Exploring regulatory barriers for the use of Data-Driven Innovation in the management of key infrastructures.

by Brenda Espinosa & Saskia Lavrijssen

Tilburg University

Understanding Society

Outline

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1. Research Background

- Legal & Organisational Network & Governance Aspects of Data-Driven Innovations in Infrastructure Management (LONGA VIA) – NGInfra Responsive Innovations Programme.
- Project leader: Saskia Lavrijssen.

Objectives:

- Identifying legal/regulatory barriers (focus on Dutch and EU level) for the implementation of DDI in smart operation and maintenance of the infrastructures & cooperation across sectors (focus on energy, water and transport).
- Developing policy recommendations to address the identified barriers.

ProRail

Port of Rotterdam

Rijkswaterstaat

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2. DDI & infrastructure management

- **Definition of Data-Driven Innovation (DDI):**

  Significant improvement of existing, or the development of new, products, processes, organisational methods and markets arising from the dynamics generated by the use of big data (OECD, 2015).

- **‘The rise of Big Data’**
  - Increasing availability of large amounts of data at low cost.
  - Increasing ability of organizations to analyze and extract value from data.

  (Mayer-Schönberger and Cukier, 2013).

- **Big Data as a driver of innovation (positive economic and social impact).**

http://www.oecd.org/innovation/data-driven-innovation-9789264229358-en.htm

2. DDI & infrastructure management

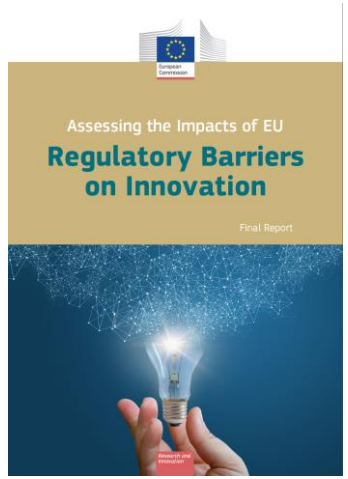
Opportunities brought by DDI in infrastructure management.

- Key role of infrastructure in society's life.
- Public values associated to infrastructure (e.g. affordability, reliability, safety, sustainability, efficency).
- Examples of DDI for infrastructure management (sensors, smart meters, smart grids, IoT, AI).
  - ✓ Transport
  - ✓ Energy
  - ✓ Water
  - ✓ Integration of multiple sectors.
- Regulatory barriers (broad sense) may deter/create challenges for the use of DDI in infrastructure management.

https://www.etfresearchcenter.com/articles/index.php/2017/03/14/etfs-for-an-infrastructure-surge/

3. ‘Regulatory gaps’ as a barrier for using DDI in infrastructure management.

- **Report on the Impacts of EU Regulatory Barriers on Innovation (European Commission, 2017):**
  - Focus on energy, water, health and food sectors.
  - Gaps in regulations and other regulatory issues may hamper innovation.
  - Addressing regulatory barriers contributes to increase investments in innovation.



- **Special challenges in the context of infrastructure management:**
  - Energy, water, transport are highly regulated sectors.
  - Uncertainty regarding responsibilities and rights.
  - Doubts regarding cost recovery (tariff regulations).
  - Uncertainty of the approach that future regulations will follow.

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http://publications.europa.eu/resource/cellar/6e4ce9f8-aa41-11e7-837e-01aa75ed71a1.0001.01/DOC_1
http://sustainablejill.com/does-your-personal-effort-to-save-the-environment-make-any-difference/question-mark-red-3d-glossy/

3.1. ‘Regulatory disconnection’

- Term coined by Law & Technology scholarship to refer to **“law’s race to keep up with technological change”** (L. Moses, 2007).
- Technological innovation opens up new possibilities of action → reveals different regulatory issues, including gaps.
- Gaps = need for rules to limit or enable innovation.
- 2 major roles of regulation with regard to innovation:
  - Filter out unethical or problematic innovations → precautionary intervention.
  - Maximize benefits and minimize harms → facilitation or promotion.

Flexibility and adaptability → key aspects to enable innovation.

Different regulatory strategies:

- *Who creates the rules?*
  - Agency specialized on innovation.
  - Co-regulation
  - Self-regulation
- *Broadness of the rules*
  - Principles-based
  - Technology neutral
  - ‘Sui generis rules’
- *Monitoring and adaptation*
  - Mandatory periodic reviews.
  - ‘Sunset clauses’
  - Experimental legislation

http://self-love-u.blogspot.com/2017/07/disconnection-is-rejection.html

3.2. Illustrating the disconnection

Smart Water Meters (SWM) for households in the Netherlands

- No European or Dutch legislation (unlike electricity and gas smart meters).
- Technology is available but Dutch drinking water companies have not initiated a roll-out for households.
- **Applying the theoretical framework of 'regulatory disconnection'**
  - No inmediate threat to health, environment or human dignity → no need for precautionary intervention.
  - Rules might be necessary to reap benefits and control risks:
    - ❑ **Benefits:** Timely monitoring; precise consumption measurement; easing and lowering the cost of meter reading; balancing customer demand; prompt leaking detection and reparation. Linked to public interests behind drinking water supply: affordability, security of supply, rational use, consumer protection.
    - ❑ **Risks:** Mainly related to privacy concerns → insights into private and family life.
  - ❖ ***Dutch experience with regulations for electricity smart meters***

4. Conclusions

- DDI has the potential to improve the management of infrastructures used in key sectors (energy, water and transport) → achievement of public values (e.g. reliability, affordability, safety, sustainability).
- DDI raises questions regarding the suitability of existing regulatory frameworks to acknowledge and deal with both the opportunities and possible risks, often evidencing regulatory gaps.
- The lack of rules → uncertainty regarding the possibilities of action in highly regulated sectors → hinders innovation and prevents the realization of the advantages that DDI may bring for the general public.
- Regulatory gaps → result of a disconnection between increasingly fast technology and legal systems that are not sufficiently flexible and adaptive.
- New rules might be necessary to govern new dynamics enabled by innovation → limit harms and maximize benefits.
- Opportunities and risks should be adequately balanced when deciding if a certain type of DDI is worth promoting via the enactment of regulations, and how those regulations should look like. Privacy → pressing issue in light of DDI.

Further Research

- Other types of barriers/challenges (outdated regulations, stringent requirements, unclear regulations, etc.)
- Governance of data: who retains the ownership? for which purposes can data be used? who can access the data? will the Clean Energy Package contribute to solve these questions in the energy sector?
- In European context: impact of GDPR (and proposed e-privacy Regulation) in the management of personal data employed by DDI in infrastructure management.
- Exploring the synergies that cross-sectoral cooperation in the management of infrastructure can enable, particularly by means of data sharing, and the regulatory challenges that come along with it.
- Common governance issues related to DDI in different infrastructure sectors → opportunity to think of a cross-sectoral regulatory approach?
- Comparative research to identify approaches employed around the globe.

Contact

Brenda Espinosa

PhD Researcher at TILEC (Tilburg University)

E-mail: B.P.EspinosaApraez@uvt.nl

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