Types of Information Systems

ISR Lecture IV
Transaction Processing System (TPS)

- Transaction Processing System (TPS)

A computerized system that performs and records daily routine transactions necessary to the conduct of the business.

- TPSs are information systems that process data resulting from the occurrence of business transactions.
  - Example: payroll system; production instructions
STAGES OF TRANSACTION PROCESSING

- Five Stages Of Transaction Processing
  - Data Entry
  - Processing
  - Database Maintenance
  - Document And Report Generation
  - Inquiry Processing
Transaction Processing System (TPS) (cont.)

DATA ENTRY → PROCESSING → REPORT GENERATION

→ ADHOC INQUIRIES

DATABASE
Management information system (MIS)

- provides information for managing an organization
  - Extract and summarize data from TPSs
  - Allow managers to monitor & direct the organization
  - Provide accurate feedback
  - Provide pre-specified reports on a scheduled basis
    - Top managers make strategic decisions
    - Middle managers make tactical decisions
    - Line managers make operations decisions
    - Knowledge workers create and integrate knowledge
    - Clerical workers use and manipulate information
Decision support system (DSS)

an interactive information system that provides information, models, and data manipulation tools to help make decisions in semi-structured and unstructured situations

- Support analytical work
- Simulation and Optimization
  - Simulation model – calculates the simulated outcome of tentative decisions and assumptions
  - Optimization model – determine optimal decisions based on criteria supplied by the user, mathematical search techniques, and constraints
Online analytical processing (OLAP) : the use of data analysis tools to explore large databases of transaction data

Data mining : the use of analysis tools to find patterns in large transaction databases
Executive information system (EIS)

- A highly interactive system that provides a flexible access to information for monitoring results and general business conditions

- Use both internal and competitive information

- User-friendly interface
Information Systems that Support Long-Range Planning of Senior Management.

**Figure 2-1** Types of information systems
Support monitoring, controlling, decision-making, and administration by middle management.
Operational Level Systems

Figure 2-1 Types of information systems

Operational Level Systems

Produces routine answers
Types of systems at the 4 levels

Level 1-Transaction Processing Systems (TPS)

Level 2-Management Information Systems (MIS)

Level 2-Decision Support Systems (DSS)

Level 3-Executive Information Systems (EIS)
Types of systems at the 4 levels (cont.)

Lowest Level (operational)-

Transaction Processing Systems (TPS):

Inputs: Transactions or events
Processing: Sorting; listing; merging; updating
Outputs: Detailed reports; lists; summaries
Users: Operational personnel; supervisors
Level two (management level)-

Management Information System (MIS):

- Inputs: Summary transaction data
- Processing: Simple models; low level analysis
- Outputs: Summary reports
- Users: Middle managers

Example: Weekly, monthly, and annual resource allocation. Not five year plans and not daily details, but something in between.
Types of systems at the 4 levels (cont.)

Management Information System (MIS)

- Some characteristics of MIS that make them differ from DSS (on next slide)
  - Structured and semi-structured decisions
  - Output is often the kind that you need routinely each term (quarter, month, year) to evaluate how to proceed next (quarterly sales data for past 5 years)
level two (management level)-

Decision Support System (DSS):

- **Inputs:** databases optimized for statistical analysis
- **Processing:** Interactive. Simulations and statistical analysis
- **Outputs:** Responses to queries; statistical test results.
- **Users:** Professionals, staff
- **Example:** Could answer the following query:
  
  “We need to trim 5% of our menu offerings to limit complexity in operations. Which items are the worst performing; are most likely to lead to sales of other products left on the menu, and have the most ingredients unique to their recipes?”
Types of systems at the 4 levels (cont.)

Top level (strategic level)-

Executive Support System (ESS):

- **Inputs:** Aggregate data. Internal and external
- **Processing:** Interactive and graphical simulations
- **Outputs:** Projections
- **Users:** Senior managers

Example: 5-year operating plan. Answer question like “what are long-term industry cost trends and how are we doing relative to them?”

- Gets data from all internal IS plus external industry data bases
Types of systems at the 4 levels (cont.)

**Figure 2-2** The four major types of information systems
Types of systems (INTERRELATIONSHIPS)

TPS generally feed all other systems
- MIS generally indicate when a DSS is needed and provide input for them
- ESS take all internal data but usually only summary data from MIS and DSS level

Output data from one is input data for others to process
Expert Systems

- Support professionals faced with complex situations requiring expert knowledge in a well-defined area
  - They represent human expertise also called knowledge-based systems
  - Typically use if-then rules
  - Used as interactive advisors or as automated tools
Help people perform personal record keeping, writing, and calculations efficiently

Main types of tools include:

- Spreadsheet programs
- Text & image processing systems
- Personal database systems and note-taking systems
Communication Systems

- Sharing information in many different forms
- Teleconferencing
  - The use of electronic transmission to permit same-time different-place meetings
- Audio conferencing
  - a single telephone call involving 3 or more people
- Audio-graphic conferencing
  - an extension of audio conferencing, permitting the participants to see graphical material
- Videoconferencing
  - interactive meeting involving groups of people that can see each other using display screens
- E-mail, Voice Mail, and Fax
- Instant Messaging and Chat
Communication Systems (Cont.)

- **Groupware**
  - Software and related procedures that help teams work together by sharing information and by controlling internal workflows. e.g. Lotus Notes

- **Intranets and Extranets**
  - **INTRANETS**: Private networks, Use the same interface as the Web, Accessible only to company employees
    - Examples of applications: Corporate news, Employee manuals, Corporate policies, Telephone directories, etc.
  - **EXTRANETS**: Similar to intranets, but geared towards customers
    - Examples of applications: Detailed product descriptions, FAQs, Maintenance information, etc.
Information Systems: Types

- Information System Categories Related to Specific Functional Areas of Business.
  - Cross-Functional Systems
  - Management Support Systems
  - Operations Support Systems
Cross-Functional Systems: An Example

The Order Fulfillment Process

order fulfillment cuts across sales, accounting, and manufacturing and distribution