INFO5992 Understanding IT Innovations

Week 6: Distributed Innovation III – User Innovation and Platform Ecosystem

Semester 1, 2025

THE UNIVERSITY OF SYDNEY

Acknowledgement of Country

I would like to acknowledge the Traditional Owners of Australia and recognise their continuing connection to land, water and culture. I pay my respects to the first nations people and their Elders, past, present and emerging.

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UoS Semester Outline

Week	Learning Outcomes	Lectures
Module 2: Innovation Framework		
Week 01	L01, LO2, LO3	Unit of Study Introduction, Administrivia, Definition of IT Innovation, Importance of Innovation to a Country, General Purpose Technologies, Overview of Emerging Technologies
Week 02	LO4, LO5	Innovation Frameworks I: Dynamics of IT Innovation, Dominant Design
Week 03	LO6	Innovation Frameworks II: Disruptive Innovation, Innovator's Dilemma, Value Chain & Value Network
Module 2: Development of Key Intellectual Property in the Modern Age		
Week 04	LO7	Introduction to Open Innovation and Closed Innovation Distributed Innovation I: Product Platforms, Web APIs
Week 05		Distributed Innovation II: Crowdsourcing, Free and Open- Source Software, Open Data
Week 06		Distributed Innovation III: Platform Ecosystems, User Innovation
Module 3: Commercialisation Process and Business Strategies for Emerging Technologies		
Week 07	LO8	Commercialisation I: Startup vs Traditional Companies, Lean Startup Methodology and Agile Development
Week 08		Commercialisation II: Customer Development Process, Value Proposition Canvas
Mid semester break		
Week 09	LO8, LO9	Commercialisation III: Innovation Management, Business Model Canvas Commercialisation IV: Capital & Fundraising for IT Innovation
Week 10	LO11, LO12	Organisational Cultures and Structures Supporting Innovation, Judging IT Innovation
Module 4: Innovation At-Scale		
Week 11	LO10	Innovation Ecosystem: Silicon Valley and Australia
Week 12	N/A	Course Review | Innovation Pitch Presentation
Week 13	N/A	Innovation Pitch Presentation
Final Exam		

Distributed Innovation

Recap week5 and 6: Some approaches to Distributed Innovation

These are some approaches companies use to get external companies/individuals involved in their 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

User Innovation

Traditional model of innovation: "Producer innovation"

- Producer makes product/service for consumers
- Design for innovations comes from producer companies
- Producer innovators profit from many users of the same product/service
- **The 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 producers to "protect" innovation through patents

Source: Baldwin and von Hippel (2011)

"User innovation" definition

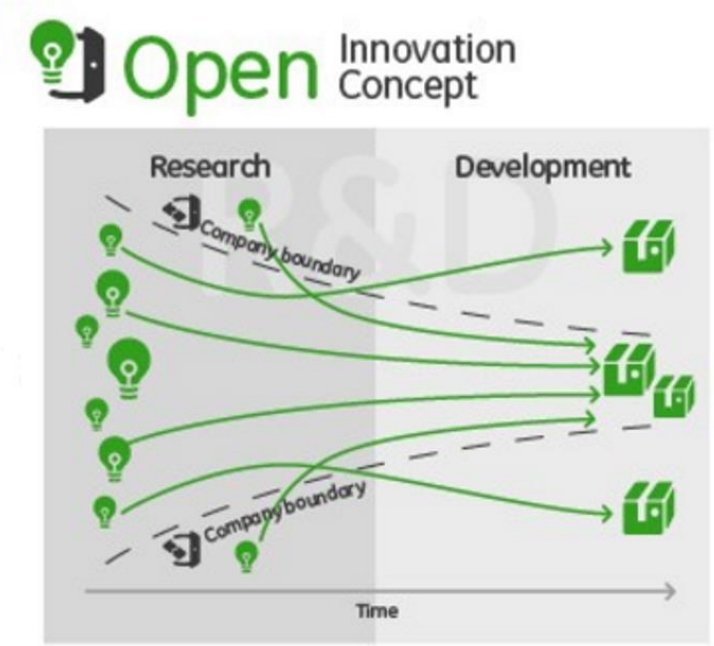
- **User innovation** is the idea that users and consumers are more innovators of new products than suppliers.
- Eric von Hippel was among the first to notice and explore this trend.
- Products made by manufacturers (or software companies) are typically developed to meet a wide range of the needs of a wide range of people.
- Therefore, when a particular user experiences needs that are not yet felt by most consumers, they make the adjustments themselves to meet their needs.

Eric Von Hippel (MIT)

"User innovation" definition cont'd

- Often, these ideas are fed back to the companies from these users in the hope that the product will be produced for them.

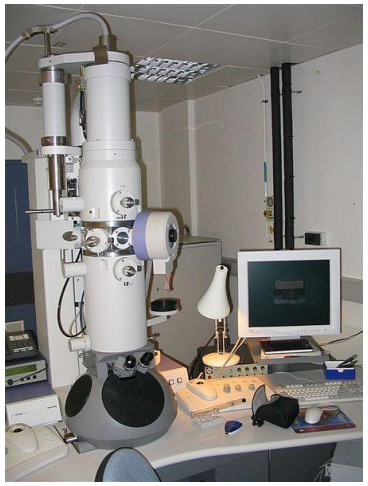
- **These ideas, which we discussed as part of 'Open Innovation' can also lead to new companies being formed, especially with IT products**



The importance of user innovation: Examples

Eric Von Hippel (MIT)

- Approx 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

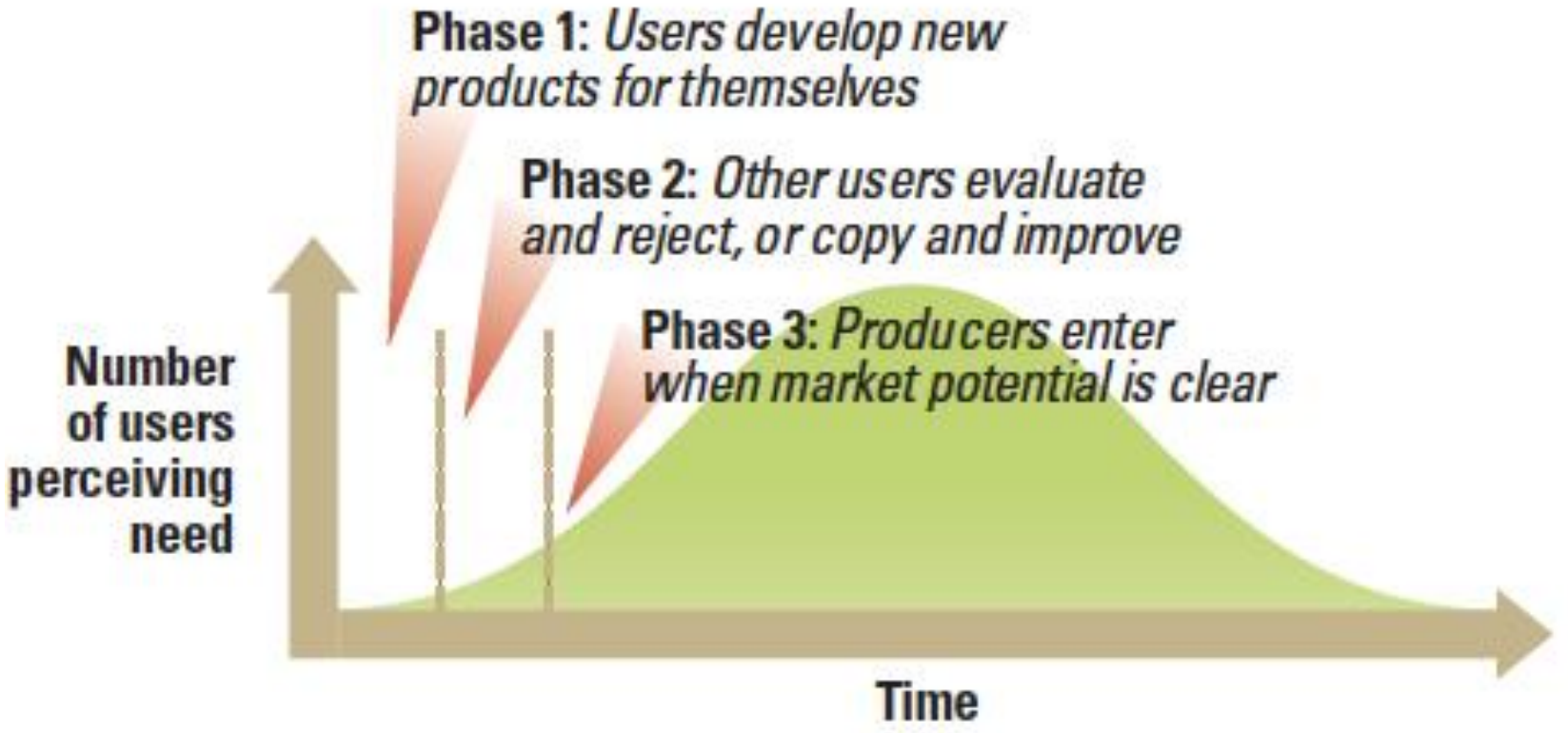


http://www.flickr.com/photos/tz1_1zt/112072422/ (MAR'25)

connorbaxter.com

User Innovation

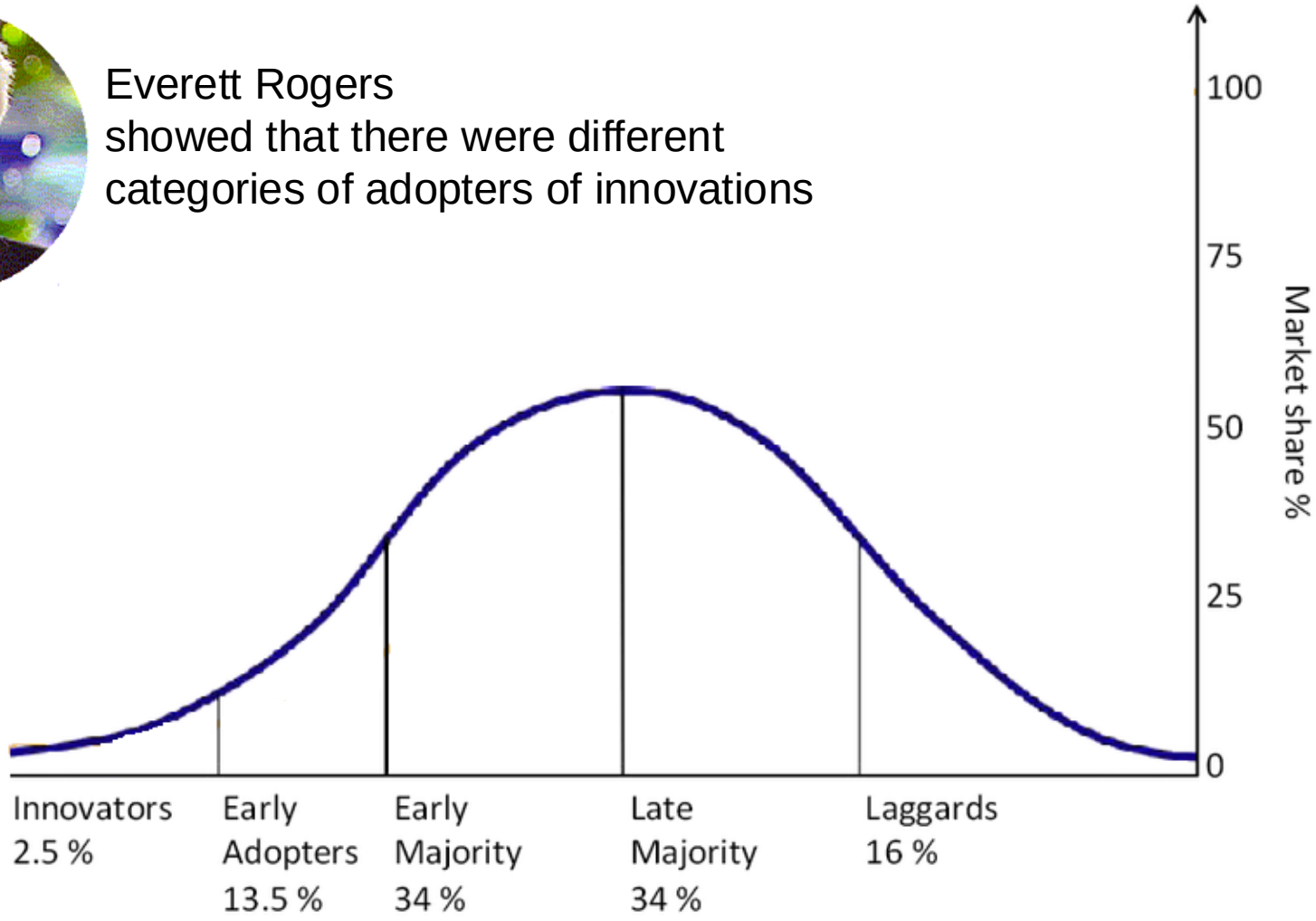
Eric Von Hippel
MIT Sloan School of Management



http://sloanreview.mit.edu/article/the-user-innovation-revolution/ (MAR'25)

Recap week 3: Diffusion of Innovation

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



Lead users

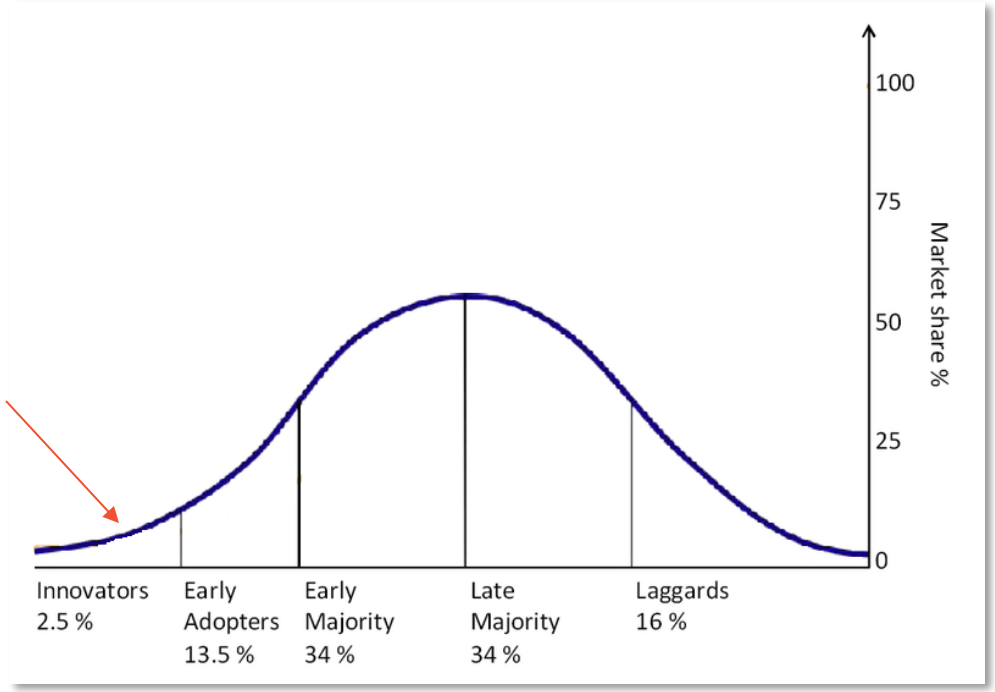
1986 journal article in *Management Science*
"Lead Users: A Source of Novel Product Concepts"

Lead Users

- Involving lead users often leads to more effective innovation.
- Lead users may be individuals, companies, or communities.

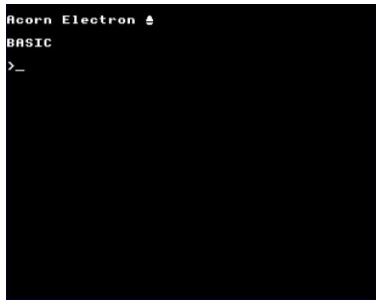
*1986 journal article in **Management Science***
"Lead Users: A Source of Novel Product Concepts"

Lead users

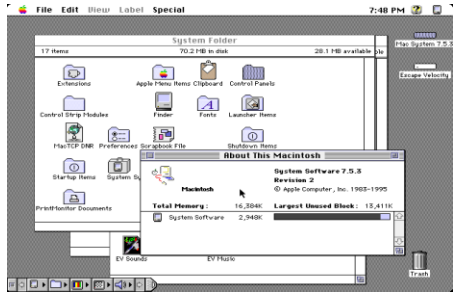


Lead users

- In some product categories (e.g. cleaning products, food products etc), market research focuses on **typical users** (e.g. with interviews, or focus groups)
  - The feedback and opinions of typical users can be useful in developing new products.
- For IT and other high-tech industries, typical users are not so effective
  - E.g. they often suffer from "**functional fixedness**" (a cognitive bias that limits a person to use an object only in the way it is traditionally used)



Typical users not likely to suggest



Typical users not likely to suggest

How to identify lead users

- According to Von Hippel…

- **Lead Users:**
  - Face the needs that will be general in the market, but months or years before the general marketplace realises the needs.
  - Will benefit significantly by obtaining a solution to those needs
  - Spend resources trying to solve those needs
  - Are at the leading edge of trends and are very knowledgeable about "state of the art."
  - **Note:** Lead users are not usually a company's "lead customers" – they are usually not satisfied with current products, so have had to create their own

Source: Von Hippel (1986)

User-led Innovation – An alternative perspective

- **Users insights can't predict future demand:** The users themselves often have no idea if they will like a breakthrough product before they start using it.

- **User focus makes companies miss out on disruptive innovations:** "Focusing on users will lead companies to make incremental innovations that typically tend to make the products more expensive and complicated and ironically, in the long run, less competitive."

- **User-led design leads to sameness:** "Even if user insights were useful, it is not a competitive advantage. Even the most advanced user studies are now widely available."

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 (MAR'25)

User-led Innovation – Apple?

- Apple has a good track record when it comes to its consumer products, and that's because of how they define "insanely great products." To quote Jobs again:

  "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."

- In other words, Apple makes products that they want to use themselves. They are their own leading-edge customers.

https://hbr.org/2012/12/to-stay-ahead-of-disruptions-curve
(MAR'25)

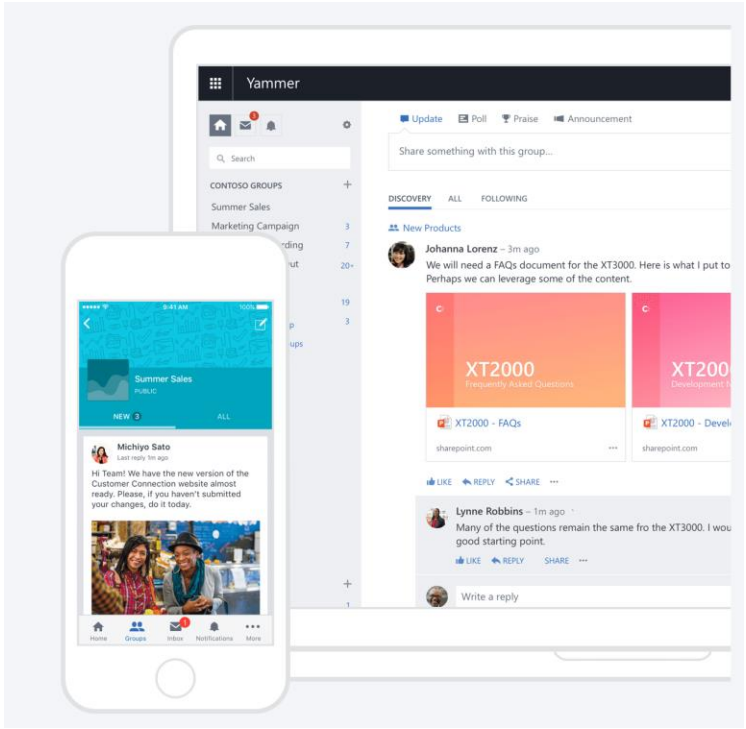
Case Study on User Innovation

Examples of user innovation in IT

- The World Wide Web
  - It was created by a worker at a scientific research agency so that 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
  - 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: Geni to Yammer

https://www.geni.com/



https://www.yammer.com/

- Powerful Genealogy Tools to Help You Grow Your Tree
- Find Your Ancestors, Connect to New Relatives

- A private social network for your company.
- To share files, discuss projects, and get work done faster
- Discuss ideas, share updates, and crowdsource answers from coworkers around the globe.

Example of user innovation: Yammer

David Sacks

http://www.socaltech.com/interview_with_david_sacks__geni_and_yammer/s-0017613.html (MAR'25)

https://www.yammer.com/

- Yammer started as an internal productivity tool at Geni. We built the tool to help people stay connected, and we've been using it internally for six months.
- We have about 30 employees at Geni and have about 20,000 messages on Yammer.
- It's been incredibly successful at Geni and is the centre of the company's culture. We decided to spin it out into a separate company so that other companies can also use the product. About a month ago, we spun it out and premiered it at TechCrunch50, as you know, and won that event.
- Microsoft bought Yammer for $1.2 billion in 2012
- Yammer is now used by more than 200,000 companies (source: yammer.com)

Example of User Innovation: Slack

Game Neverending

flickr

Find your inspiration

Glitchthegame.com

Stack is your digital HQ

The Slack origin story | TechCrunch (MAR'25

Example of user innovation: Slack

Stewart Butterfield

https://www.npr.org/2018/07/27/633164558/slack-flickr-stewart-butterfield (MAR'25)

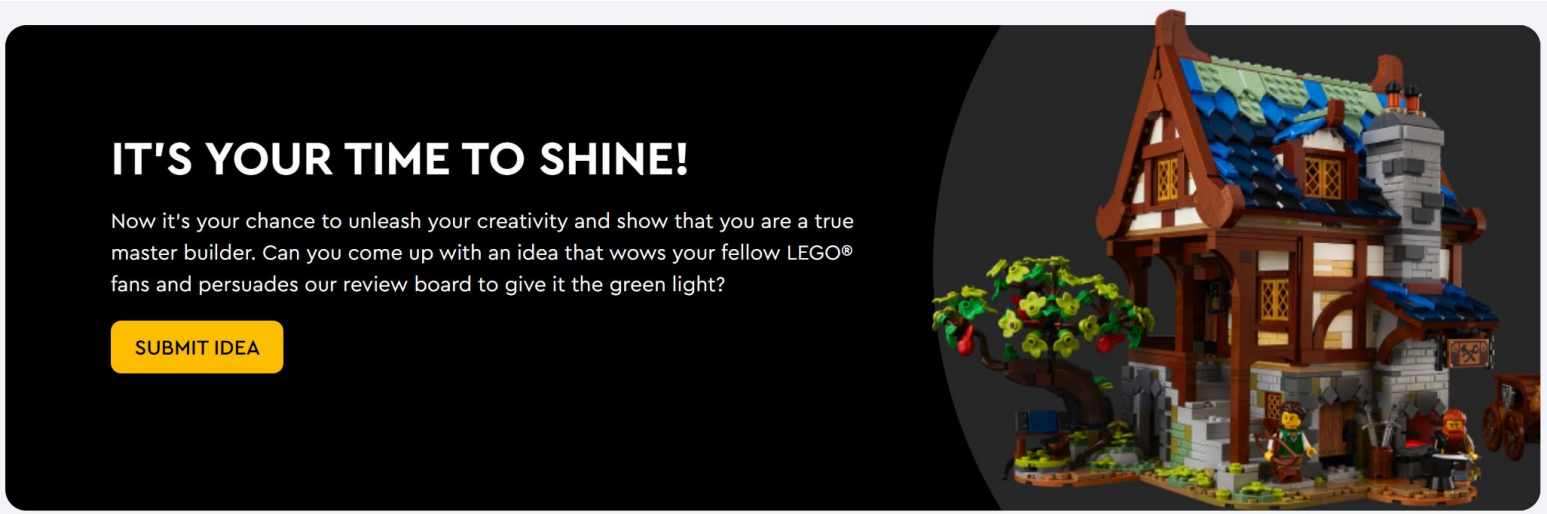
- In the early 2000s, Stewart tried to build a weird, massively multiplayer online game, Game Neverending, but the venture failed.
- Instead, he and his co-founders used the technology they had developed to create the photo-sharing site Flickr.
- After Yahoo acquired Flickr in 2005, Butterfield returned to the online game idea, Glitch, only to fail again.
- They had developed a tool for team communication that they used to coordinate their work on the game and realized that it could also be helpful for other teams.
- The office messaging platform Slack rose from the ashes of that second failure — In 2019, Slack went public through a direct listing on the New York Stock Exchange, with a valuation of over $20B.

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/ (MAR'25)

Example: Lego Ideas

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



Example of user innovation: Apache web server

- In 1994, the most popular web server was “httpd” by Rob McCool at NCSA (same place as Mosaic – most popular web browser at the time)
- This was available as open source
- Many httpd users (webmasters) modified the server code for their own sites
- Rob McCool left NCSA in mid 1994
- Eight httpd users emailed each other to discuss using each others changes
- In 1995, they created a common code base
- By 1996, it was the world’s most-used web server
- It’s still one of the most used today

Example of user innovation: MySQL

http://dev.mysql.com/doc/refman/5.1/en/history.html (MAR'25)

- We started out with the intention of using the mSQL database system to connect to our tables using our own fast low-level (ISAM) routines. However, after some testing, we came to the conclusion that mSQL was not fast enough or flexible enough for our needs. This resulted in a new SQL interface to our database but with almost the same API interface as mSQL. This API was designed to enable third-party code that was written for use with mSQL to be ported easily for use with MySQL.
- MySQL is named after co-founder Monty Widenius's daughter, My.
- MySQL was bought by Sun Microsystems for $1 billion in 2008

Maker Movement

How It All Began

Make: is the magazine for Makers, which was first published in 2005 and used the word "Maker" to name the community. Now in its 13th year, Make: is published bi-monthly in print and features dozens of DIY technology projects. Called the "bible" for makers, Make: and its companion website, Makezine.com, cover makers, their projects and technologies as well as the communities that grow up around them.

Gathering the Community

Maker Faire is the "Greatest Show on Earth," an incredible celebration of makers and a showcase of innovative-in-the making. Maker Faire is the best evidence of the power and reach of the Maker Movement — all around the globe. The first Maker Faire was held in 2006 in the San Francisco Bay Area. In 2016, there were nearly 200 Maker Faire around the world with four of the events drawing at or above 100,000 people in San Mateo, New York, Rome and Shenzhen.

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IT Innovation to Maker Innovation

- User Innovation propelled by IT – simple to get started as all the necessary technologies are already available e.g., APIs, open source, cloud computing, etc.
- But building, it's more difficult as there is the need for manufacturing (e.g. prototype), electronics etc.
- Things are changing with new technologies, in particular, 3d printer, Raspberry Pi etc.

- Maker movement has made tremendous interest in the recent years

User innovation: becoming an even bigger force in innovation – e.g. "Maker movement"

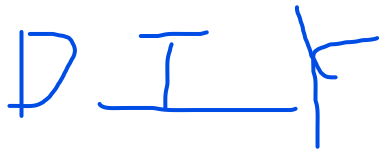
Image source: http://spotlight.macfound.org/blog/entry/craftsmanship-is-dead-long-live-maker-culture/

Image source: http://robodino.org/

"The maker movement, as we know, is the umbrella term for independent inventors, designers and tinkerers"

http://time.com/104210/maker-faire-maker-movement/ (MAR'25)

What is Maker Movement



- *The Maker Movement is the embodiment of the do-it-yourself tech community — a celebration of the ever-growing culture bred from the cross-section of collaboration and creativity that is continuously recruiting people and ideas and technologies and inviting them to be tested and broken and shared. Makers are everywhere — welding in a garage, tucked away in a lab or DIY-ing on the living room floor — but the community's unofficial headquarters are all around the nation, and creating a place for makers of all kinds in the form of Makerspaces.*

Make: Community – Home (MAR'25)

Platform Ecosystems

Platform Business

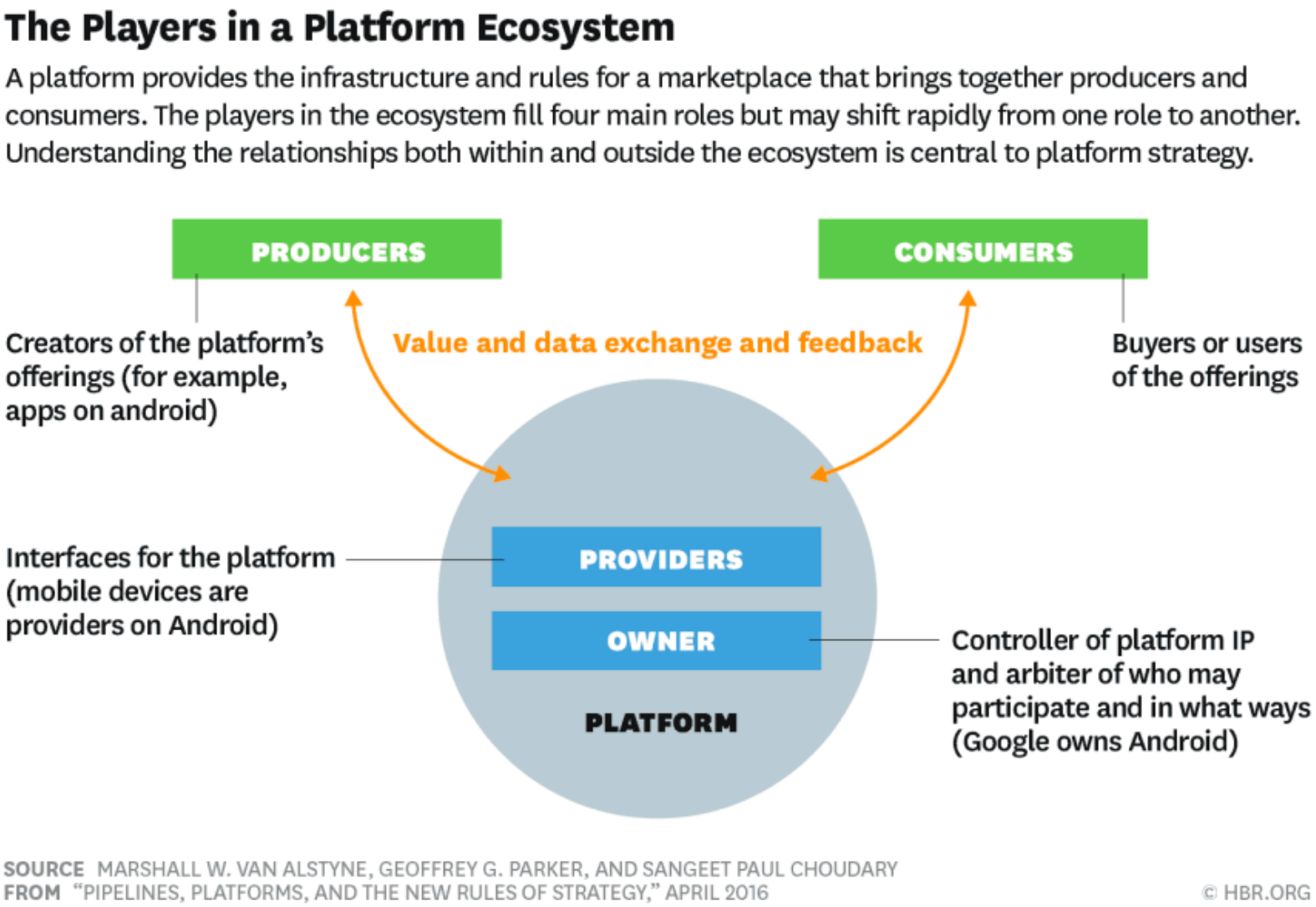
Platform businesses

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

Source: Van Alstyne, Parker and Choudary

Main players in a platform ecosystem

Platform Ecosystem



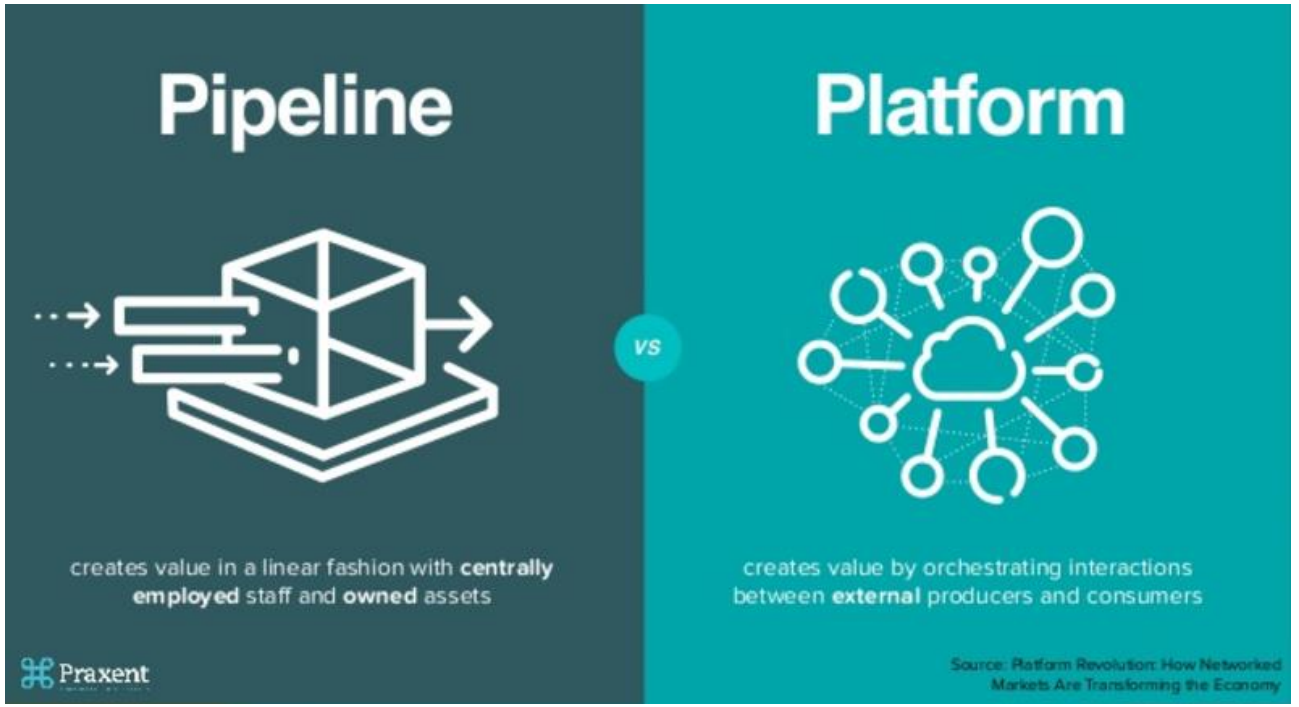
Roles in a platform ecosystem

- **Producers** create the platform's offerings
- **Consumers** buy or use the platform's offerings
- **Platform providers** provide the interfaces to the platform
- **Platform owners** owns platform intellectual property (e.g., trademarks) and control who participates in the platform and how they participate

Source: Van Alstyne, Parker and Choudary

Pipelines vs Platforms

Companies that take in resources, add value to them and then release products that are higher value



Companies that create value by controlling the interactions between producers and consumers

Can be both (e.g., Amazon, Apple)

https://www.slideshare.net/praxent/launching-a-hyper-scalable-platform-business-by-praxent (MAR'25)

Strategy: From Pipeline focus to Platform focus

1. From *resource control* to *resource automation*
   - The main asset for platforms is the network of producers and consumers

2. From *internal optimisation* to *external interaction*
   - Platforms focus on facilitating interactions in the network

3. From a focus on *customer value* to a focus on *ecosystem value*
   - Platforms focus on the total value of the expanding network

Source: Van Alstyne, Parker and Choudary

Measuring a platform business

- Interaction failure:
  - Failure of a key interaction between producers and consumers
- Engagement:
  - Level of participation enhancing network effects
- Match quality:
  - Level of quality of interactions between producer and consumer

- Negative network effects:
  - Need to manage the platform carefully to avoid e.g., over-supply or over-demand

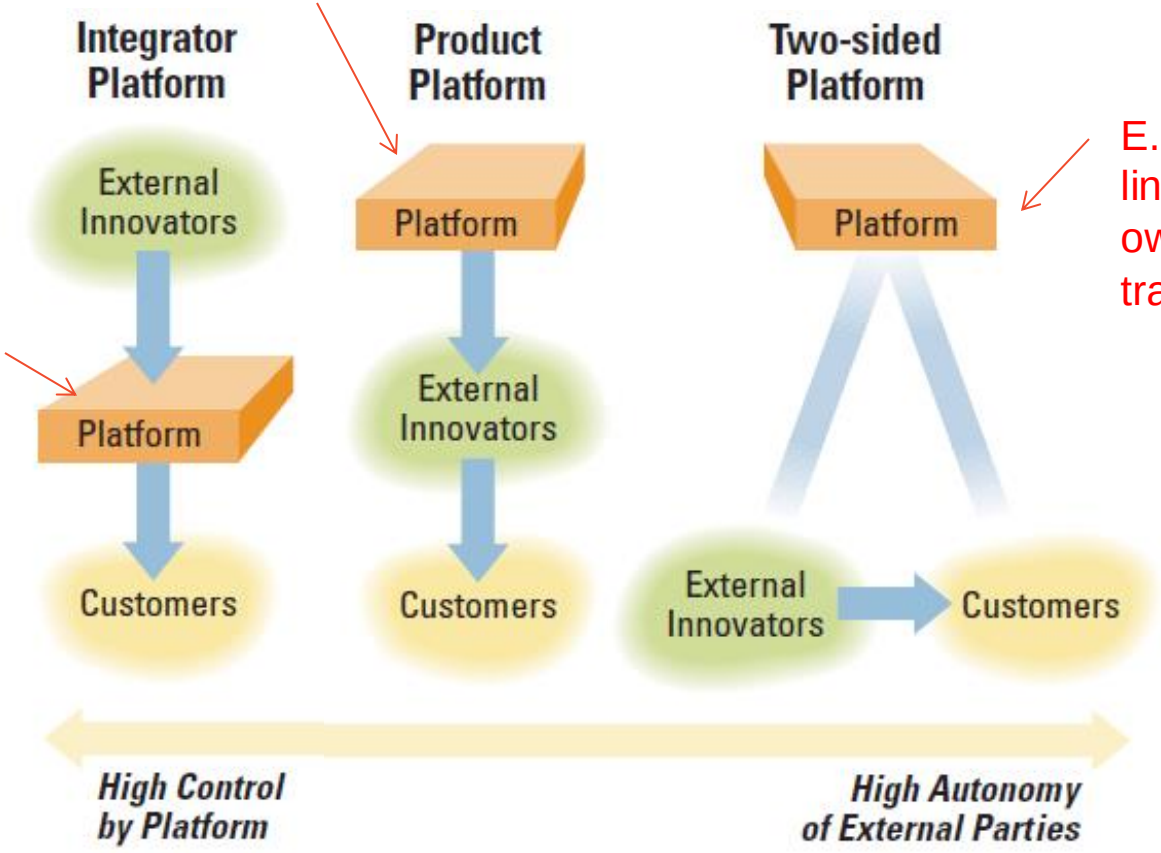
Source: Van Alstyne, Parker and Choudary

Different forms of platform businesses

E.g., Intel x86 Architecture

E.g., Apple iPhone app architecture

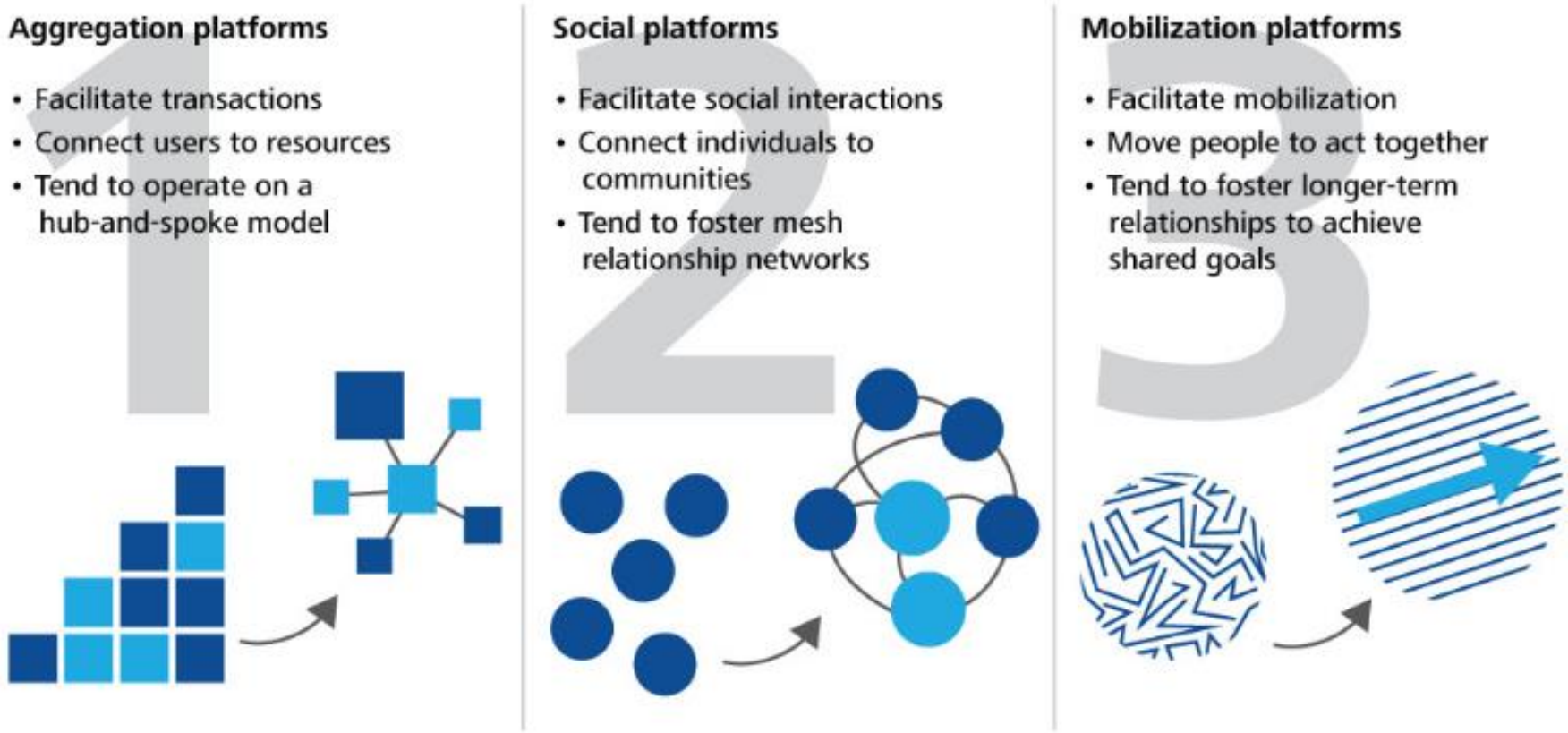
E.g., Airbnb, which links property owners with travelers.



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

Common Platform Types

Figure 2. Three common platform types that facilitate transactions, interactions, and mobilization



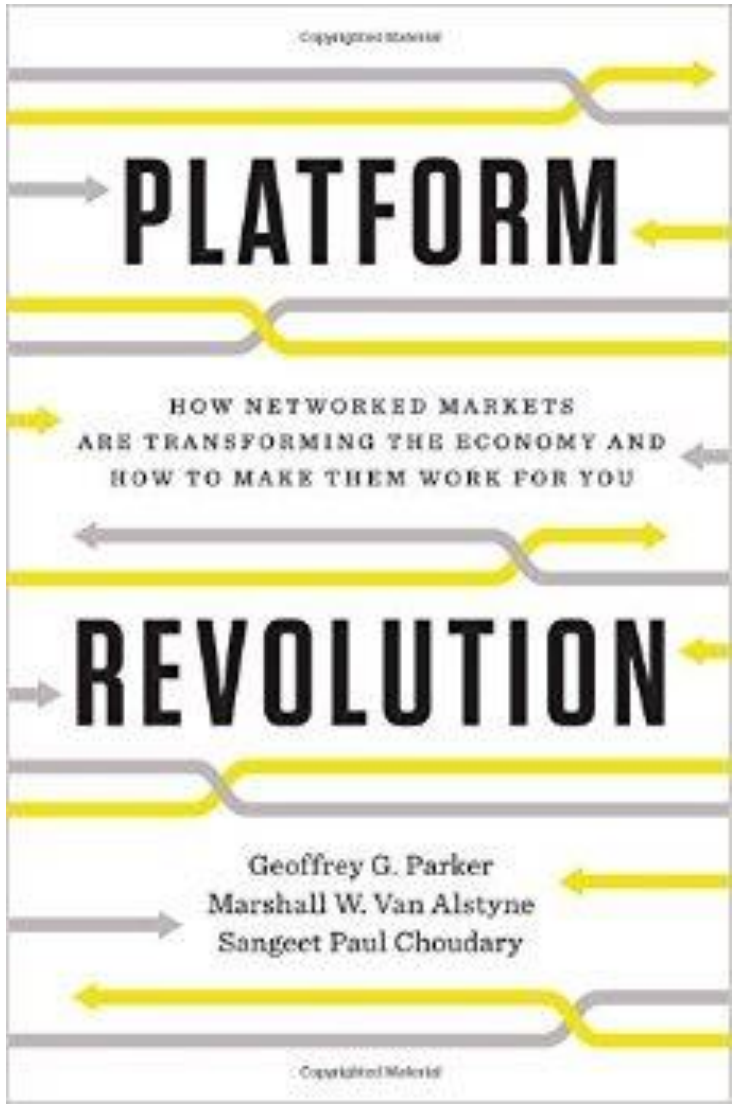
eBay, Etsy, and the App Store, Airbnb, Kaggle

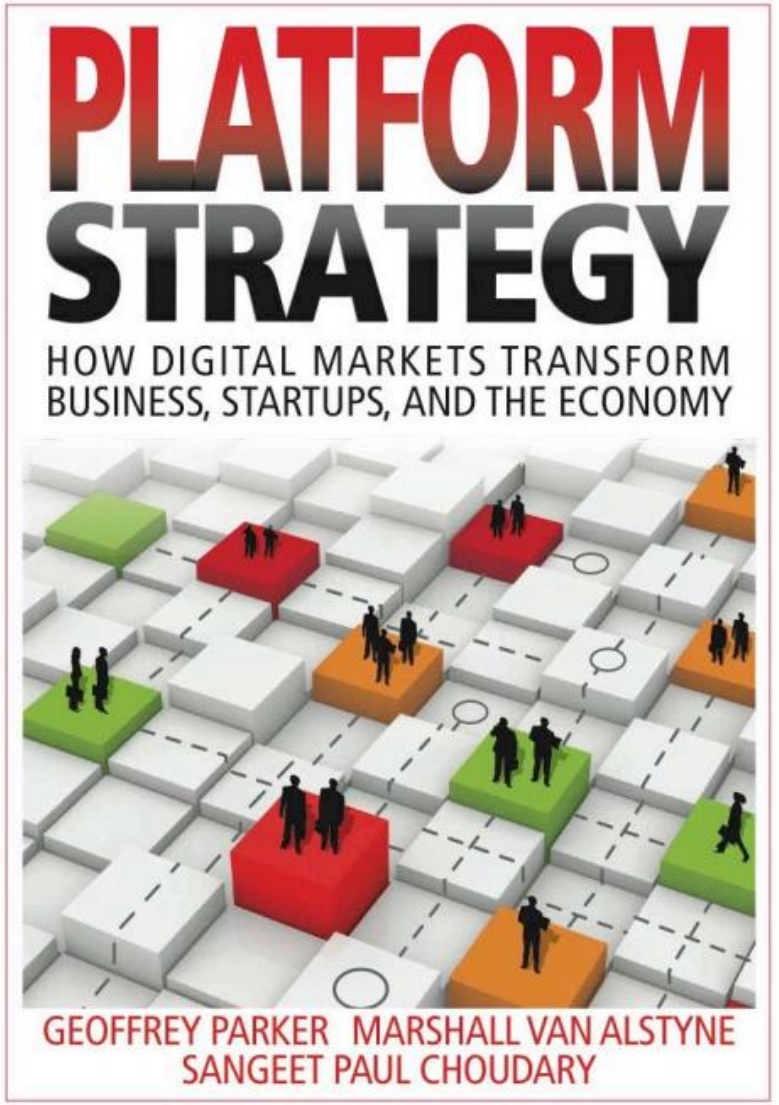
Facebook and Twitter

Linux or Apache

Deloitte, 2015

Suggested reading





Platform Ecosystems

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.

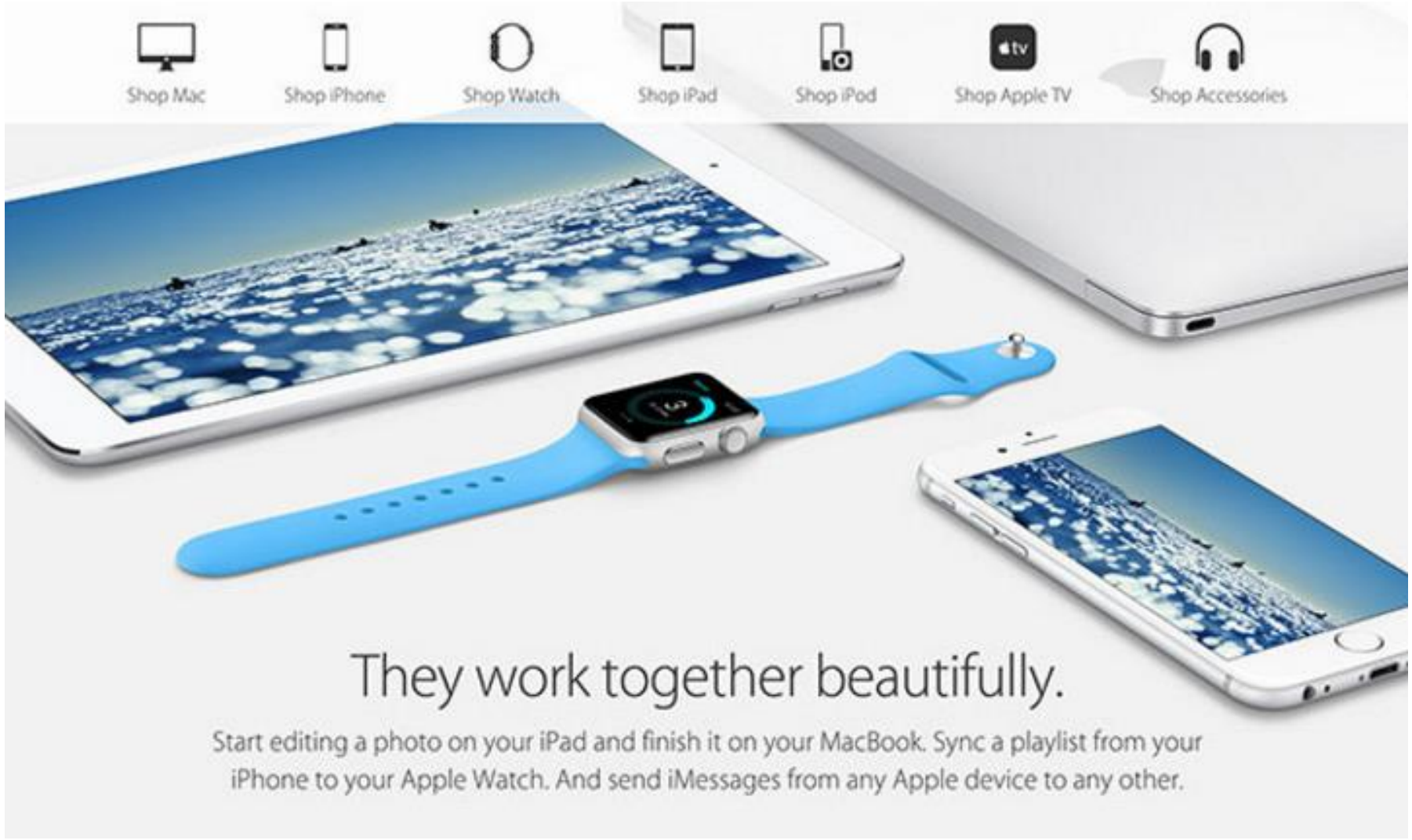
Properly designed, Platforms can become powerful catalysts for rich ecosystems of resources and participants.

Deloitte, 2015

Governance – Protocols or Standards

- A couple of key elements come together to support a well-functioning platform:
  - **A governance structure:** 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 are increasingly supported by global digital technology infrastructures that help to scale participation and collaboration


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…

- Back in 2007, the five major mobile-phone manufacturers – Nokia, Samsung, Motorola, Sony Ericsson, and LG – collectively controlled 90% of the industry's global profits. That year, Apple's iPhone burst onto the scene and began gobbling up market share.
- By 2015 the iPhone singlehandedly generated 92% of global profits, while all but one of the former incumbents (former companies) made no profit at all.

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 (MAR'25)

Apple – Pioneering the App platform

- Apple (along with Google's competing Android system) overran the incumbents by exploiting the **power of platforms** and leveraging the new rules of strategy they give rise to.
- **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.
- Understanding this, Apple conceived the iPhone and its operating system as more than a product or a conduit for services. **It imagined them as a way to connect participants in two-sided markets – App developers on one side and App users on the other – generating value for both groups.**

Marshall W. Van AlstyneGeoffrey G. ParkerSangeet Paul Choudary, 2016

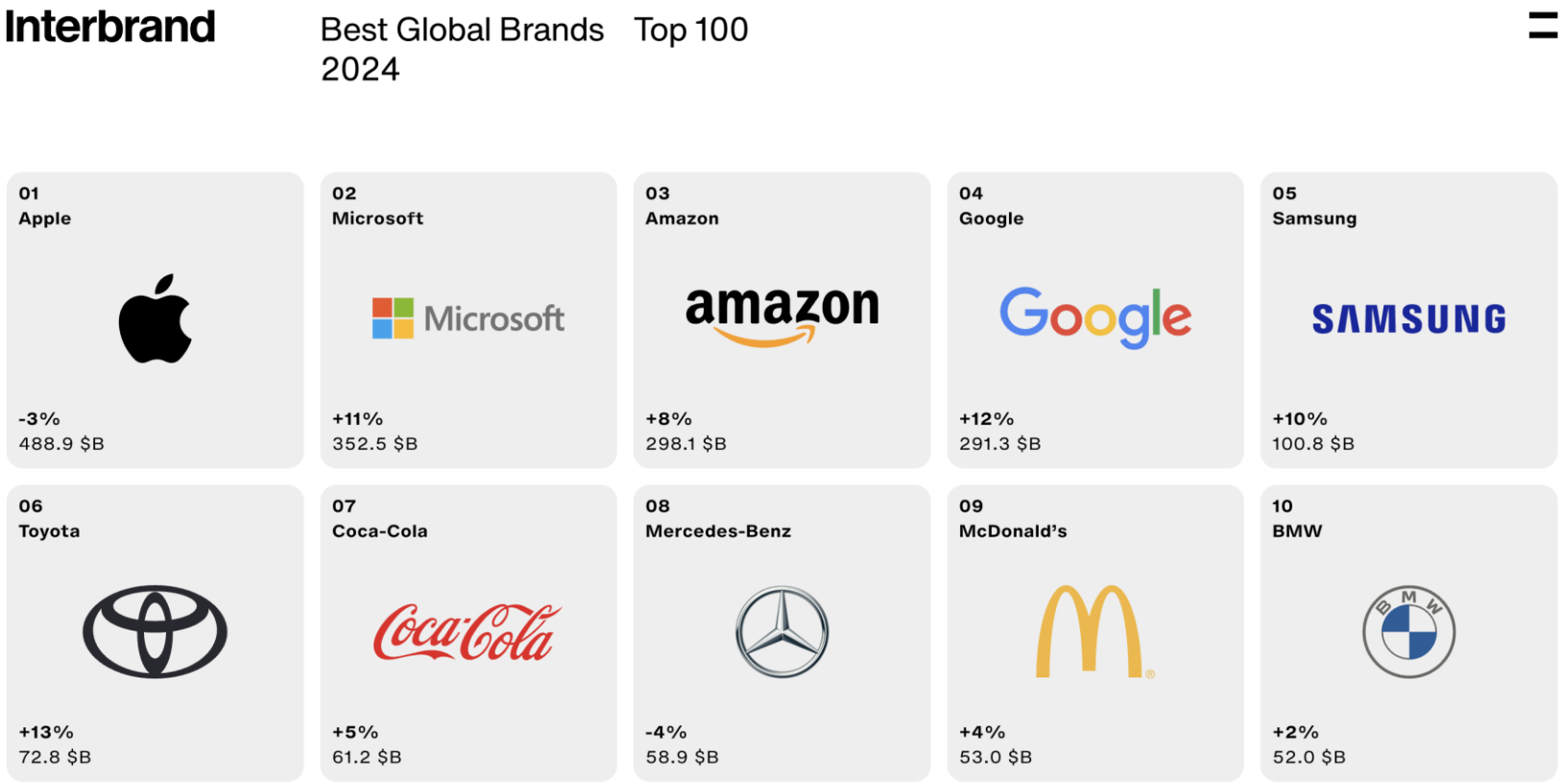
Apple – leveraging the Network Effect

- As the number of participants on each side grew, that value increased – a phenomenon called "network effects," which is central to platform strategy. By January 2025, the company's App Store had offered 1.92 million apps, and the developers generated US$1.1 trillion in total billings and sales in the App Store ecosystem in 2022.
- Apple's success in building a platform business within a conventional product firm holds critical lessons for companies across industries.
- Firms that fail to create platforms and don't learn the new rules of strategy will be unable to compete for long.

Platform Economy

Case Studies

Platforms



https://interbrand.com/best-global-brands/ (MAR'25)

Platform Economy – Global companies

- Seven of the 10 most valuable companies globally are now based on a platform business model: the creation of digital communities and marketplaces that allow different groups to interact and transact. Companies like Apple, Google, Amazon and Alibaba have used the model to grow exponentially and grab significant market share from established firms.
- Platforms represent a big change in the way industries have traditionally been organized. And first mover advantage is important in an environment where the winner often takes all.
- More than 30% of global economic activity — some $60 trillion — could be mediated by digital platforms in six years' time, according to a McKinsey research report, and yet experts estimate only 3% of established companies have adopted an effective platform strategy.

Companies …

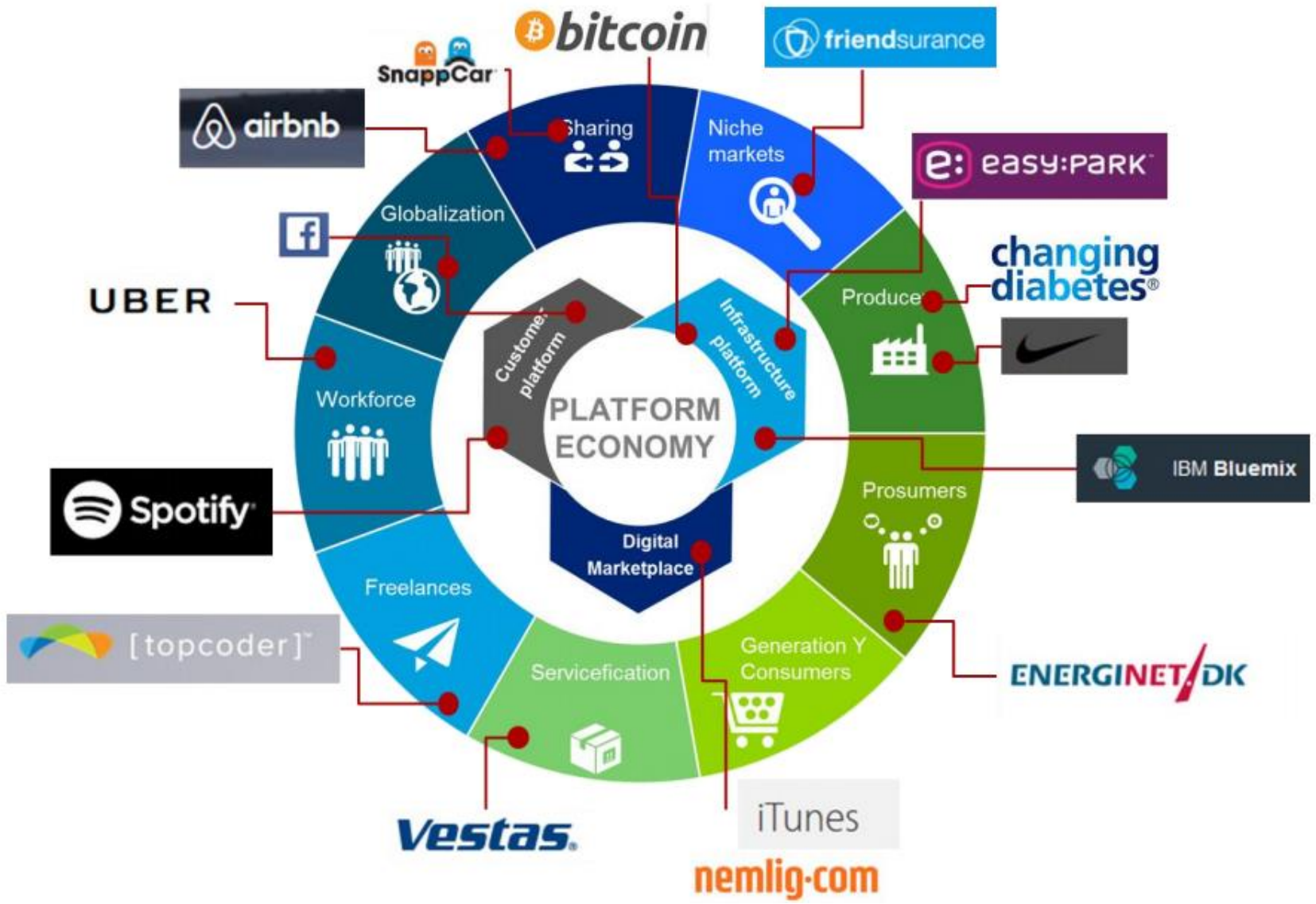
InterBrand 2013

- Google
- Apple – e.g., iTunes
- Microsoft – e.g., OS, App store
- Amazon
- **IBM – e.g., Marketplace**
- eBay
- Samsung
- Oracle
- **SAP – e.g. Marketplace**
- American Express
- Intel
- Cisco

New Brands…

- Airbnb
- Uber
- Alibaba
- Tiktok

Examples



Deloitte. Digital

12

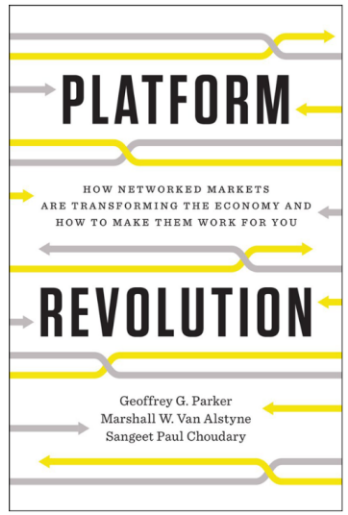
Can you Map the examples to Platform economy type?

- Producer, Consumer, Provider, Owner
- Aggregate, Social, Mobilise
- How about Distributed innovation ?
  - Product platforms, Web APIs, Crowdsourcing innovation / Crowdfunding Innovation, Releasing data sets “Open data”, Free and Open Source Software, User innovation

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.



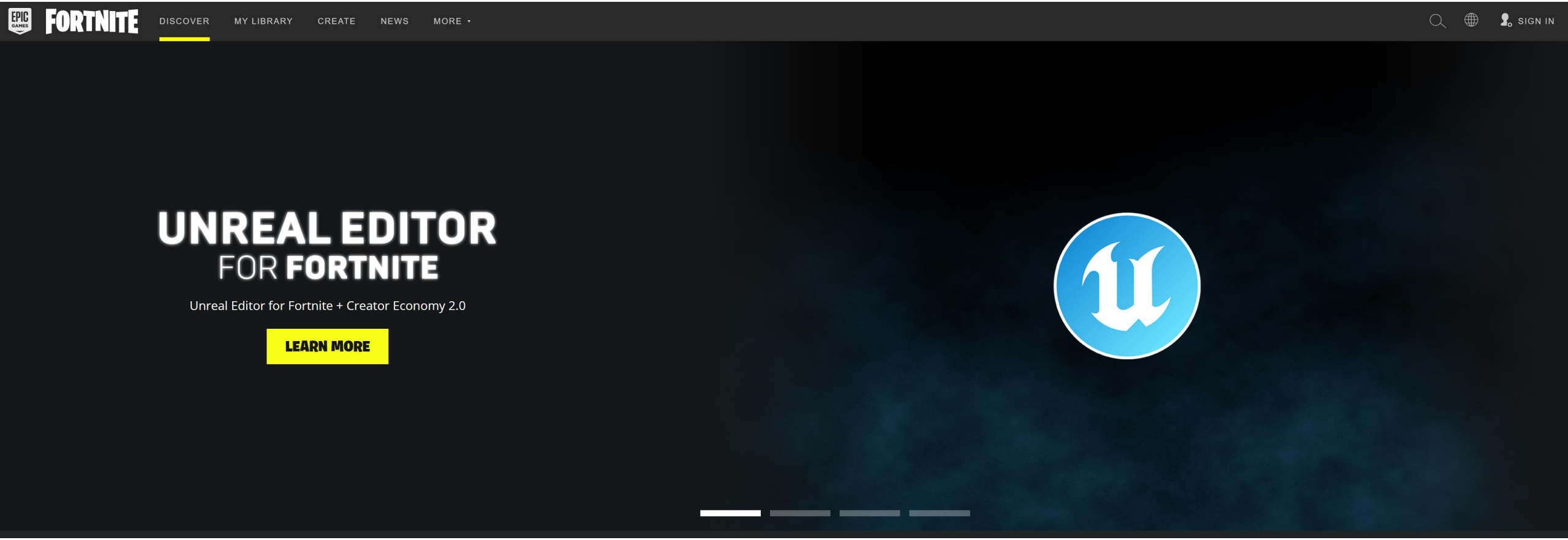
Platform Revolution - Book

Source: Parker, Van Alstyne and Choudary

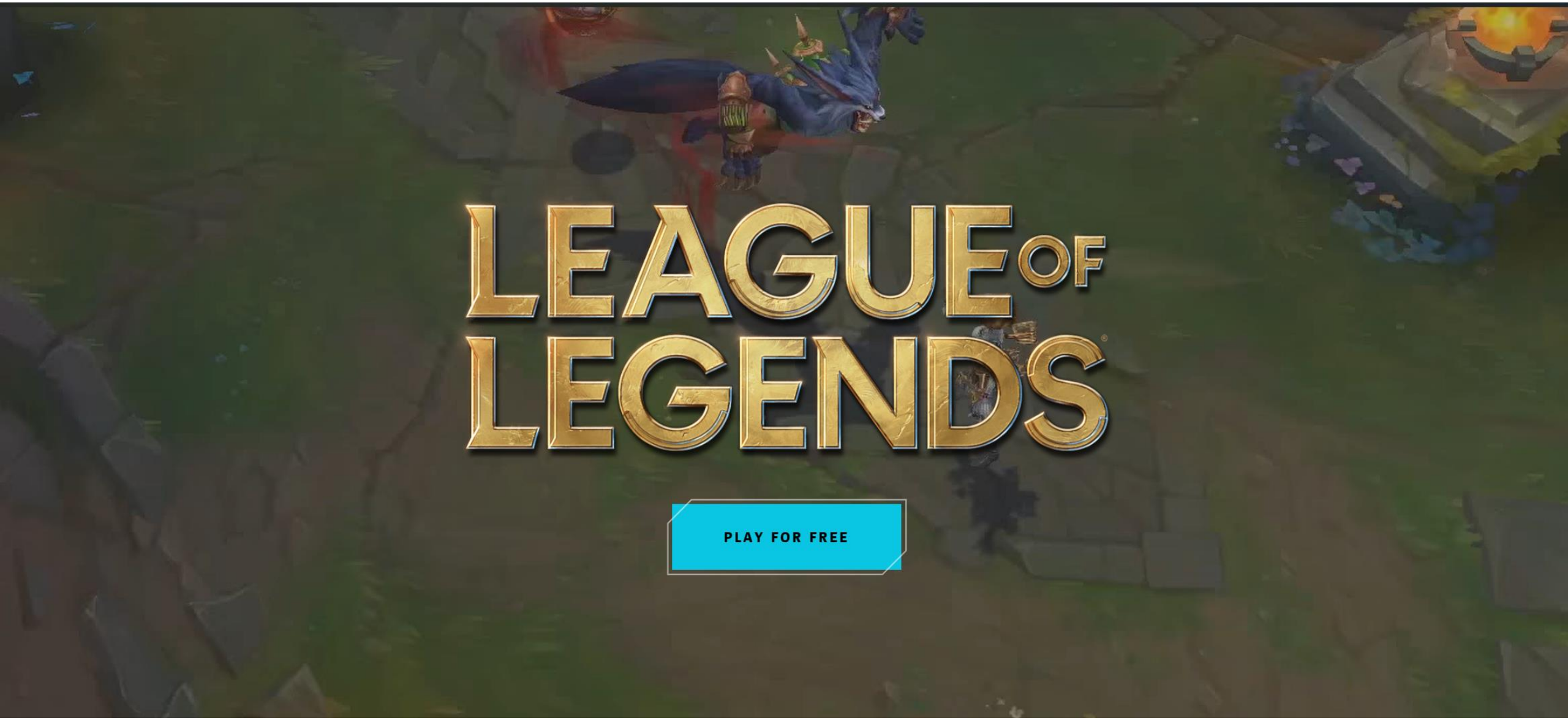
Case Study on Platform Economy:

Online Gaming

THE UNIVERSITY OF SYDNEY



Fortnite | Create, Play & Battle With Friends for Free - Fortnite



http://leagueoflegends.com/

Platform economy – Online Games

- In 2009, Riot Games released a new game product - League of Legend
- **More than a new product, the strategy was to build a *platform*.**
- 67 million people play it each month, generating some $1 billion dollars in annual revenue for the company. $1.75B in 2020
- Play for free; Riot Games makes its money when, having drawn players into its designed 'environment', it finds other ways to capitalize on their presence e.g., character skins and game boosters. Such an environment will have 'governance' – a set of protocols or standards to 'play' within it.
- Live events, in which League of Legend teams compete in tournaments in front of live spectators, 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 (MAR'25)

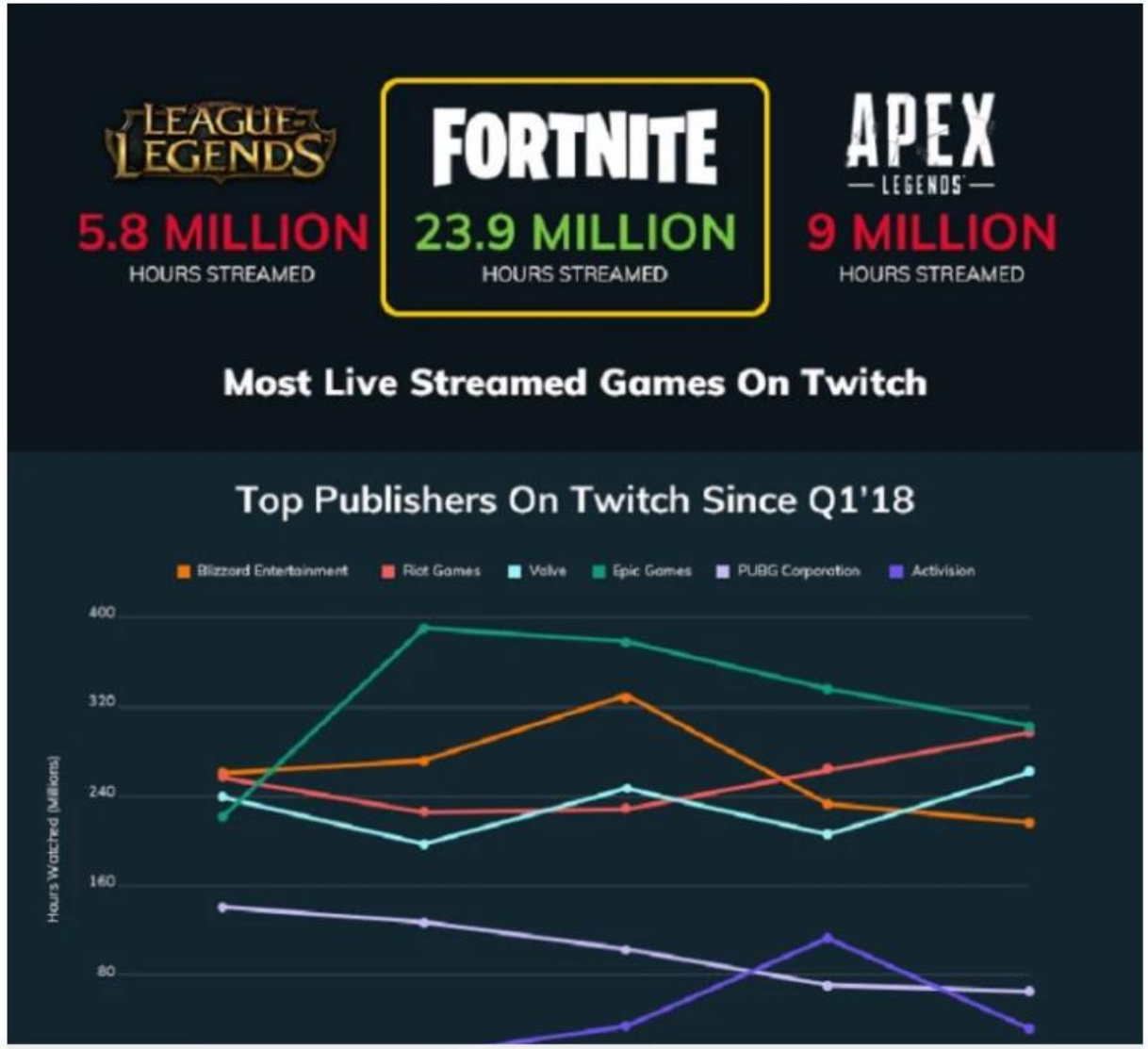
How does free game make money?

- Skinning
- Coaching
  - https://www.dexerto.com/apex-legends/apex-legends-coaches-will-train-you-for-a-price-524718 (MAR'25)
- Broadcast rights/competition etc
- Advertisement
- Sponsorships
- Broadcasting stars!

- Creator economy
  - Unreal Editor for Fortnite and Creator Economy 2.0 Are Here

Competitive Landscape

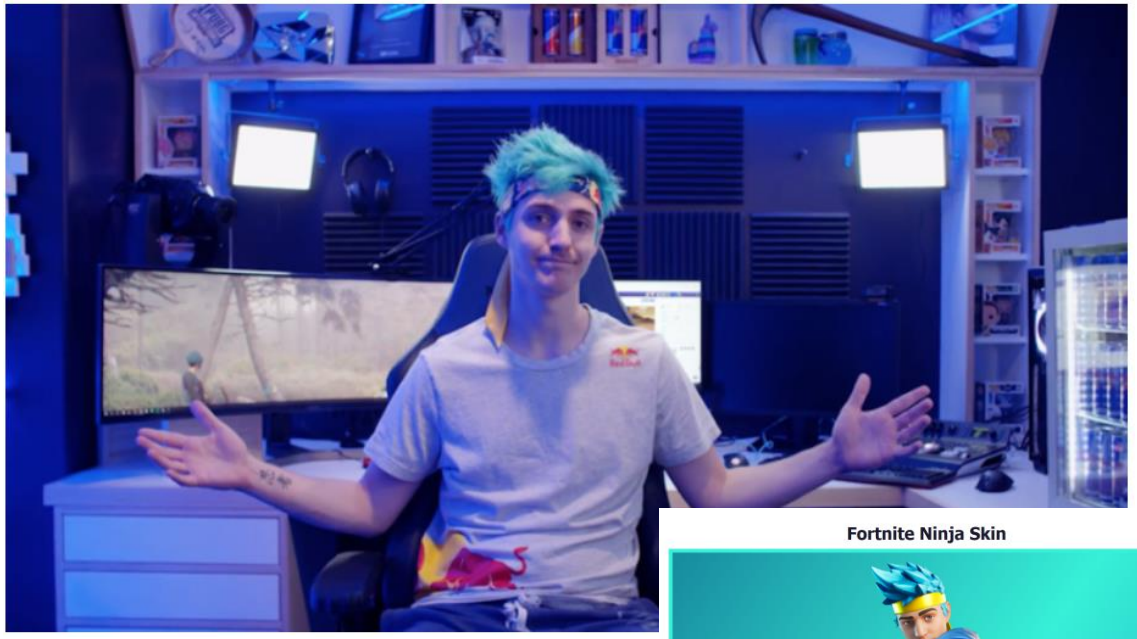
- Competitive landscape….
- New platforms coming with similar business model but more popular game mechanics

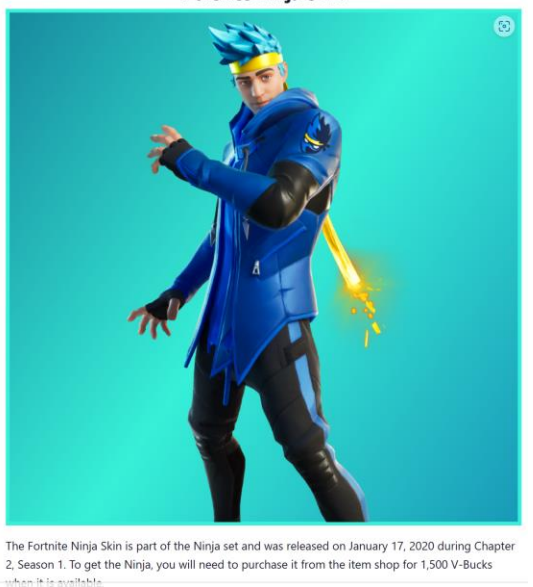


https://venturebeat.com/2019/04/18/fortnite-rules-q1-streaming-hours-but-apex-places-no-2-and-surpasses-league-of-legends/ (1st Quarter)
The Most Watched Games on Twitch, March 2023 (twitchmetrics.net) (MAR'25)

A new Media industry, enabled by Platforms?

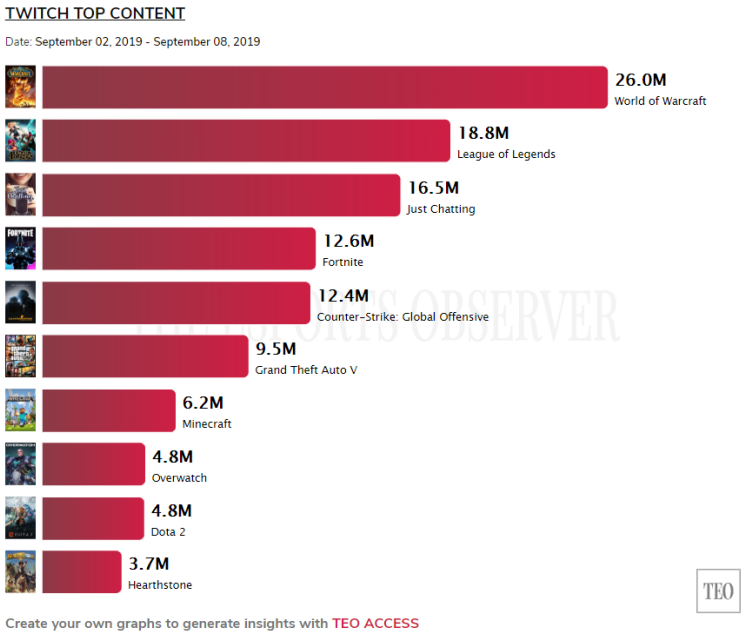
- **Ninja made almost $10 million in 2018 with Fortnite**
- He also made more than $500,000 “on a good month” of 2018.
- https://dotesports.com/culture/news/ninja-made-almost-10-million-in-2018-with-fortnite (MAR’25)





- Microsoft recruits Ninja’d
- https://arstechnica.com/gaming/2019/08/ninjaed-microsoft-swipes-top-game-streamer-from-amazons-twitch/ (MAR’25)
-

Relaunch a classic, now for the modern generation



– *The following content is ranked according to the total number of hours watched on Twitch from Monday to the following Sunday, with data compiled using TEO Access.*

ESPORTS ACCOUNTS FOR 11% OF VIEWERSHIP

TOP FIVE ESPORTS BROADCASTERS PER PLATFORM | YOUTUBE GAMING & TWITCH | GLOBAL | Q1 2018

YouTube GAMING

8.2%
Esports Hours (Q1 2018)

twitch

11.6%
Esports Hours (Q1 2018)

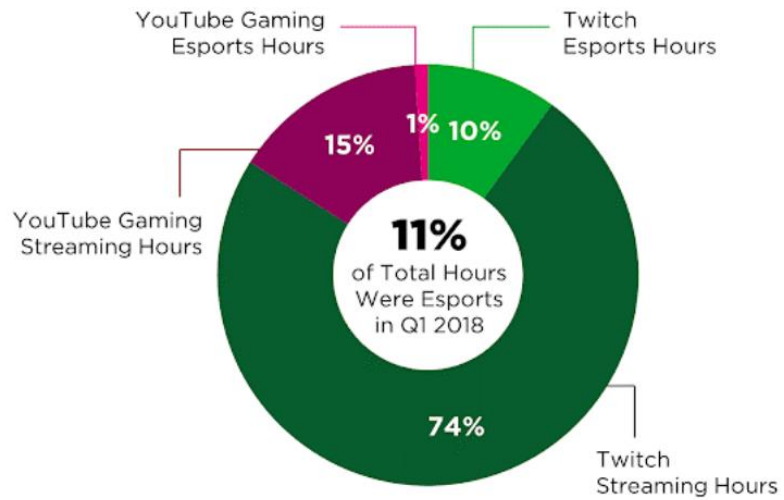
YouTube GAMING

32M
Total Esports Hours (Q1 2018)

twitch

228M
Total Esports Hours (Q1 2018)

SHARE OF HOURS | ESPORTS VS. STREAMERS



TOP FIVE ESPORTS BROADCASTERS | YOUTUBE GAMING & TWITCH

TOP ESPORTS BROADCASTERS	VIEWERSHIP HOURS
RIOT	22.1M
VIETNAM ESPORTS TV	3.2M
LIGAGAME ESPORTS	1.5M
ESL	1.0M
GARENA	0.9M

TOP ESPORTS BROADCASTERS	VIEWERSHIP HOURS
RIOT	42.4M
TURNER	38.9M
STARLADDER	27.0M
RUHUB	17.5M
ESL	17.4M

www.newzoo.com/game-streaming-tracker

Image: Newzoo's Game Streaming Tracker

The explosive growth of eSports | World Economic Forum (weforum.org) (MAR'25)