Innovation Process and Ethics in Technology: An approach to ethical (responsible) innovation governance

DR GANESH NATHAN

FHNW & BSL (SWITZERLAND)

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Introduction

- This presentation is based on the forthcoming article:

Nathan, G. 2015 (forthcoming). Innovation Process and Ethics in Technology: An approach to ethical (responsible) innovation governance, **Journal on Chain and Network Science**, Wageningen Academic Publishers

A special issue on Responsible Innovation

- One of the references:

Nathan, G. 2014a. Technological innovation and ethics, In*: **Innovation Ethics: African and Global Perspectives***, eds. J-C. Bastos and C. Stuekelberger. Globethics.net series “Global”.

Outline

- Introduction
  - Why do we need ethical (responsible) innovation governance models?
- Emerging and converging technologies
  - E.g. ICT, nanoscience, nanomedicine
- (Un)ethical decision-making framework
- The issues with linear technological innovation process models
- Proposal for a circular innovation process model for responsible innovation governance
- Conclusion and further research

Innovation governance models

- Traditionally, governance is related to risk management
- Innovation governance usually refers to the organizational structure for innovation within a firm, in order to minimize risk and maximize return on investment
- The main goal of innovation governance may be understood as the alignment of structure and process along with strategy, culture and leadership for effective innovation management
- Therefore, the scope of innovation can vary
- Giving importance to ethical governance can lead to management and leadership taking measures to be ethical

Responsible Innovation

René von Schomberg (2013: 63), the European Commission's Directorate General for Research and Innovation, proposes the following definition:

- *Responsible Research and Innovation is a transparent, interactive process by which societal actors and innovators become mutually responsive to each other with a view to 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)*.

Technological evolution, innovations and ethical concerns and dilemmas

- Technological innovations have been blinded to ethical impacts and concerns (Nathan, 2014)
- Technological evolution faces many challenges to the environment and society, as well as to humanity
- Social constructivist perspective underscores interactions among consumers, designers, actual and potential users (Grübler, 1998)
- Technological innovations are not always embraced wholeheartedly and are subjected to societal disapproval and rejection
  - E.g. EPRS (Electronic Patient Record System) and smart electricity meters in the Netherlands

Ethical implications of ICT

- Predictable ethical issues
  - Privacy, security, trust, liability and digital divides
- Less predictable ethical issues
  - View of humans (therapy vs. enhancement, normality, morality and identity)
  - Power relationships
  - Changing cultures and the environment
- Ethical issues from different perspectives
  - Law, (institutional) ethics, gender and technology assessment (Stahl et al. 2013)

Converging technology

- Combinations of (emerging) technologies (Roco & Bainbridge, 2002)
  - E.g. nanotechnology, medicine and ICT -> nanomedicine and nanophramacy
- There are myriad potential ethical and social issues stemming from these combination of technologies
- It is important to consider how morally contentious issues of one technology may affect others (Nathan, 2014)

A framework for understanding (un)ethical-decision making

- The four-stage model (Jones, 1991)
  - Stage 1: recognizing the moral issue
  - Stage 2: making a moral judgement
  - Stage 3: establishing moral intent
  - Stage 4: engaging in moral behaviour

- These stages are affected by both individual and situational factors (including organizational, context-dependent and issue-dependent factors) (Crane & Matten, 2010)
- There are challenges and issues making ethical decision overcoming impediments and unexpected difficulties

Some implications for managers

1. Managers need to recognize a moral issue
2. They should be able to make moral judgements not entirely relying on consequentialist thinking of cost-benefit analysis
3. They also need to be aware of both personal and organizational factors influencing their decision-making
4. Managers need to consider all the stakeholders who may be affected by their decisions and potential ethical impacts
5. Managers need to engage with all concerned stakeholders with understanding of their interests, rights, responsibilities and duties as well as their ethical concerns and dilemmas (a stakeholder map will help)

Innovation process models and decision-making

- Innovation process models simplify complex processes and procedures for the sake of understanding and refining the innovation process and introducing changes required
- Innovation decision-making is not an easy and simple task of making choices between 'clearly defined options' (Tidd and Bessant, 2009)
- The innovation process models attempt to convert 'uncertainty to risk' through knowledge (Tidd and Bessant, 2009)
- However, there are risks associated with technological lock-in and path dependency (Collinridge, 1980)

Some innovation process models

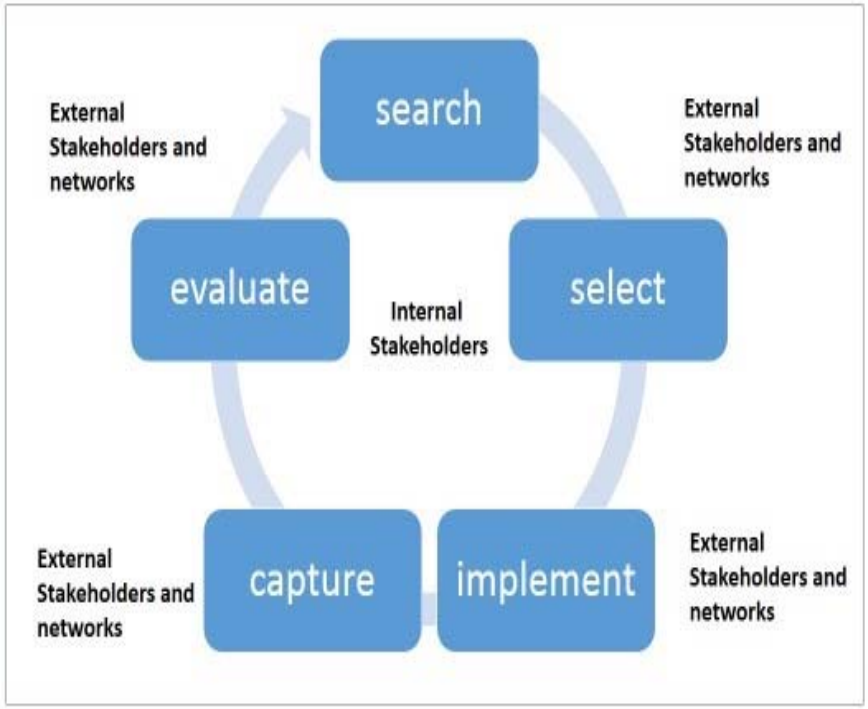
- The stage-gate approach (Cooper, 1998 & 2008)
  - Attempts to minimize risks of failure, from idea generation to product launch
  - Gate-keepers make decisions whether to allow to the next stage – mainly based on the criteria for potential for commercial success – cost-benefit analysis
  - It is a linear process and closed to external stakeholders and lacks feedback loop from launch
- Open innovation process model (Chesbrough, 2003)
  - Open to external stakeholders' engagement
  - Again, it is a liner model and lacks feedback loop

Simplified value chain approach

- Four key phases: Search, Select, Implement & Capture
  - It is again a linear model – sequential and open ended
  - Emphasizes the importance both internal and external knowledge sources

- The above mentioned structures and processes are simplified linear models to grasp major innovation drivers and capabilities, ignoring nuanced approaches to ethical decision-making process along with positive and negative impacts on society and the environment.
- With the linear innovation process models, at least conceptually, responsibility starts with the beginning of the process and finishes with the end of process. Responsibility may not end with the launch of products/services.

Circular responsible innovation process model



Source: Nathan, 2015

Responsible innovation governance

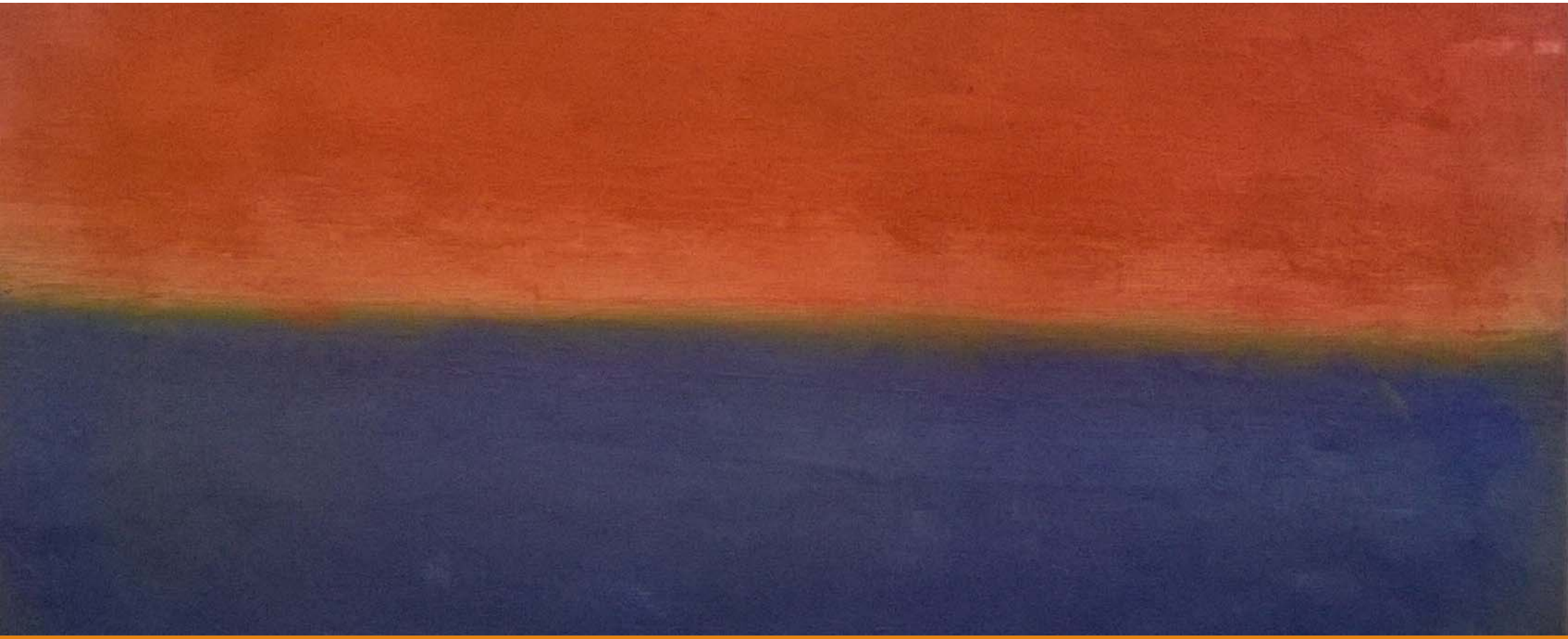
- Must embed ethical decision-making framework
- Implement circular responsible innovation process model instead of linear one
- Understand all relevant stakeholders' interests, rights, responsibilities and duties as well as ethical concerns and dilemmas (stakeholder map)
- Deliberate with those and engage through moral imagination and systems thinking and multiple perspectives find solutions that mitigate those ethical concerns that no stakeholder can reasonably reject
- Include anticipatory, reflective, deliberative and responsive dimensions of responsible innovation (Owen et al. 2013)

Conclusion

- Innovation decision-making should include ethical decision-making framework
- Solutions to be sought through stakeholder dialogue, deliberation and engagement
- Incorporate moral imagination, systems thinking and multiple perspectives
- Include participatory and anticipatory mechanisms
- Take collective responsibility seriously

Future research directions

- Understand challenges, dilemmas and constraints when implementing responsible innovation governance
- Through empirical and qualitative research methods



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