DIGITAL INFRASTRUCTURES FOR CIRCULAR ECONOMY GOVERNANCE

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Circular Economy (CE)

- **Sustainability and Circular Economy high on the political agenda**
  - Paris Agreement, European Green Deal
- **From**
  - A linear model with focus on take-make-dispose (waste)
- **To**
  - A circular model with focus on aspects such as *reuse* and *recycle*, use of *secondary raw materials*, limiting the environmental impact and *reducing (*eliminating) *waste*
- **Example of Targets***
  - By 2030- use **50% fewer primary resources** (minerals, metals and fossil fuels)
  - By 2050- a **waste-free economy** that runs entirely on reusable raw materials.

*see e.g. Nederland Circulair in 2050, https://www.rijksoverheid.nl/onderwerpen/circulaire-economie/nederland-circulair-in-2050 (in Dutch)

Monitoring CE

- **Instruments to stimulate sustainability and Circular Economy**
  - E.g. Subsides, taxes, penalties

- **However**
  - **Measures and instruments** are **prone for misuse** unless proper **monitoring** is put in place

  - CE flows **lack visibility** needed for governments and other actors (e.g. auditing firms, banks offering green loans) to be able to properly monitor and control theses, e.g.:
    - Visibility related to the **sourcing**, **raw materials** used, **production processes**
    - Visibility in the processes of **reuse** and **recycling**

The need for transparency

- **In the media**
  - Export of materials for recycling ending up disposed as waste
  - Difficult to monitor what happens after the cargo leaves the EU
- **It is likely that more differentiation will take in the future, for:**
  - *Stimulating* trade in sustainable and circular products and
  - *Discouraging* flows of products that are less circular and sustainable
    - E.g. Carbon Border Adjustment Measure (CBAM)
    - HS codes/ nomenclatures can be used for the differentiation
- **CE monitoring requires finer level of transparency and visibility**
  - Visibility on material composition and the raw materials used
    - And assurances/ visibility thereof
  - Visibility on the production, recycling and reuse processes

IT innovations for data sharing

IT innovation on the government side

PROFILE

Data Analytics for Customs Risk Assessment

Innovation network for Customs professionals

PEN-CP
Pan-European Network of Customs Practitioners

Data Analytics and AI– Detection Technology-Laboratory Equipment

IT innovation on the business side
EU projects
ITAIDE (2006-2010); CASSANDRA (2011-2014); CORE(2014-2018)

IT Innovations opportunities

- **Physical Internet and IoT devices**

Physical integrity
(e.g. smart container seals)

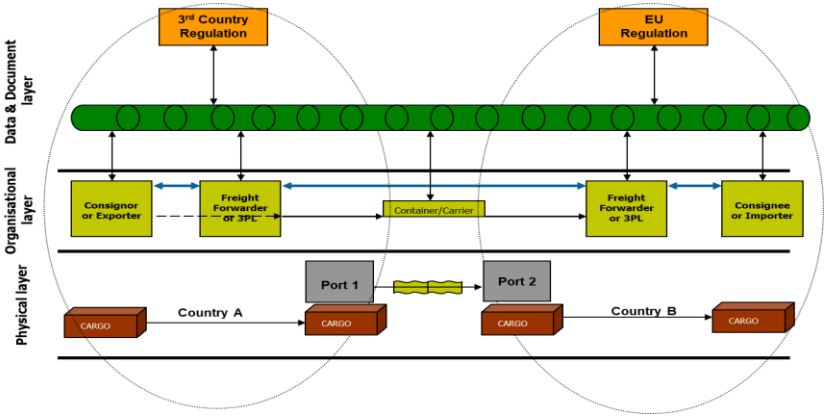
- **Blockchain**

Immutability, audit trail

- **Data Analytics and AI**

Insights

Digital trade infrastructures and platforms for <u>VOLUNTARY</u> business-government information sharing
(ITAIDE, CASSANDRA, CORE)



Conceptualization of the data pipeline by David Hesketh and Frank Heijmann (see e.g. Hesketh, 2010; see also van Stijn et al., 2012)

Responsible use of IT and search for win-wins

- Data protection (GDPR)
- Responsible AI
- Interoperability
- Search for win-wins

Hesketh, D. (2010). Weaknesses in the supply chain: who packed the box. World Customs Journal, 4(2), 3–20.

van Stijn, E., Klievink, B., Janssen, M., & Tan, Y. (2012). Enhancing business and government interactions in global trade. CESUN 2012. Delft: Delft University of Technology.

Digital Infrastructures for CE Governance**

Circular Economy (CE) Governance

Authorities (Customs, other)	Banks (Green loans)	Auditing firms	Businesses

Digital Infrastructures for CE visibility

(blockchain, IoT, Physical Internet)

Visibility at the border

(1) Information from digital infrastructures

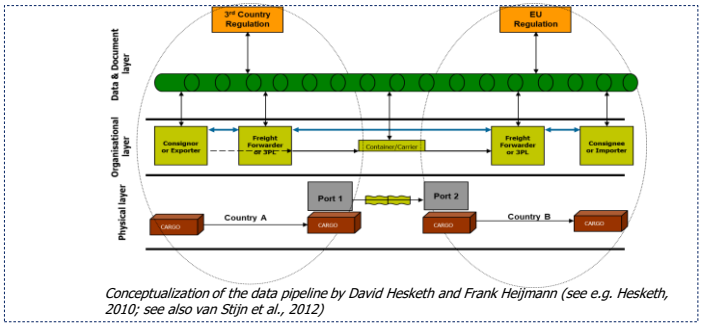
- certificates (e.g. UTZ, FSC), digital product passport, chemical composition, goods provenance)

(2) Detection technologies

3

1

Visibility in the production process and materials used



Conceptualization of the data pipeline by David Hesketh and Frank Heijmann (see e.g. Hesketh, 2010; see also van Stijn et al., 2012)

2

Visibility in the processes of recycle, refurbish, reuse

CE system flows

CE flows can be made explicit by using the Circular Economy system diagram (see https://www.ellenmacarthurfoundation.org/circular-economy/concept/infographic)

**Based on:

Rukanova, B. Tan, Y.H., Hamerlinck, R., Heijmann, F., Ubacht, J. (2021). **Extended Data Pipeline for Circular Economy Monitoring**. In DG.O2021: The 22nd Annual International Conference on Digital Government Research (DG.O'21).

Based on: Rukanova, B. Tan, Y.H., Hamerlinck, R., Heijmann, F., Ubacht, J. (2021). **Digital Infrastructures for Governance of Circular Economy: A Research Agenda**. In: EGOV-CeDEM-ePart2021 proceedings (forthcoming)

International trade and CE

- **International trade and sustainability and CE**
  - **International trade** will be affected by measures to achieve sustainability and CE goals
  - When **borders are crossed**, customs will continue to play an important role
    - E.g. CBAM, other measures will be introduced in the future
- **Innovations that customs has developed with trade**
  - **Are relevant** for CE monitoring
    - E.g. business **digital trade infrastructures** and voluntary sharing of information; **Scanning and detection technologies**; **Linked data** and **data analytics** to link **image and declaration data**
  - **But**
    - Will need to be expanded to meet the needs for sustainability and CE
- **PEN-CP Innovation Network for Customs Practitioners**
  - **Annual study** planned for 2022 on **Green Customs**
  - On-line workshop on **"The Role of Customs in Green Supply Chains in the Future"**

Thank you!

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For further information on:

- the on-line workshop "The Role of Customs in Green Supply Chains in the Future", January- February 2022
- **Please contact**: pen-cp@cross-border.org