Decision Support Systems

Computer-Supported Decision Making
By Susan Miertschin
Decision Support Systems

Decision processes aided by computers – can help with effective decision making by structuring decision processes and providing valuable information.
Decision Support Systems

- DSS
- “… are computer technology solutions that can be used to support complex decision making and problem solving.”
Decision Support Systems

- Another Definition
  - “interactive computer-based systems that help people use computer communications, data, documents, knowledge, and models to solve problems and make decisions”
- Key components of an organization’s IT infrastructure
- Enable increased productivity
- Provide competitive advantage
- Ancillary systems that support human decision-making
DSS Types

- Data-driven DSS
  - Manipulation of large databases of structured data (data warehouses, data marts)
  - OLAP, BI

- Model-driven DSS
  - Emphasize access to and manipulation of models
  - Financial, representational, optimization models
  - Use data and parameters, not data intensive

- Knowledge-driven DSS
  - Recommend action to managers
  - Use business rules, knowledge-bases
  - Expert systems, data-mining systems
DSS Types (cont.)

- Document-driven DSS
  - Storage and retrieval of documents
  - Search engines, clustering & visualization systems
- Communication-driven DSS & GDSS
  - Integrates collaboration, communication and decision support technologies
  - A hybrid DSS that emphasizes use of communication technologies and decision process models
  - Chat and Email based systems, white board, bulletin board etc.
Business Intelligence

• “is the delivery of accurate, useful information to the appropriate decision makers within the necessary timeframe to support effective decision making.”

Data Mining

- Uses mathematical algorithms to examine data for
  - Patterns
  - Correlations
  - Clusters
- Operates on detail data, as opposed to statistically summarized data, generally speaking
- A type of DSS
DSS Suitability to Different Decision Situations

- **Data-driven DSS**
  - Managers need to conduct ad-hoc analyses of large sets of data and need to do so frequently

- **Model-driven DSS**
  - Recurring, semi-structured decision situations where quantitative models can support analysis

- **Knowledge-driven DSS**
  - Narrow domain of expertise can be defined, experts identified and knowledge can be codified

- **Communication-driven DSS**
  - Two or more people are involved in ad hoc decision processes

- **Document-driven DSS**
More DSS Types

- Inter-organizational or Intra-organizational
- Function-specific or General
- Web-Based
Competitive Advantage with DSS

- Competitive advantage
  - Do something better than competitors
- “IT doesn’t matter?” – Nicholas Carr
  - IT has been commoditized
  - IT does not provide competitive advantage
- IT does matter
  - Extracting value from IT requires innovation in business practices
Gaining Competitive Advantage

- Identify IT opportunities that can provide strategic advantages
- DSS must be *used* once implemented
- Unique, proprietary DSS can produce competitive advantage
  ...
- For awhile, until competitors catch up
  - Look for investments that can provide an “edge” for at least 3 years
Strategic Impact of DSS

• “Wal-mart’s most significant investment for increasing its efficiency is its Information Technology”

• “At any moment, executives and store managers can pinpoint the exact date an item was bought, the quantity purchased, number sold and days it took to turn”

• “By all accounts, technology and scale are at the core of Wal-Mart’s advantages over its rivals.”

• “Wal-Mart's aggressive adoption of information technology to improve logistics and back-office efficiency has been a major driver of productivity”
Wal-Mart’s IT Investment

- Wal-Mart creates RetailLink to share data with suppliers (1991)
- Wal-Mart invests $700 million in IT (1992)
- Wal-Mart announces Collaborative Forecasting System (1996)
- Wal-Mart creates world’s largest data warehouse (1997)
Benefits from Successful DSS

- Improve individual productivity
- Improve decision quality and speed up problem solving
- Improve inter-personal communications
- Improve decision making skills
- Increase organizational control
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