SOFTWARE PROJECT MANAGEMENT

UNIT V

DECISION SUPPORT SYSTEMS

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UNIT V - SYLLABUS

- Decision structure- Decision Support Trends- DSS Components- Using DSS
- What-if analysis- sensitivity analysis- Goal Seeking Analysis- Optimization Analysis
- Executive Information Systems- Enterprise portals and decision support- knowledge management systems.

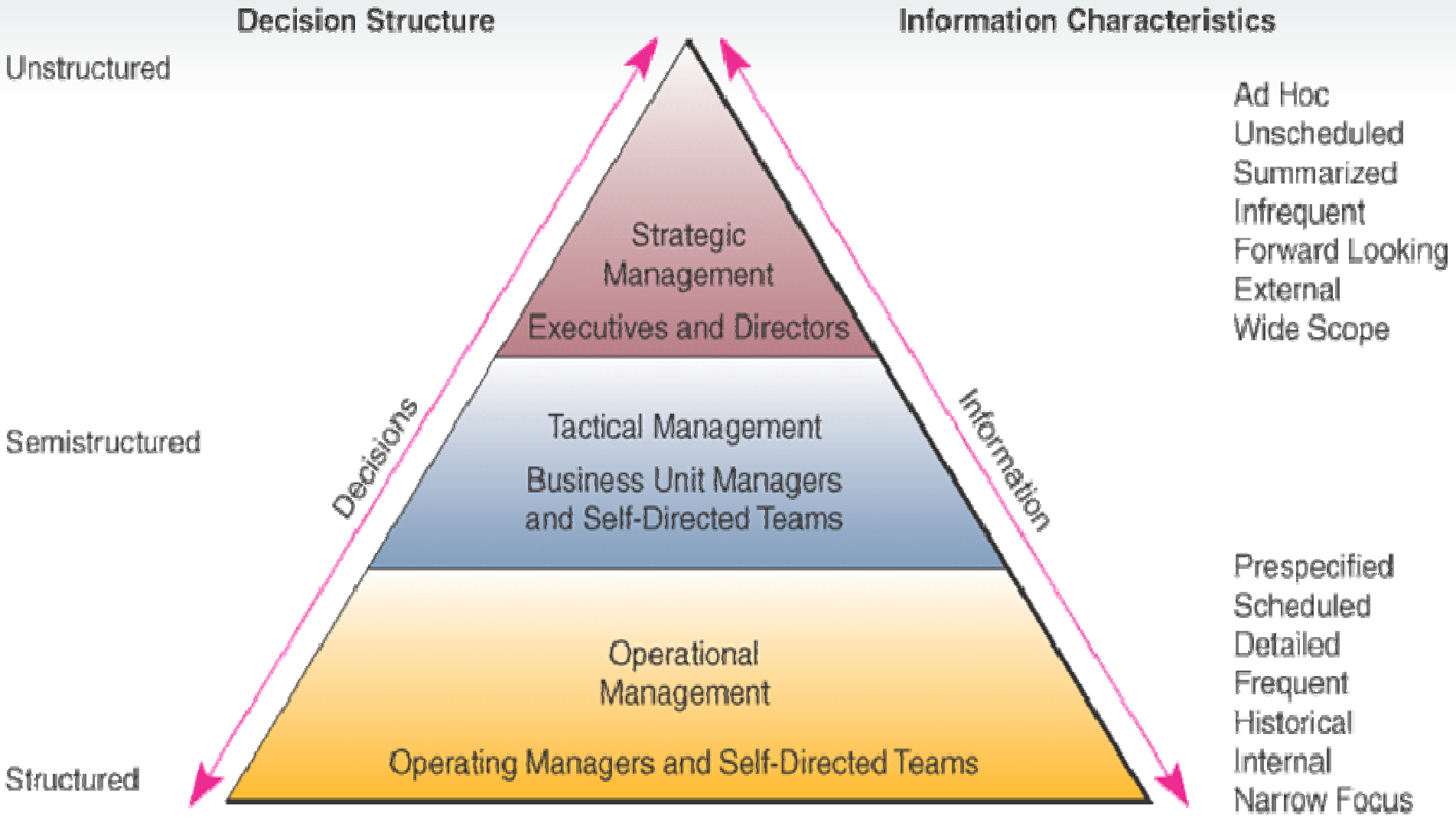
1. Decision - Definition

- **decision**
  - */dɪˈsɪʒ(ə)n/*
    - *noun*
  - *a conclusion or resolution reached after consideration.*

2. Types of Decisions in an Organization

- **Structured decisions**
  - *Can be automated because a well-defined standard operating procedure exists for these types of decisions, Known as programmable tasks*
- **Semistructured decisions**
  - *Include a structured aspect that benefits from information retrieval, analytical models, and information systems technology*
- **Unstructured decisions**
  - *No standard operating procedure*
  - *Decision maker's intuition plays a important role as ITtechnology offers less support for the decisions*

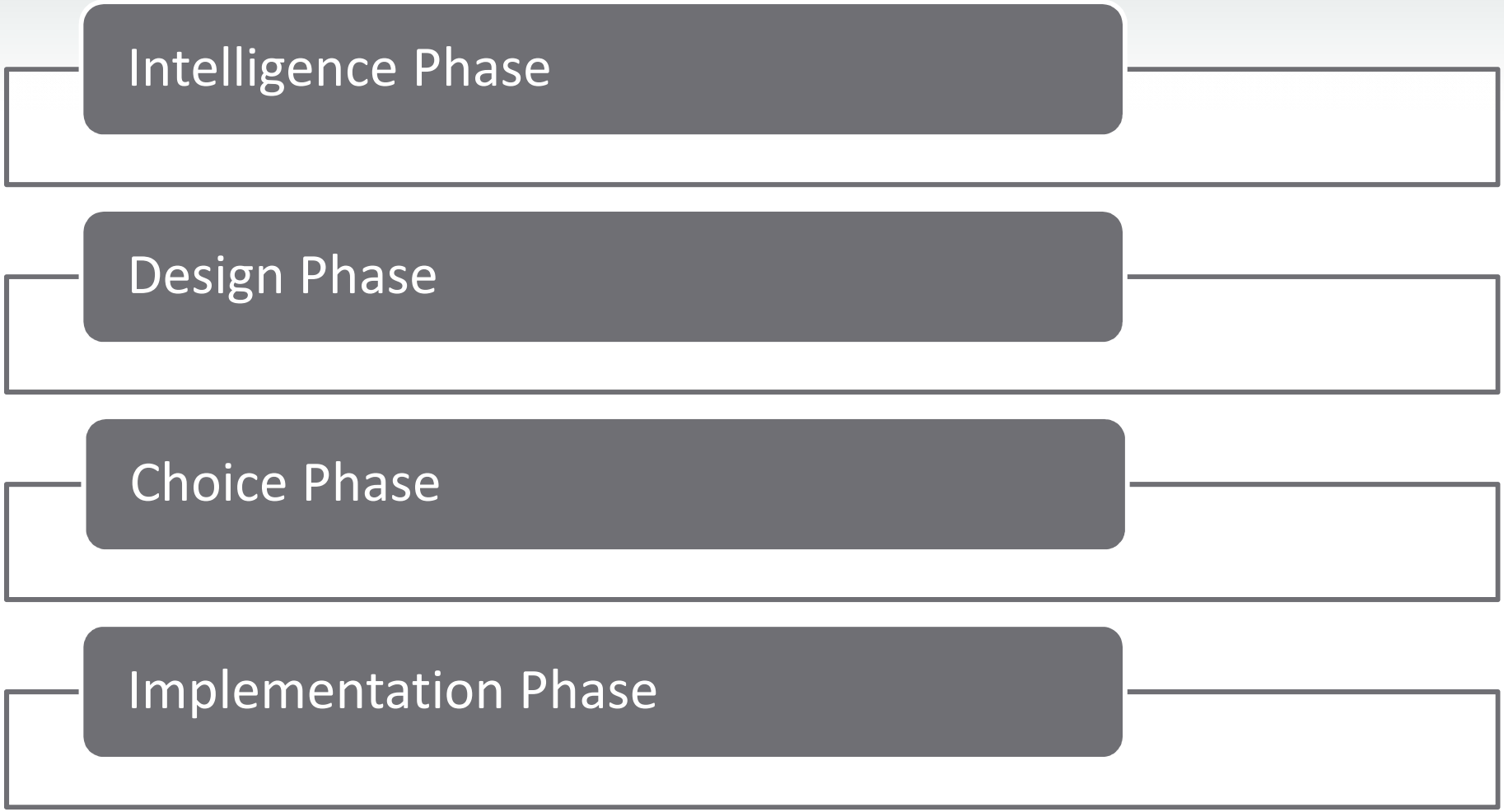
3. Organizational Levels and Types of Decisions



4. Management Support Systems (MSSs)

- Different types of information systems that have been developed to support certain aspects and types of decisions
- Each type is designed with unique goals and objectives

5. Phases of Decision Making



Intelligence Phase

- Decision maker examines the organization's environment for conditions that need decisions
- Data is collected from a variety of sources and processed
  - *Allows decision maker to discover ways to approach the problem*

Design Phase

- Defines criteria for the decision
- Generates alternatives for meeting the criteria
- Defines associations between the criteria and the alternatives
  - *Requires understanding how each alternative affects the criteria*
- Information technology does not support this phase of decision making

Choice Phase

- Involves selecting best and most effective course of action is from the alternatives
- Analyzes each alternative and its relationship to the criteria to determine whether it is feasible
- Decision support system (DSS)
  - *Helps sort through possible solutions to choose the best one for the organization*
  - *Includes tools for calculating cost-benefit ratios*

Implementation Phase

- Organization devises a plan for carrying out the alternative selected in the choice phase and obtains the resources to implement the plan
- DSS does a follow-up assessment on how well a solution is performing

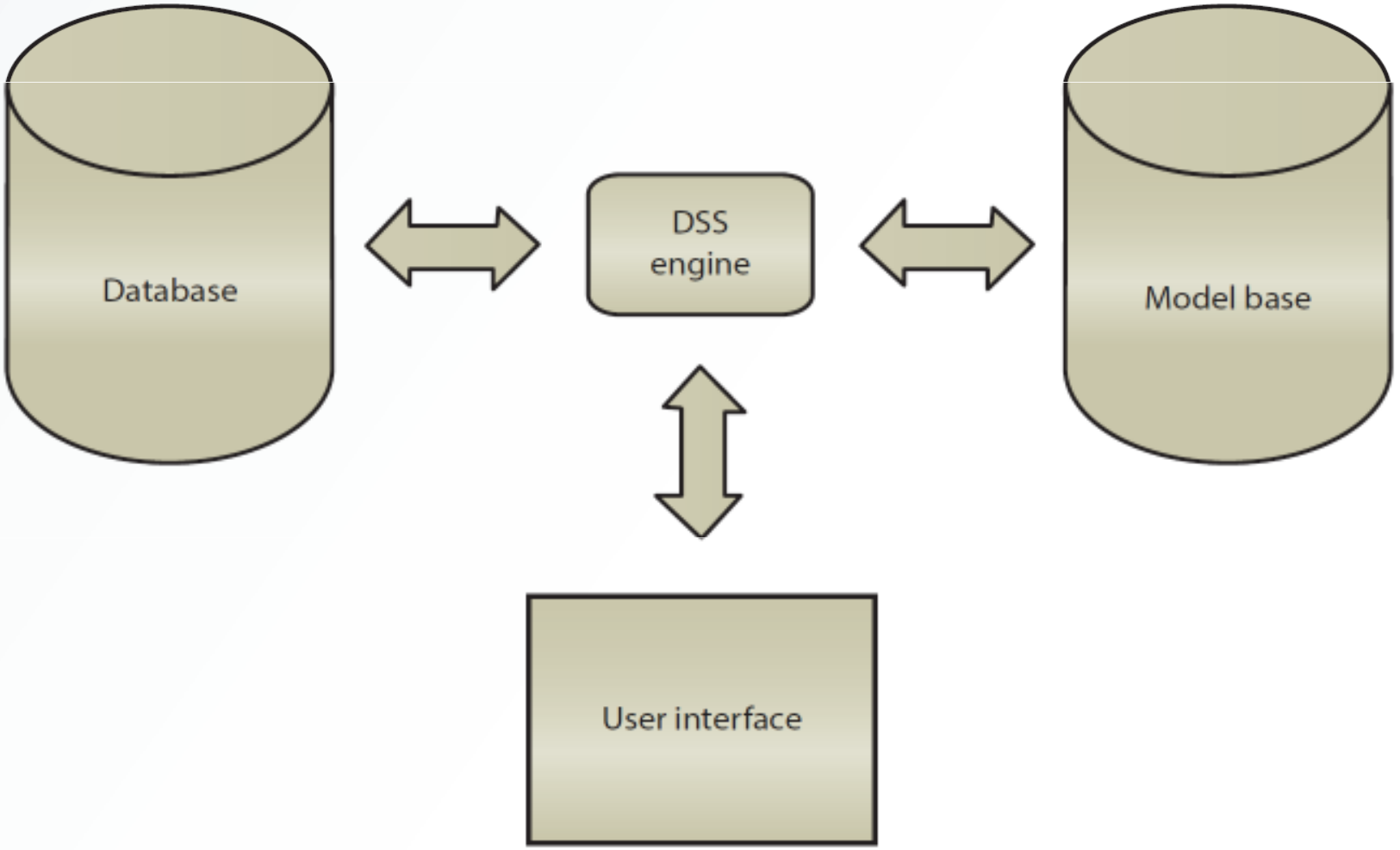
6. Decision Support Systems (DSS)

- Decision Support System (DSS) is an interactive computer-based system intended to help decision makers use communications technologies, data, documents, knowledge and/or models to identify and solve problems, and make decisions.
- Decision Support System is a general term for any computer application that enhances a person or group's ability to make decisions.

Decision Support Systems (DSS)

- **DSS Consists of:**
  - *Hardware*
  - *Software*
  - *Data*
  - *Mathematical and statistical models*
- **Requirements**
  - *Be interactive and incorporate the human element as well as hardware and software*
  - *Use internal and external data*
  - *Include mathematical and statistical models*
  - *Support decision makers at all organizational levels*
  - *Emphasize semistructured and unstructured tasks*

Components of a DSS



Components of a Decision Support System

- **Database**
  - *Includes internal and external data, and a database management system (DBMS)*
  - *Enables a DSS to perform data analysis operations*
- **Model base**
  - *Includes mathematical and statistical models that enable a DSS to analyze information*
- **Users access**
  - *User acces the DSS through user interface*
  - *DSS engine manages and coordinates the major components*

7. DSS Capabilities

- DSS includes following features to support decision making
  - *What-if analysis*
  - *Goal-seeking*
  - *Sensitivity analysis*
  - *Exception reporting analysis*
- Other capabilities
  - *Graphical analysis, forecasting, simulation, statistical analysis, and modeling analysis*

- **Sensitivity analysis**
  - Assesses the **impact of change in inputs** or parameters on solutions
  - Allows for **adaptability and flexibility**
  - Eliminates or reduces variables
  - Can be automatic or trial and error
- **What-if analysis**
  - Assesses solutions based on changes in variables or assumptions
- **Goal seeking analysis**
  - Backwards approach, starts with goal
  - Determines values of inputs needed to achieve goal
  - E.g. break-even point determination

Roles in the DSS Environment

- User
  - *Crucial because they use the DSS*
  - *Include department or organizational units in addition to people*
- **Managerial designer**
  - *Defines the management issues in designing and using a DSS*
  - *Issues are related to management's goals and needs*

Roles in the DSS Environment

- **Technical designer**
  - *Focuses on how the DSS is implemented*
  - *Addresses questions about data storage, file structure, user access, response time, and security measures*

Roles in the DSS Environment

- **Model builder**
  - *Liaison between users and designers*
  - *Responsible for supplying information on:*
    - What the model does
    - What data inputs the model accepts
    - How the model's output should be interpreted
    - What assumptions go into creating and using the model

8. CLASSIFICATION OF DSS SYSTEMS

- text-oriented DSS
- database-oriented DSS
- spreadsheet-oriented DSS
- solver-oriented DSS
- rule-oriented DSS
- compound DSS.

9. Benefits of a DSS

- Increase in the number of alternatives examined
- Fast response to unexpected situations
- Ability to make one-of-a-kind decisions
- New insights and learning
- Improved communication and control over operations

Benefits of a DSS

- Cost savings from making better decisions and analyze several scenarios in a short period
- Better decisions
- Effective teamwork
- Time savings
- Better use of data resources

10. Executive Information Systems (EISs)

- Branch of DSSs
- Interactive information systems that give executives easy access to internal and external data
- Include drill-down features and a digital dashboard for examining and analyzing information
- Designers should focus on simplicity when developing a user interface

Executive Information Systems (EISs)

- Adding features such as multimedia, virtual reality, and voice input and output increases ease of use
- Require access to both internal and external data
- Designed to provide information related to an organization's critical success factors
- Includes a digital dashboard

Digital Dashboard

- Integrates information from multiple sources and presents it in a unified, understandable format as charts and graphs
- Offers up-to-the minute snapshots of information
- Assists decision makers in identifying trends and potential problems
- Example of Web-based digital dashboard
  - *Microsoft SharePoint*

Reasons for Using EISs

- Provides managers with analytical and decision-making tools
- Includes graphical representations of data that helps executives make critical decisions
- Used by executives to share information with others quickly and easily
- Used by managers to improve efficiency and effectiveness of decision making

Factors Leading to a Failed EIS

- Organizational resistance to the project or perception that the project is unimportant
- Lack of interest or commitment from management
- Inability to define objectives and information requirements clearly
- System's objectives are not linked to factors critical to the organization's success
- Project's costs can not be justified

Reasons for EIS failure

- Developing applications takes too much time or the system is too complicated
- Vendor support has been discontinued
- Senior executives lack computer proficiency
- Senior executives being unlikely to use systems that need training and regular use to learn
- Lack of understanding about what executives' work involves

EIS Packages and Tools

- Consist of following components:
  - *Administrative module for managing data access*
  - *Builder module for developers to configure data mapping and screen sequencing*
  - *Runtime module for using the system*

Tasks Performed by Managers Using EIS

Tracking performance	Flagging exceptions	Ranking
Comparing	Spotting trends	Investigating or exploring

11. Group Support Systems (GSSs)

- Assist decision makers working in groups
- Use computer and communication technologies to formulate, process, and implement a decision-making task
- Help overcome the limitations of group interactions
  - *Reduce communication barriers*
  - *Introduce order and efficiency into situations that are inherently unsystematic and inefficient*

Group Support Systems (GSSs)

- Success depends on following factors
  - *Matching the GSS's level and sophistication to the group's size and the scope of the task*
  - *Management support*

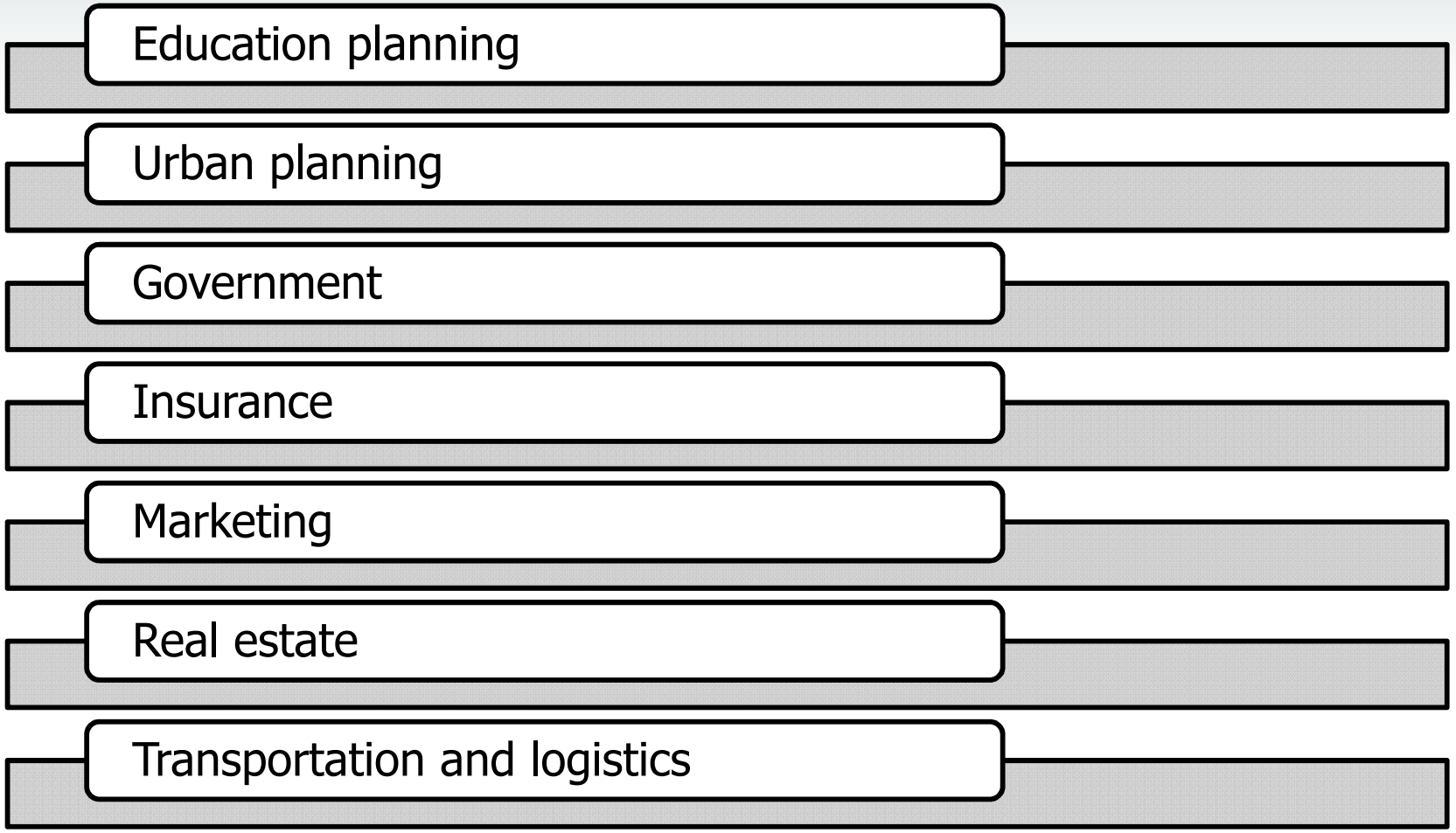
Group Support Systems (GSSs)

- Useful for:
  - *Committees*
  - *Review panels*
  - *Board meetings*
  - *Task forces*
  - *Decision-making sessions that require input from several decision makers*

12. Geographic Information Systems (GIS)

- Example of a GIS: Getting driving directions from Google Maps
  - *Interactive GIS that identifies routes from start to destination*
  - *User-friendly interface that helps you visualize the route*

GIS Applications



13. Executive Information Systems

- Combines many features of MIS and DSS
- Provide top executives with immediate and easy access to information
- Identify factors that are critical to accomplishing strategic objectives (critical success factors)
- So popular that it is used by managers, analysis, and other knowledge workers

Features of an EIS

- Information presented in forms tailored to the preferences of the executives using the system
  - *Customizable graphical user interfaces*
  - *Exception reports*
  - *Trend analysis*
  - *Drill down capability*

14. Enterprise Information Portals

- An EIP is a Web-based interface and integration of MIS, DSS, EIS, and other technologies
  - *Available to all intranet users and select extranet users*
  - *Provides access to a variety of internal and external business applications and services*
  - *Typically tailored or personalized to the user or groups of users*
  - *Often has a digital dashboard*
  - *Also called **enterprise knowledge portals***

15. REALTIME - DSS

- **GPS route planning** determines the fastest and best route between two points by analyzing and comparing multiple possible options.
- **Medical diagnosis software** that allows medical personnel to diagnose illness.

DSS TOOLS AND PACKAGES

- Software for financial simulation and modeling (FINANSEER, Budget Expres, MicroSIMPLAN etc),
- Statistical and econometric software (SAS, Forecast Master Plus, ESP etc.),
- Software for building matrices and tree of decision (Expert Choise, Decision Aide, DecisionPad etc.)
- Software for special applications (PROMCALC, GAIA, TACDSS, TAPS) etc..

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