



**Turban, Aronson, and Liang  
Decision Support Systems and Intelligent Systems,  
Seventh Edition**

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# Chapter 1

## Management Support Systems: An Overview





# Learning Objectives

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- Understand how management uses computer technologies.
- Learn basic concepts of decision-making.
- Understands decision support systems.
- Recognize different types of decision support systems used in the workplace.
- Determine which type of decision support system is applicable in specific situations.
- Learn what role the Web has played in the development of these systems.



# Harrah's Makes a Great Bet Vignette

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- Data Warehouse
- Data Mining
- Business Intelligence
- Transaction Processing System
- Customer Relationship Management
- Decision Support System



# Mintzberg's 10 Management Roles

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- Interpersonal
  - Figurehead
  - Leader
  - Liaison
- Informational
  - Monitor
  - Disseminator
  - Spokesperson
- Decisional
  - Entrepreneur
  - Disturbance Handler
  - Resource Allocation
  - Negotiator



# Productivity

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- The ratio of outputs to inputs that measures the degree of success of an organization and its individual parts



# Factors Affecting Decision-Making

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- New technologies and better information distribution have resulted in more alternatives for management.
- Complex operations have increased the costs of errors, causing a chain reaction throughout the organization.
- Rapidly changing global economies and markets are producing greater uncertainty and requiring faster response in order to maintain competitive advantages.
- Increasing governmental regulation coupled with political destabilization have caused great uncertainty.



# What do Decision Support Systems Offer?

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- Quick computations at a lower cost
- Group collaboration and communication
- Increased productivity
- Ready access to information stored in multiple databases and data warehouse
- Ability to analyze multiple alternatives and apply risk management
- Enterprise resource management
- Tools to obtain and maintain competitive advantage





# Cognitive Limits

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- The human mind has limited processing and storage capabilities.
- Any single person is therefore limited in their decision making abilities.
- Collaboration with others allows for a wider range of possible answers, but will often be faced with communications problems.
- Computers improve the coordination of these activities.
- This knowledge sharing is enhanced through the use of GSS, KMS, and EIS.





# Management Support Systems

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- The support of management tasks by the application of technologies
  - Sometimes called Decision Support Systems or Business Intelligence



# Management Support Systems Tools

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- DSS
- Management Science
- Business Analytics
- Data Mining
- Data Warehouse
- Business Intelligence
- OLAP
- CASE tools
- GSS
- EIS
- EIP
- ERM
- ERP
- CRM
- SCM
- KMS
- KMP
- ES
- ANN
- Intelligent Agents
- E-commerce DSS

# Decision Support Frameworks

	Type of Control		
Type of Decision:	Operational Control	Managerial Control	Strategic Planning
Structured (Programmed)	Accounts receivable, accounts payable, order entry	Budget analysis, short-term forecasting, personnel reports	Investments, warehouse locations, distribution centers
Semistructured	Production scheduling, inventory control	Credit evaluation, budget preparation, project scheduling, rewards systems	Mergers and acquisitions, new product planning, compensation, QA, HR policy planning
Unstructured (Unprogrammed)	Buying software, approving loans, help desk	Negotiations, recruitment, hardware purchasing	R&D planning, technology development, social responsibility plans



# Technologies for Decision-Making Processes

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Type of Decision	Technology Support Needed
<b>Structured (Programmed)</b>	<b>MIS, Management Science Models, Transaction Processing</b>
<b>Semistructured</b>	<b>DSS, KMS, GSS, CRM, SCM</b>
<b>Unstructured (Unprogrammed)</b>	<b>GSS, KMS, ES, Neural networks</b>

# Technology Support Based on Anthony's Taxonomy

	Type of Control		
	Operational Control	Managerial Control	Strategic Planning
Technology Support Needed	MIS, Management Science	Management Science, DSS, ES, EIS, SCM, CRM, GSS, SCM	GSS, CRM, EIS, ES, neural networks, KMS



**Figure 1.2** Decision Support Frameworks

Type of Decision	Type of Control			Technology Support Needed
	Operational Control	Managerial Control	Strategic Planning	
<b>Structured</b>	Accounts receivable, account payable, order entry <b>1</b>	Budget analysis, short-term forecasting, personnel reports, make-or-buy <b>2</b>	Financial management (investment), warehouse location, distribution systems <b>3</b>	Management information system, management science models, transaction processing
<b>Semistructured</b>	Production scheduling, inventory control <b>4</b>	Credit evaluation, budget preparation, plant layout, project scheduling, reward system design, inventory categorization <b>5</b>	Building new plant, mergers and acquisitions, new product planning, compensation planning, quality assurance planning, HR policies, inventory planning <b>6</b>	DSS, KMS, GSS, CRM, SCM
<b>Unstructured</b>	Selecting a cover for a magazine, buying software, approving loans help desk <b>7</b>	Negotiating, recruiting an executive, buying hardware, lobbying <b>8</b>	R & D planning, new technology development, social responsibility planning <b>9</b>	GSS, KMS ES, neural networks
<b>Technology Support Needed</b>	Management information system, management science	Management science, DSS, ES, EIS, SCM CRM, GSS, SCM	GSS, CRM EIS, ES, neural networks, KMS	



# Management Science/Operations Research

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- Adopts systematic approach
  - Define problem
  - Classify into standard category
  - Construct mathematical model
  - Evaluate alternative solutions
  - Select solution





# Enterprise Information Systems

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- Evolved from Executive Information Systems combined with Web technologies
- EIPs view information across entire organizations
- Provide rapid access to detailed information through drill-down.
- Provide user-friendly interfaces through portals.
- Identifies opportunities and threats



# Enterprise Information Systems

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- Specialized systems include ERM, ERP, CRM, and SCM
- Provides timely and effective corporate level tracking and control.
- Filter, compress, and track critical data and information.



# Knowledge Management Systems

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- Knowledge that is organized and stored in a repository for use by an organization
- Can be used to solve similar or identical problems in the future
- ROIs as high as a factor of 25 within one to two years



# Expert Systems

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- Technologies that apply reasoning methodologies in a specific domain
- Attempts to mimic human experts' problem solving
- Examples include:
  - Artificial Intelligence Systems
  - Artificial Neural Networks (neural computing)
  - Genetic Algorithms
  - Fuzzy Logic
  - Intelligent Agents



# Hybrid Support Systems

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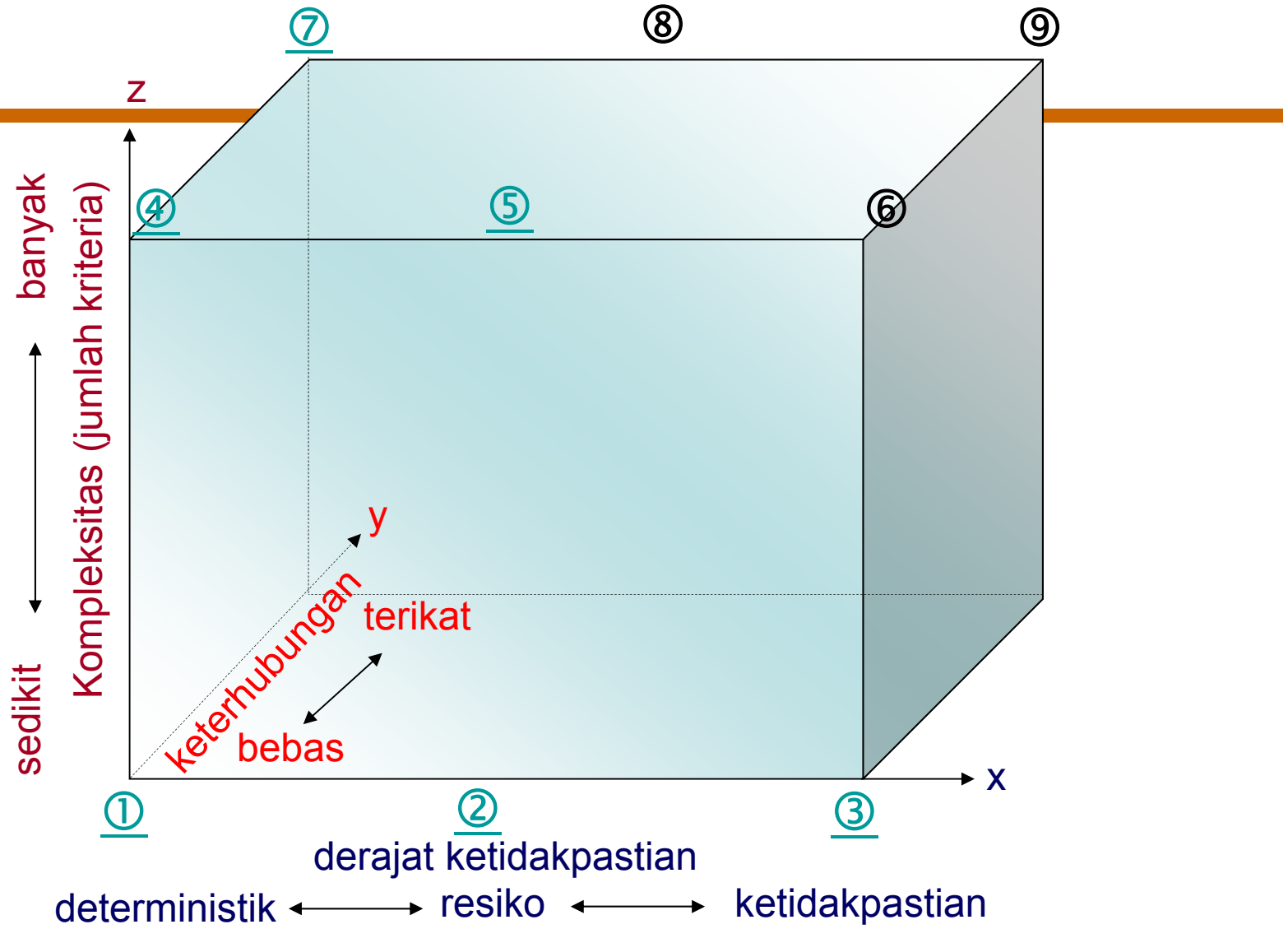
- Integration of different computer system tools to resolve problems
- Tools perform different tasks, but support each other
- Together, produce more sophisticated answers
- Work together to produce smarter answers



# Emerging Technologies

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- Grid computing
- Improved GUIs
- Model-driven architectures with code reuse
- M-based and L-based wireless computing
- Intelligent agents
- Genetic algorithms
- Heuristics and new problem-solving techniques





# Metode yang digunakan

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## 1. Masalah **optimasi** pada perancangan teknik.

- Linear programming
- Quadratic programming
- Generalized Reduced Gradient method
- Sequential Quadratic Programming
- Augmented Lagrangian Method
- Genetic Algorithms
- Simulated Annealing



## 2. Masalah pengambilan keputusan **dibawah resiko**, seperti:

<i>Tipe resiko &amp; ketidakpastian</i>	<i>Contoh</i>
Manufaktur	<ul style="list-style-type: none"><li>■ Macam-macam manufaktur</li><li>■ Macam-macam properti material</li></ul>
Desain/analisis	<ul style="list-style-type: none"><li>■ Evaluasi kinerja produk</li><li>■ Translasi nilai kinerja</li></ul>
Ekonomi/pemasaran	<ul style="list-style-type: none"><li>■ Perubahan lokasi pemasaran</li><li>■ Aksi kompetitif</li><li>■ Perubahan preferensi customers</li><li>■ Harga material</li><li>■ Faktor ekonomi eksogen</li></ul>

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- Perancangan probabilitas dengan metode statistik: *Statistical Interval Estimation* (Confidence Interval, Tolerance Interval, and Prediction Interval, dll); Analysis of Variance (ANOVA); Factorial and Fractional; Factorial Design of Experiments (DOE) dan Regression Analysis.
  - Utility analysis & risk profile (Von Neumann & Morgenstern utility method)
  - Robust design (Taguchi method)





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3. Pengambilan keputusan **di bawah ketidakpastian**:

- Menggunakan pertimbangan subyektif dan atau menghimpun data baru (teorema Bayes)

4. **Multicriteria decision making** di bawah kepastian:

- Multi Attribute Decision Making (MADM): Pugh's selection method, Quality Function Deployment (QFD), Analytic Hierarchy Process (AHP).
- Multi Objective Decision Making (MODM)






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## 5&6 . Multicriteria decision making di bawah resiko dan ketidakpastian:

- Teori himpunan fuzzy
- Multi Attribute Utility Theory (MAUT)
- Decision tree
- Bayesian method





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7,8,9 Pengambilan keputusan **terdistribusi**, dilakukan melalui tahap-tahap:

- Definition phase
- Conceptual phase
- Embodiment phase
- Detail phase

