BYTE:

***B**ig data roadmap and cross-disciplinar**Y** community for addressing socie**T**al **E**xternalities*

Big Data Externalities – the BYTE Case Studies

Rachel Finn

Trilateral Research & Consulting, LLP

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Project details: BYTE

- Big data roadmap and cross-disciplinarY community for addressing socieTal Externalities (BYTE) project
- March 2014 – Feb 2017; 36 months
- Funded by DG-CNCT: €2.25 million (Grant agreement no: 619551)
- 11 Partners
- 10 Countries

Objectives

The BYTE project has three main objectives:

1. To produce a **research and policy roadmap and recommendations** to support European stakeholders in increasing their share of the big data market by 2020 and in capturing and addressing the positive and negative societal externalities associated with use of big data.

2. To **involve all of the European actors relevant to big data** in order to identify concrete current and emerging problems to be addressed in the BYTE roadmap. The stakeholder engagement activities will lead to the creation of the Big Data Community, a sustainable platform from which to measure progress in meeting the challenges posed by societal externalities and identify new and emerging challenges.

3. To **disseminate the BYTE findings, recommendations** and the existence of the **BYTE Big Data Community** to a larger population of stakeholders in order to encourage them to implement the BYTE guidelines and participate in the Big Data Community.

Case studies: big data practitioners assist to identify externalities


Environmental data


Energy


Utilities / Smart Cities


Cultural Data


Health


Crisis informatics


Transport

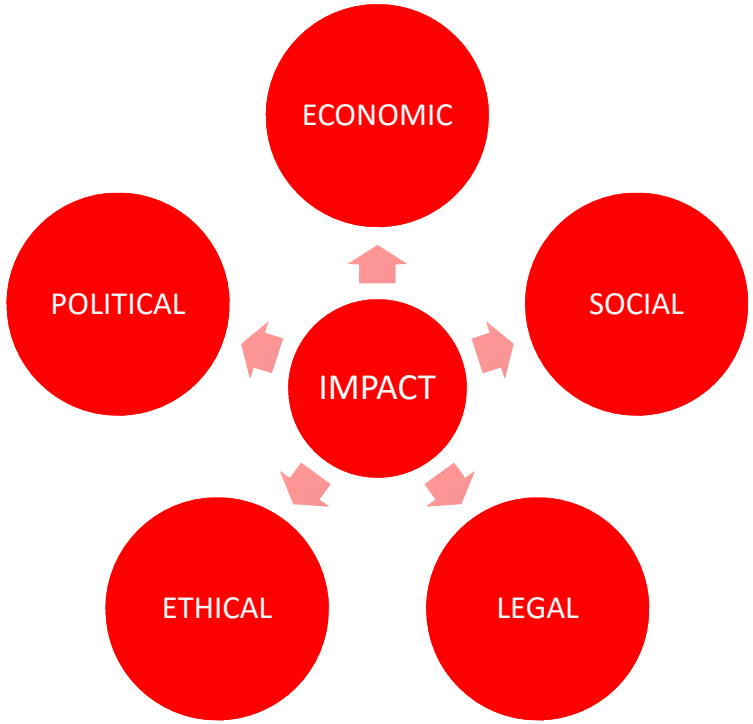
Understanding ‘externalities’

- In BYTE we consider the **externalities** or **impacts** of big data

- **Positive** effects or benefits realised by a third party
- **Negative** costs (or harm) that affects a third party

- Externalities relate to **social processes** linked to big data, as well as the opportunities & risks that may arise as a result of the **existence of the data**.

- Some effects may be **unexpected or unintentional**



Big data concerns: externalities

Economic	Legal	Social & Ethical	Political
• Boost to the economy • **Innovation ✔** • **Increase efficiency ✔** • Smaller actors left behind • Shrink economies	• **Privacy ✔** • **Data protection ✔** • **Data ownership ✔** • Copyright • Risks associated with inclusion & exclusion	• **Transparency ✔** • Discrimination • Methodological difficulties • Spurious relationships • Consumer manipulation • **Improved services ✔**	• **Reliance on US services ✔** • **Services have become utilities ✔** • Legal issues become trade issues • **Dependent on public funding ✔**

Select horizontal findings

Positive externalities	Negative externalities
• Efficiencies • Product and service innovation • New business models • Societal benefits (improved decision-making in healthcare, crisis management, commercial organisations; personalised services)	• Dependence on public funding to create the environment in which big data business models can flourish • Privacy concerns • Fear of losing proprietary information • Outdated legislation • Difficulty in adapting business models

Case study-specific findings: health

- Big data in healthcare is **quite well developed and widespread across a number of health areas**.
- **Genetic data use is maturing** and focused on high-grade analytics and the discovery of rare genes and genetic disorders.
- The key improvements include timely and more accurate diagnosis, the development of personalised medicines, and drug and other treatments/ therapy development, which **can save lives.**
- Key innovations include the development of privacy protecting and secure databases for genetic data samples.
- However, there tends to be a **reluctance by public sector initiatives** to share data due to legal and ethical constraints.

"So in our own consent we never say that data will be fully anonymous. We do everything in our power so that it is deposited in a anonymous fashion and […] when we consent we are very careful in saying look it's very unlikely that anyone is going to actively identify information about you" (Program head, Clinical geneticist)

Case study-specific findings: crisis informatics

- Crisis informatics is in the **early stages** of integrating big data.
- Currently, its primary focus is on integrating social media and geographical data.
- The key improvement is that the analysis of this data **improves situational awareness** more quickly after an event has occurred.
- A key innovation is the **combination of human computing and machine computing**, primarily through digital volunteers, to validate the data collected and determine how trustworthy it is.
- Stakeholders in this area are making progress in **addressing privacy and data protection issues**.
- There is evidence of a **reliance on US** cloud and computing services.

> "And I have seen this on multiply occasions from […] big private companies in this, they'll deal with their own huge amount of data and response to crisis and so on. But [then] become very unpredictable unsustainable outside of an emergency, do a good job of talking about what they do during a crisis but then sort of disappear in-between." (Programme manager, International Governmental Organisation)

BYTE project key outputs

- Define research efforts and policy measures necessary for responsible participation in the big data economy
- Vision for Big Data for Europe for 2020, incorporating externalities
  - Amplify positive externalities
  - Diminish negative ones
- Roadmap
  - Research Roadmap
  - Policy Roadmap
- Formation of a Big Data community
  - Implement the roadmap
  - Sustainability plan

Next event

Validating case study externalities
Dublin 14th October 2015, 9am-5pm
Presentations by:
Sonja Zillner, SIEMENS *Big Data in a Digital City* Knut Sebastian Tungland, Statoil *Big data in the energy sector*

THANK YOU

Any questions?

Key contacts:

- **Rachel Finn –** rachel.finn@trilateralresearch.com
- **Kush Wadhwa –** kush.wadhwa@trilateralresearch.com

Trilateral Research & Consulting