

Evolution of e-Ordering in the Chinese Drug Distribution Industry: a Case Study of Inter-firm Digital Platforms in China

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Background: Digital Platforms in China

- ◆ B2C online market platforms are well developed
 - Tmall and Taobao (Alibaba): over 7.4 billion Euro of sales on one single day (November 11, 2014)
- ◆ C2C crowd-sourcing platforms are flourishing
 - e.g., taskcn.com, zhubajie.com
- ◆ B2B inter-firm platforms are lagging
 - Why?
 - What are possible directions?

Our Research Project

◆ “Innovating in a **Learning Community**”

- Facilitating and Understanding the Evolution of Inter-organizational Information Services in the Chinese Drug Distribution Industry

◆ Researchers

- Xunhua Guo, Tsinghua, Information Systems
- Mingzhi Li, Tsinghua, Economics
- Kai Reimers, RWTH Aachen U., Information Systems
- Bin Xie, Tsinghua, Operations Management

Motivation: Practice Background

- ◆ Providing safe and affordable medicines is a great challenge in all countries
 - particularly in China
- ◆ Application of novel IT is expected to contribute to solving some of the most pressing problems
- ◆ The key
 - emergence of an open information infrastructure that facilitates easy information sharing across the whole supply chain.
- ◆ Potential needs
 - joint, open innovations.

Motivation: Academic Interests

- ◆ Inter-organizational information services
 - Forms and attributes
 - Emergence and evolution
 - Governance structures
- ◆ Collective innovations across a supply chain
 - pursuance of proprietary advantage
 - need for open, public infrastructures.

Overall Goals

◆ Practically

- Facilitating the collective efforts towards innovative use of novel IT in the Chinese drug distribution industry

◆ Academically

- Theorizing the evolution patterns and mechanisms of inter-organizational information services

Method

- ◆ Methodological foundation
 - The Practice Theory
- ◆ Challenge: data collection
 - Practice opacity: practices are opaque to outsiders.
 - Practice blindness: practitioners are blind to many aspects of their own performance.
- ◆ Our proposed approach: novice-based data collection
 - Learning Community (LC)

Method:

The Learning Community

◆ Form: A group consisting of

- representatives of prospective organizational participants in the practice
- researchers

◆ Functions:

- Enable and capture the mutual alignment of involved parties
- Provide a forum for exchange and mutual learning

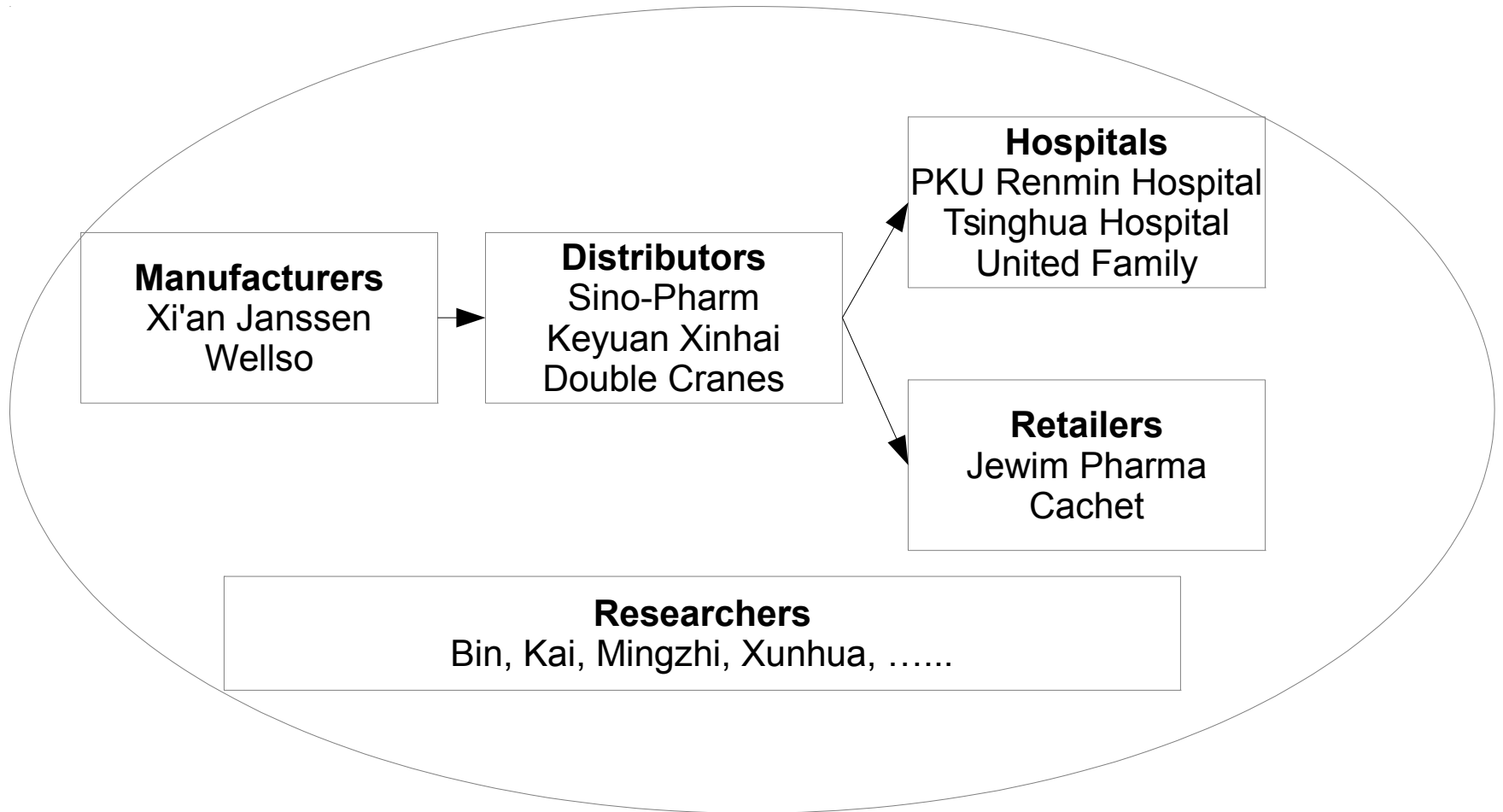
◆ Activities

- Regular meetings, visits, interns, and small projects.

◆ Roles of researchers

- Establish the group and initialize small projects.
- Participate in meetings, visits, structure and monitor discussions, and ensure detailed documentation.

Our Learning Community



Progress (2010-2014)

◆ Nine regular LC workshops

- discuss issues of common concern and possible joint activities.

◆ Other activities

- 45 interviews
- 13 visits
- 3 sub-projects
- 3 interns
- A blog

Interim Outcomes

- ◆ Four annual reports

- ◆ One book

- ◆ Three conference papers

- ◆ Three journal papers

- Reimers, K., Johnston, R. B., Guo, X., Klein, S., Xie, B., and Li, M. 2013. "Novice-based data collection methods for the study of IOIS: practice probes and learning communities," *Electronic Markets* (23:4), pp. 285-293.

- Guo, X., Reimers, K., Xie, B., and Li, M. 2014. "Network Relations and Boundary Spanning: Understanding the Evolution of e-Ordering in the Chinese Drug Distribution Industry," *Journal of Information Technology* (29:3), pp. 223-236.

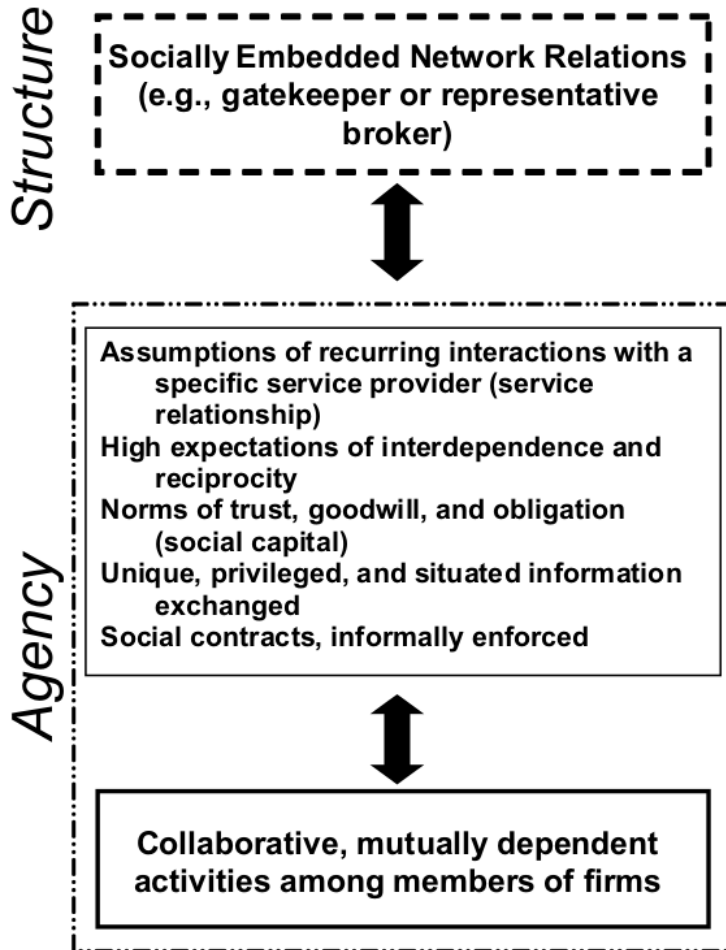
- Reimers, K., Li, M., Xie, B., and Guo, X. 2014. "How Do Industry-wide Information Infrastructures Emerge? A Life Cycle Approach," *Information Systems Journal* (24:5), pp. 375-424.

E-Ordering Platforms: The story we have

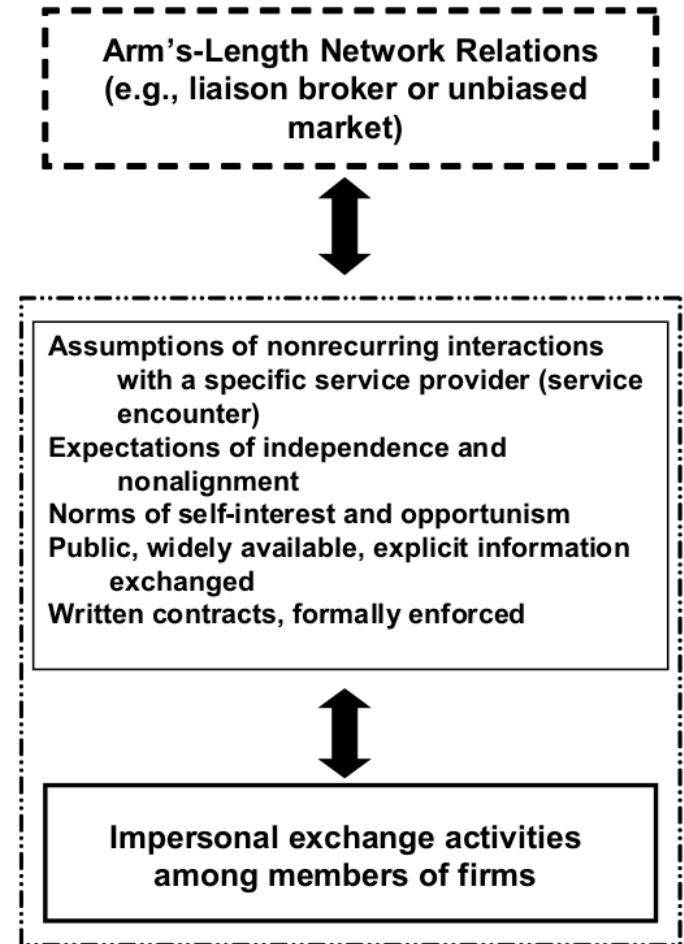
- ◆ Government deployed a centralized bidding and ordering system
 - It did not work
- ◆ Hospitals and distributors are deploying countless e-ordering systems
 - Built by distributor, owned and run by hospital ("1+y")
 - Built, owned, and run by distributor ("x+y")
 - (very few) Built by third-party IT company, owned by hospital
- ◆ Distributors use the systems to retain relationships with hospitals
- ◆ Hospitals use the systems to improve efficiency

Network relations (Schultze and Orlikowski 2004)

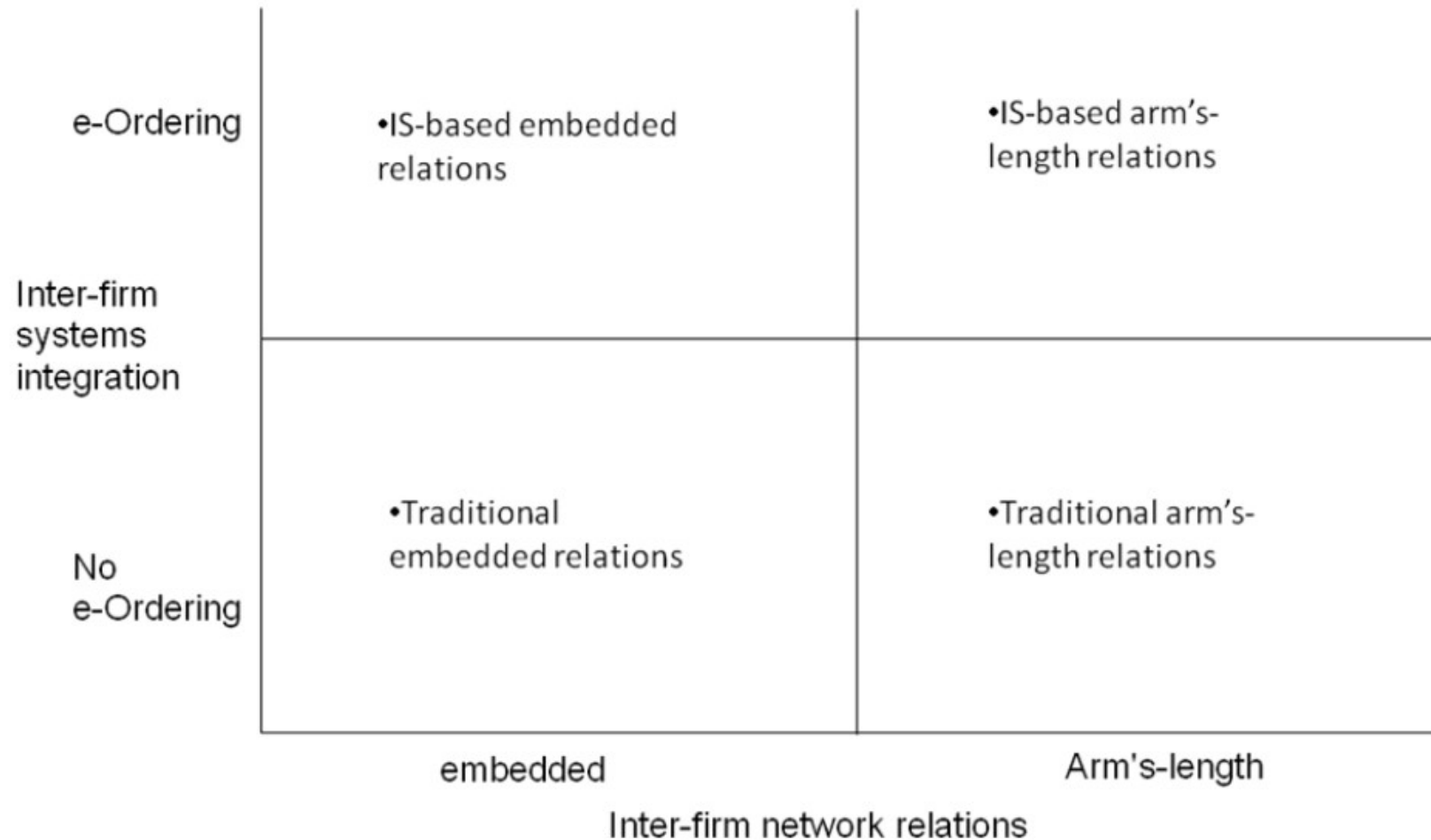
(a) Embedded Relations



(b) Arm's-Length Relations



A taxonomic framework for IOIS practices



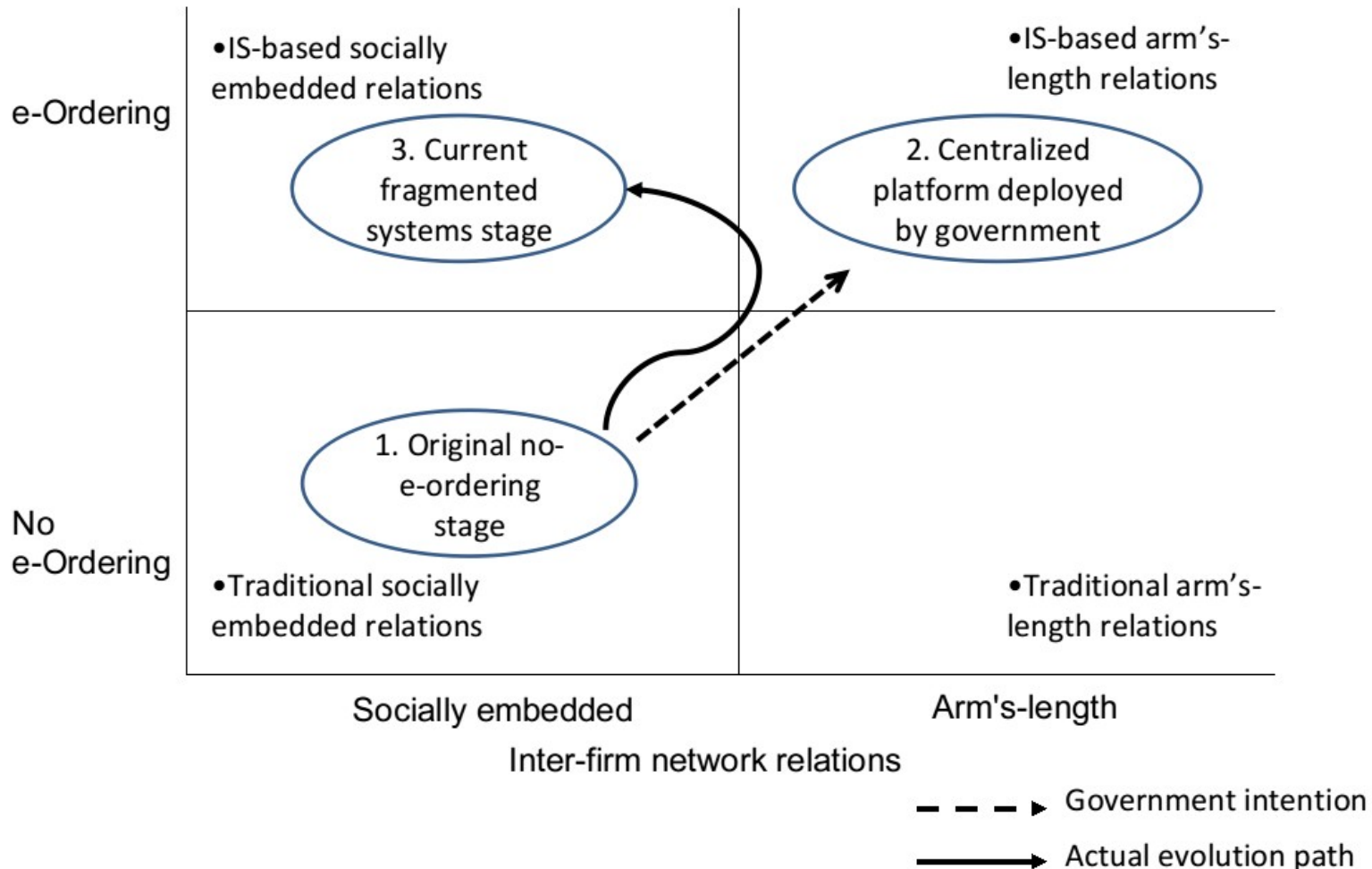
Data Coding

ID	Source	Statement	Stage	Construct	Relation Type	Boundary Spanning
1	Interview with G in 2004	Whether e-commerce platforms will be used for ordering and invoicing still an open question (as of 2004)	1	Structure	N/A	No e-ordering
2	Interview with L in 2004	In the 1990s, manufacturers started building relationships with hospitals through sales offices and a black market flourished	1	Pattern	Embedded	N/A
3	Interview with B in 2007	Hospital compliance with bidding rules is enforced through the reimbursement system	2	Structure	Arm's length	e-ordering
4	Interview with K in 2005	Hospitals bargain to delay payments to K	2	Pattern	Embedded	N/A
5	Workshop , May 2011	Because there are no standards for data exchange, hospitals need to bilaterally negotiate with distributors every time they implement a new exchange link (014)	3	Pattern	Embedded	e-ordering

Data items distribution

	Structure	Mediating Elements	Pattern	Sum
Stage 1	9	5	6	20
Stage 2	38	17	38	93
Stage 3	152	88	126	366
Sum	199	110	170	479

Understanding the Chinese Story



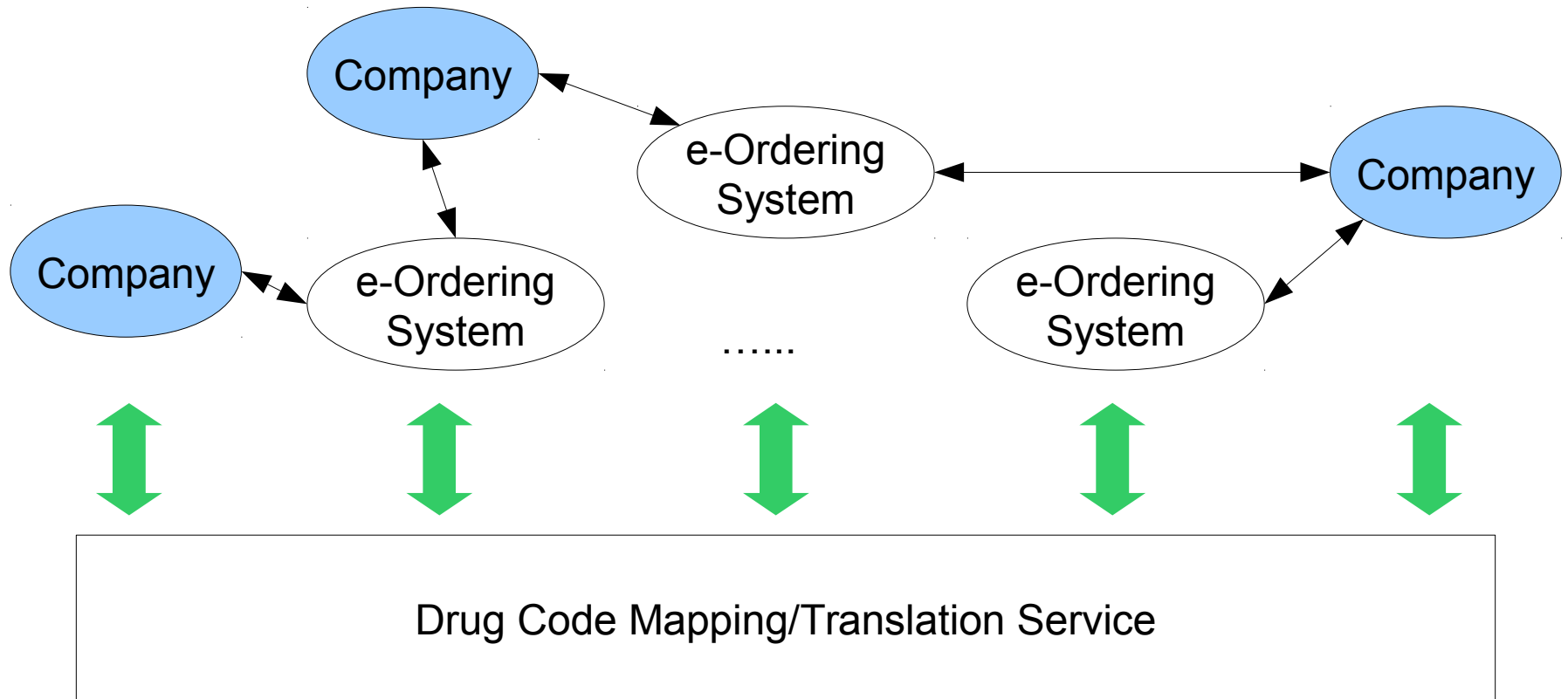
Findings

- ◆ The centralized e-ordering system was aimed at breaking through the embedded relations and establishing arm's length relations
 - Assumption: "arm's length" can help improve transparency
- ◆ The practice did not evolve to "arm's length"
 - Boundary spanner try to preserve their social capital
 - Needs for customized service
 - Embedded relations are deeply entrenched in China
- ◆ The multiple systems built by hospitals and distributors maintain and reinforce embedded relations
 - Embedded relations can help improve efficiency, provide customized service, and achieve cooperation
- ◆ "arm's length" is not the only way to improve transparency
 - If data are standardized and integrated, "embedded relations" can also be transparent

Practical Insights

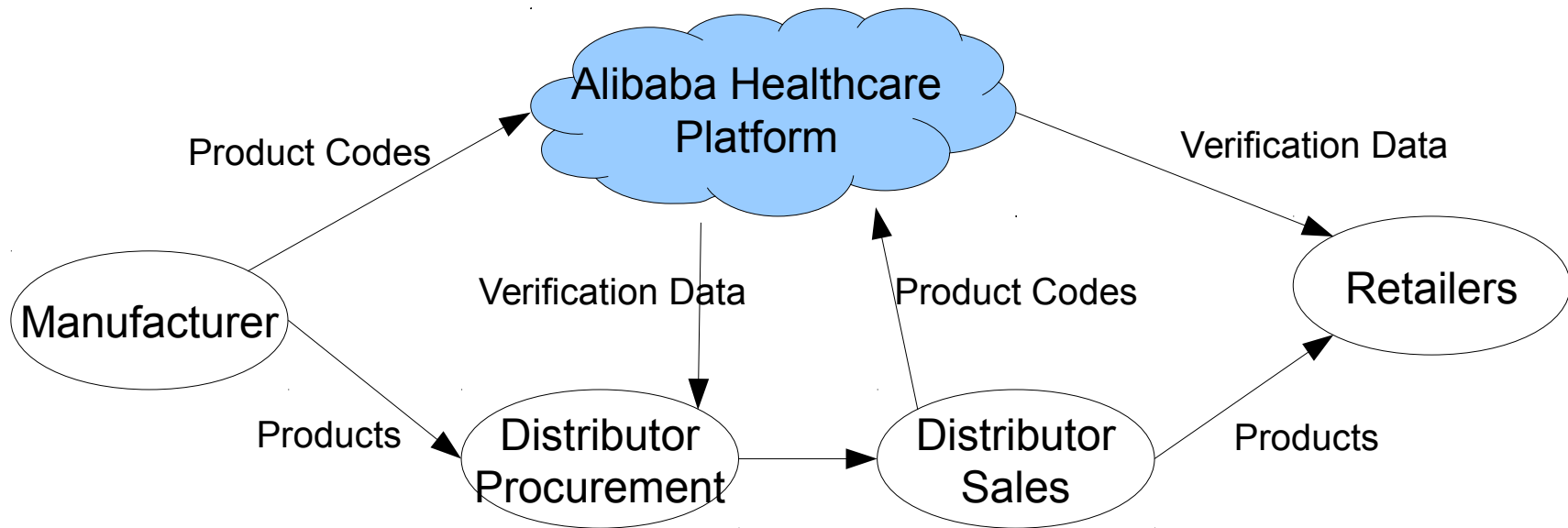
- ◆ It is unlikely that the practice will evolve towards arm's length relations
 - even with further government effort.
- ◆ The difficulty for supervision and regulation is caused by
 - the large number of distributors and the vast scale of the distribution network
 - not the socially embedded relations
- ◆ We propose that
 - instead of imposing direct supervision through a mandatory, centralized platform
 - a more feasible way is to increase transparency through facilitating the "IS-based embedded" practice

A “Code Mapping” Platform



- Inspired by our findings
- Built and run by Industry Association
- Supported by Ministry of Commerce

New Platform Provided by Alibaba



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