Neki FRASHERI*
Gudar BEQIRAJ**

THE TRAGEDY OF INNOVATION — REFLECTIONS ON INNOVATION AND DISRUPTION IMPACTS

Abstract: Fifteen years ago we carried out a study on the history of informatics in Albania and, based on an excessive study of literature reached some conclusions on how informatics and Internet are impacting the world, focusing mainly in developing countries. Some of conclusions were simple: introduction of innovative technologies has the tendency not to solve problems but to shift them in other dimensions. Actually innovations are considered an important factor for economic growth and opening of new working places — this is a key topic in different political agendas. We argue that disruption caused by innovation does not improve a-priori economic processes, instead it may led to even spectacular but local optimizations that may be problematic for the global optimization of the economy. And this phenomenon may be even tragic for small developing countries especially in conditions of globalization. Policies in small developing countries should be carefully tuned, avoiding blind exportation of ideas from great developed countries, in order to stimulate the local sustainable growth and prosperity.

INTRODUCTION

During the difficult years of the transition in nineties we were forced to reflect on the complex of relations between technology, society and politics from multiple points of view — technical, historical and political, [1],[2],[3]. The work was facilitated due to the collaboration with the IFIP WG 9.4 group and experiences from other countries in development analyzed widely and in depth by this group. The accumulated knowledge was used for an extended work paper [4] where one of conclusions was a reformulation of Kransberg Law (*technology is neither good nor bad; nor is it neutral*) [5] as „technology does not solve the problem; it only shifts it to another 'dimension'".

Actual developments are oriented towards applied research and innovation more than basic research, conditioned by economic and market requirements in

* Academy of Sciences of Albania

an accelerating [6] and globalizing world. Innovation is seen as an important factor for economic growth, included in political agendas and research programmes, and promoted in all levels of scientific collaboration and publication. But it seems that things are not so clean and beautiful and the Kransberg Law remains valid.

First, a question remains — are all countries able to exploit in proper degree results of innovation? The concept of difference of rationales is well known in scientific circles [7] but not reflected in political agendas of international collaboration characterized by import of solutions „copy — paste", a phenomenon identified in developing countries. The well-known argument that it is necessary to have the research budget over certain limit in order to have impact in the economy is widely used in political discussions, supported by statistics, but without a clear analysis how much may a developing economy may absorb the results of its own research and which are ways of that absorption depending on specifics of each country.

Second, it has to do with the concept of innovation and its specific impact in the economy and society — the disruption. In social media one may find „strong" propositions like for example social media blogs [8], [9], [10], [11], [12], [13]; but also the issue is discussed in-depth in scientific media, a short review presented in the next section of this paper.

DISRUPTIVE INNOVATION — GOOD OR BAD?

Disruption affects both the economy and the society — the way of life. In particular Information and Communication Technologies (ICT) are merging the big world in a „small" village. Following the logic of Kransberg, this impact is is positive as well as negative; and Clayton explains the latter aspect that „*a trend has emerged where the benign and correct use of ICT may unexpectedly result in social disruption and harm to others, resulting in consequential damages*" [14]. One may argue about ethics [15] and responsible innovation [16] but the problems cannot be solved simply with words:

— How far we may predict short-time and long-time impacts of innovation, and

— How we may find applicable solutions for problems conditioned by contradictory factors?

In 1980 Collingridge defined a dilemma: „*At the initial stages of a new technology, knowledge about its consequences (including undesired outcomes) is limited; Later we have more systematic knowledge about costs and benefits of technology; by this stage, change is costly and difficult to achieve; technology is entrenched; must confront powerful vested interests…*" [17]. Schomberg accepts that „*personal lives become … more constrained as more choices are offered and communication is increased*" in his report for the European Commission [18]. Negative impacts of innovation may remain invisible for a long time. For example Ferguson et al identified a hidden negative impact of the Internet: „*People are less willing to rely on their knowledge and say they know something when they have access to the Internet, suggesting that our connection to the web is affecting how we think*" [19]. Analyzing autonomous vehicles, Bonnefon et al pointed out the „*formidable challenge to define the algorithms that will guide AVs confronted with moral dilemmas*" [20]. Responsible innovation has

its own limits. Robin [21] concludes that „*anticipation techno-social futures have often been disappointing extrapolated from a limited and somewhat stereotypical set of narratives …*". Rip and TeKulve consider the impact as „*even less clear — attempts to find out about them are then social science fictions*" [22]

From economic point of view, half century ago Ted Levitt pointed out that „*companies develop significant myopia over time, only seeing things that are squarely in the mainstream of their market*" [23] and as result became prey of innovations that target neglected market areas. The idea was further developed by Clayton [24] with the „*innovator's dilemma*" that „*doing the right thing is the wrong thing.*"; who defined „disruptive innovation" as selling products that initially target less profitable customers but eventually takes over and devours an entire industry, not because of missed opportunity but the velocity of history. Lepore details that disruptive innovation has not been subject to serious criticism because it's headlong and the modern concept of innovation is the idea of progress [25]. The process of innovation disruption that targets grassroots of market to explode upwards is described by Clayton in [26] — big companies that target higher levels of the market react slowly losing their market — disruption happened.

The „verdict" of King and Baatartogtokh is that „*it's not nearly as valuable as its proponents argue*" [27]

MODELING OF DISRUPTION IN ECONOMY

Innovation has been and remains the engine of the progress of human society, and negative comments towards it may sound like absurd. Nevertheless the progress is not without pains — World changes and the first key issue is how individuals may adapt in time to such changes.

The second key issue is the complexity of socio-economic relations. If we focus on specific sectors and forget the complexity of inter-sector relations, we cannot evaluate correctly the overall and long term impact of innovations. We may simplify model the socio-economic system with two circular flows of threads entangled in complex braids rotating against each other (Fig. 1) in a dynamic equilibrium.

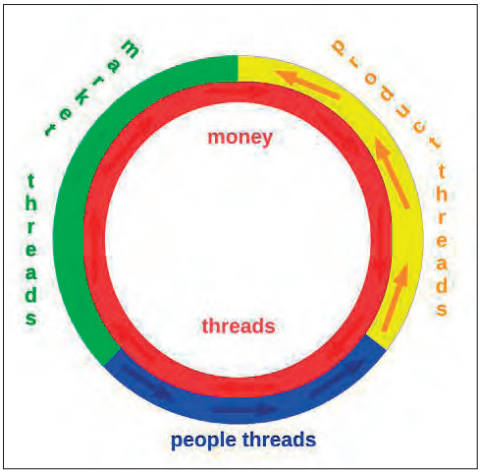
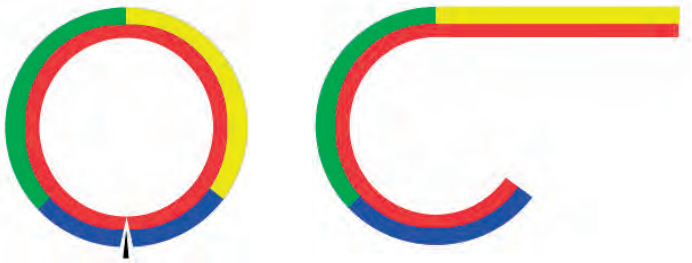


Fig. 1 — a simplified model of socio-economic complex relations

Disruption in this system happens when some threads are cut or braids reshuffled, and the crisis situation may last until a new equilibrium is achieved in the system. In the post war period the world has experienced two characteristic disruptions:

— Automation of industry, which cut part of links between people and product threads together with entan-



(a) (b)

Fig. 2 — disruption from (a) automation and (b) export of capitals

gled braids. Nevertheless all components of the system remained in local and the system somehow reached a new equilibrium (Fig. 2 a).

— Exportation of capitals, which caused significant cuts of links between people and product threads together with entangled money threads and, differently from automation it shifted cut ends of product — money braids far away (Fig. 2 b). This made impossible for the system to reach equilibrium …

In this system the component that reacts slower compared with others is people — fast changes in the production or market components are followed with difficulty by people especially aged generations. Innovation creates premises for fast changes in production and in market. Slow reaction from people and big companies creates the disruption, and disrupted companies generate an avalanche effect disrupting more people. Focusing at innovation as a"tool" to open new businesses means focusing for local improvements that on the other side create disruption and problems for the whole system. It is local optimization versus global optimization — it is well known that the probability of the former to „kill" the latter is significantly high.

Today innovation is accelerating considerably, apparently more from to concurrency instead of real requirements of people. This creates disruption and crisis situations. Local innovations may force reshuffling of braids of socio-economic relation threads, resolving one crisis with a new one. While globalization makes difficult for the system to reach equilibrium in local scale. Reshuffling of markets is also pushed by big companies „overloading" them with varieties of products and services proposed and promoted (not requested) by people. Typical examples are smartphones that come with lot of preinstalled software, part of which not used by people, locked against uninstallation, which services are less important in the hierarchy of human needs.

Risk analysis and ethical evaluation of projects impacts is requested by many development programmes. But an old proverb says „from saying to doing is a full sea". Conclusion of research (Kransberg, Clayton, Collingridge etc.) is that the real impact of innovation is very difficult to predict. Science Europe Scientific Committee for the Humanities in its report [28] emphasizes the need for taking into consideration the human dimension in innovation policies, which is missing in actual European policies.

CONCLUSIONS

Innovation is one of key topics in political agendas, strategies and development programmes. It is considered as an important factor of growth and new working places. This is correct — innovation has been the engine of development. The other side of the medal — forced / accelerated innovation creates disruption in a complex of socio-economic relations that are practically impossible to fully understand and manage. This kind of disruption impact contradicts the political goals of innovation.

We argue that disruption caused by innovation does not improve a-priori economic processes, instead it may led to even spectacular but local optimizations that may be problematic for the global optimization of the economy. We are forced to live in such world characterized by significant changes fueled by the innovation disruption and in order to evaluate and lessen global negative impacts the focus should not be simply innovation per-se but include human relations impacted by innovation.

This phenomenon may be even tragic for small developing countries especially in conditions of globalization. Big / small / developed / less developed countries have their individual specifics conditioned by their history and geographical position, and the ways of absorption of innovation results is different. Policies in small developing countries should be carefully tuned, avoiding blind exportation of ideas and tendencies of competition with big / developed countries, in order to stimulate the local sustainable growth and prosperity.

Crucial questions are related with what science and innovation we need, and how we may exploit its results. Running blindly towards „popular" topics and [*the subjective*] impact factor while having less resources compared with other countries is useless adventure. Even in case of significant innovations it may be exported for marketing abroad there where the economic and industrial capacity is suitable for its absorption and further development. At the same time we have lot of needs that require strong collaboration between politics and research, not in the form of nice written strategies and platforms but through concrete collaboration and involvement in the process of practical resolving of the needs.

REFERENCES

[1] G. Beqiraj, N. Frasheri: „Albania — contradictory story of applied information systems." *IFIP WG 9.4 International Working Conference „Implementation and evaluation of information systems in developing countries", 18–20 February 1998, Bangkok — Thailand.*

[2] N. Frasheri: „Recent IST development in Albania — new trends and new problems." *IFIP WG 9.4 Conference „Information flows, local improvisations and work practices", 24–26 May 2000, Cape-Town, South Africa.*

[3] N. Frasheri: „Reflection of policies for effectiveness of IS implementation in DCs." *Newsletter of IFIP WG 9.4 and Commonwealth Network for Information Technology, v. 8, no. 3, July 1998*

[4] N. Frasheri: „E-Governance, International Cooperation and Security — New Millennium Challenges for a Small Country." *SSRC ITIC 2001 Work Paper. SSRC ITIC Program Fellow — Summer 2001. http://arxiv.org/pdf/1312.2246.pdf*
[5] M. Kranzberg: „Technology and History: „Kranzberg's Laws"." *Technology and Culture, Vol. 27, No. 3, pp. 544–560.*
[6] B. Bimber: „The Internet and political transformation: populism, community, and accelerated pluralism." *Polity v 31, n 1. 1998.*
[7] C. Avgerou: „Recognizing alternative rationalities in the development of information systems." *EJISDC, v 3 r 7. 2000*
[8] C. Popp: „Innovation is a Dirty Word — Looking for Animation." *http://www.linkedin.com/e/v2?e=3D113lyp-i0tjtkx3–1y&t=3Dgde&m=idToken=3DAQE_rrykeGXxyQ&ek=3Db2_anet_digest&li=3D75&m=3Dgroup_=discussions&ts=3Dtextdisc-0&itemID=3D5923592223307350016&itemTy=pe=3Dmember&anetID=3D3731775 (3 Oct 2014)*
[9] W. A. Sussland: „Deadly Sins of Innovation Strategies." *http://www.linkedin.com/e/v2?e=113lyp-hv7zd1pw-4n&t=gde&tracking=eml-b2_group_digest-grouppost-textdisc-0&ek=b2_anet_digest&itemID=5872265831332741120&anetID=4427025&itemType=member (15 May 2014)*
[10] F. L. Rajas: „Is Innovation a Buzzword? Bringing down three myths about innovation." *https://www.linkedin.com/pulse/innovation-buzzword-luis-rajas-fern%C3%A1ndez [retriev. Feb 23 2016]*
[11] F. L. Rajas: „Innovation is Just an Excuse." *https://www.linkedin.com/pulse/dont-you-see-innovation-just-excuse-luis-rajas-fern%C3%A1ndez [retriev. Feb 23 2016]*
[12] P. Hobcraft: „Caught in the Headlights of Disruptive Innovation." *https://paul4innovating.com/2016/03/02/caught-in-the-headlights-of-disruptive-innovation/ [retrieved in 3. 3. 2016]*
[13] K. Drotner: „Disruptive innovation: requires humanities' input." *http://www.euroscientist.com/disruptive-innovation-requires-humanities-input/ [retrieved in 9. 4. 2016]*
[14] C. J. Pavlovski: „Information & communications technology evolution and consequential damage." *In Record of the Communications Policy & Research Forum 2007 compiled by Franco Papandrea and Mark Armstrong. ISBN 978–0-9804344–0-8. Network Insight Pty Ltd. October 2007*
[15] B. C. Stahl: „IT for a better future: how to integrate ethics, politics and innovation." *Journal of Information, Communication & Ethics in Society. Vol. 9 No. 3, 2011. pp. 140–156*
[16] R. Owen, J. Stilgoe, P. Macnaghten, M. Gorman, E. Fisher, and D. Guston: „A Framework for Responsible Innovation." *In Responsible Innovation, edited by Richard Owen, John Bessant and MaggyHeintz. John Wiley & Sons, Ltd. 2013*
[17] D. Collingridge: „The social control of technology." *Frances Pinter, 1980*
[18] R. von Schomberg: „Research and innovation in the information and communication technologies and security technologies fields." *A Report from the European Commission Services. Directorate General for Research and Innovation, 2011.*
[19] A. M. Ferguson, D. McLean, E. F. Risko: „Answers at your fingertips: Access to the Internet influences willingness to answer questions." *Consciousness and Cognition 37, 2015*
[20] J.-F. Bonnefon, A. Shariff, and I. Rahwan: „Autonomous vehicles need experimental ethics: are we ready for utilitarian cars?" *arXiv: 1510.03346 v 1, 12 Oct 2015*
[21] W. Robin: „Bridging the big divide: on the uneven gaze of science, technology and innovation studies." *Future of Science and Technology in Society: Symposium in Honour of Arie Rip. University of Twente, 16 — 17 June 2011*

[22] A. Rip and H. TeKulve" „Constructive Technology Assessment and Socio-Technical Scenarios." *The Yearbook of Nanotechnology in Society, Volume 1: Presenting Futures. E. Fisher, C. Selin and J. M. Wetmore, Springer 2008.*
[23] A. Scott: „How Understanding Disruption Helps Strategists." *Harvard Business Review 11, 2015. https://hbr.org/2015/11/how-understanding-disruption-helps-strategists*
[24] C. M. Clayton: „The Innovator's Dilemma: The Revolutionary Book That Will Change the Way You Do Business." *Harper Business Essentials, 2011*
[25] J. Lepore: „The Disruption Machine — What the gospel of innovation gets wrong." *Annals of Enterprise. The New Yorker, June 23, 2014.*
[26] C. M. Clayton, M. F. Raynor, R. McDonald: „What Is Disruptive Innovation?" *Harvard Business Review 12, 2015. https://hbr.org/2015/12/what-is-disruptive-innovation*
[27] A. A. King and B. Baatartogtokh: „How Useful Is the Theory of Disruptive Innovation?" *MIT Sloan Management Review, Fall 2015*
[28] SESCH: „Radical Innovation: Humanities Research Crossing Knowledge Boundaries and Fostering Deep Change" *Science Europe Scientific Committee for the Humanities Opinion Paper, Dec. 2015, http://www.scienceeurope.org/uploads/PublicDocumentsAndSpeeches/SCsPublicDocs/151222_HUMAN_OP_Radical_Innovation_web.pdf*