Information, Organization, and Management

Unit 3: Transaction Costs: How ICT Changes the Rules of the Game

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Overview

- **Coase:** The Nature of the Firm
- **Williamson:** The Economics of Organization
- **Wallis and North:** Measuring the Transaction Sector in the American Economy
- **Read:** I, Pencil. My Family Tree as told to Leonard E. Read
- Efficient Division of Labor
- Specificity of Goods
- **Malone et al:** Electronic Markets
- **Sampson:** The Myth of Diminishing Firms
- **Cordella:** Does information technology always lead to lower transaction costs?
- **Wigand, Picot, and Reichwald:** Factors Influencing the Level of Transaction Costs
Coase: The Nature of the Firm

- **Starting Point:** Why do firms exist? At first sight, there is no reason to hire staff or engage in long-term commitments with regard to other resources.
Coase: The Nature of the Firm

- **Explanation:** Using the price mechanism (market) consumes resources

- search
- select
- negotiate
- set-up contract
- exchange
- supervise
- enforce
Coordination of Economic Activity


Tasks in their own rights that consume resources, too!
Williamson: The Economics of Organization

• Transaction costs:
  „Friction“ … „when a good or service is transferred across a technologically separable interface“

• Can be used to explain
  – the determination of efficient boundaries of the firm,
  – the organisation of internal transactions
Wallis/North: Empirical Findings

Percentage of Transaction Costs on GNP

-simplified from Wallis/North (1986);
cf. Wigand/Picot/Reichwald (1997)
Read: I, Pencil. My Family Tree as told to Leonard E. Read

- Example of how even trivial consumables require complex interaction between many individuals
Division of Labor and Specialization

• Mutually dependent
• Division of Labor
  – Breakdown of complex transformation processes into individual tasks and assigning dedicated workforce for single tasks or small sets of tasks
• Specialization
  – One individual is involved in only a very small task of the overall transformation
• Motivation:
  – Cognitive and temporal limitations of humans
  – Productivity gains: Specific knowledge, processes, skills

  cf. Wigand/Picot/Reichwald (1997)
Coordination

• Division of labor increases the problem of coordination:
  – who shall produce what in which quantity by when using which resources (...) ?

• Coordination does not happen automatically, but is a task in its own right
  – Exchanges must be initiated, negotiated, observed
  – also consumes resources
  – „Management“

• Ignored in neo-classical models
  – Determining prices etc. free of cost

cf. Wigand/Picot/Reichwald (1997)
Trade-off: Specialization Gains vs. Cost of Coordination

• Further increase in specialization is limited by level of transaction costs (cost of coordination)

• Thus, technology and methodologies for reducing transaction costs are of utmost importance for future economic development.

cf. Wigand/Picot/Reichwald (1997)
Efficient Division of Labor

Total Production Costs per Unit

Coordination

Production

Division of Labor

cf. Wigand/Picot/Reichwald (1997)
**Williamson: The Economics of Organization (2)**

- Complex contracts are costly to write and enforce.
- Humans have limited abilities in collecting and processing information.
- Can be used to explain
  - the determination of efficient boundaries of the firm,
  - the organisation of internal transactions.
Williamson: Asset Specificity

- **Specificity**: A good’s decrease in value if used for the second best purpose
- “the most important dimension for describing transactions and the most neglected attribute in prior studies of organization“

- **Drivers**:
  - Nature of the resource
  - Location
  - Logistics

[Will1981], [WiPR1997]
Specificity

• Value reduction of a good when used not for the originally intended purpose but the second best alternative.

• Sources
  – Location
  – Time
  – Logistics
Asset Specificity
Asset Specificity (2)

Complexity of Describing a Good
Coase et al.: Efficient Size of the Firm

- The size of a firm is determined by the trade-off between
  - costs of internal coordination and
  - costs of using the market mechanism
Market and Hierarchy: A Continuum in between

cf. Wigand/Picot/Reichwald (1997)
Coordination Forms and Specificity

cf. Wigand/Picot/Reichwald (1997)
ICT promises to reduce Transaction Costs

• Froogle vs. printed yellow pages
• Communication by e-mail, IRC, Skype vs. TTY
• ERP Systems
• eBay vs. Flea Market
• etc.
From “Make” to “Buy”

  - Computer-based trade processes reduce the transaction costs and trigger a shift towards the usage of markets.
Malone et al: Electronic Markets

- ICT will reduce transaction costs by automating the processing of information in the various stages.
- This will cause a shift towards markets over other forms of organization.

Reduced Transaction Costs – Increased Market Volume

**eBay:**
- Active Users: 34.1 million
- Gross Merchandise Sales (GMS): $5.6 billion in Q2-03

**Walmart Inc.:**
- $62.1 billion in Q2-03
What is E-Business?

- Any form of business operations between any two parties using digital communication over open networks, especially the Internet.

cf. e.g. Thome/Schinzer/Hepp (2005)
Computer-supported Coordination of Economic Activity

Faster, cheaper
Stages of E-Business

- Communication
- Information
- Interaction
- Transaction

Scope of Functionality

ERP
XML
Shops
Java
WWW
HTML
Editor
E-Mail

Cf. Thome/Schinzer/Hepp (2005)
Impact of ICT on Market Structures and Organizations

Transaction Costs

Specificity

Markets

Hybrid Form

Hierarchy

Original version: Wigand/Picot/Reichwald (1997)
Criticism on Malone et al.

- **Sampson: The Myth of Diminishing Firms**
- **Cordella: Does information technology always lead to lower transaction costs?**
Factors Influencing Transaction Costs

Behavioral Assumptions

- Transaction atmosphere
- Availability of capital and know-how
- Transaction frequency

- Bounded Rationality
- Opportunism

Environmental Factors

- Uncertainty/Complexity
- Specificity

Distribution of Information
cf. Wigand/Picot/Reichwald (1997)
Limitation 1: Media Breaks in the Current Web

xyz

Corporate Data Sources

abc

ERP or PDM

3rd party
Limitation 2: Building and Maintaining Machine-feasible Vocabularies

Thank you!

The slides of today’s class will be available at http://www.heppnetz.de/teaching/img/ shortly.