Development of IT-Standards

--Dynamics of Market-based Standardization Processes--

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Question

- How can market-based standardization processes be analyzed?

Positive Network Externalities

- Benefit of a good depends upon the number of consumers

- Types
  - Direct: communications network, club, social network
  - Indirect: hardware/software paradigm, service networks
  - Other possible explanations: information availability, signalling function of market share, psychological bandwagon effects

Predictions

- Networks will be smaller than socially optimal
  - Consumers ignore positive effect on others
- Winner-takes-all competition (network tipping)
  - Small-size advantage starts positive feed-back loop (multiple equilibria)
- Lock-in (inferior technology cannot be replaced)
  - Superior new technology cannot compensate network advantage (excess inertia)
- Self-fulfilling prophecy (pre-announcements as a competitive weapon)
  - Brand visibility may prematurely tip a market (insufficient friction; excess momentum)

Implications for Standardization

- Choices:
  - In which network to participate?
    => emergence of de facto standards
  - Whether or not to make products compatible?
    => different kinds of firms have different incentive structures; fierce competition in first phase, monopoly in second
  - Type of standardization process?
    => Adoption versus negotiation; possibility of side payments matters

- The concept is not applicable to negotiation processes

Limitations

- Limited evidence of increasing prices as a result of increased network sizes
- Similarity with concept of natural monopolies (fixed costs rather than network externalities)
- Difference between direct and indirect network effects is important
- Difficulty of distinguishing between network effects and network externalities (criterion of remediableness)
- Existence of sub-groups in a communications network (importance of strong ties)

Extensions

- Social network theory: existence of a subset of network members with strong ties
- Test of this concept through technology choice decisions for 2G systems in the Americas (Suarez, 2005)
- Result: dominant technology in neighbouring countries has a significant impact on choice of network technology (network standard)

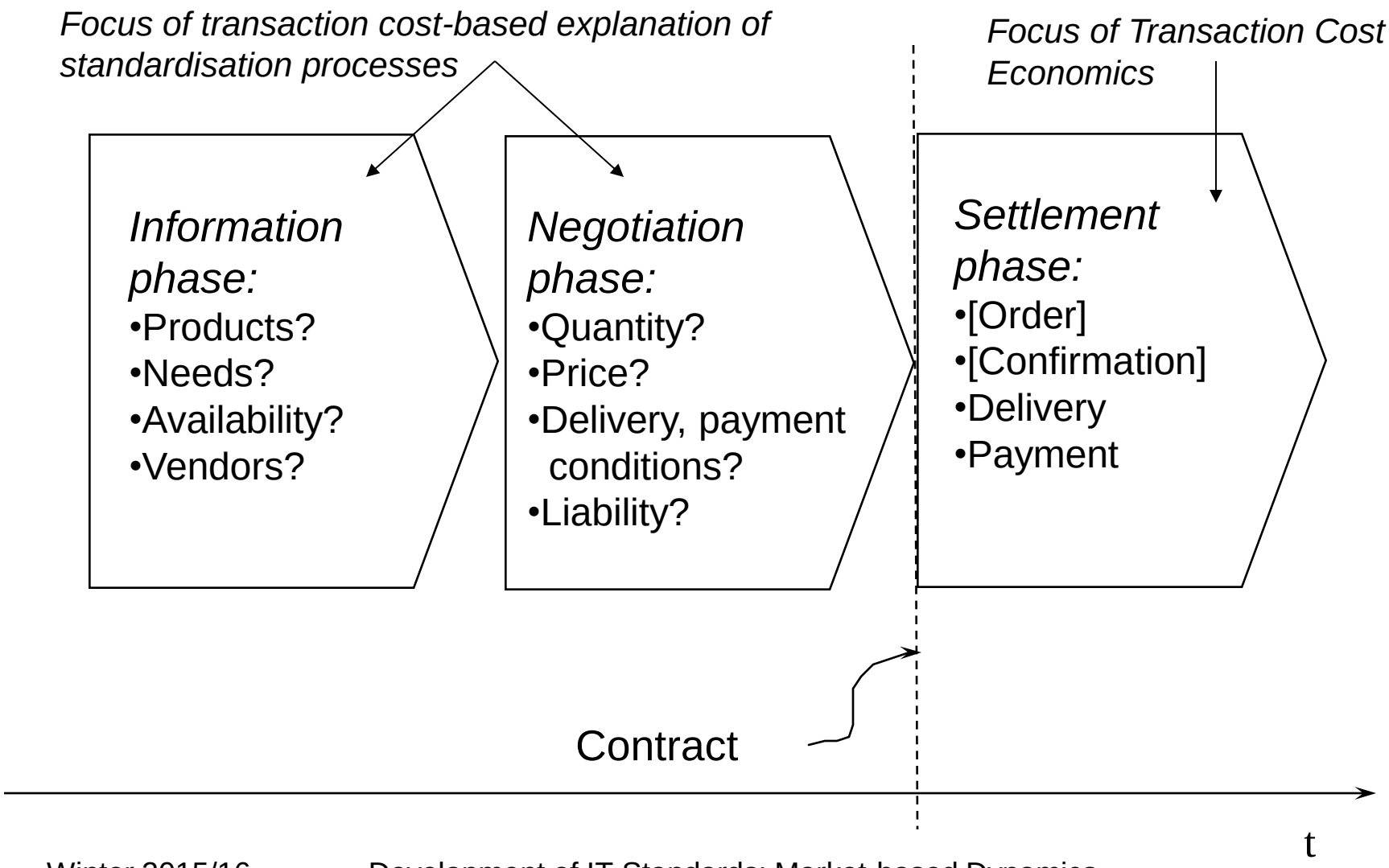
Alternative

- Transaction cost theoretic interpretation of network effects
- Separation of value of product and costs of buying/selling a product
- Standards reduce transaction costs of choosing/ negotiating technologies => standards as generalized agreements on sharing costs/benefits of horizontal compatibility

Transaction Costs

- Definition: The costs of using the market mechanism for coordinating economic activities
- Distinction between ex ante and ex post transaction costs
  => traditional Transaction Cost Economics focuses on ex post (adaptation) costs
- Distinction between a physical and an institutional view of markets:
  - Markets as the site of the physical exchange of commodities
  - Markets as the site of agreeing on purchasing contracts

Transaction Phases



Implications for Market-based Standardization Processes

- The value of a standard increases with the number of adopters of the standard (not of the products)
- Standards may be separated from products (through publication of interface specifications)
  => creation of competitive product markets
- Adoption of standards carries costs too
  => emergence of new problems such as critical mass
- Possibility of explaining/describing standardization processes as separate from market-penetration processes

References

- Katz, Michael L.; Shapiro, Carl (1994): Systems Competition and Network Effects. In: Journal of Economic Perspectives, Vol. 8, No. 2 (Spring 1994), pp. 93-115.

- Suarez, Fernando F. (2005): Network Effects Revisited: The Role of Strong Ties on Technology Selection. In: Academy of Management Journal, Vol. 48, No. 4, pp. 710-720.

- Reimers, Kai; Li, Mingzhi (2005): Antecedents of a Transaction Cost Theory of Vertical IS Standardisation Processes. In: Electronic Markets, Vol. 15, No. 4 (Special Issue on Vertical Industry Information Technology Standards and Standardization), pp. 301-312.