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# The Delphi Method

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**A**ctuaries are paid handsomely to use their expertise to evaluate the likelihood of uncertain future events. Empirical data that can be shaped and molded to produce a range of expected future outcomes is typically the actuary's willing partner in this work. Data-based decision making is a bedrock of our profession as evidenced by the Society of Actuaries' use of the Ruskin quote, "The work of science is to substitute facts for appearances, and demonstrations for impressions," to describe our responsibilities as actuaries.

At times actuaries are asked to make pronouncements about futures for which established facts do not exist. Evaluations of this sort require a toolkit quite distinct from the one used to maneuver data since the raw materials are of a different nature. When data is not available, the actuary must often rely on the judgment of experts. Whereas data is objective

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and public, judgments are subjective and personal. Just as the process for extracting diamonds from the earth is distinct from the process of extracting crude oil, so too the means of gathering expert judgment is distinct from the methodology of assembling data. The nature of judgments requires that human interaction be engaged for this raw material to be mined.

Thousands of years of societal evolution have caused human interactions to be extremely complex and greatly influenced by numerous societal hierarchies. In this societal milieu characterized by verbal and nonverbal jousting, the result of face-to-face discussions is often the convergence of group opinion to the individual opinion of the most powerful member of the group. The Delphi method attempts to

filter out the consensus bias that can result from societal forces by employing a technique whereby an anonymous collection of opinions is used supplemented by feedback loops that can be used to influence outcomes.

The Delphi method is relatively straightforward in its application and has a wide variety of business and professional applications. The Delphi approach requires a planned iterative process to support the anonymous gathering of input from a selected group of experts and the anonymous dissemination of summarized information to all participants. A stated objective of the Delphi method is that it purports to form an unbiased consensus of opinion on a specified topic. The reality is that though bias may be eliminated, convergence of consensus may never occur. This lack of convergence may be considered a strength of the Delphi process rather than a weakness as a diversity of opinion on a particular topic may best describe the collective thinking of the participants. For many issues a convergence of opinion is indicative of a process designed to produce conformity of opinion, either overtly or subtly. The Delphi method validates that divergence of opinion may be the best reflection of the range of possibilities for some issues for which there are no known outcomes.

The individual opinions of every participant are anonymously summarized and distributed after each round of the process. The absence of face-to-face interaction means that personalities will not influence the outcome to converge on the opinion of the most vocal, most articulate, most charismatic, most feared or most respected of the participants. Separating ideas apart from the personalities from which they emanate better allows each idea to be judged on their own merit. By preserving anonymity of all participants, the Delphi method allows even the most extreme opinions to be voiced and recorded without fear of embarrassment because of their nonconformance with the norm.

The iterative aspect of the Delphi method is designed to allow the perspectives of each participant to be summarized

in an anonymous manner so that they can be used to influence the thinking of the other participants. Without this aspect, the Delphi method would be no more than a collection of independent ideas, no more useful than an election in which each candidate votes only for themselves. The value of the Delphi method is the collection of thinking of the individual experts with regard to options and possibilities in solving the problem or situation presented to them. Although the final summary may be a recounting of the final ranking of various solutions, the true gems may be found in the collective thoughts documented by the group of participants.



Giving validity to all ideas is an objective of the Delphi method. Therefore, rather than stating that the goal of the Delphi method is consensus of opinion, a more accurate perspective is that the end result of the Delphi method is to produce a stability of opinion, such that as a result of all input into the process views are no longer changing.

### THE DELPHI METHOD DESCRIBED

The Delphi method can be applied to numerous areas of research that are of interest to actuaries. The key elements for using the Delphi method are: 1) a topic for research; 2) a group of experts willing to participate; and 3) an individual sponsor or planning committee to control the flow of information.

The topic for research should be on a subject for which there is little or no existing data on which to base an objective decision. The possible subjects for study could range from those that cannot be known at the present time, such as predictions about possible future events, to

much more practical activities such as making an informed choice between a number of competing priorities or opportunities. Whatever topic is chosen, for the process to be truly effective, it is essential that the research is on a topic that is of vital interest to the participants.

The experts should cover as broad a spectrum of professional views as possible to avoid narrow thinking that may emerge if the participants are relatively homogeneous in their backgrounds. Participants must commit to active participation within the prescribed timeframes, to providing candid and anonymous opinions, and to reading and assessing the anonymous comments of their peers before completing each round of the Delphi process.

The planning committee serves a critical role in the Delphi method since all participants rely on this central group to frame the issues and provide an anonymous summary of feedback as the opinions unfold. The planning committee is responsible for the original positioning of the issue and for distributing, coordinating and summarizing all information

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received in the process. The planning committee must commit to guiding the process and providing a summary of the findings of the process at the end of the research.

The careful framing of the research question by the planning committee is an essential first step in the Delphi method. The topic must be clearly positioned with the participants to provide ample background to underscore the value of the research, the importance of each member's participation and the nature of the process that will be used to gather information.

The planning committee is also responsible for identifying and soliciting experts to participate in the research process. The number of participants can range from a handful of experts to more than one hundred. The greater the number of participants, the greater the effort required to manage the information flow. Once the number of participants exceeds more than a dozen or so, the use of available software to facilitate the compilation and summarization of the data will be essential to the process.

The planning committee is responsible for all communication with the participants starting with the initial framing of the issue, providing the subsequent anonymous summaries of results received from each round of the process and sending clear instructions for each round. The strength of a committee over a single individual is the opportunity to get a broader perspective on how questions will be interpreted and responded to so as to ensure that each round is as effective as possible.

The exact process used with the Delphi method can vary as suited to the issue being researched. Some topics lend themselves to the following approach: Participants review an issue; suggest a range of solutions; evaluate the total set of solutions developed by all participants; and rank the solutions based on the collective input. Other topics may not so neatly lead to a ranking of a set of solutions. For these topics, iterative collection of comments until some

sort of stability of opinion occurs may be the best approach. Whatever approach is appropriate, a key element of the Delphi method is that the comments of each participant will be used to influence the end result.

Using the first of the two approaches just described, a typical process for the Delphi method involves several distinct stages. The first stage is to develop a questionnaire to be sent to the participants that presents the issue and poses an open-ended question or questions to be answered in a specified timeframe. Some guidance may be offered to the participants that responses should be short, concise bullets, rather than rambling responses, in order to facilitate the summary process.

The planning committee collects the responses to this first round of questions and summarizes the results anonymously, being careful not to unintentionally bias the result during the summarization. This summary is distributed to the participants who are asked to review the responses and evaluate each one by providing a short commentary on each, again preferably in bullet form.

The planning committee summarizes the round two responses and distributes them to the participants asking for additional feedback. In the first of two approaches, this third round will require some sort of ranking of the options developed in the first two rounds. This ranking will most likely be the basis of the final conclusions from the study.

If there is no convergence of opinion as a result of this ranking round, the planning committee may choose to continue beyond three rounds by constructing a means to have additional input filtered to the participants. When the planning committee determines there is stability in opinion, even if there is no convergence, they will gather the collected data and determine the findings of the study which they will document in a report.

## THE DELPHI METHOD: A CASE STUDY

To provide a view as to how the Delphi method can be executed and to demonstrate its versatility as a means to collect data and gain understanding of an issue, I will describe my recent experience in using the Delphi method to gather information concerning which product development projects to pursue within the business I work in.

While the Delphi method is ideal to gather input from a dispersed group of experts, it is also useful to assemble information from a resident group of experts who are unable to gather together for whatever reason. The Ideation Committee at the company that employs me is composed of members from marketing, distribution, systems and product management. This group is responsible for providing input into the company's product development planning process. The travel requirements of many members of the committee would not allow them all to commit to meeting every other week. However, all members agreed that they could provide written feedback via e-mail as part of a Product Development Delphi method designed to gather information about which product development projects our company should pursue.

The approach used in this exercise is described as a Modified Delphi Technique based on a template developed by University of Illinois Extension and available online. The Modified Delphi Technique is designed to use "mail or e-mail to gather information, provide feedback, and report conclusions" and is similar in operation to the Delphi methodology previously described. The approach of the Modified Delphi Technique involves three rounds: Round One collects a range of solutions to an identified issue; Round Two evaluates the ideas proposed in Round One; and Round Three ranks the ideas using the commentary provided in Round Two.

Round One requires a questionnaire to be developed by the Sponsor or Planning Committee. This questionnaire frames the issue being investigated and solicits as many responses

to the issue as the participants can muster. One key to this first step is for the Sponsor or Planning Committee to be extremely thoughtful in developing the initial questionnaire to clearly frame the issue and to provide enough instructional detail to avoid vague or ambiguous responses.

In the Product Development Delphi method, it wasn't difficult to clearly frame the issue to solicit appropriate responses from the participants. The Round One question was framed as, "What product development projects, including developing new products and riders and enhancing existing products, should Individual Insurance undertake to produce (profitable) sales growth, both currently and in the future?"

As the Sponsor of the study, I both developed and distributed the initial questionnaire and collected the responses from all participants via e-mail. I also summarized the Round One results making sure that there was no attribution to any participant. For a number of reasons there is generally a benefit in forming a planning committee. In this situation, however, I had willingly become a planning committee of one.

In this exercise, compiling the ideas from the first round and maintaining anonymity of responses was not especially difficult. The nine participants produced 40 distinct product

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development ideas that were easily compiled into a single list. Originally I thought it would be important to list the ideas in random order so as to not introduce any unintentional bias into the process, but I quickly realized that with 40 ideas, some sort of grouping of ideas would help facili-

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tate soliciting commentary in the second round. Since many of the ideas involved enhancements to existing products, a natural grouping was to collect the enhancement ideas by product type with the rest of the ideas grouped separately if they represented a new product or rider.

Round Two in the Modified Delphi Technique requires participants to comment on feasibility of each idea, that is, to evaluate the ideas. The objective of Round Two is to gather text around the collective thoughts of the participants on each idea that will subsequently be used as input into the ranking of the ideas in Round Three. Hence clarity of instructions with regard to evaluation in Round Two is essential to allow for an effective ranking in Round Three.

In the Product Development Delphi method, the primary Round Two participant instruction was, “For each product development project listed below, clarify, add to, and comment on the feasibility or opportunity, etc., as you feel appropriate.” While this instruction seemed consistent with the guidance of the Modified Delphi Technique, the actual responses received showed signs that it would have been productive for me to have spent more time in developing the Round Two instructions to describe more clearly the nature of responses required in Round Two. This is evidence that a planning committee may have been more effective than

the use of an individual sponsor to manage the process.

Round Two did generate a significant amount of appropriate feedback that when summarized would be useful to participants in Round Three. The weakness of Round Two in the Product Development Delphi method was that many responses were too general to be useful. In particular, responses of “Like this idea” or “Don’t like this idea” have no value in a Delphi study because of their anonymity, whereas the same com-

ments might be weighty and influential in a face-to-face discussion depending on their source. Since there were adequate responses of a more substantial nature that were received in Round Two, it was unnecessary to restart Round Two to provide further direction.

Summarizing the results of Round Two and maintaining anonymity was no more difficult than for Round One. The challenge was that many of the Round Two comments required material interpretation on my part to be useful for the next Round. I tried to be as true as possible to represent the commentary presented by the participant while modifying the comment without adding undue bias so that it could be interpreted by other participants. The resulting summary spanned eight typed pages, a lengthy document for participants to absorb as part of Round Three.

Round Three is designed to provide some sort of ranking of the ideas using the collective Round Two evaluation and commentary of the participants. Since a straight ranking of 40 possible product development projects did not seem like a productive activity, in the Product Development Delphi method I chose to collect the ideas into logical groupings, similar to those of Round Two, and ask participants to rank within each of these subsets of ideas. The categories I created were: 1) Repricing of products in the existing

portfolio; 2) Development of new products not currently in portfolio; 3) Development of riders not currently in the portfolio; and 4) Enhancements to existing products in the existing portfolio. Since product development resources are limited and the scope of projects in the ideation list ranged from small to large efforts, rather than request a pure top to bottom ranking within each category, I requested that, within each grouping, participants identify those projects (no more than half of total projects in the grouping) that they felt should be worked on currently and those projects that should not be worked on currently.

With these results I was easily able to tabulate the rankings and use these tallies to establish a view of the group's thinking as to priorities that the company should pursue. From this list, we have advanced the four top ideas to the next phase of activity in the product development process wherein we research each idea deeply enough to create a "charter" for the product which will be reviewed and a decision made before the product moves to the feasibility stage of the product development process.

The ideation phase is just the beginning of the product development process. For various reasons not every good idea makes it into the product development queue. However, it was extremely useful to collect specific input from stakeholders about every product development idea on the list of possible projects. The use of the Delphi method in this situation was a pragmatic solution to a scheduling problem. However, the resulting information and subsequent discussion of the findings as a result of using the method gave a significant base on which to build future product development activity.

Round One was distributed to the Ideation Committee on April 20<sup>th</sup> and the last Round Three response was received on May 15<sup>th</sup>. A draft report was produced and distributed within a week and the results were discussed at a June 1<sup>st</sup> Ideation Committee meeting. The first charters were presented to the Individual Insurance Product Committee on June 9<sup>th</sup> and one charter was moved to the Feasibility Stage

of the product development process. Relatively speaking this Product Development Delphi Process was more efficient than I had originally anticipated.

## CONCLUSIONS

The Delphi method has been used in the past by the Futurism Section (recently rechartered as the Forecasting and Futurism Section to expand its impact on the actuarial profession) in several studies as a means of exploring possible futures. A recent use of the Delphi technique by the Futurism Section, in conjunction with the Investment Section, the Committee on Finance Research and the Committee on Knowledge Extension was completed in 2005. The results of this study are documented in a report entitled, "Forecasting Selected U.S. Economic Variables and Determining Rationales for Judgments," which is available on the SOA Web site.

For many, Delphi conjures up images of a priestess possessed of mystical powers, reeking of sulphur, seated on a stool over a fissure that radiates from the center of the earth, and making indecipherable proclamations about how the future will unfold. The application of the term "Delphi" to a method that gathers information using anonymous feedback is clearly intended as irony. Usage of a methodology that was named after a ranting Oracle will not compromise or diminish our professional stature as long as we communicate our findings clearly.

The Delphi method can be a useful approach to explore issues when the opinions of experts are needed. Its strength is in its ability to solicit a wide range of opinions and to allow consensus to form without forcing it to do so. The method has an efficiency and efficacy that makes it a valuable tool to actuaries and other professionals. ▼



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