**Business value of improved decision making:** Improving hundreds of thousands of “small” decisions adds up to large annual value for the business.

**Types of decisions:**
- **Unstructured:** Decision maker must provide judgment, evaluation, and insight to solve problem.
- **Structured:** Repetitive and routine; involve definite procedure for handling so they do not have to be treated each time as new.
- **Semistructured:** Only part of problem has clear-cut answer provided by accepted procedure.

**THE DECISION-MAKING PROCESS [4]:**
1. **Intelligence:** Discovering, identifying, and understanding the problems occurring in the organization.
2. **Design:** Identifying and exploring solutions to the problem.
3. **Choice:** Choosing among solution alternatives.
4. **Implementation:** Making chosen alternative work and continuing to monitor how well solution is working.

**MANAGERS AND DECISION MAKING IN THE REAL WORLD:**
- Information systems can only assist in some of the roles played by managers.
- **Classical model of management** obtains Five functions of managers: planning, organizing, coordinating, deciding, and controlling.
- **More contemporary behavioral models:**
  - Actual behavior of managers: appears to be less systematic, more informal, less reflective, more reactive, and less well organized than in classical model.
  - Mintzberg’s behavioral model of managers: defines 10 managerial roles falling into 3 categories.
- **Managerial roles differences from classical model:**
  1. Managers perform a great deal of work at an unrelenting pace.
  2. Actives are fragmented.
  3. Prefer current, specific, and ad hoc information.
  4. Prefer oral form of communication to written.
  5. Give high priority maintaining a divers and complex web of contacts.

- **Mintzberg’s Managerial roles**
  - **Interpersonal roles:** Figurehead, Leader, Liaison.
  - **Informational roles:** Nerve center, Disseminator, Spokesperson.
  - **Decisional roles:** Entrepreneur, Disturbance handler, Resource allocator, Negotiator.

**Three main reasons why investments in information technology do not always produce positive results**
1. **Information quality:** High-quality decisions require high-quality information.
2. **Management filters:** Managers have selective attention and have variety of biases that reject information that does not conform to prior conceptions [e.g. Cisco].
3. **Organizational culture [inertia and politics]:** Strong forces within organizations resist making decisions calling for major change.
SYSTEM FOR DECISION SUPPORT [4]:

- Management information systems (MIS)
- Decision support systems (DSS)
- Executive support systems (ESS)
- Group decision support systems (GDSS)

- **Management information systems (MIS):** Help managers monitor and control business by providing information on firm’s performance and address structured problems. They typically produce fixed, regularly scheduled reports based on data from TPS.
  - E.g. **exception reports:** Highlighting exceptional conditions, such as sales quotas below anticipated level.
  - E.g. **California Pizza Kitchen MIS:**
    For each restaurant, compares amount of ingredients used per ordered menu item to predefined portion measurements and identifies restaurants with out-of-line portions.

- **Decision-support systems (DSS):** Support unstructured and semistructured decisions.
  - **Model-driven DSS:** Earliest DSS were heavily model-driven [what if?]. e.g. voyage-estimating DSS.
  - **Data-driven DSS:** Some contemporary DSS are data-driven that use **Online Analytical Processing (OLAP)** and data mining to analyze large pools of data. e.g. business intelligence applications.

- **Components of DSS**
  - **Database** used for query and analysis
    - Current or historical data from number of applications or groups.
    - May be small database or large data warehouse.
  - **User interface:** Often has Web interface.
  - **Software** system with models, data mining, and other analytical tools.

- **Model:** Abstract representation that illustrates components or relationships of phenomenon [ÉÉÉ]; may be physical, mathematical, or verbal model.
  - Statistical models.
  - Optimization models [e.g. P&G].
  - Forecasting models.
  - Sensitivity analysis models [what if?].

- **Pivot table:** A table that displays two or more dimensions of data in a convenient format.
  - Categorizes and summarizes data very quickly
  - Displays two or more dimensions of data in a convenient format

- **PivotTable Wizard three elements:**
  - Empty PivotTable: With labels for rows, columns, and data areas.
  - PivotTable Field List: Lists fields in list or database.
  - PivotTable Toolbar.

**BUSINESS VALUE OF DSS [3 examples]:**

- **Burlington Coat Factory:** DSS for pricing (price optimization software using ProfitLogic's Markdown software).
  DSS manages pricing and inventory nationwide, considering complex interdependencies between initial prices, promotions, markdowns, cross-item pricing effects and item seasonality.

- **Syngenta:** DSS for profitability analysis
  DSS determines if freight charges, employee sales commissions, currency shifts, and other costs in proposed sale make that sale or product unprofitable.
• **Compass Bank: DSS for customer relationship management**
  
  DSS analyzes relationship between checking and savings account activity and default risk to help it minimize default risk in credit card business.

**DATA VISUALIZATION AND GEOGRAPHIC INFORMATION SYSTEM (GIS):**

• **Data visualization tools:** Help users see patterns and relationships in large amounts of data that would be difficult to discern if data were presented as traditional lists of text.

• **Geographic information systems (GIS):** Category of DSS that use data visualization technology to analyze and display data in form of digitized maps. It is used for decisions that require knowledge about geographic distribution of people or other resources. E.g. CompStat

**CUSTOMER DECISION-SUPPORT SYSTEM (CDSS):** Support decision-making process of existing or potential customer. It uses Web information resources and capabilities for interactivity and personalization to help users select products and services.

  E.g. search engines, intelligent agents, online catalogs, Web directories, newsgroup discussions, other tools.
  • Automobile companies that use CDSS to allow Web site visitors to configure desired car.
  • Financial services companies with Web-based asset-management tools for customers. E.g. RiskMetrics

**GROUP DECISION-SUPPORT SYSTEM (GDSS):** Interactive, computer-based system used to facilitate solution of unstructured problems by set of decision makers working together as group. It is designed to improve quality and effectiveness of decision-making meetings.

  • Make meetings more productive by providing tools to facilitate:
    • Planning, generating, organizing, and evaluating ideas.
    • Establishing priorities.
    • Documenting meeting proceedings for others in firm.

**Components of GDSS**

• **Hardware:** the conference facility itself, including the room, the tables, and the chairs.

  Facility: Appropriate facility, furniture, layout, and Electronic hardware.

• **Software:** originally developed for meetings in which all participants are in the same room, but they also can be uses for networked meetings.

  • Electronic questionnaires: aid the organizers in premeeting planning by identifying issues of concern and by helping to ensure that key planning information is not overlooked.
  • Electronic brainstorming tools: enable individuals, simultaneously and anonymously, to contribute ideas on the topics of the meeting.
  • Idea organizers: facilitate the organized integration and synthesis of ideas generated during brainstorming.
  • Questionnaire tools: support the facilitators and group leaders as they gather information before and during the process of setting priorities.
  • Tools for voting or setting priorities: make available a range of methods from simple voting to ranking in order.
  • Stakeholder identification and analysis tools: use structured approaches to evaluate the impact of an emerging proposal on the organization and to identify stakeholders and evaluate the potential impact of those stakeholders on the proposed project.
  • Policy formation tools: provide structured support for developing agreement on the wording of policy statements.
  • Group dictionaries: documents group agreement on definitions of words and terms central to the project.

• **People:** Participants and trained facilitator, support staff.
Overview of GDSS meeting

- Each attendee has workstation, networked to facilitator’s workstation and meeting’s file server
- Whiteboards on either side of projection screen
- Seating arrangements typically semicircular, tiered
- Facilitator controls use of tools during meeting
- All input saved to server, kept confidential
- After meeting, full record (raw material and final output) assembled and distributed

Business value of GDSS

- Supports greater numbers of attendees. Without GDSS, decision-making breaks down with more than 5 attendees.
- More collaborative atmosphere, Guarantees anonymity.
- Can increase number of ideas generated and quality of decisions made.
- Most useful for idea generation, complex problems, large groups.

Successful use of GDSS depends on many factors
Facilitator’s effectiveness, culture and environment, planning, composition of group, appropriateness of tools selected, etc.