ISYS2160
Information Systems in Internet Age

Lecture 5:

Information Systems for Competitive Advantage

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Week 2-4

- Internet and E-Commerce (week 2)
  - B2C
  - B2B
- M-commerce applications (week 3)
  - Mobile computing
  - Electronic payment mechanisms
  - Combining online and offline
- Digital Marketing (week 4)

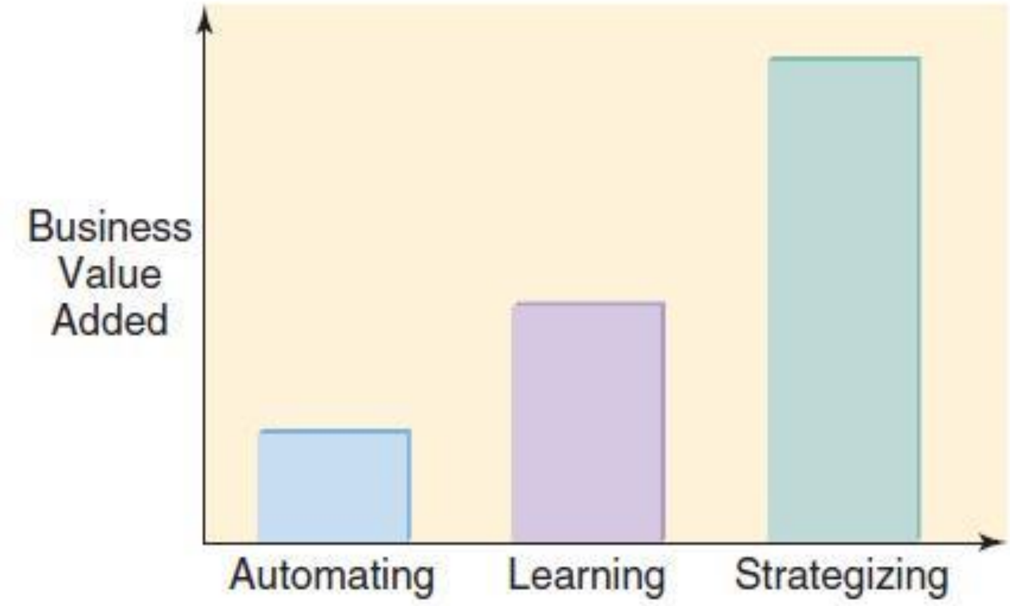
Lecture Outlines

- Describe how to use Porter's Five Forces Model to evaluate the relative attractiveness of an industry
- Describe the role of value-chain model for identifying value-added and -reducing processes
- Describe the strategies that organizations typically adopt to counter the competitive forces
- Understand the innovator's dilemma and the reason why new technologies cause great firms to fail
- Understand the benefits and limitations of different technology strategies adopted by an organization

Valuing Information Systems

Information systems can be used in three ways to add value to an organization:

1. **Automating**
   – Task can be completed faster, cheaper, more accurately, with greater consistency
2. **Learning**
   – Learn about processes
   – Improve processes
3. **Strategizing**
   – Enable firm to gain or sustain **competitive advantage**



Competitive Advantage

- Competitive Advantage
  - An edge over rivals in attracting customers and defending against competitive forces
  - An advantage over competitors in some measure such as cost, quality, or speed; leads to control of a market and to larger-than-average profits
- Competitive Necessity
  - Something the organization must do in order to survive

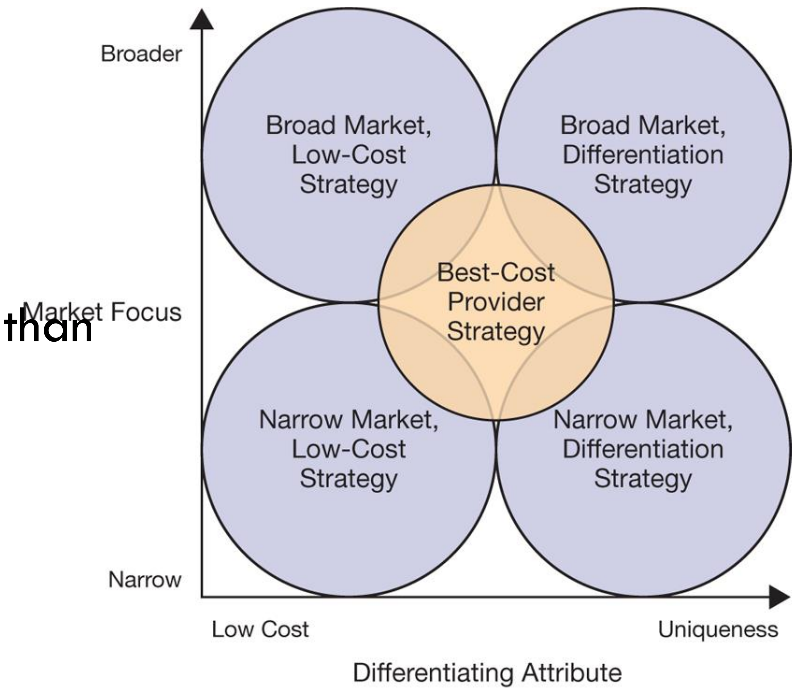
Pursuit of Competitive Advantage

Pursuit of Competitive Advantage

- Best-made product
- Superior customer service
- Lower costs than rivals
- Proprietary manufacturing technology
- Shorter development/test lead times
- Well-known brand name
- More value for the money

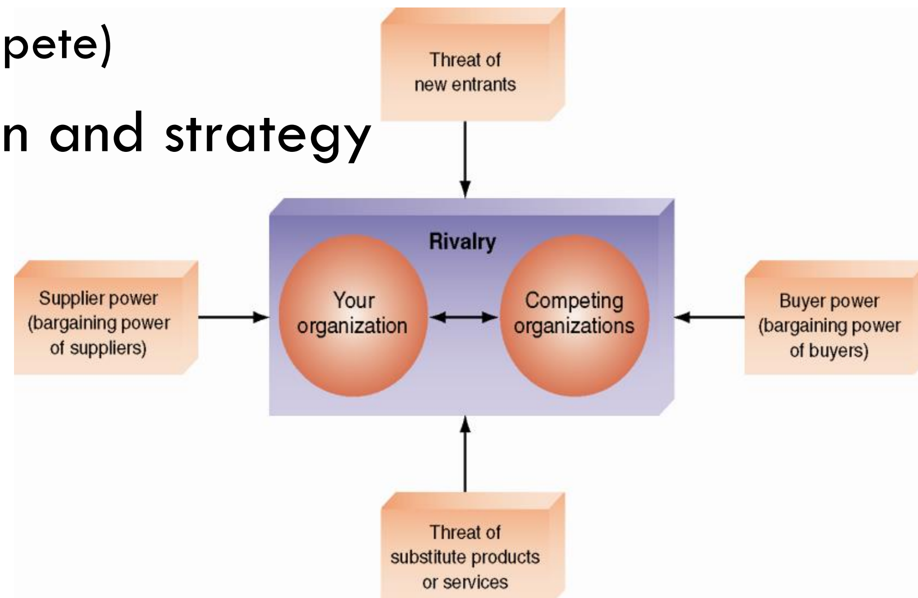
Five General Organizational (Competitive) Strategies

- Cost Leadership
  - Offer the best prices on goods and/or services
- Differentiation
  - Provide better products and/or services than competitors
- Broad Market
  - Aim broadly at many different types of customers
- Niche Market
  - Focus on a particular segment of consumers
- Best-Cost Provider
  - Offer products or services of reasonably good quality at competitive prices



Porter's Five Forces Model

- Industry Analysis
  - Analyze the competitiveness and profitability of an industry
  - Strategy formulation (where to compete)
- Five forces that shape competition and strategy
  1. Threat of new entrants
  2. Bargaining power of suppliers
  3. Bargaining power of buyers
  4. Threat of substitutes
  5. Rivalry among existing competitors



- Aware of the five forces can help a company understand the structure of its industry and stake out a position that is more profitable and less vulnerable to attack

Threat of New Entrants

– Depends on
  – **Barriers to entry**
    - Advantages that incumbents have relative to new entrants
  – **Expected retaliation**
    - How potential entrants believe incumbents may react

Threat of New Entrants - Barriers to Entry

- Supply-side economies of scale
  - Arise when firms that produce at larger volumes enjoy lower costs per unit because they can spread fixed costs over more units, employ more efficient technology, or command better terms from suppliers
  - E.g., Intel in research, chip fabrication, consumer marketing
- Network effects (Demand-side economies of scale)
  - A buyer's willingness to pay for a company's product increases with the number of other buyers who also patronize the company
  - E.g., eBay in online auction
- Customer switching costs
  - Fixed costs that buyers face when they change suppliers
  - E.g., costs of moving to a new Enterprise Resource Planning (ERP) software vendor because of embedded data, adapted internal processes, etc.

Threat of New Entrants - Barriers to Entry

- Capital requirements
  - Financial resources needed to invest in order to compete
  - E.g., fixed facilities, customer credit extended, inventories, start-up losses
- Incumbency advantages independent of size
  - Cost or quality advantages not available to potential rivals
  - E.g., propriety technology, raw material sources, geographic locations, brand identities, cumulative experience to efficient production
- Unequal access to distribution channels
  - Sometimes so high a barrier that new entrants must bypass distribution channels altogether or create their own
  - E.g., competing for space on a grocery store shelf for food companies
- Restrictive government policy
  - E.g., licensing requirements, restrictions on foreign investment

Threat of New Entrants - Expected Retaliation

- Newcomers are likely to fear expected retaliation if
  - Incumbents have previously responded vigorously to new entrants
  - Incumbents possess substantial resources to fight back
    - E.g., excess cash and unused borrowing power, available productive capacity, or clout with distribution channels and customers
  - Incumbents seem likely to cut prices because
    - they are committed to retaining market share at all costs
    - the industry has high fixed costs, which create a strong motivation to drop prices to fill excess capacity
  - Industry growth is slow so newcomers gain volume only by taking it from incumbents

Power of Suppliers

- A supplier group is powerful if
  - It is more concentrated than the industry it sells to
    - E.g., Microsoft's near monopoly in operating systems, coupled with the fragmentation of PC assemblers
  - It does not depends heavily on the industry for its revenues
  - Industry participants face switching costs in changing suppliers
    - E.g., Bloomberg terminals used by financial professional
  - Suppliers offer products that are differentiated
    - E.g., Patented drugs by pharmaceutical companies
  - No substitute for what the supplier group provides
    - E.g., pilot unions
  - It can credibly threaten to integrate forward into the industry

Power of Buyers

- High if a customer group has negotiating leverage
  - There are few buyers, or each one purchases in large volumes
  - Products are standardized or undifferentiated
  - Buyers face few switching costs in changing vendors
  - Buyers can credibly threaten to integrate backward if the vendors are too profitable
- High if a buyer group is price sensitive
  - The product it purchases from the industry represents a significant fraction of its cost structure or procurement budget
  - The buyer group earns low profits, is strapped for cash, or is otherwise under pressure to trim its purchasing costs
  - The quality of buyers' products or services is little affected by the industry's product
  - The industry's product has little effect on the buyer's other costs

Threat of Substitutes

- A substitute performs the same or a similar function by different means
- May appear to be very different from the industry's product
  - Technological changes in seemingly unrelated businesses can have a major impact on industry profitability
- The threat of substitute is high if:
  - It offers an attractive price-performance trade-off to the industry's product
  - Buyer's cost of switching is low

Rivalry Among Existing Competitors

- Rivalry takes many different forms:
  - Price discount
  - New product introduction
  - Advertising
  - Service improvement
- Impact of rivalry on profitability depends on
  - Intensity with which companies compete
    - If no industry leader, slow growth, rival commitment to a business, exit barriers are high
  - Basis (dimensions) on which they compete
    - If rivals compete on the same dimensions

Porter's Five Forces Model

– Exercise

– Airline Industry Analysis- Australian Market for Qantas Airlines

Potential New Entrants

Bargaining Power of Suppliers

QANTAS

Bargaining power of Buyers

Substitute Products and Services

Impact of Internet on industry structures

– Read the article before next week's tutorial

Porter, M. E. (2001). Strategy and the Internet. Harvard Business Review, 79(3), 62-78.

Discuss how Internet influences the five forces

Use of IS to Combat Competitive Forces

Competitive Force	Implication for Firm	Potential Use of Information Systems
Rivals within your industry	Competition in price, product distribution, and service	Reduce costs, use the Internet to increase service
New entrants	Reduced prices and market share	Inventory control to manage excess capacity, Internet to differentiate products
Customers' bargaining power	Reduced prices, demand for better quality and service	CRM to improve service, CAD/CAM
Suppliers' bargaining power	Increased costs and reduced quality	Use internet to work with new distant suppliers
Threat of substitute products	Decreased market share, customer loss	Better assess customer needs, use CAD to design better products

Porter's Value Chain Model

- Firm Analysis
  - Analyzes the activities of a firm and identify how information systems can be used to develop a competitive advantage
  - Strategy execution (how to compete)
- Value Chain
  - A sequence of activities (processes) through which the organization's inputs are transformed into more valuable outputs
  - **Value:** the amount that buyers are willing to pay for what a firm provides them
    - The difference between the value that an activity generates and the cost of the activity is called the **margin**
  - Primary activities: Related to the production and distribution of the firm's products and services
  - Support activities
    - Do not add value directly to the firm's products or services
    - Contribute to the firm's competitive advantage by supporting the primary activities

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Porter's Value Chain Model

SUPPORT ACTIVITIES

Administration and management	Legal, accounting, finance management	Electronic scheduling and message systems; collaborative workflow intranet
Human resource management	Personnel, recruiting, training, career development	Workforce planning systems; employee benefits intranet
Product and technology development	Product and process design, production engineering, research and development	Computer-aided design systems; product development extranet with partners
Procurement	Supplier management, funding, subcontracting, specification	E-commerce Web portal for suppliers

PRIMARY ACTIVITIES

Inbound logistics	Operations	Outbound logistics	Marketing and sales	Customer service
Quality control; receiving; raw materials control; supply schedules	Manufacturing; packaging; production control; quality control; maintenance	Finishing goods; order handling; dispatch; delivery; invoicing	Customer management; order taking; promotion; sales analysis; market research	Warranty; maintenance; education and training; upgrades
Automated warehousing systems	Computer-controlled machining systems; computer-aided flexible manufacturing	Automated shipment scheduling systems; online point of sale and order processing	Computerized ordering systems; targeted marketing	Customer relationship management systems

FIRM ADDS VALUE

IS and the Value Chain

- The value chain provides a useful framework to perform high-level analysis of a firm from the perspective of competitive strategy

- Draw a generic value chain for the firm and identify individual activities that add value
- Evaluate the contribution of each activity to the value of the product/service
  - Can IT/IS be used to add value?
  - IS can be used to revamp the value chain
    - Reengineer core business processes, e.g., digitize the product or process, bypass the middleman
    - Concentrate on core competencies by forging alliances with partners, e.g., use FedEx for transport

Innovation as a Strategy is Difficult

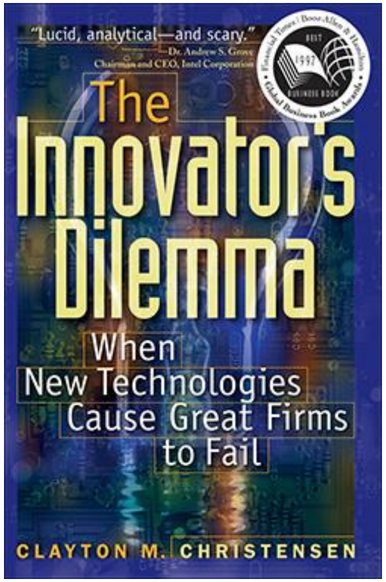
- Successful innovation is difficult
  - Innovation is often fleeting
    - The pace of change is fast
    - Smart rivals quickly adopt any advantage
  - Innovation is often risky
    - Competing technologies result in a winner and a looser (e.g. Blu-Ray and HD DVD)
  - Innovation choices are often difficult
    - It is impossible to pursue all opportunities
    - It is hard to predict which opportunities will lead to success
- Many innovations deliver non-sustainable competitive advantages and become competitive necessities

Example: Digital Equipment Corporation

- 1970s
  - Focused on midrange computers to serve the needs of high- and mid-performance users
  - Microcomputers deemed by the company and its customers as toys
- 1980s
  - Microcomputers developed in the 1970's had the capabilities and price for users in the low-performance category of the marketplace
  - Ignored by DEC and other established players in the industry
- 1990s
  - Microcomputers improved and met the needs of mid-performance range of the marketplace
  - DEC lost its biggest market segment
  - Sold to Compaq in 1998 (Compaq was acquired by HP in 2002)

The Innovator's Dilemma

- How disruptive innovations, typically ignored by established market leaders, cause these established firms to lose market dominance, often leading to failure
  - Blindly following the maxim that good managers should keep close to their customers can sometimes be a fatal mistake
- Sustaining Innovations
  - New technologies, products, or services that sustain or reinforce established trajectories of product performance improvement
    - Improve in incremental ways that the markets expect
    - Do not create new markets and value networks
- Disruptive Innovations
  - New technologies, products, or services that redefine performance trajectories
    - Improve in different ways that markets do not expect
    - Underperform in the existing markets
    - Create new markets and value networks
    - Eventually disrupt the existing markets and value networks



Examples of Disruptive Innovations

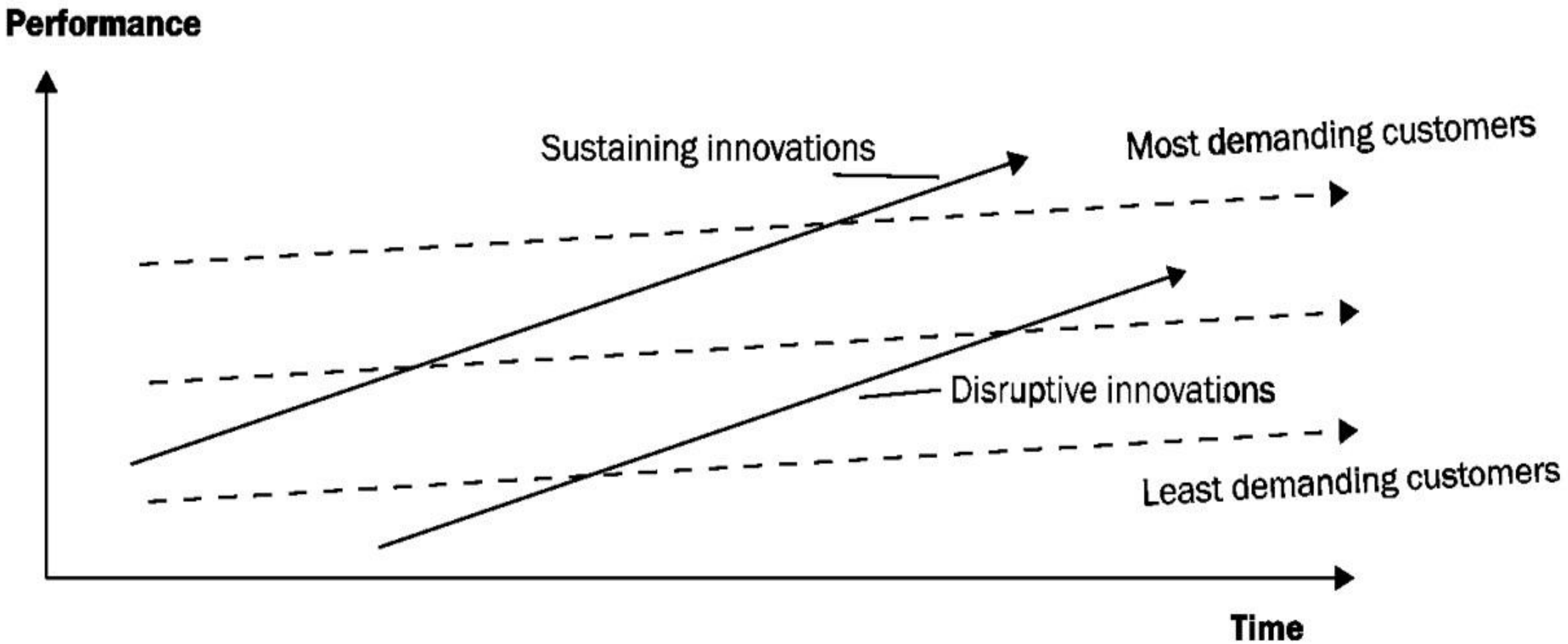
Disruptive Innovation	Displaced or Marginalized Technology
Digital photography	Chemical photography
Online stock brokerage	Full-service stock brokerages
Online retailing	Brick-and-mortar retailing
Distance education	Classroom education
Unmanned aircraft	Manned aircraft
Semiconductors	Vacuum tubes
MP3 players and music downloading	Compact discs and music stores
Smartphones	MP3 players, dedicated GPS navigation
Tablets	Notebook computers

Theory of Disruptive Innovation

- Trajectories of Market Need
  - Within every market, there are customers who have relatively high, moderate, or low performance requirements
- Trajectories of Performance Improvement
  - Technological improvement often outpaces what the market requires
- As disruptive innovations and incremental improvements are introduced, product capabilities improve in all segments
  - As product capabilities improve at the high-performance end of the market, the number of potential customers for these products gets relatively smaller
  - As the low-end products also improve, they are increasingly able to capture more and more of the mainstream marketplace

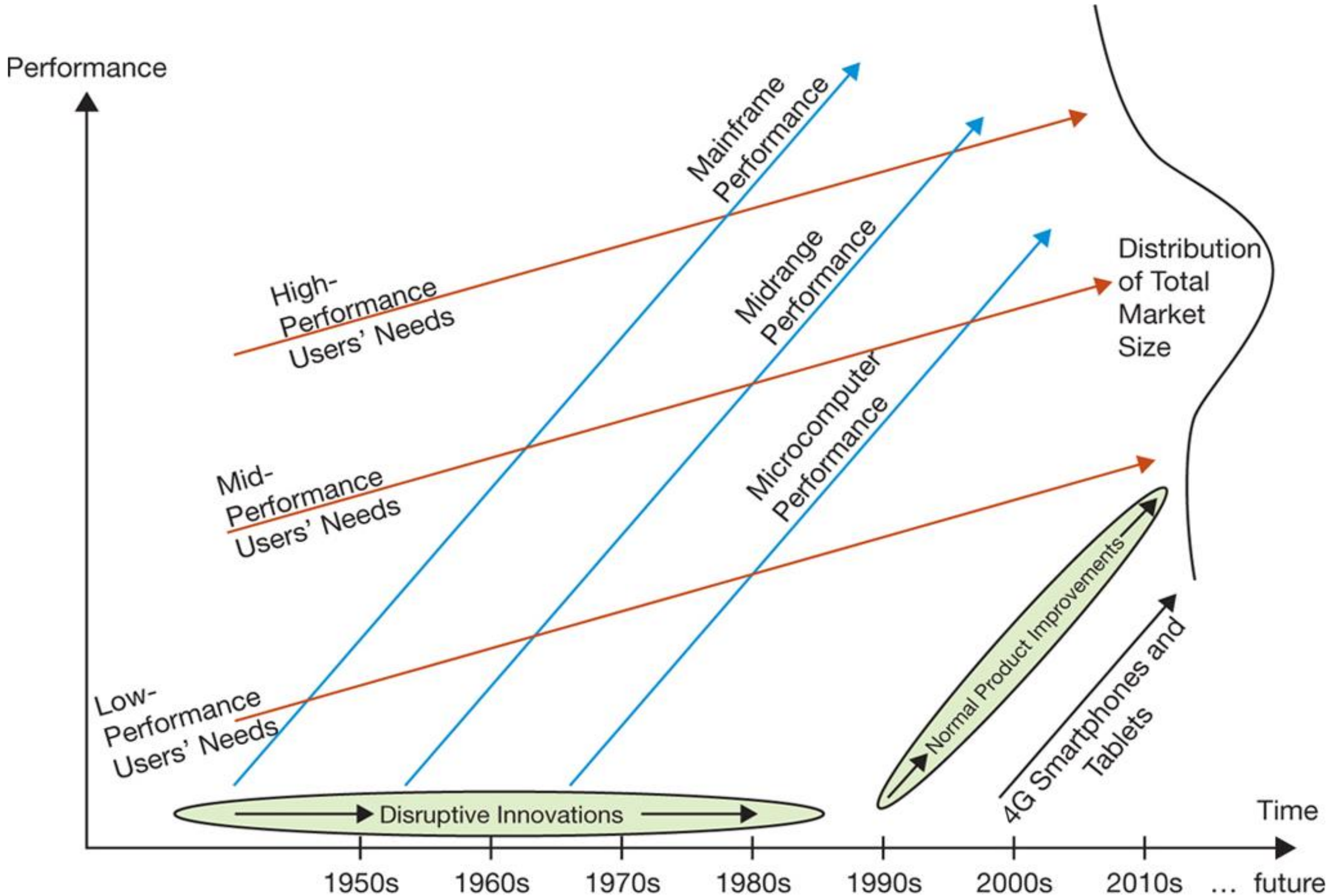
Theory of Disruptive Innovation

EXHIBIT 1
The Theory Of Disruptive Innovation

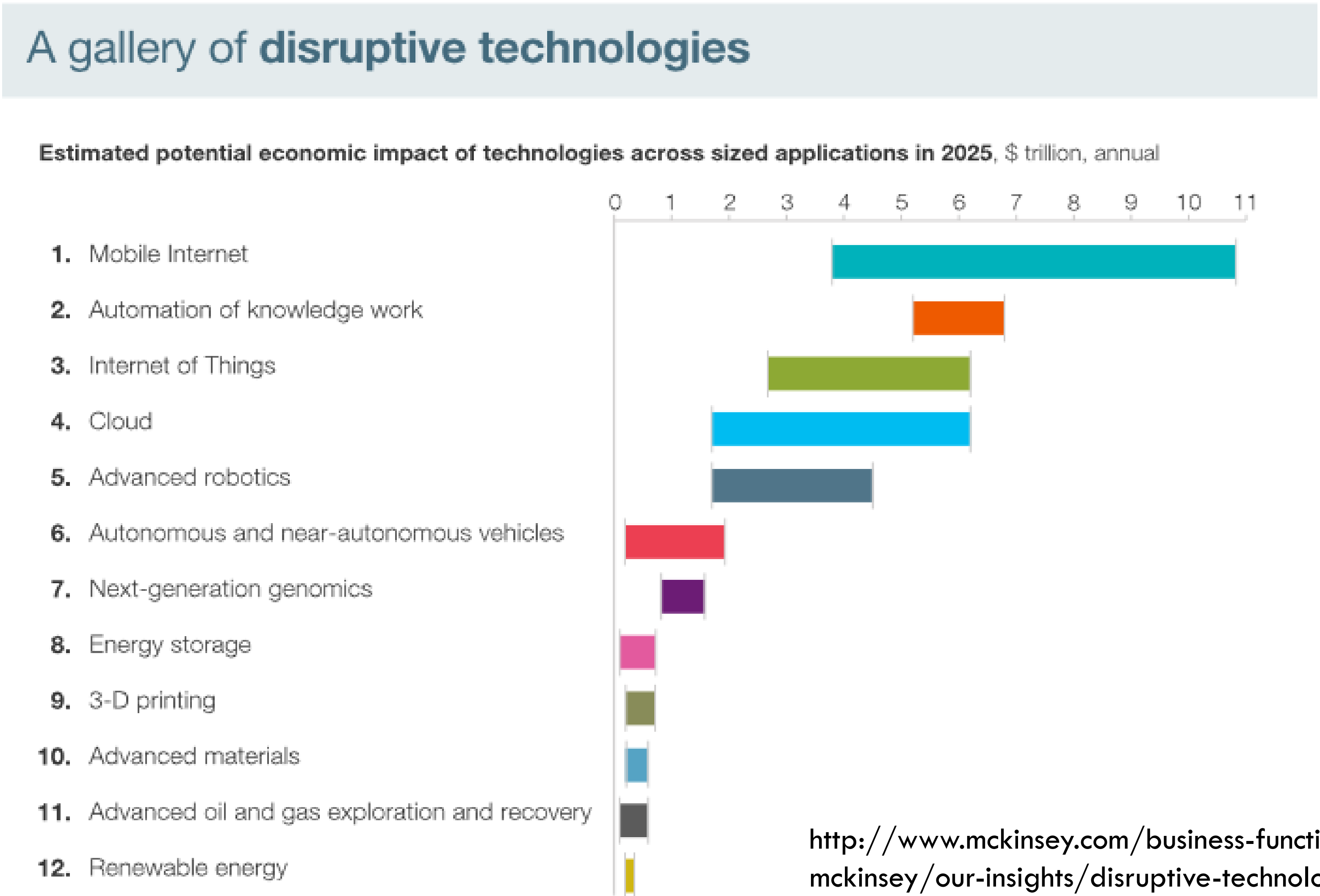


SOURCE: C.M. Christensen, *The Innovator's Dilemma: When New Technologies Cause Great Firms to Fail* (Boston: Harvard Business School Press, 1997).

Theory of Disruptive Innovation



The Next Disruptive Innovation?



http://www.mckinsey.com/business-functions/digital-mckinsey/our-insights/disruptive-technologies

R&D/Technology Strategy

- **Technological leader**
  - Pioneering an innovation
  - Firm seeks to be the first to introduce technological changes
- **Technological follower**
  - Imitating the products of competitors
  - Firm chooses not to be first in innovations
- Decision to become a technological leader or follower can be a way of achieving firm's generic strategy

Porter, M. E. (1985). Technology and competitive advantage. *Journal of business strategy*, *5*(3), 60-78.

R&D/Technology Strategy

	Technological Leadership	Technological Followership
Cost		
Differentiation		

Porter, M. E. (1985). Technology and competitive advantage. *Journal of business strategy*, *5*(3), 60-78.

R&D/Technology Strategy

Technological Leadership is Favored If …

- Technological lead can be sustained
  - Competitors cannot duplicate the technology
  - Competitors cannot catch up with the firm’s rate of innovation
- First-mover advantages are significant
  - Reputation
  - Preempting a positioning
  - Exploiting buyer’s switching cost

First-Mover Disadvantages?

- ❑ Pioneering costs.
- ❑ Demand uncertainty
- ❑ Low-cost imitation.

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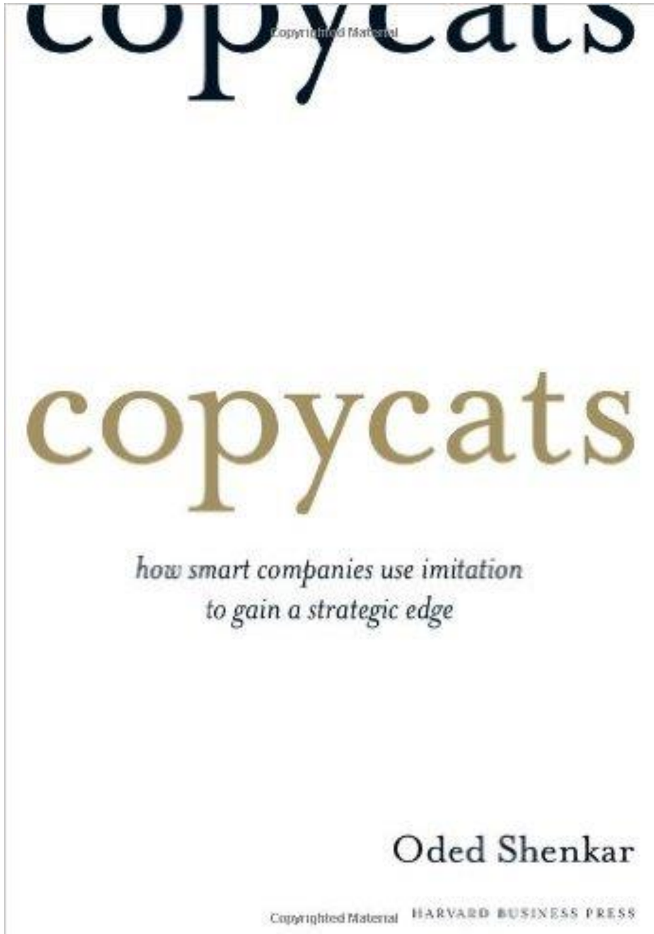
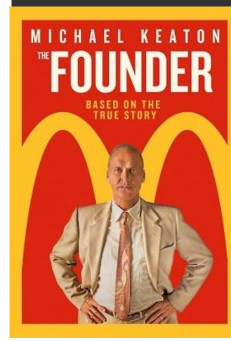
R&D/Technology Strategy





Imitation With Innovation Reduces Risk in Startups

What are the benefits of being a "copycat"?

- Avoid initial major R&D cost
- Learn from competitors and early adopters.
- Easier to find investors.
- Imitation drives progress.
- Try a new country or market

Reference

– Porter, M.E. (January 2008) The Five Competitive Forces That Shape Strategy, Harvard business Review.
  – Search article title in http://web.a.ebscohost.com.ezproxy1.library.usyd.edu.au/ehost/search/basic?sid=1e0754bd-a349-4048-8289-cde4a2fb895e%40sessionmgr4003&vid=1&hid=4114

** Complete the mid-semester feedback survey by 7th of Sep. (available on Canvas)