Industrial Data & Regional Economic Development

An emerging industry nexus

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# Research Team

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What are Industrial Data?

Industrial Data are:

Data obtained by measuring and assessing the production and operations of industrial equipment, processes, and systems.

Sources include:
  - Equipment production
  - Equipment operation
  - Manufacturing and control systems
Motivation

• 20.8 billion things to be connected by 2020 compared to 4.9 billion in 2015 (Gartner, 2015).

• Economic impact estimated at FY15$ 4-11 trillion by 2025, of which industrial data constitutes ~ 35-41% (McKinsey Global Institute, 2015).


Overview

1. Demonstrate industrial data as an industry
2. Illustrate geographic (local, regional, and national) variation
3. Unpack sectoral linkages

Key Assumptions

1. Industrial data has a unique production chain that exists in parallel to the domain in which the data are collected.
2. The industrial data industry depends on local and global conditions that impact the strategies, locations, and issues of firms
Preliminary Findings
How the ID Industry Works?

Sources

1. Equipment production
2. Equipment operation
3. Manufacturing & control systems

Uses

1. Monitor equipment performance, in real-time or otherwise
2. Diagnose equipment performance by comparing with historical and baseline conditions
3. Optimize operations
4. Develop new markets
Data from equipment in production and operation. Frequency of data collection in power generation has grown ten times in the last ten years.
How the ID Industry Works?

Monitor equipment performance real time or otherwise.
How the ID Industry Works?

Diagnose adverse changes in equipment performance typically done through a team of domain experts and data scientists.
How the ID Industry Works?

Optimize equipment performance through visualization and algorithms.
Develop new markets, such as fostering the development of application on existing platforms or offering additional services.
Production Chain & Industry Ecosystem

Collection

Storage

Aggregation

Analysis

Use

$ Legacy industry sectors
Research institutions
National policymakers

$ Start-up firms
Regional policymakers

$ Industry regulators

$ Large tech and automation firms
Large industrial firms
Regional Factors

Collection
Storage
Aggregation
Analysis
Use

Reliable Connectivity
Firm Development
National Data Policies
Domain Knowledge
Policy Implications

**Ensure** reliable data connectivity.

**Develop** university-industry research partnerships to build high-fidelity, advanced, analytical models.

**Support** upskilling in the regional labor market.

**Incubate** start-ups.

**Lead** the development of a global governance framework for industrial data.
Publications

Clark et al. (2018) *Industrial Data & Regional Economic Development, Phase 1 Study Findings: Industrial Data in Power Generation* (EPICenter white paper)


Thank you

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HOLD
Approach

Study
1. Industrial data use cases
2. Key informant interviews

Framework B: Dicken, 2007
Interaction between territorial, topological, and geopolitical factors

Factors that influence competitive advantage

Results
1. Production chain of ID
2. Conditions for regional competitive advantage
3. Strategies for regional economic development
We define connectivity by the speed of interaction between machines, and between machines and personnel.

Rural and agricultural regions, even in industrialized economies such as the United States, experience poor broadband connections (Tomer et al., 2017).

In general, reliability of connectivity in existing sectoral geographies influence evolution of the emerging industry as a whole.

They also influence the location of production activities that are not geographically tied.

Industry domain knowledge is important for the aggregation, analysis and use pieces of the ID production chain.

Personnel with domain knowledge expertise are required to segregate useful data from others for further aggregation and analysis.

Research institutions and networks serve as intermediaries in the diffusion of domain knowledge.

University-industry partnerships
Incubating spaces around universities.

Industry networks provide another avenue for domain knowledge diffusion.
Regional Driver: National Policy

Data localization refers to the storage of data in the country from which it originated.

Potential consequences of data localization policies include:
1. Inability to access low-cost infrastructure.
2. Additional investment to locally store data in certain countries or regions, dependence on available local connectivity, security and other resources.

The cost of data localization policies is estimated to be 0.1-0.36% of United States’ GDP (Cory, 2017).
Motivation: Southeastern Concentration