: What are characteristics of a decision support system?

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How do you know a computerized system is a decision support system (DSS)? This question is important because knowledge transfer is more meaningful when we classify and categorize. Identifying characteristics, distinguishable features, attributes or aspects of all DSS helps distinguish such systems from other systems. Once accurate classification occurs, we are more likely to identify patterns and generalizations. In general, information systems that provide decision relevant information and results are decision support systems. DSS are interactive computer-based systems and subsystems intended to help decision-makers. These definitions include a number of characteristics. My approach has been to use a "big tent" definition and include business intelligence systems, some workflow systems, groupware, conferencing software, management expert systems and model-based analytic systems as decision support systems. So what are the major characteristics of DSS?

Alter (1980) identified three major characteristics of DSS:

1. DSS are designed specifically to facilitate decision processes,

2. DSS should support rather than automate decision making, and

3. DSS should be able to respond quickly to the changing needs of decision makers.

Clyde Holsapple and Andrew Whinston (1996) identified four characteristics one should expect to observe in a DSS (see pages 144-145). Their list is very general and provides an even broader perspective on the DSS concept. Holsapple and Whinston specify that a DSS must have a body of knowledge, a record-keeping capability that can present knowledge on an ad hoc basis in various customized ways as well as in standardized reports, a capability for selecting a desired subset of stored knowledge for either presentation or for deriving new knowledge, and must be designed to interact directly with a decision maker in such a way that the user has a flexible choice and sequence of knowledge-management activities.

Turban and Aronson (1995) and others try to narrow the "population of systems" called DSS. Turban and Aronson define DSS as “an interactive, flexible, and adaptable CBIS specially developed for supporting the solution of a nonstructured management problem for improved decision making (p. 77)”. A few paragraphs later, they broaden the definition and define 13 characteristics and

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capabilities of DSS. Their first characteristic is “DSS provide support for decision makers mainly in semistructured and unstructured situations by bringing together human judgment and computerized information. Such problems cannot be solved (or cannot be solved conveniently) by other computerized systems or by standard quantitative methods or tools”. Their list is a useful starting point.

Turban and Aronson note their list is an ideal set. They state “Because there is no consensus on exactly what a DSS is, there is obviously no agreement on standard characteristics and capabilities of DSS”. This conceptual confusion and lack of consensus on a well defined DSS concept originally prompted me in 1995 to try to more systematically define and categorize DSS. It seems impossible to conduct meaningful scientific research about systems that can't be consistently identified and categorized. A more consistent definition of DSS and set of “characteristics” should also improve communications about these important computerized systems with students and DSS practioners.

The following is my list of the characteristics of a DSS.

- **Facilitation**. DSS facilitate and support specific decision-making activities and/or decision processes.

- **Interaction**. DSS are computer-based systems designed for interactive use by decision makers or staff users who control the sequence of interaction and the operations performed.

- **Ancillary**. DSS can support decision makers at any level in an organization. They are NOT intended to replace decision makers.

- **Repeated Use**. DSS are intended for repeated use. A specific DSS may be used routinely or used as needed for ad hoc decision support tasks.

- **Task-oriented**. DSS provide specific capabilities that support one or more tasks related to decision-making, including: intelligence and data analysis; identification and design of

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alternatives; choice among alternatives; and decision implementation.

- **Identifiable**. DSS may be independent systems that collect or replicate data from other information systems OR subsystems of a larger, more integrated information system.

- **Decision Impact**. DSS are intended to improve the accuracy, timeliness, quality and overall effectiveness of a specific decision or a set of related decisions.

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