



Aalto University  
School of Science

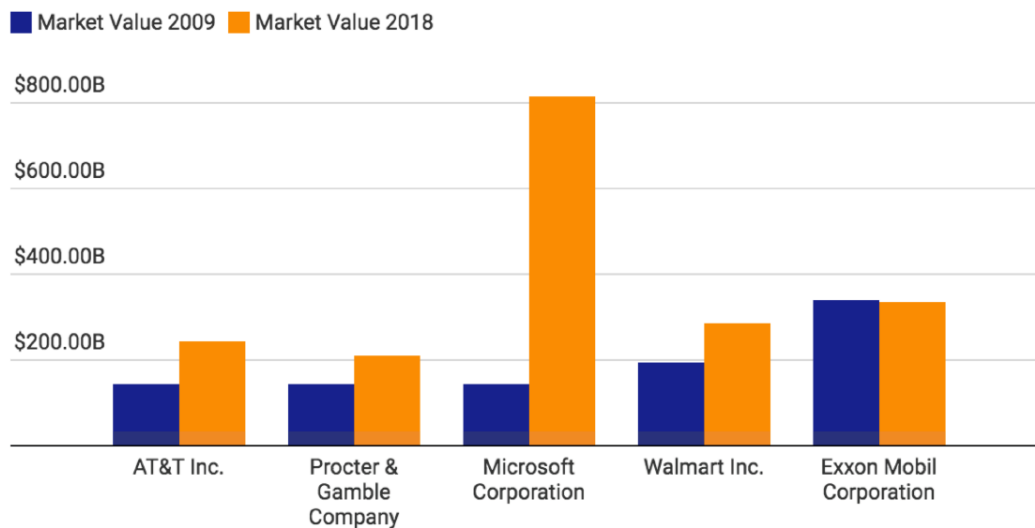
# Platform Economy Primer

*CS-E5130 16.11.2023*

*Mikko Heiskala (partially based on slides by Kimmo Karhu)*

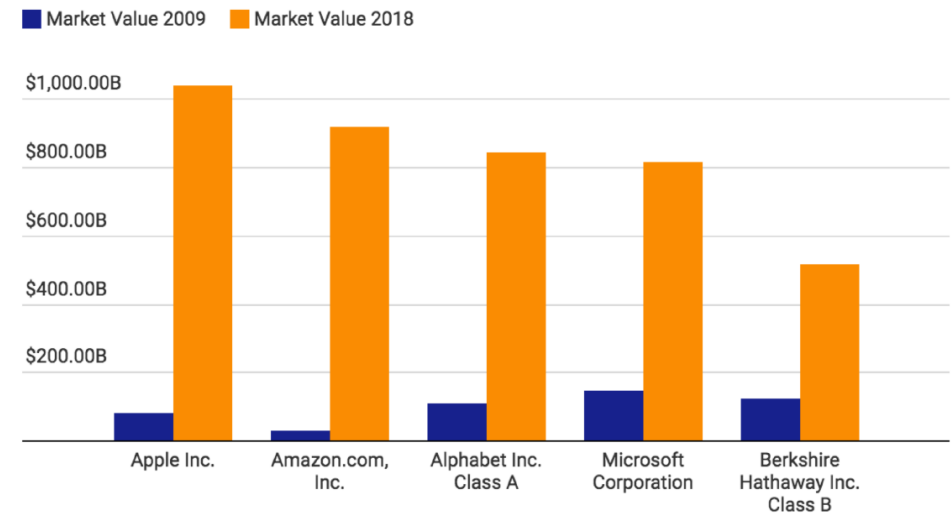
# The shift towards platform economy

## 2009



Market Value 2009 as of 02/27/2009 and Market Value 2018 as of 08/21/2018

## 2018



Market Value 2009 as of 02/27/2009 and Market Value 2018 as of 08/21/2018

# Apple "nation" vs Finland in 2019 (estimate)



**App Store: \$51B**  
**Net sales: \$260B**



**GDP: \$266B**



**\$1B**

**NETFLIX**

**\$700M**

# Matkapuhelin-Nokia jäi alustatalouden jalkoihin

**Alustataloudessa voittaja vie usein kaiken. Tämä markkinadynamiikka selittää Nokian matkapuhelinten romahdusta paremmin kuin johtajuus- ja ohjelmisto-ongelmat.**

**NOKIA** menetti 2010-luvun alussa vahvan asemansa matkapuhelinmarkkinoilla. Romahduksen syitä on pohdittu viime vuosina paljon,

taan. Markkinadynamiikka suojasi Applea myöhemmin alustamarkkinoille tullutta Nokiasa vastaan.

**MIKSI** Google onnistui valtaamaan itselleen suuren markkinaosuuden, vaikka yhtiö tuli Nokian tavoin alustamarkkinoille Applen jälkeen?

Applesta poiketen Google avasi älypuhelin-alustansa – Androidin – myös laitevalmistajille. Tämä syn-

Verkostovaikutusten kiihdyttämällä alustamarkkinalla voittaja vie kaiken, jos vaihto toiseen alustaan merkitsee alustan osapuolille merkittäviä lisäkustannuksia ja jos vaihdosta saatava lisäarvo on vähäinen.

Älypuhelimien käyttäjän on työstä siirtää yhteystiedot, viestit, valokuvat ja muu sisältö toista alustaa käyttävään älypuhelimeen. Vastaavasti sovellusten kehittäjä joutuu alustaa vaihtaessaan opiskelemaan eri ohjelmointikielen ja rakentamaan sovelluksen uudes-

paavista alustamarkkinoista ovat datan jakaminen monien asiakasyritysten kesken – vaikkapa rahti-liikenteessä – ja dataa murskaavat teollisuuden analyysisovellukset.



**Kimmo Karhu ja Mikko Heiskala**  
Karhu on tutkijatohtori ja Heiskala opettaja Aalto-yliopiston tietotekniikan laitoksella.

*“Nokia Mobile Phones was trampled by platform economy”*

Helsingin Sanomat  
Vieraskynä  
27.10.2018

13.11.2023

4

**What  
happened??**

**Where is the  
differentiation!?**

*Platforms and new  
sides; new customers*



# Digital platforms firms and their ecosystems 'rule'

—

# Why?



# Primer: Ecosystems and complementarity

# Business ecosystem



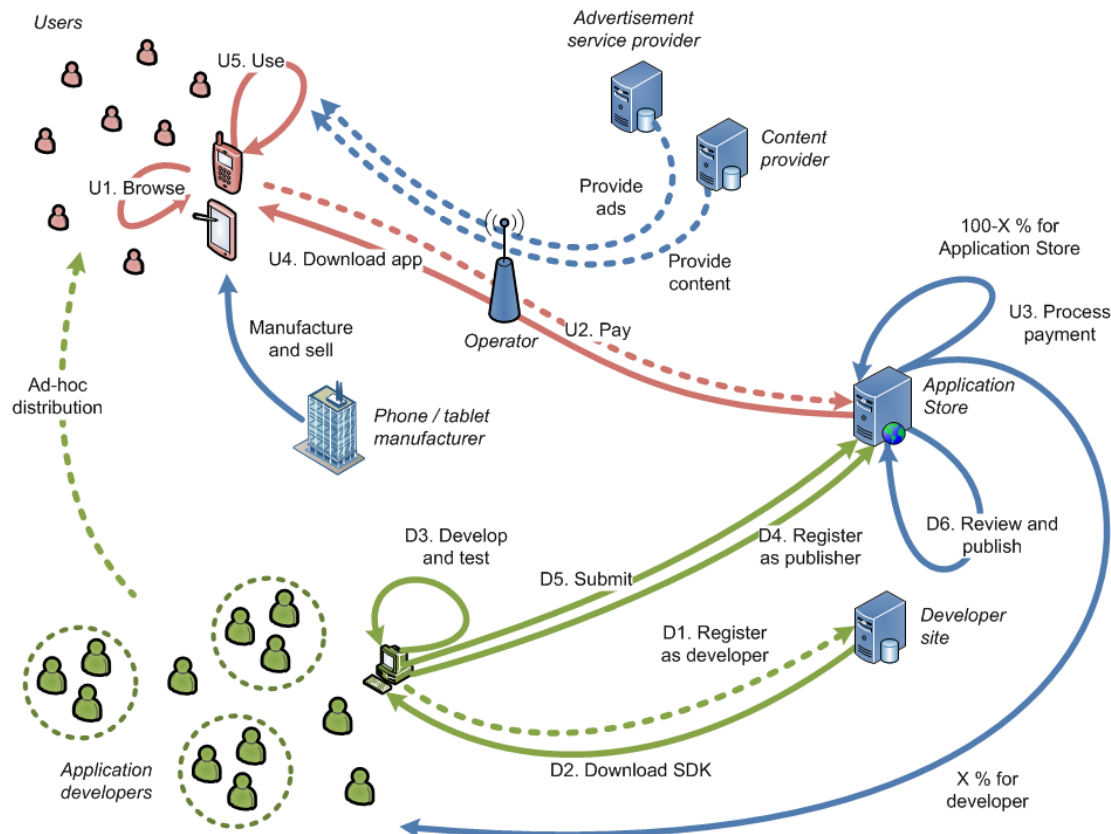
- A company should be viewed not as a member of a single industry but as part of a business ecosystem that crosses a variety of industries
- Companies work cooperatively and competitively to support new products and satisfy customer needs



# Ecosystems and complementarity

- “An ecosystem is a **set of actors with** varying degrees of multilateral, **nongeneric complementarities** that are **not fully hierarchically controlled**“ (Jacobides et al., 2018)
- **Complementarity**
  - $V(A+B) > V(A) + V(B)$
  - E.g., razor + blade

# Example: Mobile ecosystem



- “An ecosystem is a set of actors with varying degrees of multilateral, *nongeneric complementarities* that are not fully hierarchically controlled“ (Jacobides et al., 2018)

## Complementarity

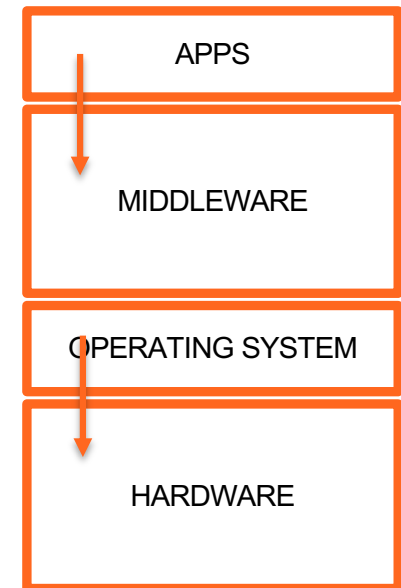
- $V(A+B) > V(A) + V(B)$
- E.g., razor + blade

# Generic vs specific complementarity

- **Generic complementarity means that there is no need to coordinate in specific ways**
- **No need to create a specific alignment structure among the economic actors.**



**Specific, non-generic**



# Ecosystems vs platforms?

## ECOSYSTEM

The **alignment structure** of the multilateral set of partners that need to interact in order for a focal value proposition to materialize

- Adner (2017) Journal of Management

**Groups of firms** that produce products or services that together comprise a coherent solution

- Hannah & Eisenhardt (2018) Strategic Management Journal

**Communities of interdependent yet hierarchically independent heterogeneous participants** who collectively generate an ecosystem value proposition

- Thomas & Autio (2020) Oxford Research Encyclopaedia of Business and Management

## PLATFORM

**Interfaces** that mediate the transactions between the sides, such as networks of buyers and sellers, or complementors and users

- McIntyre & Srinivasan (2017) Strategic Management Journal

**Products, services, or technologies that act as a foundation** upon which external innovators, organized as an innovative business ecosystem, can develop their own **complementary** products or services

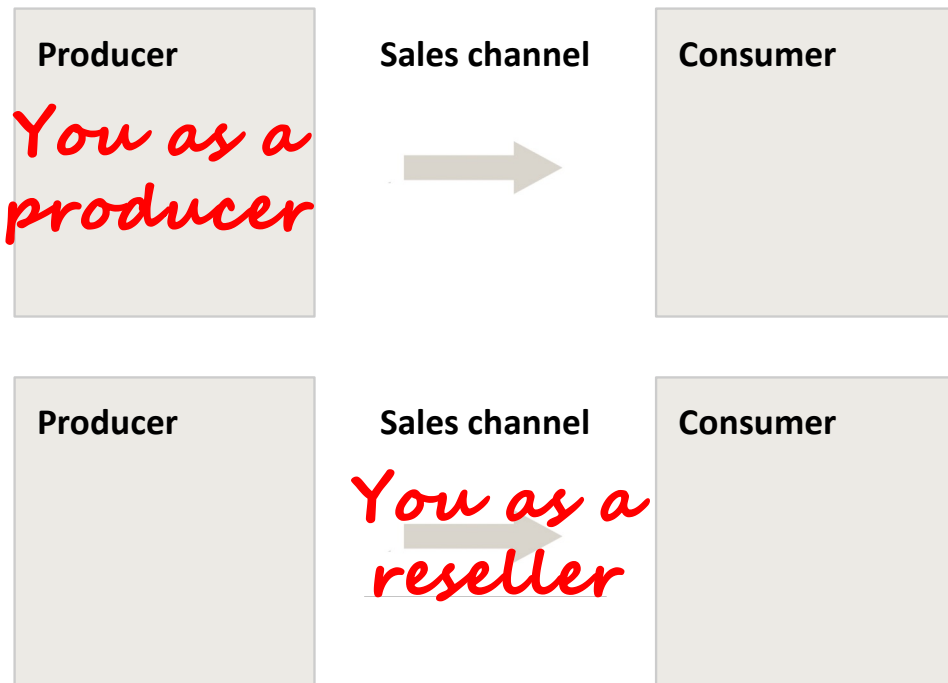
- Gawer & Cusumano (2014) Journal of Product Innovation Management

# Platforms and complementarity

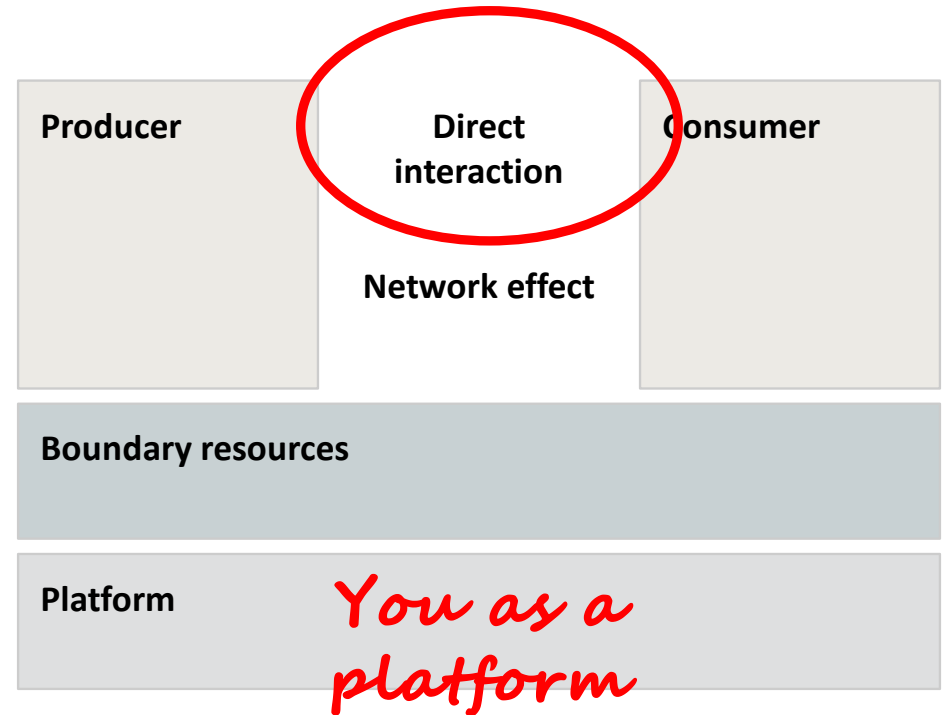
- **Platforms often have specific complementaries**
- **Technical compatibility of platform core and complements that use/depend on the core**
  - Operating system (core) and apps (complements)
- **Technical compatibility used as control point by the platform owner (how open)**
- **Specific complementarities may arise from ‘non-technical’ grounds too**

# Pipeline products vs platforms?

# Pipeline vs platform business model



PIPELINE / RESELLER BUSINESS MODEL

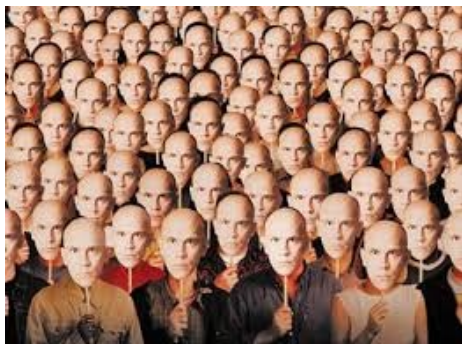


PLATFORM BUSINESS MODEL

# Pipeline and platform in print business



→ **The  
New York  
Times** →



↙ ↘  
**facebook**

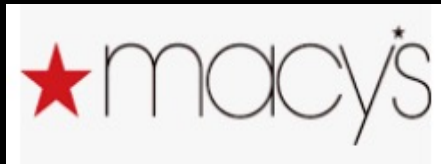




# Whose pipeline business is disrupted by the platform?

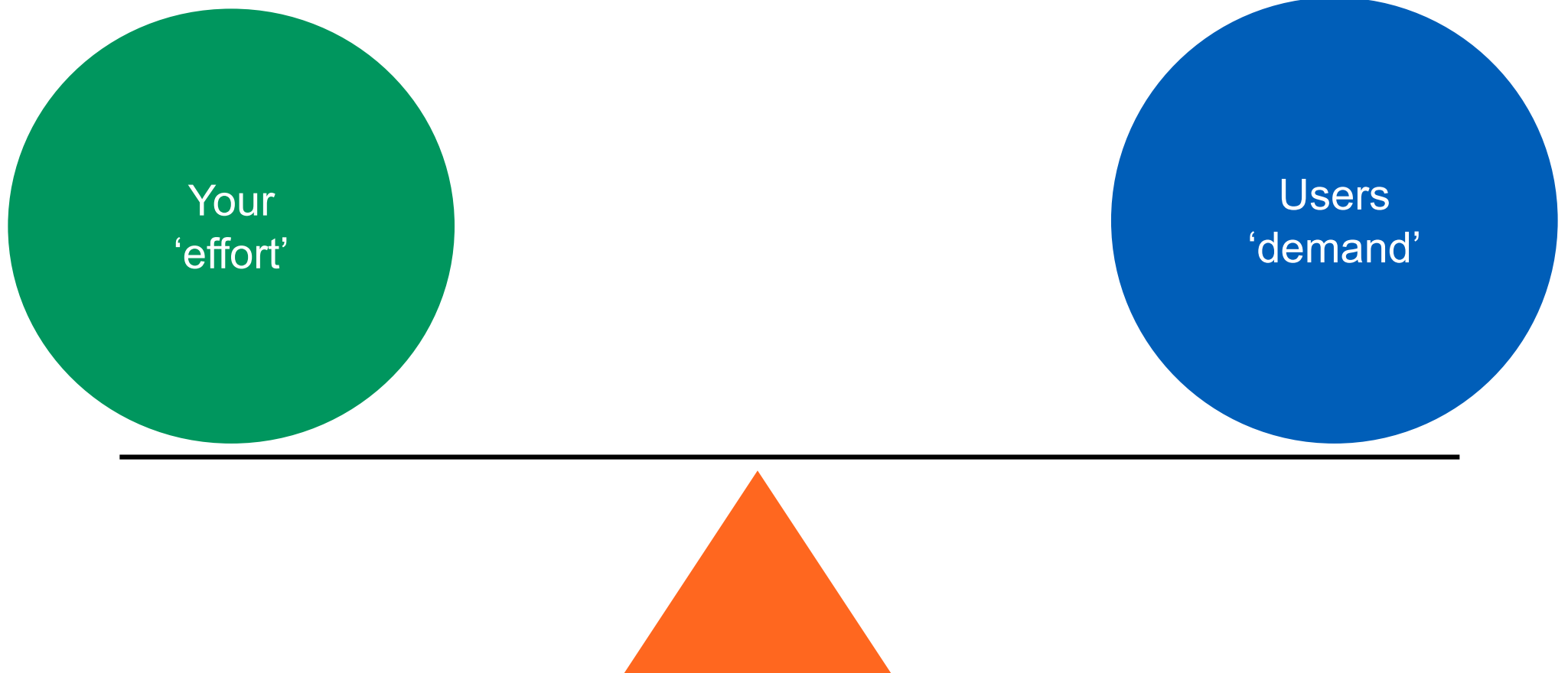
"Pipeline" incumbent

Platform entrant



# Why platforms beat products?

# Traditional pipeline business



# Employees of digital platforms vs traditional firms in 2018 (and market caps)

Figure 1: Market values of digital platform firms vs comparable traditional firms, 2018

Firm	Start year	Employees	Market capitalization (billion \$)
BMW	1916	131,000	51
Uber	2009	16,000	76
Marriott	1927	177,000	39
Airbnb	2008	10,000	38
Walt Disney	1923	199,000	163
Facebook	2004	35,000	473

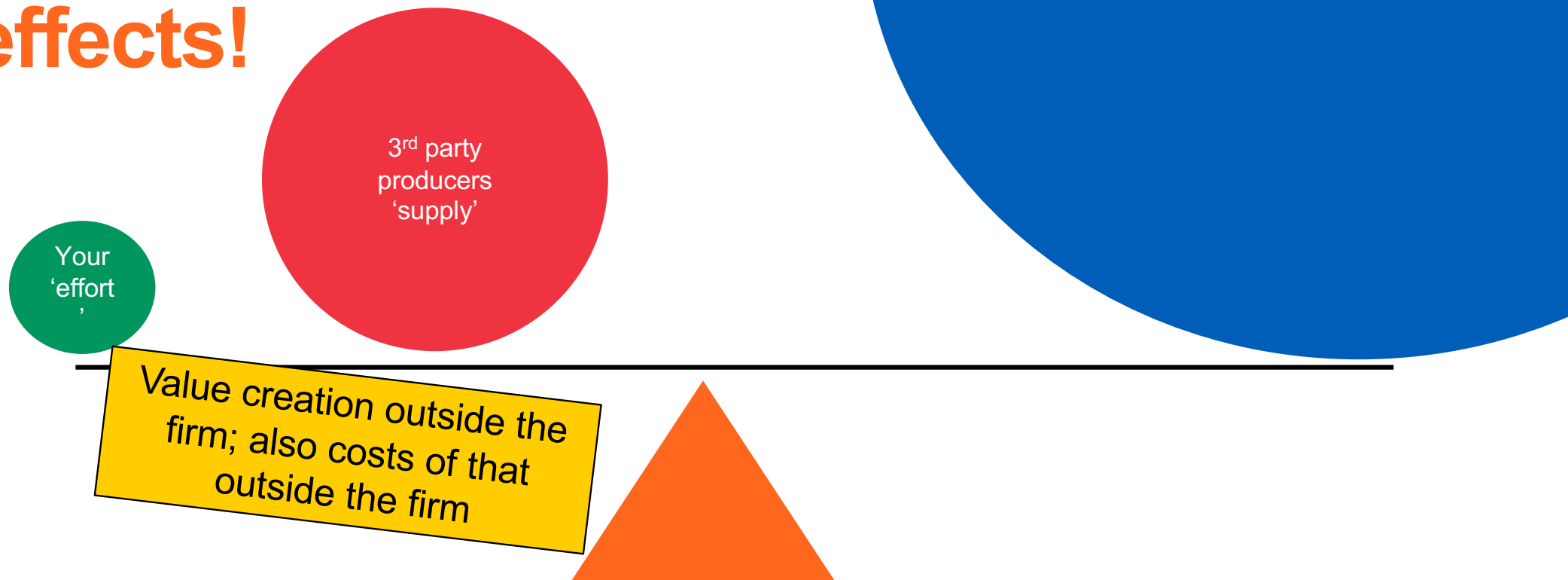
# Platform business

Users  
'demand'

Your  
'effort'

# HOW?!

# Leverage: digitalization, generativity + network effects!



# Digitalization



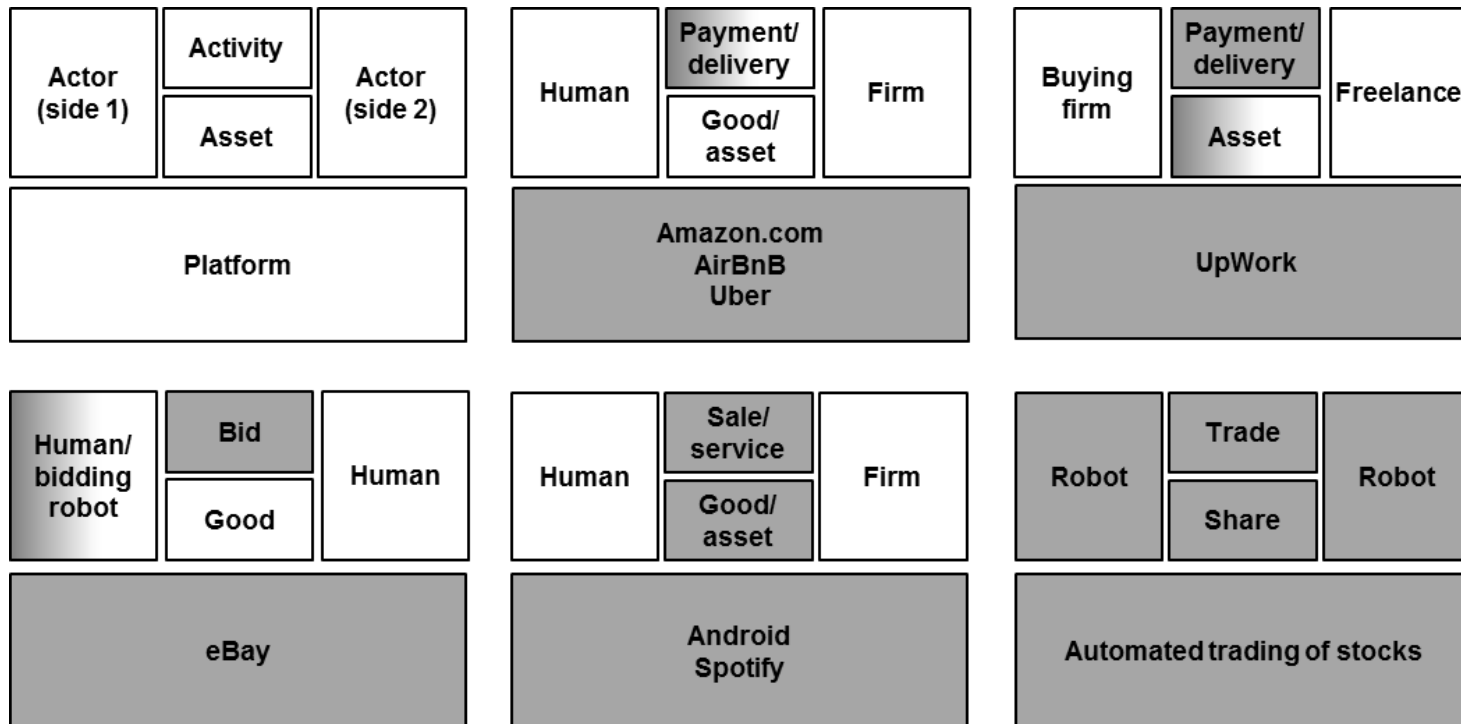
# Digitalization

**Scale of 'end product' production**

**Ease and speed of transfer; scale of 'addressable market'**

**Tools that support 3rd party production and generativity**

# Extent of digitizing (in platforms)



# GENERATIVITY !

# THE GENERATIVE INTERNET

*Jonathan L. Zittrain\**

*The generative capacity for unrelated and unaccredited audiences to build and distribute code and content through the Internet to its tens of millions of attached personal computers has ignited growth and innovation in information technology and has facilitated new creative endeavors. It has also given rise to regulatory and entrepreneurial backlashes.*


# Generativity

DOI: 10.1111/ijmr.12277

ORIGINAL ARTICLE



## Generativity: A systematic review and conceptual framework

Llewellyn D. W. Thomas<sup>1</sup>  | Richard Tee<sup>2</sup>

*“We propose that generativity is a sociotechnical system where social and technical elements interact to facilitate combinatorial innovation.”*

*We argue that generativity is a sociotechnical system where social and technical elements interact to facilitate combinatorial innovation, and where generative fit and governance play a central role.”*

**In platform business  
model you need to give  
up production** (*= value creation*)  
**to external 3rd parties**  
*(often it also fosters generativity)*

# App Store hits 20M registered developers and \$100B in revenues, 500M visitors per week

Ingrid Lunden @ingridlunden / Jun 4, 2018

Comment



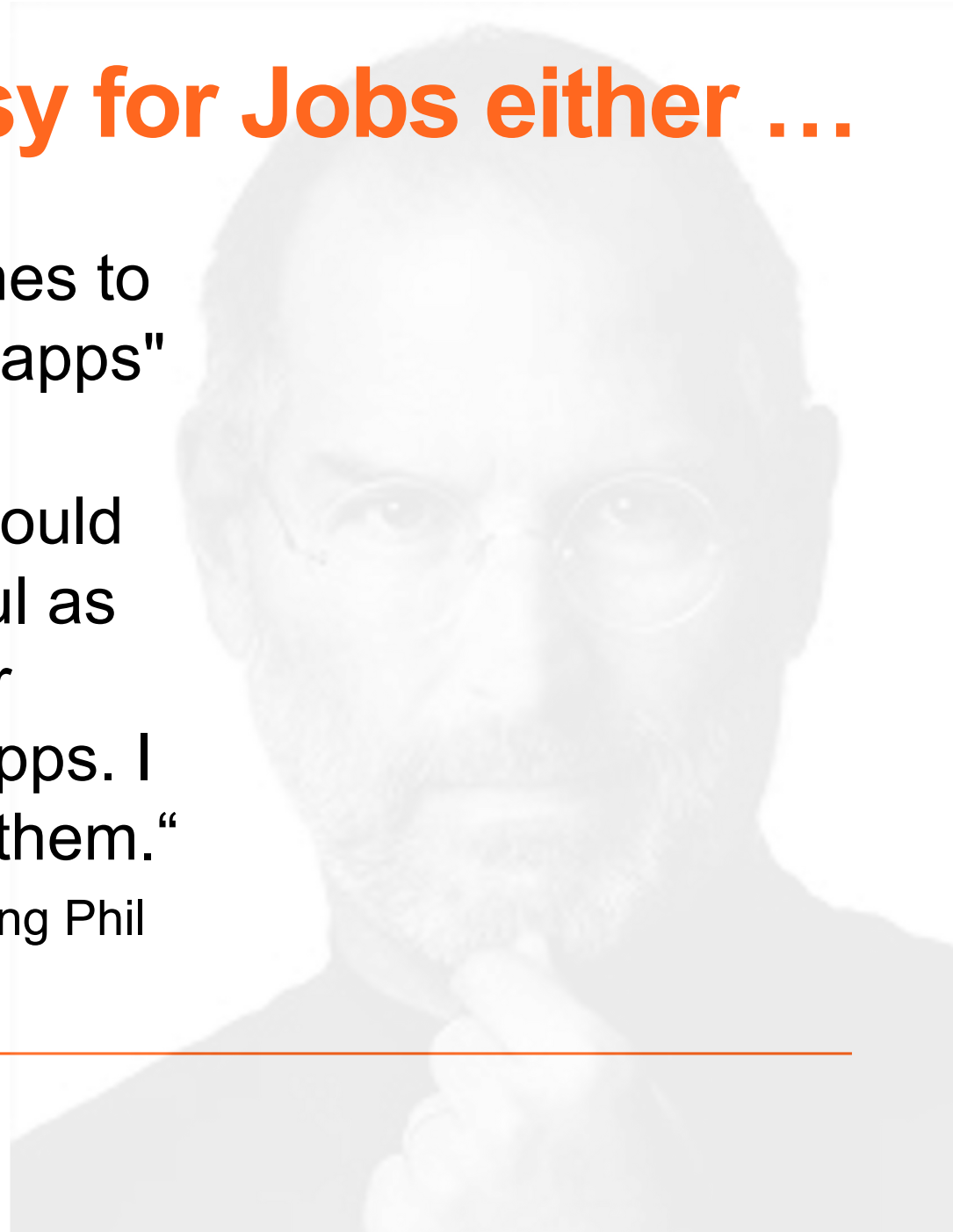
How you compete vs 'workforce' of 20m ??



<https://techcrunch.com/2018/06/04/app-store-hits-20m-registered-developers-at-100b-in-revenues-500m-visitors-per-week/>

# Opening was not easy for Jobs either ...

- "I called him a half dozen times to lobby for the potential of the apps"
  - Apple board member Art Levinson
- "I couldn't imagine that we would create something as powerful as the iPhone and not empower developers to make lots of apps. I knew customers would love them."
  - SVP of worldwide product marketing Phil Schiller





# About those external developers and how Microsoft loved them... (from 1999/2000)

[https://www.youtube.com/watch?v=XxbJw8PrIkc&ab\\_channel=BlueOSMuseum](https://www.youtube.com/watch?v=XxbJw8PrIkc&ab_channel=BlueOSMuseum)



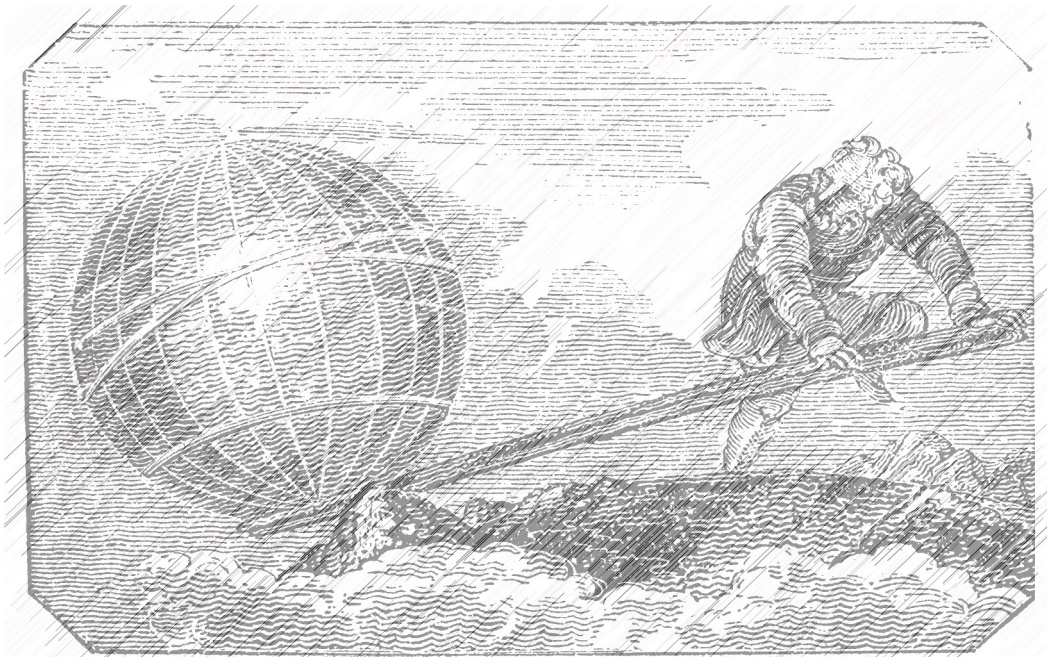
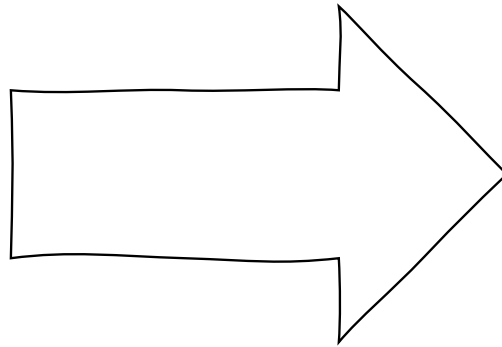
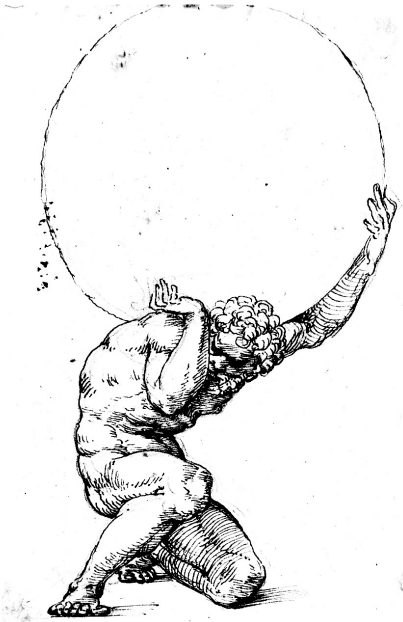
# Platforms as ‘inverted firms’

Parker et al. 2017 (see also managed ecosystems, Altman et al. 2022)

**The locus of value creation outside the firm, external**

- At a scale rarely possible within the firm or with resources of the firm

**Focal firm retains (some) control of value creation**



“Give me a lever long enough and a fulcrum on which to place it, and I shall move the world.” -*Archimedes*

# Platform economy fundamentals

# From technical platforms to platform economy

*Internal to the firm*

*Alliance / Industry*

*Open to **crowds** at **arms-length***

product  
platform

industry  
platform

facebook

platform  
economy

upwork™

UBER

COHEALO 

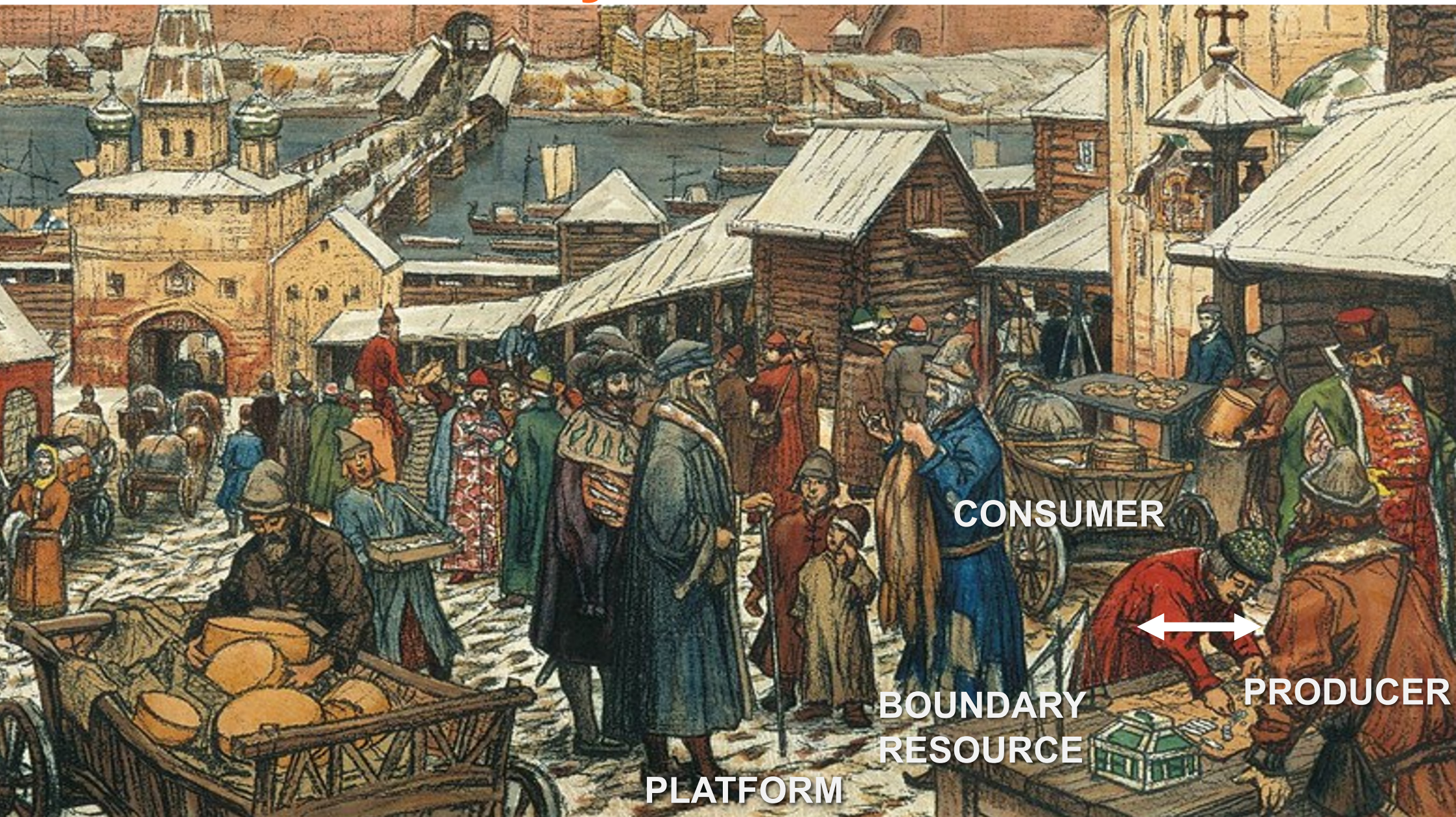
**We are still more used to this side**

*Opening the platform* →

# Platform economy fundamentals in a nutshell

1. **Direct interaction that removes friction**
2. **Growth through network effects**
3. **Digitalisation enables extended scale and scope**
4. **Production at arms-length using boundary resources**

# Platform economy in medieval times



# Direct interaction

# Direct interaction

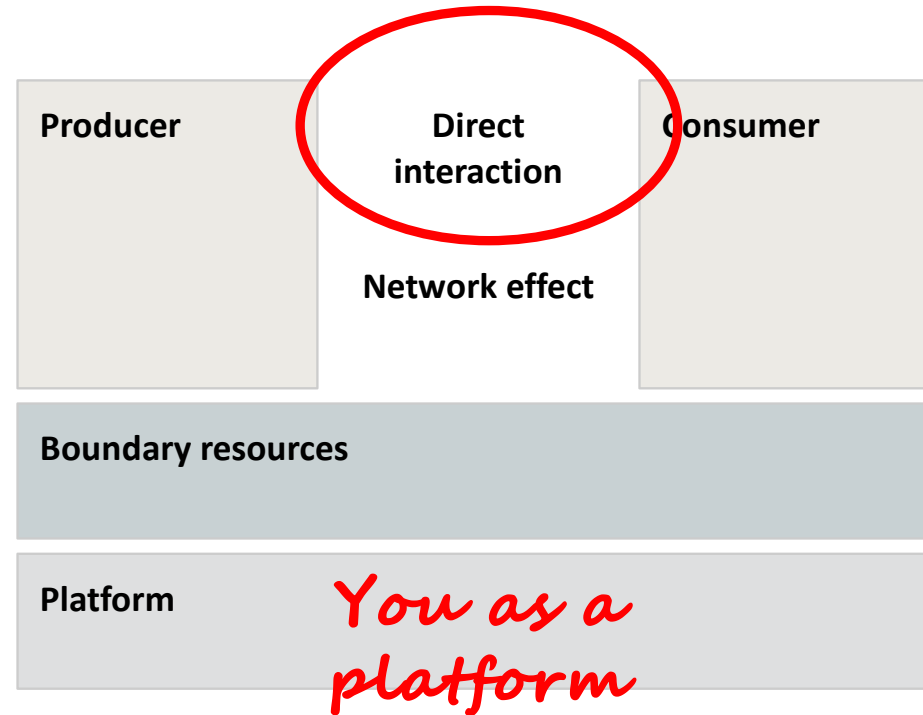
**Platform must facilitate easier  
direct interaction between the  
sides of the platform (market)**

–

***than without the platform***



# Platform business model



PLATFORM BUSINESS MODEL

# Large scale of 3<sup>rd</sup> party production is possible as platforms reduce transaction costs of organising

## AirBnB

- How renter can be sure that the apartment is good?
- How landlord dares to let stranger into their home?

Solution:

- AirBnB intermediating trust; ensuring identities of the parties, making sure information is correct and money transfer happens

→ When lowering transaction costs, the platforms 1) reduce the need of formal organizations to coordinate action 2) bring in to the sphere of the economic exchange such activity that used to be gray (i.e. was unprofitable to offer due to high transaction costs)

## Uber

- How can customer be sure that the ride is safe?
- How can driver be sure that customer is trustful?

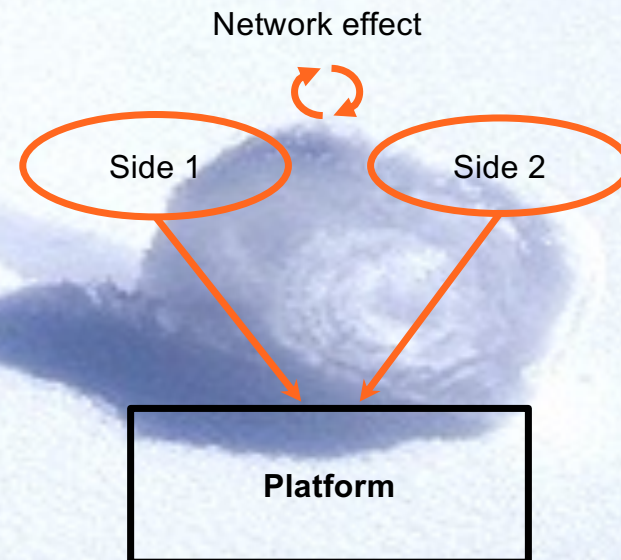
Solution:

- Uber providing trust to the identities, routes and payments

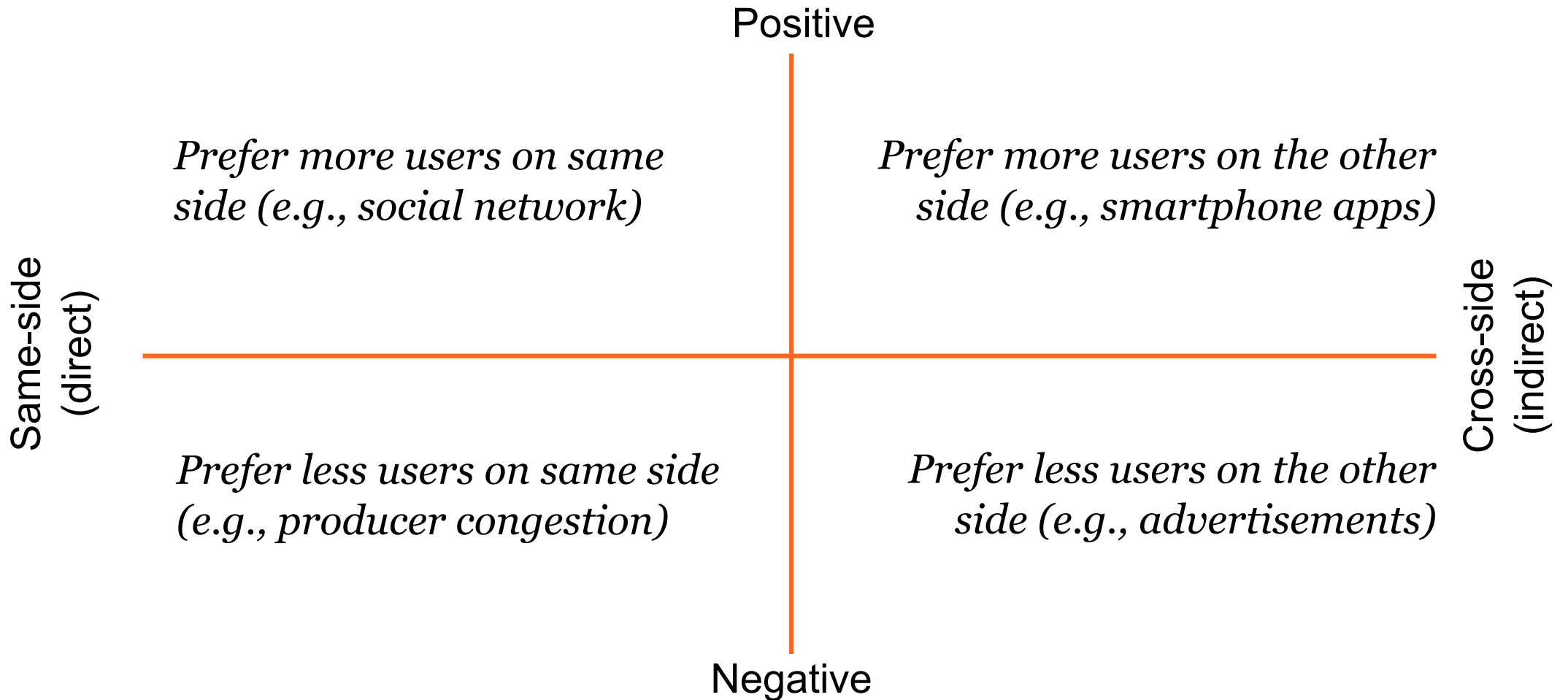
# Network effects

# Network effects

- When the benefit of one side depends on the amount of participants on the other side, platform growth is boosted by network effects
- The more (and varied) apps → The more useful the platform is for users
- The more users → The more attractive the platform market is for developers



# Four types of network effects



# Group discussion: What are the main network effects in Google Maps?

**Identify the side(s) and what type of network there is between/within them**

**Describe the 'rationale'; why increased number leads to increased/decreased (perception of) value?**

# Boundary resources

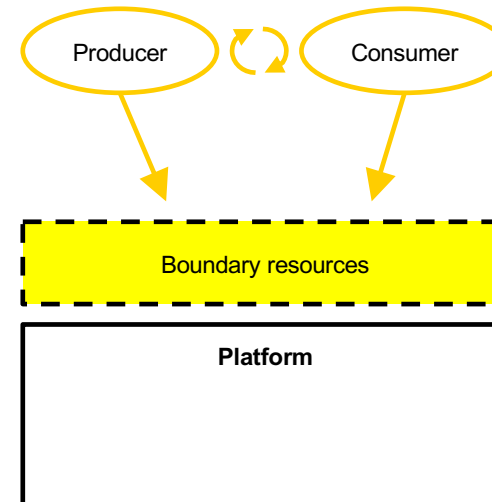


# What are boundary resources in a nutshell?

**Resources on the “boundary” of the platform that enable and foster 3<sup>rd</sup> party production**

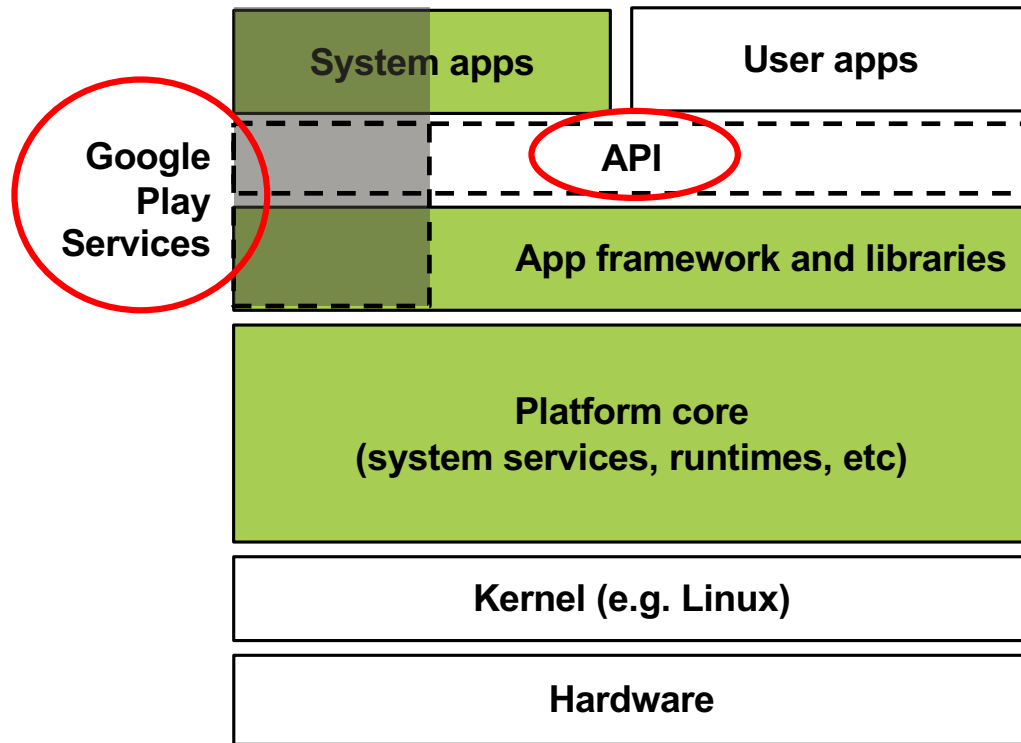
**For example, APIs and SDKs enable developers to build complementing apps**

**Essential in governing the participants at arms-length distance without the need for resource intensive and costly interaction facilitated by the platform owner**





# Example: Android platform stack



## Boundary resources



Google Mobile Services (GMS)  
**PROPRIETARY!**

Android open-source platform (AOSP)  
**Apache License 2.0**

**Boundary resources are the  
concrete tools & rules that help  
to deal with platform's  
governance challenges**



# Three main functions for boundary resources

## 1. Interfaces that define openness

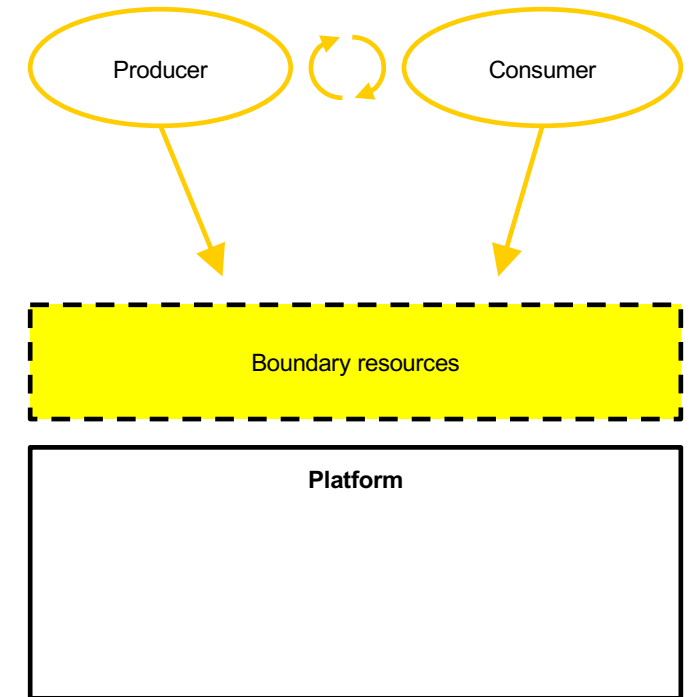
- Access openness
- Resource openness

## 2. Tools to foster interactions

- How to build an outstanding producer experience?

## 3. Rules to control the platform

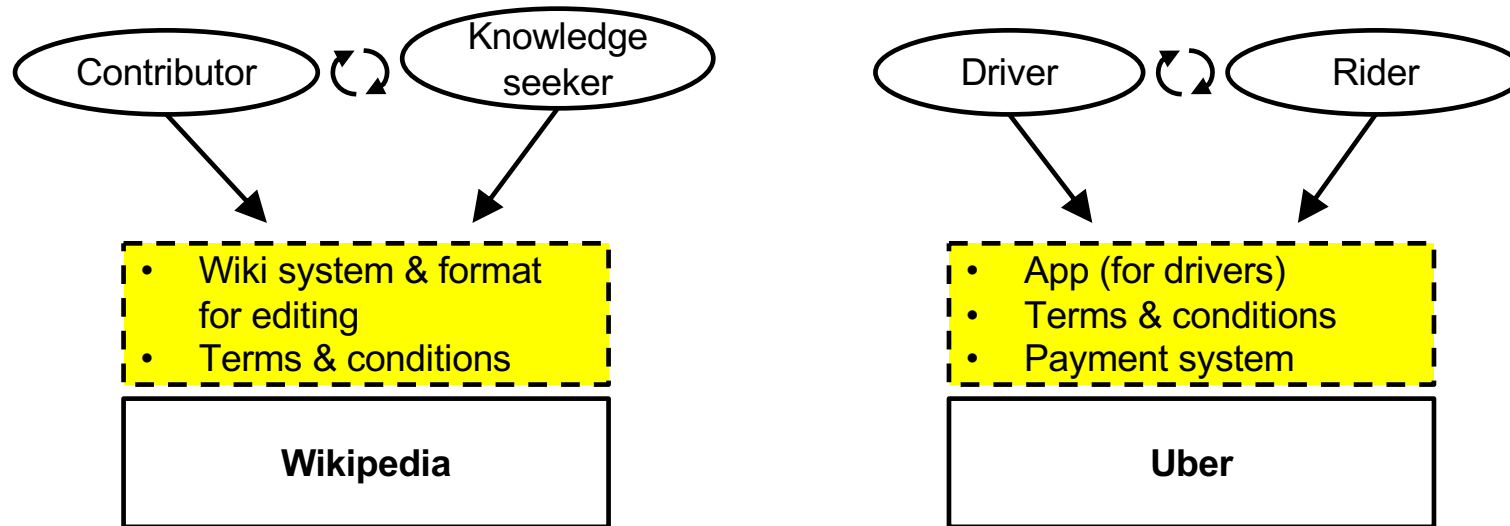
- Terms & Conditions, Licensing...



# Boundary resources for non-innovation (digital) platforms

Boundary resources concept have been developed for innovation platforms (e.g. Ghazawneh and Henfridsson, 2013). However, I consider that boundary resources concept applies for transaction and information platforms as well.

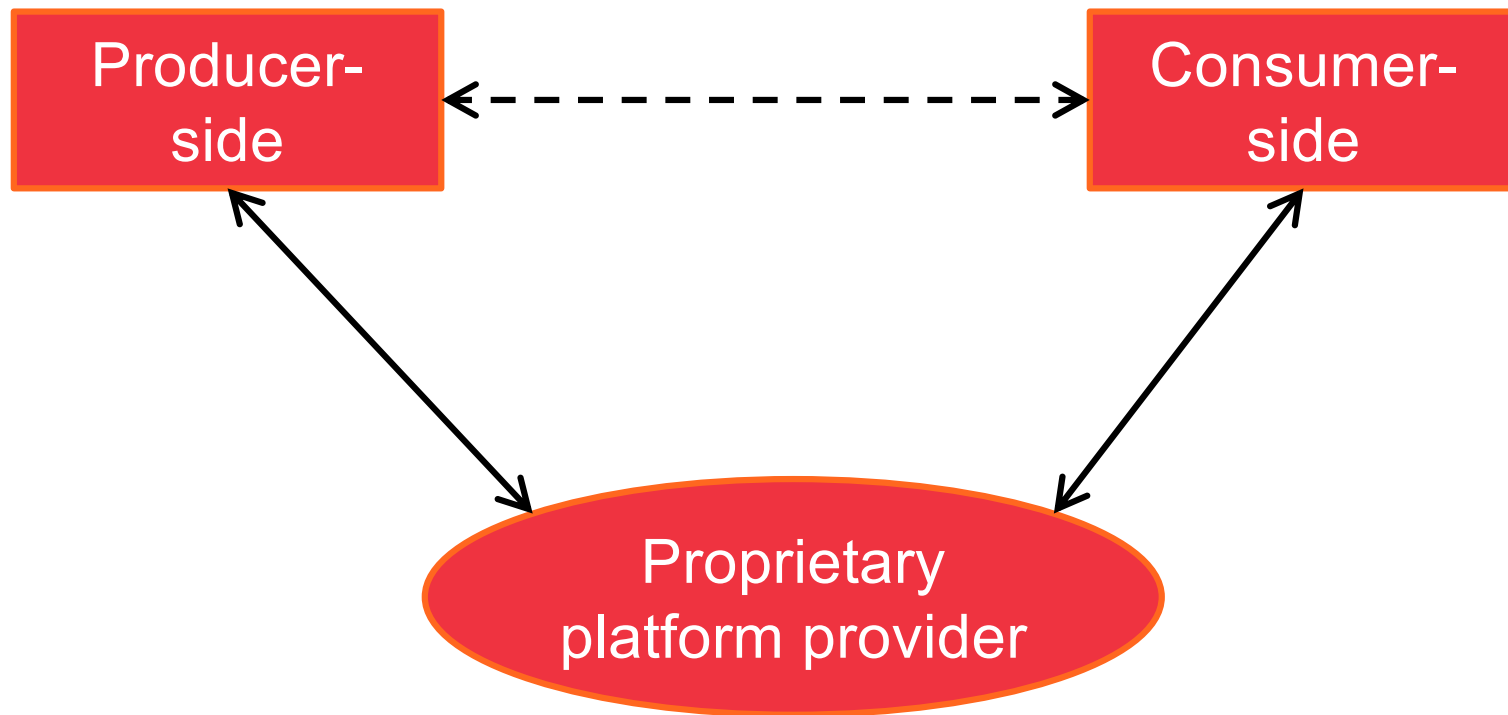
# Examples of boundary resources for other platform types



**Boundary resources are the interfaces, tools, and rules to enable, foster, and steer an arm's-length relationship between the platform owner and third-party producers.**

# Modeling platforms businesses

# On platforms



# Platform Modeling

*(simple Fourkind platform canvas)*

FOURKIND PLATFORM CANVAS

DESIGNED FOR:

DESIGNED BY:

DATE:

<p><b>Producer</b> Who is the producer / seller side?</p>	<p><b>Direct interaction</b> What is the direct interaction that platform enables between the two sides?</p> <p><b>Network effect</b> What is the main positive cross-side network effect between the sides that feeds the growth of the platform?</p>	<p><b>Consumer</b> Who is the user / buyer side?</p>
<p><b>Boundary resources</b> What are the various boundary resources (APIs, SKDs, Terms&amp;Conditions, etc.) interfacing each side that enable them to interact with the platform at arms-length distance without resource intensive facilitation by the platform owner?</p>		
<p><b>Platform</b> What is your platform core on top of which producer / seller side builds its offering?</p>		



Fourkind Platform Canvas is licensed under a Creative Commons Attribution-ShareAlike 4.0 International

**FOURKIND**



Producer

*Independent developer*

Direct interaction

*User finds and buys an app*



Consumer

*Smartphone user*

Network effect

*The more and varied apps, the more users, and the more user, the more appealing the market is for developers*



Boundary resources

*APIs, SDK, Developer Terms & Conditions, App store*

Platform

*IOS operating system*



# Thank you!