SENG 31333 – Business Intelligence and Management Support Systems

Lecture 1 - Introduction to Decision Support Systems

Decision Making

- Is a process of
  - choosing among two or more alternative courses of action for the purpose of attaining one or more goals.
- It is influenced by
  - behavioral and scientific disciplines.

Managerial Responsibilities

- Planning
- Organizing
- Commanding
- Controlling
- Coordinating

Decision Making Steps

- Define the problem
- Construct a model
- Identify & Evaluate possible solutions
- Compare, choose, and recommend a potential solution to the problem

Decisions Making Scenarios

- Structured Decisions
  - established situation, programmable decision, situation fully understood, routine, specialized mfg. process
- Semi-structured decisions
  - have some structured elements and some unstructured elements
- Unstructured Decisions
  - emergent situation, creative decision, situation unclear, one-shot, general processes

Decision Making Constraints & Complexities

- Evaluating what-if scenarios
- Experimentation with a real system
- Changes in the decision-making environment may occur continuously
- Time pressure on the decision maker
- Analyzing a problem takes time/money
- Insufficient or too much information
- Accuracy versus speed
- Effectiveness versus efficiency

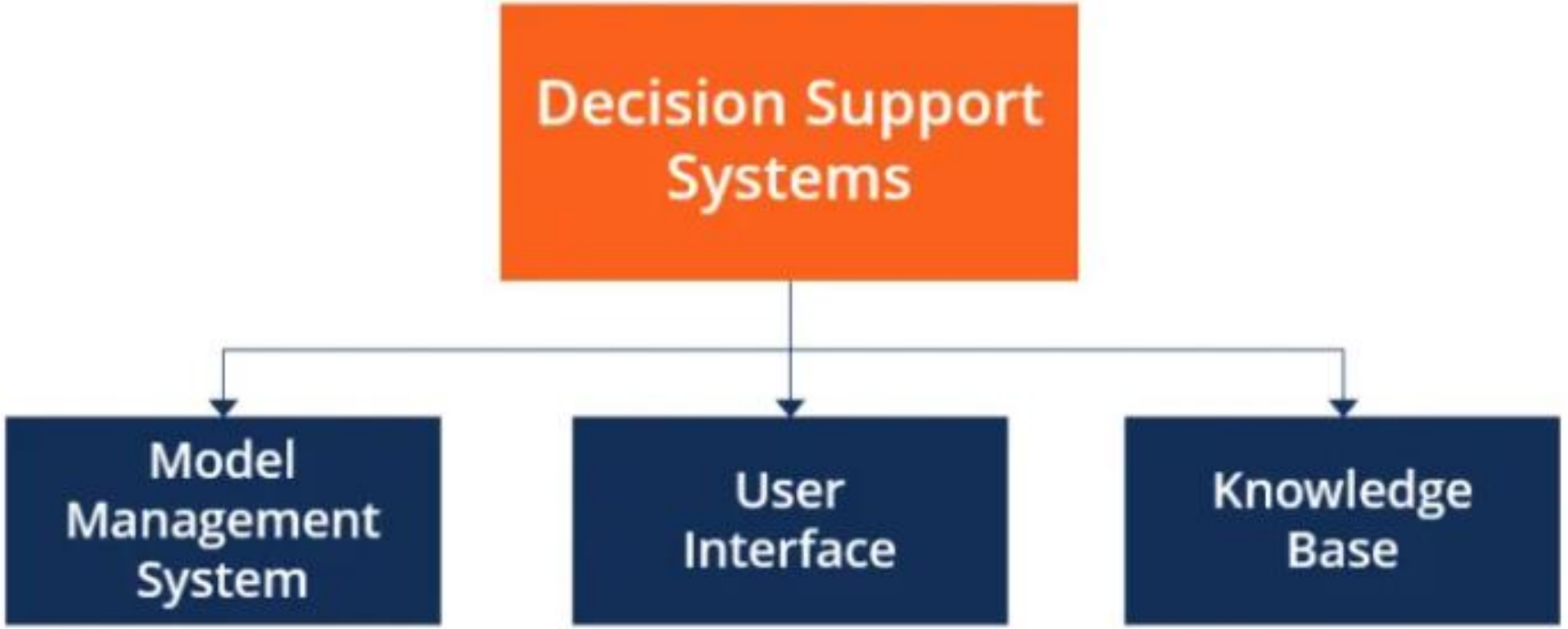
Decision Making Support

- Group communication and collaboration
- Improved data management
- Giant data warehouses and big data
- Analytical support
- Overcoming cognitive limits in information processing and storage
- Knowledge management
- The ability to access information anywhere, anytime

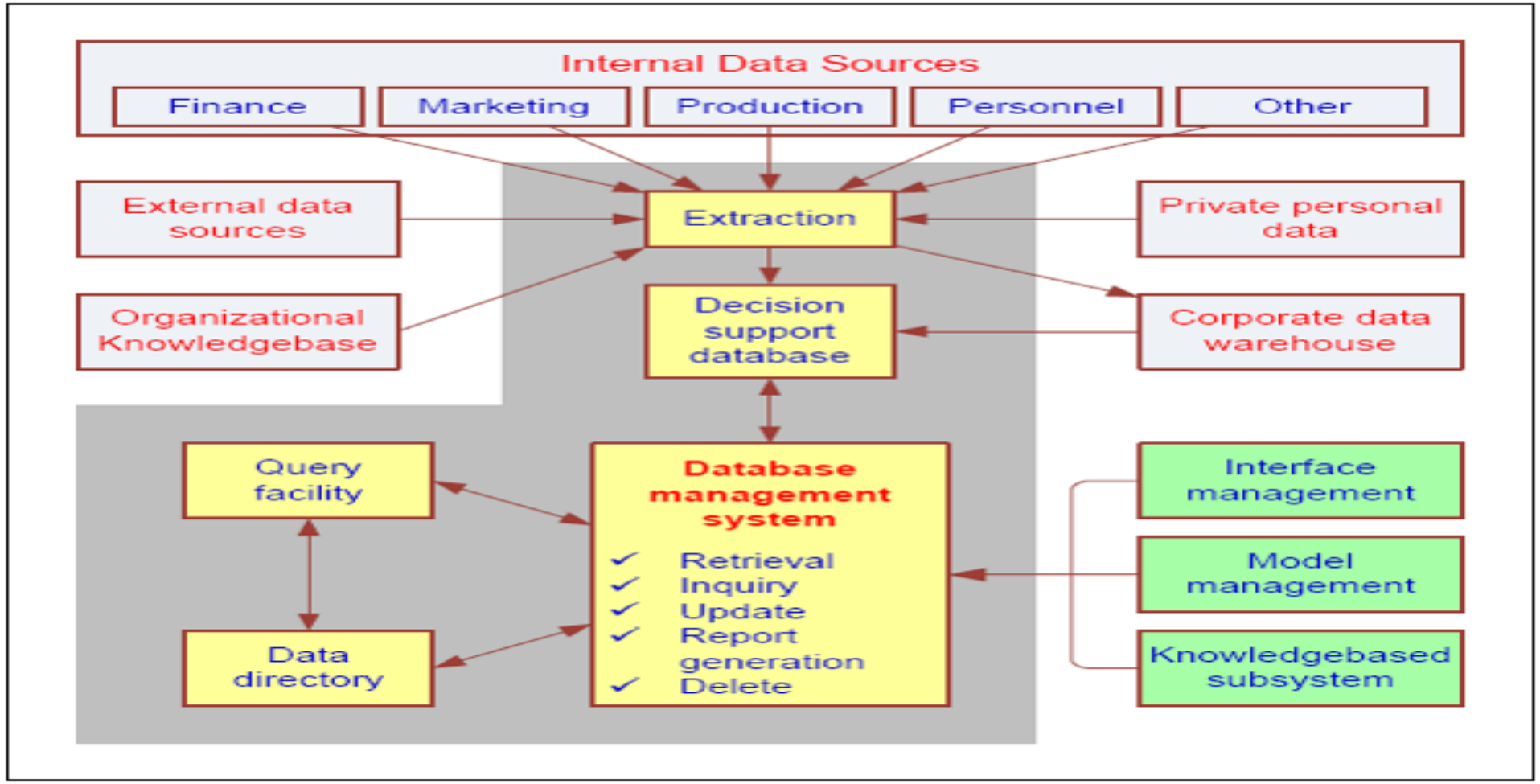
Decision Support Systems (DSS)

- DSS describes any computerized system that supports decision making in an organization.
- DSS is to support managerial decisions in semi-structured and unstructured decision situations that middle-level managers typically face;
  - attempt to combine the use of models or analytical techniques with traditional data access and retrieval functions;
  - focus on features which make them easy to use in an interactive mode;
  - emphasize flexibility and adaptability to accommodate changes in the environment and decision-making approach of the user.

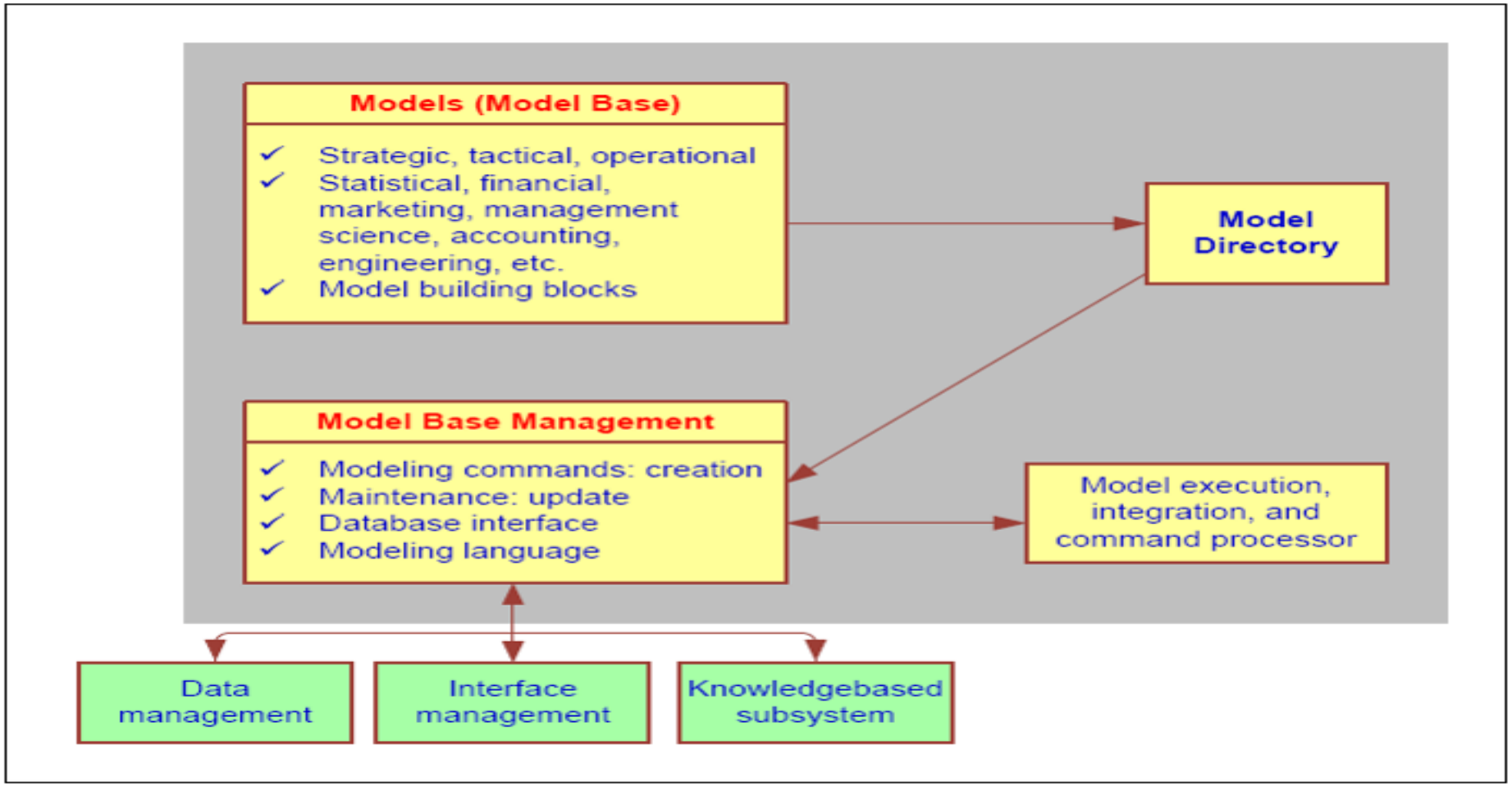
Components of DSS



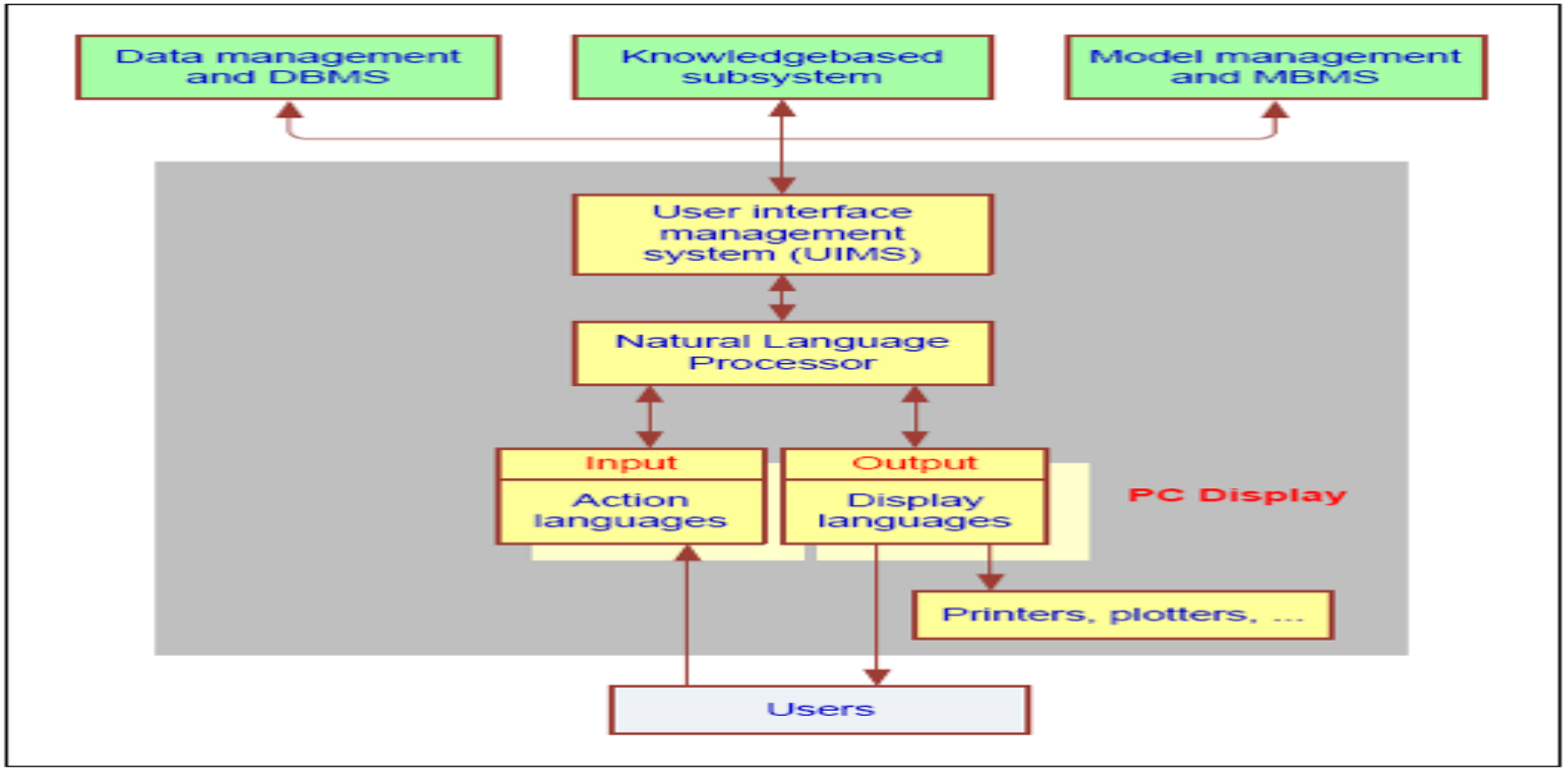
Data Management Subsystem



Model Management Subsystem



User Interface Subsystem



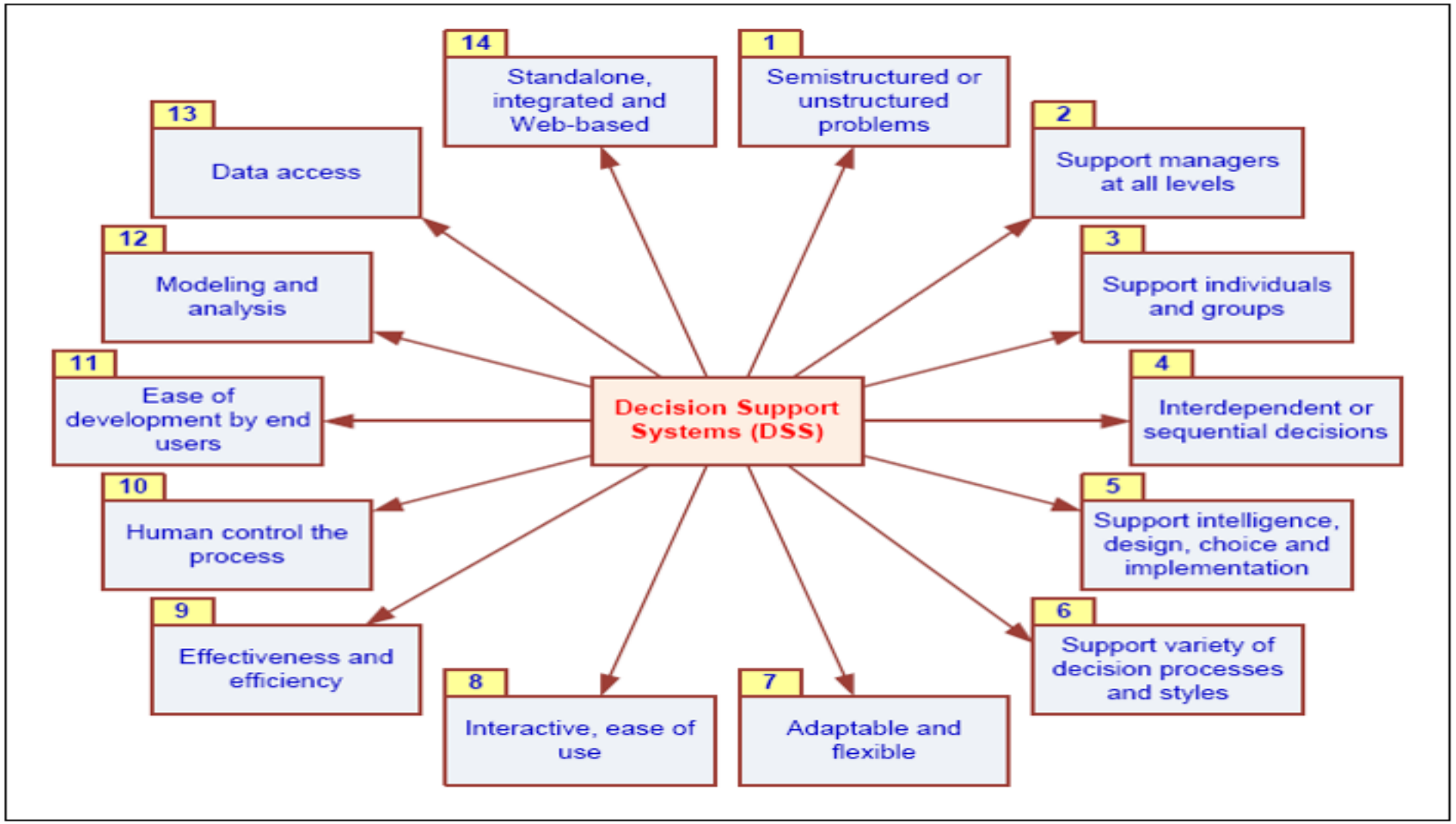
DSS Classifications

- Data-driven
  - file drawer systems, data analysis systems, analysis information systems, data warehousing and emphasizes access to and manipulation of large databases of structured data
- Document-driven
  - help managers retrieve and mange unstructured documents and web pages by integrating a variety of storage and processing technologies to provide complete document retrieval and analysis
- Knowledge-driven (management expert systems or intelligent decision support systems)
  - provide recommendation and/or suggestion schemes which aids the user in selecting an appropriate alternative to a problem at hand
- Model-driven
  - emphasize is on access to and manipulation of a model, rather than data
- Communications driven (group decision support systems (GDSS))
  - emphasizes the use of communications and decision models intended to facilitate the solution of problems by decision makers working together as a group

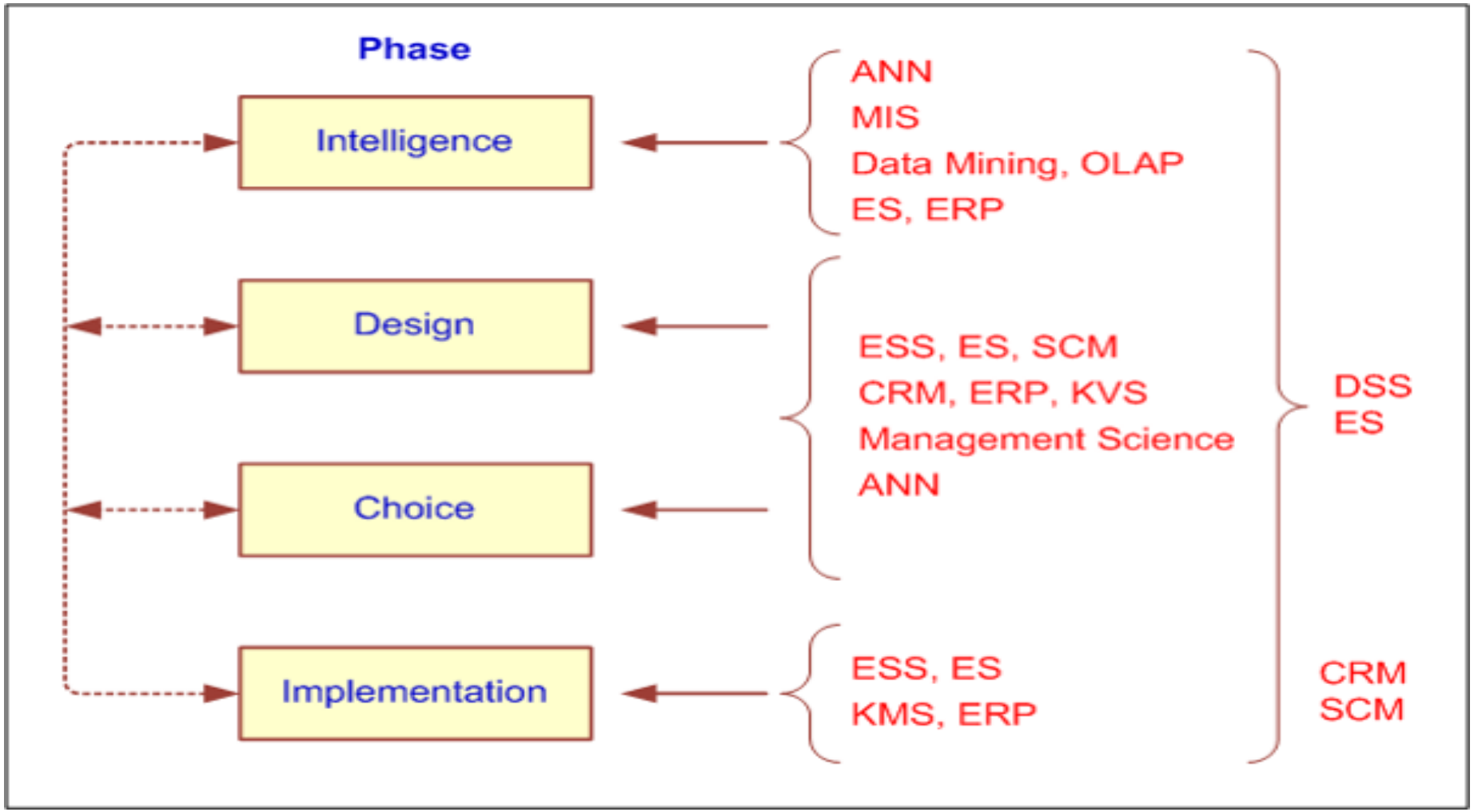
Evolution of DSS Applications

- Executive Information Systems (EIS)
- Group Support Systems (GSS)
- Geographic Information Systems (GIS)
- Expert Systems (ES)
- Knowledge Management Systems (KMS)
- Enterprise Resource Planning Systems (ERP), Customer Relationship Management Systems (CRM), Supply Chain Management Systems (SCM)

DSS Capabilities



How decisions are supported in Practice



How decisions are supported in practice **Intelligence Phase**

- Enabling continuous scanning of external and internal information sources to identify problems and/or opportunities
  - Business activity monitoring (BAM)
  - Business process management (BPM)
  - Product life-cycle management (PLM)
  - Resources/technologies: Web; ES, OLAP, data warehousing, data/text/Web mining, EIS/Dashboards, KMS, GSS, GIS, …

How decisions are supported in practice
Design Phase

- **Generating alternatives**
  - *Structured/simple problems*
    - standard and/or special models
  - *Unstructured/complex problems*
    - human experts, ES, KMS, brainstorming/GSS, OLAP, data/text mining

Support for the **Choice Phase**

- Use sensitivity analyses, what-if analyses, goal seeking
- Resources
  - KMS
  - CRM, ERP, and SCM
  - Simulation and other descriptive models

Support for **Implementation Phase**

- Decision communication, explanation and justification to reduce resistance to change
- Resources
  - Corporate portals, Web 2.0/Wikis
  - Brainstorming/GSS
  - KMS, ES

Other DSS types

- Ad hoc DSS
- Custom-Made Versus Ready-Made DSS
- Institutional DSS

Generations of DSS

- DSS with separate databases
- DSS with traditional data warehousing
- DSS with real time data warehousing
- DSS embedded in other systems
- DSS components integrated more frequently

Summary

- Identify role of computerized support for decision making and explain its importance
- List the different types of decisions managers face, and the process through which they make a decision.
- Learn how DSS have evolved over last decade
- Comprehend how DSS support various phases of decision making and identify related DSS
- Summarize how DSS have evolved into Business Intelligence and Analytic systems