Delphi Method

Definition

The Delphi Method is designed to elicit opinion and counter opinion from a group of experts in order to inform better the decision making process. These experts may be geographically dispersed. Traditionally, information is captured through the use of questionnaires and their analysis is fed back to the experts in an unattributed manner through a continuous loop system until the group converges on a common opinion. The approach is valuable when decisions have to be made in highly charged domains e.g., politics, education, or when actions may have severe outcomes e.g., thermonuclear warfare.

Conceptual Overview

Uncertainty in environmental contexts can be reduced to risk, structural and unknowable components. In futures thinking, risk can be predicted and so is handled using a number of proven aids e.g., forecasting, trend impact and cross impact analysis. Structural interventions e.g., natural disasters, technological upheavals, do not lend themselves well to probabilistic modelling as the underlying nature of a phenomena is changed fundamentally. Here, the harnessing of expert opinion through the Delphi Method or Morphological Analysis is a fruitful way to inform future prospecting. Unknowable

interventions cannot be predicted but only imagined through the lenses of some scenario thinking techniques.

After WWII, the need to make a close link between military operations and technological development became clear to many US military experts and politicians. To meet this end, the RAND Corporation was established in 1946, focussing initially on defence related issues but diversifying later into social issues. The limitations of probabilistic forecasting techniques soon became apparent as the research teams tried to tackle complex problems with numbers before any precise scientific laws had been established upon which to build their modelling assumptions. Hence, in the early 1950s, 'Project Delphi' investigated the most efficient and reliable use of groups of experts. Later, two RAND researchers Olaf Helmer and Nicholas Rescher published a paper on "The Epistemology of the Inexact Sciences" in which they argued that because there were areas in which science had yet to develop its laws and boundary conditions, expert opinion was a vital and legitimate source of data. Incidentally, these founders did not like the Greek imagery portrayed by the name Delphi. But, the name stuck.

Consequently, researchers at RAND developed a Delphi technique based upon a Hegelian 'Dialectical Inquiry' approach comprising of: Thesis, where an opinion is formed on a complex topic; Antithesis, where a conflicting opinion is gathered and Synthesis, where a new consensus is established that becomes the new thesis on the topic. Creative thinking and the avoidance of group-think are crucial aspects of the process. Understandably, the method was used first in long run (e.g., 30 year) technology

forecasting on issues like automation, space progress and weapon systems. Thereafter, its use was extended to business interests like new product market assessment and then to the public good e.g., health care and education. Its accuracy in fortifying business forecasts seemed exceptional for the time. Basu and Schroeder claimed that the Delphi Method predicted the sales of a new product during the first two years with accuracy of 4-5% compared with actual sales. Quantitative methods produced errors of 10-15% and traditional unstructured forecast methods of about 20%.

Two Delphi methods are in active use today-the standard ‘paper and pencil’ version and the broadband digital conference version. Both approaches depend on groups of experts, carefully chosen for their insight about parts of the complex problem, but who need not be experts on the whole problem. Brockoff has suggested that groups as few as four work well, but between fifty and one hundred is usual for larger projects. Such experts need not gather together but can operate in isolation and anonymously. For example, to explore the future transportation system for a large city, several panels were established comprising of planners, academics, technologists, climatologists together with representatives of public transport users, operators, car drivers, delivery drivers, commuters, employers, parents of schoolchildren and so on.

In the standard approach, a Delphi team designs the survey questions that are administered to panel experts and returned for analysis. Conditioned by the results of the first survey, a second survey is designed and fed to the panel experts for revision and this process repeated until consensus is reached. The interactions between the Delphi

panellists are controlled by a trained facilitator who filters out information not relevant to the group as a whole. Three rounds is usually the limit before new ideas dry up and participants get bored. For the city transport issue, a standard approach allows cost effective and rapid engagement of panellists across the city concerned, adjacent cities and towns and outlying rural areas. The responses can be handled centrally by the City planning officers or outsourced to specialist consultants. The results feed into the planning process of into the building of scenarios for the future of the city region.

The digital version brings the panellists together before and during the iteration process to capture their interactive thinking on key issues. Clearly, this version has advantages of communication and analytical speed and where the experts are remote or when group size is large. The basic process is identical in each delivery system.

Critical Commentary and Future Directions

In paper and pencil form, the Delphi Method has probably reached product maturity. On the assets side, it can lead to rapid consensus and is effective when experts are geographically dispersed; when a topic is so complex that many subject inputs are required to master it; when the topic is controversial and anonymity is needed to enable the experts to speak openly; and when dealing with a specific, single dimension issue. Moreover, by keeping the experts in isolation, it can avoid some of the criticisms of group decision making in regard to dominant voices, overt lobbying and group think. In addition, Fowles has referred to it as a ‘method of last resort’ when no other approaches can cope with the extent of complexity subsumed in the problem.

On the liabilities side, many argue that the collection of opinion, and not hard data, is unscientific. Moreover, its success is premised upon both the quality of this opinion with its potential for bias and subjectivity and the quality of the survey instruments utilised. Additionally, the opinion-based data must be analysed in an unbiased manner and distributed in an even way by the facilitator to avoid manipulation. As many of its uses are client confidential, there is little transparent reporting in the literature to monitor these issues. More serious, even experts struggle with major structural changes. Their knowledge of the unknowable can be as weak as that of the forecaster, especially as their foresight is within their expert silo and not connected to the whole problem under study.

Its ethical application is challenged when it is used in a covert manner by clever facilitators and their colleagues, planted within audiences, who are intent on keeping up an illusion of communal inclusiveness while invisibly directing groups to a pre determined end. By pitting one faction against another and protecting the popularity of their own role, they can gain the confidence of credulous audiences and drive the conversation towards the goal of their client. To diffuse this approach, audience members are advised to remain courteous, stay focused and be persistent.

To continuously improve Delphi, the use of advanced computer graphics, real time analytical software and powerful video conference suites can be integrated better to increase the collective human intelligence of expert groups and improve the efficiency of the process. To improve its effectiveness, Delphi can be reinforced with cross-impact

analysis and used in this combination to bolster foresightful techniques e.g., scenario planning, so making substantial contributions to the mapping of future pathways.

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Cross References

See also Forecasting; Morphological Analysis; Trend Impact Analysis; Cross Impact Analysis; Scenario Planning

Further Readings and References

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