their opinions, expressing their desires and suggesting improvements to proposing solutions.

Implementation and Growth: After developing ideas up to a level accepted by the community, it is time to make

them real, to bring them to the world and to take them to people. Here the resulting design is concluded, produced and launched, and then it's feedback should be gathered. This is a movement to materialize the developed solutions, not leaving them in the field of ideas and thoughts, but in fact making them help improving the community members' lives. Thus, that phase is fundamental to co-design processes, because only implementing the developed design one can consider that solutions become feasible socio-technical innovations. Growth strategies consider that the greater the goals and intentions of a project, the higher can also be the impact of innovations on people's lives. In this way, good solutions should be disseminated on scales able to positively affect the lives of a higher number of people, making innovation accessible to everyone. It is precisely about this point what the growth phase means: after being implemented, designed socio-technical innovations can be able to expand, moving from a community level (here, the Niches space of the MLP model) to a more far-reaching solution (Socio-technical regimes and later to the Socio-technical landscape). It is important to consider building the abilities and financial models that will ensure that the innovations will be well implemented and can be sustained over a long term. Developing platforms to communicate and raise awareness will help spreading it more widely. At this point, it is also time to take into account a design reprogramming, which considers a community design intervention as a project that will remain solid over time, enabling new possibilities of future interventions and ordering modifications in the adopted innovation model.

It is remarkable that while the co-design process evolves and goes through the proposed stages of the intervention, the profile of outputs produced by various methods and tools applied also changes and becomes more concrete. That is to say, an initial plan of intervention inside community evolves for a project after performing the initial phase (Immersion and Definition), where desired outputs are fundamental definitions and insights for the development of the design. In the Creative phase, characterized by the interaction between Ideation and Prototyping and Testing and Feedback, the desired outputs are ideas evolved to a proposed system of solutions. When this system of solutions is deployed and scaled, the outputs may be considered socio-technical innovations in the niches level that may evolve along time to socio-technical regime and, later, to landscape.

Conclusions

Bottom-up innovation movements were evidenced and underlined as good ways for designing effective socio-technical innovations, with potential to be appropriated and easily accepted by people and to promote socio-economic development in a local environment. The insertion of various project's stakeholders (active participation of partners from civil society, government and private sector) is crucial in transforming ideas into technically and economically feasible solutions.

Considering not only the technological/production side, but also the importance of relational/social side of innovation means understanding that socio-technical innovation implies a process of systemic change, both in the productive structure and in the relations between the actors within the system, affecting production, distribution and consumption. In that sense, the concept of socio-technical innovation means expanding the scope of design and therefore increasing the possibilities for design interventions, revealing greater focus on results and impact than in products or services.

The co-design process is thus transformed, requiring not only the creative development of ideas and projects, but at an early stage calls for a high level of empathy with the community members, as well as requiring that ideas are implemented and can be scaled for a larger number of people. Therefore, through the evolution and movement among the levels of the MLP model, the change may happen and the impacts may be effective.

References

AAKER, D. 2011. *Relevância de Marca: como deixar seus concorrentes para trás*. Porto Alegre, Bookman, 342 p.

BEST, K. 2012. *Fundamentos de Gestão Do Design*. Porto Alegre, Bookman, 208 p.

BOES, A.; TRINKS, K. 2007. Internationale Innovationspartnerschaften in der ITBranche. *In:* J. LUDWIG; M. MOLDASCHL; M. SCHMAUDER; K. SCHMIERL (eds.), *Arbeitsforschung und Innovationsfähigkeit in Deutschland*. Munich, Rainer Hampp Verlag, p. 85-94.

BROOKS, H. 1982. Social and technological innovation. *In*: S.B. LUNDSTEDT; E.W. COLGLAZIER JR. (ed.), *Managing innovation*. Elmsford, Pergamon Press, p. 9-10. https://doi.org/10.1016/B978-0-08-028815-4.50008-5

BULLINGER, H.J. 2006. Verdammt zur Innovation. *RKW-Magazin*, **57**(1):12-14.

CESCHIN, F. 2012. *The introduction and scaling up of sustainable Product-Service Systems: A new role for strategic design for sustainability*. Milano, Italia. PhD Thesis. Politenico di Milano, 374 p.

GEELS, F.W. 2005. The Dynamics of Transitions in Socio-technical Systems: A Multi-level Analysis of the Transition Pathway from Horse-drawn Carriages to Automobiles (1860-1930). *Technology Analysis and Strategic Management,* **17**(4):445-476. https://doi.org/10.1080/09537320500357319

GEELS, F.W. 2004. From sectoral systems of innovation to socio-technical systems: Insights about dynamics and change from sociology and institutional theory. *Research Policy*, **33**(6/7):897-920. https://doi.org/10.1016/j.respol.2004.01.015

GOVINDARAJAN, V.; TRIMBLE, C. 2012. *Reverse Innovation: Create Far From Home, Win Everywhere*. Boston, Harvard Business Review Press, 256 p.

GRIMALDI, P. 2014. *Blur design: il branding invisibile*. Bologna, Fausto Lupetti Editore, 205 p.

HARRISSON, D.; BOURQUE, R.; SZÉLL, G. 2009. Social Innovation, Economic Development, Employment and Democracy. *In:* D. HARRISSON; R. BOURQUE; G. SZÉLL (eds.), *Social Innovation: the Social Economy and World Economic Development. Democracy and Labour Rights in the Era of Globalization*. Frankfurt, Peter Lang, p. 7-15.

HOWALDT, J.; SCHWARZ, M. 2014. *Social innovation: concepts, research fields and international trends*. 5. Aachen, ZWE der TU Dortmund, 78 p.

LURTZ, K.; MÜLLER, S.; RÜEDE, D. 2013. *Social Innovations: Expert Opinions on the Status Quo ans Future Directions*. World Vision Center for Social Innovation (org.). Trasformation in Business and Society, EBS Universitat fur Wirtschaft und Recht. 1st ed., Oestrich-Winkel, EBS Universität für Wirtschaft und Recht.

MANZINI, E. 2015. *Design When Everybody Designs: An Introduction to Design for Social Innovation*. London, MIT Press, 256 p.

MANZINI, E. 2010. Small, Local, Open and Connected: Design for Social Innovation and Sustainability. *In:* L. DEBENEDITTIS; M.H. ROBB; A. SIEGEL; C. LAWSON (eds.), *The Journal of Design Strategies*, **4**(1):8-11.

MANZINI, E. 2007. Design research for sustainable social innovation. *In*: R. MICHEL (ed.), *Design Research Now: Essays and Selected Projects*. Basel, Birkhäuser Basel, 233-245. https://doi.org/10.1007/978-3-7643-8472-2_14

MURRAY, R. 2009. *Danger and Opportunity: Crisis and the New Social Economy*. London, NESTA, 58 p.

NAGY, J.; FAWCETT, S.B. 2015. Designing Community Interventions. *Community Toolbox*. Lawrence, Kansas University. Available at: http://ctb.ku.edu/en/table-of-contents/analyze/where-to-start/design-community-interventions/main. Accessed on September 26, 2015.

PEREZ, C. 2010. The financial crisis and the future of innovation: a view of technical change with the aid of history. *In:* The Other Canon Foundation and Tallinn University of Technology Working Papers in Technology Governance and Economic Dynamics 28, TUT Ragnar Nurkse Department of Innovation and Governance. Available at: http://hum.ttu.ee/wp/paper28.pdf Accessed on: November 19, 2018.

ROTMANS, J.; LOORBACH, D. 2010. Towards a better understanding of transitions and their governance: a systemic and reflexive approach. *In*: J. GRIN; J. ROTMANS; J. SCHOT (ed.), *Transitions to Sustainable Development: New Directions in the Study of Long Term Transformative Change*. London, Routledge, p. 105-222.

SANDERS, E.B.-N.; STAPPERS, P.J. 2008. Co-creation and the new landscapes of design. *Journal of CoDesign*, **4**(1):5-18. https://doi.org/10.1080/15710880701875068

STEIN, J. 2012. *Bottom-up and Top-down Innovation: Create an Innovative Company*. New York, Simply Innovate, 192 p.

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