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Decision Support Systems Glossary

Key Decision Support Systems Terms

Managers and DSS Analysts need to understand Decision Support Systems jargon and buzzwords.

A

Ad-Hoc Query - Any spontaneous or unplanned question or query. An ad-hoc query often consists of dynamically constructed SQL that is constructed by desktop-resident or Web-based query tools.

Ad-Hoc Query Tool - An end-user tool that accepts an English-like or point-and-click request for data and constructs an ad-hoc query to retrieve the desired data from a database.

Agents – Self-contained processes that run in the background on a client or server and that perform useful functions for a specific user/owner. Agents may monitor exceptions based on criteria or execute automated tasks. For example once an event occurs a daemon performs a pre-defined action and then it returns to a monitoring state. See daemon.

Aggregate Data or Aggregated Data - Data that is results from applying a process to combine data elements. These terms refer to data that is summarized.

Alerts - A notification from an event that a trigger has exceeded a pre-defined threshold. See agents.

Analytical Hierarchy Process - An approach to decision making that involves structuring multiple choice criteria into a hierarchy, assessing the relative importance of these criteria, comparing alternatives for each criterion, and determining an overall ranking of the alternatives.

B

Business Data - Data about people, places, things, business rules, and events used to operate a business. It is not metadata.

Business Intelligence - BI is a popularized, umbrella term introduced by Howard Dresner of the Gartner Group in 1989 to describe a set of concepts and methods to improve business decision making by using fact-based support systems. The term is sometimes used interchangeably with briefing books and executive information systems. A Business Intelligence System is a Decision Support System.

Business Model - In a data warehouse it is the designer's view of how the business functions. The view can be from a process, data, event or resource perspective, and can be the past, present or future state of the business.

Business Transaction - According to Microstrategy, a business transaction is a unit of work acted upon by a data capture system to create, modify, or delete business data. Each transaction represents a single valued fact describing a single business event. Examples of transactions include a sales or loan transaction.

C

Client/server architecture - A network architecture in which computers on a network act as a server managing files and network services OR as a client where users run applications and access servers. Clients rely on servers for resources like web pages, data, files, printing and OLAP. For more information, please see the client/server FAQ at <http://www.abs.net/~lloyd/csfaq.txt>.

Cognitive Overload - A psychological phenomenon characterized by an overload of information for a decision maker. The amount of information exceeds the person's cognitive capacity. DSS can reduce or increase cognitive overload.

Communications-Driven DSS – A Decision Support Systems that uses network and communications technologies to facilitate collaboration and communication. The communications technologies is central to supporting decision-making. Technologies include: LANs, WANs, Internet, ISDN, Virtual Private Networks. Tools used include groupware, Videoconferencing, Bulletin Boards.

Computer-Mediated Communication - The use of computers to create, store, deliver, and process communications.

Computer Supported Cooperative Work – This term refers to the use of computers to support cooperative work among multiple participants (for example, collaborative authoring), as distinct from work that may not be cooperative.

Conferencing, Videoconferencing or Teleconferencing - Real-time, two-way communications. Conferencing is audio-video telecommunication support of simultaneous interactions among participants involving conference calls or videoconferencing.

Controllable Variables - Decision variables that can be changed and manipulated by a decision maker, such as quantity to produce, amount of resources to allocate, etc. .

Corporate Planning System - A decision support system that holds and derives knowledge relevant to planning decisions that cut across organizational units and involve all of an organization's functions including., its operations, finance, marketing, and human resources functions.

Cost/Benefit Analysis - This analysis addresses the allocation of capital. Cost-Benefit Analysis is a systematic, quantitative method for assessing the life cycle costs and benefits of competing alternatives. One identifies both tangible and intangible costs and benefits. Typical measures in Cost-Benefit Analysis (CBA) are return on investment (ROI), net present value (NPV), and discounted cash flow.

Critical Success Factors - Key areas of business activity in which favorable results are necessary for a company to reach its goals.

D

Data - Binary (digital) representations of atomic facts, text, graphics, bit-mapped images, sound, analog or digital live-video segments. Data is the raw material of a system supplied by data producers and is used by information consumers to create information.

Data Conferencing - This term refers to a communication session in which two or more participants are sharing computer-based data in real-time. Any participants' keyboard/mouse can control screens of other participants. Voice communication can be out-of-band using a totally separate voice connection or in-band using a simultaneous voice and data technology.

Data Dictionary - A database about data and database structures. A data dictionary is a catalog of all data elements that contains their names, structures, and information about their usage. It is a central location for metadata. Normally, data dictionaries are designed to store a limited set of available metadata, concentrating on the information relating to the data elements, databases, files and programs of implemented systems.

Data-Driven DSS - This type of Decision Support System emphasizes access to and manipulation of a time-series of internal company data and sometimes external data. Simple file systems accessed by query and retrieval tools provide the most elementary level of functionality. Data warehouse systems that allow the manipulation of data by computerized tools tailored to a specific task and setting or by more general tools and operators provide additional functionality. Data-driven DSS with On-line Analytical Processing (OLAP) or data mining tools provide the highest level of functionality and decision support that is linked to analysis of large collections of historical data. Early, very limited versions of Data-Driven Decision Support Systems were called Data-Oriented (Alter, 1980) or Retrieval-Only DSS by Bonczek, Holsapple and Whinston (1981).

Data Element - The most elementary unit of data that can be identified and described in a dictionary or repository which cannot be subdivided.

Data Mining - A class of analytical applications that search for hidden patterns in a data base. Data mining is the process of sifting through large amounts of data to produce data content relationships. This is also known as data surfing. Data mining tools use a variety of techniques including case-based reasoning, data visualization, fuzzy query and analysis, and neural networks. Case-based reasoning tools provide a means to find records similar to a specified record or records. These tools let the user specify the "similarity" of retrieved records. Data visualization tools let the user easily and quickly view graphical displays of information from different perspectives. For more information, please check the data mining FAQ at [http:// www.rpi.edu/~vanepa2/faq.html](http://www.rpi.edu/~vanepa2/faq.html).

Data Quality - High quality data is accurate, timely, meaningful, and complete. DSS must have high quality data; low quality data can result in bad decisions. Assessing or measuring data quality is a preliminary task associated with evaluating the feasibility of a data-driven DSS project.

Data Warehouse - A database designed to support decision making in organizations. It is batch updated and structured for rapid online queries and managerial summaries. Data warehouses contain large amounts of data. A data warehouse is a subject-oriented, integrated, time-variant, nonvolatile collection of data in support of management's decision-making process. Check "What is a Data Warehouse" by W.H. Inmon at http://www.cait.wustl.edu/cait/papers/prism/voll_no1/ According to Ralph Kimball "A data warehouse is a copy of transaction data specifically structured for query and analysis" (see Kimball, R. The Data Warehouse Toolkit: Practical Techniques for Building Dimensional Data Warehouses. 1996. Also, see Greenfield, L. A Definition of Data Warehousing.)

Data Visualization - This term refers to presenting data and summary information using graphics, animation, 3-D displays, and other multimedia DSS tools.

Decision - The choice of one from among a number of alternatives; a statement indicating a commitment to a specific course of action.

Decision Analysis Tools - DA tools help decision makers decompose and structure problems. The aim of these tools is to help a user apply models like decision trees, multi-attribute utility models, bayesian models, Analytical Hierarchy Process (AHP), etc. Examples of DA software packages include AliahThink, BestChoice3, Criterium Decision Plus, DecideRight, DecisionMaker, Demos, DPL, Expert Choice, Strad, Supertree, and Which and Why.

Decision Room - A physical arrangement for a group DSS in which workstations are available to participants. The objective for using a Decision Room is to enhance and improve the group's decision-making process.

Decision Systems - Computer based programs and technologies intended to make routine decisions, monitor and control processes, and aid or assist decision makers in semi-structured and/or non-routine decision situations.

Decision Support Systems (DSS) - Interactive computer-based systems intended to help decision makers utilize data and models to identify and solve problems and make

decisions. The "system must aid a decision maker in solving unprogrammed, unstructured (or "semistructured") problems...the system must possess an interactive query facility, with a query language that ...is ...easy to learn and use (Bonczek, Holsapple & Whinston, 1981; p. 19)". DSS help managers/decision makers use and manipulate data; apply checklists and heuristics; and build and use mathematical models. According to Turban (1990), a DSS has four major characteristics: DSS incorporate both data and models; they are designed to assist managers in their decision processes in semi-structured or unstructured tasks; they support, rather than replace, managerial judgment; and the objective of DSS is to improve the effectiveness of the decisions, not the efficiency with which decisions are being made (cf., p. 9).

Decision Variables - In a Model-Driven DSS a decision variable is a changing factor in the model that is determined by a decision maker. They are sometimes called independent variables and the range of values for the decision variables constrain the choices of the decision maker.

Demon or Daemon - A computer program or procedure that is automatically activated when it recognizes a specific, predefined state or condition.

Descriptive Model - Physical, conceptual or mathematical models that describe situations as they are or as they actually appear.

Deterministic Model - Mathematical models that are constructed for a condition of assumed certainty. The models assume there is only one possible result (which is known) for each alternative course or action.

Development Environment - A Development Environment is used by a designer/builder. A development environment typically includes software for creating and maintaining a knowledge base and software for the inference engine.

Dialog Generation and Management System (DGMS) - A software management package in a DSS whose functions in the dialog subsystem is similar to that of a DBMS in a database (see Sprague and Carlson, 1982, Ch. 7).

Dialog System - The hardware and software that create and implement a user interface for a DSS. A DSS dialog system creates the human-computer interface.

Document-Driven DSS - It integrates a variety of storage and processing technologies to provide complete document retrieval and analysis. The Web provides access to large document databases including databases of hypertext documents, images, sounds and video. Examples of documents that would be accessed by a Document-Based DSS are policies and procedures, product specifications, catalogs, and corporate historical documents, including minutes of meetings, corporate records, and important correspondence. A search engine is a powerful decision-aiding tool associated with a Document-Driven DSS (cf., Fedorowicz, 1993, pp. 125-136).

Domain Expert - A person who has expertise in the domain in which a specific expert system is being developed. A domain expert works closely with a developer (known as a knowledge engineer) to capture the expert's knowledge (especially rule and relationship information) in a computer readable representation often called a knowledge base.

Drill Down/Up - An analytical technique that lets a DSS user navigate among levels of data ranging from the most summarized (up) to the most detailed (down).

DSS Generator - Computer software package that provides tools and capabilities that help a developer quickly and easily build a specific Decision Support System (cf., Sprague and Carlson, 1982, p. 11). Excel is an example of a DSS Generator. Many companies market tools for building DSS and EIS, see DSS Companies page.

DSS Development Tools - Software components (such as editors, code libraries, specific objects, visual interfaces) that facilitate the development of a specific DSS. New tools include object oriented languages like Java and C++.

E

e-Meetings - A term for a meeting supported by full-motion video, audio, and Web meeting tools. One or more participants in the meeting is participating remotely in the meeting. It is possible that all participants are in different physical locations.

Enterprise-wide DSS – An enterprise-wide DSS is a DSS that supports a large group of managers in a networked client-server environment with a specialized data warehouse as part of the DSS architecture.

Evolutionary Design Process - A systematic process for system development that is recommended for use in creating DSS. A portion of the DSS system is quickly constructed, then tested, improved, and enlarged in systematic steps. This methodology is similar to prototyping and iterative design. See [prototyping](#).

Exception Reporting - A reporting philosophy and approach that supports Management by Exception. Reports should be designed to display significant exceptions in results and data. The idea is to "flag" important information and bring it quickly to the attention of managerial users of the report. Exception reporting can be implemented in any type of DSS, but it is particularly useful in Data-Driven DSS and EIS.

Executive Information Systems (EIS) – An EIS is a computerized system intended to provide current and appropriate information to support executive decision making for managers using a networked workstation. The emphasis is on graphical displays and an easy to use interface that present information from the corporate database. They are tools to provide canned reports or briefing books to top-level executives. EIS offer strong reporting and drill-down capabilities.

Executive Support Systems (ESS) - An ESS is an Executive Information System (EIS) that includes specific decision aiding and/or analysis capabilities.

Expert Systems – An expert system is a man-machine system with specialized problem-solving expertise. The "expertise" consists of knowledge about a particular domain, understanding of problems within that domain, and "skill" at solving some of these problems.

F

Facilitator - A person(s) who manages the use of a Group Decision Support System from initial planning through actual operation of the GDSS.

Feasibility Study - A study of the technical and economic prospects for developing a system prior to actually committing resources to developing it.

Function-Specific DSS - A decision support system that holds and derives knowledge relevant for decisions about some function an organization performs. For example, a DSS may support a marketing function like advertising or a production function like resource planning.

G

Generators - Software packages that are designed to expedite programming efforts that are required to build information systems, especially expert and decision support systems.

Goal-seeking - The capability of asking the computer software what values certain variables must have in order to attain desired goals. It is a tool that uses iterative calculations to find the value required in one cell (variable) in order to achieve a desired value in another cell. A common use of the goal-seeking feature in a spreadsheet is calculating a break-even quantity.

Geographic Information Systems (GIS) - A support system that represents data using maps. It helps people access, display and analyze data that have geographic content and meaning. Check U.S. Geological Survey page on Geographic Information Systems. Examples of software packages include ArcView, Map/IDIS, Proximity, and TargetView. See Spatial DSS.

Graphical User Interface (GUI) - A GUI is a program interface that uses a computer's graphics capabilities to make the program easier to use. Graphical interfaces use a pointing device to select objects, including icons, menus, text boxes, etc. A GUI includes standard formats for representing text and graphics. See [user interface](#).

Group Decision Support Systems (GDSS) - An interactive, computer-based system that facilitates solution of unstructured problems by a set of decision-makers working together as a group. It aids groups, especially groups of managers, in analyzing problem situations and in performing group decision-making tasks. A GDSS is a hybrid DSS that emphasizes both the use of communications and decision models. See **Communications-Driven DSS**.

Groupware - This type of software is designed to support more than one person working on a shared task. Groupware is an evolving concept that is a broad concept that provides more functionality than multi-user software that allows shared access data. Groupware provides a mechanism that helps users coordinate and keep track of on-going projects. It allows people to work together through computer-supported communication, collaboration, and coordination. Lotus Notes, Microsoft Exchange, Communicator, Novell GroupWise, Netscape SuiteSpot, Eclipse, Team Talk, and Internet

Explorer/NetMeeting are examples of groupware products. See **Communications-Driven DSS**.

H

Heuristics - The informal, judgmental knowledge of an application area that constitutes the "rules of good judgment" in the field. Heuristics also encompass the knowledge of how to solve problems efficiently and effectively, how to plan steps in solving a complex problem, how to improve performance, and so forth. From the Greek--Heuriskein to discover.

Hypermedia - Combination of several types of media such as text, graphics, audio, and video.

Hypertext - An approach for handling text and other information by allowing the users to jump from a given topic, whenever he or she wishes, to related topics. A knowledge management technique in which knowledge is represented in linked documents and processed in a way that allows a user to select a highlighted marker on the currently viewed page to access a linked page about a topic indicated by the marker.

I

Icon - A visual, graphic representation of an object, word, or concept.

Independent Variables - Variables in a model that are controlled by the environment and that influence the results of a decision (also called Input Variables, parameters, givens).

Industry-Specific DSS - A computer-based system that helps a manager accomplish a specific task in a specific industry environment like banking or hospitals.

Inference - Inference is the process of drawing a conclusion from given evidence. It means to reach a decision by reasoning.

Inference Engine - That part of an expert system that actually performs the reasoning function.

Information - Data that has been processed to add or create meaning and hopefully knowledge for the person who receives it. Information is the output of information systems.

Information Economics - This term refers to an approach to evaluating DSS/IS projects using a scoring approach to cost/benefit analysis that assesses technical and company tangible and intangible benefits and costs (see Parker, Trainor and Benson, Information Strategy and Economics, 1989).

Information Systems Architecture - A formal definition of the business processes and rules, systems structure, technical framework, and product technologies for business information systems. An information systems architecture consists of four layers:

business process architecture, systems architecture, technical architecture, and product delivery architecture.

Interdependent Decisions - A series of decisions that are interrelated. A sequential set of decisions are usually interdependent.

Internet - The Internet (capitalized) refers specifically to the DARPA Internet and the TCP/IP protocols it uses. The Internet is a collection of packet-switching networks and routers that uses the TCP/IP protocol suit and functions as a single, cooperative virtual network. A global web connecting more than one million computers. Visit URL <http://www.w3.org/>, The World Wide Web Consortium, and <http://www.stars.com/Internet/About.html>, The Web Developers Virtual Library, for more information about the Internet.

Inter-Organizational DSS – a DSS that serves a company's stakeholders including customers or suppliers. An Inter-Organizational DSS provides stakeholders with access to a company's intranet and authority or privileges to use specific DSS capabilities. Companies can make a Data-Driven DSS available to suppliers or a Model-Driven DSS available to customers to design a product or choose a product.

Intranet - An internal organizational network using TCP/IP with at least one web server that is only accessible by an organization's members or others who have specific authorization. A firewall and password protection limit access to the network. The intranet is used to share corporate information, including DSS capabilities. See web based DSS at <http://dssresources.com/dss/online.html> and check the Intranet FAQ at <http://www.intrack.com/intranet/ifaq.shtml>.

J

Java - An object-oriented programming language developed by Sun Microsystems. A Java applet running on a web page provides more user interaction and dynamic information updating. Java is platform independent, and the official Java web site is <http://java.sun.com/>. The largest directory of Java applets and Java-related web sites is <http://www.gamelan.com/>.

JavaScript – A programming language that is highly integrated with web browser objects. JavaScript is downloaded as part of an HTML page and it is processed by the web browser as it is received. JavaScripts consist of functions that are called as a result of web browser events. A tutorial introduction to JavaScript is at <http://javascript.internet.com/>.

K

Knowledge - Knowledge refers to what one knows and understands. Knowledge is sometimes categorized as unstructured, structured, explicit or tacit. What we know we know is called explicit knowledge. Knowledge that is unstructured and understood, but not clearly expressed, is called implicit knowledge. If the knowledge is organized and easy to share then it is called structured knowledge. To convert implicit knowledge into explicit knowledge, the knowledge must be extracted and formatted.

Knowledge Acquisition - The extraction and formulation of knowledge derived from various sources, especially from experts.

Knowledge Base - A collection of facts, rules, and procedures organized into schemas. A knowledge base is the assembly of all the information and knowledge of a specific field of interest.

Knowledge-Driven DSS - Knowledge-Driven DSS can suggest or recommend actions to managers. These DSS are person-computer systems with specialized problem-solving expertise. The "expertise" consists of knowledge about a particular domain, understanding of problems within that domain, and "skill" at solving some of these problems. A related concept is Data Mining. It refers to a class of analytical applications that search for hidden patterns in a database. Data mining is the process of sifting through large amounts of data to produce data content relationships. Tools used for building Knowledge-Driven DSS are sometimes called Intelligent Decision Support methods (cf., Dhar and Stein, 1997). Data Mining tools can be used to create hybrid DSS that have major data and knowledge components.

Knowledge Engineer - An AI specialist responsible for the technical side of developing an expert system. The knowledge engineer works closely with the domain expert to capture the expert's knowledge in a knowledge base.

Knowledge Engineering (KE) – KE is an engineering discipline that involves integrating knowledge into computer systems in order to solve complex problems normally requiring a high level of human expertise.

Knowledge Management (KM) - KM is the distribution, access and retrieval of unstructured information about "human experiences" between interdependent individuals or among members of a workgroup. Knowledge management involves identifying a group of people who have a need to share knowledge, developing technological support that enables knowledge sharing, and creating a process for transferring and disseminating knowledge.

Knowledge Management Software (KMS) - KMS can store and manage unstructured information in a variety of electronic formats. The software may assist in knowledge capture, categorization, deployment, inquiry, discovery, or communication. Products include electronic document management systems (EDMS). Visit KMWorld at URL <http://www.kmworld.com/>.

L

Linear Programming - A mathematical model for optimal solution of resource allocation problems.

M

Metadata or Meta Data - Data about the data in a data warehouse. Metadata provides a directory to help the DSS locate the contents of the data warehouse; it is a guide to mapping data as it is transformed from the operational environment to the data warehouse environment; and it serves as a guide to the algorithms used for

summarization of current detailed data. Metadata is semantic information associated with a given variable. Metadata must include business definitions of the data and clear, accurate descriptions of data types, potential values, original source system, data formats, and other characteristics. Metadata defines and describes business data. Examples of metadata include data element descriptions, data type descriptions, attribute/property descriptions, range/domain descriptions, and process/method descriptions. The repository environment encompasses all corporate metadata resources: database catalogs, data dictionaries, and navigation services. Metadata includes things like the name, length, valid values, and description of a data element. Metadata is stored in a data dictionary and repository. It insulates the data warehouse from changes in the schema of operational systems.

Methodology - A system of principles, practices, and procedures applied to a specific branch of knowledge.

Middleware - A communications layer that allows applications to interact across hardware and network environments.

Model Base - A collection of preprogrammed quantitative models (e.g., statistical, financial, optimization) organized as a single unit.

Model-Driven DSS - This type of DSS emphasizes access to and manipulation of a model, e.g., statistical, financial, optimization and/or simulation. Simple statistical and analytical tools provide the most elementary level of functionality. Some OLAP systems that allow complex analysis of data may be classified as hybrid DSS systems providing both modeling and data retrieval and data summarization functionality. Data Mining is also a hybrid approach to DSS. In general, Model-Driven DSS use complex financial, simulation, optimization and/or rule (expert) models to provide decision support. Model-Driven DSS use data and parameters provided by decision makers to aid decision makers in analyzing a situation, but they are not usually data intensive, that is very large data bases are usually not need for Model-Driven DSS. Early versions of Model-Driven DSS were called Model Oriented DSS by Alter (1980) and Computationally Oriented DSS by Bonczek, Holsapple and Whinston (1981).

Modeling Tools - Software programs that help developers/users build mathematical models quickly. Spreadsheets and planning languages like IFPS are modeling tools.

Multi-dimensional Database (MDBS and MDBMS) - A database that lets users analyze large amounts of data. An MDBS captures and presents data as arrays that can be arranged in multiple dimensions. Variables are the objects that hold data in a multidimensional database. These are simply arrays of values (usually numeric) that are "dimensioned" by the dimensions in a database. For example, a UNITS variable may be dimensioned by MONTH, PRODUCT, and REGION. This three-dimensional variable or array is often visualized as a cube of data. Multi-dimensional databases can have multiple variables, with common or a unique set of dimensions. This multi-dimensional view of data is especially powerful for OLAP applications.

Multi-Participant DSS - A decision support system that supports multiple participants engaged in a decision-making task (or functions as one of the participants). See [Group DSS](#).

Multipoint Conference - An audio, data and/or video conference among more than two remote participants.

Multipoint Control Unit (MCU) - A device used to link remote sites into a single conference call or a device to manage several simultaneous, independent conferences.

N

Normalization - The process of reducing a complex data structure into its simplest, most stable structure. In general, the process entails the removal of redundant attributes, keys, and relationships from a conceptual data model.

O

Object - A person, place, thing, or concept that has characteristics of interest to an environment. In terms of an object-oriented system, an object is an entity that combines descriptions of data and behavior.

On-line Analytical Processing (OLAP) – OLAP is software for manipulating multidimensional data from a variety of sources that has been stored in a data warehouse. The software can create various views and representations of the data. OLAP software provides fast, consistent, interactive access to shared, multidimensional data. Check the Guide to OLAP Terminology from the OLAP Council

Operational or Transaction Database - The database-of-record for a transaction-update system. The operational database is the source of data for the data warehouse. It contains detailed data used to run the day-to-day operations of the business. The data continually changes as updates are made, and reflect the current value of the last transaction.

Optimize - The decision strategy of choosing the alternative that gives the best or optimal overall value.

Organizational DSS - A Multi-Participant DSS designed to support a decision maker in a setting that has a more elaborate infrastructure than a group (i.e., involving specialized roles, restricted communication patterns, differing authority levels). See enterprise-wide DSS.

P

Pivot - Changing the dimensional orientation of a display or report. See rotate in the OLAP Guide to terms.

Planning - A managerial function concerned with making forecasts, formulating outlines of things to do, and identifying methods to accomplish them.

Prototyping - A strategy in system development in which a scaled down system or portion of a system is constructed in a short time, tested, and improved in several iterations. A prototype is an initial version of a system that is quickly developed to test

the effectiveness of the overall design being used to solve a particular problem. Prototyping is similar to the Evolutionary (Iterative) Design Process. It is sometimes termed rapid prototyping and is similar to rapid application development (RAD).

Q

Query - Generically query means question. Usually it refers to a complex SQL SELECT statement for decision support. See Ad-Hoc Query or Ad-Hoc Query Software.

R

RAID - Redundant Array of Independent Devices, refers to a storage device with multiple hard drives that have data stored in a manner that insures that if one drive fails, that the drive can be replaced and the system will recreate automatically all of the data that was lost from the malfunctioning hard drive.

Rapid Application Development (RAD) – RAD is part of a methodology that specifies incremental development with constant feedback from the customers. The point is to keep projects focused on delivering value and to keep clear and open lines of communication. Oral and written communication is not completely adequate for specification of computer systems. RAD overcomes the limitations of language by minimizing the time between concept and implementation.

Rational Decision Behavior –Rational decision behavior is goal-oriented in reaching a decision. Behavior is guided by the consequences likely to result from the selection of a given alternative. A decision maker believes based upon analysis that a chosen alternative will result in achieving one or more desired objectives. Rational decision behavior can be supported by Decision Support Systems.

Record - A group of data values consisting of one value for each of a prescribed set of relational fields; an occurrence of a record type.

Report and Query Tools - these tools produce a of tabular list of information from data stored in a relational database. Examples include Microsoft Access and Brio Query.

Representation - The formulation or view of a problem. Developed so the problem will be easier to solve.

Result Variables - In a Model-Driven DSS a result variable shows the consequences of changing decision variables. Result variable are also referred to as dependent variables.

ROMC (Representation, Operations, Memory Aids, Mechanism Control) Design Approach - A Systematic approach for developing large-scale DSS, especially user interfaces. It is user-oriented approach for stating system performance requirements (cf., Sprague and Carlson, 1982).

Rule - A rule is a formal way of specifying a recommendation, directive, or strategy, expressed as IF premise THEN conclusion. Rules are the primary building blocks of Rule-Driven DSS.

S

Scalability - The ability to scale hardware and software to support larger or smaller volumes of data and more or less users. The ability to increase or decrease size or capability in cost-effective increments with minimal impact on the unit cost of business and the procurement of additional services.

Semistructured Decisions - Decisions in which some aspect of the problem are structured and others are unstructured.

Sensitivity Analysis – Conducting a sensitivity analysis involves running a decision model several times with different inputs so a modeler can analyze the alternative results. See [“What If” analysis](#).

Shell - An expert system development tool consisting of two stand-alone pieces of software: a rule set manager and an inference engine capable of reasoning with rules set built with the rule set manager. A shell is a complete expert system stripped of its specific knowledge.

Simulation – Simulation is a modeling technique for conducting one or more experiments that tests various outcomes resulting from a specific quantitative model of a system.

Spatial DSS – One sub-category of Data-Driven DSS is Spatial DSS. A Spatial DSS uses Geographic Information Systems technologies to support managers in analyzing data with a geographic or spatial component.

Specific DSS - A computer-based system that actually helps a person accomplish a specific task. "Specific DSS are the hardware/software that allow a specific decision maker or group of them to deal with specific sets of related problems" (cf., Sprague and Carlson, 1982, p. 10).

Spreadsheet - In the accounting world a spreadsheet was and is a large sheet of paper that lays everything out for a businessperson. It spreads or shows all of the costs, income, taxes, etc. on a single sheet of paper for a manager to look at when making a decision. An electronic spreadsheet organizes information into columns and rows. The data can then be "added up" by a formula to give a total or sum. The spreadsheet summarizes information from many sources in one place and presents the information in a format to help a decision maker see the financial "big picture" for the company. A program that has a collection of cells whose values can be displayed on a computer screen. By changing cell definitions and having all cell values reevaluated, a user can readily observe the effects of those changes. Decision support systems built using spreadsheet software are sometimes called Spreadsheet DSS. See "A Brief History of Spreadsheets" by Daniel Power at URL <http://dssresources.com/history/sshistory.html>.

Star Schema - A relational database schema organized around a central fact table joined to a few smaller dimension tables using foreign key references. The fact table contains raw numeric items that represent relevant business facts like price, discount values, number of units sold, dollar value, etc. The facts are typically additive and are accessed via dimensions. Since the fact tables are presummarized and aggregated along business dimensions, these tables tend to be very large. The basic premise of star schemas is that information can be classified into two groups: facts and dimensions. Facts are the

core data element being analyzed. For example, units of individual items sold are facts, while dimensions are attributes about the facts. Dimensions are the product types purchased and the date of purchase. The star schema has also been called a star-join schema, data cube, data list, grid file, and multidimensional schema. The name star schema comes from the pattern formed by the entities and relationships when they are represented as an entity-relationship diagram (ERD). The results of a business activity are at the center of the star surrounded by the people, places, and things that come together to perform this activity. These dimensions are the points of the star.

Strategic Planning - A decision-making process in which decisions are made about establishing organizational purposes/mission, determining objectives, selecting strategies and setting policies.

Structured Decisions - Standard or repetitive decisions situations for which solution techniques are already available (also sometimes called routine or programmed decisions). The structural elements in the situation, e.g. alternatives, criteria, environmental conditions, are known, defined and understood.

Suggestion DSS – A Suggestion DSS uses Artificial Intelligence technologies like rules and frames to draw inferences and make suggestions and recommendations to managers and other decision-makers. See **Knowledge-Driven DSS**.

Symbolic Processing - Use of symbols, rather than numbers, combined with rules-of-thumb (or heuristics), in order to process information and solve problems.

Systems Development Life Cycle (SDLC) – SDLC is a process by which systems analysts, software engineers, programmers, and end-users build systems. It is a project management tool, used to plan, execute, and control systems development projects. The steps in the cycle include: 1) Determine user requirements; 2) Systems analysis; 3) Overall system design; 4) Detailed system design; 5) Programming; 6) Testing; and 7) Implementation. Each step is concluded by developing a written document that must be reviewed and approved before the next step begins.

T

Table - A term used in relational database management systems to identify a collection of related attributes or fields. A table can be viewed as a collection of data rows that share the same column attributes. A table has a primary key that uniquely identifies each row in a table. A table can also contain primary keys from another table called foreign keys.

Ticker - A small Java Applet that displays a specific set of headlines, information, etc. Every web page that wants to display a Ticker must add some special HTML code into the page. This code ensures that the JAVA Applet is loaded from a server. Some parameters control the visible output like coloring and of course they control which news are loaded. Visit <http://7am.com/ticker/> or <http://www.tickerland.com/>

U - V

Unstructured Decisions - This type of decision situation is complex and no standard solutions exist for resolving the situation. Some or all of the structural elements of the decision situation are undefined, ill-defined or unknown. For example, goals may be poorly defined, alternatives may be incomplete or non-comparable, choice criteria may be hard to measure or difficult to link to goals.

User-Friendly - An evaluative term for a Decision Support System's user interface. The phrase indicates that users judge the user interface as to easy to learn, understand, and use.

User Interface - The component of a computerized support system that allows bi-directional communication between a system and its user. This component is also called the dialogue component or Human-Computer Interface of a DSS. An interface is a set of commands or menus through which a user communicates with a program. See [graphical user interface](#).

W - X - Y - Z

Web-Based DSS - A computerized system that delivers decision support information or decision support tools to a manager or business analyst using a "thin-client" Web browser like Netscape Navigator or Internet Explorer. The computer server that is hosting the DSS application is linked to the user's computer by a network with the TCP/IP protocol. In many companies, a Web-Based DSS is synonymous with an enterprise-wide DSS that is supporting large groups of managers in a networked client-server environment with a specialized data warehouse as part of the DSS architecture. Web-Based DSS can be communications-driven, data-driven, document-drive, knowledge-driven, model-driven or a hybrid.

"What If" Analysis - The capability of "asking" the software package what the effect will be of changing some of the input data or independent variables. See sensitivity analysis.

Internet Exercises

1. Visit DSSResources.COM at <http://dssresources.com/> and check the online DSS glossary for updates and new terms.
2. Visit the <http://techweb.com/encyclopedia> web site and search for the terms Decision Support Systems, OLAP, and data warehouse and compare the definitions to those in this DSS glossary.

References

Alter, S.L. *Decision Support Systems: Current Practice and Continuing Challenge*. Reading, MA: Addison-Wesley, 1980.

Bonczek, R. H., C.W. Holsapple, and A.B. Whinston. *Foundations of Decision Support Systems*. New York: Academic Press, 1981.

Dhar, V. and R. Stein. *Intelligent Decision Support Methods: The Science of Knowledge*. Upper Saddle River, NJ: Prentice-Hall, 1997.

Holsapple, C.W. and A. B. Whinston. *Decision Support Systems: A Knowledge-based Approach*, Minneapolis, MN: West Publishing Co., 1996.

Inmon, W.H. "What is a Data Warehouse?", **PRISM**, vol. 1, No. 1, 1995, URL http://www.cait.wustl.edu/cait/papers/prism/voll_no1/.

Keen, P. G. W. and M. S. Scott Morton. *Decision Support Systems: An Organizational Perspective*. Reading, MA: Addison-Wesley, Inc., 1978.

Power, D. J. "[What is a DSS?](#)" , DSSStar, The On-Line Executive Journal for Data-Intensive Decision Support, October 21, 1997: Vol. 1, No. 3.

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

Turban, E. *Decision Support and Expert Systems: Management Support Systems*. (Fourth Edition) Englewood Cliffs, NJ: Prentice Hall, Inc, 1995.

Turban, E. and J. Aronson. *Decision Support Systems and Intelligent Systems*. (Fifth Edition) Englewood Cliffs, NJ: Prentice-Hall, Inc, 1998.

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