CHAPTER 16
Organizational Computing for Decision Support

1. Offer an organizational perspective that identifies and relates multiple kinds of decision support systems found in an organization.

   - 4 class of ODSS in a 3 Dimensional Framework (see Figure 16-1)

   Classes - corporate planning systems
   - functional decision support systems
   - executive decision support systems
   - local decision support systems
   - corporate decision support systems

   Framework - Formality
   - User
   - Scope

   Why do organizations exist?
   - Participants collectively can accomplish more that they could individually
   - Knowledge resources are distributed, yielding a range and complexity of organization knowledge beyond any single participant.
   - Must be properly processed to accomplish organization's work
     -depends on organization infrastructure (OI)
     -supporting technological infrastructure (TI)

   -OI and TI
   OI refers to
   -roles
   -relationships among them
   -regulations governing use of roles and relationships

   -For example, OI for groups differ from OI for teams
   -TI refers to computer-based means for designing, enabling, monitoring, evaluating, enforcing, and modifying OI.
   -For example, TI may allow
     -roles that are otherwise not practical for a single participant due to cognitive limitations
     -relationships that are otherwise impractical due to time/space differences
     -regulations that permit simultaneous message passing, anonymous communication, market-oriented decision making.

   -Good fit of TI with OI is important for an organization's performance
     -seek TI to fit existing OI
     -redefine OI to fit advances in TI (business process reengineering)
2. Outline the organizational computing field and discuss its relevance to the decision support system. (see figure 16-2)

-Organizational Computing (OC)
  -concerned with
  -creating new kinds of TI
  -studying fits between TI and OI
  -Portion of OC field of interest here involves DSSs for supporting multiple persons involved in making a decision (in contrast to DSSs for individuals making decisions)
  -multiparticipant DSSs are subject to all generic DSS features identified earlier
  -have added features making them suitable for supporting decision making of multiple participants
    -organized according to some structure of interrelation
    -operating according to some set of regulation
  -these features come from research in such OC areas as
    -groupware technology
    -computer-supported cooperative work technology
    -computer-mediated communication technology
    -coordination technology
  -still evolving

3. Identify the categories of multiparticipant decision support systems.

1. Corporate Planning Systems (CPS)
   -hold/derive knowledge relevant to overall planning decisions of organization's top managers
   -decisions that cut across departments and divisions
   -decisions that affect all of an organization's functions
   -KS includes extensive data about the organization's functions and its environment
   -DSS includes solvers that mathematically model the organization's processes
   -designed to respond to what-if questions of corporate planner to show corporate-wide implications of scenarios posed by planner
   -actually predate the DSS term
   -widespread in large organizations
   -built and maintained by professional developers

2. Functional Decision Support Systems (FDSS)
   -hold/derive knowledge relevant for decisions about some function an organization performs
   -deploying cash on hand
   -budgeting an advertising campaign
   -scheduling production of backordered products
   -relative to CPS, FDSS support systems
   -within a function
   -with shorter time horizon
of lower level managers
-requires less effort than CPS to create/maintain

3. Executive Information Systems (EIS)

-holds knowledge relevant to wide-ranging decisions made by a high level executive
-not restricted to planning or any particular function
-supports diverse mix of immediate, short-term decisions executives make
-satisfies ad hoc information needs about current performance and anticipated activities
-may have relatively simple modeling capabilities
-built and maintained by professional developers

4. Local Decision Support Systems (LDSS)
-tends to be localized within some function (more specialized than FDSS)
-usually built and maintained by the end user

-Organization-wide framework for DSSs

-All four DSS types can exist in a single organization
-How should they be managed, coordinated, evaluated?
-Basis for studying these issues is a framework that relates the four DSS types on three dimensions

-organizational level/scope
-operational/narrow: FDSS, LDSS
-strategic/wide: CPS, EIS

-formality of design and documentation
-formal due to support of recurring decisions: CPS, FDSS
-less formal for unanticipated, one-shot decisions: LDSS, EIS

-User Class
-support for individual decision maker
-support for multiparticle decision maker

-DSS planning should
-assign responsibility for development, maintenance, control, and evaluation of each DSS type
-specify whether they are to be developed in parallel or some sequence
-indicate how they are to be linked (if at all)
-clarify relationships that developers and users of each type can have with other computer-related elements of organization
-establish oversight authority and regulations to ensure consistency across DSSs’ KSs

4. Describe the nature of groupware, computer-mediated communication, computer supported cooperative work, and coordinated technology.
The overlap of OC and decision support
- Understanding types of DSSs available for improving organizational productivity
- Organization-wide planning for their development and coordination
- Evaluation of their collective impacts on the organization
- Multiparticipant decision support systems (MDSSs)
  - tow main categories studied by researchers
  - group decision support systems (GDSSs)
  - organizational decision support systems (ODSSs)
  - team decision support systems (TDSSs) have yet to be researched
  - cutting across these are negotiation support systems (NSSs)
  - related to other major OC subjects
    - groupware
    - computer-mediated communication
    - computer supported cooperative work
    - coordination technology

1. **Groupware**
   - Computer-based systems that
     - provide an interface to an environment shared by a group of persons
     - support the group in carrying out a common task or meeting a common goal

   Classes of Groupware
   1a. **message systems**
     - use message management
     - allows persons to pass messages among themselves
     - examples: e-mail, bulletin boards
     - permit asynchronous communication
     - decision support in sense of knowledge acquisition

   1b. **Conference systems**
     - instead of a face-to-face conference, participants interact via their computers to have a conference

     - three approaches
       1. real-time computer conferencing
          - interact at same time
          - can be supplemented with audio/linkage (conference call)
          - lack of video capability
       2. Computer teleconferencing
          - video conferencing
          - specially equipped rooms plus linkages to other sites
          - lack ability to share text and graphics images
       3. Desktop conferencing
          - interact via desktop computers
          - each screen partitioned into windows
          - some for text/graphical interaction
          - others for video images of participants
          - computers also equipped for audio interaction
-decision support to the extent that conference objective is to inform or make a decision

1c. **Collaborative authoring**
- allows groups to collaborate on creation/revision of a document
- document composed of sections
- anyone can view and comment on any section at any time
- only one participant can modify a section at a time
- decision support to the extent that the document describes a collective decision

1d. **Group decision support systems**
- other kinds of groupware not devised solely for decision support
- GDSS assistance includes
  - removal of communication barriers
  - facilities for structuring flow of deliberations
- GDSS can help participants generate ideas, organize comments on relevant topics, analyze issues, rank alternatives, etc.
- typical setup
  - participants meet in room equipped with local area network (LAN) of computers and a large public display screen: “electronic meeting room”
  - each computer screen has a private space (for preparing contributions) and public space (for viewing collective results)
- some GDSSs allow participants to be in different places

1e. **Coordination systems**
- aim to help in integration and harmonizing of participant activities
  - show each participant status of own actions and what others have done
  - issues alerts and reminders (i.e. system keeps track of who has filled out what form)
  - for example, system that circulates electronic forms

1f. **Intelligent agent systems**
- software (autonomous entity) that employs some AI mechanism to carry out certain set of tasks
  - for example, those that behave like personal assistants
  - concealing task complexity
  - doing tasks for user
  - monitoring events
  - notifying user about situations
  - Intelligent agents can
  - function as participants in groupwork
  - help participants collaborate
  - help participants use other groupware

2. **Computer-Mediated Communications**
- systems that use computers to create, store, deliver, process communications
- CMC system usually has all or some of the following traits:
  - text management facility to create/modify messages
-notebook for each participant to keep notes, drafts, personal documents
-messages, each sent to one or more participants and held at receiving computer until processed
-journals which are shared spaces for posting and viewing messages
-conferences, each of which is a storage space common to a set of participants determined by an organizer, for which each participant can add or view comments

-CMC impacts on group decision makers
-CMC groups less likely to
-reach total consensus
-have a dominant participant

-CMC groups more likely to:
-have requests for sharing of opinions
-use fewer works in producing decisions
-have higher quality decisions
-reach decisions farther away from individual preferences

3. Computer supported cooperative work

-Varying views on what it is
-Just another term for groupware
-but not all cooperative work is done by groups
-and not all group work is cooperative

-More comprehensive than groupware

-Attempts to understand nature of cooperative work as a basis for designing supportive computer-based systems
-aim to reduce overhead coordination costs of cooperative work
-aim to improve outcome of cooperative work
-not defined by a set of technologies

-Support provided by CSCW systems distinguished in 3 ways
 1. system likely to be distributed across multiple computers in a way that allows them to function together to support cooperative work
 2. system will establish, maintain, process representations of