

# : *What decisions are appropriate for model-driven DSS?*

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Some decision problems occur across diverse businesses. Various approaches can be used to solve them depending upon the size and complexity of the business, its computing sophistication and the availability of relevant data. Model-driven DSS provide access to and manipulation of a quantitative model, for example, a financial, optimization or simulation model. Common decision problems that can be supported using quantitative models include: 1) cost estimation and cost-benefit analysis, 2) forecasting, 3) financing and investment, 4) inventory control and stockout, 5) location, allocation, distribution and transportation, 6) human resources planning and assignment, 7) project planning and control, 8) queuing and congestion, 9) reliability and replacement policy, and 10) sequencing and scheduling. Let's examine these 10 general decision problem types.

**1) Cost estimation and cost-benefit analysis:** It is common to estimate costs in decision making. What should we bid on the job? What is the anticipated cost of a project? What is the appropriate pricing? In some choice situations we also assess benefits. Sometimes costs and benefits are intangible and must be monetized. For example, given the decision maker's assessment of costs and benefits, which choice should be recommended? A model-driven DSS can increase accuracy of the estimates.

**2) Forecasting:** In business there are many unknowns and forecasting tools can provide projections to help anticipate outcomes. Often it is possible to use a time series analysis of data to answer questions such as: What will demand be for a product? What are the sales patterns? How will sales affect profits?

**3) Financing and investment:** Managing and budgeting capital is an ongoing task in businesses. Some decisions are short-term, others long-term. For example, how much capital do we need? How much will the capital cost? What are our assets worth? How much debt can the firm have?

**4) Inventory control and stockout:** Stockouts result from poor inventory control. Managers must analyze periodically inventory levels and ask questions like: How much product supply should we hold? When should we order more? How much should we order?

**5) Location, allocation, distribution and transportation:** Operations activities can often be

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conducted in many places and in many ways, choices must be made. Where is the best location for an operation? How big should a facility be? What resources are needed for a project? Will there be shortages?

**6) Human resources planning and assignment:** Making decisions about staffing needs and levels are often critical to business success. How many employees do we need? With what skills?

**7) Project planning and control:** How long will a project take? What activities are most important? How should resources be used?

**8) Queuing and congestion:** How long are waiting lines? How many servers or providers should we have? What service level are we providing?

**9) Reliability and replacement policy:** How well is equipment working? How reliable is it? When should we replace it?

**10) Sequencing and scheduling:** Setting priorities and organizing work processes often involve tradeoffs. For example, what job is most important? In what order should we complete jobs?

Part of analysis and design for an innovative DSS is categorizing the situation, examining the decision problems and evaluating alternative solution approaches. In a given organization facing any one of the above decision problems, a model-driven DSS may or may not be appropriate, but such an approach should be considered.

### References

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