

Development of IT-Standards

--Definition, Types, Costs and Benefits--

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Winter 2015/16

Questions

- What is an IT standard?
- What types of standards can be distinguished?
- What are costs and benefits of IT standards?

A popular View: What a Standard Is ...

(LaMonica, 2004)

- An IT standard is produced by a standards organization
- A standards organization ...
 - is chartered to be one
 - develops specifications by consensus of all serious players for stakeholders of some domain
 - has some open process and standard procedures
 - makes standards freely available and implementable

... and What a Standard Is Not

according to LaMonica (2004)

- Specifications by industry consortia
- Specifications containing IPRs
- Specifications developed in pro forma open, de facto closed standardization processes
- Specifications developed by rival standards organizations

Some more Antonyms

- open vs. closed
- free vs. proprietary
- de jure vs. de facto
- ex post vs. ex ante
- implemented vs. embedded
- national vs. global vs. industry-wide

Criteria for Open Standards

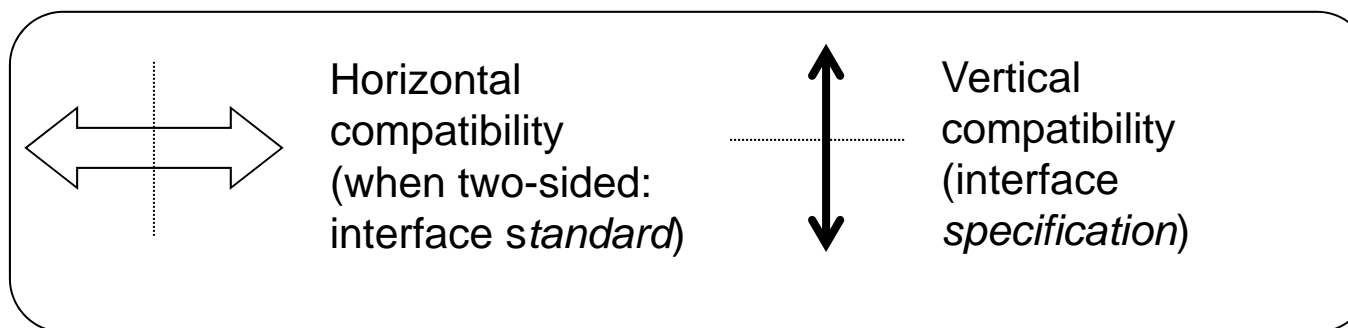
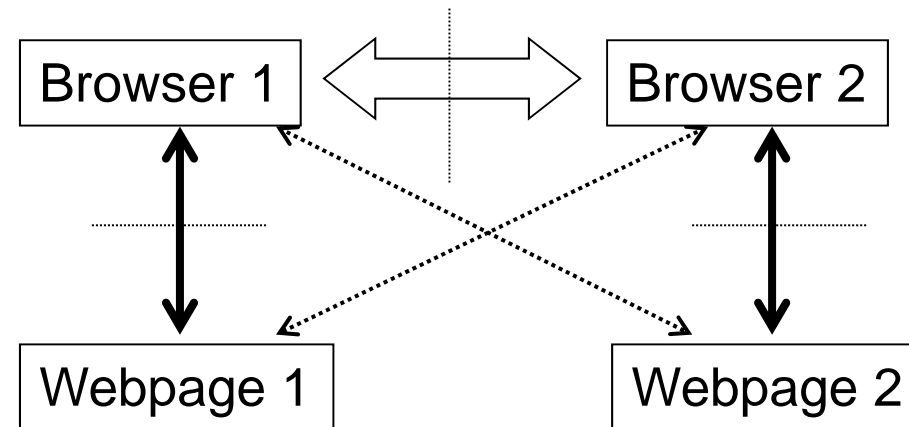
(West, 2004)

- Open to whom (customers, 'complementors', competitors)
- Rights of non-sponsors (participation in specification definition, use of specification, use of implementation)
- Difficulty/costliness of obtaining rights (to access, use a specification)
- Hidden interfaces?
- Accessibility of tacit knowledge?

Issues in the Definition of Standards

- Degree of legitimacy
 - Type of body publishing a specification
 - Procedures applied in developing a specification
 - Diffusion/adoption of a specification
- Extent of diffusion
 - National, international, industry-wide, cross-industry
- Degree of openness
 - Availability of specification
 - Royalties, fees
 - ...

Two Types of Compatibility



Working Definition

- An IT standard is an interface specification such that two or more components of an IT system are vertically and horizontally compatible (in some domain)
- An IT standard can have evolved through various processes (including market-based processes) and its reach can be industry-wide, nation-wide, or global
- An IT standard can have various degrees of openness while a minimum degree of openness is necessary to allow for horizontal compatibility

Types of Standards

(Kindleberger, 1983)

- Standards of measurement
 - Weights, measures, temperature, time, value
- Standards of quality
 - Grading cotton, coffee etc., reputation/brand name,
- Standards for interchangeability (compatibility)
 - Working hours, statistical semantics, money
 - Railway gauges, hard- and software

Excursion: Public/Collective Goods

- Public goods:
 - Definition: use is non-rival
=> Such goods *should* be provided by government
- Collective goods:
 - Definition: use cannot be excluded
=> Such goods *will* often fail to be produced because of free-rider problem
- Private goods:
 - Definition: use can be restricted [use is rival]
=> Such goods *are/should be* provided by the market
- Problem: Combination of positive and normative analysis

Nature of Standards

(Kindleberger, 1983)

- Public goods
 - E.g. standards of measurement (consumption is non-rival)
- Collective goods
 - E.g. quality standards in certain industries (free-riding is possible)
- Private goods
 - E.g. reputation, private grading schemes (of merchants), “owned” standards

Summary, Types of a Standards

- Standards can be classified with regard
 - the object to which they apply
 - their economic character
- In this course, we mostly deal with
 - standards of interchangeability (compatibility)
 - standards as collective goods
- However: standards do not conform with traditional classification schemes (private, collective, public goods) but constitute a new category (network goods)

Benefits of Standards

(Kindleberger, 1983)

- Reduction of transaction costs
 - Saving time in description, inspection or evaluation of goods (e.g. quality standards for wool, grain, coffee; compatibility standards)
 - Protection of consumers from adulteration, short-selling etc. (e.g. measurement standards)
- Physical economies internal or external to firms (economies of scale, e.g. railway gauge)

Excursion: Economies of Scale

- Internal economies of scale
 - Example: Lot sizes for production runs
- External economies
 - Example: cutlery making in Solingen
- Positive network externalities
 - Example: Video recorders/recordings, telephone

=> Set-up or fixed costs as common cause

Social Costs of Standards

(Kindleberger, 1983)

- Limiting competition
 - Example of cooperatives, brands
 - [IPU in Ireland]
- Hampering innovation
 - Example of British machine-tool-merchants
 - [Microsoft DOS/Windows]
- Limiting adaptation to local conditions
 - Example of construction industry and working hours
 - [Time zones in China]
- However: static vs. dynamic view

Issues in Evaluating Private Costs and Benefits of Standards

- Distribution of benefits
 - E.g. large firms profit more than smaller ones with regard to economies of scale
- Relativity of private costs and benefits
 - E.g. brand names, IPRs (patents etc.)
- Causality regarding costs and benefits
 - E.g. reduction of production vs. transaction costs through compatibility standards

Summary Costs/Benefits of Standards

- Distinction between private and social costs/benefits important
- Two perspectives, an institutional and a physical view, are possible (production vs. transaction cost emphasis)
- Short term efficiency drastically deviates from long term welfare effects

References

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- Kindleberger, Charles P. (1983): Standards as Public, Collective and Private Goods. In: *Kyklos*, Vol. 36, No. 3, pp.377-396.
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