

Appendix III

Key Decision Support System Terms

A

Ad Hoc Query – Any spontaneous or unplanned question or query. An ad hoc query is often developed with an Ad Hoc Query and Reporting tool and Structured Query Language (SQL).

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

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

Analytical Hierarchy Process (AHP) – 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.

Analytical Information System – A descriptor for a broad set of information systems that assist managers in performing analyses based on tools like dimensional analysis, on-line analytical processing, simulation, optimization, quantitative models, and statistics.

Artificial Intelligence (AI) – A branch of computer science that studies how computer software can imitate the cognitive activities of people. AI software, including expert system software, is used in building knowledge-driven DSS. See *expert system*.

B

Business Data – Data about people, places, things, business rules, and events used to operate a business. See *data*.

Business Intelligence (BI) – Business Intelligence 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 extracting and analyzing data from databases. The term is sometimes used interchangeably with briefing books and executive information systems. Data-driven DSS provide Business Intelligence. The most commonly marketed BI software is query and reporting software.

Business Process – A “collection of activities that takes one or more kinds of input and creates an output that is of value to the customer” (Hammer and Champy, 1993). Business processes usually include one or more decision processes. See *decision process*.

Business Process Reengineering (BPR) – The rethinking and redesign of business processes to achieve major improvements in performance. Hammer and Champy (1993) argue BPR should involve fundamental changes and radical improvements in performance or “starting over.” This concept is sometimes referred to as business process redesign, business reengineering or reengineering.

Business Transaction – A work task recorded by a data capture system that creates, modifies, or deletes business data. Each transaction represents a fact describing a single business event. Examples of transactions include a purchase made at a grocery store or a loan application entered at a bank.

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 are computers that rely on servers for resources like Web pages, data, files, and printing.

Cognitive Overload – A psychological phenomenon characterized by an overload of information for a decision maker. Overload occurs when the amount of information exceeds a person’s cognitive capacity.

Communications-Driven DSS – A DSS that uses network and communications technologies to facilitate collaboration and communication. Communications technologies are central to supporting decision making and provide the dominant decision support functionality. Related concepts include *groupware*, *video conferencing*, and *GDSS*.

Competitive Advantage – A skill, resource, or capability of an organization that is a strength, that is unique or proprietary, and that is sustainable for at least three years. It is something important that an organization does much better than its competitors.

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

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

performance indicators (KPIs) are often linked to CSF and monitored in Data-driven DSS targeted for senior executives.

Cycle Time – The elapsed time from when a decision or business process is initiated to when it is completed.

D

Data – Binary representations of atomic facts, text, graphics, bit-mapped images, sound, analog or digital video segments. Data is the raw material of any information system. Data producers supply data and it is used by information consumers to create information. See *business data*.

Data Dictionary – A database about data elements 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 DSS derives its functionality from access to and manipulation of a very large time-series of internal company data and, sometimes, external data. Data-driven DSS help analyze, display and manipulate large structured data sets that contain numeric and short character strings. Databases accessed by ad-hoc query tools provide the most elementary level of functionality. Data warehouse systems that support the analysis of data provide additional functionality. Data-driven DSS with OLAP and Spatial DSS provide the highest level of functionality and decision support that is linked to analysis of large collections of historical data. See *Spatial DSS*.

Data Flow Diagram (DFD) – A modeling method used for process modeling that graphically depicts business processes and the logical flow of data through a process.

Data Mining – A class of analytical applications that search for patterns in a database. Data mining is the process of sifting through large amounts of data to produce data content relationships. Data mining tools use a variety of techniques including case-based reasoning, data visualization, fuzzy query and analysis, and neural networks.

Data Modeling – A process that organizes a database designer's thinking about the appropriate structure for the decision support data store. A conceptual data model shows the overall logical structure of a database. In general, a data model is any method for visualizing the information needs of a system.

Data Quality – High-quality data is accurate, timely, meaningful, and complete. Data-driven 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 Visualization – This term refers to presenting data and summary information using graphics, animation, 3-D displays, and other multimedia DSS tools.

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. Bill Inmon (1995) defines a data warehouse as a subject-oriented, integrated, time-variant, nonvolatile collection of data in support of management’s decision-making process. According to Ralph Kimball (1996), “A data warehouse is a copy of transaction data specifically structured for query and analysis.”

Decision – The choice of one alternative solution from among a number of alternatives; a statement indicating a commitment to a specific course of action. Three types of decisions include selection of an alternative including a yes or no decision, evaluation of one or more alternatives, and design and construction of a solution.

Decision Analysis (DA) 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, or Analytical Hierarchy Process (AHP).

Decision-Oriented DSS Design – An approach to building DSS that involves predesign description and diagnosis of decision making (cf., Stabell 1983) and then either rapid prototyping, structured systems development (SDLC) or end-user development.

Decision Process – The steps or analyses that lead to a decision. Decision processes are often part of larger business processes. See *business process*.

Decision Process Audit – An activity that can be included as part of a decision-oriented diagnosis to review operational and managerial decision processes. The audit typically includes five steps and it may focus narrowly on a single process or more broadly on decision process in a unit or an entire organization.

Decision Room – A physical arrangement for a communications-driven or group DSS in which individual workstations are available to each participant in a meeting room.

Decision Support Analyst – A support staff user of Decision Support Systems who prepares special studies for middle-level and senior managers. These analysts may use a Data-Driven DSS to conduct an ad hoc query that is then analyzed with a statistical package, Excel or a desktop OLAP tool. They may build small Model-Driven DSS and write-up the results of the analysis. See *DSS analyst*.

Decision Support Readiness Audit – A checklist of questions that can help assess a company’s capabilities and readiness to develop innovative and successful DSS.

Decision Support Systems (DSS) – A class of information system that supports decision-making activities (cf. Sprague and Carlson, 1982). Interactive computer-based systems intended to help decision makers use data, documents, knowledge and models to identify and solve problems and make decisions. Five more specific types include: *communications-driven*, *data-driven*, *document-driven*, *knowledge-driven* and *model-driven DSS*.

Decision System – A computer-based program intended to monitor and control processes and make routine decisions.

Decision Variables – In a model-driven DSS, a decision variable is a factor or parameter that is chosen or determined by a decision maker. A decision variable is sometimes called a controllable or independent variable and its range of values constrains the choices of a decision maker.

Descriptive Model – Physical, conceptual, or mathematical model that describes a situation as it is or as it appears.

Deterministic Model – A mathematical model that is constructed for a condition of assumed certainty. The model builder assumes there is only one possible result for each alternative course of action.

Development Environment – A development environment is used by a DSS designer or builder and typically includes software for creating and maintaining a DSS. This term is often used with expert system technologies. See *DSS generator*.

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. See *user interface*.

Document-Driven DSS – A document-driven DSS integrates a variety of storage and processing technologies to provide document retrieval and analysis. An organized collection of documents provides the functionality for a document-driven DSS. Document-driven DSS help analyze, display and manipulate text including logical units of text called documents. Examples of documents that might 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 knowledge-driven DSS is being developed. A domain expert works closely with a knowledge engineer to capture an expert's knowledge in a computer readable representation often called a knowledge base.

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

DSS Analyst – An intermediary or liaison between users and DSS developers. He/she may work as a member of a DSS application support team. A DSS analyst often works gathering requirements, analyzing solutions, writing specifications, maintaining product information as well as assisting in training and documentation support. A DSS Analyst often works with users to define and document system requirements for Decision Support Systems. A DSS analyst may help redesign business processes to better use a computerized Decision Support System. Some DSS analysts manage a specific DSS or ensure data integrity in a focused data mart like a customer data mart. See *decision support analyst*.

DSS Architecture – It includes the IS/IT architecture components relevant to the DSS. A DSS may be a subsystem of a larger information system and a specific DSS may have multiple types of decision support subsystems. See *system*.

DSS Development Tools – Software components (such as editors, code libraries, specific objects, visual interfaces) that facilitate the development of a specific DSS.

DSS Generator – A computer software package that provides tools and capabilities that help a developer build a specific DSS (cf., Sprague and Carlson, 1982, p. 11). Microsoft Excel is an example of a DSS generator for creating small-scale data and model-driven DSS. See *development environment*.

E

e-Business – Electronic business is a broad term for using Internet and Web technologies to provide, deliver and enable transaction processing and decision support on intranets and extranets for a wide array of stakeholders and customers.

e-Meeting – A term for a meeting supported by full-motion video, audio, and Web meeting tools. One or more participants in the meeting are participating remotely. It is possible that all participants are in different physical locations. An e-meeting can involve the use of communications-driven DSS.

Enterprise-Wide DSS – A specific DSS that supports a large group of managers across the various units and levels of a business enterprise or organization. A synonymous term is *organizational DSS*.

Evolutionary Design Process – A systematic process for systems development that is recommended for use in creating model-driven DSS. A portion of the DSS 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) – EIS are data-driven DSS intended to provide current and appropriate information to support decision making for senior executives. The emphasis of EIS is on graphical displays and an easy-to-use interface that presents information from a corporate-wide database. EIS provide reports or briefing books to top-level executives and offer strong reporting and drill-down capabilities. Executives can use an EIS to monitor key performance indicators and critical success factors. See *critical success factors*.

Expert System – It is an Artificial Intelligence system with specialized problem-solving expertise. The “expertise” consists of knowledge about a particular domain, understanding of problems within that domain, and “skill” at

resolving a specific problem. Expert system technologies are commonly used to build knowledge-driven DSS.

Extranet – An intranet that is accessible to authorized external stakeholders. An extranet provides various levels of access and decision support. A username and password determine what parts of an extranet one can view and use. See *intranet* and *portal*.

F

Facilitator – A person who manages the use of a group Decision Support System in a decision room from initial planning of a meeting through actual operation of the GDSS.

Feasibility Study – A study of the technical and economic prospects for developing a specific DSS that is completed prior to actually committing resources to developing a proposed DSS.

Firewall – Hardware and software, or a combination of both, that evaluates incoming and outgoing data. If a data packet does not meet certain criteria, it is denied access. A firewall is designed to prevent unauthorized access to or from a private network.

Function-Specific DSS – A decision support system 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

Geographic Information System (GIS) – A category of software and systems that represents data using maps. It helps people access, display, and analyze data with geographic content and meaning. GIS software is used to build spatial DSS.

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.

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 System (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 like brainstorming. A GDSS is a hybrid DSS that emphasizes both the use of communications and qualitative decision heuristics. See *communications-driven DSS*.

Groupware – Software designed to support more than one person working on a shared task. Groupware helps users coordinate and keep track of ongoing projects and tasks. It helps people work together through computer-supported communication, collaboration, and coordination. Groupware applications include email, video, scheduling, bulletin boards, chat, and collaborative writing and drawing systems. See *communications-driven DSS*.

H

Heuristics – The informal, judgmental knowledge of an application area that provides procedures or the “rules of good judgment” in the field. Heuristics also encompass the knowledge of how to solve problems efficiently and effectively.

Hypertext – An approach for handling text and other information by allowing the user to jump from a given topic to related topics.

Hypertext Markup Language (HTML) – An authoring language used to create documents on the World Wide Web. HTML uses markup tags to define the structure and layout of a Web document. One important tag, an anchor tag, is used to specify hypertext links. Extensible Markup Language (XML) is a related markup language for describing data elements in a web page.

I

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

Independent Variables - Variables in a model that are controlled by the decision maker or the environment and that influence the results of a decision (also called input variables or parameters). See *decision variables*.

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 or knowledge-driven DSS that actually performs the reasoning function and knowledge processing.

Information – Data that has been processed to add or create meaning and, ideally, knowledge for the person who receives it. Information is an output of information systems including DSS.

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

Information Systems Architecture – A formal definition of the elements or parts of an information system including decision support systems. The architecture defines business processes and rules, the system structure, technical framework, and product technologies for an information system. The architecture also defines the structures and controls that define how the platform can be used, and the categories of applications that can be created on the

platform. It includes the hardware and software used to manage information and communication; the tools used to access, package, deliver, and communicate information; the standards, models, and control frameworks; and the overall configuration that integrates the various components (cf., Applegate et al., 1996).

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

Internet – The Internet (capitalized) refers specifically to the DARPA Internet and the Transmission Control Protocol/Internet Protocol (TCP/IP) that it uses. The Internet is a collection of packet-switching networks and routers that uses the TCP/IP protocol suite and functions as a single, cooperative virtual network. It is a global Web connecting more than ten million computers. Visit The World Wide Web Consortium (<http://www.w3.org/>) for more information about the Internet.

Interorganizational DSS – An interorganizational DSS is a DSS that serves a company's stakeholders including customers or suppliers. An interorganizational 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.

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.

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.

K

Knowledge – Knowledge refers to what one knows and understands. Knowledge is sometimes categorized as unstructured, structured, explicit, or implicit. 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. 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 knowledge-driven DSS. See *data mining*.

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 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. Document-driven DSS can support KM.

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. Knowledge management software is an important delivery component for document-driven DSS. See *document-driven DSS*.

L

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

Local Area Network (LAN) – A networking technology that connects computers in a small area like a building or an office. It may involve premise wiring or radio or infrared technology (a wireless LAN).

M

Management Information System (MIS) – It is a broad umbrella term for any information system that provides managers with on-line access to information. Historically, an MIS is “an integrated, man/machine system for providing information to support the operations, management, and decision-making functions in an organization. The systems utilize computer hardware and software, manual procedures, management and decision models, and a database”

(Davis, 1974, p. 5). The term is sometimes used narrowly for an information system that provides management reports.

Metadata or Meta Data – Data about the data in a data warehouse or database. Metadata provides a directory to help locate data; it is a guide to mapping data as it is transformed from the operational environment to a 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 includes the name, length, valid values, and description of a data element.

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. The decision support functionality comes from the ability to manipulate the model for “What if?” or sensitivity analysis. 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. In general, model-driven DSS use complex financial, simulation, and optimization 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 databases are usually not needed for model-driven DSS.

Modeling Tools – Software programs that help developers build mathematical models. Spreadsheet functions and planning languages like IFPS are modeling tools.

Multidimensional Database (MDB) – A database that lets users analyze large amounts of data. An MDB captures and presents data as arrays that can be arranged in multiple dimensions. Multi-dimensional databases can have multiple outcome or performance variables, with a common set of dimensions. A multidimensional view of data is especially important for data-driven DSS.

Multiparticipant 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*.

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

On-Line Analytical Processing (OLAP) – Software for manipulating multidimensional data from a variety of sources. The software can create various views and representations of the data. OLAP software provides fast, consistent, interactive access to shared, multidimensional data.

Operational or Transaction Database – The database of a transaction processing system. An operational database is often the source of data for a data warehouse. It contains detailed data used for the day-to-day operations of the business. The data continually changes as updates are made and reflects the last transaction.

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

Organizational DSS - A multiparticipant DSS is designed to support a decision maker in a setting that has a more elaborate infrastructure than a group. For example, participants have specialized roles, restricted communication patterns, and differing authority levels. See *enterprise-wide DSS* and *interorganizational DSS*.

P

Pivot – Changing the dimensional orientation of a display or report. It means to rotate or turn. In a pivot table one changes the variables on the vertical or horizontal axes.

Portal – A portal provides users with an integrated, personalized, and secure Web-based interface to business content including information, application, and collaboration services. A portal may be accessed from an intranet or the Internet. A DSS portal emphasizes accessing decision support applications.

Project Scope – A measure of the number of potential users, the size of the project staff, the potential impacts on existing systems, and the amount of programming or development effort that will be required.

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). See *rapid application development*.

Q

Query – Generically, “query” means “question.” Usually, it refers to a complex Structured Query Language statement used for decision support. See *Ad Hoc Query* or *Structured Query Language*.

R

Rapid Application Development (RAD) – A systems development methodology that specifies incremental iterative development with constant feedback from potential users. The point is to keep projects focused on delivering value and to keep clear and open lines of communication. See *prototyping*.

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 DSS.

Record – A group of data elements, consisting of one value for each of a prescribed set of relational fields.

Report and Query Tools – These tools produce a tabular list of information from data stored in a relational database. The most common Business Intelligence tool is a report and query tool. Report and Query tools provide limited functionality for building data-driven DSS. See *ad hoc query tool*.

Representation – The formulation or view of a problem. Developed so the problem will be easier to solve. Also, in the ROMC approach to DSS design a representation is a way of visualizing or presenting information like a chart or a table. See *ROMC design approach*.

Result Variables – In a model-driven DSS, a result variable shows the consequences or outcomes of changing decision variables. Result variables are also referred to as dependent variables. See *decision variables*.

ROMC Design Approach – A systematic approach for developing large-scale DSS, especially user interfaces. *ROMC* stands for *Representations, Operations, Memory Aids, and Control Aids*. 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-based, knowledge-driven DSS.

S

Scalability – The ability to scale hardware and software to support larger or smaller volumes of data and more or fewer users. It also refers to 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 aspects of the problem are structured and others are unstructured. See *structured decisions* and *unstructured decisions*.

Sensitivity Analysis – A sensitivity analysis involves running a decision model several times with different inputs so a modeler or decision maker can analyze alternative results. One examines the outcomes from a model-driven

DSS over the range of one or more input parameters to determine if they are sensitive to small changes in inputs. See “*What If*” analysis.

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. There are two distinct types of simulation models: Monte Carlo simulation and systems simulation.

Spatial DSS – It is a sub-category of data-driven DSS. A Spatial DSS uses Geographic Information Systems (GIS) technologies to support managers in analyzing data with a geographic or spatial component.

Special Decision Study – An analysis prepared to support decision-making in situations that are especially important and novel. Situations that are very unstructured, involve negotiation or bargaining or that are political are also likely candidates for special decision studies. Existing data-driven DSS may be used for ad-hoc queries or models may be built in such studies, but it is usually not appropriate to build new DSS in these situations.

Specific DSS – A computer-based system that helps a person accomplish a specific decision 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 – It is a computer program that has a collection of cells whose values can be displayed on a computer screen. A spreadsheet summarizes information and presents the information in a format to help a decision maker. Decision support systems built using spreadsheet software are called Spreadsheet DSS.

Star Schema – A relational database structure organized around a central fact table joined to a few smaller dimension tables using foreign key references. The fact table contains numeric items that represent relevant business facts like price, discount values, number of units sold, and dollar value. The facts are typically retrieved using dimensions. Information is classified into two groups: facts and dimensions. The name “star schema” comes from the pattern formed when the fact and dimension tables are represented as an entity-relationship diagram (E/RD).

Strategic Information System (SIS) – A SIS is any information system that changes organizational goals, products, services, or environmental relationships of an organization and provides a competitive advantage. DSS can be strategic information systems, but every DSS is not a SIS and some DSS are basic business systems needed to compete in an industry.

Structured Decisions – Refers to standardized or repetitive decisions situations for which solution techniques are already available. Structured decisions are sometimes called routine or programmed decisions. The structural elements in such situations include alternatives, criteria, goals, and environmental conditions. All of these elements are known, defined, and understood for structured decisions. A decision system can sometimes be developed to automate structured decisions. See *decision system*.

Structured Query Language (SQL) – It is a set of commands used to process and retrieve data in a relational database. Some major database

management systems (DBMSs) that support SQL are DB2, Oracle and Sybase. See *ad hoc query tool* and *report and query tools*.

Suggestion DSS – It is another name for a knowledge-driven DSS used by Alter (1980). It 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*.

System – An interrelated set of components including people, activities, technology and procedures that are designed or intended to achieve a predefined purpose. A system is usually decomposable into subsystems.

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. Typical 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. Developing a written document that must be reviewed and approved concludes each step in the SDLC. It is sometimes called the “Waterfall” approach or model.

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.

Transaction Processing System (TPS) – A computerized system designed to expedite and automate transaction processing, record keeping, and simple reporting of business transactions. See the terms *business transaction* and *operational or transaction database*.

U - V

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

User Friendly – An evaluative term for a DSS’s user interface. The phrase indicates users judge a 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*.

Video Conferencing – Real-time, two-way communications with full motion video images. Video conferencing is audio-video telecommunication support of simultaneous interactions among participants.

Virtual Organization – An organization that uses e-mail, Web-based DSS and other technology tools to facilitate communication, coordination, collaboration and control and that operates without regard to time and place constraints. The term also refers to an organization made up of independent contractors and small companies that work together using information technologies.

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. Web-based DSS can be communications-driven, data-driven, document-driven, knowledge-driven, model-driven, or a hybrid.

“What If” Analysis – Changing the value of an input variable to determine what will change in the output of a model. The capability of “asking” a model-driven DSS, what happens if I change this value? See *sensitivity analysis*.