

Industrial Internet Platforms

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

Dr. Florian Butollo

Weizenbaum Institute for the Networked Society / Berlin Social Science Center

Conference “Work in the digital age: The challenges of platform firms”

March 16-18, 2021

*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

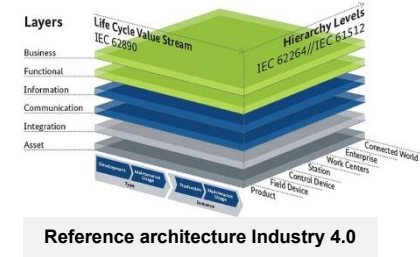
42 interviews with industrial internet platforms and customers in **Germany**

- 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

- Abdelkafi, N., Raasch, C., Roth, A., & Srinivasan, R. (2019). Multi-sided platforms. *Electronic Markets*, 29(4), 553–559. <https://doi.org/10/ghgn3g>
- Cusumano, M. A., Gawer, A., & Yoffie, D. B. (2019). *The business of platforms: Strategy in the age of digital competition, innovation, and power* (First edition). Harper Business, an imprint of HarperCollinsPublishers.
- Kenney, M., & Zysman, J. (2016). The Rise of the Platform Economy. *Issues in science and technology*, 32, 61–69.
- McAfee, A., & Brynjolfsson, E. (2017). *Machine, Platform, Crowd: Harnessing Our Digital Future*. Norton & Company.
- Srnicek, N. (2016). *Platform Capitalism* (1.). Polity.
- Staab, P. (2019). *Digitaler Kapitalismus: Markt und Herrschaft in der Ökonomie der Unknappheit* (Originalausgabe). Suhrkamp Verlag.
- Zuboff, S. (2015). Big other: Surveillance Capitalism and the Prospects of an Information Civilization. *Journal of Information Technology*, 30(1), 75–89. <https://doi.org/10.1057/jit.2015.5>