# Management Info Systems Management 3061

# Chapter 1: Learning Outcomes

1. Discuss common applications of computers & info systems
2. Explain the difference between computer literacy & info literacy
3. Define transaction processing systems & management info systems
4. Describe the 4 major components of an info system
5. *Discuss the differences between data & information*
6. Explain the importance & applications of info systems in functional areas of a business
7. *Discuss how info tech are used to gain a competitive advantage*
8. Explain the 5 Forces Model & strategies for gaining a competitive advantage
9. *Summarize the future outlook of info system*

# What’s a CRM ?

Customer Relationship Management (marketing) = managing how a company interacts with past & future customers by analyzing data about them,

3 types
Operational (automate sale/marketing/support)
Analytical (process data for further use)
Collaborative (feedback on improvements)
In business magazines have many ads for info systems

# What is an Information System ?

Combo of `hardware, software & networks` that collect/ create & distribute data

Input >> process data >> output of info products

Raw materials >>> manufacture process >> output product

# Management info systems

Integration of hardware & software technology that *supply data*

Designed to make timely integrated relevant accurate & useful info
Reports on sales, loss, costs, goals, STATS

**Competitive advantage**

# A knowledge Worker (Peter Drucker, 1959)

`A professional that creates/ modifies info as part of their job`

Requires higher education than agriculture/manufacturing jobs, 35% of work in Canada

# Computer Literacy vs. Info Literacy

skills in using software

Understanding how info generates business intelligence (how data is collected & why, the type of data, indexed, etc)

business intelligence = (historical/ current & predictive views of business operations & environments, **competitive advantage**)

# Transaction Processing Systems (TPS)

COMPUTERS collect & processing data

Cost reduction

Repetitive operations w/ minimal human involvement

<< FedEx >>

# 4 major Info System components
# DDPI

# Data

External (offline) / internal input sources of data

Aggregated & disaggregated

# database

collects data & organizes it  into /files

Database Management Systems are essential for any info system

# Process

Generates info for decision making

transactions/ reports/ analysis

# information

Output = analyzed facts + data

User interface must be flexible (GUI)
Goal = business intelligence

<< university stores data in database >>

# The 4 “M” of resources

**Manpower** = personnel info system

**Machinery** = manufacturing info system

**Materials** = logistic info system

**Money** = financial info system

# 6 major roles & goals of IT

# 6 roles & goals of IT

1. Increase employee productivity by reducing time errors & costs of use
2. Better decision making
3. Improve team collaboration
4. Create business partnerships and alliances
5. Enable global reach all over the world taking into consideration the culture of each nation or society
6. Facilitate organizational transformation as the organization evolve/ respond to marketplace

# Cyrus McCormick

American inventor of mechanical reaper & McCormick Harvesting Machine Company

First to offer money back guarantee & payment installments & free trials

Competitive advantage = long term benefit

Worth $11 million @ death
McCormick sued a competitor inventor of mechanical reapers but lost the case (Manny the competitor, his lawyer hired lawyer Abraham Lincoln)
McCormick factory was making 4000 reapers per year in 1856, later it burned down, after the rebuild his grandson ran the company with poor wages causing riots
The reaper reduced human labor and increased productivity

# Info tech for **competitive advantage**

Michael Porter (Harvard Business School)

3 strategies for competing = cost leadership, differentiation & focus

| | |
|---|---|
| Cost leadership<br><br>(Wal-Mart)<br><br>*broad* | Differentiation<br><br>(Amazon.com)<br><br>*broad* |
| Cost **focus**<br>(La Quinta = hotels) | Differentiation **focus**<br>(Nordstrom) |

# Porter’s 5 Forces
# Business enviro

# 5 forces of business Analyzing organization's position in marketplace how infosystems help competitiveness

**Substitute** products/ services

**Supplier** power (bargain power) **buyer power** (channels)

Threat of **new entrants**

Ex. prescriptions = (buyer power is low, substitute is low, supplier power is low, new entrants is low)
*this is all good for pharma industry* < Rivalry is based on patent laws >

Pizza: buyer power is high, sub is high, supply power is low, new entrants is high, rivalry is competitive
Loyalty program is databases, lots of suppliers together, ATM is costly to get into,

# Chapter 2: Computers

# Learning outcomes

1. Define a computer system & describe its components
2. Discuss the history of computer hardware & software
3. Explain the factors distinguish computing power of computers
4. Describe the major operations of computers
5. Summarize the binary system & data representation
6. Discuss the types of input, output and memory devices
7. Explain how computers are classified
8. Describe 2 major types of software
9. List the generations of computer languages

# Parts of a computer

Processing = motherboard [CPU, RAM, 2nd storage, slots (processors) & ports (I/O devices)]

Power of computers exceed humans = speed, accuracy, storage & retrieval
Input device = anything that sends data & info to computer (keyboard, mouse, etc)

Output devices = mainframes & personal computers
- **Soft** copy = monitors (cathode ray tubes, liquid crystal display)
- *Hard* copy = printer, voice

## Memory device:

- Main = stores data & info, unstable RAM & Read Only Memory (ROM)
  elect erasable program Read Only Memory (EEPROM)
- 2nd = secure storage of data when CPU is off, hard drives, USB flash drives, memory cards

# Classes of computers

($, amount of memory, speed)

Supercomputers

Mainframe

workstations

# Digital divide

The digital divide = gap between people with effective access to digital info technology and those with very limited or no access at all

Those with tech and those who don’t

# Server platforms

Server = computer & software that manages the network resources

Types = apps, database, file, mail, print, web

# software

A program that runs a computer system
(software / applications)

KERNEL = supervisor program, controls all programs in the OS

Operating system software (OS) set of programs for controlling & managing hardware & software

Interface between computer & the user

Better  efficiency by sharing resources & repetitive tasks

Control programs = job management, resource allocation, data & communication

# History of software

Machine language

Assembly language

High level language

4th Gen language

Natural language processing (NLP)

# Chapter 3: Database systems

# Database systems = data stored, organized & analyzed

Hierarchy = (CFRFD) char → field →records → files → database

Advantages = [data indep, lower redundancy, file sharing, app dev, higher quality & access]

Data types = internal (online transactions) or external (Gov't records, shopping data, etc)

Accessing files = SAFS seq access file struct (" primary key ID" based)
ISFSA *indexed* seq file struct access (seq or rand())
RAFS rand(access) file struct (any order, small # of records)
ISA*M* *indexed* seq access method (seq or random, index value, disk location)

Logical design = physical (stored data & retrieved on flash drives etc),
logical (info shown to users)
data model (data: created/ rules/ operations)

# Database systems - continued

Components = engine (data storage, manipulation, retrieval)
Data def (creates data dict: +, -)
Data manip (+,- records: SQL or QBE *query by example*)
App gen (data entry GUI)
Data admin (create, read, backup, restore, security) E-Dd-Dm-Apg-DAdm

Data warehouse/mart = collects all business info

Data mining = info analysis & **finds patterns** (NETFLIX suggestions)

Online analytical processing = software for complex data analysis

Data warehouse: Input (enterprise resource planning + CRM), ETL (extract, transform & load data), store raw data & output == Online ***Transaction*** Processing (OLTP) reports & Online Analytical processing (OLAP) -quick multi analytical queries

Rubix cube of data: to find product X sales in NW region last quarter == OLAP

# Chapter 4: ethics of info systems

# Privacy issues:  Web & network

Acceptable use policy + accountability + non repudiation

**Acceptable use policy** = employee signs set of rules for use

**Accountability** = user + organization responsibilities

**Nonrepudiation** = binding all parties to contract

**Minimize invasion of privacy** = use sites with privacy policies easy to read & find, limit access to personal information, any data collection must state purpose & time duration

# Web Data collection

Web Data collection  use cookies and log files

Cookies = small text files w/ unique ID tags in browsers & saved on hard drives

Log files = record actions on websites

# Intellectual property

Legal protection of copyrights, trademarks, trade secrets and patents

`Cybersquatting` = registering/ selling/  using a domain name to profit from someone else's trademark

# Info tech workplace

`Virtual` organizations = networks of indep companies/ suppliers/ customers/ manufacturers connected via tech (no central offices)

Benefits = better focus on customers, skillsets are shared, *faster customer response*, customized products

Info tech + health = video display terminals cause physical problems due to poor posture, few rest breaks, poor lighting etc

## Green computing = sustainable enviro

ICT = info communication tech

# Chapter 5: protecting info resources

# Risks w/ info tech

Cyber crime = hackers

**Spyware** = software that **secretly** gathers info on users

Adware = software collects info about user that determines advertisements shown to user

**Phising** = fraud emails **pharming** = *redirecting* IP address, users to fraud websites & stealing info

Keystroke logger = records keystrokes

Sniffing = captures & records network traffic

Spoofing = attempt to gain access by posing as authorized person

Computer fraud = unauthorized use of computer data for personal gain

**Script kiddies** = inexperienced hacker using developed programs to attack

# Network sec - basics

Confidentiality = no access to unauthorized persons

Integrity = accuracy of info resources, no unauthorized changes

Availability = only authorized access network, quick recovery if sys failure

McCumber cube to evaluate info security: level 1 (front end servers internal & external users, =email), level 2 (back end systems, internal database), level 3 (corporate network, DoS attacks)

Sec system:

- fault tolerant system = uninterrupted power supply (UPS)
- (RAID) Redundant Array of Indep Disks (collection of disk drives store data)
- mirror disks = 2 disks, same data

# Threats

V W Tr Lb Bkdr

**V**irus = self propagating program

**W**orms = indep programs that spread w/o attachments

**Tr**ojan program = code that disrupts computers network/ website hidden with a program

**L**ogic **b**ombs = release threats at certain time

**B**ackdoors = programming routine built into a system by design that bypasses system sec

# Security

**Biometric security measures** = facial/ fingerprints/ hand geometry/ iris analysis/ palm prints

Non biometric security = callback modems (verify user by phone call), firewalls & intrusion detection systems

Intrusion detection system (IDS) protect internal/ external network access, stops DoS

**Physical security** = locking hardware from theft

**Virtual private networks (VPN)** transmit data via private networks, data is encrypted

*`layer 2 tunneling protocol`* security

# Data encryption

(**SSL**) Secure sockets layer -- encryption protocol that manages transmission security

(TLS) Transport layer security -- cryptographic protocol ***ensures*** data security & integrity

`Public key infrastructure (PKI)` = enables users of public network to secure & private exchange of data via pair of keys 1 private 1 public

`Asymmetric encryption` uses 2 keys, 1 public 1 private, decrypt using the 1 algorithm private key

Symmetric encryption uses **same** key to encrypt & decrypt messages