Experiencing MIS

Fifth Canadian Edition

Chapter 3

Productivity, Innovation, and Strategy

Q3-1: Why Should I Care About Productivity and Innovation? (1 of 2)

- labour productivity = ratio of gross domestic product (GDP) of a country divided by the total paid hours worked by people in the country
- primary indicator of our per capita income, and increases are the best measure of Canada's growth (Conference Board of Canada)
- Canada has **not** increased its productivity
- As of 2014, Canada's labour productivity was $50 per hour ($67/h in U.S., $75/h in Norway)

Q3-1: Why Should I Care About Productivity and Innovation? (2 of 2)

- to increase productivity, countries must innovate and adapt
- Canada also needs to open to more competition and increase machinery and equipment in the economy
- Computers have so far **not** impacted productivity of economies

Productivity Paradox

- In 1989, economist Stephen Roach predicted there would be no increase in labour productivity associated with increase in IT investment
- “We see computers everywhere except in the productivity statistics.”
- The **Productivity Paradox** was born
- Over time, measurement error may be affecting observed lack of productivity increase from IT investments.
  - Increasingly service-based economy
  - Intangible benefits associated with IT

How Can IT Create Business Value (1 of 4)

- **Productivity** – IT allows a company to
  - make more output from the same inputs,
  - and/or
  - better output,
  - and/or
  - make the output faster than before the technology

How Can IT Create Business Value (2 of 4)

- **Structure of competition** – IT can alter the way corporations compete.
  - Competitive structure changes because of IT to include software and tech support
  - Example: video rental industry
    - Move to stream, rent, and watch movies online eliminated need to go to store, and ended problems of blockbusters being unavailable, late fees, damaged merchandise, and others
    - The structure of competition had been altered by technological advancement

How Can IT Create Business Value (3 of 4)

- **Benefits to the End customer** – IT helps make processes more efficient and changes the nature of the competition.
  - Consumer may see cheaper and better goods and services.
  - Example: Netflix can use analytics to recommend additional movies based on your viewing history
  - Consumer benefits from the higher investment in IT

How Can IT Create Business Value (4 of 4)

- Not all agree on how productive IT investments are
- Some feel need to upgrade to “keep up”, even if no benefit
  - “Technology for technology’s sake”
  - **“tech for tech’s sake” Does Not Work**
- Organizations must understand if value will result from investment
  - Requires knowledge of both IT and business: Business Technology Management

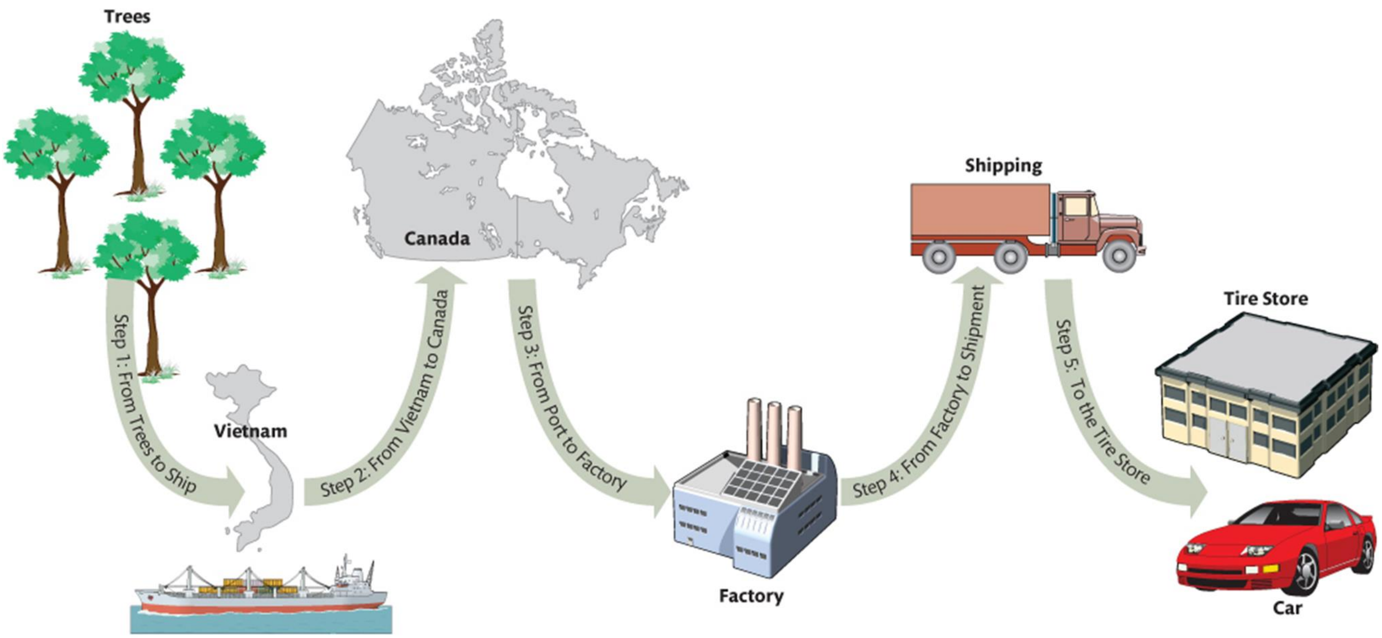
Q3-3: How Do Information Systems Improve Productivity?

- Productivity can be increased through efficiencies or effective processes
- **Increasing efficiency**
  - business processes can be accomplished either more quickly or with fewer resources and facilities (or both)
  - "doing things right"
- **Increased effectiveness**
  - company considers offering either new or improved goods or services that the customer values
  - "doing the right things"

Business Processes and Value Chains

- A **value chain** is a network of value-creating activities
  - Primary activities
  - Support activities
- Made up of at least one and often many business processes
- Each step in the chain adds some value to the product/service.

Figure 3-1
Example of Business Processes



Primary Activities (1 of 2)

- Primary activities are activities in which value is added directly to the product
- Primary activities include the following (five):
  1. Inbound logistics
  2. Operations
  3. Outbound logistics
  4. Marketing and sales
  5. Service
- Stages accumulate costs and add value to product
  - Net result is **total margin of chain**

Primary Activities (2 of 2)

- **Inbound logistics**: Receiving and storing inventory
- **Operations**: Using inputs to create or generate the final product
- **Outbound logistics**: Retrieving and distributing the product or service to the customers
- **Marketing and sales**: Convincing the customer and enabling purchase of the good or service
- **Service**: Supporting the customers' use of the product or service

Support Activities (1 of 3)

- Range of activities that **do not add** value directly to the product
- Support the primary activities
- Include:
  - Firm infrastructure
  - Human resources
  - Technological development
  - Procurement

Support Activities (2 of 3)

- Contribute indirectly to production, sale, and service
- Add value and costs
  - Produce margin that is difficult to calculate

Support Activities (3 of 3)

- More efficient support activities helps companies increase their profit margins
  - Examples: financial accounting systems
  - Human resources systems
  - Production systems
  - customer relationship management systems

Q3-4: How Are Organizational Strategy and Industry Structure Related?

- Organizational strategy reflects a company's organization's goals and objectives
- Developed from organizational structure
- Creates the value chain for organization
- Establishes the structure, features, and functions of information systems
- A company's strategy is influenced by the competitive structure of the industry the company is in

Porter's Five Forces Model

- Commonly used model to assess an industry structure
- States that five competitive forces determine industry profitability
  1. Bargaining power of customers
  2. Threat of substitutions
  3. Bargaining power of suppliers
  4. Threat of new entrants
  5. Rivalry among existing firms
- **Intensity** of each determines the characteristics of the industry, and he profitable/sustainable it is

A Competitive Strategy

- Organization's response to structure of its industry
- Porter identified four competitive strategies:
  1. Cost leadership across industry
  2. Cost leadership focused on particular industry segment
  3. Differentiation across industry
  4. Differentiation focused on particular industry segment
- Porter says goals, objectives, culture, and activities must be **consistent** with strategy

Figure 3-3
Porter's Four Competitive Strategies

	Cost	Differentiation
Industry-wide	Lowest cost across the industry	Better product/service across the industry
Focus	Lowest cost within an industry segment	Better product/service within an industry segment

Source: Based on The Free Press, a Division of Simon & Schuster Adult Publishing Group, from Competitive Advantage: Creating and Sustaining Superior Performance by Michael E. Porter. Copyright © 1985, 1998 by Michael E. Porter. All rights reserved.

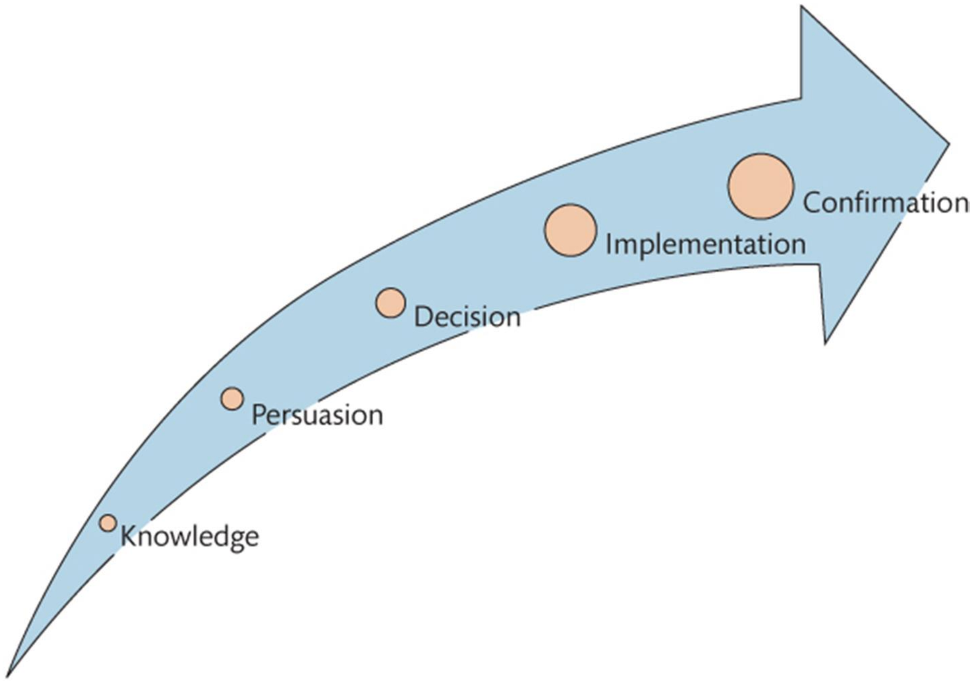
Q3-5: What Is the Relationship Between Innovation and IT?

- Changes to industry structure often occur through innovation
- Bower and Christensen suggested two general types of technology innovations:
  1. **Sustaining technologies:** changes in technology that maintain the rate of improvement in customer value
  2. **Disruptive technologies**: new package of attributes to accepted mainstream products

Diffusion of Innovation

- Defined by Everett Rogers
- "Process by which an innovation is communicated through certain channels over time among members of a social system."
- **Stages**:
  1. **Knowledge** (when first heard about an innovation)
  2. **Persuasion** (when you become interested)
  3. **Decision** (consider pros and cons of adopting)
  4. **Implementation** (use, and decide to continue)
  5. **Confirmation** (use the innovation to its full potential)

Figure 3-4
Roger's Theory of Diffusion of Innovation



Q3-6: How Do Information Systems Provide Competitive Advantage?

- Organizations respond to the five competitive forces in numerous ways
- For our purposes, we can distill those ways into the list of principles
- You can also apply these principles to a personal competitive advantage
- Some of these competitive techniques are created via products and services, and some are created via the development of business processes

Figure 3-5
Principles of Competitive Advantage

Product Implementations

1. Create a new product or service
2. Enhance products or services
3. Differentiate products or services

System Implementations

4. Lock in customers and buyers
5. Lock in suppliers
6. Raise barriers to market entry
7. Establish alliances
8. Reduce costs

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Competitive Advantage via Products and Services

- Organizations gain a competitive advantage by first three stages of competitive advantage principles:
  - Creating new products or services
  - Enhancing existing products or services
  - Differentiating their products and services from those of their competitors
- Information systems can achieve these objectives

Competitive Advantage via Business Processes (1 of 2)

- Organizations can gain a competitive advantage by last five principles of competitive advantage:
  - Locking in customers – make it difficult or costly to switch
    - **switching costs**
  - Locking in suppliers – make it difficult for suppliers to switch (or make it easies to connect with you)
    - **Making it easy to connect to and work with organization**
  - Creating entry barriers – make it difficult and costly for a new competitor to enter

Competitive Advantage via Business Processes (2 of 2)

- Establish alliances with other organizations
  - This creates standards
  - Promotes product awareness
  - Develops market size
  - Reduces purchasing costs
- Reduce costs
  - And/or increase profitability
  - Higher shareholder value
  - More cash
  - Fund further innovation

Q3-7: Can Competitive Advantage Through Information Systems Be Sustained? (1 of 2)

- Competitors often react to innovations by replicating the technology
- The more ubiquitous—existing everywhere—information technology becomes, the less competitive advantage information technology provides

Q3-7: Can Competitive Advantage Through Information Systems Be Sustained? (2 of 2)

- While this may be true about technology,
- it isn't true about information systems which also include organizational procedures and people along with hardware and software
- In business, **people** make the difference!

Sustained Competitive Advantage

- Companies must find a distinctive way to compete
- Companies must successfully integrate many technology systems with people and procedures in the organization
- While competitors might be able to purchase the technology, it takes time for people to gain the necessary experience and skill
- Matching the entire set of information systems is a high barrier for companies with less experience and success in integrating people and technology

The Amazon of Innovation (1 of 3)

- To fulfill 36.8 million items shipped per day in holiday season, Amazon needed enormous infrastructure
- During off-season, the infrastructure was excess capacity
- Leased the capacity to other companies, and created cloud services
- Amazons business lines were now separated into three: online retail, order fulfillment, cloud services

The Amazon of Innovation (2 of 3)

- Retail business margins are thin; products sold at a discount, and 2-day shipping is free for Prime members
  - Must drive employees hard
- Order fulfillment services are sold – you can ship your inventory to Amazon to treat as if their own
  - Customers won't know Amazon was involved
- Amazon web services allow leasing of computer equipment
  - Very flexible offers and payment plans – can buy computer time for less than $0.01 p/hour.

The Amazon of Innovation (3 of 3)

- Other services have included
  - WorkMail (competes with Microsoft Exchange)
  - Amazon Home Services (professional local services)
  - Destinations (travel)
  - Dash (re-ordering)
  - Prime Air (drone delivery)
- Fulfillment by Amazon – where sellers can ship to Amazon for stocking, packaging, and shipment.
  - Customers can sell on Amazon or their own channel, or both