IM

Information Management and Knowledge Management (IMKM)

Lecture 5
Digital Platforms

TUM

Chair for Information Systems

Lecture Schedule

Information Systems Strategy

Business Value of IT

- Business IT Alignment
- Guest Lecture: Digital Leadership and the CIO Role
- IT-enabled Strategies
  - **Digital Platforms**

Information Management

- IT Controlling and IT Governance
- IT Sourcing and IT Off-Shoring
- IT Security, Privacy and Risk Management
- Guest Lecture: Natural Language Processing for IM

Knowledge Management

- Basics
- Tools
- Guest Lecture: Applications

IMKM lecture 5: Digital Platforms

Outline

1. **Overview**
   1. **Key Elements of Digital Platform Ecosystems**
   2. Multi-sided Market Business Model Characteristics
2. Value-creating Mechanisms
   1. Value Creation in Digital Platform Ecosystem
   2. Platform Governance
3. Ecosystem
   1. Complementor Autonomy
   2. E^3 Value Modelling

Learning Objectives

- *You understand digital platforms and their ecosystems*
- *You understand and can analyze characteristics of multi-sided market business models*
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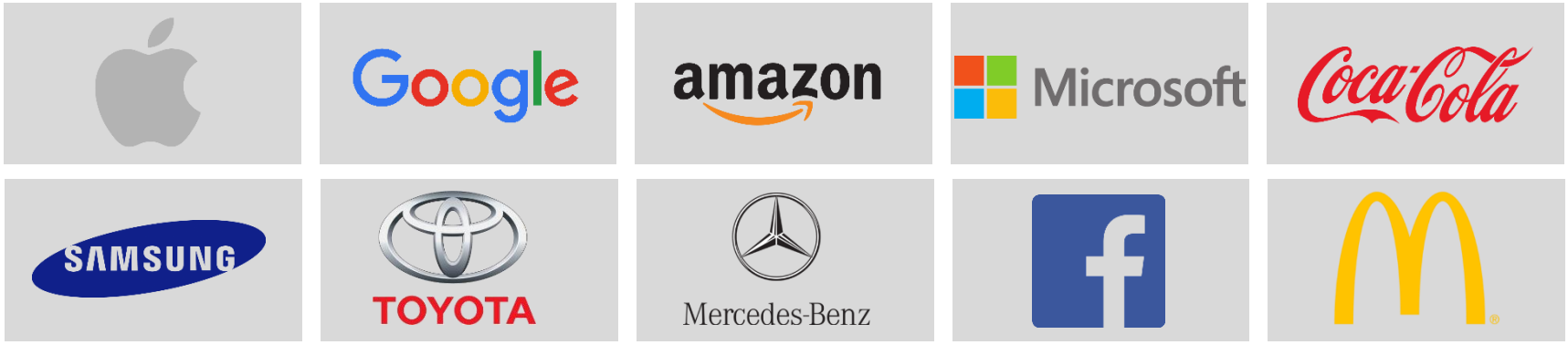
- *You can apply the E^3-Value Modelling*

Importance of platform ecosystems

Top 10 brands 2018[1]



Top 10 US startups 2018[2]

Ride-sharing platform	Ice cream	Digital wallet	AI as a service	E-scooter sharing
Investment app	Payment platform	Beauty products (influencer platform)	Autonomous cars	Cloud data management platform

1) Interbrand (2018) 2) LinkedIn (2018)

Importance of platform ecosystems

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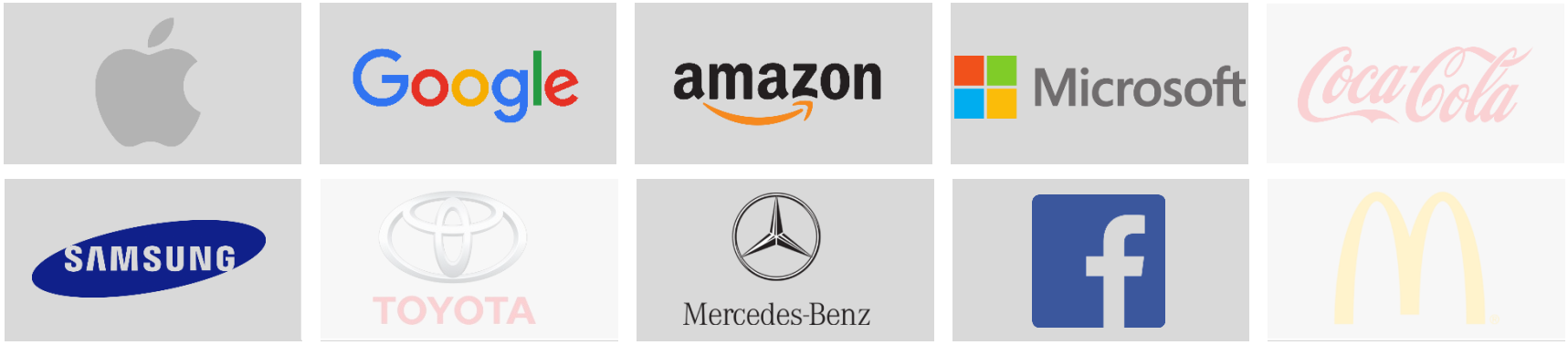


Top 10 US startups 2018[2]

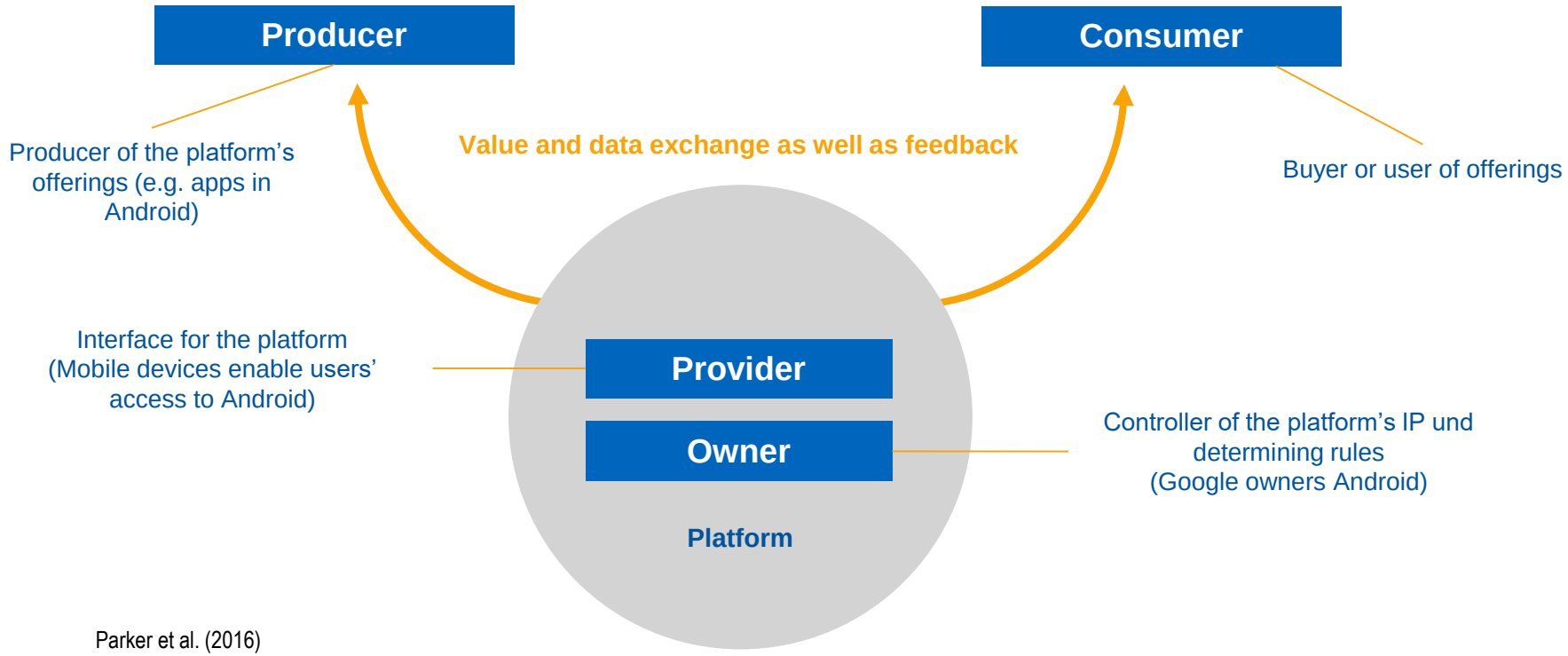
lyft Ride-sharing platform	HALO TOP Ice cream	coinbase Digital wallet	Noodle.ai AI as a service	Bird E-scooter sharing
Robinhood Investment app	ripple Payment platform	Glossier. Beauty products (influencer platform)	AURORA Autonomous cars	rubrik Cloud data management platform

1) Interbrand (2018) 2) LinkedIn (2018)

Platform from a business perspective – Key Roles

A platform is a business based on enabling value-creating interactions between external producers and consumers.

Parker et al. (2017)

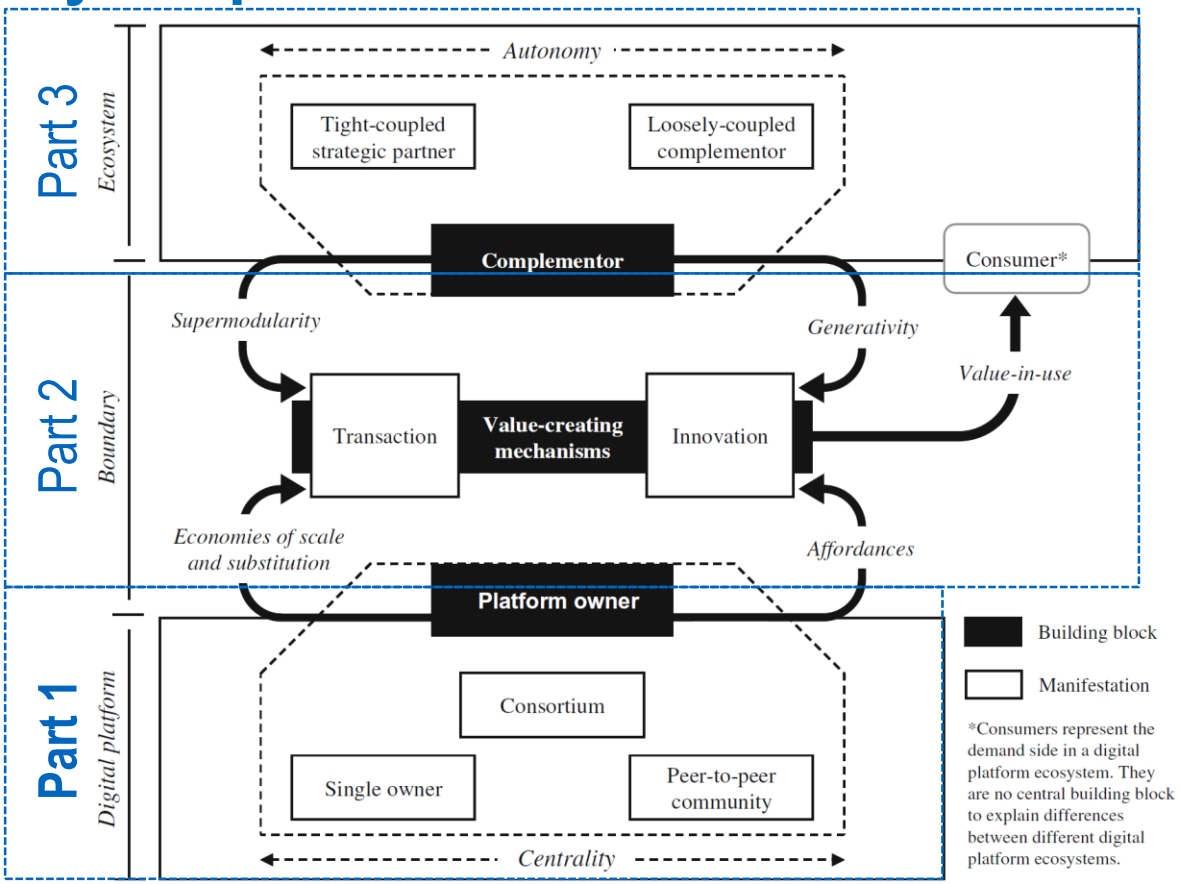


Parker et al. (2016)

What is a digital Platform?

- "**Markets**, where users' interactions with each other are subject to **network effects** and are facilitated by **a common platform provided by one or more intermediaries**" (Eisenmann et al. 2011).
- "A platform is a business based on enabling value-creating **interactions between external producers and consumers**. The Platform provides an open, participative infrastructure for these interactions and sets governance conditions for them." (Parker et al. 2016)
- "Digital platforms combine and **deploy [digital] technologies** in new ways to incubate and **coordinate an ecosystem** of supply and demand" (Hein et al. 2019a).
- "A **set of stable components** that supports variety and **evolvability** in a system by constraining the **linkages** among the other components" (Baldwin et al. 2008).
- "**Extensible IT artifact** that provides core functionality that can be used by applications. The **applications access the platform** via interfaces." (Boudreau, 2010)

The Digital Platform Ecosystem and today's 3 parts of the lecture



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Platform ownership

- Essential factor for the design and governance of digital platform ecosystems (Bakos and Katsamakas 2008; Tiwana et al. 2010)
- Defines the relationships among partners in the ecosystem

- Distribution of power in the ecosystem:
  - **Single Owner**: a single, central owner controls the digital platform ecosystem
    - E. g. Facebook, iOS, SAP Cloud Platform
  - **Consortium**: a group of actors owns the digital platform
    - E. g. Cloud Foundry
  - **Peer-to-peer Community**: a community (typically including users) governs the digital platform
    - E. g. Blockchain, Ethereum

Hein, A., et al. (2020)

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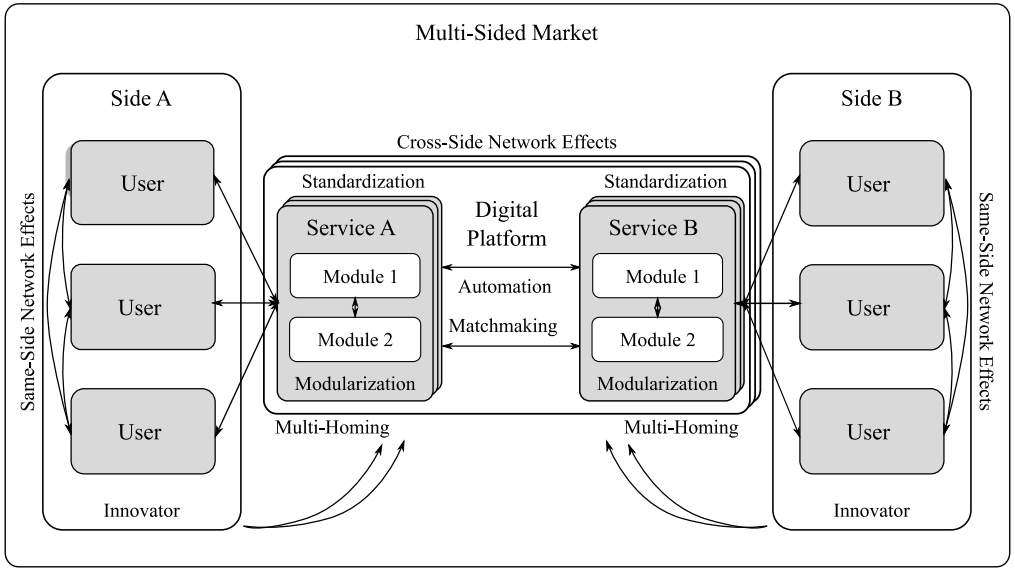
Multi/ Two-Sided Markets

- markets in which one or several platforms **enable interactions** between **end-users** and try to get the two sides on board by appropriately charging each side
- businesses includes **two independent groups of customers**



Examples of Multi-Sided Markets

Product category	Market one	Intermediary	Market two
Portable documents	Document reader	Adobe	Document writer
Credit cards	Consumer credit	Issuing bank	Merchant processing
Operating systems	Complementary applications	Microsoft, Apple, Sun	Systems developer toolkits
Ladies' nights	Men's admission	Bars, restaurants	Woman's admission
Broadcast and publishing	Content	Magazine publisher, TV, Radio	Advertisement
Recruiting	Applicants	Monster.com, LinkedIn	Employers
Reservation systems	Travelers	Expedia, Travelocity	Hotels, airlines, rental cars
Shopping malls	Shoppers	Mall of America	Stores
TV format	Color UHF, VHF, HDTV	Sony, Phillips, RCA	Broadcast equipment
Academic journals	Articles	Management Science	Author submission
Stock exchange	Equity purchasers	NYSE, NASDAQ	Listed companies
Home real estate	Home buyers	Real estate agents	Home sellers
Paid search	Searchers	Google.com	Marketers

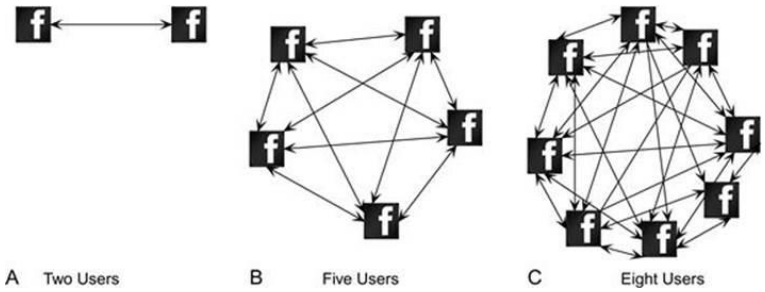
Source: Eisenmann et al. (2006): Strategies for Two-Sided Markets; Parker et al. (2005): Two-Sided Network Effects: A Theory of Information Product Design: Hyrynsalmi (2014): Letters from the War of Ecosystems

Multi-sided Market Business Model Characteristics: Network Effects

Direct/ Same-side Network Effects

increase in usage leads explicitly to **increased welfare of the same side** of the network.

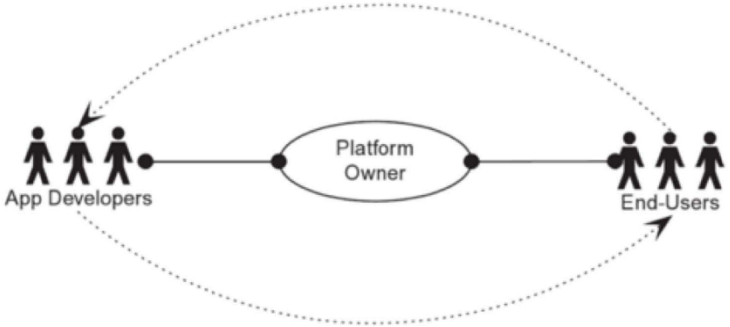
Examples: telephone or social networks



Indirect/ Cross-side Network Effects

increase in the usage of one product or service increases the value of **complementary products** in the network.

Examples: credit cards or app stores



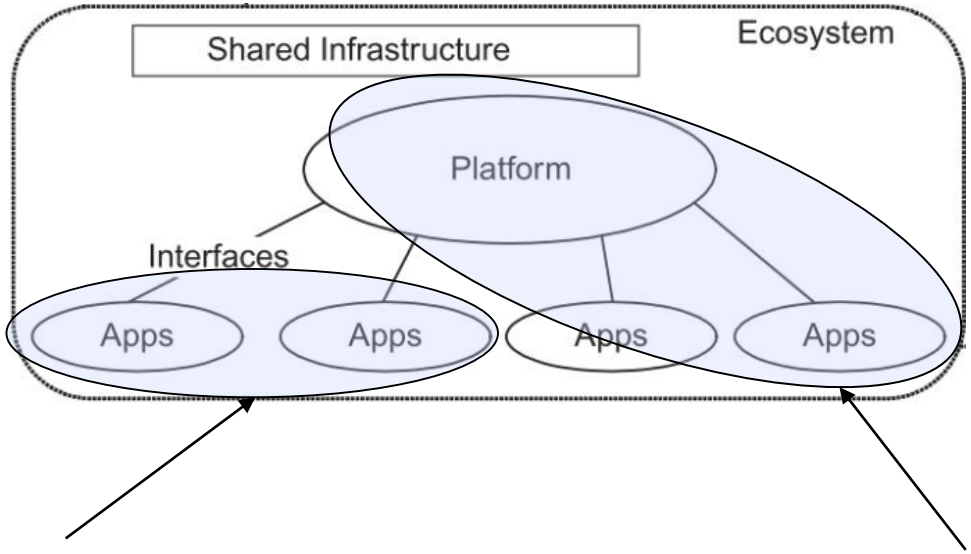
Tiwana (2014)

Multi-sided Market Business Model Characteristics: Launch Strategies

- Each side of the platform depends on the prior existence of the other side (see indirect network effects)
- How to launch a digital platform and build a user base?
  - **Follow-the-rabbit strategy**: build on existing success based on non-platforms, e.g., Amazon's own book sales
  - **Piggyback strategy**: connect with existing user base from other platform, e.g., PayPal piggybacked on eBay
  - **Seeding strategy**: Create value units that will be relevant to at least one set of potential users, .e.g., Google awarded Android app developers

Parker et al. (2016)

Multi-sided Market Business Model Characteristics: Competition *Within* Platform Ecosystems



User level:

competition between developers

Platform level:

competition between complementor and platform (e.g., Amazon Marketplace)

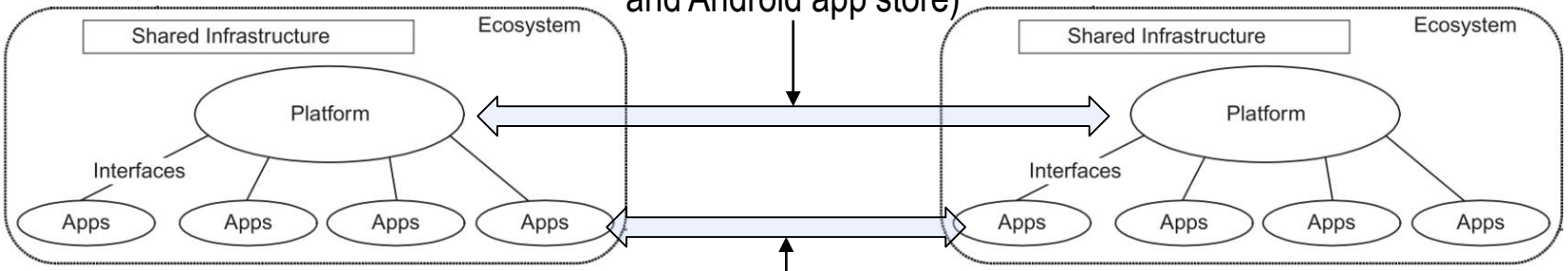
Tiwana (2014)

Multi-sided Market Business Model Characteristics: Competition *Between* Platform Ecosystems

Competition between platform ecosystems under strong network effects evoke **winner-take-all** or **winner-take-some** markets

Platform level:

interoperability vs. exclusivity (e.g., iOS and Android app store)



User level:

single- vs. multihoming

Multihoming in platforms refers to when a platform participant on either side participates in **more than one platform ecosystem**
Example: using Netflix **and** Disney+ or
providing apps for iOS **and** Android app stores

Tiwana (2014)

Multi-sided Market Business Model Characteristics: Winner-take-all

- Four forces often characterize winner-take-all markets:
  - Supply-side economies of scale (scale leads to lower cost per unit)
  - Strong network effects
  - High multihoming or switching costs
  - Lack of niche specialization

Google

NETFLIX

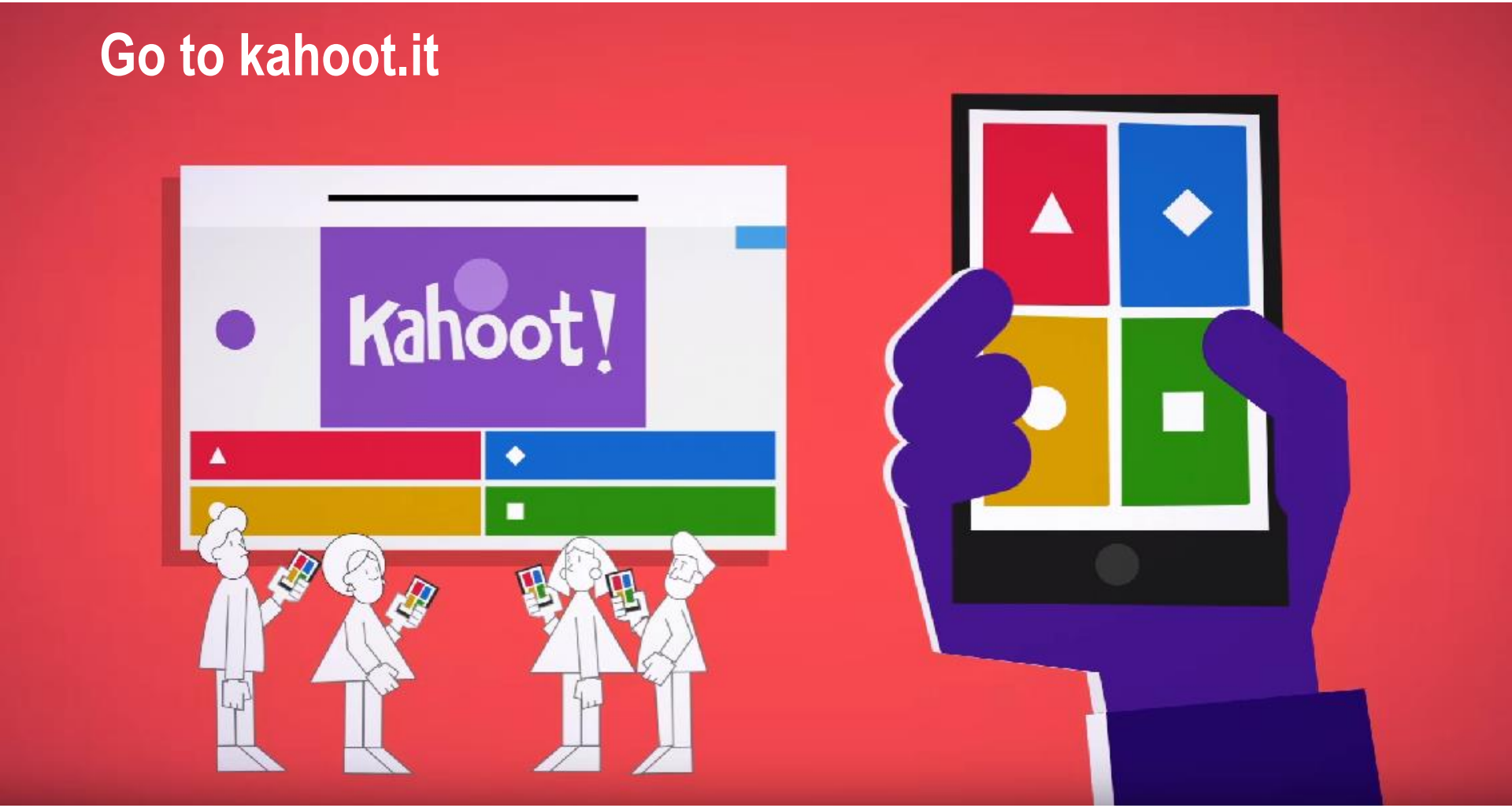
facebook

amazon

Parker et al. (2016, p.224 - 228)

Quiz Time!

Go to kahoot.it



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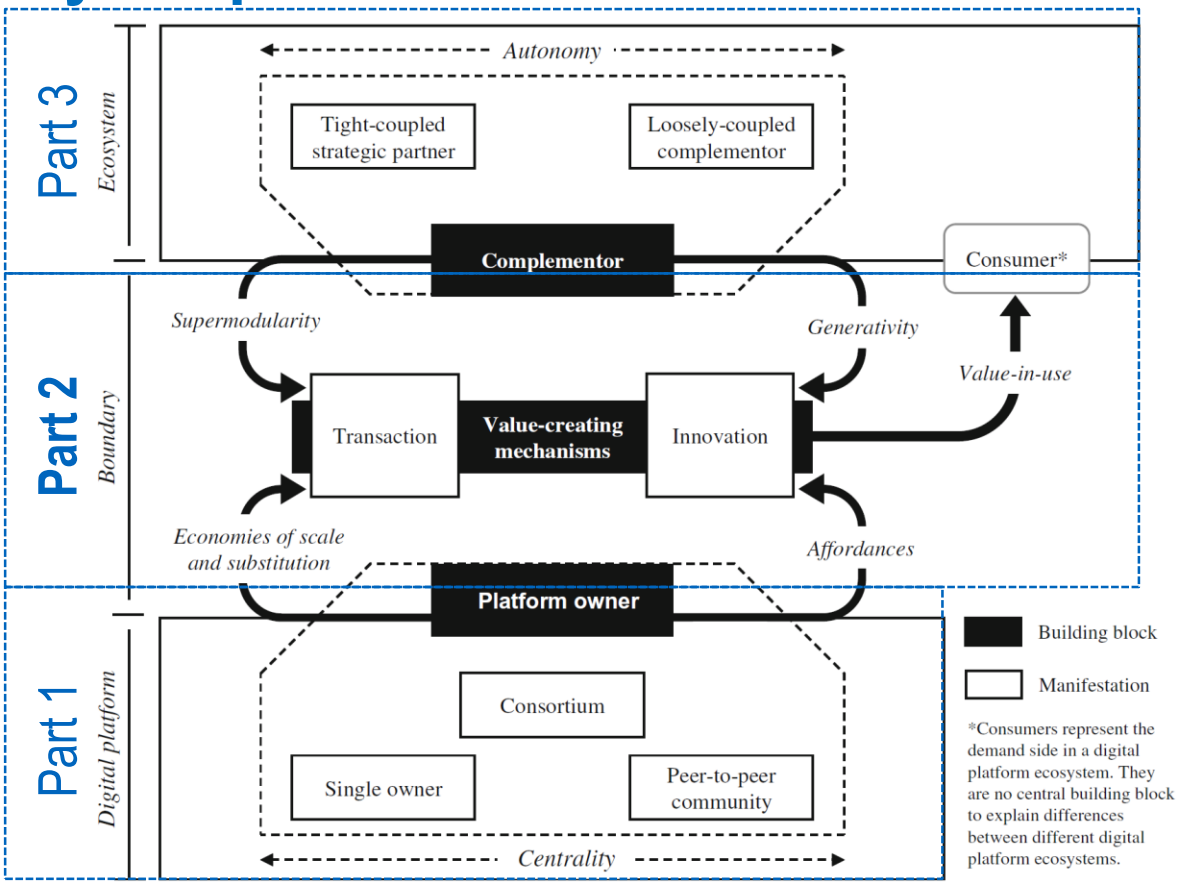

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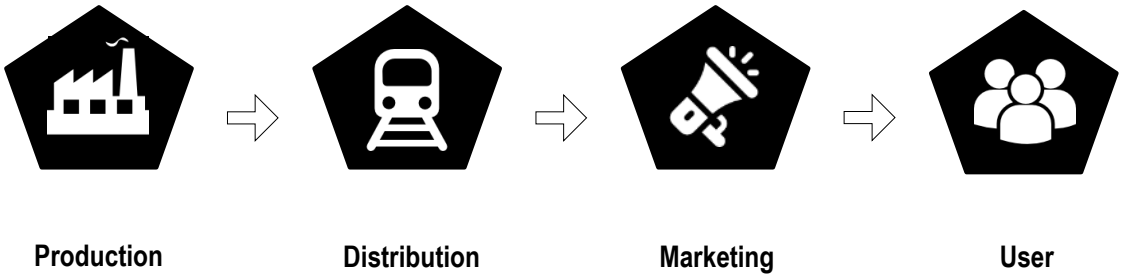
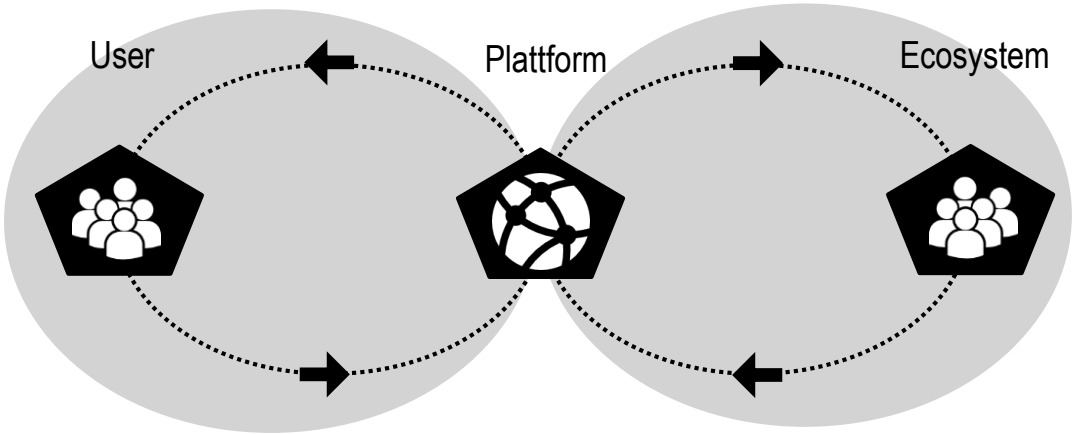
Value Co-Creation



Without platform: Value creation process is linear and determined



- Developer
- Publisher
- Property Owner
- Companies
- Service offerer

With platform: Value co-creation process is continuous and follows a virtuous cycle

Parker et al. (2016)

Platform value-creating mechanisms

- Efficient and convenient facilitation of **transactions** (Tiwana 2014)
  - digital platforms help complementors and consumers **locate** and **interact** with each other and **exchange value** in a mutually beneficial manner
  - acts as an intermediary by directly **matching supply to demand**

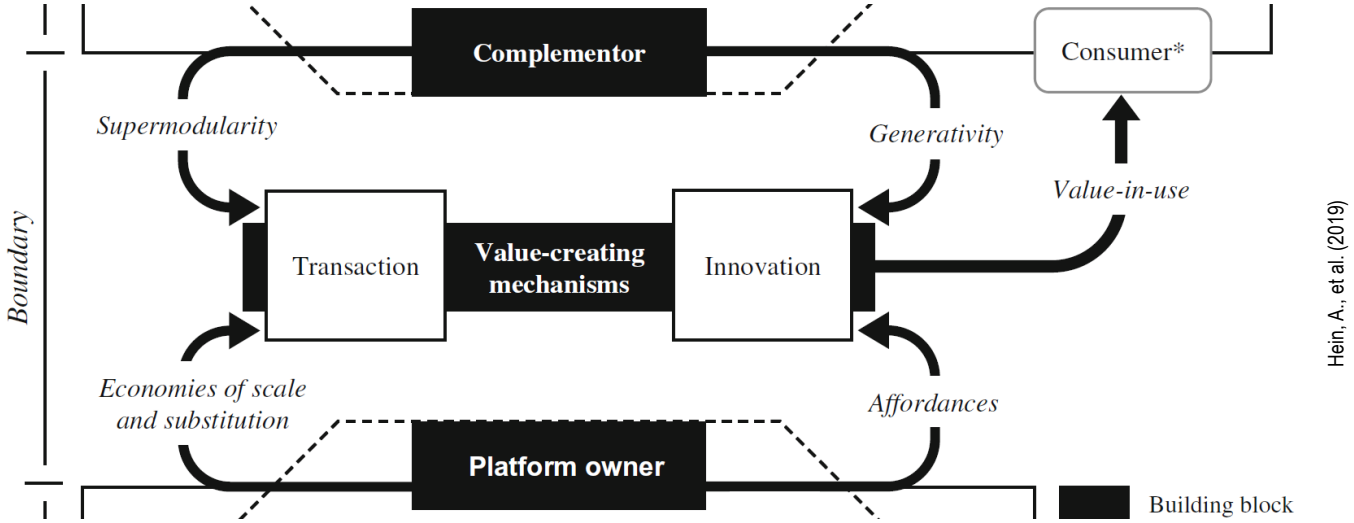
- Provision of affordances making the digital platform a breeding ground for **innovation** (Yoo et al. 2012)
  - platform owner provides **affordances** by offering development tools for complementors
  - use those **boundary resources** to co-create value-adding complements

Hein, A., et al. (2020)

Platform value-creating mechanisms

Supermodular complementarity:
an increased amount of Product A makes Product B more valuable, where A and B are different products or services.

Generativity:
"overall capacity to produce unprompted changes driven by large, varied, and uncoordinated audiences" (Zittrain 2005)



Economies of scale and substitution:
"Reusing modular and upgradable components in a platform instead of designing a system from scratch" (Garud and Kumaraswamy 1993)

Affordances:
Digital infrastructure building upon a modular software-based platform, meaning it can be *reconfigured* to adapt user needs and prompt new technological advances

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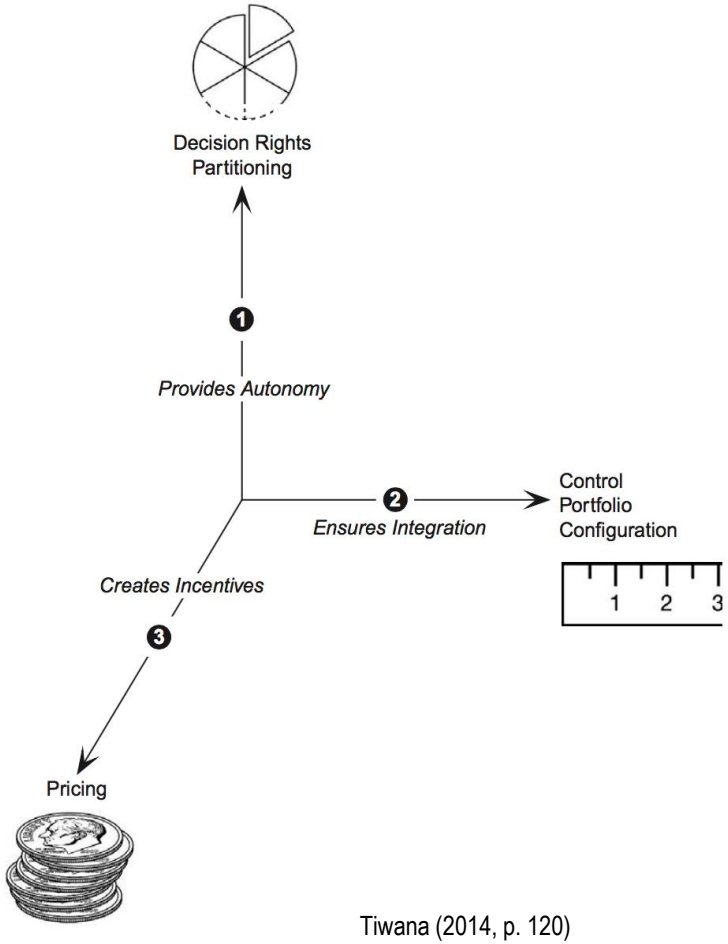
Platform Governance in an App Store



Tiwana (2014, p. 120)

How to influence the platform's ecosystem

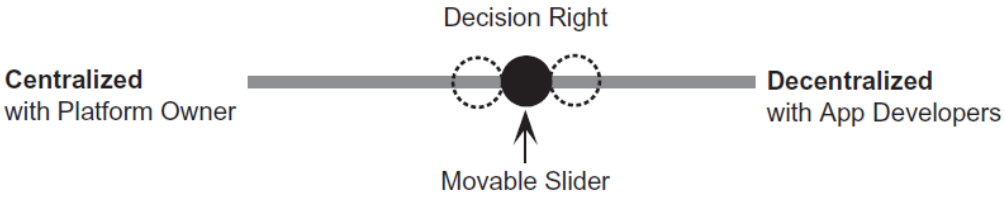
3 dimensions of platform governance:

- *Decision rights partitioning – provide autonomy*
  The platform owner can transfer decision rights to the app developer to trigger innovation
- *Control portfolio design – ensure integration*
  The platform owner needs to control and guide the development process of third-parties.
- *Pricing – create incentives*
  The platform owner needs to create incentives e.g. by sharing revenues with developers

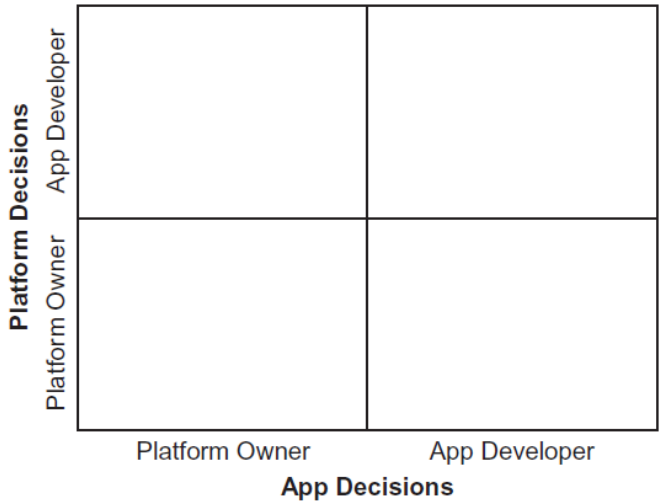
Platform Governance: Decision Rights Partitioning

- Platform vs. App Decision Rights (degree of decentralization)
  - **Platform decision rights** refer to whether the platform owner or the app developers have the authority and responsibility for making decisions directly pertaining to the **platform**
  - **App decision rights** refer to whether the platform owner or the app developers have the authority and responsibility for making decisions directly pertaining to **apps**

- Two classes of decision rights:
  - **Strategic**: What should be accomplished
  - **Implementation**: How it should be accomplished

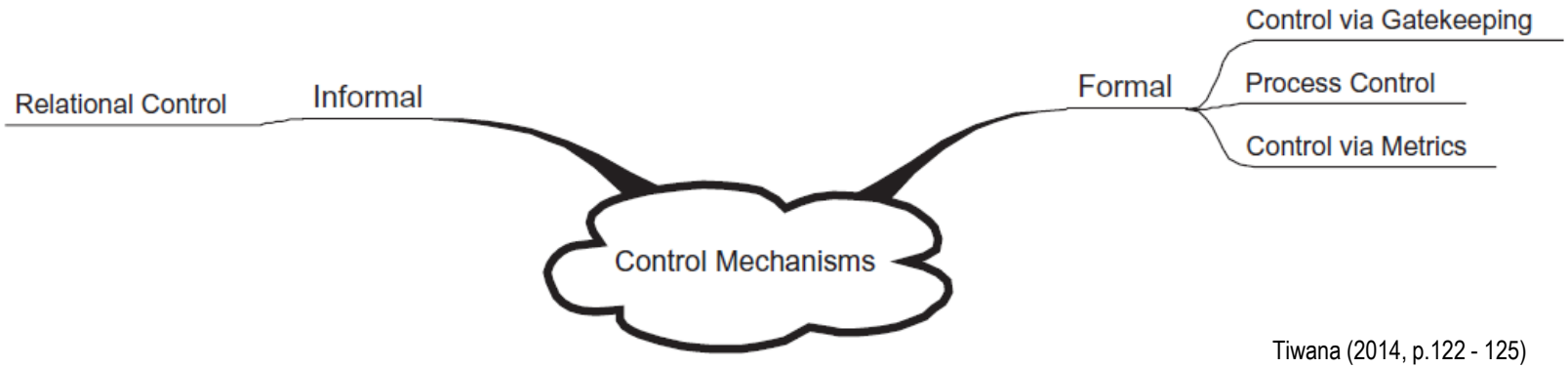


Tiwana (2014, p. 121f)



Platform Governance: Control Portfolio Design

- **Gatekeeping**: criteria who and what apps are allowed
- **Process control**: incentives to follow prescribed development methods & procedures
- **Metrics**: incentives based on predefined performance metrics
- **Relational control** (informal): the platform's norms & values



Tiwana (2014, p.122 - 125)

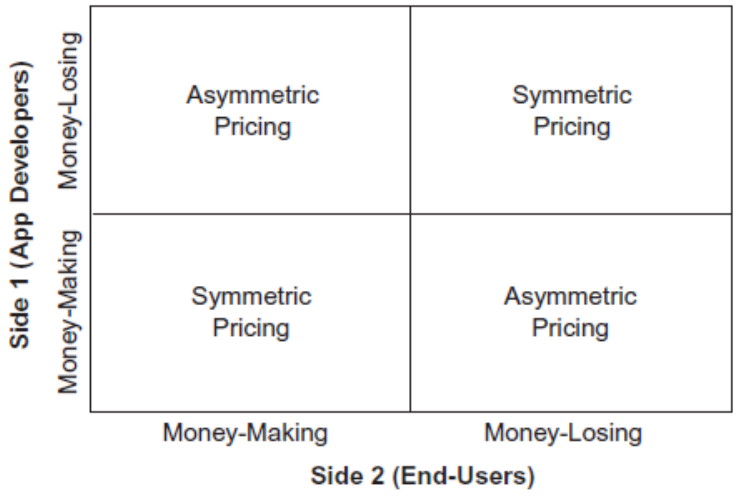
Platform Governance: Pricing Policy

Goal: Create incentives for app developers to invest in own app offerings to ensure their prosperity and the platform's vibrancy

- Symmetric or asymmetric pricing?
  - If asymmetric, who to subsidize and for how long?
- Pricing for access vs. usage?
- Pie-splitting using a fixed scale or a sliding scale
- App pricing decisions
  (Single perpetual, subscription- or usage-based licence)

Tiwana (2014, p.126)

Platform Governance: Pricing Policy



"We want to make money when people use our devices, not when they buy our devices."
Jeff Bezos, CEO of Amazon

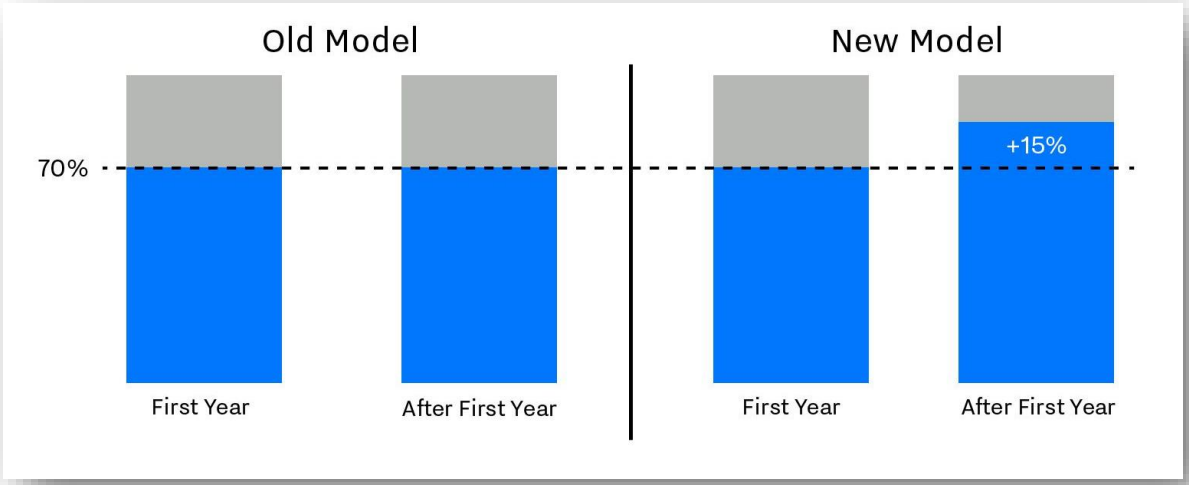
Asymmetric: subsidize one side (typically the more price sensitive or more needed side, e.g. end-users), e.g. free shipping

- Make up losses by increased profits from the other
- Considers long-term over short-term profitability

Tiwana (2014, p.127f)

Platform Governance: Pricing & Revenue Strategies

- **Revenue sharing** as incentive for third-party developers to join the ecosystem (e.g.: Apple's new revenue share for subscriptions)



Goode (2016)

- **Subsidizing** of one side of the platform

Implementing platform governance: Boundary Resources

Definition Boundary Resources (BR)

Resources that **support** developers in their development efforts

They **define** interaction with the platform

They **implement** platform governance

Application BR

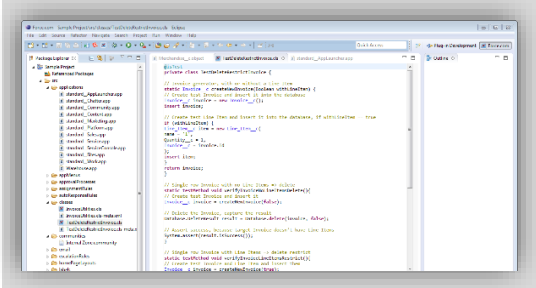
Technical resources

E.g.: APIs, technologies, frameworks

Development BR

Support of the development process

E.g.: SDKs, IDEs, GUI Builder, Marketplace



Social BR

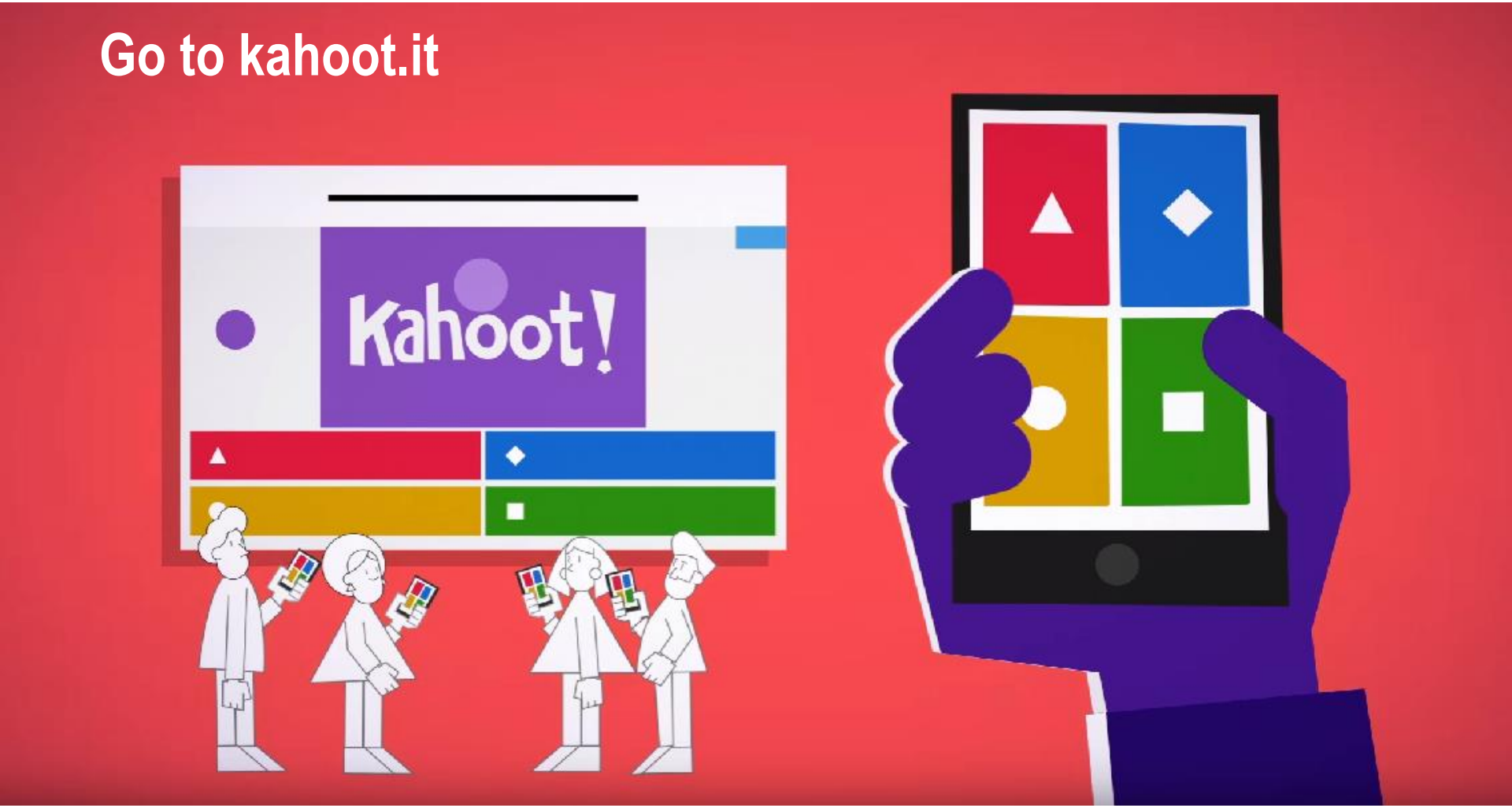
Control interactions and behavior

E.g.: Partner program, documentation, training

Dal Bianco et al. (2014); Ghazawneh & Henfridsson (2013)

Quiz Time!

Go to kahoot.it



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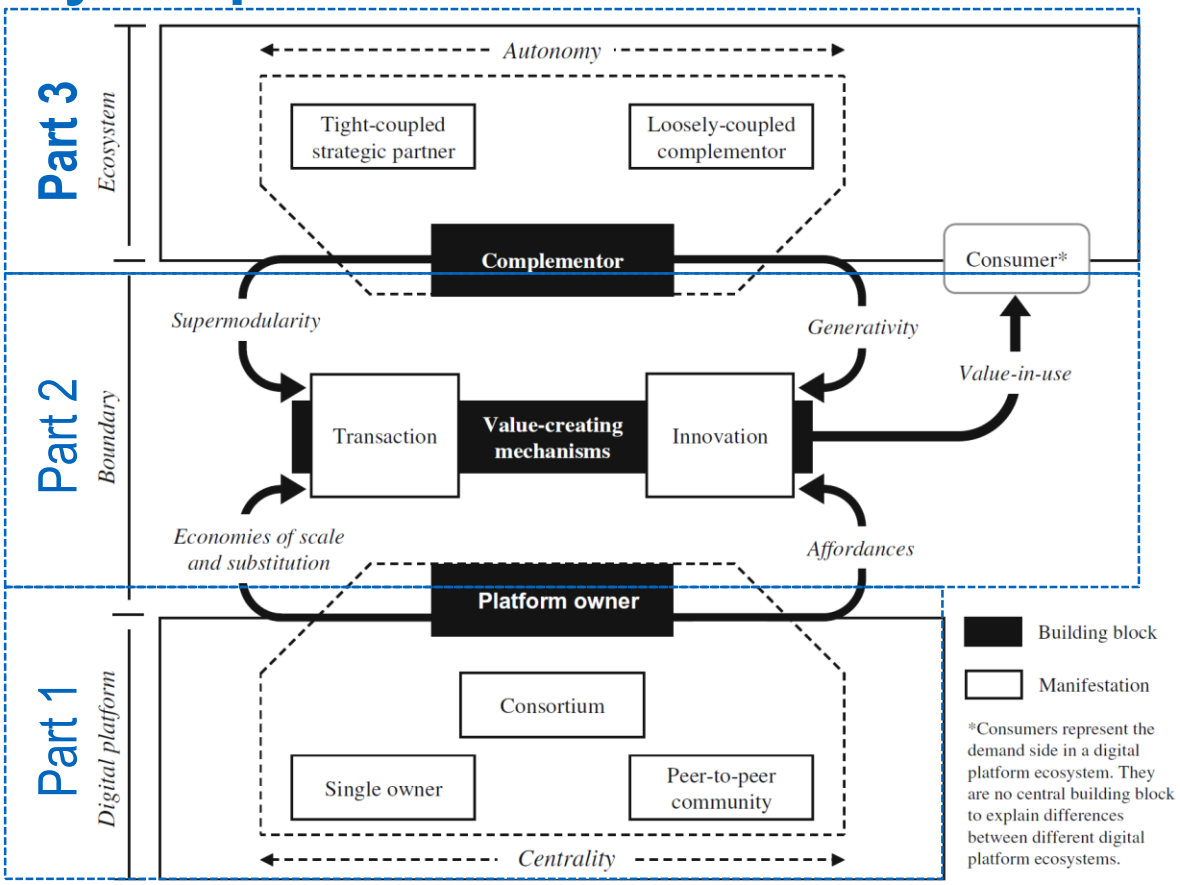

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Digital Platform Ecosystems

*A digital platform ecosystem comprises a **platform owner** that implements governance mechanisms to facilitate **value-creating mechanisms** on a **digital platform** between the platform owner and an ecosystem of autonomous **complementors** and **consumers***

Hein, A., Schreieck, M., Riasanow, T., Setzke, D. S., Wiesche, M., Böhm, M., & Krcmar, H. (2020). Digital platform ecosystems. *Electronic Markets, 30*(1), 87–98. doi: https://doi.org/10.1007/s12525-019-00377-4

Why „ecosystem“?

Picture: Shutterstock

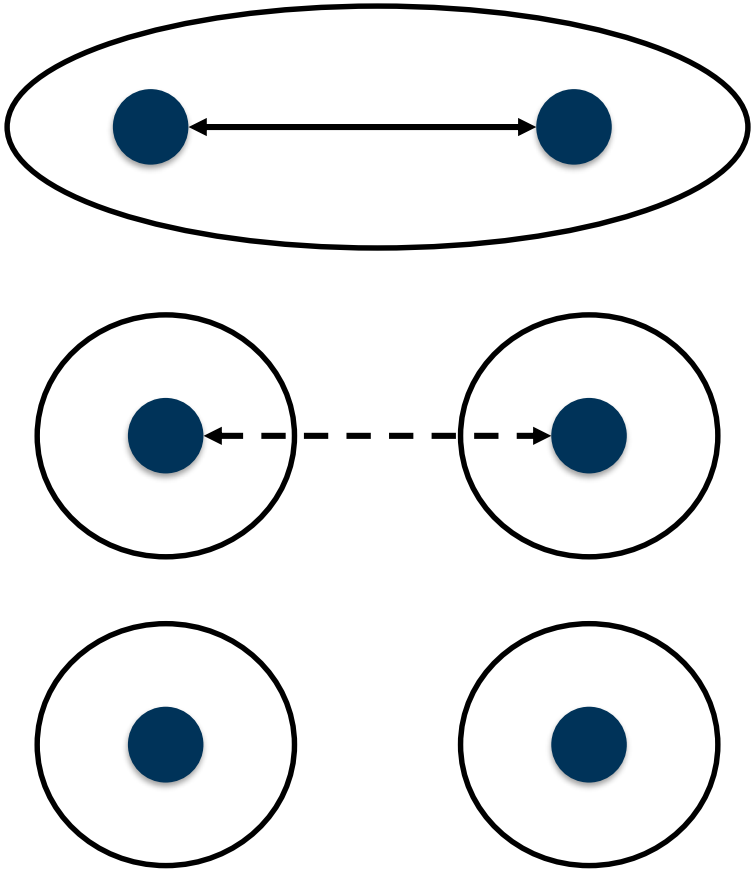
The ecosystem analogy

- Reservoir of **finite resources**
- Populations are controlled by **impulses**
- **Interactions** between participating units
- **Adaption** of individuals and the system
- Need for **balance**/adaption
- Why does **diversity** matter?

	Ecosystem – Biology/Ecology	Ecosystem – IT
Description	**Physical and biological components** of an environment considered **in relation** to each other **as a unit**	A **set of actors functioning as a unit** and **interacting with a shared market** for software and services, together with the relationships among them
Measurement	Degree of variation of all life forms	Variety in the developer and user communities
Purpose	Higher biodiversity supports a more stable equilibrium of an ecosystem	When one market segment is obsolete because of competing technological platforms, the ecosystem can still foster other areas
Dynamics	Food web: top-down (predator & prey), bottom-up (limited resource availability)	Interfirm network: top-down (one dominant keystone firm), bottom-up (e.g., open source consortium)

Mens et al (2014); Willis (1997); Jansen et al. (2009)

Ecosystem Integration: Tight- and Loose-Coupling



(1) Tight Coupling:
- Mutual dependent elements,
- Responsiveness without distinctiveness,
- Close relationships and low degree of information asymmetry.

(2) Loose Coupling:
- Independent and distinct elements,
- Distinctive responsiveness,
- Flexible (outside) scalability (inside)

(3) Decoupling:
- Independent elements,
- Distinctiveness without responsiveness

Responsiveness: extent of responses to other element's changes

Distinctiveness: extent to which the elements are different from each other

Complementor autonomy

= Degree of freedom complementors have when co-creating value with the digital platform (Ye and Kankanhalli 2018)

- High autonomy → loosly-coupled complementor → contribute to the variety and amount of complements
- Low autonomy → tightly-coupled strategic partner → strengthen the core focal-value proposition

- Depending on the autonomy of complementors, the platform owner must cope with varying levels of control, scalability, and flexibility

Hein, A., et al. (2020)

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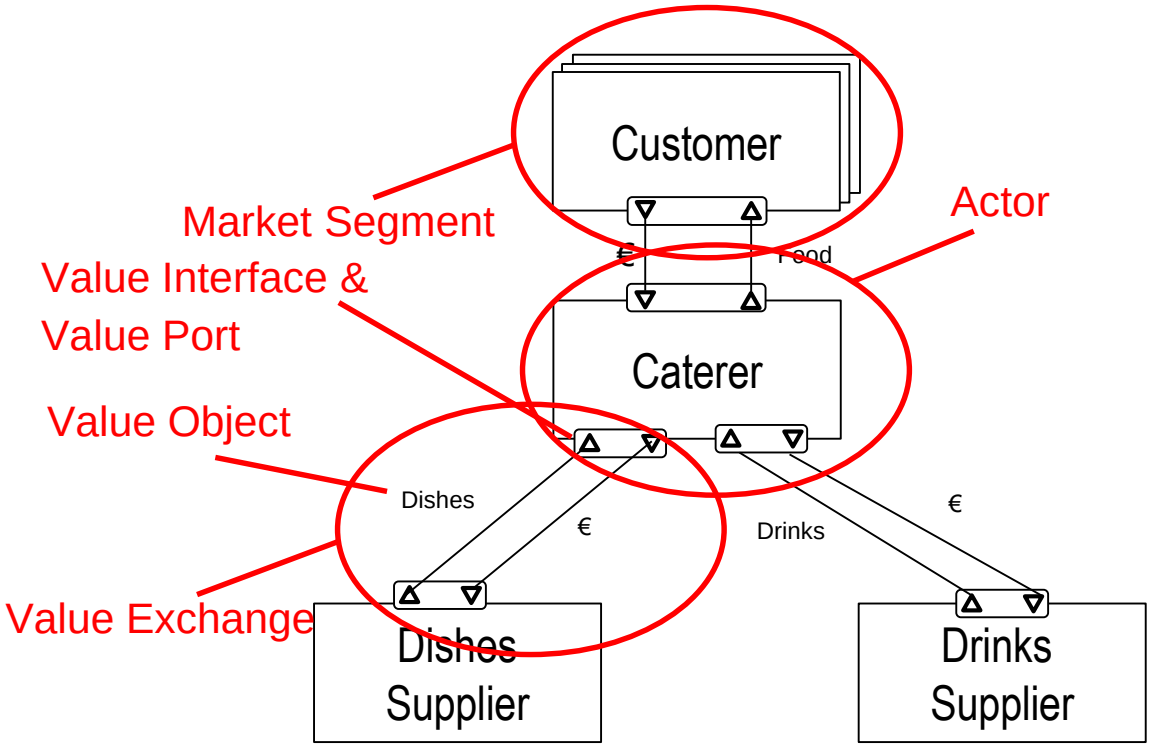
   2. Platform Governance
3. **Ecosystem**
   1. Complementor Autonomy
   2. **E^3 Value Modelling**

Learning Objectives

- *You understand digital platforms and their ecosystems*
- *You understand and can analyze characteristics of multi-sided market business models*
- *You know and understand value-creating mechanisms on digital platforms*
- *You understand and can analyze three types of platforms governance and their implementation*
- *You know and understand different forms of complementor autonomy in platform ecosystems*
- *You can apply the E^3-Value Modelling*

E³-Value Model – Concepts



Actor
Independent economic unit

Market Segment
Set of actors having equal value objects and value interfaces

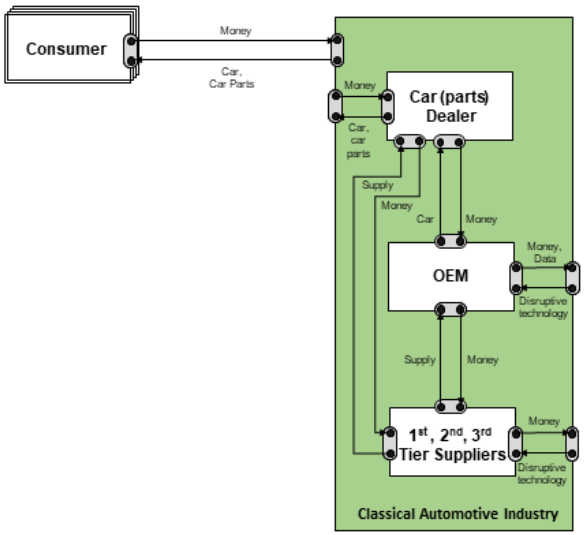
Value Object
Object, which is being exchanged between actors, that represents a value (e.g. assets, money)

Value Port
Supply/Demand indicator for value objects

Value Interface
Contains value ports and shows, what is exchanged for what

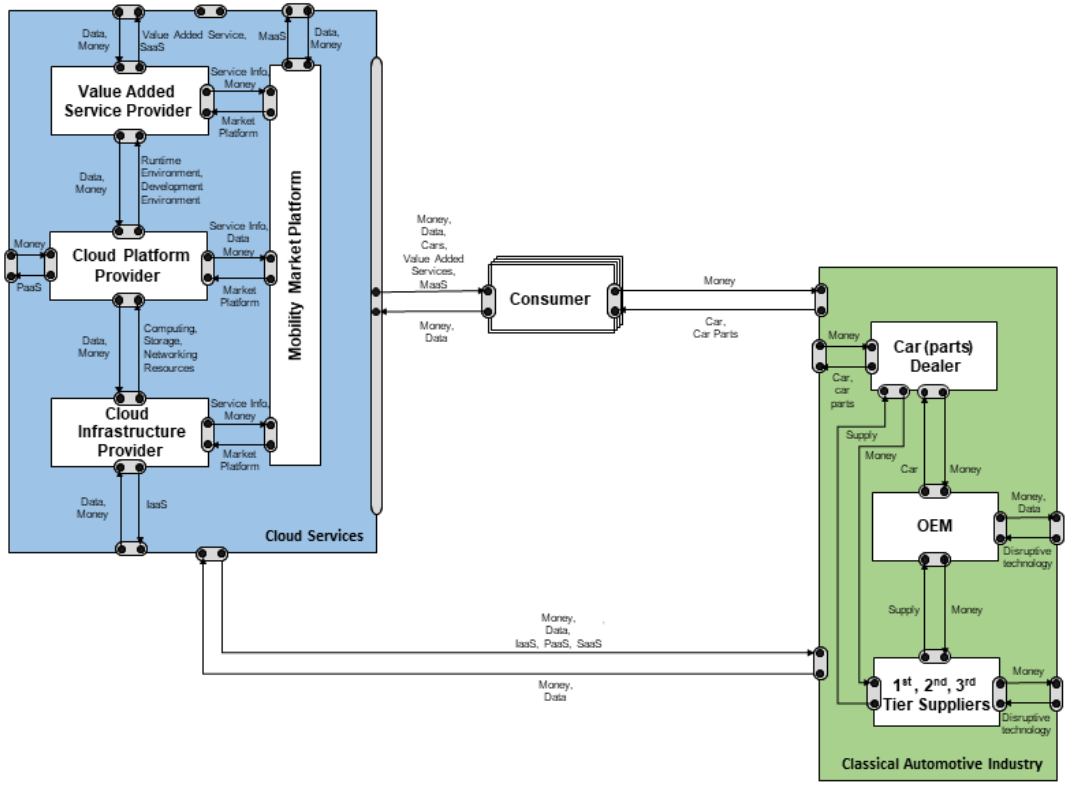
Value Exchange
Connection of two value ports having an exchange relationship

Example: Ecosystem Change in the Mobility Context



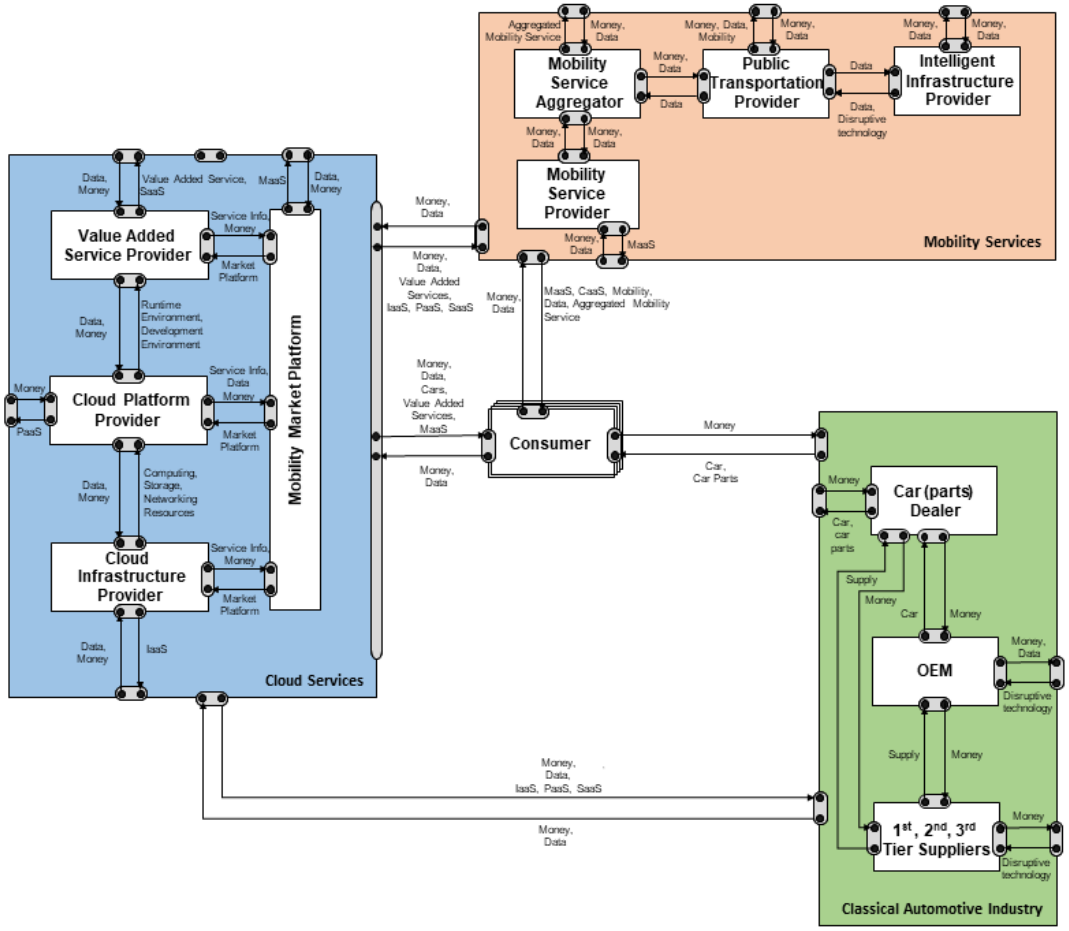
Riasanow et al. (2017)

Example: Ecosystem Change in the Mobility Context



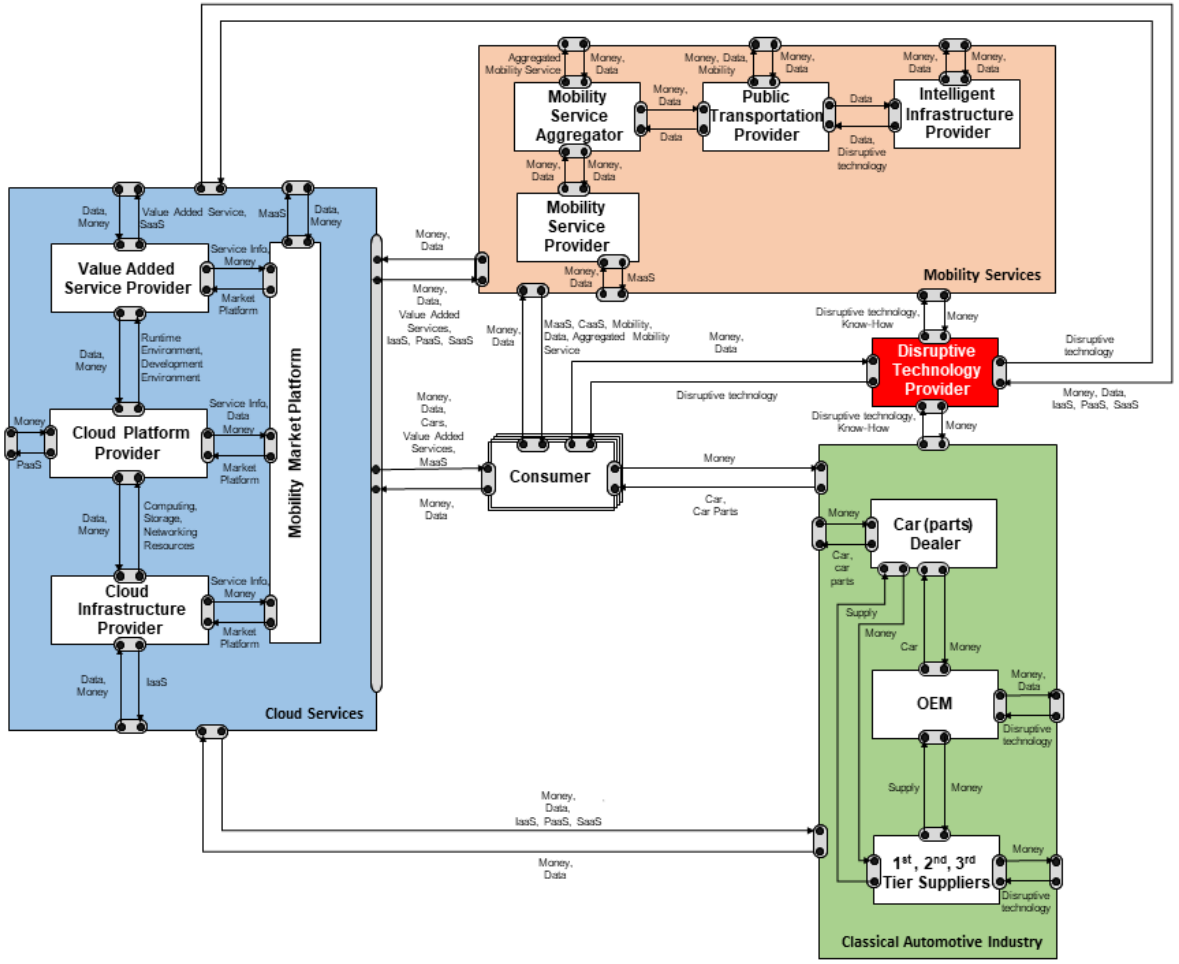
Riasanow et al. (2017)

Example: Ecosystem Change in the Mobility Context



Riasanow et al. (2017)

Example: Ecosystem Change in the Mobility Context



Riasanow et al. (2017)

Core Literature: Krcmar, Informationsmanagement (2015)

1. Einleitung (pp.1-8)
2. Begriffe und Definitionen (pp.11-26)
3. Modellierung (pp. 31-78)
4. Aufgabe des Informationsmanagements: Informationsmanagement (pp. 85-109)
5. Aufgabe des Informationsmanagements: Management der Informationswirtschaft (pp. 113-165)
6. Aufgabe des Informationsmanagements: Management der Informationssysteme (pp. 173-302)
7. Aufgabe des Informationsmanagements: Management der Informations- und Kommunikationstechnik (pp. 315-385)
8. Führungsaufgaben des Informationsmanagements
   8.1 Unternehmensstrategie und Informationsmanagement (pp. 396-427)
9. Referenzmodelle des Informationsmanagements (pp. 601-630)
10. Einsatzfelder und Herausforderungen des Informationsmanagements (pp. 633-753)
11. Fallstudie „Rockhaus AG“ (pp. 767-783)

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