What is a modern decision support system?

by Dan Power

Editor, DSSResources.com

"Modern" keeps moving forward with computing and software progress, but generally the term means the system is "current", "up-to-date" or relatively "new". The modern era in decision support systems (DSS) started in many ways in 1995 with the specification of HTML 2.0 and the introduction of handheld computing and cell phones. Today the Web 2.0 technologies, mobile integrated devices and improved software development tools have revolutionized DSS user interfaces, while the decision support data store backend has gotten extremely powerful.

Modern DSS are more complex and more diverse than those prior to 1995. We need to stay current as decision support evolves and keep focused on what we expect in modern DSS. Technology got a bad reputation in Charlie Chaplin's movie "Modern Times" (1936). Today we are seeing more decision automation and more knowledge-driven decision support, but modern DSS are not dehumanizing the job of the manager. We are not in a struggle of man vs. machine, rather modern DSS provide one of the "keys" to helping us live successfully on this planet.

Computerized decision support systems have been in use for at least 40 years and some researchers trace such systems to 1951 and the Lyons Tea Shops business use of the LEO I (Lyons Electronic Office I) digital computer. LEO handled the company's accounts and logistics. Decision support software also factored in the weather forecast to help determine the goods carried by "fresh produce" delivery vans. One of LEO I's early tasks was the capture of daily orders which were phoned in every afternoon by the tea shops and used to calculate the overnight production requirements, assembly instructions, delivery schedules, invoices, costings and management reports (cf., Wikipedia). Frank Land, London School of Economics, considers Lyons the first company to use decision support applications. The SAGE system built for the U.S. military in the late 1950s was another first generation decision support application. The system built by Michael Scott-Morton in 1966 started efforts to build decision support applications with second generation computing technology (cf., Power, 2002; Power, 2006; Scott Morton, 1971).
What is a modern decision support system?

are at least 3 computing technology generations beyond 1966.

By the mid-1980s, all of the current types of DSS were implemented in some form, but those initial systems were primitive compared to modern DSS. Just as the video games of the 1980s like Donkey Kong and PacMan can still be played, some early DSS remain usable. But modern DSS are light years ahead in graphics, speed and functionality like modern videogames on X-Box 360 and Nintendo Wii. So early DSS like the first Atari games still have some interest, however the capabilities of modern DSS are much advanced.

The features of the specific categories of DSS have been reviewed. Check the discussions on communications-driven DSS (Power, 2007a), data-driven DSS (Power, 2007b), document-driven DSS (Power, 2007c), knowledge-driven DSS (Power, 2007d), and model-driven DSS (Power, 2007e). The defining characteristics of DSS have not changed. DSS remain characterized by facilitation, interaction, ancillary, repeated use, task oriented, identifiable and decision impact (cf., Power, 2003).

The following is a list of attributes that are becoming increasingly common in new and updated decision support systems. Not all modern DSS have these attributes, but some do! Some attributes are more closely associated with one category of DSS than another, but complex DSS often have multiple subsystems that fit in different categories. So for example, a complex, modern DSS may have a well-defined data-driven subsystem and a model-driven decision support subsystem. Major attributes of modern DSS include:

1) Broad domain of applications with diverse functionality -- who uses a DSS and for what purpose has expanded. We are identifying many use cases for DSS and we are beginning to capture each specific use in use case models.

2) Faster access to data stored in very large data sets -- data access refers to software and activities
What is a modern decision support system?

related to retrieving or acting upon data in a database or other repository. Data-driven DSS can have almost unlimited historical data stores.

3) Faster deployment -- software deployment is all of the activities that make a new DSS available for use. Faster deployment is partly due to the use of Web technologies, but better prototyping, templates, and vertical market applications also speed deployment of DSS.

4) Faster response -- how quickly an interactive system responds to user input has improved significantly. In a distributed computing environment, the lag with video, voice, data retrieval or transmitting model results is now negligible.

5) Integrated DSS with TPS, multiple decision support subsystems -- enterprise-wide decision support applications are increasingly common. A standardized interface and single sign-on security helps create an integrated and unified decision support/transaction processing environment. The days of standalone DSS are numbered and few.

6) Lower cost per user -- total annual cost for licensing DSS development software on a per user basis is declining. This trend will continue given the increased open source decision support applications for BI and CRM.

7) Multi-user and collaborative interaction -- DSS are increasingly collaborative and shared decision making environments.

8) Real-time data, DSS use and system response-- the classical conception is an immediate real-time system that is used while action is occurring. That vision is increasingly possible and sometimes very useful. See the Ask Dan! columns on real-time DSS (cf., Power, 2002a, 2002b).

9) Ubiquitous -- DSS are available and seem to be usable everywhere. DSS for a particular function
What is a modern decision support system?

can go with the targeted user.

10) User friendly and a better user experience -- Usability denotes the ease of using a particular tool. All DSS are much easier to use, but we can do more to improve usability and reduce information load.

11) Visualization, graphics intensive, visual applications -- visualization involves creating images, diagrams, or animations to communicate a message. Modern DSS increasingly include capabilities to see and manipulate visualizations.

This list of attributes of a modern DSS is likely incomplete. A modern DSS is usually ahead of the current practices, but may represent "best practices". Those of us interested in modern computerized decision support systems are promoting new ideas and approaches, and encouraging progress in supporting decision making.

References


(c) 2016 Daniel J. Power, Power Enterprises <power@dssresources.com>
What is a modern decision support system?


Power, D. J., "What was the first computerized decision support system (DSS)?" DSS News, Vol. 7, No. 27, December 31, 2006.


Power, D. J., "What are the features of a knowledge-driven DSS?" DSS News, Vol. 8, No. 6, March 25, 2007d.
What is a modern decision support system?


Scott Morton, M. S. Management Decision Systems; Computer-based support for decision making. Boston, Division of Research, Graduate School of Business Administration, Harvard University, 1971.


Author: Daniel Power
Last update: 2007-12-27 01:40