Product Life Cycle Theory and the Maturation of the Internet

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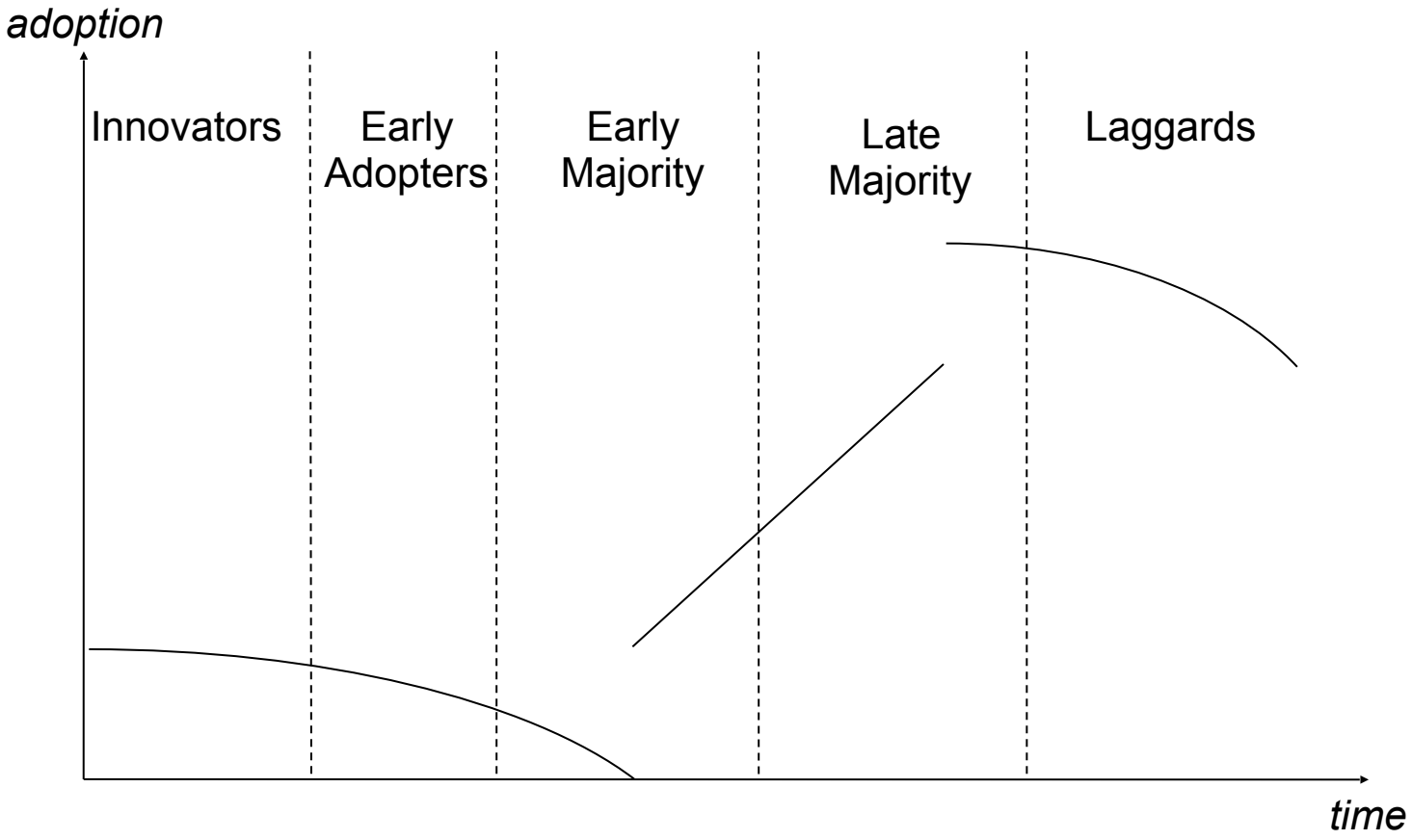
Classic Product Diffusion Curve



Theories of Market Maturation

- Product life cycle (demand-side focused)
- Dominant design (supply-side focused)
- Technological trajectories/design hierarchies (sociology of innovation)
- Complementary assets (new institutional economics)

All have implications for how the nature of competition, innovation, and industry structure change over time.

Implications of Market Maturation

- Shift from extensive to intensive competition
  - Higher quality (but see Christensen, disruptive innovation)
  - Broader range and increasing specialization of services
  - Greater price competition
- Emphasis on cost/process improvements (capital)
- Industry shakeout (horizontal concentration)
- Vertical integration (dominant design, Teece)
- Incremental innovation vs. frame-breaking change

Limits of Market Maturation Theories

- Category/definitional problems
- Empirical validation
- Confounding considerations (e.g., omitted variables, multicollinearity, consumer heterogeneity)
- Endogenizing technological change
- Policy implications

Examples of Dynamic Changes to Architecture

- DSL/cable modem and the role of regional ISPs
- Emergence of data centers/CDNs
  - Creation of new intermediaries (VMware)
  - New opportunities for intermediation
  - Policy impacts (services vs. products, obfuscation)
  - Missing: endogenization of the full range of options
- Software defined networks/network virtualization/ network slicing

Reference

- Christopher S. Yoo, "Product Life Cycle Theory and the Maturation of the Internet," *Northwestern University Law Review* 104(2): 641–670 (Spring 2010).
- Other projects
  - BDAC data collection
  - 1 World Connected: empirical study of approaches to increasing connectivity/validating impact on economics, health, education, etc.
  - NSF privacy and security of cyber-physical systems
  - NSF legal barriers to RPKI route origination
  - Empirical studies of FTTH, LTE, infrastructure sharing