Model-driven DSS: What is a Spreadsheet-based DSS?

A Decision Support System that has been or will be implemented using a spreadsheet package can be termed a spreadsheet-based DSS. A spreadsheet is the enabling technology for the DSS. A wide variety of DSS can be implemented using desktop, client-server or Java spreadsheet applications.

In the world of accounting, a spreadsheet spreads or shows all of the costs, income, taxes, and other financial data on a single sheet of paper for a manager to look at when making a decision. Also, a spreadsheet is a collection of cells whose values can be displayed on a computer screen. An electronic spreadsheet organizes data into columns and rows. The data can then be manipulated by a formula to give an average, maximum or sum. By changing cell definitions and having all cell values re-evaluated, a user performs "what if?" analysis and observe the effects of those changes. Decision support systems built using spreadsheet software are sometimes called spreadsheet-based DSS (see Power, D. J., "A Brief History of Spreadsheets" at DSSResources.COM).

Are spreadsheet packages DSS generators? Sprague and Carlson (1982) defined a DSS Generator as a computer software package that provides tools and capabilities that help a developer quickly and easily build a specific Decision Support System (see p. 11). Spreadsheet packages qualify as DSS generators because: a) they have sophisticated data handling and graphic capabilities; b) they can be used for "what if" analysis; and c) spreadsheet software can facilitate the building of a DSS.

Model-driven and data-driven DSS are the most common types of DSS one would consider developing using a spreadsheet package. Spreadsheets seem especially appropriate for building a DSS with one or more small models. A developer would then add buttons, spinners and other tools to support a decision maker in "what if?" and sensitivity analysis. A data-driven DSS can also be implemented using a spreadsheet. A large data set can be downloaded to the DSS application from a DBMS, a web site or a delimited flat file. Then pivot tables and charts can be developed to help a decision maker summarize and manipulate the data.

Spreadsheet-based DSS can be created in an end user development environment or in a multiuser environment. Microsoft Excel is certainly the most popular spreadsheet application development environment. Add-in packages like Crystal Ball, Premium Solver and @Risk increase the capabilities of a spreadsheet and the variety of models that can be implemented. At DSSResources.COM, one can read spreadsheet-based DSS case examples from Decisioneering "SunTrust 'Banks' on Crystal Ball for assessing the risk of commercial loans" and Palisade "Procter & Gamble Uses @RISK and PrecisionTree World-Wide". Check the Spreadsheet-based DSS pages at DSSResources.COM for product links.

My colleague Cliff Ragsdale of Virginia Tech and author of "Spreadsheet Modeling and Decision Analysis" recently commented in an email that "if you want to give students hands-on experience creating a DSS, I don't think you can beat spreadsheets!" I agree and spreadsheets can be used to create many useful "production DSS applications" that deliver real benefits at a modest cost.

References

Power, D. J., "A Brief History of Spreadsheets". URL http://dssresources.com/history/sshistory.html, version 3.3, March 11, 2000

Ragsdale, C., Spreadsheet Modeling and Decision Analysis, Cincinnati, OH: South-Western Thomson Learning, 2000.

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Sprague, R. H. and E. D. Carlson. Building Effective Decision Support Systems. Englewood Cliffs, N.J.: Prentice-Hall, Inc.: 1982.

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