

INFO4444 Computing 4 Innovation

Week 7: Distributed Innovation III – User Innovation, Platform Ecosystem & Intellectual Property Protection

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Agenda

Section One (1st Half)

1.1 User Innovation
Case Studies

1.2 Platform Ecosystem
Type of platform ecosystem

1.3 Platform Economy
Sharing economy

Section Two (2nd Half)

2.1 Intellectual Property

2.2 Intellectual Property Protection

Distributed Innovation

- A. Product platforms
- B. Web APIs
- C. Crowdsourcing innovation / Crowdfunding Innovation
- D. Releasing data sets “Open data”
- E. Free and Open Source Software
- F. User innovation**
- G. Platform ecosystems (Sharing economy as an example)**
- H. Accelerators, investment and others (Startup strategies)

User Innovation

Traditional model of innovation: “Producer innovation”

- Producer makes product/service for consumers
- Producer companies make innovation
- Producer innovators profit from many users of the same product/service
- **Assumption that a producer serving many customers can afford to invest more in innovation than a single user innovating for themselves**
- To encourage this investment, typical innovation policy allows producer to “protect” innovation through patents

Source: Baldwin and von Hippel (2011)

“User innovation” definition

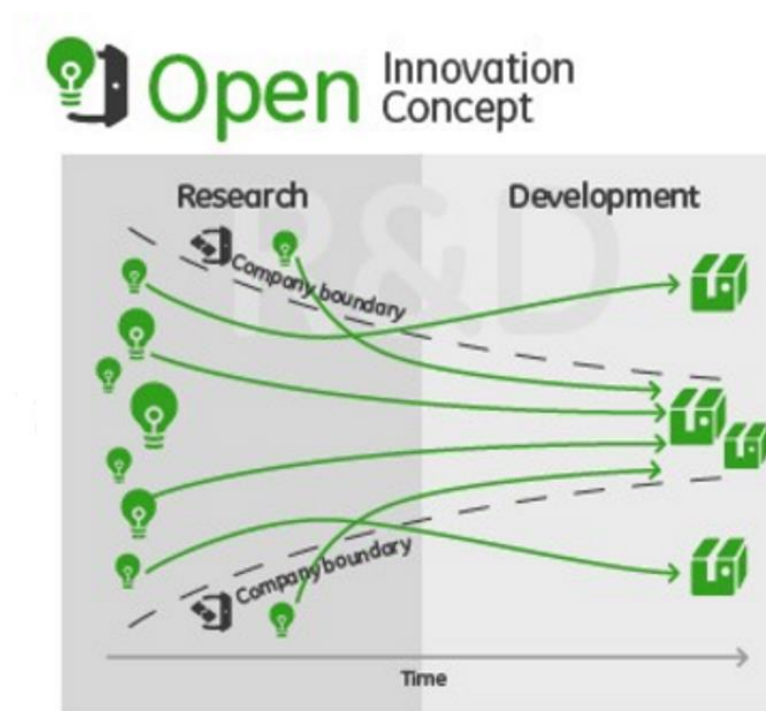
- Users/consumers are the more of the innovators of new products than suppliers
- Products developed to meet a wide range of the needs of a wide range of people
- Consumer make the adjustments to meet their own needs
- Ideas fed back to the companies
- **These ideas can lead to new companies being formed, especially with IT products**



Eric Von Hippel (MIT)

“User innovation” definition cont’d

- Ideas fed back to the companies from users
- **Ideas can also lead to new companies being formed**



The importance of user innovation: Examples

- ~ 80% of the most important scientific instrument innovations were by users (von Hippel, 1976)
- Many product innovations in sports are innovations by users (von Hippel, 2005)
- Many innovations in Science are by users
- Many innovations in IT are innovations by users

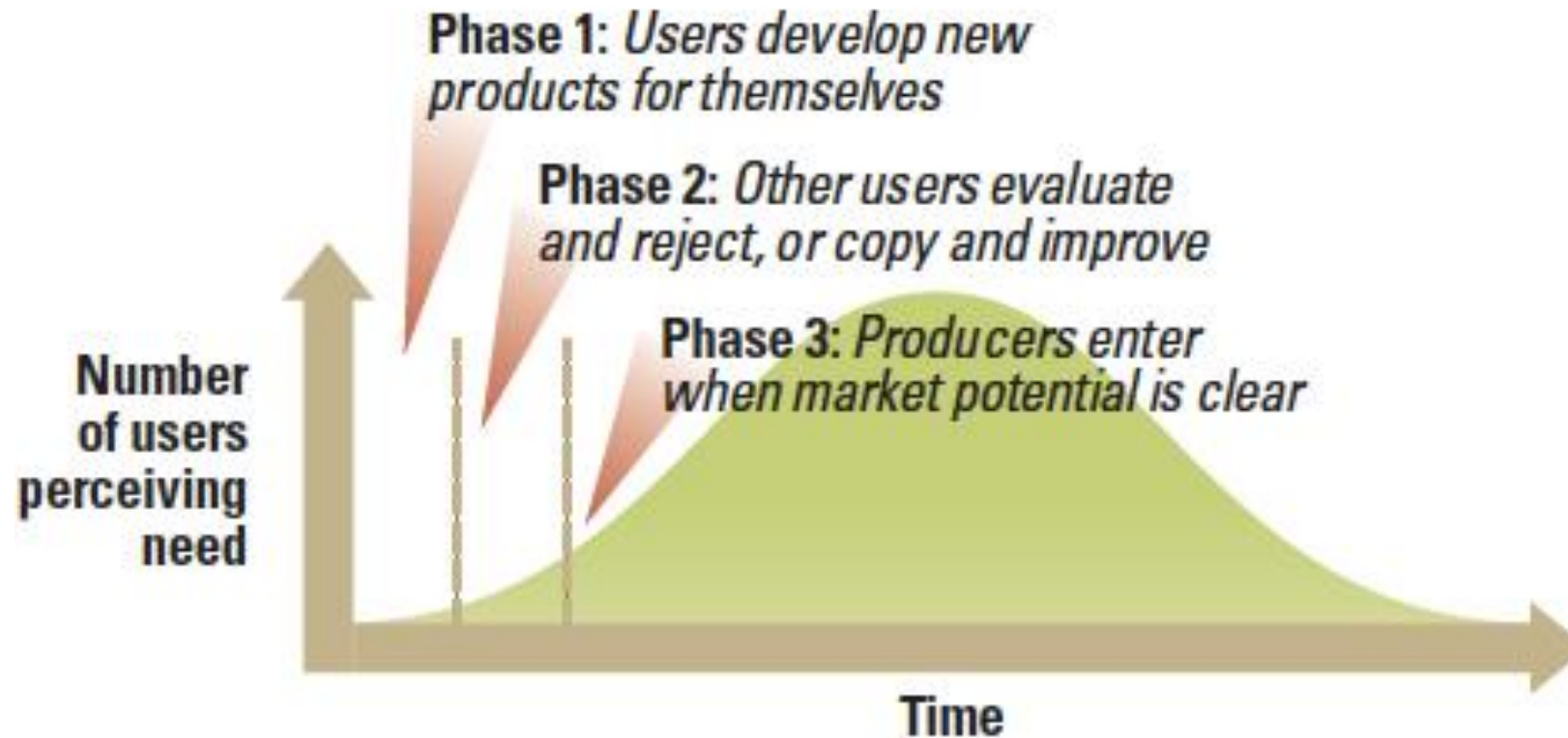


http://www.flickr.com/photos/tz1_1zt/112072422/



connorbaxter.com

User Innovation



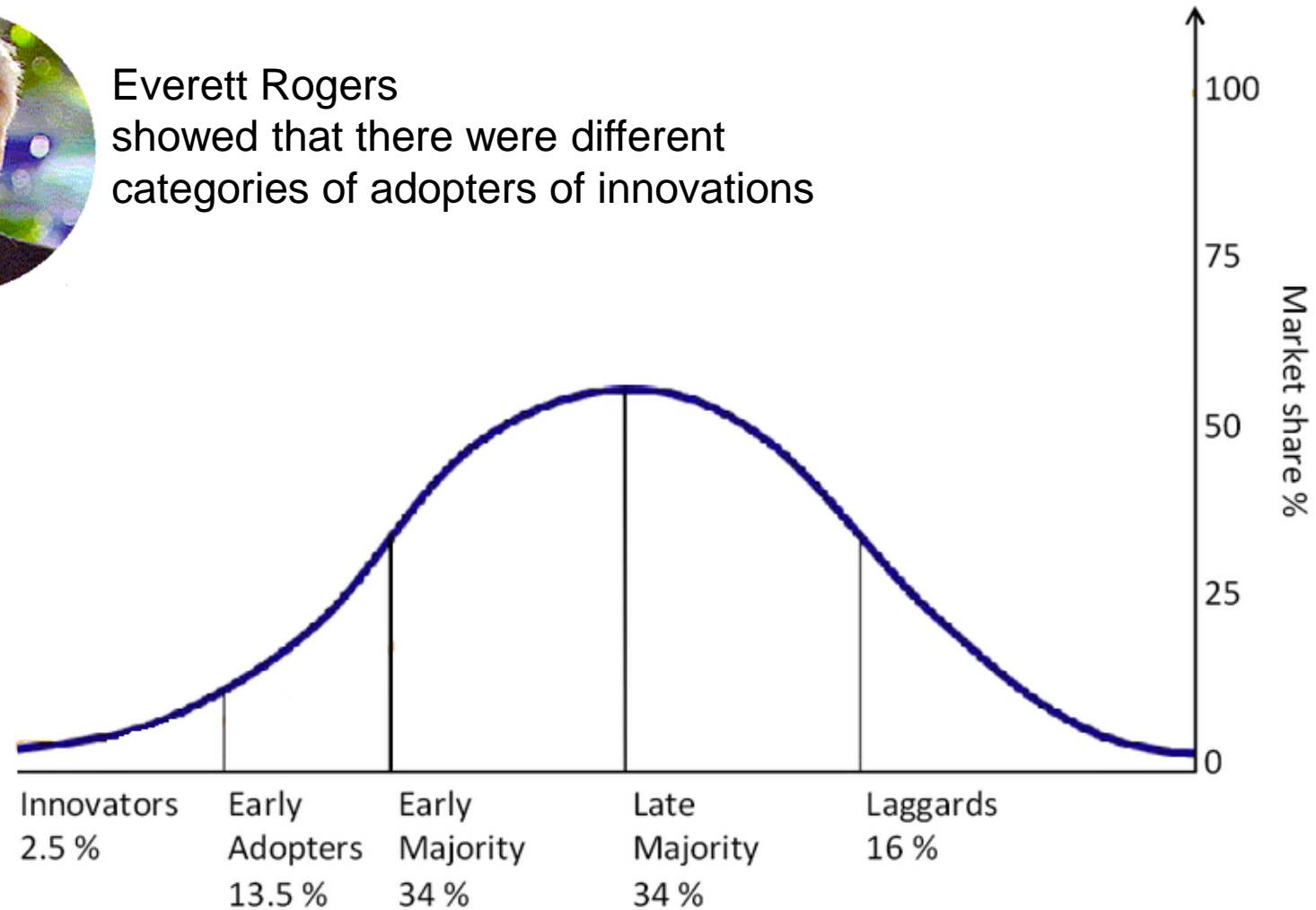
Eric Von Hippel
MIT Sloan School of Management

<http://sloanreview.mit.edu/article/the-user-innovation-revolution/>

Recap: Diffusion of Innovation



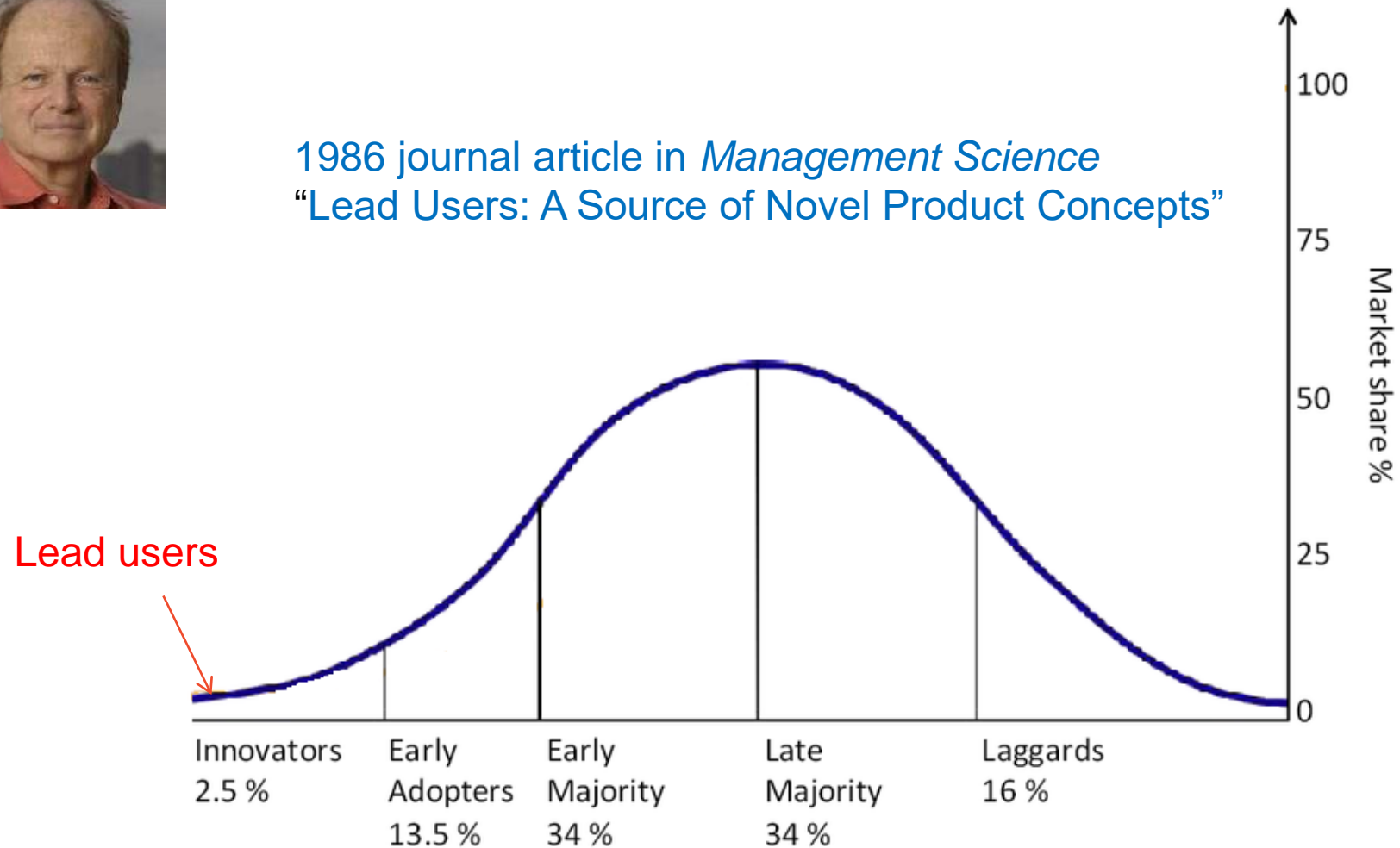
Everett Rogers
showed that there were different
categories of adopters of innovations



Lead users



1986 journal article in *Management Science*
“Lead Users: A Source of Novel Product Concepts”



Lead users

- Lead users may be individuals, companies or communities
- Often leads to more effective innovation
- In some product categories, market research focuses on typical users
- Feedback and opinions from typical users (market research) for new products
- Not so effective for IT and other high-tech industries
 - **“functional fixedness**

Identifying lead users

- Lead Users:
 - Face the needs that will be general in the market first
 - Will benefit significantly by obtaining a solution to those needs, and try to solve those needs
 - Are at the leading edge of trends
 - Note: Lead users are not usually a company's “lead customers”

Source: Von Hippel (1986)

Users as source of innovation

- Provide concepts for products, services, processes and features
- Sometimes, carry on the innovation themselves

User-led Innovation – alternative perspective

- **Users' insights can't predict future demand**
- **User-centered processes stifles creativity**
- **User focus makes companies miss out on disruptive innovations**
- **User-led design leads to sameness**

<http://www.forbes.com/sites/stevedenning/2011/02/15/user-led-innovation-cant-create-breakthroughs/#35edb5c75a9b>
<http://www.fastcodesign.com/1663220/user-led-innovation-cant-create-breakthroughs-just-ask-apple-and-ikea>

User-led Innovation – Apple?

“It’s not about pop culture, and it’s not about fooling people, and it’s not about convincing people that they want something they don’t. We figure out what we want. And I think we’re pretty good at having the right discipline to think through whether a lot of other people are going to want it, too. That’s what we get paid to do.” – Steve Jobs

User Innovation

Case Studies

Examples of user innovation in IT

- The World Wide Web
 - created by a worker at a scientific research agency so that the scientists could communicate better
- Many Firefox add-ons
 - Many developers start by developing a plug-in for their own use and then make it available to others
- Apache server modules
 - often originally implemented by a web server administrator
- A lot of open source software is user innovation
 - but not all, many companies also release open source

Example of user innovation: Apache web server

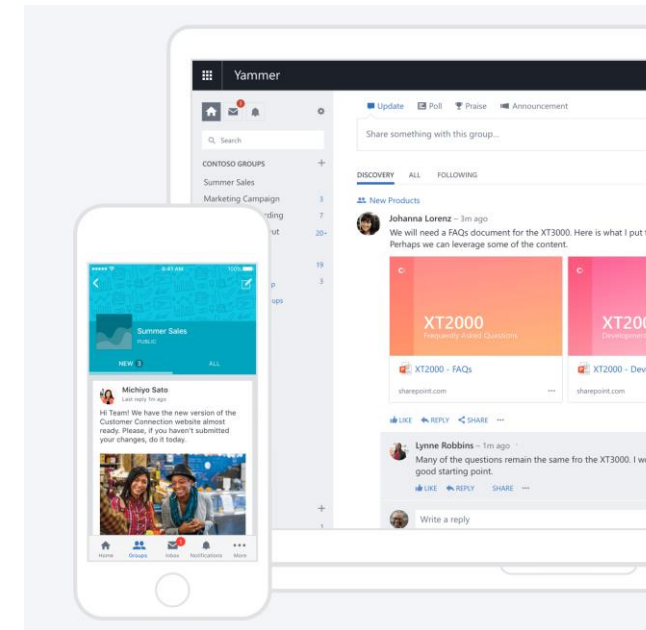
- The most popular web server was “httpd” by Rob McCool at NCSA (1994)
- Modified by many users for their own sites (open source)
- Rob McCool left NCSA (mid 1994)
- Many users discussed using each others’ changes
- They created a common code base (1995)
- Became the world’s most used web server (1996)



<http://brian.behlendorf.com/>

Brian Behlendorf
Primary developer of
Apache

Example of user innovation: Geni to Yammer



<https://www.yammer.com/>

- Genealogy tools to grow family tree
- Find your ancestors, connect to relatives
- A private social network for companies
- Share files, discuss projects, and get work done faster
- Discuss ideas, share updates, and crowdsource answers from coworkers around globally

Example of user innovation: Yammer

- Internal productivity tool at Geni to help people stay connected
- 30 employees at Geni and about 20,000 message on yammer
- Very successful and the center of the company's culture
- Spin it out into a separate company, so that other companies can use the product
- Yammer was bought by Microsoft for \$1.2 billion in 2012
- Yammer is now used by more than 200,000 companies



David Sacks

http://www.socaltech.com/interview_with_david_sacks_geni_and_yammer/s-0017613.html

<https://www.yammer.com/>

Example of user innovation: Slack



Stewart Butterfield

https://en.wikipedia.org/wiki/Stewart_Butterfield
<https://www.npr.org/2018/07/27/633164558/slack-flickr-stewart-butterfield>

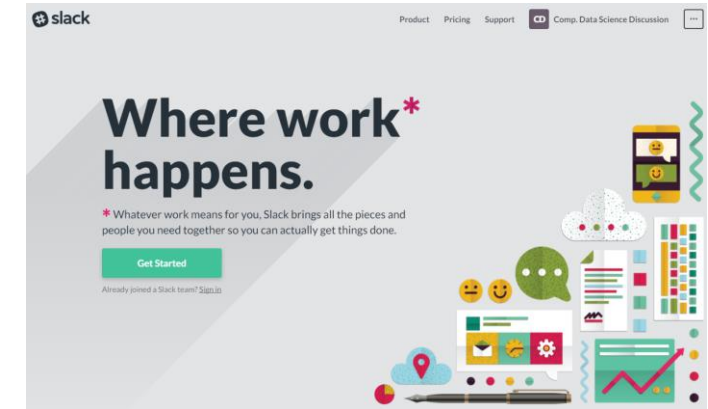


<https://www.flickr.com/>



Glitch is Dead, Long Live Glitch!
Art & Code from the Game Released into Public Domain

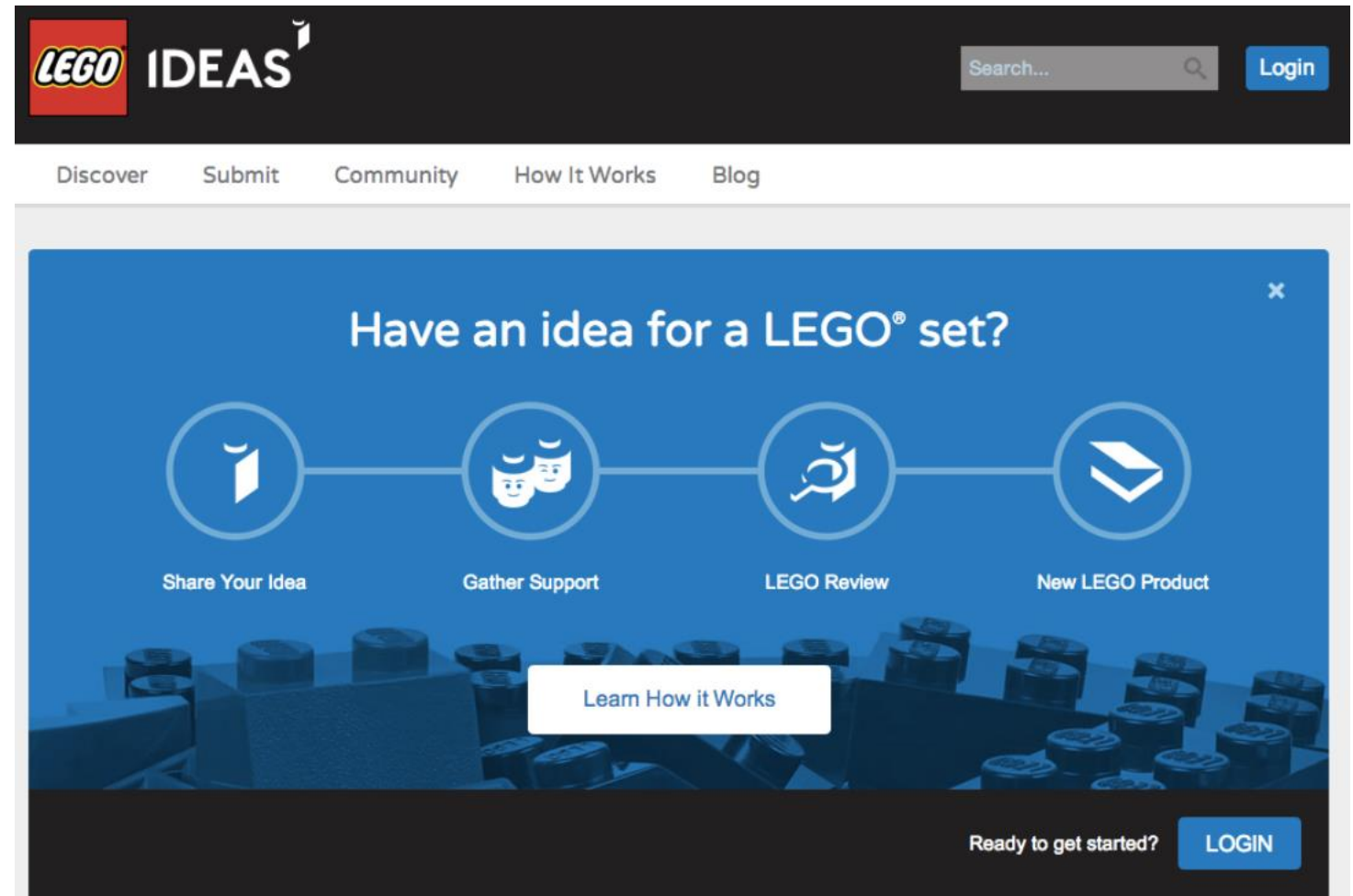
<https://www.glitchthegame.com/>



<https://slack.com/>

http://www.slate.com/articles/business/how_failure_breeds_success/2014/05/stewart_butterfield_flickr_and_slack_how_he_snatched_victory_from_the_jaws.html
<https://jumpstartmag.com/fun-fact-flickr-and-slack-started-as-a-game-that-never-ends/>

Example: Lego Ideas



<https://ideas.lego.com/#all>

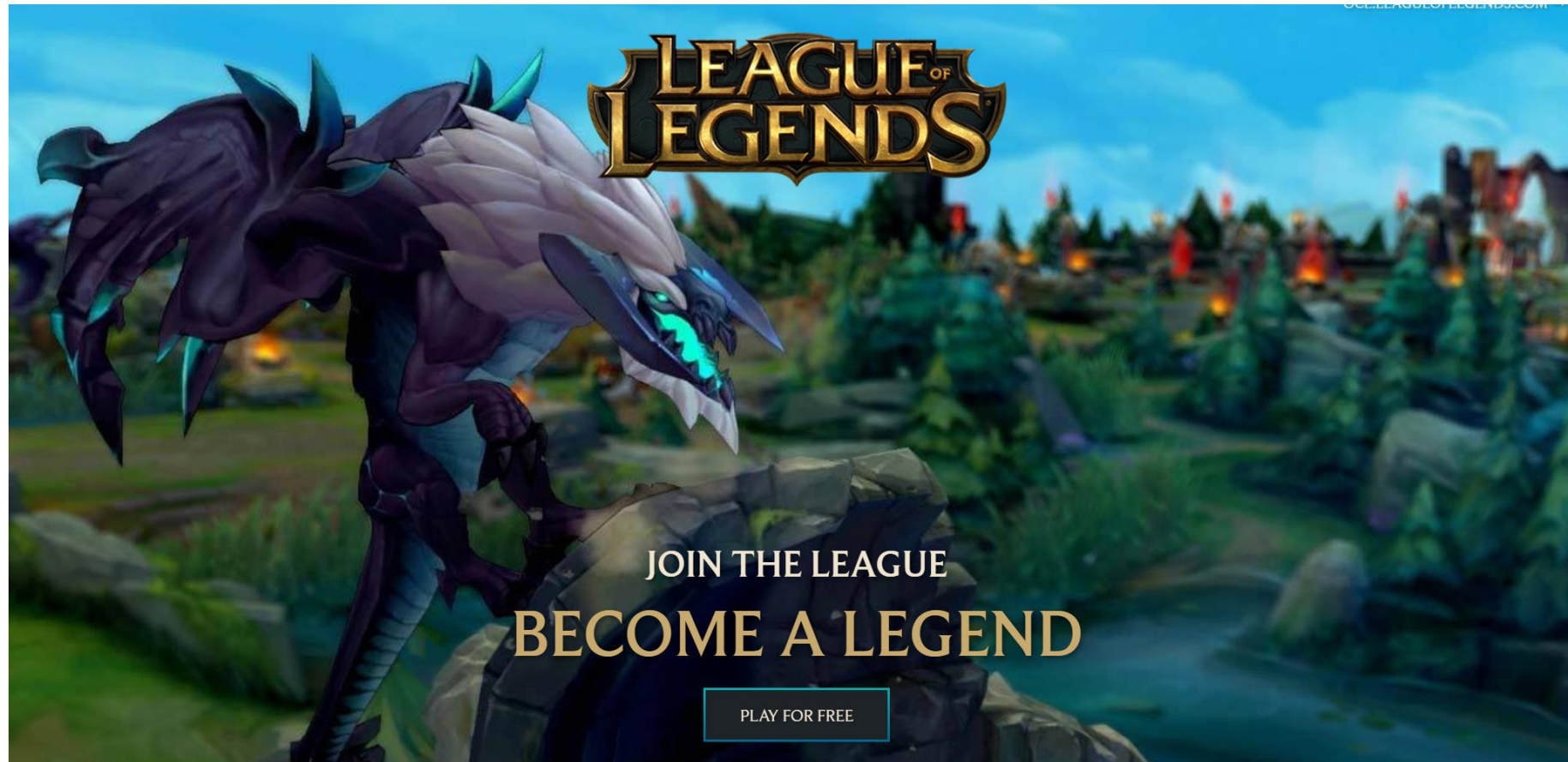
Platform Ecosystem



Platform ecosystem

- A platform consists of components with some degree of mutual dependence
- Value created of each component impacts the value of other components
- Example
 - Home Box Office (HBO) and Amazon Prime services
 - Unlike HBO, Amazon prime platform is open to any producer

Platform Ecosystem – Example



<http://leagueoflegends.com/>

Platform economy – Online Games

- League of Legend by Riot Games in 2009
- **The strategy was to build a *platform***
- 67 million people play it each month,¹ generating some \$1 billion dollars annual revenue²
- Play for free; Riot Games capitalizes on the players presence. Such an environment will have ‘governance’ a set of protocols or standards to ‘play’ within it.
- Live events: teams compete in tournaments in front of live spectators, **e-sports**, launched what is now the fastest growing part of the sports industry, e sports, which has TV rights etc.

<https://dupress.deloitte.com/dup-us-en/focus/business-trends/2015/platform-strategy-new-level-business-trends.html>

Governance – Protocols or Standards

- A well-functioning platform require:
 - **A governance structure or protocols:** including a set of protocols that determines who can participate, what roles they might play, how they might interact, and how disputes get resolved.
 - **An additional set of protocols or standards:** is typically designed to facilitate connection, coordination, and collaboration.
- Platforms supported by global digital technology infrastructures

Deloitte, 2015

Platform economy – Online Games

“There is money to be made in providing layers of capabilities and standards that other players in that market can tap into and use to interact more efficiently.”

“Properly designed, Platforms can become powerful catalysts for rich ecosystems of resources and participants.”

Deloitte, 2015



Shop Mac Shop iPhone Shop Watch Shop iPad Shop iPod Shop Apple TV Shop Accessories

They work together beautifully.

Start editing a photo on your iPad and finish it on your MacBook. Sync a playlist from your iPhone to your Apple Watch. And send iMessages from any Apple device to any other.

Apple iPhone

- Major mobile phone manufacturers (Nokia, Samsung, Motorola, Sony Ericsson, and LG) collectively controlled 90% of the industry's global profits (2007)
- Apple's iPhone introduced in the same year (2007)
- iPhone alone generated 92% of global profits (2015)

Marshall W. Van AlstyneGeoffrey G. ParkerSangeet Paul Choudary, "Pipelines, Platforms, and the New Rules of Strategy", Harvard Business Review, April 2016
<https://hbr.org/2016/04/pipelines-platforms-and-the-new-rules-of-strategy>

Apple – Pioneering the App platform

- Apple (and Google's Android) exploited the **power of platforms**
- **Platform businesses bring together producers and consumers in high-value exchanges**
- The iPhone and its OS was **imagined as a way to connect participants in two-sided markets – App developers and App users**

Marshall W. Van Alstyne Geoffrey G. Parker Sangeet Paul Choudary, 2016

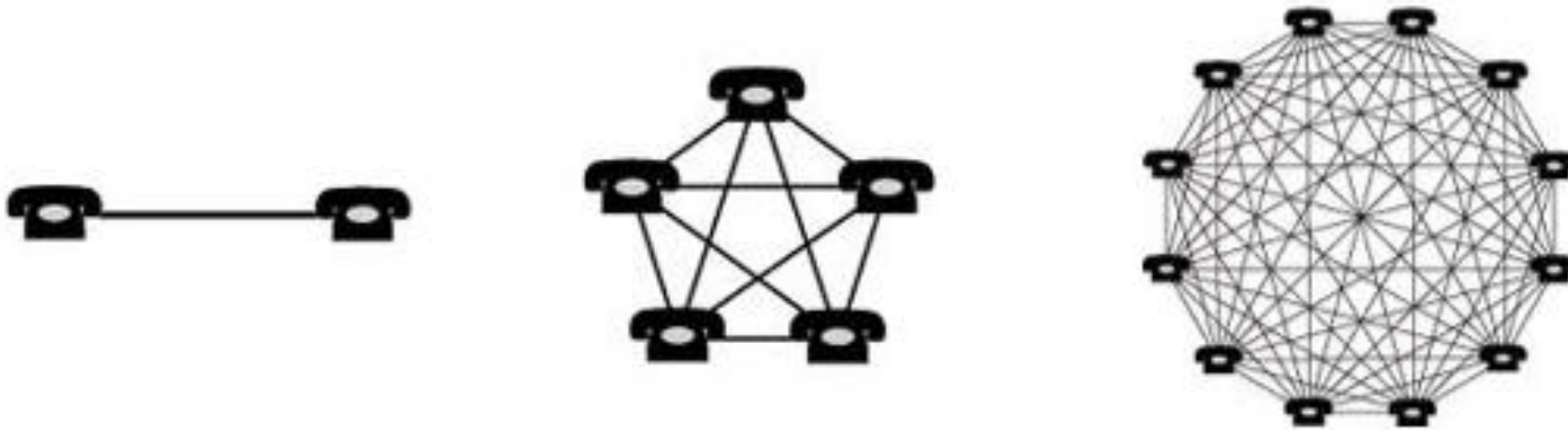
Apple – leveraging the Network Effect

- As the number of participants on each side grew value increases
 - 1.4 million apps on Apple's store, \$25 billion for developers
- Apple's success in building a platform business within a conventional product firm holds critical lessons for companies across industries.
- Firms failed to create platforms lost the competition

Recap: Networks

Wk3: Network effects - For technologies with network effects, the benefit from using a technology increases with the number of other users

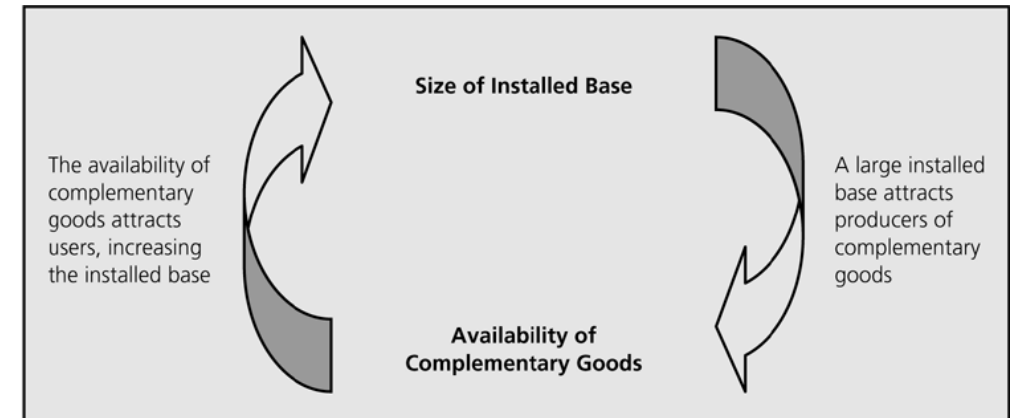
- Direct network effects:
- Indirect network effects:
- Two-sided network effects:
- Local network effects:



Recap: The self-reinforcing cycle

- A technology with a large installed base attracts developers of complementary products;
- A technology with a wide range of complementary products attracts users;
- An increase in the number of users is an increased installed base.
- This leads to a self-reinforcing cycle

FIGURE 4.2
The Self-Reinforcing Cycle of Installed Base and Availability of Complementary Goods



Source: Schilling (2008)

Recap: Modularity

- *Modularity refers to the extent to which a software/Web App may be divided into smaller modules. Software modularity indicates that the number of application modules are capable of serving a specified business domain.*
- <https://www.techopedia.com/definition/24772/modularity>
- Products may be modular at:
 - **User level** e.g. Firefox add-ons, Office plug-ins, Smartphone Apps
 - **Producer level** e.g. Canon camera, Software products based on company platforms
 - **Industry level** e.g. each component of PC made by different company, web API, etc.

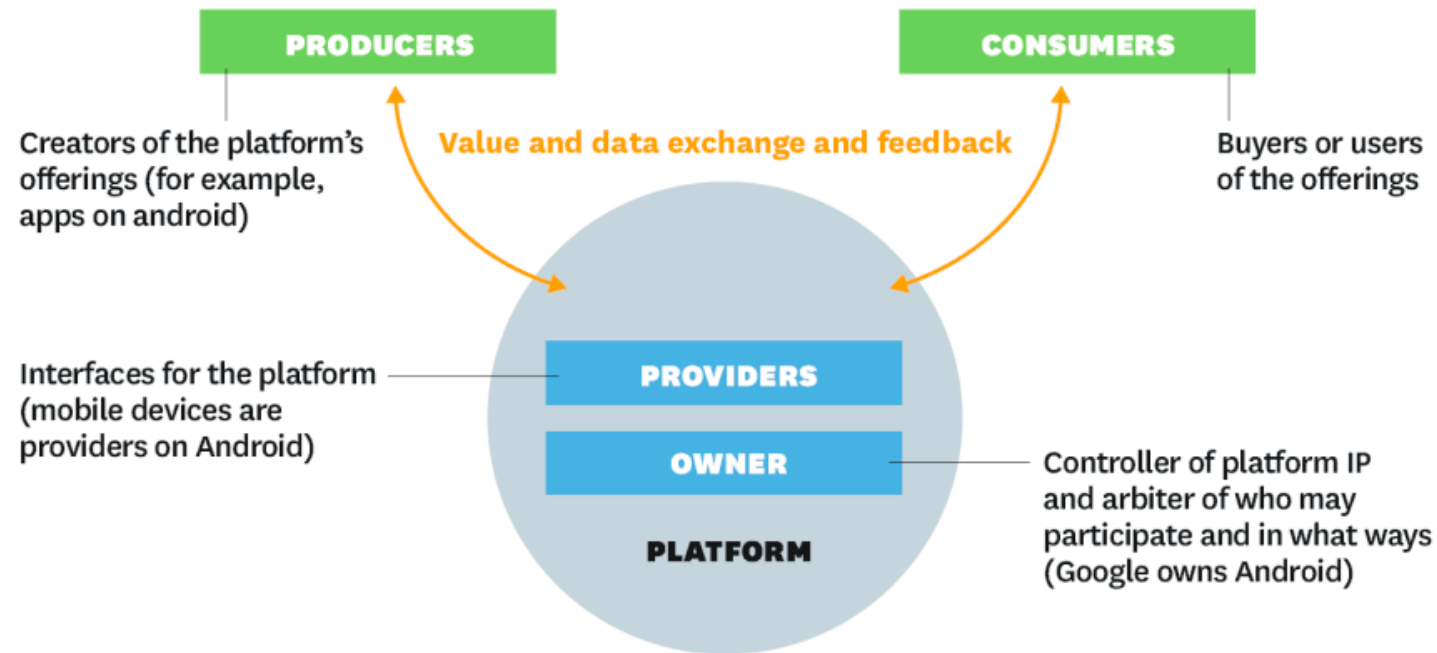
Types of Platform Ecosystem

Platform ecosystems/businesses

- Platform businesses bring together producers and consumers in high-value exchanges
- Their chief assets are information and interactions, which together are also the source of the value they create and their competitive advantage.

Source: Van Alstyne, Parker and Choudary

Main players in a platform ecosystem



SOURCE MARSHALL W. VAN ALSTYNE, GEOFFREY G. PARKER, AND SANGEET PAUL CHOUDARY
FROM "PIPELINES, PLATFORMS, AND THE NEW RULES OF STRATEGY," APRIL 2016

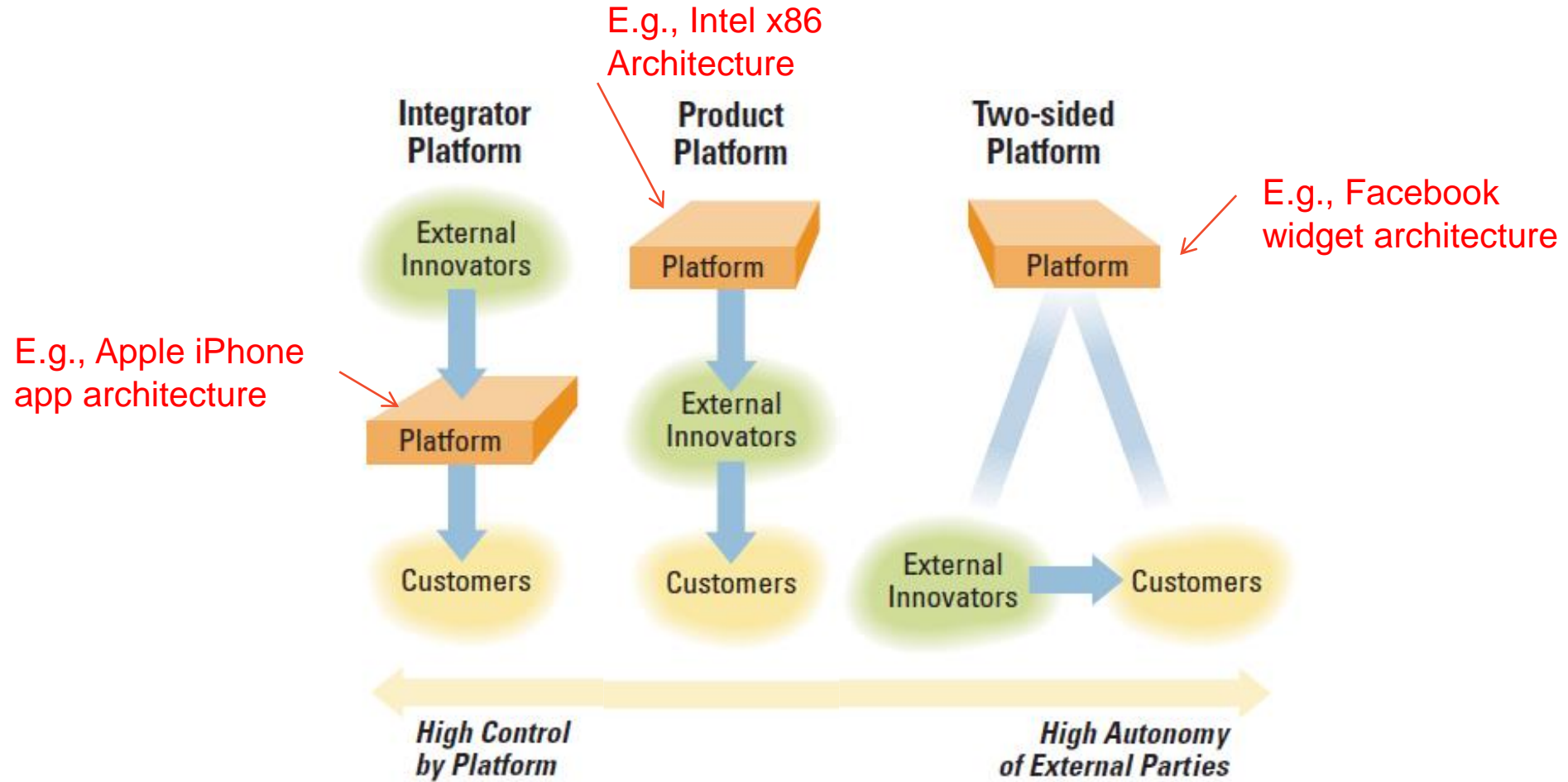
© HBR.ORG

Roles in a platform ecosystem

- **Producers** create offerings
- **Consumers** buy/use the offerings
- **Platform providers** provide the interfaces to the platform
- **Platform owners** owns platform IP and control who and how to participate

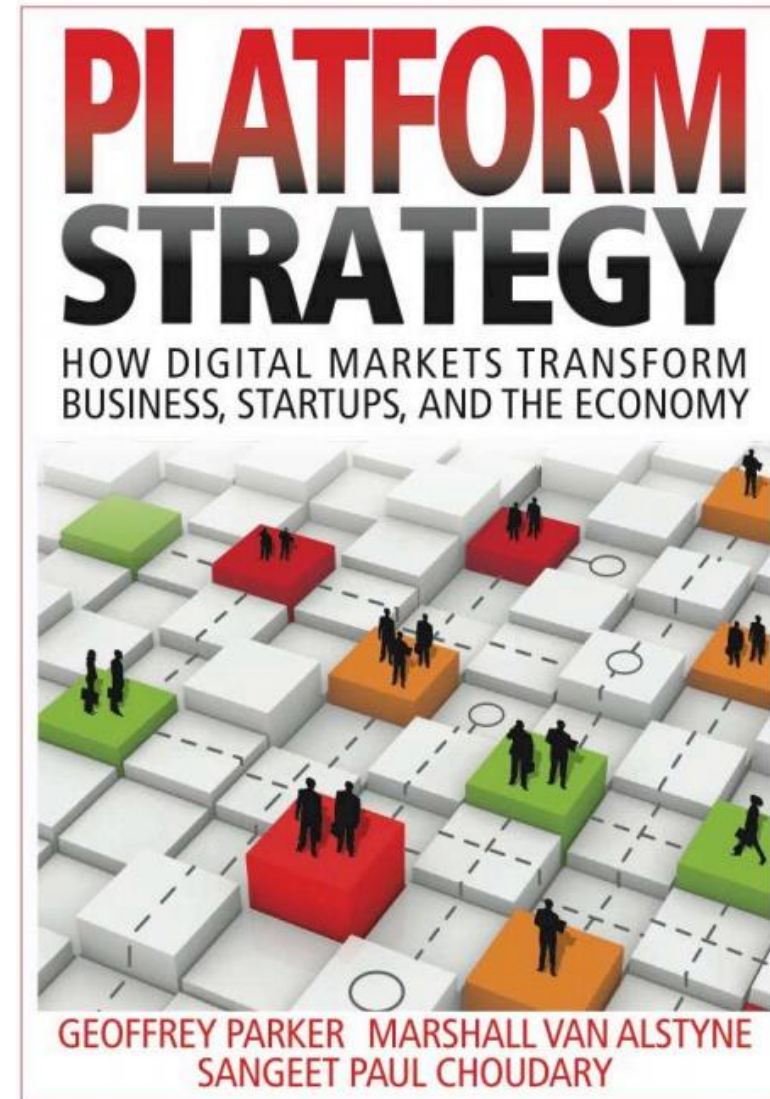
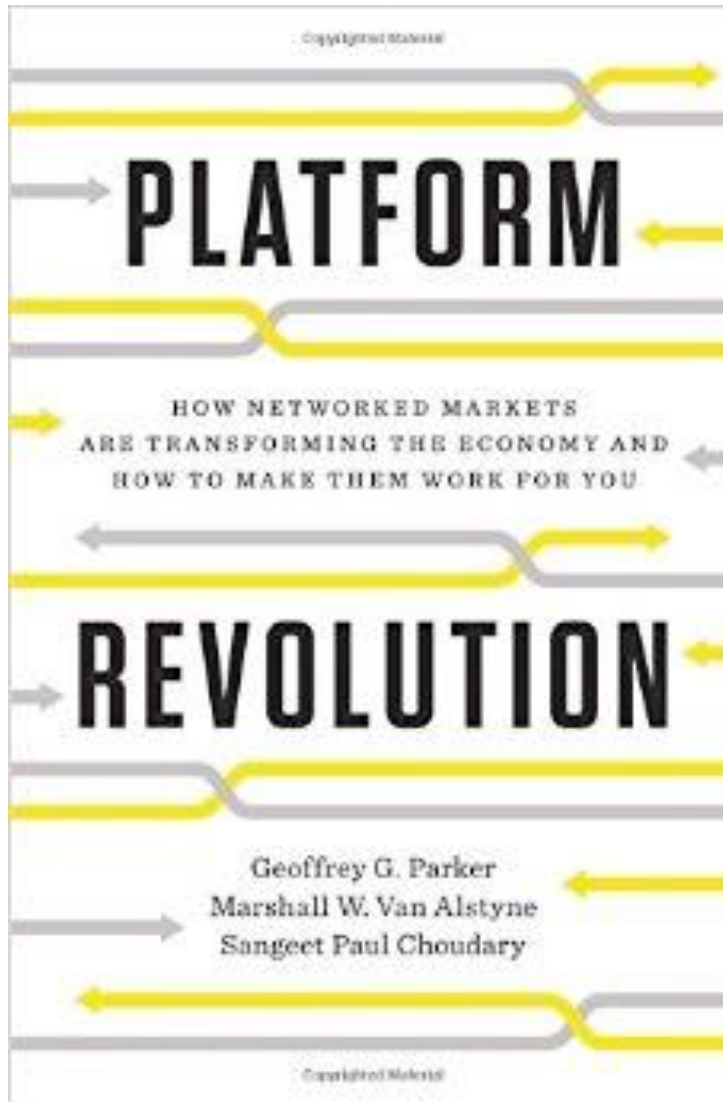
Source: Van Alstyne, Parker and Choudary

Different forms of platform businesses



Source: K.J. Boudreau and K.R. Lakhani

Suggested reading










Platform Economy

Case Studies

1  +28% \$98,316 \$m TOP RISER	2  +34% \$93,291 \$m TOP RISER	3  +2% \$79,213 \$m	4  +4% \$78,808 \$m	5  +3% \$59,546 \$m	6  +7% \$46,947 \$m
11  +6% \$31,904 \$m	12  +10% \$31,839 \$m	13  +7% \$29,053 \$m	14  +3% \$28,147 \$m	15  -1% \$25,843 \$m	16  +1% \$25,105 \$m
19  +27% \$23,620 \$m TOP RISER	20  +7% \$18,490 \$m	21  +10% \$18,168 \$m	22  +8% \$17,892 \$m	23  +12% \$17,646 \$m	24  +13% \$17,085 \$m
	26  +8% \$13,818 \$m	27  +5% \$13,763 \$m	28  +20% \$13,162 \$m	29  +15% \$13,035 \$m	30  +8% \$12,987 \$m
					31  +6% \$12,614 \$m

Marshall Van Alstyne, Professor at Boston University, <https://www.slideshare.net/InfoEcon/the-rise-of-platforms-and-what-it-means-for-business>, 2013

These are Platforms

1  +28% \$98,316 \$m TOP RISER	2  +34% \$93,291 \$m TOP RISER	3  +2% \$79,213 \$m	4  +4% \$78,808 \$m	5  +3% \$59,546 \$m	6  +17% \$46,947 \$m
11  +6% \$31,904 \$m	12  +10% \$31,819 \$m	7  +5% \$41,992 \$m	8  +20% \$39,610 \$m	9  -5% \$37,257 \$m	10  +37% \$35,346 \$m
13  +7% \$29,053 \$m	14  +3% \$28,147 \$m	15  -1% \$25,843 \$m	16  +1% \$25,105 \$m	17  +6% \$24,803 \$m	18  +9% \$24,088 \$m
19  +27% \$23,620 \$m TOP RISER	20  +7% \$18,490 \$m	21  +10% \$18,168 \$m	22  +8% \$17,892 \$m	23  +12% \$17,646 \$m	24  +13% \$17,085 \$m
26  +6% \$13,818 \$m	27  +5% \$13,763 \$m	28  +20% \$13,162 \$m	29  +15% \$13,035 \$m	30  +8% \$12,987 \$m	31  +6% \$12,614 \$m

How are these related?



Each Side Attracts More of the Other

Twitter: @InfoEcon :: [marshall@platformeconomics.com](#) :: PlatformEconomics.com

Industries being transformed by platform businesses

INDUSTRY	EXAMPLES
Agriculture	John Deere, Intuit Fasal
Communication and Networking	LinkedIn, Facebook, Twitter, Tinder, Instagram, Snapchat, WeChat
Consumer Goods	Philips, McCormick Foods FlavorPrint
Education	Udemy, Skillshare, Coursera, edX, Duolingo
Energy and Heavy Industry	Nest, Tesla Powerwall, General Electric, EnerNOC
Finance	Bitcoin, Lending Club, Kickstarter
Health Care	Cohealo, SimplyInsured, Kaiser Permanente
Gaming	Xbox, Nintendo, PlayStation
Labor and Professional Services	Upwork, Fiverr, 99designs, Sittercity, LegalZoom
Local Services	Yelp, Foursquare, Groupon, Angie's List
Logistics and Delivery	Munchery, Foodpanda, Haier Group
Media	Medium, Viki, YouTube, Wikipedia, Huffington Post, Kindle Publishing
Operating Systems	iOS, Android, MacOS, Microsoft Windows
Retail	Amazon, Alibaba, Walgreens, Burberry, Shopkick
Transportation	Uber, Waze, BlaBlaCar, GrabTaxi, Ola Cabs
Travel	Airbnb, TripAdvisor

FIGURE 1.2. Some of the industry sectors currently being transformed by platform businesses, along with examples of platform companies working in those arenas.



<https://platformrevolution.com/>
Source: Parker, Van Alstyne and Choudary

Sharing Economy

What is sharing economy?



01

A socio-economic system built around the sharing of human and physical resources

02

Includes the shared creation, production, distribution, trade and consumption of goods and services by different people and organisations

03

Needs companies like eBay, Paypal, Amazon, and Facebook

04

new rules surrounding how they operate are already changing the way they operate.

[https://www.thepeoplewhoshare.com/blog/what-sharing-economy#:~:text=In%20a%20Sharing%20Economy%2C%20people,to%20person%20\(P2P\).&text=Production%3A%20in%20a%20Sharing%20Economy,or%20collectively%20or%20co%20operatively](https://www.thepeoplewhoshare.com/blog/what-sharing-economy#:~:text=In%20a%20Sharing%20Economy%2C%20people,to%20person%20(P2P).&text=Production%3A%20in%20a%20Sharing%20Economy,or%20collectively%20or%20co%20operatively)

Benefits of sharing economy

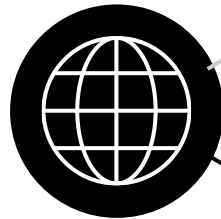
86% agree it makes life more affordable



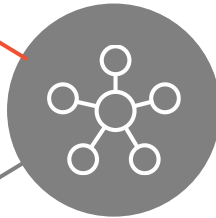
76% agree it's better for the environment



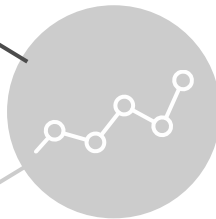
63% agree it is more fun than engaging with traditional companies



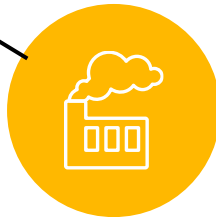
83% agree it makes life more convenient and efficient



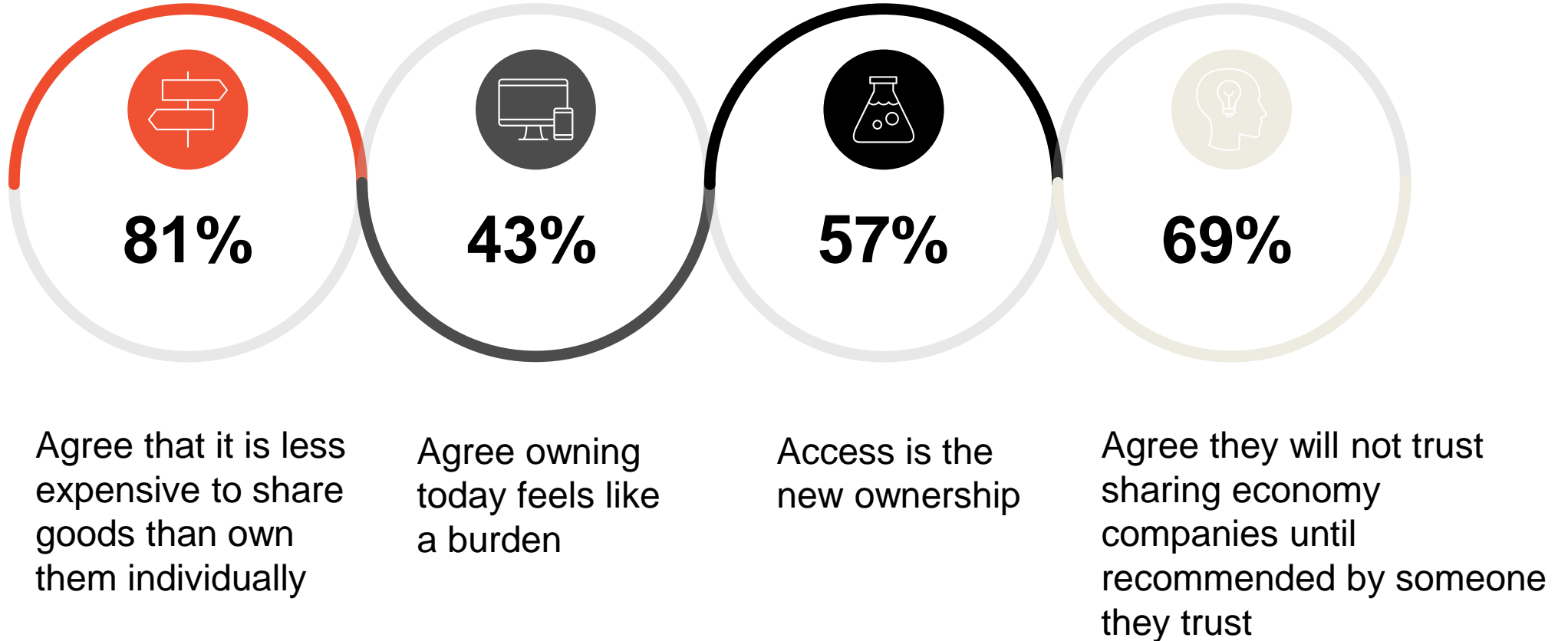
89% agree it is based upon trust between providers and users



78% agree it builds a stronger community



Re-thinking the value of ownership



<https://www.pwc.com/us/en/technology/publications/assets/pwc-consumer-intelligence-series-the-sharing-economy.pdf>

Selected Examples of Sharing Economy



- Services (**DogVacay**, <https://www.dogvacay.com/>) DogVacay is a Santa Monica based company known for home dog boarding and other pet services. It is cheaper than a kennel, and provides a more comfortable stay for the dog.



- Automobile Services (**Lyft**, <https://www.lyft.com>) Lyft is a ride sharing company for people to find rides from “regular” people who have a car.



- Wi-Fi Services (**Fon**, <https://fon.com>) Fon enables people to share their home Wi-Fi network in exchange for getting free Wi-Fi from anyone out of the 7 million people in Fon’s network.

Intellectual Property Protection

Types of Intellectual Property

Type	What is it?	What's protected?	When do you apply for it?
Patent	A patent protects how an invention works or functions.	Inventions and new processes.	If you have a device, substance, method or process that is new, inventive and useful.
Trademark	A trademark identifies the particular goods or services of a trader as distinct from those of other traders.	Logos, words, letters, numbers, colours, a phrase, sound, scent, shape, picture, aspect of packaging or branding – or any combination of these.	If you want to distinguish your goods, services (or both) from those of another business.
Registered Design	The visual appearance of a product is protected, but not the way it works.	Product designs.	If you want to protect the unique visual appearance of a product, you may need design rights.
Copyright	The owner's original expression of ideas is protected, but not the ideas themselves.	Drawings, art, literature, music, film, broadcasts, computer programs.	<i>Automatic protection</i>
Trade Secrets	These types of IP rights give creators certain rights and privileges depending on the type of IP protection.	Any confidential information, including secret formulas, processes, and methods used in production.	<i>Automatic protection</i>
Circuit Layouts	Similar to copyright, the owner's original layout design is protected, but they have a unique form of protection.	Layout designs or plans of integrated circuits used in computer-generated designs.	<i>Automatic protection</i>

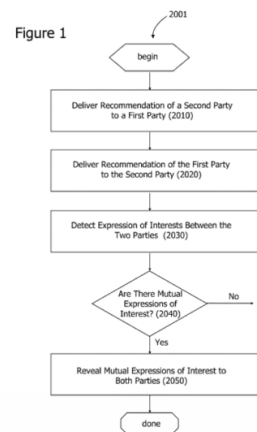
Uber's Patent Strategy

- Purchased 66 ridesharing patents and 10 patent applications from AT&T (telecom)
- UP3: Direct patent purchase program to invite small companies and patent owners to submit ridesharing-related patents
- Company acquisitions
- Defence patents to counter patent infringement attacks from competitors

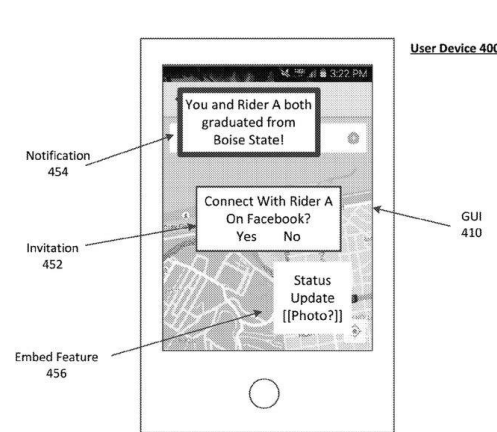


Ride matching based on selection criteria and driver characteristic information

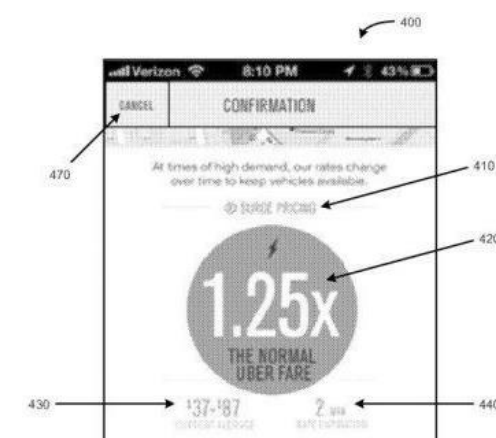
TABLE 1	
Usage behavior categories and usage behaviors	
usage behavior category	usage behavior examples
navigation and access	activity, content and computer application accesses, including buying/selling paths of accesses or click streams
subscription and self-profiling	personal or community subscriptions to process topical areas interest and preference self-profiling affiliation self-profiling (e.g., job function)
collaborative	referral to others discussion forum activity direct communications (voice call, messaging)
reference	content contributions or structural alterations personal or community storage and tagging personal or community organizing of stored or tagged information
direct feedback	user ratings of activities, content, computer applications and automatic recommendations
physiological responses	user comments direction of gaze brain patterns blood pressure heart rate
environmental conditions and location	current location location over time relative location to users/object references current time current weather condition



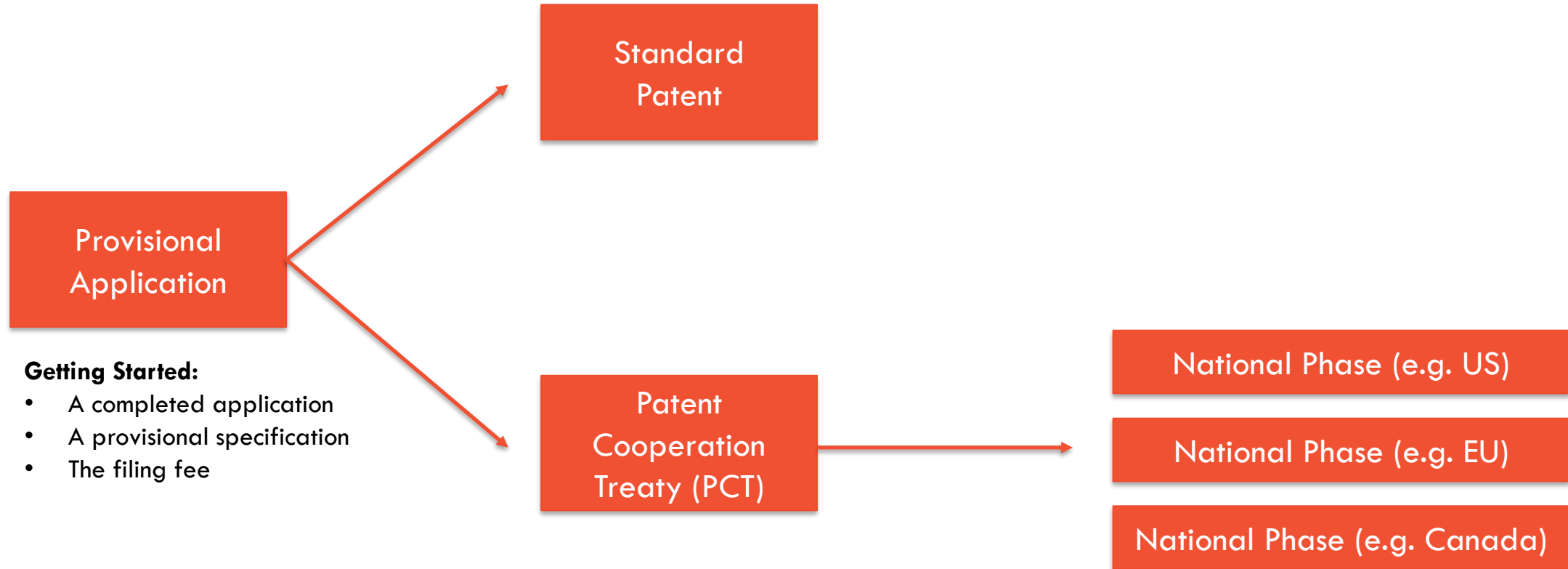
Mining social data for UberPool



Surge Pricing



Patent Application Process



W8 Lecture: Commercialization