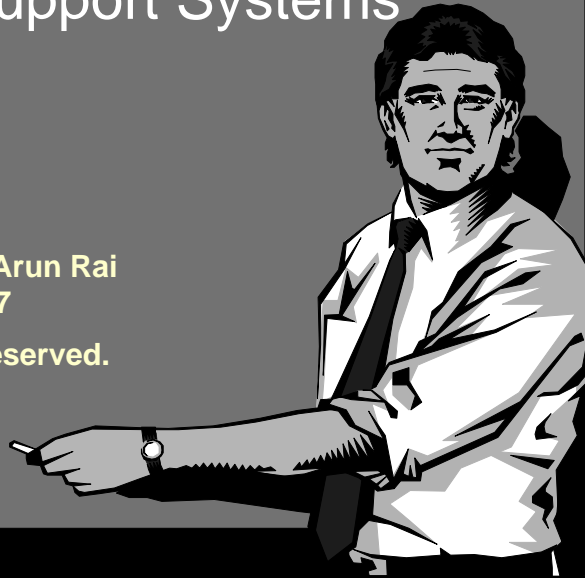


Decision Support Systems

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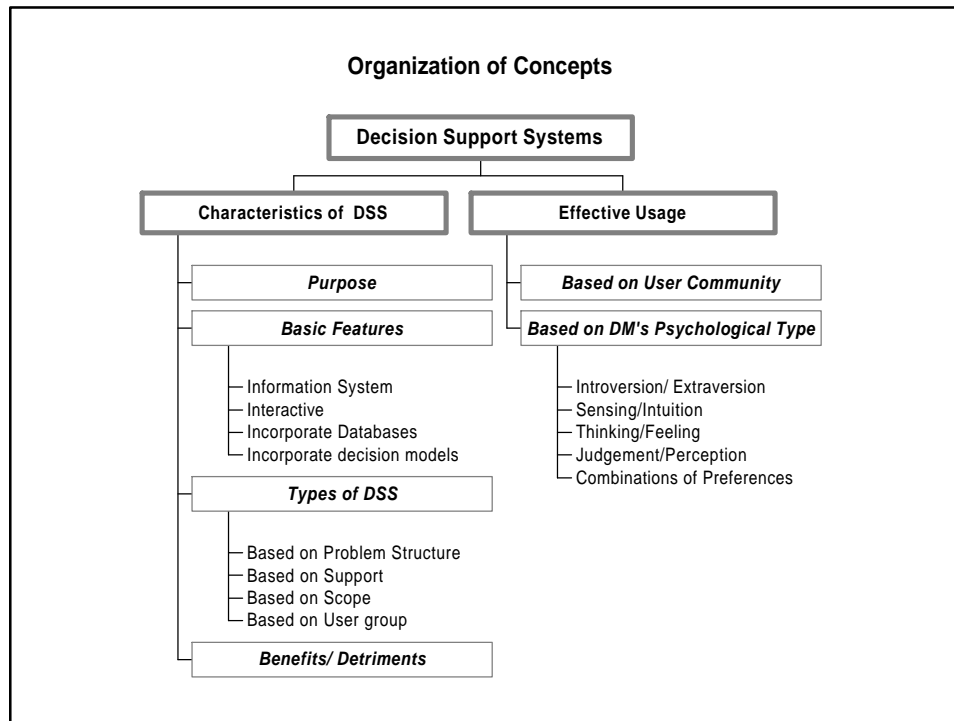
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Lecture

Outline

- **Examine what a DSS is**
 - Its purpose
 - Its basic features
- **Examine DSS typology**
- **Evaluate its benefits**
- **Examine its effective use**



Bonczek, Holsapple, and Whinston (1980)

- **A DSS is a computer-based system consisting of three interacting components:**
 - (1) a language system--a mechanism to provide communication between the user and other components of the DSS,**
 - (2) a knowledge system--the repository of problem domain knowledge embodied in DSS either as data or procedures, and**
 - (3) a problem processing system--the link between the other two components, containing one or more of the general problem-manipulatory capabilities required for decision making.**

DSS Features

- **Information systems**
- **Used by managers**
- **Used in making decisions**
- **Used to support, not to replace people**
- **Used when the decision is "semi-structured" or "unstructured"**
- **Incorporate a database of some sort**
- **Incorporate models**

DSS Features contd...

- **Has a user -friendly front end**
- **Has access to a large database**
- **Relies heavily on models**
- **Is capable of addressing "What-if" questions**
- **Can be used to address *ad-hoc*, unexpected problems**
- **Can provide a valid representation of a real world system**

DSS Types by Problem Structure

- Suggestion systems
- Optimization systems
- Representational models
- Accounting models
- Analysis information systems
- Data analysis systems
- File drawer systems



File Drawer Systems

- They are the simplest type of DSS
- Can provide access to data items
- Data is used to make a decision
- ATM Machine
- Use the balance to make transfer of funds decisions
- Database query languages accessing a single database

Data Analysis Systems

- **Provide access to data**
- **Allows data manipulation capabilities**
- **Airline Reservation system**
- **No more seats available**
- **Provide alternative flights you can use**
- **Use the info to make flight plans**

Analysis Information Systems

- **Information from several files are combined**
- **Some of these files may be external**
- **We have a true “data base”**
- **The information from one file, table, can be combined with information from other files to answer a specific query.**

Accounting Models

- **Use internal accounting data**
- **Provide accounting modeling capabilities**
- **Cannot handle uncertainty**
- **Example: Use Bill of Material**
 - Calculate production cost
 - Make pricing decisions

Representational Model

- **Can incorporate uncertainty**
- **Uses models to solve decision problem using forecasts**
- **Can be used to augment the capabilities of Accounting models**
- **Use the demand data to forecast next years demand**
- **Use the results to make inventory decisions.**

Optimization Systems

- **Used to estimate the effects of different decision alternative**
- **Based on optimization models**
- **Can incorporate uncertainty**
- **Assign sales force to territory**
- **Provide the best assignment schedule**

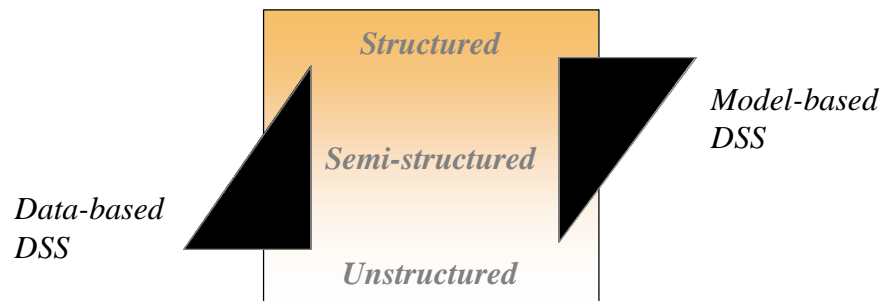
Suggestion Systems

- **A descriptive model used to suggest to the decision maker the best action**
- **A prescriptive model used to suggest to the decision maker the best action**
- **May incorporate an Expert System**
- **Use the system to recommend a decision**
- **Ex: Applicant applies for personal loan**

DSS Types contd...

■ Support based DSS

- ◆ Data-based DSS
- ◆ Model-based DSS



DSS Types contd...

■ Based on the nature of the decision situation

- ◆ Institutional
 - Culture of the organization
 - Regularly used
 - Used by more than one persons
- ◆ Ad hoc
 - One of kind
 - One-time use
 - Used by single individual

DSS Types contd...

■ Based on number of users

- ◆ Individual
- ◆ Multi-individual
- ◆ Group

DSS Benefits

- **Improving Personal Efficiency**
 - more scenarios in less time
- **Expediting Problem Solving**
 - quick, improved, consistent
 - unbiased past or future effect of decision
 - unemotional basis (tech.)

DSS Benefits continued...

- **Facilitating Interpersonal Communications**
 - Offensive use (result in future)
 - Defensive use (result in past)
- **Promoting Learning or Training**
 - Expert systems
- **Increasing Organizational Control**
 - Computerized systems can impose consistency across multiple dimensions

Detrimental DSS Effects - When and Why?

- **Design flaws**
- **Inadequate understanding of task or user**
- **Inadequate modeling of “reality”**
- **Inadequate understanding of human information processing constraints**
- **Can promote cognitive biases!**

Effective Usage: User Community

Effectiveness	Individual	Multi- individual	Group
Improving personal efficiency	H	H	L
Expediting problem solving	L	M	H
Facilitating communication	L	L	H
Promoting learning	M	H	H
Increasing control	L	H	M

Effective Usage: User Psychological Types

- Please take a test of your personality type at <http://www.davideck.com>
- **Introversion vs. Extraversion**
 - less vs. more immediate interaction
 - on line chat vs. delayed electronic discussion
- **Sensing vs. iNtuition**
 - large number of facts vs. less data more 'hunches'
 - data-oriented DSS vs. less exhaustive DSS

Effective Usage: User Psychological Types contd.

- **Thinking vs. Feeling**
 - more use of logic vs. more human/eclectic
 - Optimization or suggestion models vs. “group ware”
- **Judgment vs. Perception**
 - quick to decide vs. slow to decide
 - model-oriented DSS vs. data-oriented DSS

Combinations...

<i>Temperament</i>	<i>Needs assistance in ...</i>
SP (Sensing & Perceptive)	<ul style="list-style-type: none">• Coherence of plan• Following selected solution
SJ (Sensing & Judging)	<ul style="list-style-type: none">• Categorizing, classifying• Generating creative alternatives
NT (iNtuition & Thinking)	<ul style="list-style-type: none">• Attending to facts & details• Looking at impact on people
NF (iNtuition & Feeling)	<ul style="list-style-type: none">• Attending to facts & details• Developing realistic alternatives• Implementation