CHAPTER TWO
DECISION MAKING AND BUSINESS PROCESSES

Decision making and problem solving encompass large-scale, opportunity-oriented, strategically focused solutions. Students today must possess decision-making and problem-solving abilities to compete in the e-Business world. Organizations today can no longer use a "cook book" approach to decision making. This chapter focuses on technology and the development of business processes that make decisions, solve problems, and find new innovative opportunities including:

- Transaction Processing Systems
- Decision support systems
- Metrics for measuring decisions success
- Executive information systems
- Artificial intelligence (AI)
- Business process improvement
- Business process reengineering
- Business process modelling
- Business process management

SECTION 2.1 - DECISION-MAKING AND INFORMATION SYSTEMS

- Decision Making
- Transaction Data and Analytical Information
- Measuring Decision Success
- TPS, DSS, and EIS
- Artificial Intelligence
- AI VS TPS, DSS and EIS

SECTION 2.2 - BUSINESS PROCESSES

- Understanding the Importance of Business Processes
- Business Process Improvement
- Business Process Reengineering
- Business Process Modelling
- Business Process Management
- Business Process Modelling Examples

LEARNING OUTCOMES

2.1 Explain the difference between transactional data and analytical information and between OLTP and OLAP.

OLTP is the capturing of transaction and event data using information systems to (1) process the data according to defined business rules, (2) store the data, and (3) update existing data to reflect the new data entered. During OLTP, the organization must capture every detail of transactions and events. Transactional information from an OLTP encompasses all of the information contained within a single business process or unit of work, and its primary purpose is to support the performing of daily operational tasks. Examples of transactional information include withdrawing cash from an ATM or making an airline reservation.

OLAP is the analysis of summarized or aggregated information sourced from transaction processing systems data, and sometimes external information from outside industry sources, to create business intelligence in support of analytical and strategic (non-operational) decision making. Analytical information from an OLAP encompasses all organizational information, and its primary purpose is to support the performing of managerial analysis tasks. Examples of analytical information include trends, sales, and product statistics.

2.2 Explain how organizations use TPS, DSS, and EIS to make decisions and how each can be used to help make unstructured, semistructured, and structured decisions..

- Transaction processing system (TPS) - A transaction processing system (TPS) is the basic business system that serves the operational level (analysts) in an organization. The most common example of a TPS is an operational accounting system such as a payroll system or an order-entry system. TPS's lead to structured decisions as there are established processes to make decisions.
- Decision support system (DSS) – models information to support managers and business professionals during the decision-making process. DSS's support medium term decisions or semistructured decisions as there are some established processes as to how these decisions are made.
- Executive information system (EIS) – a specialized DSS that supports senior level executives within the organization. As EIS systems support strategic decisions they make unstructured decisions as there are no existing procedures or rules to making long-term decisions.

2.3 Describe what AI is and the four types of artificial intelligence systems used by organizations today.

AI simulates human intelligence such as the ability to reason and learn. AI systems can learn or understand from experience, make sense of ambiguous or contradictory information, and even use reasoning to solve problems and make decisions effectively.

The four most common categories of AI include:

1. Expert systems – computerized advisory programs that imitate the reasoning processes of experts in solving difficult problems
2. Neural Networks – attempts to emulate the way the human brain works
3. Genetic algorithm - system that mimics the evolutionary, survival-of-the-fittest process to generate increasingly better solutions to a problem

4. Intelligent agents – special-purposed knowledge-based information system that accomplishes specific tasks on behalf of its users

2.4 Describe how AI differs from TPS, DSS and EIS.

AI systems offer a different approach to helping organizations make better decisions than traditional TPS, DSS, and EIS. AI systems, by their definition, are intelligent systems designed to provide answers to problems and determine the best decision to make. This is in contrast to the TPS, DSS, and EIS class of systems discussed earlier where the purpose of those systems is to support end-users in their decision-making, as opposed to making decisions for them. With TPS, DSS, and EIS, data and information are provided to the user and it is up to the user to interpret that data and information and make a decision. With AI, these systems render the decision to be made and provide it to the user.

2.5 Describe the importance of business process improvement, business process reengineering, business process modelling, and business process management to an organization and how information systems can help in these areas.

Each of the areas are different and lend themselves different to a business but each is important in allowing an organization to define and create business processes. Together they act to allow organizations to develop effective and efficient business processes

- Business process improvement attempts to understand and measure the current process and make performance improvements accordingly.
- Business process reengineering (BPR) is the analysis and redesign of workflow within and between enterprises. BPR relies on a different school of thought than business process improvement.
- Business process modelling is the activity of creating a detailed flow-chart or process map of a work process showing its inputs, tasks, and activities, in a structured sequence.
- Business process management (BPM) integrates all of an organization's business process to make individual processes more efficient.

Information systems not only contain the information that helps organizations understand and measure business processes but are also used in carrying out many business processes.

If your students are unfamiliar with business processes have them review plug-in T12 – Business Processes for a detailed look at common business processes, business process modeling, continuous improvement, and business process reengineering.

SECTION 2.1
DECISION-MAKING AND INFORMATION SYSTEMS

What is the value of information? The answer to this important question varies depending on how the information is used. Two people looking at the exact same pieces of information could extract completely different value from the information depending on the tools they are using to look at the information. This chapter discusses technologies that people can use to help make decisions and solve problems.

CLASSROOM OPENER

GREAT BUSINESS DECISIONS – Walt Disney Decides to Call His Mouse Cartoon Character Mickey, not Mortimer

Sunday, November 18, 1928, is a historic moment in time since it is the day that the premier of *Steamboat Willie* debuted, a cinematic epic of seven minutes in length. This was the first cartoon that synchronized sound and action.

Like all great inventions, Mickey Mouse began his life in a garage. After going bankrupt with the failure of his Laugh O Gram Company, Walt Disney decided to rent a camera, assemble an animation stand, and set up a studio in his uncle's garage. At the age of 21, Walt and his older brother Roy launched the Disney Company in 1923. The company had a rocky start. Its first film, *Alice*, hardly made enough money to keep the company in business. His second film, *Oswald the Rabbit*, was released in 1927 with small fanfare. Then Disney's luck changed and in 1928 he released his seven minute film about a small mouse named Mickey. Disney never looked back.

The truth is Mickey Mouse began life as Mortimer Mouse. Walt Disney's wife, Lilly, did not like the name and suggested Mickey instead. Walt Disney has often been heard to say, "I hope we never lose sight of one fact – that this was all started by a mouse."

Would Mortimer have been as successful as Mickey? Would Mortimer have been more successful than Mickey? How could Walt Disney have used technology to help support his all-important decision to name his primary character? There are many new technologies helping to drive decision support systems, however it is important to note that some decisions, such as the name of a mouse, are made by the most complex decision support system available - the human brain.

CLASSROOM EXERCISE

Building Artificial Intelligence

The idea of robots and artificial intelligence is something that has captured people's attention for years. From the robots in Star Wars to the surreal computer world in the Matrix, everyone seems to be fascinated with the idea of robots.

Break your students into groups and challenge them to build a robot. The robot can perform any function or activity they choose. The robot must contain a digital dashboard and enable decision support capabilities for its owner. Have the students draw a prototype of their robot and present

their robot to the class. Have your entire class vote on which robot they would invest in if they were a venture capital firm.

CORE MATERIAL

The core chapter material is covered in detail in the PowerPoint slides. Each slide contains detailed teaching notes including exercises, class activities, questions, and examples. Please review the PowerPoint slides for detailed notes on how to teach and enhance the core chapter material.

OPENING CASE QUESTIONS

Information Systems are Central at Grocery Gateway

1. **What information systems are used at Grocery Gateway to help them make decisions? Would you classify these systems as TPS, DSS, or EIS?**
   - The web site acts as a TPS as it supports customer transactions.
   - Logistic Management System is a mostly a DSS with some aspects of an EIS incorporated into it as analyzing some of its data can lead to strategic decisions.

2. **How do these systems support operational, managerial or strategic level decisions?**
   TPS collect operational data that allows the organization to fulfill daily operations such as the web site which collects customer orders which in turn cause Grocery Gateway to need to make decisions about products, deliveries, etc. The logistics management system also fulfill some operational decisions as it allows for decisions around deliveries, routes, and other operational issues involved with deliveries. It also allows for decisions around become more efficient in routing and deliveries from analyzing the data and in turn can lead to strategic level decisions around deliveries and even web site strategies and changes.

3. **What steps could the company take to leverage the transactional data that is collected by the information systems outlined in the case to help make managerial and strategic decisions for the company?**
   The company can start to use different types of analysis on the data to help them make analytical and strategic decisions for the company. The types of analysis include:
   Sensitivity Analysis
   What-if Analysis
   Goal Seek Analysis

   These analyses can then be tied to digital dashboards for more instantaneous access to the analysis and give Grocery Gateway information on items like the market pulse, customer service and cost drivers.

4. **Identify a few key metrics that Grocery Gateway marketing executives might want to monitor.**
   Grocery Gateways customers are generally busy people with not enough time on their hands want an easier and quicker way of doing their chores. Also, people who are physically challenged and find shopping difficult, or those who do not own a car can find this service beneficial. Some key metrics might be:
   - Best-selling product
   - Worst selling product
   - Date of highest sales per month

- Date of worst sales per month
- Correlation between product sales
- Distance to nearest grocery outlet
- Sales by region
- Sales by season
- Time to delivery of goods

SECTION 2.2
BUSINESS PROCESSES

This section provides an overview of business processes and how they are develop or made more effective through business process improvement, business process reengineering, business process modelling, business process management, and finally gives some business process modelling examples.

CLASSROOM OPENER

GREAT BUSINESS DECISIONS – Richard Sears Decides to Sell Products through a Catalogue

Sears Roebuck changed the shape of an entire industry by being lucky enough to discover a huge untapped market that lay waiting to be discovered. In the 1880s about 65 percent of the population (58 million) lived in the rural areas. Richard Sears lived in North Redwood, Minnesota, where he was an agent at the Minneapolis and St. Louis railway station. Sears began trading products such as lumber, coal, and watches, when the trains would pass through. Sears moved to Chicago in 1893 and partnered with Alvah C. Roebuck, and the Sears & Roebuck Company was born. The company first published a 32-page catalogue selling watches and jewellery. By 1895 the catalogue was 532 pages long and included everything from fishing tackle to glassware. In 1893 sales reached $400,000 and by 1895 sales topped $750,000.

Sears invented many new marketing campaigns and concepts that are still in use today, including a series of rewards (or loyalty programs) for customers who passed copies of the catalogue on to friends and relatives. Sears was one of the first companies to recognize the importance of building strong customer relationships. Sears' loyalty program gave each customer 24 copies of the catalogue to distribute, and the customer would generate points each time an order was placed from one of the catalogues by a new customer. The Sears catalogue became a marketing classic. It brought the world to the isolated farms and was a feast for the new consumers. The entire world was available through the Sears catalogue, and it could be delivered to the remotest of doorsteps.

CLASSROOM EXERCISE

Reengineering a Process

There is nothing more frustrated than a broken process. Ask your students to break into groups and discuss examples of broken processes that are currently causing them pain. The process can be a university process, mail-order process, Internet-order process, return merchandise process, etc. Ask your students to agree on one of the broken processes and to reengineer the process. Students should diagram the "As-Is" process and then diagram their "To-Be" process. Bring in a large roll of brown package wrapping paper and masking tape. Give each group two large pieces of the paper and ask them to tape the paper to the wall. These make for great "As-Is" and "To-Be" process maps.

CORE MATERIAL

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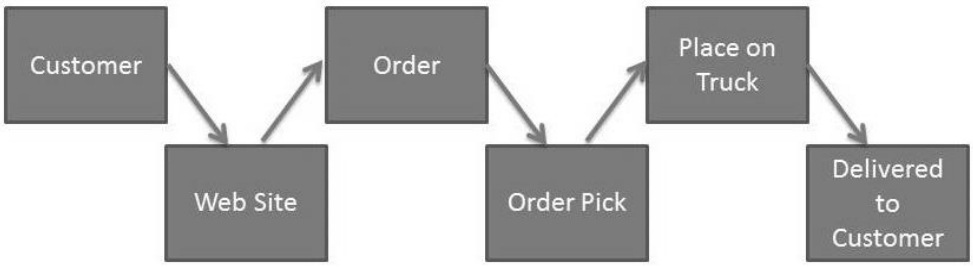
OPENING CASE QUESTIONS

Information Systems are Central at Grocery Gateway

5. What does Grocery Gateway's customer order process look like?



6. Describe how Grocery Gateway's customer Web site supports Grocery Gateway's business processes.

The web site allows customer to access its products 24 hours a day, 7 days a week in a simple way. Besides supporting online merchandising, single item picking, home delivery operations, and customer service it also allows them to use the web site to retain customers.

7. Describe how Descartes' fleet management software improved Grocery Gateway's logistics business processes.

Some business improvements experienced by Grocery Gateway include reduced delivery time by 14 percent, and increasing the stops per hour for delivery trucks by 12.4 percent. They have also improved the ordering processes and delivery mechanisms, and gained a solid and repeating customer base.

8. How does the business process affect the customer experience? The company's bottom line?

There are numerous benefits Grocery Gateway could offer its members including additional discounts for frequent shopping, menu planning, foods tailored to specific dietary needs only available to Grocery Gateway members, a Grocery Gateway calendar featuring Grocery Gateway coupons and only available for sale to Grocery Gateway members, and even recipes and online cooking tips for different kinds of foods.

9. What other kinds of information systems could be used by Grocery Gateway to improve its business processes?

Answers will vary and could include a number of different kinds of information systems. Some suggestions include:
Customer Relationship Management Systems –
Supplier Relationship Management Systems –
Employee Relationship Management Systems –

10. Comment on the need for integration between the various types of information systems at Grocery Gateway. What benefits from integration do you see for the company's

various business processes? What challenges do you think will exist in facilitating such integration?

There needs to be a great deal of integration of the systems as not only do the products that customers are ordering need to be available for delivery, the time windows that customers request deliveries in must be integrated not only into the delivery schedule but also the routing. The benefits are many and Grocery Gateway is already seeing some of these benefits such as the optimization of delivery routes which result in better customer satisfaction and cost savings. The 14% improve in on-time delivery and the 12.4% increase in yearly paid stops per paid hours, are a metrics that show these benefits. The challenges are also great and start with the need to bring employees together to develop the "As-Is" model and the "To-Be" plans so that the integration is possible in the first place. The other major challenge is that the project of integrating business processes is very large.

APPLY YOUR KNOWLEDGE PROJECTS

Try one of the following Apply Your Knowledge projects to engage students and reinforce chapter material and concepts

Project	Project Type	Focus Area	Skill Set
Measuring Efficiency and Effectiveness	Business	Performance Measurement	Efficiency and Effectiveness Metrics
Discovering Reengineering Opportunities	Business	Business Processes	Business Process Improvement and Reengineering
Dashboard Design	Business	EIS	Digital Dashboard
Modelling a Business Process	Business	Business Processes	Business Prccess Modelling
Revamping Business Processes	Business	Business Processes	Business Process Modelling
Revamping Accounts	Business	Business Processes	Business Process Management
Groove City Process	Business	Business Processes	Business Process Modelling

CHAPTER TWO
CLOSING MATERIAL

CLOSING CASE ONE
Information Systems are Critical for Take-Off in Canada's Airline Industry

1. **What advantages are there for an airline to use a revenue management system?**
   Revenue management systems are used to maximize revenue generated on every flight by forecasting the demand for a flight at various fare levels based on historical demand. Without a revenue management system airlines could not optimize the flights because, given that airlines like Air Canada carry over 20 million passengers each year, it is not possible to do forecasting by hand.

2. **Are revenue management systems a competitive advantage or simply a new necessity for doing business in the airline industry today?**
   Airlines such as Air Canada, WestJet, Air Ontario and Air Toronto know that it is necessary to use information technology to plan and schedule their flights. Because so many airlines have invested very heavily in this type of technology, it is no longer a competitive advantage to a business, but simply a necessity for the airline industry today. However, innovative uses of the technology, such as loyalty programs for frequent flyers, may allow an airline to gain a competitive advantage over the other airlines.

3. **What type of decisions could a revenue management system be used to help make?**
   An airline's revenue management system can be used to support decisions being made because it will provide information on the preferences of customers for timing and destination of flights, the time between booking and the flight, and other buying patterns.

4. **Is a revenue management system a TPS, DSS, or an EIS?**
   A revenue management system is all of these systems since it not part of the collection of transactional data but more importantly it is a DDS and EIS that help airline make critical decisions like those mentioned in the previous question.

5. **Would the revenue management system described in the case contain transactional data or analytical information?**
   Airlines can us their innovative IT systems to gain valuable business intelligence into their customer information. They conceived and rolled out hugely successful frequent flyer programs, which increased the likelihood that frequent business travelers, their most profitable customers, would fly with them instead of with a competitor. Frequent flyer programs require sophisticated computer system to properly account for and manage the flight activity of millions of customers. Ultimately, frequent flyer programs became an entry barrier for the industry because all airline companies felt they could not compete for the best customers without having their own frequent flyer systems.

6. **What types of metrics would airline executives want to see in a digital dashboard?**
   Airline executives could use throughput and speed efficiency metrics to baseline and benchmark its gate and boarding applications. They could also use usability and customer satisfaction effectiveness metrics to determine the satisfaction in its gate and boarding applications. The dashboard could also contain information on market pulse, customer service, and cost drivers. It should also allow for sensitivity analysis, what-if analysis, and goal-seeking analysis.

7. **How could AI enhance the use of an airline's revenue management system for decision support?**

   Students can answer this question in a number of ways but the key item is that the answer deals with adding reasoning to the management systems. Examples may include automatic decisions on passenger loads to the customer web site.

CLOSING CASE TWO
Leveraging the Power and Avoiding the Pitfalls of BPM

1. **How can BPM help improve global outsourcing? Records management? Supply Chain Management?**
   BPM can help improve global outsourcing by helping in making decisions about which jobs to outsource and which jobs to keep local. With records management it can help by linking records management to the business process so that records are created at the start of the process, maintained in the state they need to be in during each stage process and disposed of at the end of the process. With supply chains it can be used to more tightly integrate all the process and application need to create and maintain a tightly integrated supply chain.

2. **What other business activities are excellent candidates for BPM?**
   Other business processes that are excellent candidates are:
   - Project scope estimation
   - Business case sign-off
   - Project sponsorship identification
   - Project stakeholder management
   - Document and design "As-Is" business models
   - And the list goes on

3. **Which of the five pitfalls mentioned above do you think is the most important? Why?**
   Answers will vary here but make sure the student justifies their choice in the answer they give.

4. **Which of the five pitfalls mentioned above do you think is the most common pitfall that organizations face when undergoing BPM? Why?**
   Again answers will vary here depending on their experience but again make sure the answer is justified with the why part of the answer.

5. **What is the advantage of treating BPM as a project, as opposed to some other type of business activity?**
   The advantage of treating BPM as a project rather than another type of business activity is that if one looks at the five common pitfalls an organization faces when undergoing BPM are

commonly found in project and thus there has been the development of the project management approach to help prevent some of these pitfalls. Thus, using a project management approach and treating BPM as project rather than another type of business activity may alleviate some of the pitfalls.

CLOSING CASE THREE

Improving Business Processes at UK's Woburn Safari Park

1. **What were the benefits of creating "As-Is" models of current business processes at WSP?**
   Answers may vary. The main benefit is the understanding of the current business processes that are actually being used as the basis for the "To-Be" Plan. It also involves the employees in the process and could rally buy-in for the new process that came out of the exercise.

2. **How did information systems help identify problem areas in the feed logistics process?**
   It identified the inefficiency and waste produced by delivering the feed to one location for storage and then moving the feed to the animal encounter areas for the actual feeding.

3. **How did information systems help improve the management of feed logistics?**
   Instead of delivering feed to two warehouses the feed is now delivered to the feeding areas. The information system showed the improvement as a metric which was a savings of £4600.

4. **Are information systems necessary for business process improvements? Explain.**
   Answers may vary but the students should point out that information systems help business process improvements by attaching data to the changes and thus the ability to measure the benefits. Also students should discuss that in today's business environment business processes can be very complex and actually measuring improvements often require information systems.

MAKING BUSINESS DECISIONS

Instructor Note: There are few right or wrong answers in the business world. There are really only efficient and inefficient, and effective and ineffective business decisions. If there were always right answers businesses would never fail. These questions were created to challenge your students to apply the materials they have learned to real business situations. For this reason, the authors cannot provide you with one version of a correct answer. Be sure to focus on their justification or support for their specific answers when grading your students' answers. A good way to grade these questions is to compare your student's answers against each other.

1. **MAKING DECISIONS**
   Project Purpose: To understand benefits and risks of decision making
   Potential Solution: The biggest benefit of a good decision is the ability to provide a solid solution to a business problem. The biggest risk of a bad decision is increased cost, wasted time, and a failed business. Student's reports should highlight how information technology can enable them to make better decisions.

2. **DSS AND EIS**
   Project Purpose: To understand the value gained by using decision-support tools.

Potential Solution: Dr. Rosen can use DSS systems to model all of the organizational information to support or reject his purchase decision. Dr. Rosen can use sensitivity analysis to study of the impact that changes in buying the new business will have on his current business. He can use what-if analysis to understand how economic conditions, professional reputation, and other competitors might affect his business in the future. He can use goal-seeking analysis to determine how much revenues will have to increase to offset the cost of the purchase.

3. **FINDING INFORMATION ON DECISION SUPPORT SYSTEMS**
Project Purpose: Finding additional information on DSSs.
Potential Solution: Student answers to this question will vary depending on which systems they research on the Internet. In general, their presentation should focus on how a DSS can help grow a small to medium sized business. Be sure your students answer what types of DSS systems are available for a small business, how they can be used in a small business, and the cost associated with the different DSS systems.