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Responsible innovation and reverse logistics

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Introduction

It was not until the recent few years that the terms 'responsible innovation', 'responsible research and innovation' and 'responsible development' emerged in academic discussions. Terms draw attention of policy decision-makers as well as business organizations in their response to increased social, cultural and also legislative pressures that expand the responsibility of firms to increase attention to social and environmental concerns.

European Commission (EC) workshop in Brussels presented a report in 2011 where responsible (research and) innovation has emerged on the formal agenda because: "*innovation policy actors across sectors are drawing on past experiences in the hopes of motivating the development of technologies for social benefit, preventing both disasters and the loss of promising technological advances, and addressing public anxiety over unintended and irreversible consequences*", (Guston *et al.,* 2014, p. 3). The EC report argues that globalization and the loss of public trust in elite public and private institutions have fed apparently competing imperatives for a more deliberate and yet more accelerated approach to innovation.

The message is clear, we need to keep innovating, however we need to do it differently, that is more responsibly. The challenge provides significant opportunities for creating alternative products and services, new business models and ways of working as well as more efficient approaches to resource exploitation and energy consumption. There are good examples in the recent history of technology and innovation which indicate that taking the moral and ethical point may sometimes bring unexpected and unintended rewards.

IBM, known for is hard-nosed approach to business, is one example where their business practice in Montpellier (France) not only met broader societal and economic needs, but also offered interesting new business model which encompasses good business logic with environmental needs.

Keh *et al.* (2012) in their article, based on an IBM Montpellier case study, examined how an integrated reverse logistics model can enable companies to meet three main sustainability objectives and presented economic, environmental and social benefits.

Our study examines responsible innovation concept of integrated reverse logistics model under which we question: "*how is integrated reverse logistics model implemented on a multiple case study scenario?"* considering social, economic and environmental implications. By doing so, this paper contributes to the scholarly debate and literature on the development of the responsible innovation framework, and more narrowly, application of such a framework in practical business example.

This paper is organized as follows: next section highlights theory development. Hence, research methods, modes of analyzing and interpreting data are described. Activities, preliminary findings and conclusion are discussed in following sections.

1. Theory development

In this paper we will not challenge the presupposed concept of innovation in the responsible innovation literature. The guiding assumption here is that "*right from the start, research, development and design [can] incorporate relevant ethical and societal aspects*" (Blok *et al.,* 2014). If we incorporate ethical and societal aspects in the innovation process right from the start, it is believed that the innovation process can be steered in desired directions and that ethical and societal conflicts can be solved.

1.1. Responsible Innovation

Responsible (research and) innovation is emerging as a powerful science policy discourse, particularly in Europe. The notion is receiving ever-increasing attention from the media and the industry world. It has become a popular research topic, having different funding programmes and conferences, and its own *Journal of Responsible Innovation*[1].

Idea and concept lie in a more responsible adoption of innovation. Innovation is defined as the process of making changes to something established by introducing something new. As such, it can be radical or incremental, and it can be applied to products, processes or services and in any organization. It can happen at all levels in an organization, from management teams to departments and even to the level of the individual (O'Sullivan *et al.,* 2009). However, during past several decades we have witnessed that innovations in business context were not always

[1] *Journal of Responsible Innovation* had its first issue in 2014, on initiative of Virtual Institute for Responsible Innovation, linking American efforts in RI at the Center for Nanotechnology in Society at Arizona State University. Available on this link: www.tandfonline.com/loi/tjri20?open=1&repitition=0#vol

responsible, having negative impact on individuals, societies and eco-systems in favor of economic growth and shareholder value creation.

The challenge of responsible innovation lies, as mentioned, in a more responsive, adaptive and integrated management of the innovation process. Determining what responsible innovation is and how it can be realized or productively contested in specific research and development process, implies that the gaps among the fields of ethics, social science, law and economics (as well as natural sciences and engineering) need to be clarified, explored and spanned.

Although responsible innovation concept is rapidly evolving, there is no authoritative definition available. Von Schomberg (2011, p. 9) proposes definition of responsible innovation as: "*a transparent, interactive process by which societal actors and innovators become mutually responsive to each other with a view on the (ethical) acceptability, sustainability and societal desirability of the innovation process and its marketable products (in order to allow a proper embedding of scientific and technological advances in our society)*".

As to Marc Ingham, author of the book *Vers l'Innovation Responsable*, responsible innovation appoints: "*voluntary integration of social and environmental dimensions in the strategies, by which production and marketing of more efficient solutions provide as a consequence creation of societal value*" (Ingham, 2011, p. 11). Responsible innovation, like so, creates societal value (economic, social, environmental) and contributes to well-being of individuals and collectives.

Business organizations need to innovate in order to survive and remain profitable in an ever increasingly competitive environment. Becoming a 'responsible' business involves integrating a concrete strategy and sustainable process to that purpose, which cannot happen overnight. KARIM (European Network for Responsible Innovation) notes that such a strategy is long term process which is based on three axes which question the solutions to be developed in response to consumer needs, monitoring and managing direct impacts of innovation on social, economic and environmental factors, and considering the indirect consequences of innovation (KARIM Network, 2011). Stilgoe *et al.* (2013) proposed four dimensions that make up framework for responsible innovation: anticipation, responsiveness, reflexivity, and inclusion.

It is evident that both academic and business worlds are attempting to come to terms and frameworks with concrete definitions and examples of responsible innovation, trusting that this will somewhat ease the implementation of this new concept.

1.2. Reverse Logistics

Reverse logistics is a process in which manufacturer manages product return for possible reuse, revalorization or recycling (Keh *et al.* 2012). Reverse logistics deals with the *end-of-life* phase of products life cycle, in a closed-loop Supply Chain. Closed-loop Supply Chains include traditional forward Supply Chain Management, adding extra activities of the reverse supply chain, in order to manage the flow of secondhand products aimed to be recycled. Reverse logistics is thus characterized by five main disposal options: *remanufacturing*, *repair*, *reuse*, *recycling* and *disposal* (Figure 1).

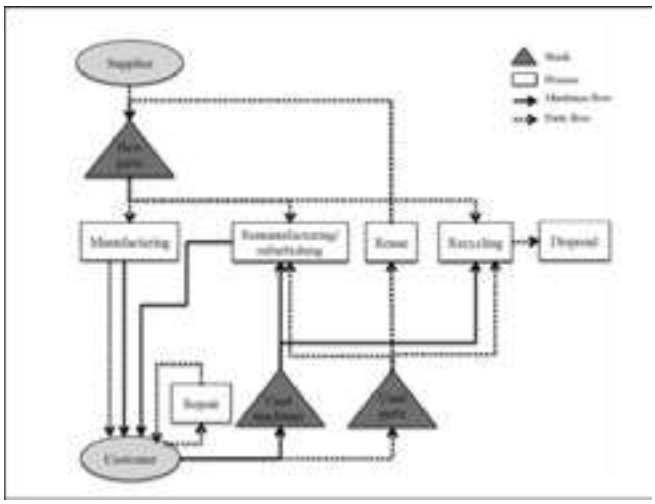


Figure 1: The closed-loop supply chain. Keh et al. (2012)

Keh *et al.* (2012) in their article, based on an IBM Montpellier case study, examined how an integrated reverse logistics model can enable companies to meet three main objectives: (1) provide economic opportunities through the resale or reuse of machines and parts, (2) successfully deal with environmental challenges such as waste management and legislative compliance, and (3) achieve an important social challenge in terms of local job preservation (Figure 2).

This four-year case study performed at our institute, reveals that integrated reverse logistics model is likely to present economic, environmental and social benefits, but it still leaves open a question of *harmonious balance* among economic, environmental and social components of the process. This offers scholars directions for future studies. Our paper suggests examining multiple examples of successful integration of reverse logistics process according with Brundtland's Theory (WCED, 1987).

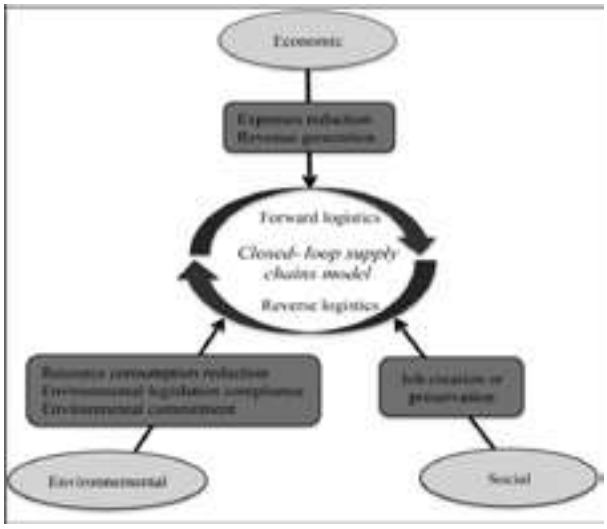


Figure 2: The driving forces of an integrated reverse logistics framework (Keh et al., 2012)

2. Research method and planned activities

We chose for this specific research to conduct a qualitative research. Qualitative research methods were developed in the social sciences to enable researchers to study social and cultural phenomena. Examples of qualitative methods are action research, case study research and ethnography (Yin, 2013; AIS, 2013; Edmondson and McManus, 2007; Eisenhardt, 1989). Performing a qualitative research enables us to use a variety of approaches, methods and techniques, which offer development of an integrated framework for the research.

Phenomena which we plan to investigate would be based on case studies, and would include interviews and questionnaires as main sources of information. Documents, websites and other relevant papers of the case studies will be collected and analyzed.

Our strategy is to perform several in-depth case studies and develop a theory based on the data collected. Such an approach would allow us to develop deeper understanding of various models of reverse logistics in use in their socially embedded contexts and organizational actions related to their use. Preferred sample group for performing case study would be Original Equipment Manufacturers (OEM) in domain of Information and Communication Technologies (ICT).

Unlike other areas of Research and Innovation such as genetically modified organisms, nuclear power or nanotechnology, ICT does not raise general concerns. At the same time, ICT has a large and growing effect on our individual

and collective lives. The pervasive use of ICT in modern societies enables countless opportunities for individuals, institutions, businesses and scientists, but also raises various environmental and social problems (van der Hoven *et al.,* 2010). Management of Waste Electrical and Electronic Equipment (WEEE) is one of the issues where ICT takes a major part globally, often in negative context (Fallery and Rodhain, 2012), and which can be addressed and significantly reduced by incorporated reverse logistics model. Further discussion is required.

Based on our findings, we will be able to identify how companies manage features of the reverse logistics process (identify specific barriers companies encountered during implementation phase) and present benefits of reverse logistics as an innovative process which carries notion of responsibility in its core, integrating ethical and moral values.

Conclusion

Based on our research so far, we conclude that innovation can provide solution to existing problems originating in environmental and social concerns. Reverse logistics is one of the examples where good business logic, aligned with socio-economic goals, offers opportunities to gain competitive advantage and increase market value. Based on responsible innovation concept, we will present benefits of integrated reverse logistics model on multiple case study scenarios. Secondly, our paper will provide empirically grounded basis for further theorizing about the responsible innovation concept.

General discussion about the subject will lack comprehensiveness without considering factors for achieving impactful research. In this context, research of universities can be considered as extra-industry sources of knowledge. Research institutes and universities in particular are sources of innovative and emerging technologies (marked as important stakeholders of European Commission HORIZON 2020 program). However, they are, in general, not the kind of organizations that focus on technology development or the exploitation of technology in commercial markets. Thus, collaboration between academic and industrial sector and creation of networks would offer us development of indicators across different sectors and technologies to illustrate how responsible innovation frameworks might be used across different disciplinary contexts.

In short, responsible innovation requires interdisciplinary research. We suggest that responsible innovation can be realized by involving science and engineering, since theory and practice of RI have an unfortunate tendency to become separated.

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