Planning DSS: What is the design concept for PlanningDSS.com?

In the Ask Dan! in DSS News of May 22, 2005, I introduced PlanningDSS.com and indicated that in a future column I might explain the overall concept and/or how the system operates. This column attempts to summarize the what, how and why of creating a process-oriented, role-based planning decision support system.

The broad vision for building PlanningDSS.com is to create a comprehensive, general purpose system for structuring a collaborative contingency planning process and for supporting analysis and choice of competing courses of action associated with a contingency either when the contingency occurs or when it is anticipated.

PlanningDSS.com is an extension of my prior software design research projects. Almost 30 years ago, I began my computerized decision aids research program with three major objectives (Power, 1977) that I'm still pursuing:

1) to develop a decision support system (DSS) for use in actual strategic decision situations in organizations;

2) to develop an experiential instructional system that will help people improve their decision making and inference behavior in strategic decision situations; and

3) to conduct research that may explain how individuals and groups make decisions and how decisions should be made.

My original project was very ambitious especially in the days of mini-computers and then standalone PCs, but the Web and open source development tools have created new possibilities and made it possible to develop a more sophisticated system for either a single user with many roles in the planning process or for multiple users assuming different roles in the process. The process owner is the designated Planner who organizes and structures the information, participants and tasks in the planning process. The Planner is responsible for monitoring every activity in the process and ideally the software protocol helps the Planner manage the process. PlanningDSS.com should help evaluate "Best Practices" in strategic decision processes and inform participants about their roles and tasks. The current focus is on the flow, organization, use and transformation of text descriptions, ratings, values and preferences. Five user roles are implemented: 1) planner; 2) analyst; 3) observer; 4) decision maker; and 5) administrator. As part of the development effort we developed use cases for each specific role in the system. The current implementation has 16 tables in the data model and the Web pages are implemented in PHP. Some of the following material about PlanningDSS.com is from the User Manual created by Paulson, Peitel, Thompson and Wu. Screen shots are included in the online User Manual.

General

At PlanningDSS.com, you will see a short welcome message, a place to enter a Username and Password, a menu bar at the top, and a footer with information on copyright, contacts, disclaimer and privacy statement links. The drop down menus contain links for navigating through PlanningDSS.com. Before logging on, however, only two links work: Help and Credits. Help is the User Manual.

The Planner creates most of the user accounts, but the Administrator can create accounts and must create Planner accounts. After logging on, a user is directed towards a personal PlanningDSS.com home page. PlanningDSS users have the opportunity to create a User Profile with First Name, Last Name, Email, a short biographical statement, and a picture. The goal is to have a complete profile with picture for each user to help personalize the system. The assumption is that most users will interact with PlanningDSS.com repeatedly. The PlanningDSS.com tools menu also allows any user to view all of the users of the system. This works in a dedicated single organization setting, but is inappropriate in an application service environment. Currently, users can change their password. When a user is done using PlanningDSS.com, and wishes to log out, they simply place the mouse over "File" in the Header menu, and click the Logout option.

A user's personal home page also lists all Planning Topics a user is associated with and related status information. What is a Planning Topic? It is the focus of the planning effort. It is the descriptor for the planning situation called the Topic Title, for example "Merger" might be the topic and then a Topic Description is "evaluating possible companies to acquire". Topics are associated with planning/decision-making tasks like "Selecting a new CEO" or with contingencies like a "Hostile takeover bid".

After clicking the "view" link for a specific Planning Topic, a user sees that Topic's description page. This page explains the Topic, the Decision Question(s) that pertain to the Topic, the Alternatives for each Decision Question, and the criteria for evaluating Alternatives associated with a Decision Question. To the right of each decision element is a link titled "Comments". This link opens a window where a user can submit a comment on a particular content element.

Planner

The Planner role creates and enters the planning content into the system. For example, the Planner identifies contingencies that may impact the organization. For each contingency, a planner enters basic planning information including potential courses of action and relevant comparison criteria. A planner follows the prescribed heuristic process and inputs situation specific information for subsequent assessment and evaluation by users who have other roles to play in the process. A planner can monitor task activity of analysts and the designated decision maker.

When designated as a Planner by the administrator, the first task is to enter a new topic. The first page outlines the requirements for creating a new planning topic. A checklist details the information needed for each topic. After checking the required checkbox, a Planner proceeds to create a new planning topic. The first required element is the Planning Topic label, then the Topic description. One or more Decision Questions, with descriptions are then entered. The next step is to create Alternatives Courses of action associated with a Decision Question. Each Planning topic requires a Decision Question with at least two Alternatives. Users can add additional information for each alternative,for example "Add Image" or "Add Document".

A planner also specifies the Criteria or factors that will be used to evaluate and score each Alternative. Each Criterion has an associated Title, Description (optional), Importance Weight, and Anchors for the best and worst outcomes and their associated descriptions.

Once the content of the Topic is entered, a Planner must specify the users that are going to help you in the Decision Process. There are two ways to do this. One is to add already existing users as analysts or as the decision maker. These users are listed in a pull down menu. The second way is to

fill out the "Add User" form.

Each Topic requires at least one Analyst, only one Decision Maker, and optionally Observers. Conceivably one person could have the roles of Planner, Analyst and Decision maker for a topic. In that situation PlanningDSS.com is supporting an individual's planning decision making. The general expectation is that the Planner will not be an Analyst or the Decision maker and that most topic situations will involve multiple analysts.

Clicking on the "Complete" button makes the Planning Topic available to the selected Analysts, and then the Planner can not change the content of the Planning Topic. If the situation changes significantly, a new Topic needs to be created.

Analyst

The analyst role can and should be assumed by multiple people knowledgeable about the focal organization and its current and future situation, and the Decision Question. Analysts are designated by the planner to complete tasks associated with assessing planning elements. For example, analysts compare Alternatives on Criteria. Logging in as an Analyst gives a user an extra option on the personal home page. This option is to "Score" a Topic. To "Score" a Topic is to assign ratings on each Alternative to a Decision Question for a set of Criteria.

Decision Maker

The Decision Maker role has tools for "What-If Analysis" and "Pro-Con Analysis". The decision maker is assisted in "seeing the big picture" and in evaluating intangible, hard to quantify aspects of the specific decision situation that is evolving.

A Decision Maker has a "decide" link that allows the user to begin the Decision Making part of the process. The first task is to identify from 2-5 criteria that will be used to evaluate the Alternatives. The "What-If Analysis" tool displays the summary of analyst ratings for the selected Criteria and the decision maker can change the weights of the Criteria to help make a decision. After changing the weights, the Decision Maker clicks the "Calculate" button to update the total scores for the Alternatives and the graph of scores. The Decision Maker must select at least two alternatives to continue with the "Pro-Con Analysis". The user is asked to choose the number of Pro Arguments for an Alternative. After selecting the number of arguments, that number of available spaces appear on a form. The user enters Arguments, and the weights of each, and clicks "Continue" to move onto the Con Arguments. The review page for the Pro-Con Analysis lists all of the arguments for each Alternative, followed by an option to edit or remove each. Editing a score and reloading the page will change the graph shown at the bottom. After reviewing the Pro-Con Analysis results, another graph is shown giving the results of the final Analysis, followed by the option to make a decision. Clicking on the "Save Final Decision" button take the Decision Maker to a decision confirmation page.

Observer

The Observer role is a read-only view of the planning database with the opportunity to comment upon and annotate information for the Topic. For example, an observer can suggest additional contingencies or Alternatives. An Observer can comment on aggregated assessments of analysts.

System Administrator

The administrator is tasked to maintain the planning database and ensure its performance. The administrator designates Planners and maintains their basic user information including user name, password, and privileges. Users must maintain their own current background and contact information. The administrator can purge or archive branches in the database. The administrator can give a Planner access to an existing database or have the Planner start with an empty database. The administrator can monitor the use of PlanningDSS by any user. The system provides Web-based administration.

PlanningDSS.com helps define a network of ideas and assessments/predictions associated with a specific Planning Topic for a specific focal organization. Planners can be trained to structure planning situations using PlanningDSS.COM and they can do that for many diverse situations. Analysts should require little training and many diverse users should potentially be able to participate as Analysts. The Decision Maker role is more specialized and the user interface needs to support a user who potentially has limited familiarity with computerized decision support.

Currently, PlanningDSS.com is best suited for use with important selection decisions and course of actions evaluations. We may develop a more specific process protocol for corporate strategic planning that would involve 5 major tasks: define and evaluate the mission, conduct a SWOT analysis by assessing strengths and weaknesses and identifying opportunities and threats, set goals and objectives, develop tactical and operational strategies, and evaluate the strategies. In the future, we may also create specialized versions of PlanningDSS.com with knowledge about a specific domain like Disaster Planning and Recovery, Military contingency planning, Business Continuity Planning, or Information Technology contingency planning.

PlanningDSS.com is in alpha testing. I am currently checking the code, making minor enhancements and preparing a list of additions, improvements and new Use cases. I hope to find some synergies with the DAS project (Decision Analysis and Support), an International Institute for Applied Systems Analysis (IIASA) project that ended in 1999. The Decision Analysis and Support (DAS) project attempted to develop software to support complex decision-making, negotiation, and planning processes (cf., www.iiasa.ac.at/Research/DAS). The DAS research program attempted to deal with the practical issues of decision support. DAS laboratory experiments and field studies focused on the following problems/questions:

1. What does the relative importance of criteria mean?

2. Can we find a general rule for explaining how people are evaluating alternatives?

3. Can we make pairwise comparisons in AHP between an alternative experienced as a loss and an alternative experienced as a gain?

4. How does Web technology affect decision-making and negotiations?

5. What are the relationships between the salient decision-maker's characteristics and the decision process and outcome?

6. Is it possible to incorporate a notion of disappointment and regret into a normative MCDM framework?

Potentially research using PlanningDSS.com can help us answer these and related

problems/questions. PlanningDSS is an ambitious project that requires a team approach. As always your comments, suggestions and feedback are welcomed and encouraged. My thanks to all who have helped with this research during the past 30 years.

References

Power, D., Design and Development of DECAID: A CAL Decision Formulation Program, unpublished Masters Thesis, University of Iowa, Iowa City, Ia, 1977.

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