

Industrial Internet Platforms

A game changer in terms of power relations in manufacturing value chains?

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*Emergence of
multiple IIoT platforms*

*Role of hyperscalers
in industry*

*Growing relevance
of industrial data*

Fears of a platform takeover in industry

*„Gaia-X“ and „Catena-X“
as response*

**Do platforms disrupt industrial value chains and how?
Who are the main beneficiaries of the IoT in industry?**

Project “**Industrial Internet Platforms, Restructuring of Production Networks, and Work in China and Germany**”
Explorative qualitative study: 01/2020-06/2022, funded by Hans-Böckler-Foundation

Theoretical references

- Critiques of platform capitalism (Srnicsek 2016, Zuboff 2015, Staab 2019)
- Literature on platform’s business models (Cusumano, Gawer, & Yoffie, 2019, Kenney/Zysman 2016, McAfee & Brynjolfsson, 2017, Abdelkafi et al., 2019)
- Data as „new intangibles“ (Butollo/Schneidmesser forthcoming)

Empirical design

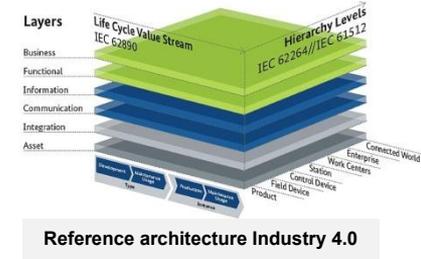
42 interviews with industrial internet platforms and customers in **Germany**

- Platform architectures: relationship between customers, platforms and complementors (app providers)
- Sources of market power: network effects and data utilization
- Revenue model: how do platforms make money? How is added-value distributed?

A new universe: platforms in the industrial realm

Foundations:

- Datafication of industry (industry 4.0), products and social relations
- Evolution of connectivity standards and reference architectures
- Cloud computing



Sources of data and functionalities/types of platforms

Production-centred PF

- Production efficiency
- Apps to improve maintenance, QC, production flow, etc.

Production process

Industrial customers

Distribution-centred PF

- Matchmaking
- Digital pricing tools

Industrial enterprise

Product platforms

- Improve product
- Update functionalities
- Equipment as a service / industrial sharing economy

Product lifecycle

Individual customers

Customization platforms

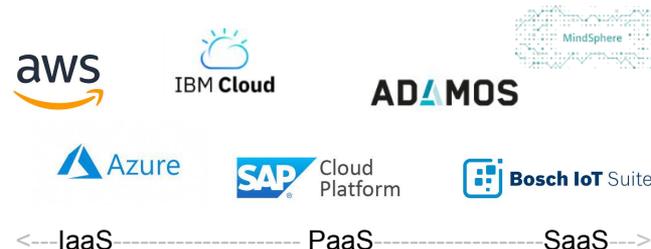
- Product design according to customers preferences
- On-demand production
- Producer-owned platforms

Production-centred platforms

(case study of platform firms operating in Germany)

Characteristics

- Operating systems for the industrial internet
- Objective: integrate apps for enhancing performance
- IIoT-Stack: functional specialization
- PaaS: (Primarily) innovation platforms



Findings concerning power relations in this emergent field

- 1. Domain-specific knowledge** matters: division of labour / competition between IaaS/PaaS/SaaS (so far) no takeover by tech enterprises. Yet disruption of field of industry software / mechanical engineering
- 2. Specificity of data:** limited insights from aggregated industry data from complex production environments weak direct network effects, “consultancy” element of customer relationship, option of fragmented market
- 3. ‘Privacy’ of data:** a complex governance (‘communities of practice’) of sharing data and benefitting from it barrier to direct network effects a
- 4. Difficulties of a proprietary lock-in:** diverse equipment settings, need to stay open indirect network effects matter!
- 5. Earnings models** depend on productivity enhancement on customers side (still an uphill battle), no secondary use (ads)

Distribution-centred platforms

(case study on online manufacturers in the metal components industry)

General characteristics

- Self-proclaimed 'online manufacturers'
- Matchmakers between customers and production partners
- (Primarily) transaction platforms



Findings concerning relationship between platforms and manufacturers:

- 1. Indirect network effects matter:** the more manufacturing partners, the more attractive the offer to customers
- 2. Platforms record and use transaction data:** AI-based pricing calculations
- 3. Ambivalent effects on manufacturing partners:**
 - Easier market access, ability to sell off overcapacities
 - Loss of direct customer relationship: hollowing out of functions?
 - Lack of transparency, price competition (with growing maturity)
 - Globalization of sourcing (Quote on prices)
- 4. Platforms as disruptors and main beneficiaries**

Conclusions

1. **Analogies** between the commercial internet and IIoT only go so far.
2. **The multiplicity of uses** of data and platform strategies needs to be acknowledged (so far debates focus on the role of hyperscalers).
3. Concrete analyses of **platform governance** are needed in order to single out potentially disruptive effects:
 - a) Innovation/transaction platform
 - b) Direct/indirect network effects, particularly: issues of data governance
 - c) Revenue models
 - d) Relationship between technological core (□ standards) and complementors
4. We need a better understanding **what industry segments** change (in case of production-centred platforms not primarily end manufacturers, but providers of industry software or mechanical engineering companies)

Literature

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