London, July 11th

FRIEDRICH-ALEXANDER UNIVERSITÄT ERLANGEN-NÜRNBERG

The bumpy road to the adoption of the Physical Internet –
Overcoming barriers from a stakeholder perspective

Chair of Supply Chain Management
Friedrich-Alexander University Erlangen-Nürnberg

Tobias Meyer
Prof. Dr.-Ing. Evi Hartmann

IPIC 2019

Agenda

FRIEDRICH-ALEXANDER UNIVERSITÄT ERLANGEN-NÜRNBERG

1 Research Scope

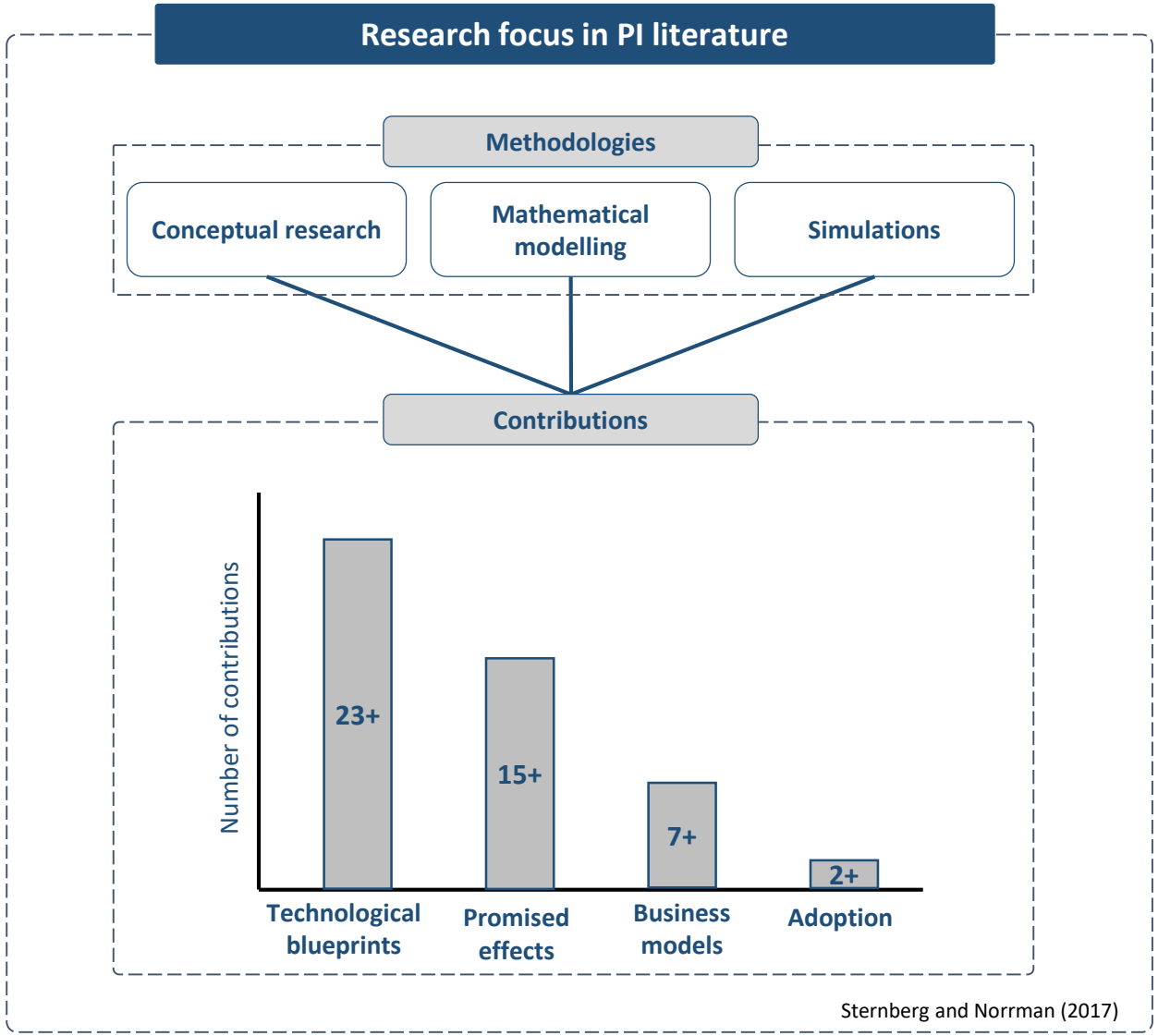
2 Structure of research

3 Analysis and discussion

4 Backup

IPIC 2019

Research Scope



Sternberg and Norrman (2017)

Research falls short regarding practically and empirically grounded knowledge to understand stakeholders adoption of the concept

1. Adoption drivers
2. Organizational and technological readiness
3. Barriers and changing supply chain processes

Agenda

FRIEDRICH-ALEXANDER UNIVERSITÄT ERLANGEN-NÜRNBERG

1 Research Scope

2 Structure of research

3 Analysis and discussion

4 Backup

IPIC 2019

Structure of research

FRIEDRICH-ALEXANDER UNIVERSITÄT ERLANGEN-NÜRNBERG

Methodology

Case Study approach

- **Sample criteria***: Logistics industry, Previous knowledge or experience with the PI*
- **Sample:** *14 organizations (different industry sectors and company size (small, medium, large))*
  - ***Logistics / Transport service provider*** *– Forwarder, Carrier, Intralogistics provider*
  - ***Shipper*** *– Automotive, Consumer goods*
  - ***PI-product companies*** *– Packaging, Trailer, Logistics software*
  - ***Researcher*** *– Logistics research institutes*
- **Interview partner***: Innovation Managers, Futurists, CEOs, Strategic researcher, Consultants*

Within and cross-unit analysis

Discussion and Conclusion

Eisenhardt (1989), Yin (2004), Seawright and Gerring (2008)

IPIC 2019

Agenda

FRIEDRICH-ALEXANDER UNIVERSITÄT ERLANGEN-NÜRNBERG

1 Research Scope

2 Structure of research

3 Analysis and discussion

4 Backup

IPIC 2019

Drivers for the adoption of the PI

FRIEDRICH-ALEXANDER UNIVERSITÄT ERLANGEN-NÜRNBERG

Perceived benefits of stakeholders

New business models

- Transfer from physical handling to digital services
- Usage of data to offer additional services
- → Transformation of the business model rather than elimination

Customer satisfaction

- Improved visibility
- Decreasing costs
- Additional service offerings

Infrastructure

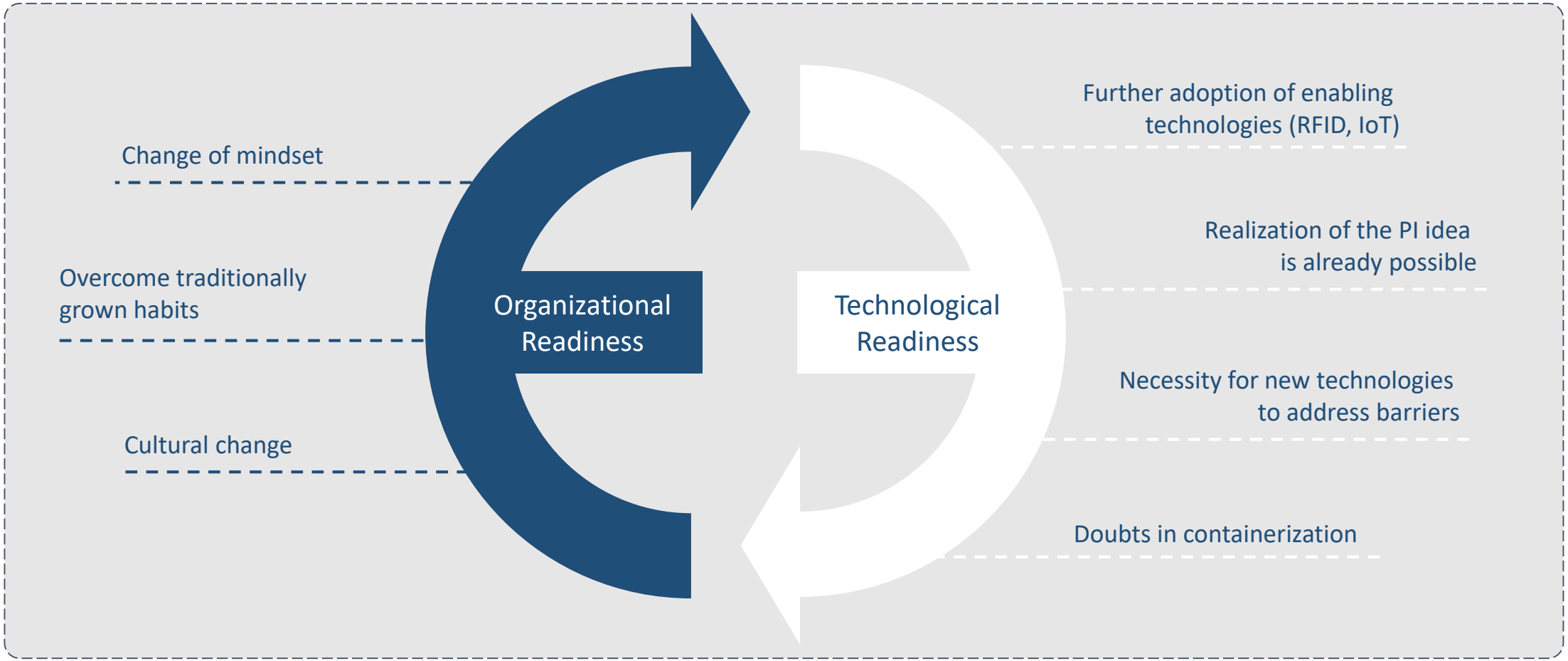
- Better access to logistics services
- Improved supply chain processes
- Unlimited network

→

- **Shippers seem to be the driving force for a fast adoption of the Physical Internet**
- **Especially small logistics service providers would benefit**
- **Economical short term benefits are considered more important than sustainability**

IPIC 2019

Organizational and technological readiness



Barriers and changing supply chain processes

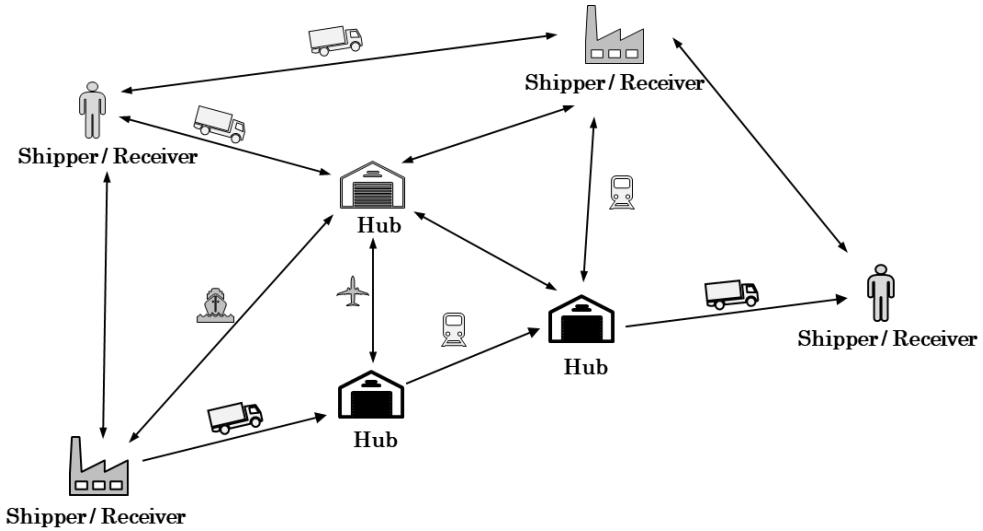
FRIEDRICH-ALEXANDER UNIVERSITÄT ERLANGEN-NÜRNBERG

Major barriers and changes

- Untrusted algorithms for planning processes
- Losing control over shipments
- Configuration of the value network
- Leadership conditions
- Fear to lose competitive advantages

Impact on

- Service offerings and competition
- Contractual, liability and ownership conditions
- Participation and entry



IPIC 2019

Thank you for your attention!

Chair of
SUPPLY CHAIN MANAGEMENT
Prof. Dr.-Ing. Evi Hartmann

Tobias Meyer, M.Sc.
Research assistant / PhD candidate
+49 (0) 911 / 5302-449
Tobias.T.Meyer@fau.de

Prof. Dr.-Ing. Evi Hartmann

IPIC 2019

References

- Sternberg, H., & Norrman, A. (2017). The Physical Internet - review, analysis and future research agenda. International Journal of Physical Distribution & Logistics Management, 47(8), 736–762.
- Eisenhardt, K. M. 1989. Building theories from case study research. Academy of Management Review, 14(4): 532–550.
- Yin, R. K. 2014. Case study research design and methods (5th ed.). Thousand Oaks, CA: Sage.
- Seawright J., Gerring J. (2008): Case Selection Techniques in Case Study Research. Political Research Quarterly 61 (2):294–308.

Agenda

FRIEDRICH-ALEXANDER UNIVERSITÄT ERLANGEN-NÜRNBERG

1 Research Scope

2 Structure of research

3 Analysis and discussion

4 Backup

IPIC 2019

Case Study Validity & Reliability

FRIEDRICH-ALEXANDER UNIVERSITÄT ERLANGEN-NÜRNBERG

Reliability / Validity Criterion	Research design	Case selection	Data collection	Data analysis
Construct validity	Development of questions based on a comprehensive literature review	N/A	Multiple sources of evidence: semi-structured interviews, reports, publications; Tandem interviews; Confidentiality and anonymity ensured	Review of study protocol by interviewees to eliminate misunderstandings; Data analysis during interviews to be open to additional findings
Internal validity	Theoretical framework	N/A	Highly knowledgeable interviewees	Pattern matching among cases; Triangulation of multiple data sources
External validity	Multiple units within the Physical Internet case	Diverse sampling and clear case description	N/A	Analytical generalization based on patterns
Reliability	Case study protocol and case study database from primary and secondary data	Single case with embedded multiple units of analysis	Case study database and protocol; Transcription of interviews	Coding process by two independent researchers with discussions until agreement was reached

IPIC 2019

Backup

FRIEDRICH-ALEXANDER UNIVERSITÄT ERLANGEN-NÜRNBERG

Table 1: Overview of interviewed case units

Category	Unit	Industry	Company Size*	Country	Informants' job title	Integration of PI in processes	Member ALICE
Logistics / Transport Service Provider (Alpha)	A_{Alpha}	Forwarder / Carrier	Large	Germany	Business Consultant	Strategy; Pilot projects	No
	B_{Alpha}	Forwarder / Carrier	Large	Austria	Head of Innovation	Innovation	Yes
	C_{Alpha}	Intralogistics	SME	Austria	Head of Product Mgmt.	Innovation; Pilot projects (urban hubs)	No
Shipper (Beta)	D_{Beta}	Automotive	Large	Germany	Managing Futurist	Strategy; Pilot projects (routing, transshipment)	Yes
	E_{Beta}	Consumer goods	Large	Belgium	Futurist and research fellow	Strategy; Pilot projects (intermodal transport, collaborative logistics arrangements)	Yes

IPIC 2019

Backup

PI-product companies (Gamma)	F_{Gamma}	Transport and Logistics Consultant	SMB	Norway	CEO	Freight consolidation and collaboration system / software	Yes
	G_{Gamma}	Packaging	SME	Belgium	Product Manager	Modular packaging; observations	Yes
	H_{Gamma}	Trailer	SMB	Canada	CEO	Trailer prototype	No
	I_{Gamma}	Logistics Software	SMB	Austria	Senior Consultant	Simulations	Yes
	J_{Gamma}	Logistics Software	SMB	France	CEO	Warehouse matching platform, information bundling	No
	K_{Gamma}	Trailer	SMB	Canada	CEO	Trailer prototype; Freight consolidation platform	No
Researcher (Delta)	L_{Delta}	Logistics / research institute	N/A	Germany	Department Head	Research; Observations	Yes
	M_{Delta}	Logistics / research institute	N/A	Germany	Strategic Researcher	Research; European pilot projects	Yes
	N_{Delta}	Logistics / research institute	N/A	Norway	Strategic Researcher	Research; European pilot projects	No

* SMB (Small and Medium-Sized Businesses) employees: 0-100, revenue: $0-$10 million
SME (small and Medium Enterprises) revenue: $10 million - $1 billion
Large enterprise: employees: >1000, revenue: >$1 billion