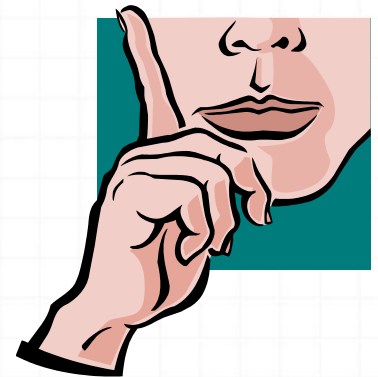Chapter 4

paradigms

What is Paradigm?

O The way you see something

O Your point of view

O Frame of preference or belief

O The way we understand and interpret the world

O It's like a map in our head

The paradigm does not necessarily describe reality, and at best only describes one aspect of reality.

Our paradigms may be true, or not. We cannot tell which until we change our paradigm! Then we can select a paradigm from our possible choices. The change is not a result of disproving paradigm, but a decision.

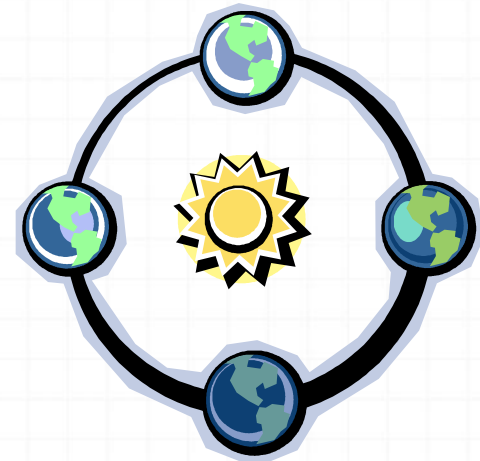# Does everyone use the same Paradigm?

Paradigm shift

0 Paradigm shift is the way of looking at something differently

0 A paradigm shift is a sudden change in point of view.

0 When we make a paradigm shift we can see, think, feel, and behave differently

Example of Paradigm Shift

O Ptolemy thought the earth was the center of the universe

O Copernicus believed the sun was the center of the universe (a paradigm shift occurred)

Paradigms of interaction

New computing technologies arrive, creating a new perception of the human—computer relationship.

We can trace some of these shifts in the history of interactive technologies.
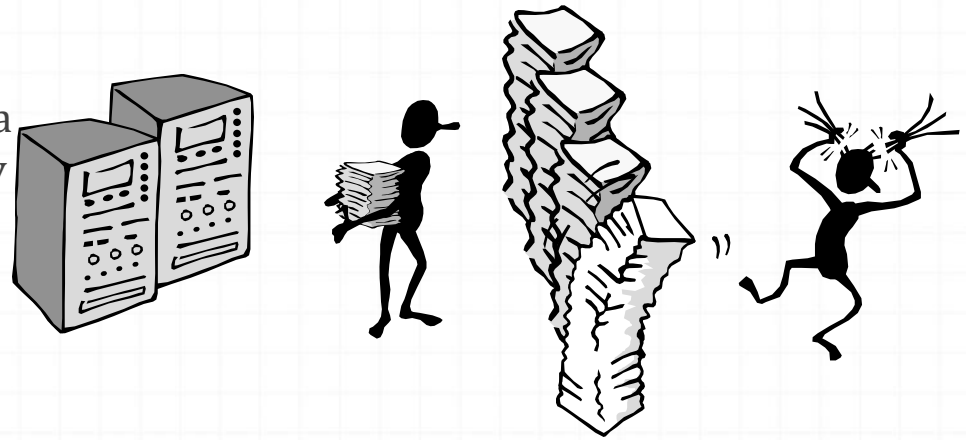
Another Example of Paradigm Shift

0 The introduction of the personal computer and the internet have impacted both personal and business environments, and is a catalyst for a Paradigm Shift.

0 Newspaper publishing has been reshaped into Web sites, blogging, and web feeds.

0 The Internet has enabled or accelerated the creation of new forms of human interactions through instant messaging, Internet forums, and social networking sites.

0 We are shifting from a mechanistic, manufacturing, industrial society to an organic, service based, information centered society, and increases in technology will continue to impact globally.

The initial paradigm

O **Batch processing**

➢ The earliest computers

➢ extremely expensive devices

➢ very slow.

➢ Machines were typically dedicated to a particular set of tasks and operated by control panel
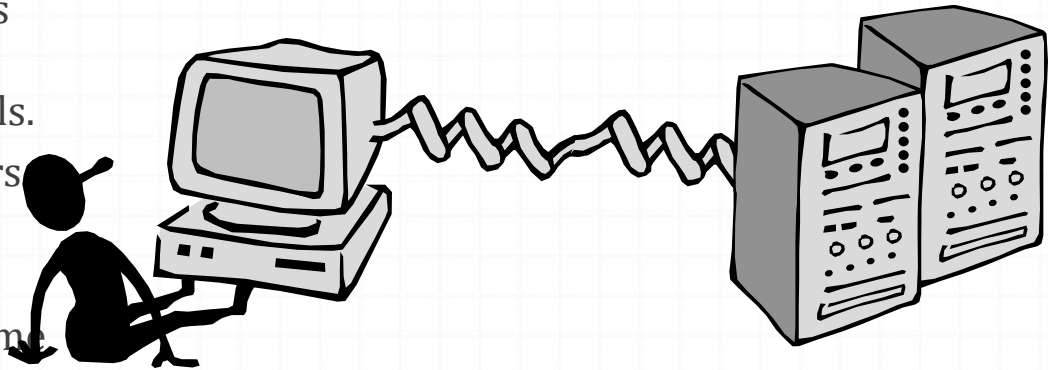
Impersonal computing

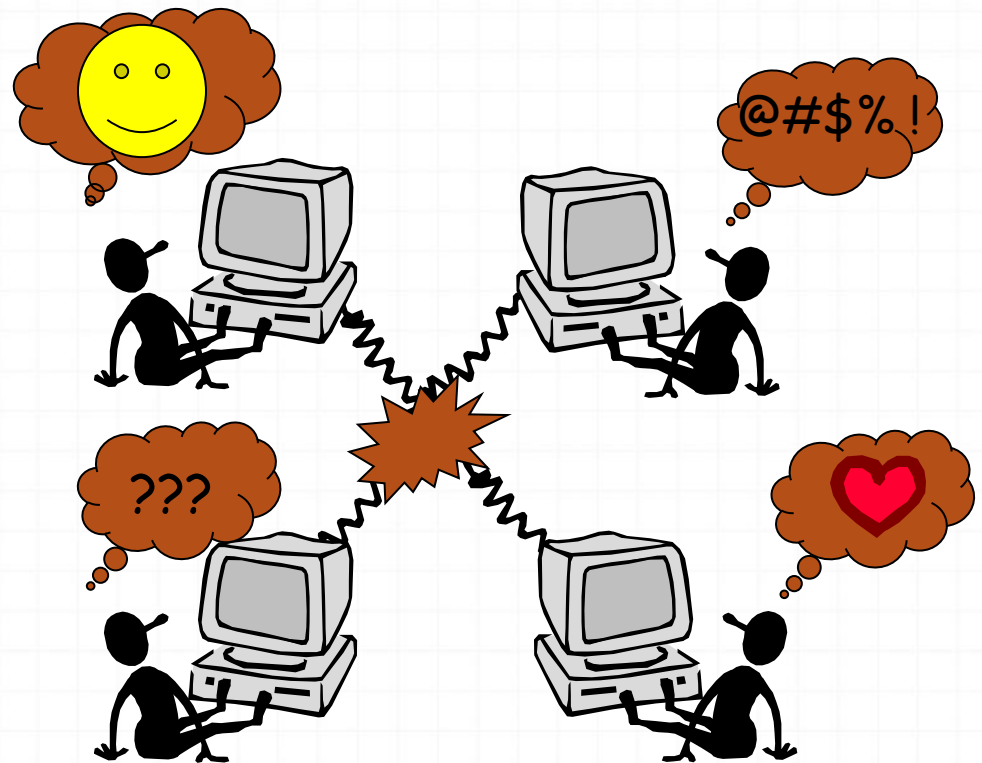# Example Paradigm Shifts

O Batch processing

O Time-sharing:

➢ A technique permitting many users simultaneous access to a central computer through remote terminals.

➢ By allowing a large number of users interact concurrently with a single computer

➢ A group of users working at the same time

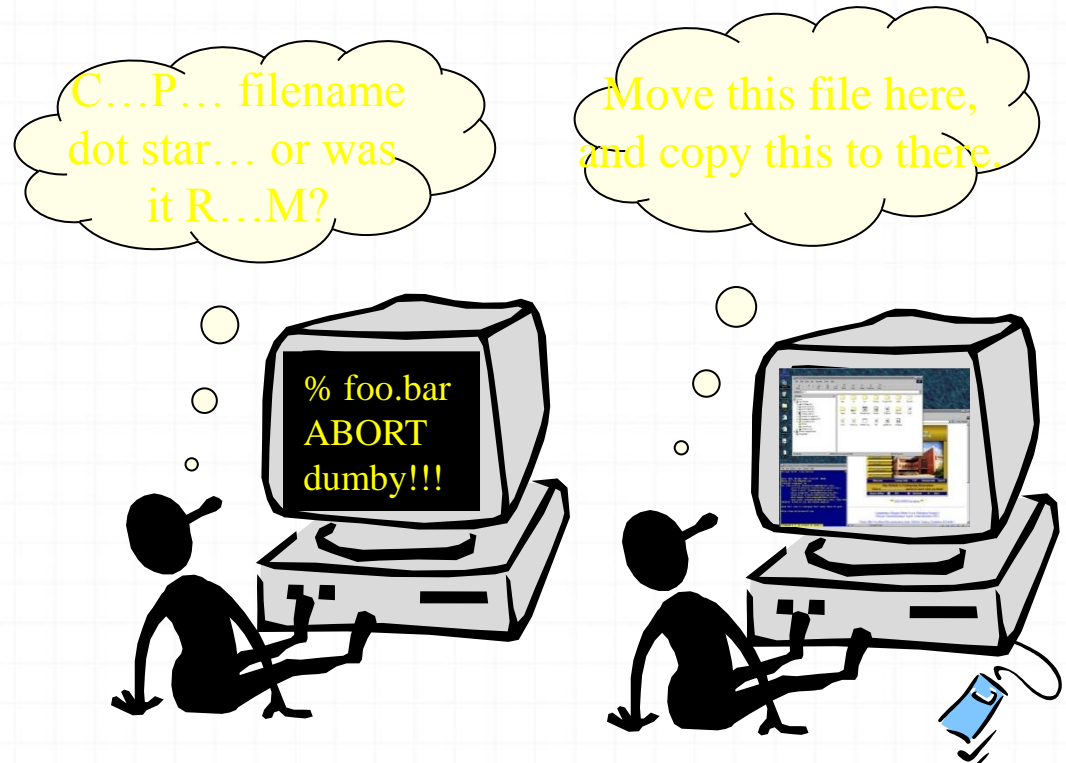*Interactive computing*

Example Paradigm Shifts

O Batch processing

O Timesharing

O Networking

➢ Linking two or more computing devices together for the purpose of sharing data.

➢ Mix of computer hardware and computer software.

Community computing

Example Paradigm Shifts
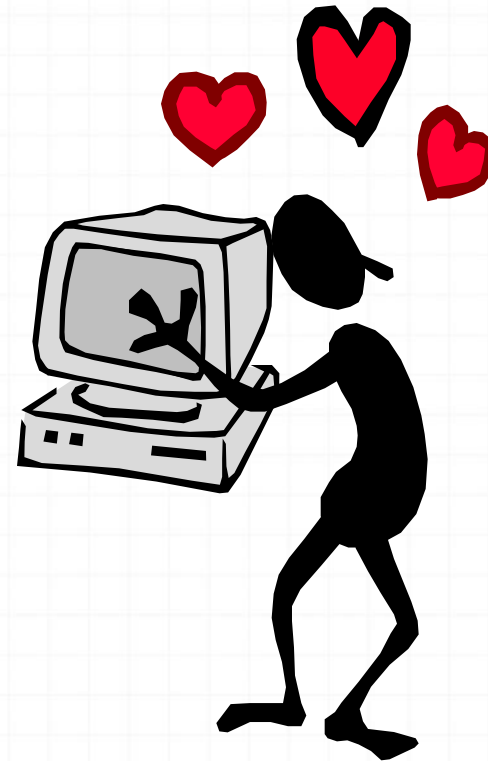
- Batch processing
- Timesharing
- Networking
- **Graphical displays**
  - Images
  - Icons
  - Videos
  - etc

C…P… filename dot star… or was it R…M?

Move this file here, and copy this to there.

% foo.bar
ABORT
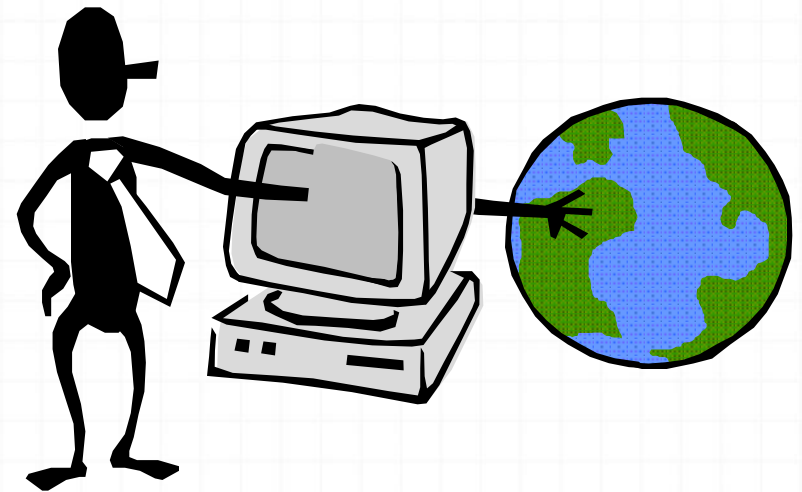dumby!!!

Direct manipulation

Example Paradigm Shifts

O Batch processing

O Timesharing

O Networking

O Graphical display

O Microprocessor

➢ It is a multipurpose

➢ Programmable device

➢ Accepts digital data as input, processes it according to instructions stored in its memory, and provides results as output.

Personal computing

Example Paradigm Shifts

o Batch processing

o Timesharing

o Networking

o Graphical display
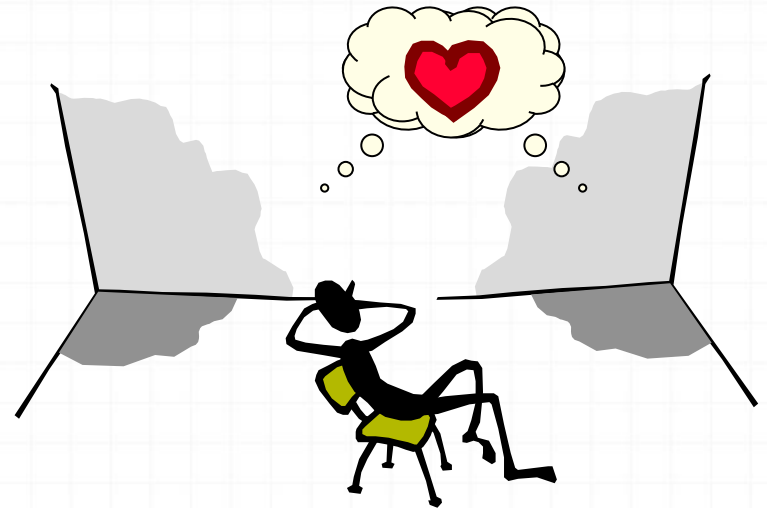
o Microprocessor

o **WWW**

Global information

Example Paradigm Shifts

- Batch processing
- Timesharing
- Networking
- Graphical display
- Microprocessor
- WWW
- Ubiquitous Computing

O A symbiosis of physical and electronic worlds in service of everyday activities.

Language versus Action

- actions do not always speak louder than words!
- DM – interface replaces underlying system
- language paradigm
- interface as mediator
- interface acts as intelligent agent
- programming by example is both action and language

Computer Supported Cooperative Work (CSCW)

O Definition: Software tools and technology to support groups of people working together on a project

O CSCW removes bias of single user / single computer system

O Example: Electronic mail

The World Wide Web

O Definition: all the resources and users on the Internet that are using the Hypertext Transfer Protocol (HTTP)

O Simple, universal protocols (e.g. HTTP) and mark-up languages (e.g. HTML) made publishing and accessing easy

Ubiquitous Computing

O Definition: information processing integrated into everyday objects and activities.

O The word ubiquitous mean "existing everywhere."

O Ubiquitous computing devices are completely connected and constantly available.

Context-aware Interaction

O What is context?
- O By example
  - O Location, time, identities of nearby users …
- O By synonym
  - O Situation, environment, circumstance
- O By dictionary [WordNet]
  - O the set of facts or circumstances that surround a situation or event
- O Context-aware is linking changes in the environment with computer systems

Context-aware Features

1. Presentation of information and services
    - Tour guide, Active Badges
2. Automatic execution of services
    - Smart homes (turn off lights, adjust temperature)
3. Tagging of context to information for later retrieval
    - Digital camera meta-data (time, location)

Sensor-based

It is used to define elemental moves within a high level programming environment

Sensor-based and Context-aware Interaction

O Humans are good at recognizing the "context" of a situation and reacting appropriately

O Automatically sensing physical phenomena (e.g., light, temp, location, identity) becoming easier

why study paradigms

Concerns

0 how can an interactive system be developed to ensure its usability?

0 how can the usability of an interactive system be demonstrated or measured?