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Chapter 4

Standards Battles, Modularity, and Platform competition

Strategic Management of Technological Innovation, 7th Edition
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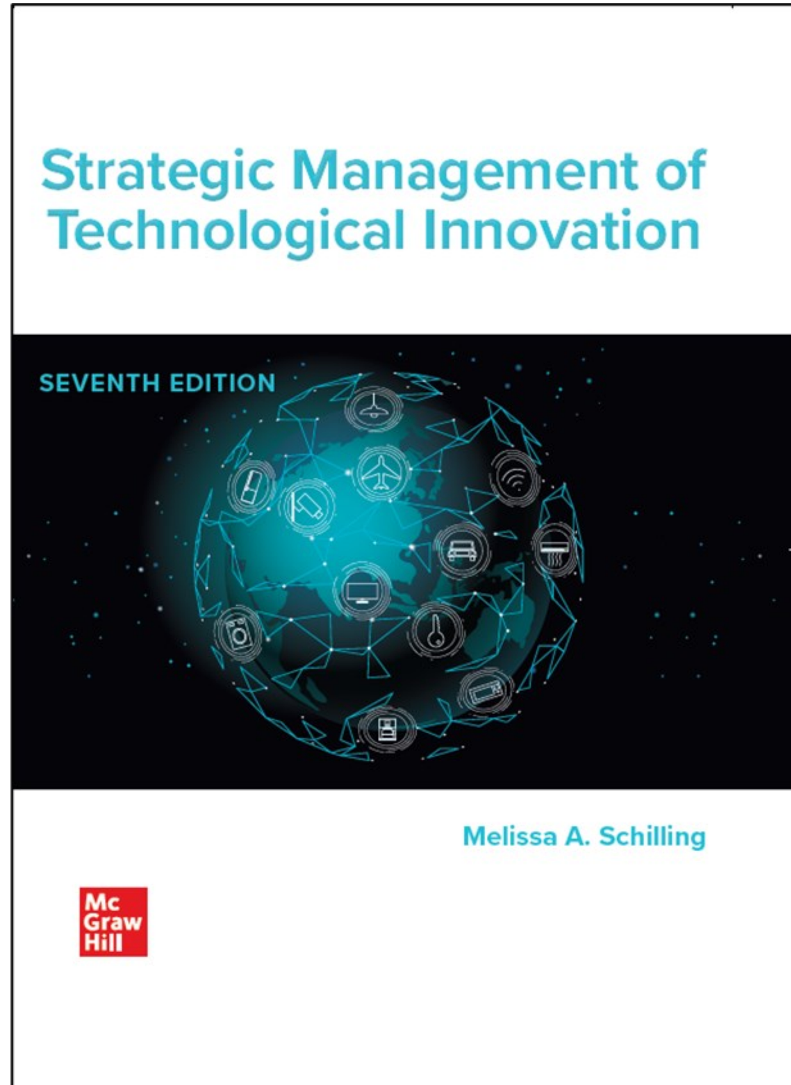


Netflix and the Battle of the Streaming Services [1]

By 2020, there were 1.1 billion subscribers to streaming services like Netflix, Hulu, Tencent Video, Disney, etc. Globally the overwhelming leader was Netflix with over 200 million subscribers in over 190 countries.

Streaming services could offer a much wider selection of content than physical stores, and offered additional services like reviews, recommender systems, movie trailers, etc.

By 2021, many streaming services were using their data on customer preferences to create original content tailored to particular market segments.

They also faced tough choices about making content exclusive: when companies made content exclusive to their channel, they were gambling that the boost in subscriptions would be worth more than wider distribution of that content – a tradeoff that was hard to calculate and predict.

Netflix and the Battle of the Streaming Services 2

Discussion Questions:

1. Based on your use of streaming services, do you feel the streaming platforms differ in terms of stand-alone value (For Example, fidelity, ease of use, recommender systems, etc.)?
2. Again based on your use, how do you feel the streaming services differ based on the types and quality of content they provide?
3. What factors do you think influence a consumer's choice of whether to subscribe to a streaming service? How important are the standalone features? How important is the content?
4. What are the pros and cons of having content be exclusive to a service?
5. Do you think the market will eventually choose a few services as "winners" and the other services will exit (or combine with the winners) or will the market continue to support many different services?

Overview

Many industries experience strong pressure to select a single (or few) dominant design(s).

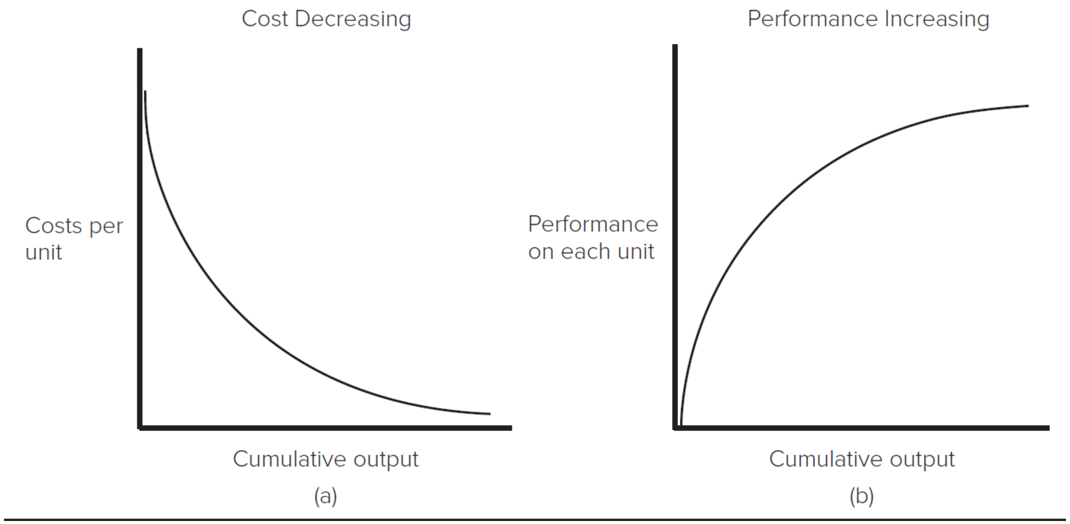
There are multiple dimensions shaping which technology rises to the position of the dominant design.

Firm strategies can influence several of these dimensions, enhancing the likelihood of their technologies rising to dominance.

Why Dominant Designs Are Selected 1

Increasing returns to adoption

- When a technology becomes more valuable the more it is adopted. Two primary sources are learning effects and network externalities.
- **The Learning Curve**: As a technology is used, producers learn to make it more efficient and effective.



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Why Dominant Designs Are Selected 2

Prior Learning and Absorptive Capacity

A firm's prior experience influences its ability to recognize and utilize new information.

- Use of a particular technology builds knowledge base about that technology.
- The knowledge base helps firms use and improve the technology.
  - Suggests that technologies adopted earlier than others are likely to become better developed, making it difficult for other technologies to catch up.

Why Dominant Designs Are Selected 3

Network Externalities

In markets with network externalities, the benefit from using a good increases with the number of other users of the same good.

Network externalities are common in industries that are physically networked.

- For example, railroads, telecommunications.

Network externalities also arise when compatibility or complementary goods are important.

- For example, Many people choose to use Windows in order to maximize the number of people their files are compatible with, and the range of software applications they can use.

Why Dominant Designs Are Selected 4

A technology with a large installed base attracts developers of complementary goods; a technology with a wide range of complementary goods attracts users, increasing the installed base. A self-reinforcing cycle ensues:

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Theory In Action

The Rise of Microsoft

- In 1980, Microsoft didn’t even have a personal computer (PC) operating system – the dominant operating system was CP/M.
- However, in IBM’s rush to bring a PC to market, they turned to Microsoft for an operating system and Microsoft produced a clone of CP/M called “MS DOS.”
- The success of the IBMPCs (and clones of IBMPCs) resulted in the rapid spread of MS DOS, and an even more rapid proliferation of software applications designed to run on MS DOS. Microsoft’s Windows was later bundled with (and eventually replaced) MS DOS.
- Had Gary Kildall signed with IBM, or had other companies not been able to clone the IBMPC, the software industry might look very different today!

Why Dominant Designs Are Selected 5

Government Regulation

Sometimes the consumer welfare benefits of having a single dominant design prompts government organizations to intervene, imposing a standard.

- For example, the NTSC color standard in television broadcasting in the U.S.; the general standard for mobile communications (GSM) in the European Union.

The Result: Winner-Take-All Markets

Natural monopolies.

- Firms supporting winning technologies earn huge rewards; others may be locked out.

Why Dominant Designs Are Selected 6

Increasing returns indicate that technology trajectories are characterized by *path dependency*:

- End results depend greatly on the events that took place leading up to the outcome.

A dominant design can have far-reaching influence; it shapes future technological inquiry in the area.

Winner-take-all markets can have very different competitive dynamics than other markets.

- *Technologically superior* products do not always win.
- Such markets require different firm strategies for success than markets with less pressure for a single dominant design.

Multiple Dimensions of Value 1

In many increasing returns industries, the value of a technology is strongly influenced by both:

- Technology’s Standalone Value.
- Network Externality Value.

A Technology’s Stand-alone Value.

- Includes such factors as:
  - The functions the technology enables customers to perform.
  - Its aesthetic qualities.
  - Its ease of use, etc.

Multiple Dimensions of Value [2]

Kim and Mauborgne developed a "Buyer Utility Map" that is useful for identifying elements of a technology's stand-alone value:

	Purchase	Delivery	Use	Supplements	Maintenance	Disposal
Customer productivity	Price of Prius slightly higher than comparable nonhybrid models		Offers speed and power comparable to nonhybrid models	Can stop less often for gas, saving money and time	NA	NA
Simplicity	Buyer may feel less able to assess value of vehicle	NA	Operates like a regular combustion engine vehicle	Refuels like a regular combustion engine vehicle	NA	Hybrids have larger batteries that would have to be recycled and disposed of at end of life

Source: Adapted from *Harvard Business Review.* Exhibit from "Knowing a Winning Business Idea When You See One," by W. C. Kim and R. Mauborgne, September– October 2000.

Multiple Dimensions of Value [3]

	Purchase	Delivery	Use	Supplements	Maintenance	Disposal
Convenience	NA	Will be sold through traditional dealer channels	Does not have to be plugged into electrical outlet	Can purchase fuel at regular gas stations	Maintenance is similar to regular combustion engine vehicle	NA
Risk	NA	NA	Buyer might face a higher risk of product failure because it embodies a new technology	NA	Buyer might have difficulty finding replacement parts because of new technology	Prius might be more difficult to resell or have lower resell value

Source: Adapted from *Harvard Business Review.* Exhibit from "Knowing a Winning Business Idea When You See One," by W. C. Kim and R. Mauborgne, September– October 2000.

Multiple Dimensions of Value 4

	Purchase	Delivery	Use	Supplements	Maintenance	Disposal
Fun and image	NA	Connotes image of environmental responsibility	NA	NA	NA	NA
Environmental friendliness	Buyers feel they are helping support the development of more environment ally friendly cars	NA	Emits lower levels of pollutants	Requires less use of fossil fuels	NA	NA

Source: Adapted from *Harvard Business Review.* Exhibit from “Knowing a Winning Business Idea When You See One,” by W. C. Kim and R. Mauborgne, September– October 2000.

Multiple Dimensions of Value 5

Network Externality Value

Includes the value created by:

- The size of the technology's installed base.
- The availability of complementary goods.

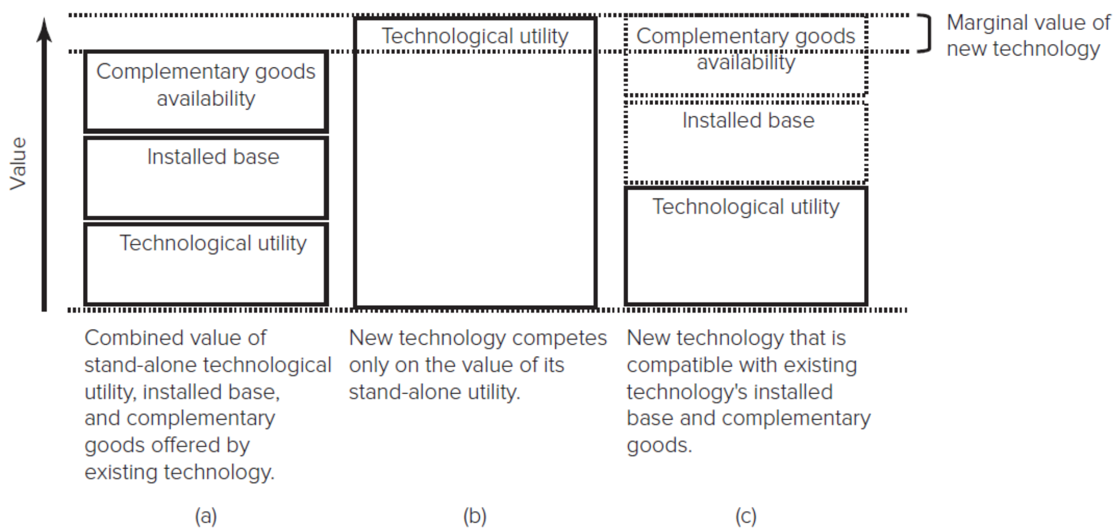
A new technology that has significantly more standalone functionality than the incumbent technology may offer less overall value because it has a smaller installed base or poor availability of complementary goods.

- For example, NeXT Computers were extremely advanced technologically, but could not compete with the installed base value and complementary good value of Windows-based personal computers.

Multiple Dimensions of Value 6

To successfully overthrow an existing dominant technology, new technology often must either offer:

- Dramatic technological improvement (for example, in videogame consoles, it has taken 3X performance of incumbent).
- Compatibility with existing installed base and complements.



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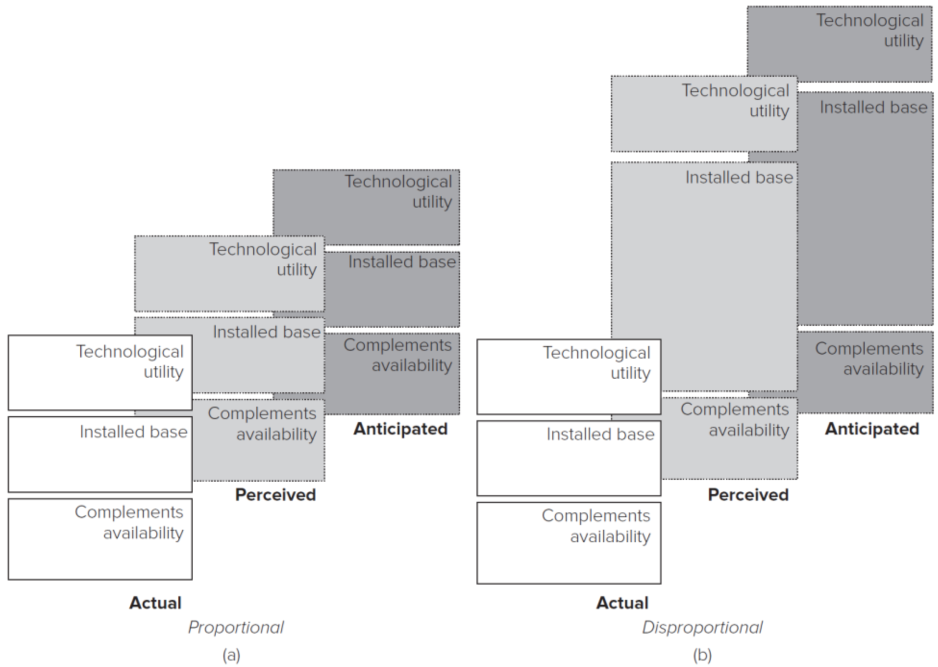
Multiple Dimensions of Value [7]

Subjective information (perceptions and expectations) can matter as much as objective information (actual numbers)

Value attributed to each dimension may be disproportional



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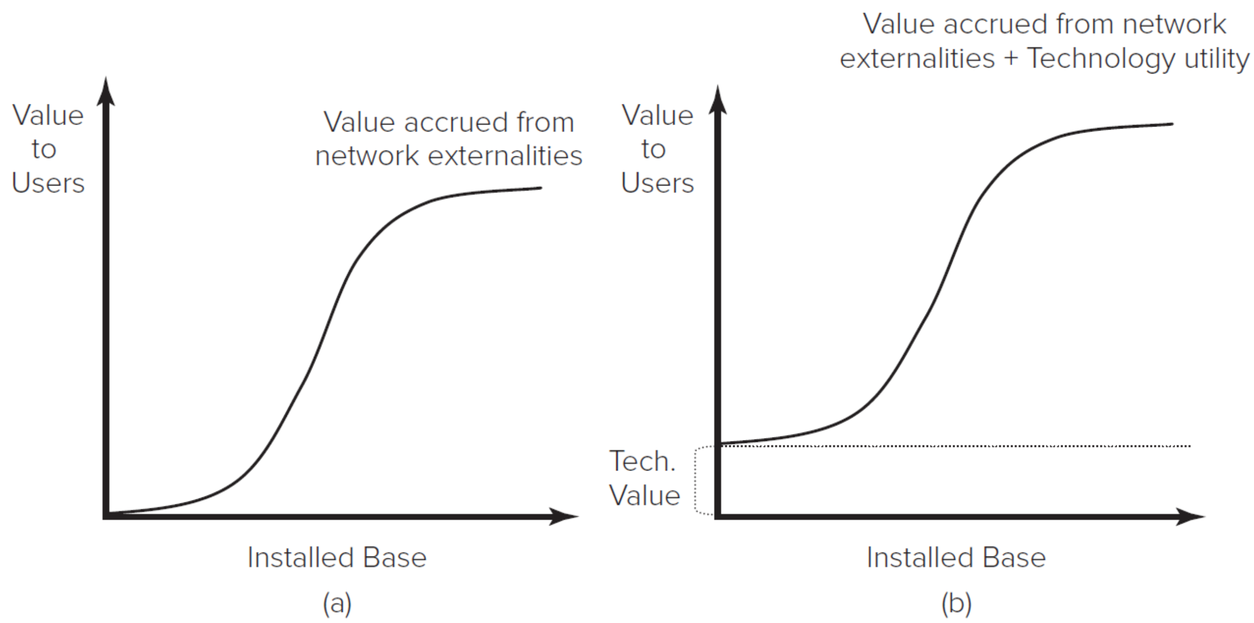
Multiple Dimensions of Value 8

Competing for Design Dominance in Markets with Network Externalities

- We can graph the value a technology offers in both standalone value and network externality value:



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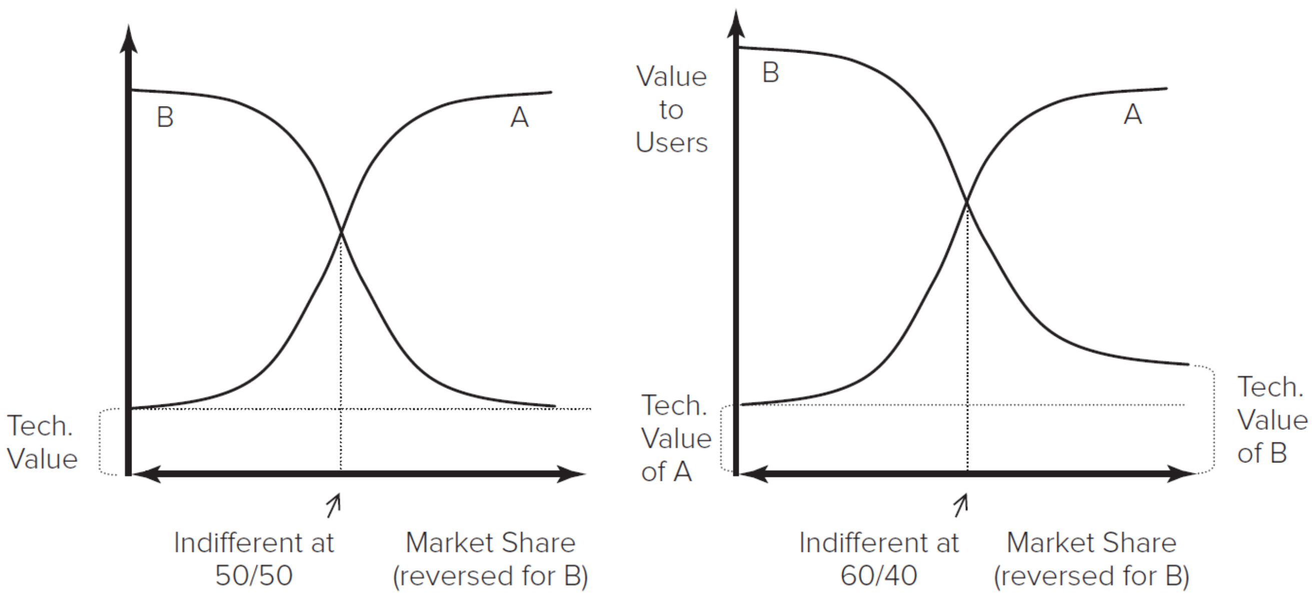
Multiple Dimensions of Value 9

We can compare the graphs of two competing technologies and identify cumulative market share levels (*installed base*) that determine which technology yields more value.



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Multiple Dimensions of Value [10]

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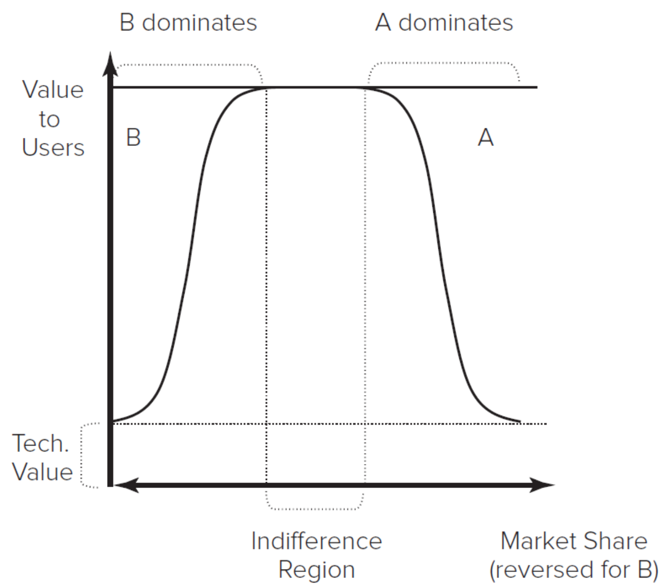

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Are Winner-Take-All Markets Good for Consumers? 1

Economics emphasizes the benefits of competition.

However, network externalities suggest users sometimes get more value when one technology dominates.

Should the government intervene when network externalities create a natural monopoly?

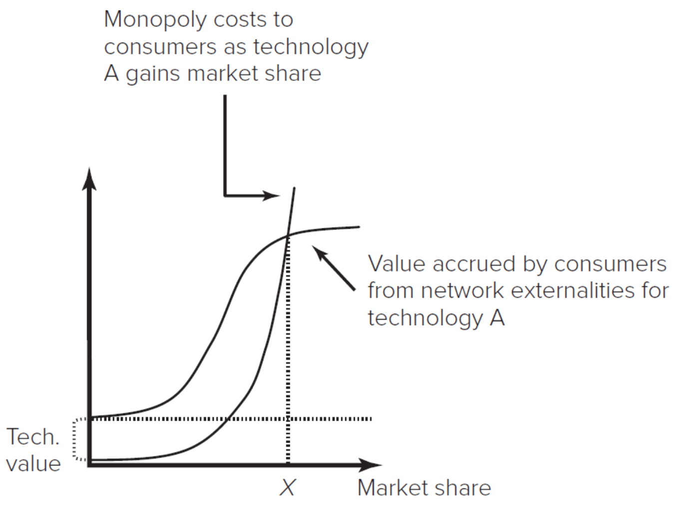
Are Winner-Take-All Markets Good for Consumers? 2

Network externality benefits to customers rise with cumulative market share

Potential for monopoly costs to customers (for example, price gouging, restricted product variety, etc.) also rise with cumulative market share.

Curve shapes are different; Network externality benefits likely to grow logistically, while potential monopoly costs likely to grow exponentially.

Where monopoly costs exceed network externality benefits, intervention may be warranted. Optimal market share is at point where lines cross.



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Modularity and Platform Competition 1

In some markets, industry players use modularity to create a platform ecosystem where many different firms contribute to the product system.

Modular systems are those that can be separated and recombined to change their configuration, scale, or functions.

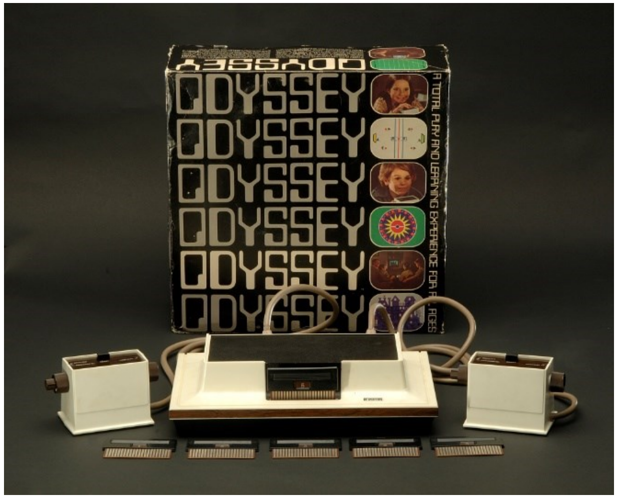
- Standardized interfaces ensure that components are compatible.
- In some product systems modularity enables components from different producers to be recombined (for example, smartphones with different apps); in others only components from a single firm are recombined (for example, Ikea shelving systems).

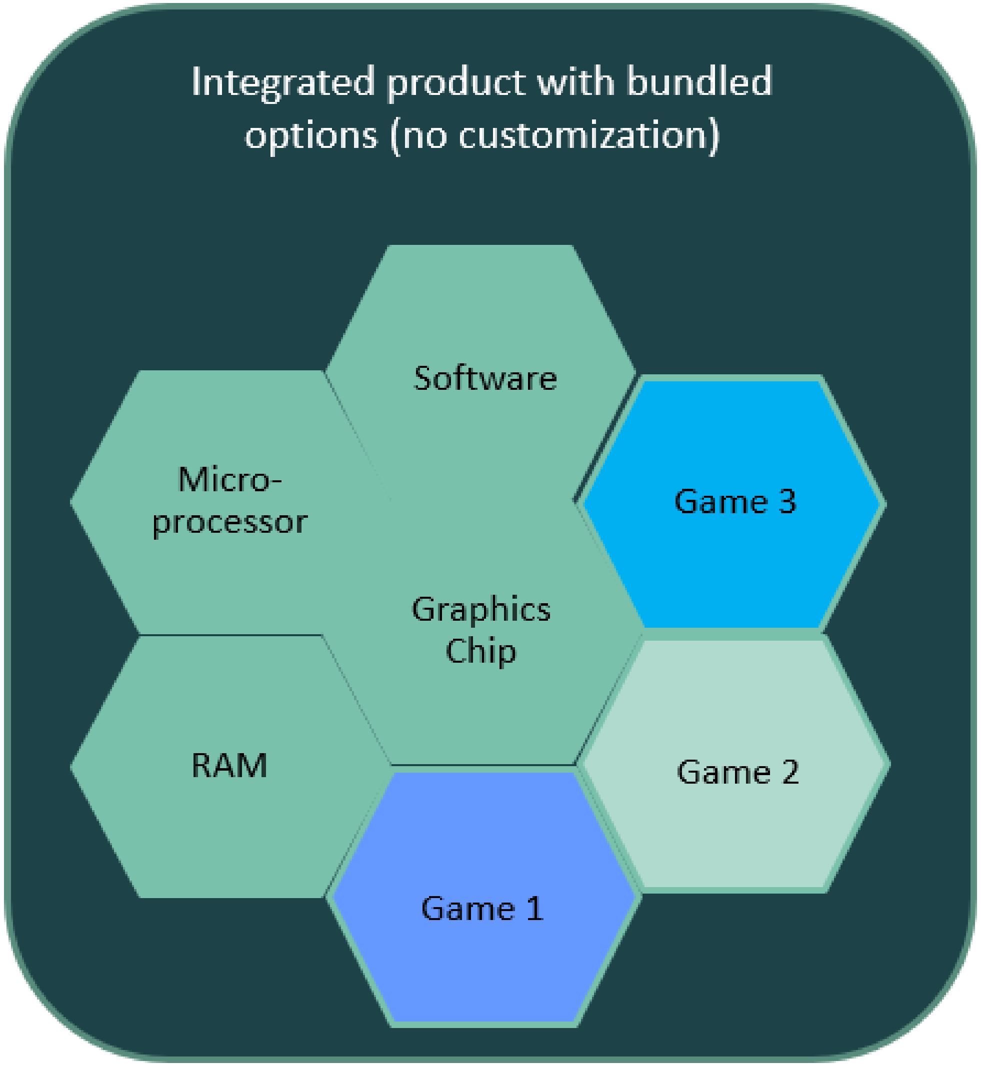
Modularity is more valuable when there are a) diverse technological options that can be recombined, and b) customers have heterogeneous preferences.

Modularity and Platform Competition 2

Traditional integrated product bundle:

- Provider tries to meet buyers needs itself.
- No customization, no external compatibility.





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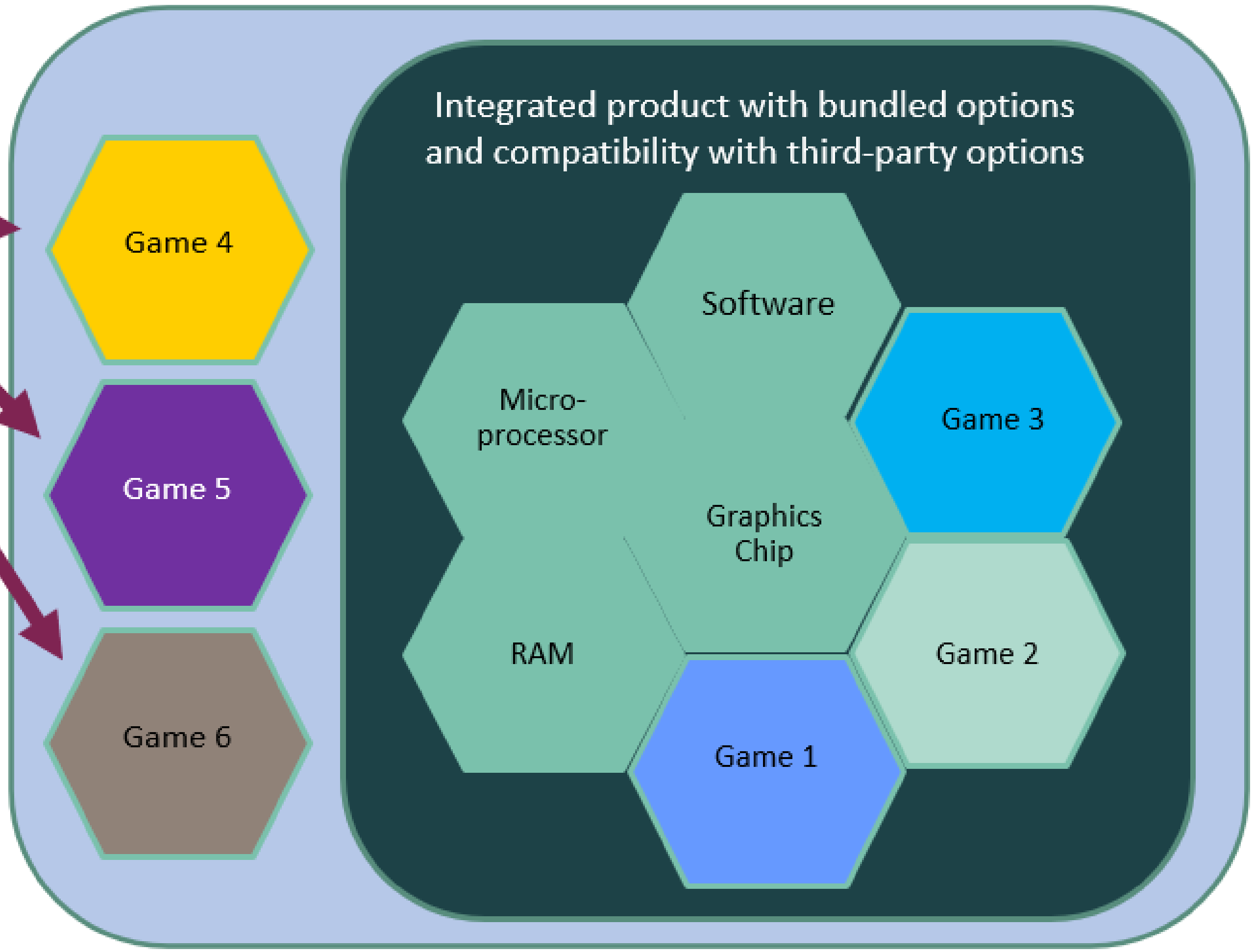
Modularity and Platform Competition 3

Compatibility with third-party options expands choice for buyer



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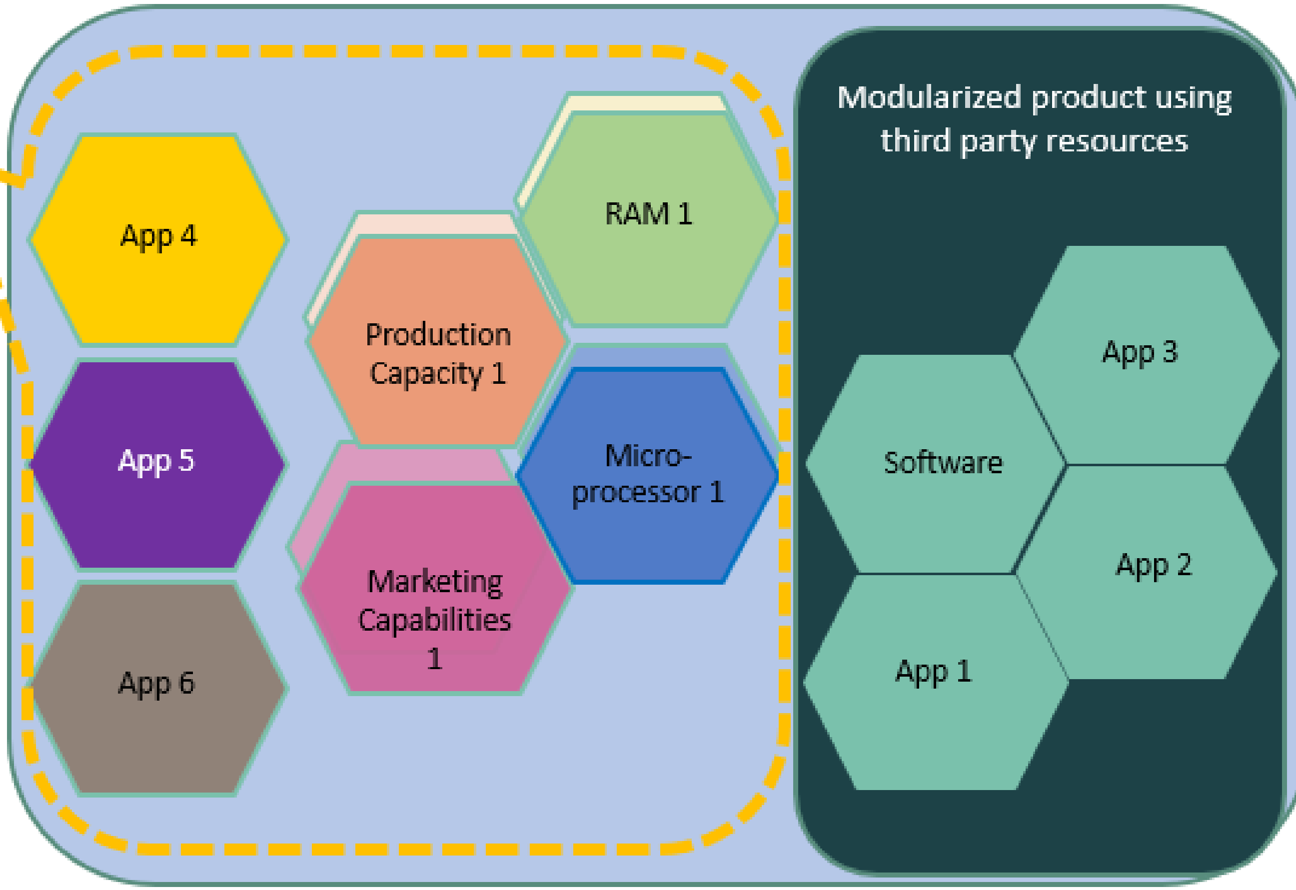
Modularity and Platform Competition 4

Complementary resources in the ecosystem enable even more configuration options



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Platform Ecosystems

In a platform ecosystem, some core part of a product (such as a video game console) mediates the relationship between a wide range of other components or complements (for example, video games, peripherals) and prospective end-users.

- A platform's boundaries can be well-defined with a stable set of members or amorphous and changing.
- The success of all members of the ecosystem depends in part upon the success of other members.
- Members often invest in co-specialization or exclusivity agreements.

Platform ecosystems strike a balance between pure modularity and pure integration

Pure Modularity

Combinations take place in the market – no co-specialization

Choice and reconfigurability Competition incentivizes firms to increase quality and decrease price

Quality and compatibility is uncertain (can be hard for customer)

Platforms

Components not owned, but *curated*.

Choice and reconfigurability, but shepherded by platform sponsor

Competition still incentivizes

Producer exerts some control over quality and compatibility

Pure Integration

Combination pre-determined by firm (no reconfiguration)

Captive supply (no competition)

High co-specialization ensures components optimized to work together

Producer controls quality and compatibility

Discussion Questions

1. What are some of the sources of increasing returns to adoption?
2. What are some examples of industries not mentioned in the chapter that demonstrate increasing returns to adoption?
3. What are some of the ways a firm can try to increase the overall value of its technology, and its likelihood of becoming the dominant design?
4. What determines whether an industry is likely to have one or a few dominant designs?
5. Are dominant designs good for consumers? Competitors? Complementors? Suppliers?
6. In what kinds of industries will platform ecosystems be more valuable than pure modularity or integrated hierarchies?

Supplemental Video

Two short videos on

Innovation Strategy: Network Externalities

https://youtu.be/CIp7TR2R4gg

Innovation Strategy: Platform Ecosystems

https://youtu.be/J0kdOIqgF6E

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