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ScienceDirect

Procedia - Social and Behavioral Sciences 185 (2015) 61 – 66

Procedia
Social and Behavioral Sciences

3rd World Conference on Psychology and Sociology, WCPS- 2014

Complexity Theory and the Development of the Social Innovation

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Abstract

The term of "innovation" has become increasingly frequent as people begin to recognize both the need for fundamental change in human beings' relationships with each other and their environment. This paper wants to bring up also the complexity theory matter in order for us to be able to build a connection between innovation and complex adaptive social systems. The critical question is whether and how social networks can help facilitate innovations to bridge the seemingly insurmountable chasms that separate local solutions from broad system transformation; that is, how they help innovations to "cross scales". Using a complexity lens to understand the meta challenges confronting the world, and applying a social innovation framework to illuminate how local novelty spreads so as to have broad system impacts, this paper proposes that institutional entrepreneurship enhances the understanding of agency that is active within networks. The Public sector adopts strategies for dealing with complexity, therefore, focuses on outcomes (rather than inputs and outputs) that are demonstrable and measurable (even if only qualitatively), collaboration and co-ordination (across sectors, fields, organizational boundaries etc.), decentralization and self-organization (by increasing decision making powers of local communities), building adaptive capacity (in order to support decentralization and self-organization and build resilience).

Peer-review under responsibility of Academic World Education and Research Center
Keywords: social innovation, complexity theory, systemic innovation, public sector

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Peer-review under responsibility of Academic World Education and Research Center
doi:10.1016/j.sbspro.2015.03.371

1. Introduction

With this paper we want to draw few lines between the complex environment where change happens and the result of that action, which is either a politics, a behavior or a service. When we encounter organized change, accompanied by a defined framework, we may have inovative aspects and therefore evolution.

We want to be as close as possible to the organization theory. Change appears to be here traditionnaly modeled as a punctuated equilibrium process in which long periods of incremental movement are interrupted by bried periods of cataclysmic adjustment (Miller & Friesen, 1984; Tushman & Romanelli, 1985).

With the science of complexity (Constanza et al., 1993; Kauffman, 1993; Holland, 1995) a new understanding of systems is emerging to augment general systems theory. A complex system can be distinguished from one that is simple, one that can be adequately captured using a single perspective, a standard analytical model, as in Newtonian mechanics and gas laws. By contrast, a complex system often has a number of attributes not observed in symple systems, including nonlinearity, uncertainty, emergence, scale, and self-organization.

The idea of smooth continuous change doesn't fit with the reality. The theory of change it requires the use of complexity to understand the process of change. Once concepts from complexity theory are applied, it then becomes a distinct possibility that this theory of change helps to explain sustainable change at all levels of human and social organization (Boyatzis, 2006).

Changes are often being non-linear. So, this brings us to the first feature of intentional change theory as a complex system. The change process is often non-linear and discontinuous, appearing or being experienced as a set of discoveries or epiphanies. They are emergent phenomenon that used to be described as catastrophic occurences. This is how innovation happens. The system wants to change his initial state into a more ingenious one, by adding non-linear and discontinous behavior that is meant to create new forms of existence.

2. The complexity framework of innovation

Complexity science reframes the way we perceive systems, and it is different from the other traditional approaches. There are a lot of ecosystems such as stock markets, human bodies, forest ecosystems, manufacturing businesses, immune systems, termite colonies, and hospitals that seem to share some patterns of behavior. These shared patterns of behavior provide insights into sustainability, viability, health, and innovation. Leaders and managers in organizations of all types are using complexity science to discover new ways of working (Zimmerman, Lindberg & Plsek, 1998).

Complexity scientists in the physical, natural and social sciences ask more than little questions. The questions are not new. Indeed, some of the 'answers' proposed by complexity science are not new. But in many contexts, these 'answers' were not explainable by theory . They were the intuitive responses that were known by many but appeared illogical or at least idiosyncratic when viewed through out traditional scientific theories (Zimmerman, Lindberg & Plsek, 1998). Complexity science describes how systems actually behave rather than how they should behave.

3. Innovation in the social environment

Innovation isn't just a matter of luck, eureka moments or alchemy. Nor is it exclusively the province of brilliant individuals. Innovation can be managed, supported and nurtured. And anyone, if they want, can become part of it (Murray, Caulier-Grice & Mulgan, 2010).

NESTA defines social innovation as: "innovation that is explicitly for the social and public good. It is innovation inspired by the desire to meet social needs which can be neglected by traditional forms of private market provision and which have often been poorly served or unresolved by services organized by the state. Social innovation' seeks new answers to social problems by: identifying and delivering new services that improve the quality of life of individuals and communities; identifying and implementing new labor market integration processes, new competencies, new jobs, and new forms of participation, as diverse elements that each contribute to improving the position of individuals in the workforce."

The term 'social innovation' it is used to refer to new ideas (products, services and models) developed to fulfill unmet social needs. Many are supported by the public sector, others by community groups and voluntary

organizations. Social innovation is not restricted to any one sector or field (Bacon, Faizullah, Mulgan & Woodcraft, 2008). Moreover, scientists have discovered three core dimensions: the satisfaction of human needs (content dimension); changes in social relations especially with regard to governance (process dimension); and an increase in the socio-political capability and access to resources (empowerment dimension). (Gerometta, Haussermann & Longo, 2005).

In the public sector, making an idea sustainable requires integrating the innovation into budgetary processes. That means evidence and tactics specific to the public sector. A service can sometimes be funded with new finance while other times existing services need to be transformed or replaced. But to move from pilots and prototypes to a securely established public innovation, it is often advisable to set it up as a separate venture, with public finance and a service contract that can prove itself at scale.

4. Can innovation apply to a complex adaptive system?

Innovation applies to processes and systems. When we try to limit our study to only one part of a system, we cannot see the interconnections that appear between our focus and the rest of the picture. Complexity is about a very large number of parts with emergent properties. An adaptive system is a dynamic of the networks and relationships and not a static entity. The social systems that we mentioned before are the communities, the political parties, the public services. Al of this need to progress and therefore innovation applies to them. Their behavior, the changes that occur in those systems is the translation of adaptation. Progress means not only a change, but also improvement.

In order for us to verify that we have to take three of the properties that a complex adaptive system has, and to transpose that in the meaning of innovation.

4.1 The dynamism of the network

Social systems are connected in different ways. If we take the public sector, we can scale up from the public servant to the public agency that coordinates that service. There are a lot of small local interactions and those networks increase if we add more agents in the picture. The more we connect in the world, the more we can reach new thinking for innovation. The internet allows communication and empowers it. Open data is available and accessing it makes the innovation process easier. This also makes things more permeable. We do need to layer innovation, like a cortex and we are constantly working on making connections for more innovation discoveries. This scale allows innovation to be part of the strategy, from the highest level to the one where we find people and processes. We are now talking about the framework of the innovation and as mentioned before, complexity science provides the language, the metaphors, the conceptual frameworks.

4.2 The emergent behaviour

While the results may be sufficiently determined by the activity of the systems' basic constituents, they may have properties that can only be studied at a higher level. An organization can evolve if it allows time for increased interactions because there is a lot of potential in our innovation behaviors and they will evolve the more we invest and discover the multiple options that reside in managing innovation as a discipline. The processes from which emergent properties result may occur in either the observed or observing system, and can commonly be identified by their patterns of accumulating change, most generally called 'growth'. Emergent behaviors can occur because of intricate causal relations across different scales and feedback, known as interconnectivity. The emergent property itself may be either very predictable or unpredictable and unprecedented, and represent a new level of the system's evolution. Life is a major source of complexity, and evolution is the major process behind the varying forms of life. In this view, evolution is the process describing the growth of complexity in the natural world and in speaking of the emergence of complex living beings and life-forms, this view refers therefore to processes of sudden changes in evolution.

4.3 The feedback loops

A feedback loop to control human behavior involves four distinct stages :

- Evidence. A behavior must be measured, captured, and data stored.
- Relevance. The information must be relayed to the individual, not in the raw-data form in it was captured in, but in a context that makes it emotionally resonant.
- Consequence. The information must illuminate one or more paths ahead.
- Action. There must be a clear moment when the individual can recalibrate a behavior, make a choice, and act. Then that action is measured, and the feedback loop can run once more, every action stimulating new behaviors that inch the individual closer to their goals.

Of course, innovation processes are rarely linear. The map includes several feedback loops, suggesting the role of iteration and the recursive nature of the process. At a basic level, innovation involves experimentation, making something new and testing it. To some extent, the process may be trial and error. The process may lead to new insights. Or it may prompt reframing of goals, consideration of new approaches, new generative metaphors. Success also leads to change: new beliefs, actions, and artifacts. But new ideas are still subject to natural selection (or natural destruction) in the marketplace or political process.

5. Healthcare, a major social innovation attractor in Romania

Social innovation in healthcare involves both public and private sectors. To help them develop effective solutions, we need not only products and services, but also the entire system to support them.

We need to focus on the health care organizations, as well as on professionals and patients. Incorporating a social innovation view could assist in the development towards “health care systems of the future”. The most important aspect is that this will lead to the increase of necessary knowledge bases for decision making in governance and management systems for quality and integrity control.

If it was to address some questions, we would focus on:

- Quality, productivity and performance? By this we need to figure if the health care systems are becoming more flexible and if the innovation contributes to the increase in quality and performance.
- Labor issues? In order to reply to this question we need to figure if the work and the employment relations change in the health care system, if social innovation interferes.
- Policy and governance issues? Does social innovation provides new areas for policy and governance issues of health care and what are the roles of health care insurance companies, political and economic actors in the process?
- Management issues? Does social innovation changes the role of healthcare executives and professionals, leadership competencies and frames and how does it contribute on the increase of cost-effectiveness and accessibility of health care?

Healthcare organizations are knowledge-intensive, and the need for professional development and innovations is essential. Rapid changes in treatment techniques, pharmaceutical products and legal requirements necessitate an on-going professional development (Chu & Robey, 2008). Innovations in health care organizations could be e.g. new treatment, new work practices and quality improvement as well as the introduction of new information systems. These innovations differ in degree of complexity.

Complex innovations in healthcare organizations are characterized by fuzzy boundaries, having a “hard core”, represented by the irreducible elements of the innovation itself, and a “soft periphery”, represented by the organizational structures and systems required for a full implementation of the innovation (Greenhalgh,, Robert, MacFarland, Bate & Kyriakidou, 2004).

Healthcare is a major complex system. His actors are interacting among different organizations and each of them has an important role. Their connectivity and their interdependence are major and the actions they take affect the status of the system. Innovations and inventions affect not only the processes and the rules but also the way the

health service is provided. From top to bottom or the other way around we notice a lot of interactions that are defining if the taken action has led to a good outcome or if it went into chaos. Because of its magnitude, the healthcare system is auto-organizing and it regulates itself before reaching to a catastrophic point.

In Romania, social innovation in healthcare meant the innovation of services, a new approach of their management, a new flow in the way resources were used, changes in the way health services were paid. The development of these systems in Europe highlighted two viable patterns: the Beveridge model, which is the national health system, and the Bismark model, represented by the social security model.

Romania chooses to step from the Beveridge model to the social security model. This action wasn't took based on a deep analysis, but on the knowledge and the preferences the officials had in 1989. The purpose was to have an increase in the quality of services, higher salaries for the medical staff, more resources for the system and transparency.

The actual problems in the system arise from the fact that the legislation has step far from the purpose and the philosophy of the "Insurance Law", and the analyses made have indicated a major difference between the politics and the reality of the facts. The national health security law begin to function in the late 90's and had suffered a lot of changes, which led to substantial changes from the initial philosophy.

The insecurity of the resources in the health service, between 1990 and 2007, determined a low rate of investment. Modern medical equipment and the quality of the services where not there and the staff had low salaries compared to the job they performed.

They have managed to deal with these gaps in the system by limiting the number of services that were available to the people. Cost management is very important and the access to high priced services is only available if there is a doctor's prescription for that. Managing with this complex issue was necessary as the resources were limited and everyone should benefit of a quality medical service. These measures were taken in the public services.

In Romania we also have an increasing number of private entities that offer high quality medical services. This system covers mostly the people that are willing to pay for their investigations. Still, in order to balance the needs and the resources, the public sector heath service immerged into the private sector by legal politics. The public health insurance covers a percentage of the private service if the patient wants a refund of the taxes or a support on paying them.

The health innovation is a work in progress in Romania. In order for great changes to be made we need stable objectives, consistency in politics, financial resources and qualified people. The health system needs to spend wiser the money, and not to spend more money. Patients need higher quality services, while costs remain low and while efficiency remains the same. The sustainability of the health systems is also very important and it can be achieved through innovation. It has to look beyond traditional products and services.

Acknowledgements

The complexity of the matter we are trying to approach is so big that this article cannot summarize. Healthcare is one of the major systems that needs to benefit the most from all the new developments and politics as without it, the other systems cannot comply with their scopes. A major attention is directed towards this actor and the increase of interest is noticeable within all the global politics. Finding the best pattern to perform will remain still, a work in progress.

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