Introduction to Information Systems

Data Science Education Program

Chapter #2

Information systems and strategy

Chapter #2 Topics

- Porter's five competitive forces
  - Threats of new entrants
  - Power of buyers and suppliers
  - Threat of substitutes and rivalry among existing competitors
- Factors that affect how the five forces operate
  - Disruptive technology and innovation including Government policies and actions
  - Complementary services and products in the ecosystem
  - Environmental events and 'wildcards'
- Value chain and strategic thinking
  - Extending the value chain from suppliers to the firm to customers and benchmarking components of the value chain
  - The ethical factor: ethical responsibility in an environmental value chain
  - IT benchmarks
- Competitive strategies in business
  - The role of information systems in strategy
  - Information systems: run, grow, and transform the business
- Information strategies and non-profit organisations
  - Fund raising / volunteering (non-profit organisations)
  - Information strategies and government
- Does it matter?
  - Spending on running, growing, and transformation

Chapter #2 Overview

CHAPTER 2

Information Systems and *Strategy*

LEARNING OBJECTIVES

1. Describe Porter's five competitive forces that shape industry competition.
2. Explain how disruptive innovations, government policies, complementary products and services, and other factors affect how the competitive forces operate.
3. Identify the components of the value chain and explain its extended version.
4. Describe how information systems apply to competitive strategies for business.
5. Explain how information systems apply to strategy for non-profit organizations and governments.
6. Explain why the role of information systems in organizations shifts depending on whether the systems are deployed to run, grow, or transform the business.

An online, interactive decision-making simulation that reinforces chapter contents and uses key terms in context can be found in MyMISLab™.

MyMISLab | *Online Simulation*

Leveling UP!

A Role-Playing Simulation on Business Strategy for a New Smartphone App

Key Terms and Concepts

KEY TERMS AND CONCEPTS

threat of new entrants
network effects
switching costs
power of buyers
power of suppliers
threat of substitutes

rivalry among existing competitors
disruptive innovation
sustaining technologies
creative destruction
ecosystem

value chain model
primary activities
support activities
benchmark
low cost leadership strategy

product differentiation strategy
focused niche strategy
strategic enabler
e-government

Introduction

information systems and organisations

- Organizations have two primary goals:
  - *Survival*
  - To *realise a profit*
- Information systems (IS) play an important role for organizations in meeting these goals by *employing strategies* to:
  - Gain competitive advantage and realize business objectives
  - Transform industries and industrial sectors
  - Achieve charitable missions for non-profit organizations

Information Systems and Government

- Governments and state bodies use information systems to disseminate information relating to:
  - Government policies
  - Legal and statutory information
  - Collect taxes
  - Provide health and safety information
  - Provide travel advisory notices including health advisory information

business objectives

- Organisations and entrepreneurs compete for business and market share
- Startup's must develop a strategy to create a viable business and grow the company sales
  - Recall: *the primary objective of all commercial business is 'survival'*
- Organisations of all types must:
  - *Operate in an increasingly dynamic and uncertain environments*
  - *Understand the developments in technology and its practical application*
  - *Leverage the power of smart technologies*
- Organisations, and even industries:
  - *Find it difficult to remain profitable and many have failed*
  - *In this chapter strategies to enable business to survive and prosper are introduced*

information systems and business strategy

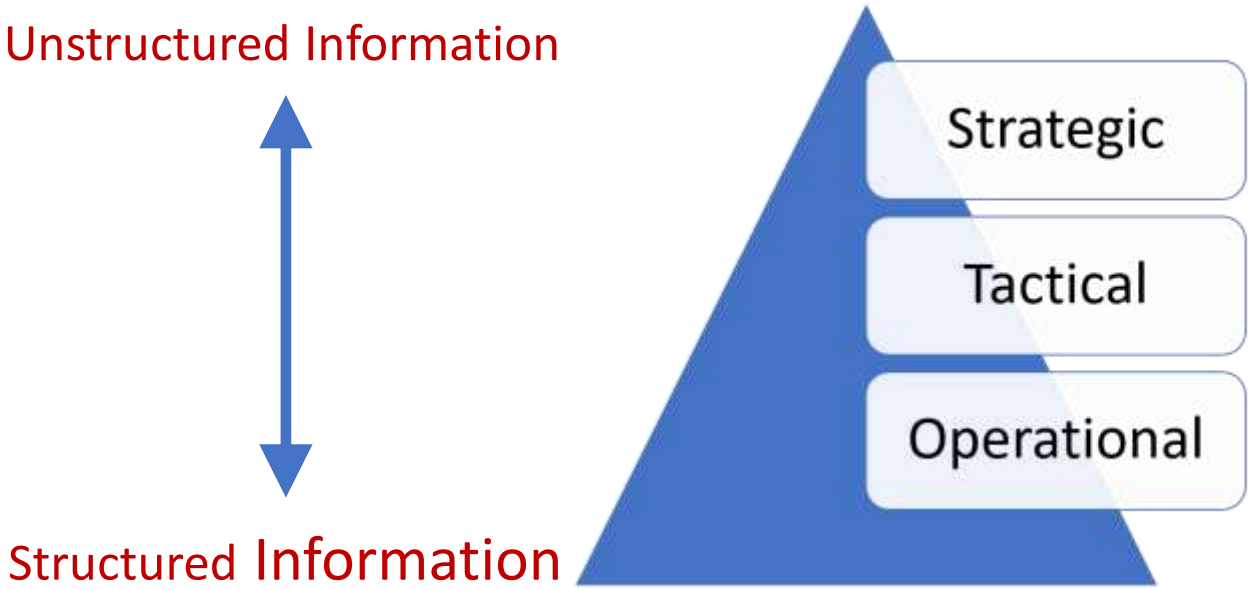
- Commercial organisations:
  - Information systems (IS) apply to *competitive business strategies*
- Non-profit and government strategy
  - *Strategies* in *non-profit organizations* (charities) and *governments* apply to such organisations
- The role of information systems
  - The *role* of IS in organizations shifts (*changes*) depending on whether the IS are deployed to *run*, *grow*, or transform the business
- Other factors:
  - Explain how *disruptive innovations*, *government policies*, *complimentary products and services*, and other factors affect how the *competitive forces* operate

information systems and business strategy

- Organizations and information systems:
  - *Operations management*
  - *Customer interactions*
  - *Decision making*
  - *Collaboration on teams*
  - *Strategic initiatives*
  - *Individual productivity*

information and decisions

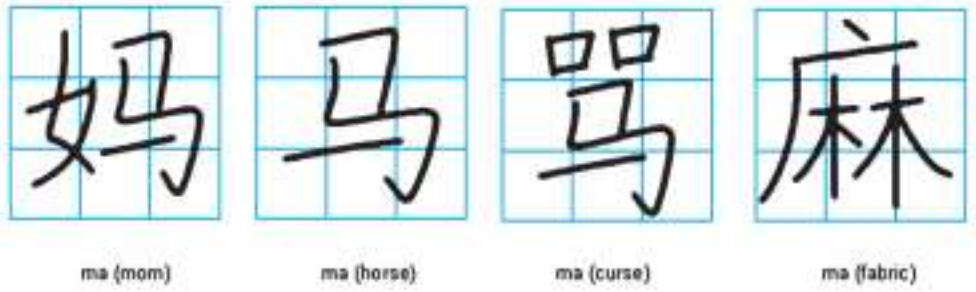
- Recall that:
  - Information ranges from structured to unstructured information
- The information types are:
  - Not discrete but may be considered in terms of a continuum
- There is a relationship between:
  - The type of information and the level of decisions



information systems and business strategy

- Focus on Chinese Internet users
- Simpler use of Chinese language
- Competition
- Dominates the Chinese Internet market
- Figure 2.1.:
  - Considers the *QWERTY* keyboard and Chinese characters

FIGURE 2-1
The syllable "ma" typed on a QWERTY keyboard can refer to many different Chinese characters with different meanings. The spoken language distinguishes among them through tones, or slight changes in vocal pitch, as the syllable is pronounced.



business strategies?

Groupon offers daily deals by email, and was once praised as "the fastest growing company ever." The founder's decision to turn down Google's offer of $6 billion to buy them out was a big mistake. After going public, Groupon's stock price plummeted over 80%, and growth is slowing. The problem is that focusing just on growth is a temporary strategy, especially when the threat of new entrants is high and the "daily deal" may be a temporary fad.[5,6]

Take a close look at the software trial versions that came preinstalled on your computer to see which products the PC manufacturer is promoting with this valuable positioning. As long as you have a recovery disk in case of problems, you can uninstall the ones you don't want to reduce clutter and improve your computer's performance.

Porters five competitive forces

Porters five forces

- Corporate competition and profitability is influenced by the five interrelated forces shown in *Figure 2.3*
- The five forces are:
  - *Threat of new entrants*
  - *Power of buyers*
  - *Power of suppliers*
  - *Threat of substitutes*
  - *Rivalry among existing competitors*

relative industry profitability

FIGURE 2-2

Profitability of selected U.S. industries.[3]

Industry	Net Profit Margin
Application software	23.2%
Semiconductors	18.0%
Drug manufacturers	16.7%
Wireless communications	14.0%
Toys and games	9.7%
Oil and gas	8.5%
Hospitals	4.3%
Sporting goods stores	3.9%
Major airlines	2.2%

significant competitive factors

network effects
The increased value of a product or service that results simply because there are more people using it.

switching costs
Costs that customers incur when they change suppliers.

power of buyers
The advantage buyers have when they have leverage over suppliers and can demand deep discounts and special services. This is one of Porter's five competitive forces.

power of suppliers
The advantage sellers have when there is a lack of competition and they can charge more for their products and services. This is one of Porter's five competitive forces.

threat of substitutes
The threat posed to a company when buyers can choose alternatives that provide the same item or service, often at attractive savings. This is one of Porter's five competitive forces.

rivalry among existing competitors
The intensity of competition within an industry. Intense rivalry can reduce profitability in the industry due to price cutting or other competitive pressures. This is one of Porter's five competitive forces.

disruptive innovation
A new product or service, often springing from technological advances, that has the potential to reshape an industry.

sustaining technologies
Technologies that offer improvements to streamline existing processes and give companies marginal advantages.

Threat of new entrants

the threat of new entrants

- Established commercial organisations must always be aware of new companies starting up and trading in their domain
  - For example: the Internet has provided a platform for businesses to start-up with little capital, no premises, few employees, and limited experience
  - There are manifest example of such companies
    - For example: *Amazon* started in Jeff Bezos garage
    - Consider the on-line simulation included in this chapter
- Existing organisations try to keep new companies out by:
  - Limiting access by competing organizations using:
    - *Network effects*
    - *Switching costs*

tactics used to retain a customer base

- *Network effects* include:
  - Increased value of product or service
  - Number of users
  - An example is *social media* where *Facebook* has generated a huge customer base and the interaction between uses with recommendations generates a *network effect*
  - Another example of established commercial organisations reaction to new entrants is wireless cellular carriers:
    - Their tactic is to try to generate *network effects* by offering free calling to any cellphone on the same network
    - While relevant for personal account holders the *network effect* is multiplied in the case of business account holders who enjoy a cost-benefit for calls between employees using a single carrier

tactics used to retain a customer base

- *Switching costs*:
  - This method relates to costs incurred by users if they change suppliers for example:
    - Cellphone networks may offer a ‘free’ additional phone with a 2-year contract
    - However, there are increased monthly fees to cover the initial cost of the phone
    - Plus, there are penalties to pay for early termination of the contract
- *loyalty programs*:
  - Orgnisations may use this approach to retain customers, raise switching costs, and discourage new entrants. For example, consider frequent flier programs which offer:
    - Air miles, automatic upgrades, and companion tickets
    - A similar program is used by hotels
    - Additionally, airlines and hotel groups offer credit cards with points based on use

information systems for business

- Organisations may purchase information systems to manage their data, information, and records
- However, to switch to another system there are many impediments:
  - There may be additional licensing fees to pay
  - There will be a significant change in business processes to migrate to the new system
  - Staff training (re-training) may be a expensive financially and in staff time
  - The change may affect suppliers and other stakeholders
  - With cloud-based solutions the data storage and migration may be an issue
- Companies may use enterprise software to manage business functions:
  - In such cases changing suppliers are reluctant to change
  - The cost of changing is one reason for the high profit margins enjoyed by the software industry

Power of buyers

the power of buyers

- Market developments have changed the balance of power between buyers and commercial organisations
- Where a supplier has a small number of buyers the supplier is at a disadvantage:
  - Losing be buyer can have a big impact on the supplier
  - For example: consider companies where a government is the main customer
  - Buyer power rises when many suppliers offer a similar product (this is a factor in mature industries)
- Consider the purchase of airline tickets:
  - For the most competitive and popular routes buyers have greater power (unless a loyalty program is in play, this can affect purchasing options)
  - With no constraints, customers can choose the best (lowest) price – this affects the airline profit margin

buyer power

- The balance of power between buyers and suppliers has moved driven by developments in the Internet:
  - For customers changing suppliers is simple and quick
  - There are market comparison web sites which show current prices
    - *Figure 2.4* is an example of such a web site
    - Additional information is provided by the reviews and the rating of suppliers

FIGURE 2-4
Price comparison website.

Power of suppliers

markets and organisation types

- In economic terms there are *mature markets*
- When a market begins to saturate with an oversupply of product and a softening in the demand it is termed a *mature market*
  - Perhaps new products have been innovated or maybe most of the new customers to find have been found
  - As growth slows, the market reaches maturity
  - A mature market is the stage where the rate of growth slows, perhaps to zero
- In macro-economic terms there are different types of organisation:
  - *Monopolies*
  - *Oligopolies*
  - Typical commercial organisations operating in a normal competition environment

markets and organisation types

- This topic is beyond the scope of this course but in summary:
  - A *monopoly*:
    - Occurs when a company and its product offerings dominate one sector or industry
    - Monopolies can be considered an extreme result of free-market capitalism and are often used to describe an entity that has total or near-total control of a market
  - An *oligopoly*:
    - Occurs when there is limited competition and a small number of firms collude (either explicitly or tacitly) to restrict output and/or fix prices, in order to achieve above normal market returns.
    - Economic, legal, and technological factors can contribute to the formation and maintenance, or dissolution, of oligopolies
  - In a *normal competition environment* *monopolies* and *oligopolies* cannot exist

the power of suppliers

- The overview of organisation types (as they relate to marker economics) is relevant to the power of buyers:
  - In normal market conditions competitive forces will be an important factor in controlling market dominance, prices, and therefore profitability
  - In a *monopoly* situation the power of suppliers is very strong and suppliers can dictate terms and prices:
    - Conversely, the power of buyers is very weak
  - For *oligopoly's*, while their market dominance is less than for a monopoly but the balance of power remains largely with the supplier
    - The power of the buyer is weak due to the limited number of suppliers and the fact that suppliers work together to fix prices and availability

the power of suppliers

- For an example of a virtual monopoly consider:
  - Microsoft:
    - The *Windows OS* (around 85% of the OS market)
    - *Office 365* (the essential office software for all types of organisation)
    - The relative proportions for OS sales have remained fairly constant over time at:
      - *Windows* (2000, XP, 8.1, 10): 87%
      - *Apple* (Mac OS): 9%
      - *Linux*: 2.5%
      - *Others* (Chrome, BSD): 1.5:
- The suppliers to *Walmart* have less power than Microsoft as:
  - The availability of products is greater and there is less reliance on single suppliers
  - However, *Walmart* suppliers have linked information systems for the supply chain and accounting

the power of suppliers

- High switching costs increase supplier power because:
  - Loyalty programs (as discussed earlier) are disincentive to switching and such programs are controlled by the supplier
  - Technology is a powerful disincentive to switching where there will be costs in:
    - Migrating to a new system and ecosystem
    - Licensing fees
    - Staff training and re-training
    - Possibly new hardware to accommodate new software
    - Implementing the new system (how to replace the old system as previously discussed)
- Of all the disincentives to switching:
  - Technology and migrating to new systems represents a major strategic decision for any organisation

Threat of substitutes

the threat of substitutes

- Threats will come from alternative products and / or substitutes:
  - *Providing the same product or service*
  - *Supplied with cost savings*
- Information systems role in substitutions:
  - *Plays a key role in many examples*
- Substitutes may come from any direction:
  - *Scientific developments*
  - *Technology developments* (e.g., video conferencing)
  - *Socio-economic change*
  - *The developments in mobile technologies will only increase the threat of substitute systems*

the threat of substitutes

- We have considered markets and organisation types
- For organisations operating in a normal competition environment in a *mature market* the *threat of substitutes* is high because:
  - The availability or products and alternative products is high
  - This puts suppliers at a disadvantage as buyers can easily switch to an alternative supplier
  - Consider Figure 2.5. and the impact of the Covid-19 pandemic

FIGURE 2-5
Videoconferencing heightens the threat of substitutes to the business travel industry.

the threat of substitutes

- Predicting potential substitutes can difficult and harder to combat because:
  - IT and ICT plays a key role in many examples of substitution threats
  - Consider:
    - *On-line education* including *continuing professional development* (CPD) and staff training
    - *Business conferencing*
    - *Virtual international conferences*
  - The Internet and developments in network speeds:
    - *Have resulted in the streaming of television programs and films*
    - *This trend has replaced scheduled programming with on-demand viewing*
    - *There has been a reduction is the number of cable companies since 2000*

the threat of substitutes

- Substitutes may appear from any direction:
  - It is critical for strategists and analysts to monitor social and texhnological developments on a vey wide scale
- Consider a pharmaceutical company:
  - New drugs will be *patented*
  - However, the *lifetime of a patent* is limited
  - When a patent expired *generic* drugs will appear and be cheaper with a large market share
- Consider the newspaper publishing model:
  - The industry failed to address the impact of the Internet
  - Sales have fallen and the advertising model has changed
  - The newspaper industry has now started to use the Internet effectively

Rivalry among existing competitors

competitor rivalry

- The profitability of an industry and the competitive structure is affected by the intensity of the *rivalry among existing competitors*:
  - The fact of competition and the nature of the competition is important
  - Competition may be related to:
    - *Price*
    - *Service*
  - When *price* is the main factor:
    - On-line changes can be immediate and responsive to competitors price movements
    - Price-wars can benefit buyers and damage suppliers
  - Considering competitive forces:
    - Competition can be beneficial (but)
    - Extreme competition can be destructive and damage the industry and the buyers can be the ultimate losers

competitor rivalry

- When *service* is the main factor:
  - Identifying companies with a good customer service level is difficult and may use focus groups and reviews
  - Where a customer service center is located (e.g., using outsourcing) is often critical in providing a good level of service with data security
- *Mature* industries have been introduced:
  - Slow growth is a feature of mature industries
  - This leads to increased company rivalry to capture (and retain) market share
  - Competitive forces and market conditions can result in the failure of companies and reductions in competition
  - However, such results have significant personal and social costs

Factors that affect how the five forces operate

the external factors

- The five forces together determine industry structures and the potential for profit
- Consider corporate strategies:
  - There are external factors that impact how the forces operate
  - Innovations can have a large influence in an industry
  - Innovation (social and technological) and how organisations manage innovations will determine if they fail or survive and prosper
- In this section we consider:
  - Disruptive technology and innovation (also termed technological determinism)
  - Sustaining technologies
  - Creative destruction
  - Government policies and actions
  - Complementary services and products in the ecosystem
  - Environmental events and ‘wildcards’

Disruptive technologies and innovations

disruptive inniovation

- A *disruptive innovation* is:
  - A new product or service often the result of technological advances
  - Such a product has the potential to reshape an industry
    - Consider for example companies began offering digital cameras do not use the traditional film in the 1990s
    - Digital cameras (and now mobile phones with camera hardware and apps) have transformed the industry
    - Sales of roll film and the cameras that used them fell along with the film processing industry
  - The early digital cameras had lower resolution:
    - However, technological advances quickly improved the resolution
    - The result is that for the average user (the professional photographer market remains) film cameras are no longer relevant along with all the services and products that support them

sustaining technologies

- *Sustaining technologies* offer:
  - important improvements to streamline existing processes
  - This can provide companies with marginal advantages
- *Innovation*:
  - Has been a feature of the economy for may decades
  - It is a driver for economic prosperity and social change
  - Figure 2.6. is an example of technological change and potential social change

FIGURE 2-6
"Innovation is the central issue in economic prosperity."
—Michael Porter.

disruptive innovation

- *Disruptive innovation* is a different proposition
- Often developed by a 'start-up' or industry outsiders:
  - It brings a radical and unexpected breakthrough that first replaces lower end products
  - It then rapidly overtakes even the high end of the market
- Figure 2.7. shows a comparative analysis of *disruptive* and *sustaining* technologies

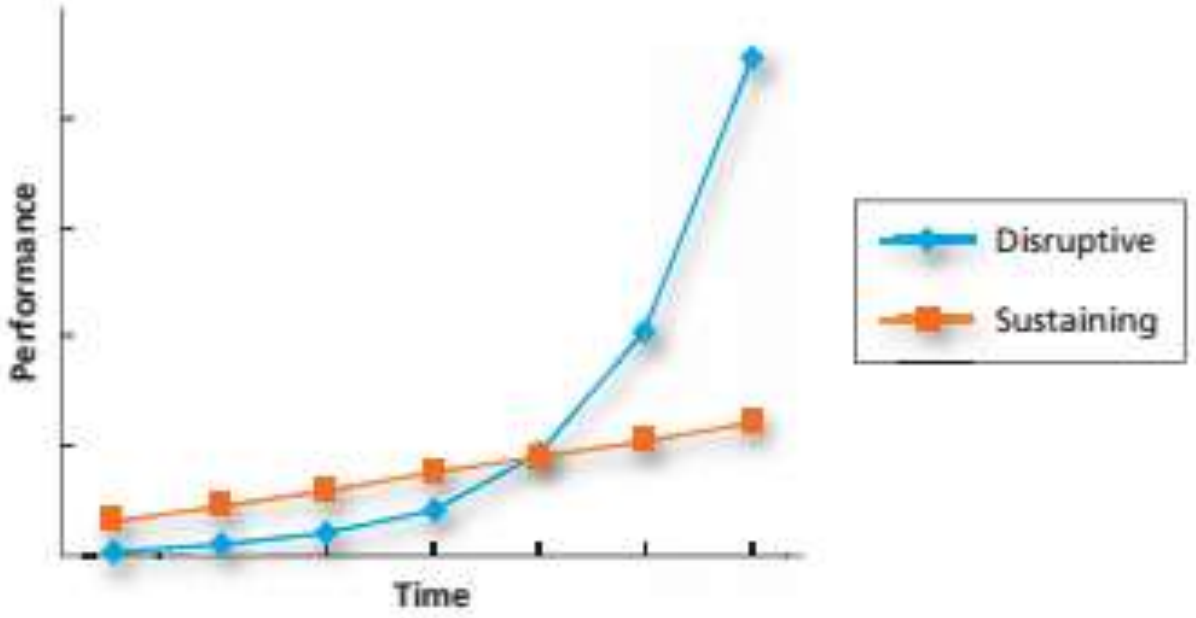


FIGURE 2-7
Comparing disruptive and sustaining innovations on performance over time.

the failure to address innovation

- Companies that cling to the older models may eventually fail
- *Figure 2.8*. provides typical examples of disruptive innovation with the products and services displaced
- We have considered in week #1 the technology and its development from an historical perspective and this has shown:
  - *The remarkable developments*
  - *The impact of the Internet which is a primary driver of disruptive innovation*
- The innovations it supports are transforming all industries on many levels including:
  - *Technology and its relationship to society*
  - *Government regulation and statutory instruments*
  - *Employment and how employees perform their tasks*

examples of the failure to address innovation

Disruptive Innovation	Displaced Products and Services
Steamships	Sailing ships
Machine gun	Rifle
Truck	Horse
Digital camera	Instant cameras, such as Polaroid, and eventually most film cameras
Desktop publishing software	Dedicated professional publishing systems
Email	Postal mail
Computer printer	Offset printing press
Music CD	Vinyl record, cassette tape, 8-track tape
Digital downloads of music and video	Music and video CD/DVD
Word-processing software	Typewriter
Online e-commerce	Physical retail stores
GPS	Printed maps
Cell phone	Landline phone
Internet video	Cable TV
Cloud computing	Locally managed data centers, locally installed software

FIGURE 2-8
Examples of disruptive innovations.

disruptive innovation

- Changes fundamentally aspects of the five forces by for example:
  - Reducing entry barriers for newcomers
  - Empowering buyers with far more information about prices and competitors
  - Virtually eliminating switching costs for many products
  - Moreover: it also facilitates a vast, global marketplace in which competitors can spring from any corner of the globe by setting up shops online to compete with your neighborhood store.
- Close behind the Internet are the advances in wireless communications and mobile technologies which:
  - Support voice and data connections *anytime and anywhere*
  - In retail for example: buyer power rises when shoppers in a shopping mall can scan a product with their smartphones and see if they can get a cheaper price online

disruptive innovation

- Consider another important industry:
  - Bus travel between cities became instantly profitable when young people discovered that they could hop on a bus for much less than traveling by car, train, or plane, and surf the web while travelling
- With free Wi-Fi:
  - Megabus attracts well-educated 18- to 34-year-olds who want to:
    - Save money
    - Avoid the hassle of air travel
    - Stay online
- .Economist Joseph Schumpeter:
  - Used the term *creative destruction* to describe what happens in an industry when disruptive innovations threaten the established players

new technologies

- New companies often find ways to capitalize on the new technologies:
  - However, many incumbents resist the change and seek ways to protect their old business models
- The music industry is an example of creative destruction:
  - Record labels once dominated this industry by:
    - Controlling pricing, distribution, and marketing
  - Napster promoted the sharing of music file online (free of charge!)
    - Record labels fought Napster in court and eventually shut it down for copyright violations:
    - However: Apple created the iTunes store with low pricing per song.
    - The labels fought again because it is more profitable to sell albums rather than individual songs (they were losing control of the industry)
    - But consumers preferred to buy one song at a time
  - The music industry now has a paradigm dominated by streaming with payment based on streams

disruptive innovation

- Sony's CEO (*whose company lost millions to Apple by fighting disruptive innovation*) stated:
  - *"I'm a guy who doesn't see anything good having come from the Internet. . . ."*
- Clayton Christensen (the author of *The Innovator's Dilemma* and *The Innovator's Solution*) argues that:
  - Industry leaders need to be alert to disruptive innovations
  - Small teams should be created to look for breakthrough opportunities
  - Such teams cannot be part of the larger organizational bureaucracy:
    - This would stifle their creativity (and)
    - Prevent improvement is current systems and the status quo
    - The changes proposed may not be popular with entrenched management views

Government policies and actions

Government policies and actions

- Governments have many legal, statutory, and regulatory powers that have an important impact on organisations of all types
- Statutory and regulatory compliance is a central requirement for management on all levels
- Government policies and funding priorities can have dramatic effects on how industries operate and how they evolve:
  - In practice companies operate in many geographical locations
  - Multi-national companies must comply with the statutory and regulatory environment that applies in the markets in which they trade
- IT systems are a vital component in managing these demands

examples of policies and actions

- Examples of policies and actions:
  - Patents reduce the threat of new entrants, for example, while low-cost loans to small business can increase that threat
  - Organizations frequently lobby for government action to influence how the five forces operate and improve profits
  - The Internet radio service Pandora, for instance, lobbied Congress to pass the "Internet Radio Fairness Act" that would drastically reduce the 11 cents it pays in royalties for every song played
    - The "fairness" part comes from Sirius XM Radio, which pays just 8% of its revenue on royalties, compared to Pandora's 55%
  - Artists strongly object to the act, though, saying they earn almost nothing from Pandora and the law would make things worse.
  - Lobbyists for state governments have pressed Congress for years to level the playing field and allow them to collect sales taxes when state residents buy products from online retailers like Amazon

examples of policies and actions

- Many lobbying groups fight for government regulation to block new entrants enabled by the Internet:
  - Optometrists once earned profits through contact lens sales, as patients used their new prescription to buy their lenses at the optometrist's store
  - When *1800contacts.com* and other retailers began offering lenses at discounted prices on-line, optometrists lobbied to make it easier for customers to compare prices and buy elsewhere
  - However, the American Optometry Association also lobbied, and the 2004 "Fairness To Contact Lens Consumers Act" contained regulations to appease both groups
  - For instance:
    - Doctors must provide patients with an original, signed prescription (but)
    - On-line sellers may not accept faxed prescriptions from the consumer without the doctor's confirmation

Complimentary services and products in the ecosystem

complimentary services

- Industries are increasingly interrelated and events in one industry can influence another industry:
  - Consider desktop publishing software: computers and color printers became more useful to small business as the capability to develop in-house menus, signs, and brochures reduced the need for external printing
  - Additionally, companies selling specialty paper benefited
- Companies are embedded in a complex *ecosystem*:
  - an ecosystem is an economic community that included related industries making complementary products and services
  - The competitors (the suppliers) are also the customers
  - Events in one arena (particularly disruptive innovation):
    - Have an impact on the whole ecosystem, affecting all players and the five forces for the industries involved

complimentary services example

- Consider the gambling ecosystem in the USA:
  - It consists of casinos, Indian reservations, government regulators, and other related activities
- However, most forms of on-line gambling is illegal in the USA:
  - This is changing driven largely by Internet driven offshore gambling companies
  - The on-line gambling spend in the USA is over $100 billion a year
  - The casinos (in the USA) would like to access this source of profit
    - That would spread throughout the ecosystem, some benefit and some lose
    - New entrants may be attracted and while hotels may suffer casinos will have another source of revenue
  - Additionally, cell-phone developers and networks will benefit by on-line gambling along with banks (use of credit cards for gambling)

complimentary services example

- Important strategic moves come from visionaries:
  - They see the future and propose fundamental changes to all the industries in an ecosystem and persuade others to join
- Consider Bill Gates and Microsoft: his vision was for computing to move from the mainframe to the desktop:
  - Success would depend on a *defacto standard* operating system (OS)
  - Such an OS provides a platform for developers of hardware and software to create systems that make the OS the *defacto* OS
  - Thus, an ecosystem is created with a compelling set of complementary products and services
  - The OS created was the Windows OS

complimentary services example

- The Windows OS was not the first graphical user interface (GUI) but it was the first generally available and working GUI
- Windows has dominated the OS market for both industry and personal computing for the past 3 decades:
  - It consistently maintains an 85% to 90% market share
  - It continues to develop to address new devices
  - Other companies have prospered using Windows as an *original equipment manufacturer* (OEM) OS
- Interestingly Microsoft does not (and never has) dominated the server market:
  - This is dominated by Linux systems (frequently Red Hat)

cloud-based solutions

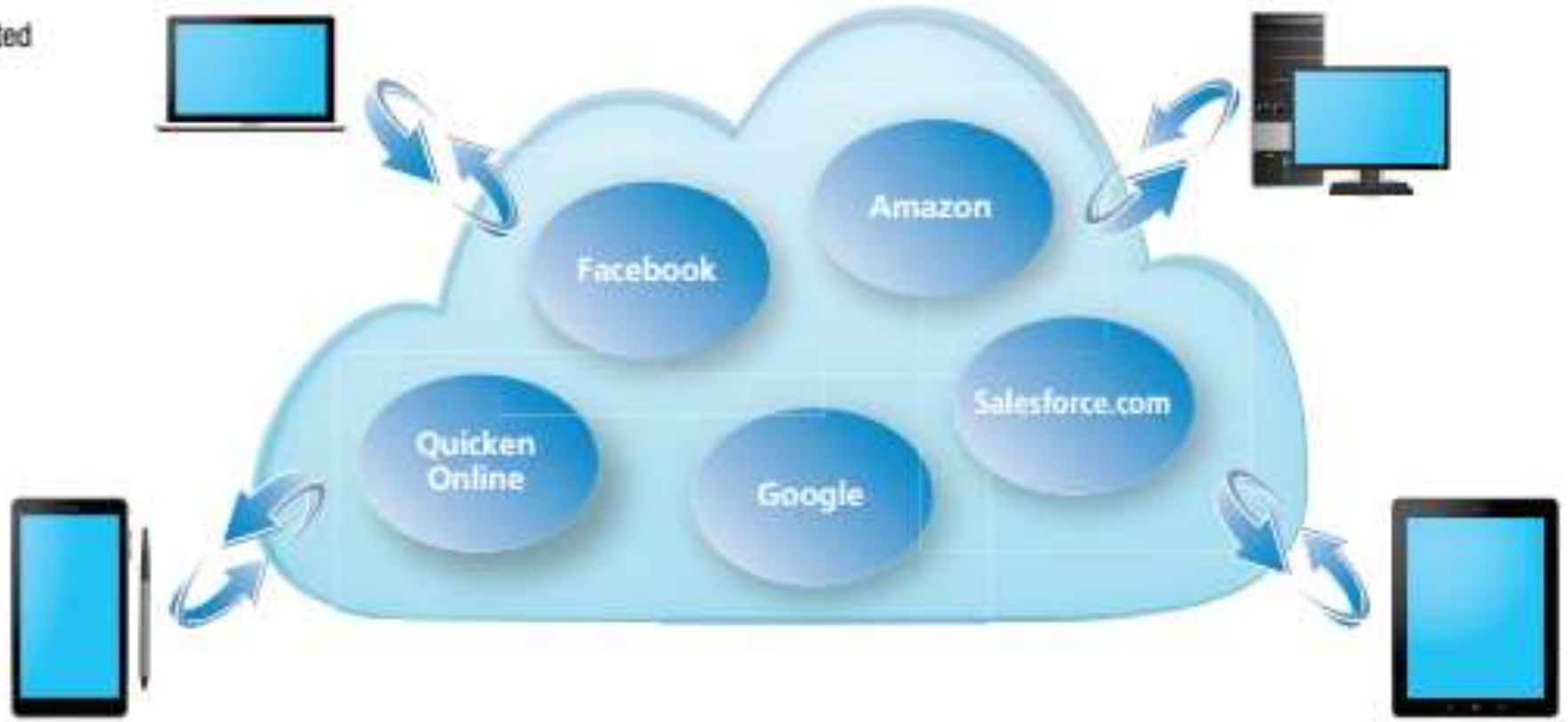
- An example of complimentary services and ecosystems is the cloud computing systems
- Cloud computing (discussed in Chapter 3) is a disruptive innovation:
  - It provides a range of services and applications to organisations including:
    - Data storage (Amazon Web Services (AWS) manage counts large and small – for example: WAS handle all the MacDonald data needs globally)
    - Network and infrastructure systems
  - All services are located on remote servers in data centers run by the cloud-computing company
  - Companies purchase subscriptions and leverage the power of the cloud while minimising hardware and software costs:
    - Cloud-based solutions are the future driven by the Internet and mobile technologies

complimentary services

- Industries are increasingly interrelated and events in one industry can influence another industry:
  - Consider desktop publishing
  - Supply chains are integrated
  - The geographical complexity of supply chains is a feature of organizations
- Companies embedded in ecosystem
  - An economic community
  - Related industries
- Visionaries lead to new beneficial directions
  - Novel products or services

Cloud-Based Solutions

FIGURE 2-9
Cloud computing supported by the Internet.



Source: opka/Fotolia.

Environmental events and ‘wildcards’

environmental events

- Environmental events are generally a problem and are a fact of life in many geographic zones globally (often without warning)
- Weather related events include:
  - Tornadoes, hurricanes, and earthquakes
- There are other events which are not weather related:
  - Pandemics, strikes, and civil unrest
- All such events will have an impact on organisations of all types
  - For example: in the USA hurricane sandy affected retailers, manufacturers, sport, transport, infrastructure, construction, and the government
- E-commerce can be impacted with issues over deliveries

current environmental events

- Current environmental concerns include:
  - Global warming
  - Water shortages (often driven by global warming)
  - Increasing prevalence of flooding (again, often driven by global warming)
- The impact on industries can be seen in terms of:
  - Rising energy costs
  - Addressing the ‘green agenda’ and moving towards a zero-carbon system
  - Production challenges driven by the ‘just-in-time’ production schedules and transport problems
- While IT systems and IS can assist in managing risk

current environmental events

- While IT systems and information systems can try to address the potential issues:
  - For example, IT systems and information systems:
    - Can track shipments and optimise routing (using AI programs)
- However, events can fall into one of three general categories:
  - The known potential issues
  - The unknown but anticipated potential issues
  - The unknown issues which cannot be anticipated
- while technology can develop strategies to try to manage these events and issues:
  - The strategies must consider the five forces and how the events and issues change the dynamic that drives the five force

risk management

- Evaluating the potential risk in the environmental events identified is a function of risk management strategies
- Development of such strategies involves short and longer term decisions:
  - Game playing using theoretical scenarios
  - Developing reactive and preemptive strategies to address the potential risk
  - Putting in place the systems to address (or at least mitigate) the risk
  - There are excellent risk management software systems to address risk management including 'Prince2'
- Mitigation of risk involves business continuity systems and data backup systems:
  - Such systems can improv the ability of organisations to react to 'events' and maintain (possibly advance) a company's competitive position

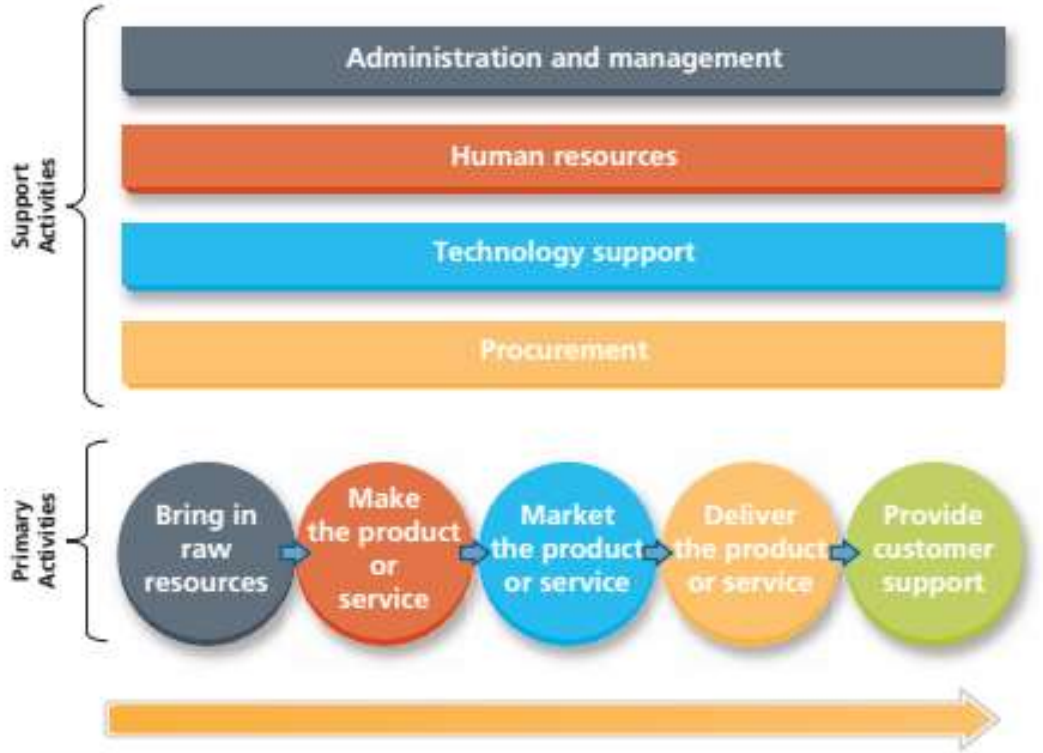
The value chain and strategic thinking

Porters value chain model

- The model describes:
  - The company *activities* performed to create added-value as the company obtains raw resources from suppliers, transforms them, and markets the product or service to buyers
  - Figure 2.10. shows the components in the value chain
- In the model:
  - The *primary activities* directly related to the processes used in the creation, marketing, sales, and delivery
  - The *support activities* cover all other processes and offices required including *administration*, *management*, *human resources*, and *technology support*

Porters value chain model

- The model describes:
  - The primary and support activities
- The model suggests a manufacturing process but:
  - Raw materials may be:
    - Physical materials
    - Pare-based materials
    - Digital materials
- Making a product or service
  - Covers many production tasks



value chain model
A model developed by Michael Porter that describes the activities a company performs to create value, as it brings in raw resources from suppliers, transforms them in some way, and then markets the product or service to buyers.

primary activities
Activities directly related to the value chain process by which products and services are created, marketed, sold, and delivered.

support activities
Activities performed as part of the value chain model that are not primary; support activities include administration and management, human resources, procurement, and technology support.

FIGURE 2-10
Components of the value chain.

Extending the value chain: from suppliers to the firm to customers

extending the value chain

- Extending the model beyond a company's primary and support activities:
  - Leads to a better understanding of how processes interact
- Figure 2.11. models the extended value chain

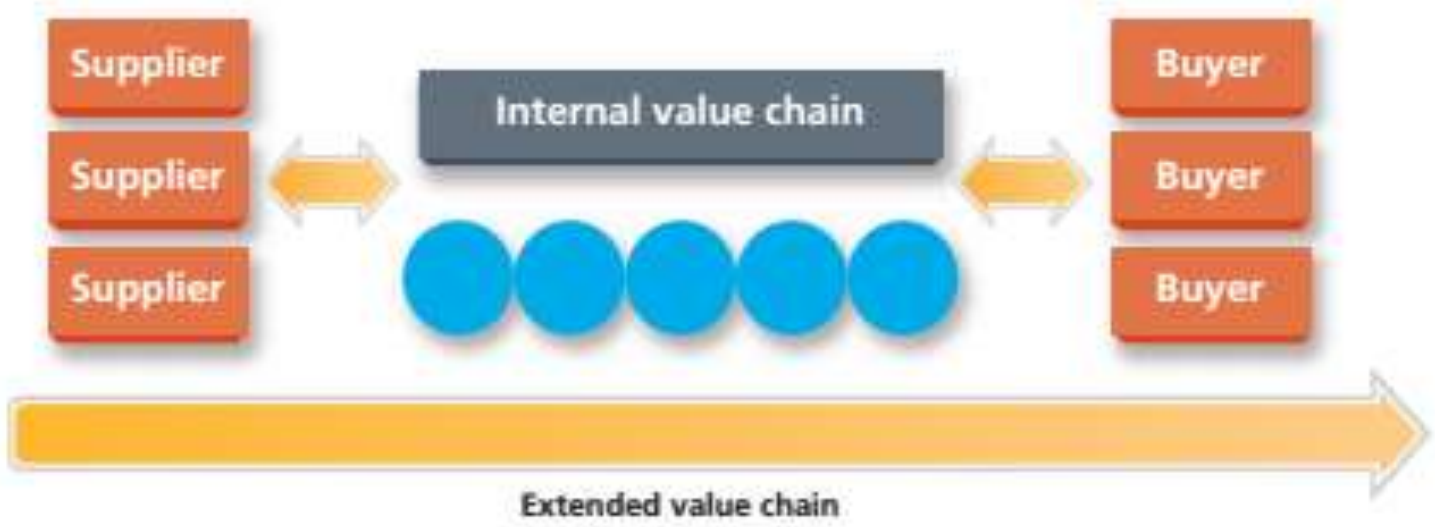


FIGURE 2-11
The extended value chain involving suppliers, the company, and its customers.

the extended value chain model

- The extended chain model shown in Figure 2.11. identified a number of features:
  - It models the relationship between suppliers and buyers
  - It points to strategic opportunities for suppliers and buyers
- In practice:
  - The chain does not begin when materials are actually delivered:
    - Delivery can be physical, paper-based, or digital materials
  - The chain does not end when a buyer pays for a product or service
    - Presale and post-sale there are strategic opportunities and also different ‘risks’
  - A company with ‘poor’ suppliers can benefit from switching or from strategic alliances with fewer suppliers to help make them more efficient

the downstream extended value chain

- Considering the downstream (or post-sale) value chain
- The value chain offers potential strategic advantages
- Considered from a buyers perspective:
  - A company is a supplier and understanding the buyers value chain is essential
  - The questions: “what are the buyers needs”? and “why are they buying the product or service”? Represent valuable intelligence
- Considered from a suppliers perspective:
  - If the buyer is another company what is that companies' strategy for creating value
  - What can your company provide

the on-line extended value chain

- In principle the value chain operates in a similar way for all types of organisation (albeit with different inputs and outputs)
- In an on-line scenario:
  - The extended value chain can include contributions from buyers which can add value to the products and services supplied
  - For example: customer reviews can be useful to potential buyers and the suppliers as feedback can be very informative for all stakeholders
- Web 2.0:
  - Provides the platform upon which interactive communication can be achieved in the extended value chain
  - This can use: text messaging, on-line forums, and web-based systems

Benchmarking components of the value chain

performance and benchmarks

- The value chain model offers:
  - A way to compare a companies' performance against industry benchmarks’
  - Such metrics enable a comparative analysis based on specific areas of operation
- A benchmark:
  - Is a reference point used as a ‘baseline measure’
  - It generally indicates metrics to evaluate if performance is *optimal*, and how performance compares to industry best practice and the industry average
  - For the value chain typical benchmarks are:
    - *Spending*, *investment*, *research and development*, *marketing and sales*, *quality control metrics*, etc.
    - Analysing benchmarks can identify areas of concern and can form part of a strategic effort to (for example) implement a recruitment policy

ethical factors

- Consider the extended value chain in Figure 2.12.:
  - How much responsibility should each of the links have in adopting an ethical approach to business?

THE ETHICAL FACTOR Ethical Responsibility in an Extended Value Chain

As the extended value chain lengthens, responsibility for harmful consequences becomes more diffuse. Considering the length and complexity of the value chain that leads to a smartphone in a customer's hands, who is ethically responsible when it overheats and injures someone? Suppose a manager allocates smartphones to the salespeople and one person is badly burned while driving. How much responsibility would you assign to each of the links in this chain listed in Figure 2-12?

If you learned that the factory's working conditions were dreadful and the smartphone company made a deal with them anyway because their costs were so low, would your judgments change? Suppose the retailer got a tip that a recall was coming but kept selling the phones to get rid of the inventory. Increasingly, people are rejecting the "plausible deniability" excuse that companies have used in the past to avoid corporate responsibility for mishaps in their extended supply chains. Nevertheless, the drive to reduce costs, particularly for firms that compete for low cost leadership, can lead to ethically questionable decisions. The blurred boundaries along the extended value chain can make it even more difficult to allocate responsibility, and easier to point fingers.

FIGURE 2-12

How much responsibility would you assign to each of these links in the extended value chain?

	Not Responsible	Somewhat Responsible	Very Responsible
The retailer who sold it to the consumer			
The smartphone company that designs and markets it under the company name			
The factory that assembles it			
The factory worker who assembled the particular phone			
The small business that supplied battery parts to the factory			
The global shipping company that transported the phones			
The procurement manager who researched the options and selected the phones for the sales staff			
The manager who supplied the smartphones			
The user who didn't read the instruction manual			

IT benchmarks

benchmarks

- Benchmarks cover a multitude of metrics but typical benchmarks are domain specific
  - For example: average IT spending is a significant indicator for all organisations
  - Figure 2.13. shows the average IT spend as a % of revenue by industry

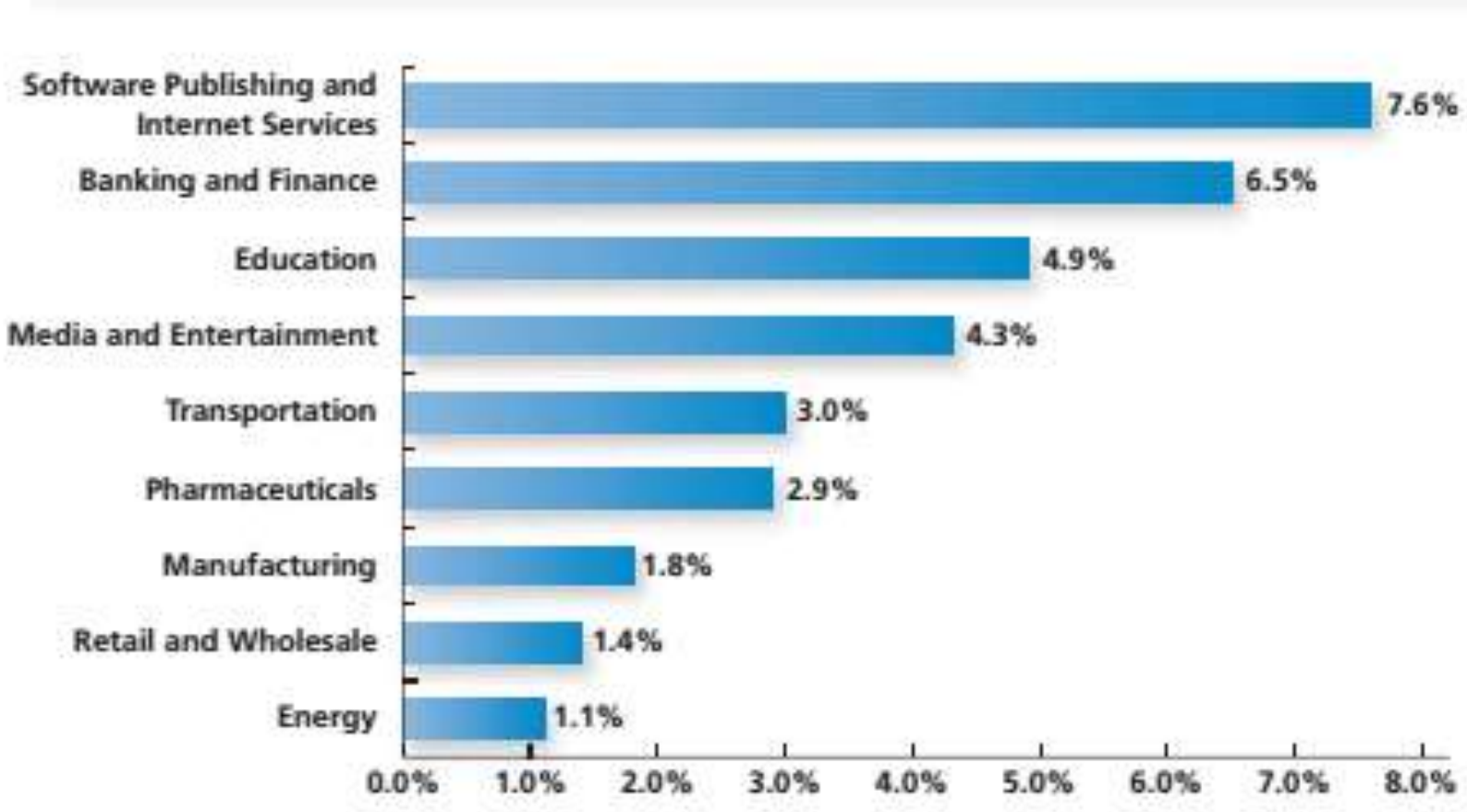


FIGURE 2-13
Average IT spending by industry as a percentage of revenue.

benchmarks

- Another useful benchmark for IS is the amount spent per employee:
  - The spend varies between industries
  - Figure 2.14. shows the spend per employee for a sample range of industries

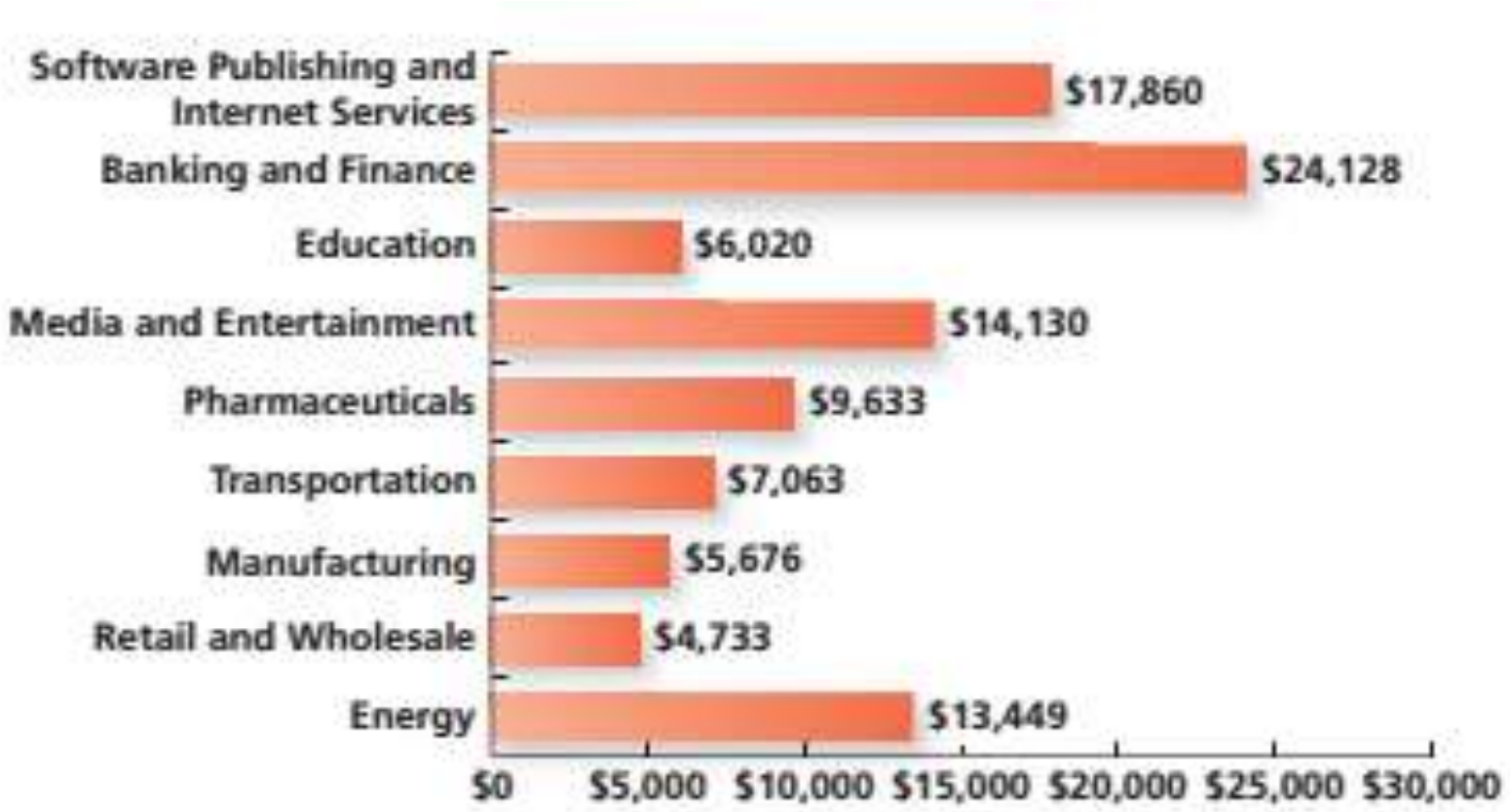


FIGURE 2-14
Average IT spending per employee in a sample of industries.

benchmarks

- Benchmarks are useful for all levels of management and point to how a company or organisation compares to other organisations and competitors
- How the data is presented is important:
  - In certain cases a tabular format may be used
  - However, a graphical format is generally clearer and imparts more information (Figures 2.13. and 2.14 demonstrate a graphical format)
- Each component points to areas of an organisation:
  - Where cost saving may be required
  - Levels of training and investment may be a problem
  - Quality control where improvement in products and /or service provision is needed

the energy factor?

Energy costs affect almost every link in the value chain, and organizations are testing out cheaper sources—including humans. California Fitness Gym connected all of its exercise bikes, rowing machines, and treadmills to generators, so customers supply up to 40% of the building's electricity.

Competitive strategies in business

competition in business

- Under Porters five forces we have considered competition (both good and destructive)
- Leadership in any industry demands skill in strategic thinking and Porter identified three basic strategies companies can adopt that can result in success:
  - The *low-cost leadership strategy*
  - The *product differentiation strategy*
  - The *focused niche strategy*
- In the following slides we consider each of the three strategies with significant examples of successful strategies

low-cost leadership strategy

- This strategy is based on:
  - Offering a similar product or service at a lower sale price
- This strategy requires:
  - A heavy focus on cost saving throughout the value chain
  - The us of information systems is essential in the automation and streamlining of processes
  - A major factor in many industries is labour costs and efficiencies in this area generally mean laying-off staff
- Walmart is an example where:
  - Its IT supported supply chain is an industry leader and is a reason for the retailers success

Southwest Airlines (USA)

- Southwest Airlines is:
  - The airline which invented the *budget airline* concept
  - The airline:
    - Reduced in-flight service levels
    - Implemented a ticketless reservation system
    - Reduced staffing levels
- The *low-cost* model:
  - Has been adopted by other airlines globally

FIGURE 2-15
Southwest Airlines stresses low cost leadership strategy.

product differentiation strategy

- As an alternative to the *low-cost* strategy an alternative approach is to implement a *product differentiation strategy* which entails adding value with:
  - Special features and /or unique add-ons for which customers will pay more
  - The strategy can reduce threats from substitute products and services
  - This strategy can also put up barriers to new entrants:
    - Apple computer is an example where a new path or product is introduced on a regular basis
- Pharmaceutical companies:
  - Adopt this strategy in their R & D to develop new drugs
  - Also, there is a re-purposing of existing drugs:
    - This applies where a patent is about to expire and generic alternative dugs result in profitability issues

focused niche strategy

- This strategy relates to differentiating a product or service for a specific market segment
- The objective is:
  - To find a smaller customer group with specific preferences
  - The product or service is tailored to suit the specific preferences
- An example is *App.net*:
  - This is a social network platform which competed with Twitter
  - The app is add-free but users must pay a small subscription each month
  - The app targets users who value privacy
    - Loss of privacy is a feature of free social media platforms that monetise their operations by collecting personal information and target advertising based on a users profile
  - The mission statement is:
    - "*We are selling our products, NOT our users*" (and) "*You own your own content*"

strategy selection (1)

- Porter advocates the selection of one of the strategies and sticking with it:
  - However: many disagree and point to the *digital age* where the five forces have been disrupted
- Many companies:
  - Have implemented hybrid models such as adopting the *best value* for the *lowest price*
  - Such a strategy contrasts with the *low-cost* approach because it encourages customers to compare:
    - The product value and it's features with the competition
    - A potential benefit of this approach is to counter destructive competition and price wars

strategy selection (2)

- Organisations can achieve a different type of success by building a large audience in a new market:
  - This route has been adopted by YouTube
  - The video platform attracted millions of people who wanted to share ‘homemade’ videos with others
  - The service was free to users and the funding came from venture capitalists
- Venture capitalists:
  - Invest in new companies
  - Their aim is to grow the company and sell it making a large profit
  - YouTube sold for over 40 times the venture capitalists investment
- YouTube:
  - Is now owned by Google and is monetised by advertising

The role of information systems in Strategy

information systems and strategy

- The strategies introduced all rely on information systems which in turn are critical to a companies competitive advantage:
  - For example: low-cost strategies often rely on automation in systems managing buyers and suppliers
  - Regardless of the strategy followed:
    - Costs can be reduced by automating back-office functions such as: *payroll*, *benefits*, *accounting*, *procurement*, *inventory tracking*, and *asset management*
    - Process management can reduce duplication
    - Efficiencies can be achieved by converting to self-service in *human resources*
    - Computerisation of repetitive manual processes reduces workload and increases efficiency and accuracy

information systems and transport

- IT support applies to every industry
- Consider transport:
  - The average IT spend is 3% of revenue but the funds are spent generally wisely
  - There is increasing use of freight trains given savings in labour and fuel costs
  - IS enable improved scheduling and co-ordination with cost savings and a reduction in accidents

FIGURE 2-16
The transportation industry takes advantage of information systems to coordinate cargo transfers.

new product launches

- The launch of a new differentiated product or service often relies on innovations in IT (not limited to high-tech companies)
- For example consider food shopping where shoppers are offered *smart* shopping trolleys with scanning devices scan a loyalty card and guide shoppers around the aisles:
  - The system can identify special sales and personalized recommendations
  - Scan purchases and calculate the bill saving shoppers time and improving the efficiency for the shop by automatically updating the inventory and placing orders as required
  - The system can collect data about the shopping preferences and send targeted ads
- There are clear benefits for both buyers (the shopper) and the company (the seller)

Information systems run, grow, and transform the business

business development

- What is the funds spent on IT used for? And how does it contribute to the corporate strategy?
  - Computers, laptops, tablets, mobile phones and other devices support productivity throughout the organisation and in every component in the value chain
- IT supports every department in a organisation including:
  - *Sales*, *finance*, *marketing*, *management functions*, and *human resources*
- Software applications support every component in the value chain to:
  - *Streamline processes*, *create customer friendly portals*, *and compiling reports* (e.g., assessing the effectiveness of marketing and sales campaigns)

investment in IT (Figure 2.17.)

- Figure 2.17.
- What is investment in IT actually spent on?
  - 66% is spent on IT in the running of an organization
  - 19% is spent on growing the business
  - 15% is spent on transforming the business model

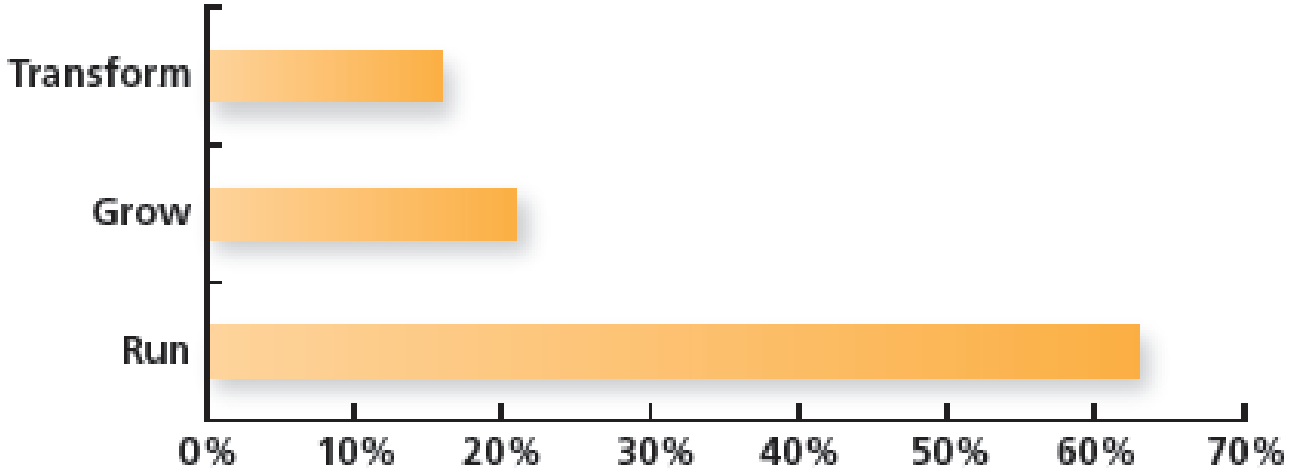


FIGURE 2-17
How do organizations spend their IT dollars?

organisation IT spend

- The costs identified in Figure 2.17.:
  - Are not discretionary but are required as organisations cannot operate without these functions and capabilities
  - There are ways to reduce such costs including:
    - Outsourcing help desks
    - Migrating systems to cloud-based solutions to leverage the power of the cloud-based systems and reduce in-house data center costs
    - A managers function is to look for such cost savings and efficiencies
- Following the *day-to-day* running of the business:
  - The strategic focus for the remaining budget lies in growing and transforming the business
  - This is important regardless of whether the business aims for:
    - *Cost of leadership*, *differentiation*, a *focused strategy*, or a *hybrid approach*

IT as a strategic enabler

- IT is not restricted to keeping the business running – IS can for example:
  - Facilitate a complete new business model
    - This was the case for eBay and Amazon (both organisations are data driven organisations supporting on-line sales)
- Figure 2.18.:
  - Identifies medical health records where:
    - The aim is to reduce healthcare costs while improving care by digitising patient histories
    - Adoption has been slower than expected
    - However, adoption is projected to improve in future

FIGURE 2-18
Electronic medical records.

Information systems and non-profit organisations

non-profit organisations (charities)

- Objectives that need strategic planning
  - volunteering
  - Fund raising
- Operational requirements
  - Similar requirements to commercial organizations
  - Emergency response
- Benefit from IS
  - Management information
  - Situational awareness
- Fund Raising
  - IS help manage donations
  - Reach worldwide audience
  - Learn about preferences and motivations

IS and non-profit organisations

- While *non-profit organizations* have no shareholders:
  - IS play a key role and *non-profit organizations* can benefit from strategic use of IS
  - Running, growing, and transforming the organization are relevant just as they are to the for-profit world, and information systems
  - In practice the operational requirements to run non-profits are similar to commercial businesses with IS used for:
    - *Payroll*, *accounting*, and *related tasks*
    - Some of the most innovative strategic uses of IS come from the non-profit world
  - Non-profit organisations include:
    - *charities*, *schools*, *grassroots projects*, *religious organizations*, *government agencies*, *self-help groups*, *medical assistance groups*, *social societies*, and many others
  - Reaching out to their constituencies is fundamental to most non-profit organizations and two areas that have benefited considerably from such innovations are:
    - *fund-raising* and *volunteer management*

Fund raising

fund-raising and non-profit organisations

- Many *non-profit organizations* rely on donations:
  - Specialized information systems help manage this critical activity
- while direct mail and telemarketing once dominated:
  - There is now a focus on on-line fundraising
  - In 4 years (for example) annual on-line donations for Chicago's YMCA increased from $450 to $24,000 (a jump of over 5,000%)
- Using the Internet technologies:
  - Even a small non-profit organisation can reach out to a worldwide audience
  - A case can be made using websites, social media, and support groups through the Internet
  - This approach can be both a fundraising activity and a case can be made for its mission and its goal of motivating people to help

fund-raising and non-profit organisations

- Non-profit organisations leverage IT and IS:
  - To learn about potential donors, their preferences, and their motivation:
- Non-profit organisations adopt a similar approach to the management of data and information to that implemented by Amazon
- Technology has become a vital component in the supply chain:
  - While there are buyers and sellers (charities require products and services) there is a role reversal in that: there is an analogy between sellers and contributors (*inputs*) and buyers and recipients of support (*outputs*)
- Opinion forms an important factor in fundraising (for example):
  - In a survey of over 6,500 people ages 20 to 35 it was found that this age group has high expectations about a non-profit's use of technology to encourage donations and attract volunteers
  - The majority said they preferred to learn about non-profits through websites, social media, or e-newsletters
  - They also made it clear they did not want to receive texts or voice calls from non-profit organisations

Volunteering

volunteering

- Attracting and retaining volunteers is a essential task for charities:
  - The efforts are similar to companies attracting and retaining customers
  - Commercial companies use *customer relationship management* (CRM) software and charities use a similar approach
- To publicise and manage the current projects:
  - Charities use IS and web-sites
  - Figure 2.19.: is a typical example of a charity project web site

FIGURE 2-19
VolunteerMatch.org helps volunteers find opportunities in their areas.

Information strategies and government

information strategies and Government

- The functions governments must accommodate include:
  - To handle operational requirements
- Citizens expect:
  - Cost-effective services
- The mission of government and state bodies:
  - To include projects with long-term benefits
- Information systems:
  - Provide the basis upon which information and policy can be disseminated to the general population

information strategies and Government

- Governments are similar to non-profit organisations to:
  - Run and manage day-to-day operational needs
  - Disseminate public information
  - Disseminate statutory, legal, and regulatory information
- Strategies are essential, for example:
  - The military needs ’real-time’ systems tp manage logistics
  - Law enforcement need access to extensive information systems
- An important area is:
  - How government strategies involve IS to develop services for citizens through research

information strategies and Government

- Increasing access and improving services to the public is a the aim of Government
- E-government has become the primary method of disseminating information and services which include:
  - Collecting tax (sales, personal and corporate)
  - Motor vehicle services and tax collection
  - Social services
- Funding research for technological innovation:
  - Governments are major funders of research
  - A strategic approach is often implemented and IS are an essential component in a strategic approach

smart meters

- A practical example of the use of IS in the ‘real-world’ is *smart meters*:
  - These Internet connected meters are used for energy and water etc.
  - Their use improves efficiency of operation by:
    - Sending meter reading automatically
    - Reducing the need for meters to be read by a human meter reader
    - Providing information to the consumer regarding energy use
  - Smart meters are:
    - The interface between the IS and a back-end database

FIGURE 2-20
Smart meters under development can monitor power transmissions in both directions so consumers can contribute power from their own sources to the grid.

Does I.T. Matter

why is IT and ICT important?

- In week #1 I introduced the course and why it is important to study data science and information systems:
  - It is clear that IT and ICT along with Internet driven systems is fundamental to all stakeholders in all areas of life
- For organisations of all types discussed in this chapter:
  - The effective use if IT and ICT will define a successful organisation and those doomed to fail
  - Investment in IT as discussed in this chapter is essential to maintain and improve service levels
  - The rapid technological and societal change demands effective networked IT systems backed by efficient database systems

why is IT and ICT important?

- In summary IT is important because:
  - Corporate advantage depends on IT and the type of IS
  - Funds to run business are commodity
  - Funds to grow and transform are more closely tied to strategy and advantage
  - The human element is critical for success

Levelling Up: a strategic analysis

Levelling Up!: a strategic analysis

- Read and review the *Levelling Up!* on-line simulation and consider the following questions:
  - How should we evaluate the industry Prakash and Dana are trying to enter and how does IT fit into their strategy?
  - How can we describe the supply chain and extended supply chain Prakash and Dana are creating?
  - How can we describe the value chain Prakash and Dana are creating?
- Apply the subjects and topics introduced in Chapter #2 to the *Levelling Up!* on-line simulation and answer the three questions

Levelling Up!

MyMISLab | *Online Simulation*

Leveling UP!

A Role-Playing Simulation on Business Strategy for a New Smartphone App

Prakash and Dana asked you to help them brainstorm the strategic direction for their new company, *Leveling UP!* Your SAT. As this chapter described, their idea is to create a smartphone application that will help high school students practice SAT questions and master the techniques they need to do well on such high stakes tests. The app will draw on the compelling features of games, though, with rewards, fast-paced action, competition, and special ringtones to indicate advancing levels of mastery, similar to what happens in some of the most popular action and playing games.

Sound like fun? It's a business, though, so you'll need to think about how a company like this with a novel idea can survive, surrounded by very powerful competitors that dominate the industry.

They'll be contacting you with more information, so log in when you're ready.

Chapter #2 summary, case studies, and Week #2 coursework

week #2 coursework

- The coursework and reading for week #2:
  - Read and understand subjects and concepts introduced in Chapter #2
  - Learn the meanings of the key terms and concepts introduced
  - Read and work through:
    - The *Levelling Up!* Exercise
    - The (two) case studies
  - At the end of the chapter you will find:
    - Chapter review questions
    - Projects and discussion questions
    - Application exercises
    - Work through these to understand the subjects and concepts in Chapter #2

CHAPTER 2

Chapter Summary

LEARNING OBJECTIVES

1. The nature of competition in the industry forms the context for every company's strategy, and Michael Porter's model describes the five forces that shape an industry's competitive structure. They help determine how profitable companies operating in the industry will be, and they include (1) the threat of new entrants, (2) the power of buyers, (3) the power of suppliers, (4) the threat of substitute products, and (5) rivalry among competitors.

2. In addition to the strategies of the companies themselves, many external factors affect how the five forces operate. Disruptive innovations, for example, can transform entire industries through the process of creative destruction. Government policies can also affect industry competition through legislation, regulation, and court decisions. Industries that operate in a larger ecosystem are affected by the development of complementary products and services that accelerate trends. In addition, environmental events such as pandemics or earthquakes can reshape industries and call for changes in strategy.

3. Organizations can use the value chain model to understand their options as they strive to compete in an industry. Primary activities (bringing in raw resources, making the product, marketing, delivery, and customer support) and support activities form the major components of the value chain. The extended value chain, which includes suppliers and customers, offers more strategic opportunities. Benchmarks are used to compare a company's performance to industry standards on components of the value chain.

4. Competitive strategies include low cost leadership, product differentiation, and a focused niche strategy for a particular market segment. Information systems support all these approaches by reducing costs, streamlining processes, and adding unique value with new products or features. Their role includes running the organization and, as a strategic enabler, growing and transforming the organization.

5. Nonprofits take advantage of information systems to manage basic operations, and also as a strategic enabler in areas such as fund-raising and volunteer management. Governments use information systems extensively for e-government initiatives, especially to increase access and enhance services for the public. Governments are also deeply involved in funding initiatives that offer potential value for the country, but that may be too risky for private investors. Examples include the research that led to the Internet and funding for alternative energy.

6. As technologies become commodities, and become widely used by almost all organizations, their strategic value diminishes. The information systems used to "run" organizations, in particular, are readily available and managers should focus on reducing their cost. However, innovative information systems in which creative people leverage technology to grow and transform the organization are critical for effective strategy.

KEY TERMS AND CONCEPTS

threat of new entrants
network effects
switching costs
power of buyers
power of suppliers
threat of substitutes
rivalry among existing competitors
disruptive innovation
sustaining technologies
creative destruction
ecosystem
value chain model
primary activities
support activities
benchmark
low cost leadership strategy
product differentiation strategy
focused niche strategy
strategic enabler
e-government

CHAPTER REVIEW QUESTIONS

2-1. What are the five competitive forces that shape industry competition? How are these forces interrelated?

2-2. How do disruptive innovations, government policies, complementary products and services, and environmental events affect how the competitive forces operate?

2-3. What are the components of the value chain? Which components comprise the primary activities? Which components comprise the support activities? What is the extended value chain?

2-4. What kind of e-initiatives do governments usually employ?

2-5. How do information systems apply to competitive strategies for business?

2-6. How are information systems used to run, grow, and transform a business?

2-7. How are information systems used for fund-raising and volunteer management in nonprofits?

2-8. Why is government funding vital in conducting research for technological innovations in information systems?

PROJECTS AND DISCUSSION QUESTIONS

2-9. Although many people think electronic book readers are too expensive, there is a massive global demand for the devices, and the trend is likely to continue for some time. Search the web to learn more about how digital technology has disrupted the book publishing industry, and prepare a 5-minute presentation of your findings.

2-10. Is a value meal related to a value chain? The value that attracts more than 60 million customers to McDonald's every day comes from capabilities that are based in its value chain. Briefly describe McDonald's value chain and discuss how information systems facilitate each component in the chain. Can you think of a way that information technology could improve your next trip to McDonald's?

2-11. Information technology enables nonprofit organizations to reach out to constituents 24 hours a day, 7 days a week. Visit www.redcross.org and note the various ways this charity is using its website to communicate with volunteers, donors, and people who need assistance. Compare the Red Cross site to your university's alumni association website. Prepare a brief summary of your findings that includes a list of specific services provided on each site. How does each website support the organization's strategic goals?

2-12. Government agencies and corporations have similar information needs. Identify and briefly discuss specific examples of information systems typically used by a law enforcement agency such as a state or local police department. Which of these systems are used to "run" the business? Which are used to fulfill the agency's mission?

2-13. What are the three basic strategies that companies adopt to compete? Describe how information systems support each strategy. What is a "hybrid" strategy? Describe a company, product, or service that adopts each of these four competitive strategies.

2-14. What are network effects? Search the web or visit websites such as Eversave.com and AmazonLocal.com and discuss how network effects can impact the threat of new entrants. Is there an Eversave offering or an AmazonLocal deal in your hometown? How would you describe the long-term value proposition of this online shopping phenomenon? In your opinion, are there any disadvantages for an organization that offers a daily deal?

2-15. In 2011, the U.S. federal government collected approximately $2.3 trillion in taxes, including individual income taxes, Social Security/Social Insurance taxes, and corporate taxes. Visit www.irs.gov and describe how this website enhances services to the public. What types of services are available to individuals? To businesses? To charities and nonprofit organizations? What kind of "tax information for students" does this site provide? Prepare a 5-minute presentation of your findings.

2-16. Why are IT resources described as a commodity? How do IT resources "matter" in terms of the different roles they play in an organization? Which component of an information system is most critical to success in growing and transforming the business? Why?

2-17. According to the Computer History Museum (www.computerhistory.org), the Kenbak Corporation sold the first personal computer in 1971. Since then, several billion PCs have been sold under various brand names. Currently, HP, Dell, Acer, Lenovo, and Asus are the leading brands in the highly competitive PC market. Work in a small group with classmates to analyze and describe the personal computer industry using the five competitive forces model.

2-18. Work in a small group with classmates to discuss how information technology plays a role in the competitive environment of your college or university. How do you describe the competition to attract and retain students? How do you describe the threat of substitutes in higher education? How does the threat of substitutes affect supplier power in education?

APPLICATION EXERCISES

2-19. EXCEL APPLICATION: IT Benchmarks

Jay's Bikes is a family-owned and operated business that stocks a wide range of bikes designed to fit the needs of professional riders, your child's first bike, and everything in between. The business has 12 full-time employees. Jay has asked you to create a spreadsheet from the data in Figure 2-21 to calculate average IT spending so that it can be compared to the retail industry average. What is the average IT spending in the retail industry? What is the average IT spending per employee in the retail industry? How do Jay's IT expenditures compare to the industry averages? How much would Jay need to increase spending in order to match the retail industry average?

FIGURE 2-21
Jay's Bikes revenue and IT expenditures.

	A	B	C
1	Revenue	Apparel & shoes	$ 1,250,000
2		Bike accessories	$ 550,000
3		New bikes	$ 2,650,000
4		Used bikes	$ 18,500
5		Bike repairs	$ 33,000
6			
7	IT Expenditures	Hardware	$ 15,000
8		Software updates	$ 18,000
9		Software licenses	$ 4,500
10		Software support	$ 4,500
11		Employee training	$ 5,000
12		Web site development	$ 5,000
13		Internet access	$ 1,200

2-20. ACCESS APPLICATION: Telethon Call Reports

The volunteer coordinator of the Downtown Emergency Shelter has asked you to use the information provided in Figure 2-22 to create an Access database. (You can download the Excel file called Ch02Ex02 and import the data into your database.) The coordinator will use the database to manage donor records and help the Shelter prepare for an upcoming Phonathon fund-raising event. During the Phonathon, volunteers will call previous donors to ask for donations to this year's fund. Your instructions are to create two tables (donors and volunteers) and prepare a Phonathon Call Report for each volunteer. The shelter manager wants you to add three fields to the donor table: this year's contribution, a calculated field that shows the average contribution per employee, and a calculated field that shows a target contribution that is 5% higher than last year's contribution. The report should list the volunteer's name and number, as well as the following donor information: donor number, donor name, company name, phone number, contribution amount from the prior year, number of employees, average contribution per employee, and target contribution for this year. Although address information will not be included on the report, that information will be used to send receipts to the donors at the conclusion of this year's fund-raising event.

FIGURE 2-22
Phonathon data.

E-PROJECT 1 Identifying Company Strategy with Online Financial Chart Tools

One useful way to catch up on a company's strategy is to check out trends in its stock price, and the net offers many free tools. Go to Google's finance website (www.google.com/finance) and type the stock ticker symbol for GameStop (GME) into the search bar to pull up current news about the company, including a graph of its share prices, from Google finance.

2-29. The letters on the graph tie into the news stories, and some of them have major effects on the company's stock. Change the graph to show 1 year of data by clicking 1y at the top left of the graph. Do you see any sudden changes in share price paired with a news story? Does the news shed light on how investors view its strategy or the execution of it?

2-30. One way to get an idea of how well the company is doing is to compare the trend in its share prices to the Dow Jones Industrial Average. Check the box next to Dow Jones at the top of the graph and compare the trends. How does GameStop's performance compare?

E-PROJECT 2 Analyzing Movie Download Times with Excel

In this e-project, you will obtain and analyze information about download times to assess Internet connectivity.

2-31. Download the file called CH02_MediaDownloads. This file shows the approximate file sizes for different kinds of media, along with estimated download times.

2-32. Add a column called Speed Advantage and enter the formula that shows how many times faster the download will be if one uses fast broadband (+d2/+c2). Copy the formula to the remaining rows, and then add a row at the bottom called "AVERAGE." On average, how much faster is it to download media files using fast broadband compared to regular broadband?

2-33. Add two more columns called Download Time per MB (Fast Broadband) and Download Time per MB (Regular Broadband). Compute these values by dividing the appropriate download time by the file size in MB, and add the average at the bottom.
   a. What is the average download time per MB for fast broadband?
   b. For regular broadband?

2-34. Download the video file called CH02_TestVideo and time how long it takes.
   a. What is the file's size in MB? If the file size is represented in gigabytes (GB), multiply that number by 1,000 to convert to megabytes (MB).
   b. Using the average download times you computed, what should be the download time using fast broadband? What would it be for regular broadband?
   c. How does your download time compare to these estimates? Do you have fast broadband, regular broadband, or something else?

Case Studies (Chapter #2)

- The *GameStop* case study considers:
  - GameStop business model
  - Rivalry among competitors
  - Barriers to entry
  - Power of suppliers
  - GameStop's response to opportunities and threats (e.g., on-line competition)
- The *Open Internet* case study addresses:
  - Net neutrality
  - Position of content providers
  - Position of telecom companies
  - Proposal
  - Criticism of proposal

CASE STUDY #1

Can GameStop Survive with Its Brick-and-Mortar Stores?

With more than 6,600 stores throughout the United States, Australia, Canada, and Europe, GameStop's management team wants to be the premier destination for gamers. The Texas-based retail chain's major source of revenue is the sale of games, consoles, and other equipment, both new and used. The used market is important because it brings customers into the store to trade in their old games and consoles for store credits. GameStop resells the used games for more than twice what it pays for them.

The business model has, so far, survived the Internet's creative destruction that swept away other brick-and-mortar outlets selling digital products, including Egghead Software and Tower Records. But competition is intense in this industry.

One major rival is Best Buy, which offers customers a chance to trade in their old games for gift cards that can be used at any Best Buy store. Unlike GameStop's store credit, the Best Buy cards can be used to purchase TVs, computers, music, and any other Best Buy merchandise.

Another threat comes from the game developers, who fume about used-game sales because they earn no royalties. To counter used sales, many developers include a coupon with a new game so that purchasers can download special content or a game upgrade. GameStop has to charge people who buy used games a fee to get that coupon, and the total price approaches the cost of the new game. Developers will continue to find ways to combat used-game sales.

Online retailers like Amazon pose another threat, especially combined with price comparison websites that show up-to-the minute prices from different outlets. The free social games such as Farmville are also luring some gamers away from the costly titles featured at GameStop, such as Call of Duty and Madden.

In addition, widespread access to high-speed Internet has a downside for GameStop. Companies such as Electronic Arts and Blizzard can deliver major upgrades and sequels to their high-end games digitally, instead of packaging them into boxes for GameStop to sell. Customers can buy them online, directly from the publisher, rather than making the trip to the store.

GameStop counters these threats by revamping its business strategy and aggressively promoting its online store as a complement to the physical stores. Customers can buy new and used products online and also check out special trade-in deals before they visit the store. They also strive to increase switching costs through a well done loyalty program called PowerUP Rewards. Members earn points for every dollar they spend, but also for telling GameStop about the games they play and their preferences. They can exchange for gift cards, merchandise, restaurant and movie rewards, and subscriptions to gaming networks. The information GameStop collects about PowerUP members reveals just which promotions might work best for each customer, so the company can save money on marketing. The program also leads to more valuable customers who are far more likely to trade in games, open marketing emails, and buy products. Members spend on average $400 per year at GameStop.

Clearly, the company appreciates the dangerous strategic waters of other brick-and-mortar media companies, many of which have closed their doors due to competition. Sales and net revenue were declining as of 2013, but time will tell if GameStop's strategies will pay off.

Discussion Questions

2-21. Perform a five forces analysis of the online gaming industry. What are the implications of the five forces analysis for GameStop?

2-22. What role have information systems played in the five forces you identified?

2-23. How has GameStop used information systems to compete more effectively?

2-24. Identify who will be accountable for any product-related issue on GameStop's value chain.

Sources: Colbert, C. (2013). GameStop Corp. Hoover's Online Company Database, accessed April 4, 2013.
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Poggi, J. (April 9, 2012). GameStop revamps business to ensure success in a digital future. *Ad Age*, http://adage.com/article/cmo-interviews/gamestop-revamps-business-ensure-success-a-digital-future/233950/, accessed March 20, 2013.

CASE STUDY #2

The Open Internet Coalition and the Battle for Net Neutrality

Debates over how government should regulate the Internet's evolution heat up whenever anyone mentions "net neutrality." Here are the two sides of the debate:

The Case for *Net Neutrality*

This side argues that carriers selling Internet access—Verizon, AT&T, and Comcast, for instance—should not discriminate for or against different content providers or applications. All traffic should be routed neutrally, and the carriers should not make special deals to favor some content by giving it more bandwidth so movies will play more smoothly and web pages load faster. The Open Internet Coalition strongly supports net neutrality and includes dozens of companies that provide content over the Internet. Amazon, eBay, Google, Lending Tree, Facebook, Skype, Paypal, and Netflix are all members. The coalition also includes nonprofits that advocate for openness, such as the American Civil Liberties Union, American Library Association, and Educause.

The Case Against *Net Neutrality*

On the other side of the debate are the carriers—AT&T, Verizon, Comcast, and others. They argue that incentives are needed to encourage their investment in the network infrastructure, and that their networks have to be managed to provide the best service at reasonable costs. Video downloads, in particular, hog bandwidth to the detriment of other users who just want to read the news or send email. In fact, this issue gained considerable steam when Comcast began throttling download speeds for subscribers using BitTorrent, software widely used to download movies. Comcast's move, while helpful to most customers, was a violation of net neutrality.

Even though adherence to the net neutrality principle was voluntary, the Federal Communications Commission (FCC) reprimanded Comcast for what it considered an outrageous violation. Comcast sued, and the courts decided the FCC didn't actually have jurisdiction to reprimand anyone because the Commission has no authority over broadband communications. The FCC went on to establish rules supporting net neutrality anyway.

To no one's surprise, the carriers objected to the FCC's rules. Verizon filed a lawsuit in 2012, arguing that the FCC went way beyond its authority when it made rules about net neutrality, as the court determined in the Comcast case. Verizon also claimed that the rules violated the company's freedom of speech by taking away their control over their own property—their networks. Whether network traffic is "speech" is an interesting question, of course.

This somewhat technical topic attracts intense lobbying efforts targeting government agencies and politicians. The outcome will affect strategy for any organization with an Internet presence, and all the players have much at stake. Their members do not want the risk that carriers could disadvantage their content in favor of a competitor or make it cumbersome for customers to access their sites.

All businesses that have an online presence have a lot at stake, too, and so do consumers. If the carriers can make deals with some companies so that their pages load faster, big, cash-rich companies might have another edge over small businesses. Or, if your carrier favors traffic coming from Amazon Instant Video over Netflix, you might drop your Netflix subscription. On the other hand, your own web browsing would be slower if neighbors who share your cable connection are downloading movies 24 hours a day, and the cable company can't throttle them down.

The outcome of Verizon's lawsuit is an important ingredient in the Internet's future, and in the way governments treat the net's development. One outcome may be that lawmakers decide it's time to rewrite the 1996 Telecommunications Act, which will undoubtedly spur debates for years to come.

Discussion Questions

2-25. What are the strategic interests of carriers? What are the strategic interests of websites?

2-26. How do the interests of carriers differ from the interests of websites? What are the implications for websites from a value chain perspective?

2-27. What is the basis for Verizon's lawsuit against the Federal Communications Commission? Why did they claim a violation of free speech?

2-28. Discuss the impact of complementary products and services, government policies, and environmental effects on how competitive forces operate.

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