Delphi Process

Background: The Delphi technique was developed by the RAND Corporation in the late 1960's as a forecasting methodology. Later, the U.S. government enhanced it as a group decision-making tool with the results of Project HINDSIGHT, which established a factual basis for the workability of Delphi.

The Delphi technique was developed to generate reliable consensus among people with exceptional knowledge about a particular subject. The technique is another way of obtaining group input for ideas and problem-solving. It utilizes written responses as opposed to bringing individuals together. Therefore, unlike the nominal group process, the Delphi does not require face-to-face participation. Essentially, the Delphi technique is a series of two or more carefully designed questionnaires interspersed with information summaries from the preceding responses. The first questionnaire asks individuals to respond to a broad question (questions might focus on emerging issues and forecasts for your community). Each subsequent questionnaire (one or more additional) is built upon responses to the preceding questionnaire. For example, the first questionnaire might ask people to identify priority issues, the second might ask them to rank the resulting summary of issues by priority, and to suggest educational needs associated with the priorities.

Delphi is particularly appropriate when decision-making is required in a political or emotional issues, or when the decisions affect strong factions with opposing preferences. The tool works formally or informally, in large or small contexts, and reaps the benefits of group decision-making while avoiding the difficulties associated with the group process; e.g., over-dominant group members, political lobbying.

Delphi has worked well when trying to prioritize national funding for projects among different states with conflicting goals, or if the scale of the decision-making problem is very large: It has the added advantage that it works as an informal, subjective model when the decisions are based on opinion, and can be directly converted to a formal model, when the data is more knowledge-based.

Delphi Prioritization Procedure

This section describes the general procedure for defining key criteria and prioritizing items that use those criteria (e.g., project funding). It is a variation on the classic Delphi technique adapted from the National Cancer Institute to fit the particular problems of corporate project prioritization.

The prioritization process enumerated below will allow the stakeholders and subject matter experts to produce a list of project rankings, or several lists, from which the decision-makers in upper management may apply other criteria to make a decision. The process can be completed in a few short meetings by a panel of experts, by the corporate associates at large in a series of questionnaires, or by a hybrid of the two. The description below is intentionally general so that the facilitator may use their discretion to invoke a variation.

1. **Select a panel of experts.** The panelists should have an intimate knowledge of the subject or project, or be familiar with experiential criteria that would allow them to prioritize projects effectively.
2. **Develop the initial evaluation criteria.** Build a list of evaluation criteria appropriate to the project including technical merit and cost, as primary criteria. Secondary criteria may be project-specific.
3. **Rank the criteria.** For each criterion, panel members rank it as 1 (very

important), 2 (somewhat important), or 3 (not important). This is done individually, and anonymously.

4. **Calculate the mean and deviation.** For each item in the list, find the mean value and remove all items with a mean greater than or equal to 2.0. Place the criteria in rank order and show the (anonymous) results to the panel. Discuss reasons for items with high standard deviations. The panel may insert removed items back into the list after discussion.
5. **Repeat ranking until stable.** Repeat the ranking process until the results stabilize. The ranking results do not have to have complete agreement, but a consensus such that the all can live with the outcome.
6. **Identify constraints, boundaries, and preferences.** Projects undertaken are often constrained by corporate budget, or mandatory regulatory impositions. These "hard constraints" are used to set boundaries on the project ranking. More flexible, "soft constraints" are introduced as preferences. Typically, hard constraints apply to all projects; preferences usually apply to only some projects. Each panelist is given a supply of preference points, about 70% of the total number of projects. (For example, give each panelist 21 preference points if 30 projects have been defined.)
7. **Rank projects by constraint and preference.** Panelists rank the projects first by the hard constraints. Which project is most important? Some projects may be ignored. Next each panelist spreads their preference points among the project list as desired. Some projects may get 10 points, others may get none, but the total may not exceed the predefined maximum (70%).
8. **Analyze the results and feedback to panel.** Find the median ranking for each project and distribute the projects into quartiles of 25, 50, and 75-percentiles (50-percentile being the median). Produce a table of ranked projects, with preference points, and show to the panel. Projects between the 25th and 75th quartile may be considered to have consensus (depending on the degree of agreement desired); projects in the outer-quartiles should be discussed. Once the reason for the large difference in ranking is announced.
9. **Re-rank the projects until it stabilizes.** After discussing why some people (minority opinion) ranked their projects as they did, repeat the rankings. Eventually the results will stabilize: projects will come to a consensus, or some will remain in the outer range. Not everyone may be persuaded to rank the same way, but discussion is unnecessary when the opinions stay fixed. Present the ranking table to the decision makers, with the various preferences as options, for their final decision.

References:

Delbecq, Andre, Andrew Van de Ven and David Gustafson, "Group Guide to Nominal Group and Delphi Processes." Glenview, IL: Scott, Foresman and Co., 1975

Corolla Development Inc.
http://www.carolla.com/wp-delph.htm

The Delphi Method (618 pages):
http://www.is.njit.edu/pubs/delphibook/delphibook.pdf

Cornell Cooperative Extension:
http://www.cce.cornell.edu/admin/program/documents/delphi.htm

Michigan State University Extension
http://www.msue.msu.edu/msue/imp/modii/iii00006.html

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