



# **Research Methodology**

## **Chapter Three: Technology and Business Research**

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# Information Needs of Business

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- **Data** is raw, unorganized facts that need to be processed. Data can be something simple and seemingly random and useless until it is organized.
  - ▣ **Example:** Each student's test score is one piece of data.
- **Information** - when data is processed, organized, structured or presented in a given context so as to make it useful, it is called information.
  - ▣ **Example:** The average score of a class or of the entire school is information that can be derived from the given data.

# Information Needs of Business

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- To run a business, useful, timely, accurate, reliable, and valid data are needed.
- Companies gather data from the external environment to assess market trends, competitive practices, and new products.
- Companies also gather data from internal areas such accounting, administration, budget, finance, sales, marketing, and human resources.

# Commonly used Technologies in Business Research

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Digital technology has come in handy for research, especially in collecting, storing, and analyzing data. These technologies include:

- The Internet
- The Intranet
- Electronic Mail
- Browsers
- Web Sites

# The Internet

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- The Internet is a worldwide system of computer networks in which users at any one computer can, if they have permission, get information from any other computer (and sometimes talk directly to users at other computers).
- It was conceived by the Advanced Research Projects Agency (ARPA) of the U.S. government in 1969 and was first known as the **ARPANet**.
- The original aim was to create a network that would allow users of a research computer at one university to "talk to" research computers at other universities.

# The Internet cont.

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- If we want industry information or published materials on any topic of interest, the Internet comes in handy.
- We can also conduct computer-interactive surveys very efficiently with large global audiences.

# The Intranet

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- An intranet is a private **network** that is contained within an **enterprise**.
- The main purpose of an intranet is to share company information and computing resources among employees.
- An intranet can also be used to facilitate working in groups and for teleconferences.
- For example, surveys can be easily conducted through the Intranet to assess employee morale or the popularity of benefit packages.



# Electronic Mail

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- The Internet also permits the exchange of **electronic mail** (e-mail), which has increasingly become the primary mode of business communication both within and outside the company.
- E-mail is inexpensive, almost instantaneous, and has the added advantage of guaranteed delivery subject only to the correctness of the e-mail address.
- Short surveys could also be conducted via e-mail.

# Electronic Mail cont.

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## Some of the advantages of using email include:

- **Price** - sending an email costs the same regardless of distance and the number of people you send it to.
- **Speed** - an email should reach its recipient in minutes, or at the most within a few hours.
- **Convenience** - your message will be stored until the recipient is ready to read it.
- **Permanent records** - a record can be kept of messages and replies, including details of when a message was received

# Electronic Mail cont.

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## Some potential disadvantages of using email include:

- ❑ **Spam** – undesired email that can overwhelm your email system unless you install a firewall and anti-spam software.
- ❑ **Viruses** - spreading through email attachments
- ❑ **Sending emails by mistake** - to the wrong person accidentally, potentially leaking confidential data and sensitive business information.
- ❑ **Data storage** - electronic storing space can become a problem, particularly where emails with large attachments are widely distributed.

# Browsers

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- A **browser** is an **application program** that provides a way to look at and interact with all the information on the **World Wide Web**.
- Browser software (like Google Chrome and Opera) allows even the nontechnical user easy access to and navigation through the web.

# Web Sites

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- A **web site** is a related collection of World Wide Web (WWW) files that includes a beginning file called a **home page**.
- Organizations create web sites to promote their image, communicate with customers, build relationships, share information, attract prospective customers, and ensure that they keep returning.

# Some Software Used in Business Research

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The following are some of the software programs that are used in the different areas of business.

1. Groupware (Collaborative software)
2. Neural Networks
3. CAM/CAD
4. Enterprise Resource Planning
5. Data Analytic Software Programs

# 1. Groupware (Collaborative software)

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- **Groupware** is a software that runs on a network so that teams can work on joint projects, and it allows employees from different departments to access data jointly.
- Groupware services can include the sharing of calendars, collective writing, e-mail handling, shared database access, electronic meetings with each person able to see and display information to others, and other activities.

## 2. Neural Networks

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- **A Neural Network** is a system of hardware and/or software patterned after the operation of neurons in the human brain.
- Neural networks – also called artificial neural networks – are a variety of deep learning technologies.
- Examples of applications of neural networks include handwriting recognition for check processing, oil-exploration data analysis, weather prediction and facial recognition.



### 3. CAD/CAM

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- **Computer-aided design (CAD)** is the use of computer systems to assist in the creation, modification, and optimization of design.
- Modern CAD Programs can improve the following:
  - ▣ Increase the Productivity of the Engineer
  - ▣ Improve the Quality of Design
  - ▣ Improve Communications through Documentation
  - ▣ Create a Database for Manufacturing

### 3. CAD/CAM cont.

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- **Computer-aided manufacturing (CAM)** is the use of computer software to control machine tools and related machinery in the manufacturing process.
- Its primary purpose is to create a faster production process and components and tooling with more precise dimensions and material consistency.

## 4. Enterprise Resource Planning

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- ***Enterprise Resource Planning (ERP)*** is a process by which a company manages and integrates the important parts of its business.
- An important goal of ERP software is to integrate business processes and facilitate the flow of information within an organization so business decisions can be data-driven.

## 4. Enterprise Resource Planning cont.

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- ERP software suites are built to collect and organize data from various levels of an organization and connect business activities across departments.
- In addition to saving time and money, an integrated approach to managing business processes ensures that everyone is working with the same data and watching the same key performance indicators.

# 5. Data Analytic Software Programs

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- There are many software programs available to ***obtain***, ***store***, and ***analyze*** raw data collected through surveys, including:
  - ▣ SPSS
  - ▣ SAS
  - ▣ Excel

# Other Applications in Technology

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- Handheld Devices
- Interactive Voice Technology
- Digital Whiteboards
- Group Videoconferencing
- Virtual Reality
- Linkage of PCs to Electronic Devices

# Information Systems and Managerial Decision Making

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- As organizations take on expanded functions and grow in size, it is important for them to be equipped with a good information system from which data can be accessed for analysis by managers at different levels.
- The following are some of the aspects used within this context:
  - ▣ Data Warehousing
  - ▣ Data Mining
  - ▣ Operations Research (OR)

# Data Warehousing

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- **Data warehousing** is the electronic storage of a large amount of data by a business.
- Typically, a data warehouse is housed on an enterprise **mainframe** server or increasingly, in the cloud.
- Data warehousing helps in maintaining historical records and analyzing the data to gain a better understanding of the business and to improve the business.



# Data Mining

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- ***Data mining*** is the process of finding anomalies, patterns and correlations within large data sets to predict outcomes.
- Using a broad range of techniques, you can use this information to increase revenues, cut costs, improve customer relationships, reduce risks and more.

# Operations Research (OR)

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- Operations Research (OR) applies scientific method to the management of organized systems in business, industry, government and other enterprises.
- OR is regularly applied in areas such as:
  - ▣ Manufacturing plants
  - ▣ Healthcare management
  - ▣ Transportation networks
  - ▣ Energy and the environment
  - ▣ Military defense

# Operations Research (OR) cont.

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- Typically, applications of OR deal with decisions involved in planning the efficient allocation of scarce resources - such as material, skilled workers, machines, money and time - to achieve stated goals and objectives under conditions of uncertainty and over a span of time.

# Advantages of Technology for Business Communication

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It is important for managers to take full advantage of information technology and keep current on the latest innovations.

- **Financial Savings** - perhaps the biggest advantage of the improvement of technology in business communication is the financial savings it affords
- **Expediency** - business communication technology has also increased the speed in which business is conducted. This is especially advantageous to companies that do business with customers and clients in far-away locations.

# Advantages of Technology for Business Communication cont.

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- **Specialized Employment** - the continued improvement of technology in business communication has offered many jobs that never before existed. Skilled professionals are required to install, operate and maintain new information technology tools.

# Ethics in Handling Information Technology

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- Although technology offers unbounded opportunities for organizations and facilitates decision making at various levels, it also imposes certain obligations on the part of its users.
- It is important that the **privacy** of all individuals is protected, whether they are consumers, suppliers, employees, or others.
- Companies also need to ensure that **confidential information** relating to individuals is protected and does not find its way to unscrupulous vendors and used for nefarious purposes.

# Ethics in Handling Information Technology cont.

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- Care should be taken to ensure that ***incorrect information*** is not distributed across the many different files of the company.
- Those who collect data for the company should be honest, trustworthy, and careful in obtaining and recording the data in a timely fashion.