

Chapter 3. Dialogue methods for understanding a problem broadly: integrating judgments

The majority of methods we identified were useful for the integration of judgments. Here, we define judgment as the ‘ability to judge justly or wisely, especially in matters affecting action; good sense; discretion [and] the forming of an opinion, estimate, notion, or conclusion, as from circumstances presented to the mind’ (Macquarie Dictionary 2005).

As we described earlier, Yankelovich (1999) went further than this, pointing out that, in making a judgment, people took into account the facts as they understood them, their personal goals and moral values and their sense of what was best for others as well as themselves.

In tackling real-world problems, it is common that research data alone are not sufficient to provide full understanding of the problem and a clear path for action. In addition, action often needs to be taken before all the research that can have a bearing can be conducted. Synthesising a range of informed judgments is then often the best way forward.

In research integration, the focus of the dialogue process is on a research question and the process aims to enable the formation of a combined judgment between the participants, with that judgment being informed by the best research evidence. Research-informed judgments can be achieved in various ways. One is to present research evidence to those whose judgments are being synthesised—through, for example, presentations, documentation or questions and answers. This is commonly done in dialogue methods that concentrate on integrating the (informed) judgments of lay people (citizens’ jury and consensus conference). Another is to concentrate on research experts and to integrate their judgments (for example, in a Delphi technique). Still another is to involve research experts and lay people and to share the research evidence through discussion (for example, in open space technology).

The research integrator is most likely to take the lead in organising the dialogue and in bringing the results to the attention of decision makers. Tasks undertaken by research integrators can therefore include determining the topic for the dialogue and the particular dialogue method, the selection of participants, as well as what research evidence will be presented and how. They are likely to also be responsible for documenting the outcomes of the dialogue and ensuring that the process is evaluated, as well as deciding to whom the results should be presented and how that is best done.

Citizens' jury

Description

A citizens' jury is a dialogue method that was developed by the Jefferson Center in the United States. The centre has registered the term 'Citizens Jury' as a trademark in that country. This method is used by organisations wishing to receive and understand the views on complex issues of a well-informed, representative group of ordinary citizens.

The process involves providing the citizens with information from subject-matter experts, advocates and other stakeholders and then bringing together the range of judgments of the citizens into a single judgment.

The core approach (as used by the Jefferson Center) is as follows:

In a Citizens Jury project, a randomly selected and demographically representative panel of citizens meets for four or five days to carefully examine an issue of public significance. The jury of citizens, usually consisting of 18 to 24 individuals, serves as a microcosm of the public. Jurors are paid a stipend for their time. They hear from a variety of expert witnesses and are able to deliberate together on the issue. On the final day of their moderated hearings, the members of the Citizens Jury present their recommendations to the public. (Jefferson Center 2004:3)

This source explains that the main characteristics of a citizens' jury are:

1. *representative*: selected by a recognised sampling method
2. *informed*: witnesses present to the jury a variety of facts, information and opinions on the matter under consideration, and are questioned by the jury
3. *impartial*: those organising the process select witnesses whose evidence is carefully balanced to ensure fair treatment to all sides of the issue
4. *deliberative*: the jury deliberates in a variety of formats and is given sufficient time to ensure that all of the jurors' opinions are considered.

As originally designed, the process operates in nine stages (Jefferson Center 2004), but as the cases below show, variations are possible.

1. *Establishment of an advisory committee* of four to 10 people with sound knowledge of the issue to be deliberated on. They advise the organisers about focusing the topic, the selection of witnesses and development of the agenda.
2. *A telephone survey* is conducted of a random sample of the public to obtain demographic and attitudinal information on the topic under consideration. Those polled who express interest in the topic are sent information about it, and about the citizens' jury process.

3. *Jury selection* occurs using techniques that aim to ensure that the jury is representative of the community from which it is drawn. Potential jurors are people who have been selected in the previous step and have agreed to have information on the topic and the jury process sent to them. They are categorised on the basis of demographic and attitudinal variables and jurors and alternatives are then selected to ensure representativeness.
4. *Witness selection* is the next step. The aim is to involve neutral resource people, as well as advocates and stakeholders. Care is taken to ensure balance in the witnesses' inputs.
5. *The charge* is determined—that is, the question or questions that the jury will consider and on which they will reach a judgment. Care needs to be taken to ensure that the scope of the charge is neither too narrow nor too broad.
6. *The hearings* are then conducted and moderated by professional facilitators. The staff prepare the venue, the order of witnesses, and so on. The hearings typically run all day for five consecutive days. Ample time is provided for jurors to discuss the issues among themselves (in small and large groups) as well as with the witnesses. The presentations end on the afternoon of the fourth day. On the morning of the fifth day, the jurors have their final discussions and prepare an answer to the charge—that is, determine their judgment. They also review an initial report from the process.
7. *Recommendations* are issued by the jury members, along with their findings, at a public forum on the final afternoon.
8. *Evaluation*, which involves all the jurors, is undertaken, with an important evaluation question assessing whether or not they feel that the process has been biased in any way. They are also invited to write a personal statement about the process. The evaluations and personal statements are included in the final report.
9. *Public outreach* occurs throughout the life of the project, sometimes entailing a web site with transcripts of evidence and media liaison activities to promote public interest in the process and awareness of its conclusions.

The Jefferson Center met difficulties that reflected aspects of the US political system and closed in 2002. (The Internal Revenue Service revoked the centre's tax-deductible status and it was threatened with legal action owing to its work in evaluating election candidates' policies.) Nonetheless, citizens' juries continue to be conducted in the United States and other countries, notably Germany, the United Kingdom, Denmark, Spain and Australia.

Examples of its use in research integration

1. The environment: deciding the future of a wetland

What was the context for the integration?

The Fens is a large, low-lying area near Ely, Cambridgeshire, in the United Kingdom. It was formerly a wetland (hence its name), but it was drained and turned into arable farmland, although there were moves to return at least some of the area to the original wetland state.

What was the integration aiming to achieve and who was intended to benefit?

A citizens' jury was conducted by researchers to explore the question 'What priority, if any, should be given to the creation of wetlands in the Fens?' (Aldred and Jacobs 2000). The organisers used the citizens' jury approach to dialogue because '[t]he premise behind this method is that, given enough time and information, ordinary people can make decisions about complex policy issues' (Aldred and Jacobs 2000:218).

What was being integrated?

The process aimed to integrate the judgments of 16 lay people (jurors), 'acting in their capacity as citizens concerned with the public good rather than [as] consumers concerned with private interests' (Aldred and Jacobs 2000:217) once they became well informed about the issues as presented by witnesses. The report on the jury process did not identify the characteristics of the witnesses and the topics on which they made presentations, stating simply that they were 'experts on different aspects of the question being considered' (Aldred and Jacobs 2000:220).

How was the integration undertaken and who did the integration?

This citizens' jury was freestanding in the sense that it was not commissioned by a body that had the power to implement the jury's findings, as would occur in most traditional citizens' juries. (Such a freestanding nature is likely to be common in research integration.) It was established, however, with the support of an advisory group made up of representatives from organisations with varying interests in the development of the Fens—that is, a range of stakeholders. Although the members of the advisory group did not commit themselves to be bound by the jury's conclusions, they 'agreed to receive the report and take its recommendations seriously' (p. 219). The question deliberated on by the jury was developed jointly by the researchers and the advisory group, as were the options that the jurors were asked to discuss. Some of the witnesses who gave evidence to the jury were representatives of the organisations on the advisory group.

Sixteen jurors were selected from among members of the public living in the local area. As the researchers who conducted the project pointed out, they had

first to decide whether to choose a representative sample based on statistically random selection (impossible if there were to be just 16 jurors, they concluded) or whether to obtain a jury that was representative of the various local interest groups. They adopted the second of these options. In doing so, however, they explicitly excluded from selection people with strongly held views on the specifics of the topic. Instead, they selected a jury that included all relevant perspectives on the issues. This was done by having a market research firm interview local residents, telling them that the jury would

discuss issues that are important matters of concern to people living locally. These issues will include farming, job creation, tourism, wildlife and the environment in Cambridgeshire, Norfolk and the Fens. The Jury is supported by Cambridgeshire and Norfolk County Councils and a group of other public bodies...[They were advised that] [t]o be a member of a CJ, you need no special training or experience. You are being asked to contribute your views and opinions as an ordinary member of the local community. (Aldred and Jacobs 2000:219)

Jurors were each paid £200 plus travelling expenses for four days, and were asked to sign a contract committing themselves to attend each day and to participate fully.

The agenda, prepared by the researchers and the advisory group, was presented to the jurors on the first day. It set out the overall question to be tried ('What priority, if any, should be given to the creation of wetlands in the Fens?') and covered four options for developments in the Fens area: turning the farmland into a nature reserve; establishing a wetland as a Fen centre; incremental development; or not taking any deliberate action at all. The first three options were proposals being advocated by various local organisations, and the fourth gave jurors the option of rejecting the idea of a wetland area in the Fens.

Following the usual procedure, a number of expert witnesses (selected mostly on the advice of the advisory group) made presentations to the jury and were questioned closely by its members. The 16 jurors regularly split into three groups (with varying membership) over the four days to consider particular topics in detail. This took the integrative work to a greater depth. The deliberations were captured by means of summaries prepared by the jurors on flip charts during small group work and plenary sessions, written records kept by the facilitators, tape recordings (everything was recorded) and evaluation questionnaires completed by the jurors at home after the jury concluded its work.

What was the outcome of the integration?

The jury's conclusions and recommendations were unanimously in support of option one (establishing a nature reserve in the Fens) and option three (incremental development). Careful attention was given to, and recommendations

made about, a range of related issues, some of which were raised by jurors themselves—that is, matters that were not included in the pre-prepared agenda.

The jury process apparently worked well:

The design and execution of the Ely Jury was in general considered very successful. The atmosphere in the meeting room over the 4 days was appropriately relaxed, with much laughter and all jurors appearing at ease to speak. All jurors were given an evaluation form on the final day; the comments on the forms returned (14 out of 16) were generally very positive. Most of the significant criticisms raised had already been recognised and acknowledged by the researchers. (Aldred and Jacobs 2000:222)

The full report on the Ely Citizens' Jury is available online (<<http://alba.jrc.it/valse/pdf/files/rap.fin.chapter6-a.pdf>>). No information was provided on how successful the process was in informing decision makers or what action, if any, was taken based on the citizens' jury findings and recommendations.

2. Public health: planning local health and welfare services

What was the context for the integration?

South West Burnley is a town in Britain characterised by high levels of social exclusion, social deprivation and complex community needs regarding health, housing, employment, education, and so on. Over the years, a number of needs assessments had been conducted, mostly using consultation with the residents, but nothing came from them. In 1999, the then Burnley Primary Care Group commissioned a citizens' jury. Oversight of the process was the responsibility of a community-based Health and Social Care Group, which had close links to the Primary Care Group, as well as action researchers from Lancaster University.

At the time, Primary Care Groups were part of the UK National Health Service's Area Authorities (they have now been replaced by Primary Care Trusts). Each Primary Care Group organised and funded primary healthcare services within a particular region, either through other National Health Service organisations or through other bodies including private medical practitioners and not-for-profit organisations. This meant that the Primary Care Group had considerable capacity to implement the recommendations of the citizens' jury.

What was the integration aiming to achieve and who was intended to benefit?

The citizens' jury approach was selected for three reasons:

- to build up a body of evidence through the testimonials of jurors, witnesses and other members of the community
- to resolve a specific longstanding problem regarding local service provision

- to open up debate about what people living in that community would prioritise for change (Kashefi and Mort 2004).

The authors of the report on the citizens' jury added that, '[a]s action researchers, we were keen to see whether the jury process could hold service providers and policymakers accountable to the community, and to explore whether the process could be used as a tool for health activism' (Kashefi and Mort 2004:292).

Importantly, the key planning and service agencies agreed that this would be the final consultation and that action would flow from its findings. Deferring action on the community's pressing concerns was no longer a viable option.

The steering group, drawn from the Health and Social Care Group, set the question to be tried by the jury: 'What would improve the health and well-being of the residents of South West Burnley?'

What was being integrated?

There is little in the report about the information provided to the jurors as part of their deliberations.

How was the integration undertaken and who did the integration?

An innovative approach to juror selection was used. The steering group analysed census data on the demographics of the area and determined the characteristics jurors should represent. A professional recruiter, who had worked in the area previously, spent some weeks informally discussing the proposal with community members with the goal of finding potential jurors who matched the profiles set by the steering committee. A diverse group of 12 local residents, aged from seventeen to seventy years, was eventually recruited as jurors. They had two evening preparatory sessions at which they got to know each other and the other people involved in the process, including the researchers. A local community worker and four people who had served on a previous citizens' jury in the area designed a training session on the practical aspects of being a juror. The jurors were paid for their participation.

The deliberative phase of the jury was conducted over five days. A wide range of witnesses gave evidence, including health workers, community development workers, community activists, general practitioners and a social worker. Most were local residents. There were two closed sessions in which the jurors focused on their own ideas and experiences. Four pieces of research were commissioned before the deliberative phase to bring local community views to the jurors and the resulting research reports were presented as evidence by various witnesses. Jurors engaged in dialogue in pairs, small groups and separate female/male groups. The process was supported by two facilitators, a chairperson and a 'jury investigator'. The last person's role was to research and find answers to questions

that arose in the course of the trial, and to rapidly (that is, within the trial time) report back to the jury.

What is the outcome of the integration?

On day five, the key recommendations were collated and pairs of jurors presented them using simple visual representations. These presentations were made to the sponsors of the jury and the local Member of Parliament. The researchers prepared a written report in consultation with the jurors (see <[http://www.lancs.ac.uk/fass/ihr/publications/elhamkashefi/burnley citizens' jury report.pdf](http://www.lancs.ac.uk/fass/ihr/publications/elhamkashefi/burnley_citizens_jury_report.pdf)>). The jury's report covered the strengths and weaknesses of the community and included some 80 recommendations—some rather general and others very specific.

The Health and Social Care Group established a system to manage the dissemination of the report to the local community and other stakeholders, and to manage the implementation of its recommendations. Some of the jurors were actively involved in this for an extended period. As the authors of the paper describing this citizens' jury advise:

Three months after publication [of the jury's report], all health and social care agencies mentioned in the report attended a public meeting to respond formally to the recommendations. Hopes were high for this event, that concrete action would be reported and plans outlined to work on the wider concerns raised by the jury...every agency sent a formal, written response to the Health and Social Care Group outlining their proposed course of action on the recommendations. (Kashefi and Mort 2004:298)

Funding bids were submitted and a multifunction community health centre was established and staffed. This was a centre for continuing community participation and service delivery for overcoming many of the problems faced by Burnley's citizens. The researchers involved in the case describe the importance of integration, as follows:

[By integration] we mean that the jury process must be embedded within the community where it happens. The subject under discussion must be of relevance to community groups and organizations, as well as individuals, and these should participate from inception to realization; knowledge from previous consultations must be integrated using local expertise, e.g. as witnesses and advisors; recommendations must be implemented using links with existing local networks in order for these to be credible and workable. Without integration, juries and other consultative activities will remain isolated and irrelevant. (Kashefi and Mort 2004:299–300)

Commentary

For our cases, we could find examples of research integration in only two of the four areas of interest (the environment and public health). Even so, it is noteworthy that the role of the researchers was not particularly clear and had to be inferred from the available documents. Even more importantly, in neither case was the evidence that was being integrated into the judgments described.

Use of the integration framework shows that, in terms of research integration, the available descriptions are very uneven. In both instances, the selection of the jurors is presented in considerable detail, while, as mentioned above, the information they were given is almost completely ignored.

This method was not developed for research integration; rather, it was aimed to be part of a broad democratic process in that it elicited and channelled information from concerned citizens to policy-makers, alerting them to the judgments of *informed* citizens on complex policy issues. Nevertheless, as the examples show, it can be used for research integration.

The method is valuable for integrating the informed judgments of citizens but not the judgments of other stakeholders, including those having to make decisions on the topic under consideration, and those potentially affected by those decisions. This means that it tackles only part of the research integration task. Other, complementary methods are needed to integrate the views of other stakeholders.

Origins and genealogy

The origins of this dialogue technique are in deliberative democracy. It is closely linked to the consensus conference (see below) and citizens' panels.

The citizens' jury method was developed at the Jefferson Center, Minneapolis, Minnesota, United States, which was founded in 1974 to undertake research and development on new democratic processes. The first citizens' jury was held the same year to pilot and explore the method; it addressed the topic of a national health plan for the United States. The centre closed in 2002 but still maintains a website <<http://www.jefferson-center.org/>> and conducted 32 citizens' juries before closing.

Further reading on citizens' juries

Carson, L., Sargant, C. and Blackadder, J. 2004, *Consult Your Community: A guide to running a youth jury*, NSW Premier's Department, Sydney, New South Wales.

Coote, A. and Lenaghan, J. 1997, *Citizens' Juries: Theory into practice*, Institute for Public Policy Research, London.

Crosby, N. and Nethercut, D. 2005, 'Citizens juries: creating a trustworthy voice of the people', in J. Gastil and P. Levine (eds), *The Deliberative Democracy Handbook: Strategies for effective civic engagement in the twenty-first century*, Jossey-Bass, San Francisco, pp. 111–19.

Jefferson Center 2004, *Citizens Jury Handbook*, Revised and updated edition, The Jefferson Center, <<http://www.jefferson-center.org/>>

Wakeford, T. 2002, 'Citizens juries: a radical alternative for social research', *Social Research Update*, no. 37, <<http://sru.soc.surrey.ac.uk/SRU37.html>>

Consensus conference

Description

The consensus conference is a highly structured event designed to involve non-expert, non-partisan citizens in deliberating on important (and typically complex) social, technological, planning and/or policy issues, and through doing so to integrate judgments. Their objective is 'to bridge the gap between the general public, experts and politicians, who only rarely have an opportunity to meet' (Grundahl 1995:31).

The chief characteristics of the consensus conference have been described as follows:

- the profile of participants is usually structured to provide a representative sample of the whole citizen group being consulted (by age, place of residence, gender, etc.)
- It involves relatively small numbers of participants (usually 12–25)
- It requires an independent and skilled facilitator
- Participants are provided with written evidence before they meet
- Participants decide who to call in as 'expert' witnesses, which allows the infusion of higher levels of knowledge and experience into the process
- It is interactive, participants meet for preparatory weekends and then a deliberative meeting of 2–4 days
- Recommendations are published in a formal report
- Either the recommendations are implemented, or sufficient grounds must be provided publicly to explain why they will not be implemented (Carson and Gelber 2001).

The consensus conference method was initially developed in Denmark, and the Danish approach has been applied widely. Some modifications have, however, been made in other settings. The steps involved have been summarised by Hendriks (2005:83):

The Danish model is based upon a two-stage procedure that engages ten to twenty-five citizens in eight days of deliberation over a period of approximately three months. In the first stage, the citizens meet for two preparatory weekends to learn about the topic, the process, and the group. During these weekends, the panel [i.e. the citizens] also develops a series of questions for the conference to address and selects the conference presenters from a list of possible experts and interest group representatives.

In the second stage of the process, the actual four-day conference takes place. On the first two days, various presenters appear before a plenary forum to respond to the questions set for the conference. Throughout

this period, the citizens' panel retreats into non-public sessions to formulate further questions for the presenters and to clarify any misunderstandings or points of contention. On the last two days, the citizens work together to write a report outlining their key recommendations, which they then present to relevant decision makers before a public audience. In some cases, the presenters have the right to reply, after which the citizens are free to reformulate their report.

In the Danish design, the people selected to be on the citizens' panel do not have expert knowledge of the topic and do not hold any strong views on it.

Consensus conferences tend to be run by government agencies or professional organisations. For example, the Danish Board of Technology has run many, with its conference reports being submitted to members of parliament. Australian examples include the Consensus Conference on Gene Technology, sponsored jointly by 28 government, research and industry bodies, and the annual Consensus Conference on Guidelines for the Use of Antiretroviral Agents in HIV-1 Infected Adults and Adolescents run by the Australasian Society for HIV Medicine. While these share some of the processes used in the US National Institutes of Health's Consensus Development Panel method (discussed below), the approaches used are more flexible, not following the highly structured format of the National Institutes of Health's approach.

Suitable topics for consensus conferences are matters of current interest that are: reasonably delimited and not too abstract, contain conflicts between the positions of various advocates, need clarification of objectives and the attitudes of proponents and opponents, require the contribution of experts to clarify the science and other issues underlying the topic, and for which the necessary knowledge and expertise are available (Grundahl 1995).

As with citizens' juries, in research integration, the consensus conference addresses a research question and is provided with a range of research evidence.

Example of its use in research integration

Technology: implications for the democracy of new telecommunication technology

What was the integration aiming to achieve and who was intended to benefit?

Technology assessment has traditionally been undertaken by subject-matter experts, but, in April 1997, a consensus conference was held in Boston to involve lay people. Its title was Citizens' Panel on Telecommunications and the Future of Democracy. This was the first consensus conference to be held in the United States and it was designed and implemented in a manner to assist lay people to learn about new technology and to develop an informed judgment about it. Its general goal was 'to improve decision making about science and technology by

expanding access and perspectives beyond the traditional elite, increase the public understanding of science and technology through informed public debate, and enhance democracy by fostering civic engagement' (Guston 1999:452).

What was being integrated?

The staff of the project selected 16 experts to make presentations to the citizens' panel: four were academics, three were from government, two were from the not-for-profit sector and seven were from the corporate sector. Six of them were also on the project's steering committee. The report on the conference does not provide details of the topics that they covered.

How was the integration undertaken and who did the integration?

The consensus conference was sponsored by a number of prestigious organisations, including universities, *Technological Review* magazine, the Loka Institute (a non-governmental organisation) and the US National Science Foundation. It had a four-member directorate drawn from the main sponsors and the directorate established a 12-person steering committee comprising academics, activists and representatives of expert practice, sponsors and targeted groups.

To identify the 15 consensus conference panellists, some 1000 people in the Boston area were randomly selected from the telephone directory and phoned. The 127 people who expressed interest were mailed background information and a questionnaire, and were selected on the basis of their responses. Additional members were targeted to attain diversity in race, age, educational level and computer familiarity. The panellists had to commit to seven days of involvement in the process, spread over three weeks: two preparatory weekend sessions and the three-day public conference. The panellists selected the subtopics for discussion and 'described the kinds of information and expertise they wanted the steering committee and project staff to gather' (Guston 1999:456) and to have presented at the public conference.

The three-day public conference included presentations by 16 selected experts and questions from the 15 panellists. On the final day, the panellists gave a media conference during which they promulgated their four-page consensus statement. Media coverage of the conference, particularly by local media outlets, was extensive.

What was the context for the integration?

The key driver for the consensus conference was that the US Federal Communications Commission was developing policies in the area of emerging telecommunication technologies, particularly with respect to the US Government's goal of access to the internet for all Americans. This prompted initial action to establish the consensus conference from the Education for Public Inquiry and International Citizenship program at Tufts University in Boston.

What was the outcome of the integration?

The consensus conference was evaluated on four criteria: direct, instrumental impact; impact on general thinking in policy arenas; impact on the training of knowledgeable personnel; and the interaction of the analysis presented by the experts with the lay knowledge of the panellists (Guston 1999).

The integrative aspect of the process was seen particularly in the fourth of these:

The interaction of analysis with lay knowledge is perhaps the most interesting category of potential impacts of a consensus conference. The presence of lay citizens on the panel means that the interaction with lay knowledge pertains to both participants—the panel members—and non-participants alike. (Guston 1999:469)

Panellists reported that they had learnt a lot about the substantive issues covered, were sensitised to the issues and learnt about civic involvement in policy issues. The experts reported how valuable they had found the interaction with the lay panellists, in contrast with their usual, narrower circle of colleagues. The evaluation concluded that the integration might have been even stronger if the experts and panellists had been given more opportunities for informal dialogue at the conference, perhaps during mealtimes and other breaks, to supplement the formal presentations and question and answer sessions.

In contrast, no real (direct, instrumental) impact was observed. The authors concluded that:

The single greatest area of consensus among the [evaluation] respondents was that the Citizens' Panel on Telecommunications and the Future of Democracy had no actual impact. No respondent, not even those governmental members of the steering committee or expert cohort, identified any actual impact. The principal reason for this finding is that having an actual impact was not a primary goal of the citizens' panel...Many respondents, however, felt that an actual impact would have been desirable. Some lamented its absence. (Guston 1999:462)

Commentary

The consensus conference method has a role in integration when the goal is to have citizens develop and communicate, to decision makers, their informed judgments on a topic of public policy interest. The presence of the decision makers who will receive their findings is a distinguishing characteristic of the method. The peripheral involvement of researchers (for example, as organisers, presenters or evaluators, rather than the people making the integrative judgments) means, however, that it is not as closely tied to research as some other methods.

The example provided adheres closely to the standard approach for this method, especially with respect to the selection of panellists from the community at large and the extensive dissemination of its findings via the mass media.

The method can be contrasted with the similarly named consensus development panel method (described below), used primarily by the US National Institutes of Health (NIH). In that approach, the panellists are selected for their expertise, in their own scientific disciplines, rather than attempting to be representative of the community.

Origins and genealogy

The Danish Board of Technology developed the consensus conference model in the late 1980s. Its starting point was the US NIH's Consensus Development Panel model described below, but they altered it to eliminate from the panel people with expertise in the area being investigated, so as to involve only lay citizens representative of the general community.

The first Australian consensus conference was conducted at the Australian Museum in March 1999 on the topic of Gene Technology in the Food Chain (details: <<http://www.amonline.net.au/consensus/>> and <<http://www.abc.net.au/science/slab/consconf/>>).

The consensus conference approach to dialogue is closely related to citizens' juries (see above). Where they differ, however, is that the former generally takes place over a far longer period (months not days), the agenda and questions to be put to the experts are developed by the panellists and they also determine which experts they wish to have present to them (Carson and Gelber 2001).

Further reading on the consensus conference

Hendriks, C. 2005, 'Consensus conferences and planning cells', in J. Gastil and P. Levine (eds), *The Deliberative Democracy Handbook: Strategies for effective civic engagement in the twenty-first century*, Jossey-Bass, San Francisco, pp. 80–110.

Joss, S. and Durant, J. (eds) 1995, *Public Participation in Science: The role of consensus conferences in Europe*, Science Museum with the support of the European Commission Directorate General XII, London.

Consensus development panel

Description

The consensus development panel and the associated consensus development conferences are a dialogue method for research integration developed and implemented under the Consensus Development Program of the US NIH.¹ Their purpose is to provide guidance in areas of medical and broader health practice, particularly in areas in which controversy exists and a body of scientific evidence is available that can be scoped, explored, assessed and synthesised to produce a consensus statement on the issue.

The NIH lists six principles that govern the conduct of a consensus development program conference and the operation of the consensus development panel:

1. A broad-based, non-DHHS [US Department of Health and Human Services], non-advocacy, independent panel is assembled to give balanced, objective, and knowledgeable attention to the topic. Panel members are carefully screened to exclude anyone with scientific or financial conflicts of interest...
2. Invited experts present data to the panel in public sessions, followed by inquiry and discussion. The panel then meets in executive session to prepare the statement.
3. Four to five predetermined questions define the scope and direction of the conference. These questions are widely circulated and are known to all conference participants. The principal job of the panel is to develop responses to them.
4. A systematic literature review is prepared for use by the panel in addressing the questions. The review is prepared by the Agency for Healthcare Research and Quality (<<http://www.ahrq.gov/>>) through one of several Evidence-based Practice Centers [of the NIH].
5. Near the end of the conference a draft conference statement is prepared by the panel in executive session and is then presented in plenary session. Following public discussion the panel may modify the statement as they deem appropriate and the resulting statement is posted on the website (<<http://consensus.nih.gov/>>) as DRAFT and is usually finalized in 4–8 weeks postconference.
6. The consensus statement is widely disseminated to achieve maximum impact on health care practice and medical research. (NIH 2008)

Two closely related types of conferences are conducted, each using the same approach but dealing with slightly different subject matter and concluding with slightly different consensus statements: the consensus development conference and the state-of-the-science conference. The difference between them is that the former covers areas of science and health practice for which a strong evidence

base exists from randomised controlled trials and high-quality observational studies. The latter deals with areas where the evidence is weaker. The purpose of state-of-the-science conferences is not to answer specific research questions or resolve controversies (as occurs with the consensus development conferences) but to summarise the evidence and recommend future directions for research. Otherwise, the two types of conferences and panel processes are very similar.

From 2003 to 2007, the Consensus Development Program conducted 10 conferences, of which two were consensus development conferences and eight were state-of-the-science conferences. The conferences held in 2006 and 2007 illustrated the breadth of the topics covered: 'Prevention of Fecal and Urinary Incontinence in Adults', 'Tobacco Use: Prevention, cessation and control', 'Multivitamin/Mineral Supplements and Chronic Disease Prevention' and 'Cesarean Delivery on Maternal Request' (a full list is available online at <<http://consensus.nih.gov/>>).

The core outcome of the panel's deliberations is a consensus statement on the topic that they have addressed. This is disseminated widely to the public (for example, through media conferences and web-casts of conference proceedings) and to scientific and practitioner audiences (for example, through the NIH web site, mailings of the statement and articles in refereed professional journals). The statements are characterised as follows:

A consensus statement is based on publicly available data and information. It is not intended as a legal document, practice guideline, or primary source of detailed technical information. Rather, the statement reflects the views of a panel of thoughtful people who understand the issue before them and who carefully examine and discuss the scientific data available on the issue. The creative work of the panel is to synthesize this information, along with sometimes conflicting interpretations of the data, into clear and accurate answers to the questions posed to the panel. The statement may reflect uncertainties, options, or minority viewpoints. Following the conference, the consensus statement receives wide circulation through both lay and medical media. Conference proceedings are webcast live (<<http://consensus.nih.gov/>>) and archived for later viewing. (NIH 2008)

The NIH's conference organisers select the panel chairperson and that person, in conjunction with the organisers, selects the other panellists. A planning committee is appointed to manage the process, including drafting the conference questions and program.

Integration is undertaken by the panellists and occurs through their work in synthesising and judging the data and research evidence that are presented in the comprehensive literature review prepared for them before the panel is

convened, and which is presented in conference sessions by outside experts. These inputs, and the linked co-sponsorship of the conferences, frequently come from a number of disciplines and practitioner perspectives. An example is the 2004 state-of-the-science conference on 'Preventing Violence and Related Health-Risking Social Behaviors in Adolescents', which was co-sponsored by agencies as diverse as the US Agency for Healthcare Research and Quality, the Centers for Disease Control and Prevention, the National Institute on Alcohol Abuse and Alcoholism, the National Institute of Child Health and Human Development, the National Institute on Drug Abuse, the National Institute of Nursing Research, the National Library of Medicine, the Office of Behavioral and Social Sciences Research, the Substance Abuse and Mental Health Services Administration and the US Departments of Education and Justice.

Example of its use in research integration

Public health: developing a state-of-the-science statement on the prevention, cessation and control of tobacco use

What was the context for the integration?

In many societies, tobacco smoking is the leading preventable cause of premature death. Tobacco contains a highly addictive, though otherwise reasonably safe, chemical, nicotine. Many different strategies aiming to reduce the adverse health and societal impacts of tobacco smoking exist, including health education, controls on the physical availability of tobacco products, taxation and promoting less dangerous ways of ingesting nicotine. Uncertainties exist, however, about which strategies, or mix of strategies, are most likely to be effective among which population groups.

What was the integration aiming to achieve and who was intended to benefit?

A US National Institutes of Health State-of-the-Science Conference on the Prevention, Cessation and Control of Tobacco Use was conducted in 2006. As an integrative method, it aimed to synthesise research evidence and integrate the judgments of experts, to produce new knowledge or confirm existing knowledge in the light of new evidence, which would provide better understanding of the impediments to reducing smoking and tobacco-related health and social problems, and how to overcome these impediments.

As is standard with the NIH consensus conference and state-of-the-science conference methods, a small number of questions was identified for the panel to address:

- What are the effective population- and community-based interventions to prevent tobacco use in adolescents and young adults, including among diverse populations?

- What are the effective strategies for increasing consumer demand for and use of proven, individually oriented cessation treatments, including among diverse populations?
- What are the effective strategies for increasing the implementation of proven, population-level, tobacco-use cessation strategies, particularly by health care systems and communities?
- What is the effect of smokeless tobacco product marketing and use on population harm from tobacco use?
- What is the effectiveness of prevention and of cessation interventions in populations with co-occurring morbidities and risk behaviors?
- What research is needed to make the most progress and greatest public health gains nationally and internationally? (National Institutes of Health State-of-the-Science Panel 2006:839)

The intended beneficiaries included smokers and their families, and society at large, which was adversely impacted on by the monetary and social costs of tobacco use.

What was being integrated?

The panel's task was to judge and synthesise the existing data and research evidence to produce a clear statement of what was currently known in the first five of the areas listed above, and to identify which areas of new research were likely to have the greatest impact (question six). The background paper prepared for the panel by the US Agency for Healthcare Research and Quality (Ranney et al. 2006) was a systematic review that began with 1288 sources, demonstrating the breadth and depth of the research effort on tobacco to date. Just 102 of the initial sources met the review's inclusion criteria, particularly those addressing research quality.

How was the integration undertaken and who did the integration?

The integration was undertaken in two phases. The first was the development of a 421-page *Evidence Report* or systematic review of the scientific literature, undertaken by the US Agency for Healthcare Research and Quality. After confirming the findings of earlier reviews about intervention effectiveness, it concluded:

The evidence base has notable gaps and numerous study deficiencies. We found little information to address some of the issues that previous authoritative reviews had not covered, some information to substantiate earlier conclusions and recommendations from those reviews, and no evidence that would overturn any previous recommendations. (Ranney et al. 2006:v)

The second stage was the work of the panel itself. The NIH convened a 27-person steering committee for the conference, chaired by the chief of its Tobacco Control

Research Branch. While the majority of the steering committee members were on the staff of the NIH, others came from outside institutions, predominantly universities.

The conference was conducted over three days, 12–14 June 2006, in a conference centre at the NIH in Bethesda, Maryland, United States. Media publicity preceded the event: the public was invited to attend and arrangements were made for a live web-cast of the proceedings. Mark Clanton, Deputy Director of the National Cancer Institute, opened the conference and the charge to the panel was delivered by Barnett S. Kramer, Director of the Office of Medical Applications of Research in the Office of the Director of the NIH. The panel and conference were chaired by David F. Ransohoff, Professor of Medicine at the University of North Carolina at Chapel Hill. The panel had 14 members drawn from the disciplines and fields of cancer prevention, nursing, health research, special population groups and various medical specialties. All were independent of the NIH, were not directly involved in tobacco research or closely allied fields and had not adopted an advocacy role relating to tobacco before the conference.

During its first day-and-a-half, the conference was addressed by 18 speakers from various disciplines. Opportunity for discussion followed each group of presentations. On the afternoon of the second day, the panel met in a closed executive session to begin its integrative work, synthesising and judging what they had read and heard and producing a draft state-of-the-science statement. Their task was to integrate the research evidence coming to them from the various disciplines and perspectives of conference participants and to integrate their individual judgments of this evidence to produce a whole-of-panel consensus statement.

On the morning of the third and final day, the panel presented to the conference its draft statement, inviting comments from the floor as it went through it section by section. The panel then met in a second closed executive session to review the public comments it had received. On the afternoon of the third day, a media statement was issued and a media conference convened to begin the dissemination of the panel's findings. The draft statement was immediately posted on the Consensus Development Program's web site and the final statement, after further deliberation by the panel, was released some weeks later (these documents are available online at <<http://consensus.nih.gov/2006/2006TobaccoSOS029main.htm>>). As is standard practice for these conferences, the statement was subsequently published in the medical journal *Annals of Internal Medicine* (National Institutes of Health State-of-the-Science Panel 2006).

What was the outcome of the integration?

The huge amount of data and research evidence about interventions for the prevention, cessation and control of tobacco use was synthesised, through the conference process, enabling the panel to issue a state-of-the-science statement

on the topic. To achieve this product, the panel members had to gain a sound understanding of the evidence, synthesise the multiple types of evidence addressing each individual component of their remit and weigh the conflicting and qualitatively different types of evidence. Furthermore, although the panel was relatively large, with 14 members, its resulting statement represented their consensus position; no dissenting reports were included.

The final statement was brief—19 pages—and was structured around the six questions reproduced above. For each, it stated why the question was important and summarised ‘what we know’ and ‘what we need to know’. The statement concluded:

Tobacco use remains a very serious public health problem. Coordinated national strategies for tobacco prevention, cessation, and control are essential if the United States is to achieve the Healthy People 2010 goals. Most adult smokers want to quit, and effective interventions exist. However, only a small proportion of tobacco users try treatment. This gap represents a major national quality-of-care problem. Many cities and states have implemented effective policies to reduce tobacco use; public health and government leaders should learn from these experiences. Because smokeless tobacco use may increase in the United States, it will be increasingly important to understand net population harms related to use of smokeless tobacco. Prevention, especially among youth, and cessation are the cornerstones of strategies to reduce tobacco use. Tobacco use is a critical and chronic problem that requires close attention from health care providers, health care organizations, and research support organizations. (NIH 2006:2)

Commentary

The consensus development panel process developed and used regularly by the US NIH is a highly structured approach for integrating scientific research evidence emanating from different disciplines. At the core of the process is judging the evidence and reaching a consensus position that is then communicated to the health professions and the public in non-technical language.

It shares some features with citizens’ juries and the consensus conference, particularly in that experts and others present evidence to a panel, the members of which then synthesise and judge that information to reach a decision on the topic being explored. Where the NIH consensus development panel process differs, however, is that the panellists are not intended to be representative of the citizens of a community. Instead, they are selected on the basis of their advanced expertise in some area of health, as well as their independence from the sponsoring bodies and advocacy groups. They are not experts in the subject matter of the particular conference and have no financial or career advancement

investment in the topic covered. As the Consensus Development Program explains, their role is more like that of a judge than a subject-matter expert (<<http://consensus.nih.gov/FAQs.htm>>).

The example provided above shows close adherence to the standard approach. This reflects the management of the process, from inception to conclusion, by the staff of the NIH's Consensus Development Program.

As an integrative method, it is particularly valuable when a body of research evidence is available addressing a tightly defined topic, and where experts in the area feel that the evidence needs to be—and can be—drawn together and weighed by professionals to develop a shared understanding of what the evidence reveals and what future research can be undertaken to fill gaps in knowledge. The independence of the panellists and the significant efforts made to draw to the public's attention the conference process and the panel's findings are also significant features.

Origins and genealogy

The Office of Medical Applications of Research at the US NIH conducts the Consensus Development Program. Conferences have been conducted under the program since 1977, with at least one conference held each year since then. We are not aware of any documentation explaining how the program originated.

Further reading on consensus development panel

The NIH's Consensus Development Program's web site (<<http://consensus.nih.gov/>>) provides detailed information on the goals and implementation processes used by the consensus development panel. It also provides full documentation of completed conferences and information on those planned for the future.

Delphi technique

Description

The Delphi technique is 'a method for structuring a group communication process so that the process is effective in allowing a group of individuals, as a whole, to deal with a complex problem' (Linstone and Turoff 1975:3). Furthermore, it is 'a method for the systematic solicitation and collation of judgments on a particular topic through a set of carefully designed sequential questionnaires interspersed with summarized information and feedback of opinions derived from earlier responses' (Delbecq et al. 1975:10). It is used most frequently to integrate the judgments of a group of experts. A key feature of this technique, however, is that the respondents do not meet and their responses may be anonymous. We still consider it to be a dialogue method, however, because 'conversation' between the parties occurs, even though it is not face-to-face.

Three separate groups of actors are generally involved:

1. Respondent group: those whose judgments are obtained through completing the process
2. Staff group: those who design the initial questions, summarise the responses and prepare the questions for subsequent phases
3. Decision-makers: those wishing to receive a product such as a consensus position from experts, or a recommendation (adapted from Delbecq et al. 1975).

Although some flexibility exists in implementation, the core method, as described by Delbecq et al. (1975:11), is as follows:

First, the staff team in collaboration with decision makers develops an initial questionnaire and distributes it...to the respondent group. The respondents independently generate their ideas in answer to the first questionnaire and return it. The staff team then summarizes the responses to the first questionnaire and develops a feedback report along with the second set of questionnaires for the respondent group. Having received the feedback report, the respondents independently evaluate earlier responses. Respondents are asked to independently vote on priority ideas included in the second questionnaire and mail their responses back to the staff team. The staff team then develops a final summary and feedback report to the respondent group and decision makers.

Variations of this basic approach include:

- whether the respondent group is anonymous
- whether open-ended or structured questions are used to obtain information from the respondent group

- whether the responses are collected in written form or verbally—for example, over the phone
- how many iterations of questionnaires and feedback reports are used
- what decision rules are used to aggregate the judgments of the respondent group.

The number of participants can range from a few to many hundreds. The larger the number of iterations employed, the closer to consensus will be the result. Written questionnaires can be in pencil-and-paper form or distributed and returned using electronic communication tools including email and the internet. Computer-based systems, using highly structured questionnaires, can produce real-time findings.

Examples of its use in research integration

1. The environment: developing an environmental plan for a university

What was the context for the integration, what was the integration aiming to achieve and who was intended to benefit?

Senior administrators at Dalhousie University in Halifax, Nova Scotia, Canada, were aware of a significant gap between the university's environmental policies and their implementation. As a result, they resolved to develop an implementation plan that would be acceptable to all those who would be responsible for making it work.

Those responsible for developing the implementation plan used the Delphi technique

to consult with key representatives of the university community in order to generate ideas about the most desirable and feasible ways in which to incorporate the new Environmental Policy into the activities and structure of the university...Modifying a Delphi study for policy research can be used to generate ideas and provide decision-makers with the strongest arguments for and against different resolutions to an issue. (Wright 2006:763)

Who did the integration, how was it undertaken and what was integrated?

A panel of 28 individuals was selected, with equal numbers drawn from the identified key stakeholders: 'students, staff, faculty, and administrators.' A core feature was that the Delphi study participants would be anonymous to one another, as the Delphi technique was implemented by email between the panellists and the project managers, rather than through face-to-face discussion. This was considered important as it gave equal weight to each panellist's judgments, avoiding problems that the power imbalances among the panellists

(for example, between students and faculty) might otherwise create. No information was provided on what was integrated.

The Delphi questionnaires were distributed and responses received by email. Round one was the open-ended question: 'After reading the Environmental Policy, what recommendations do you have to incorporate it into the activities and structure of Dalhousie University?' A master list of 125 suggestions was developed from the responses. In round two, the participants were asked to review the master list from round one and rate each item for desirability and feasibility (separately) on a five-point Likert scale. The responses to the second round were analysed statistically for measures of central tendency and dispersion. The items were categorised as those that received consensus: a) for being desirable and feasible; b) for being desirable but not feasible; or c) rated as either not desirable or unsure. Each participant received a personalised questionnaire in round three, listing that person's ratings in round two, along with the group responses. They were asked to reconsider their ratings and make any changes. In round three, the majority of participants modified two to five of their round two ratings.

What was the outcome of the integration?

The results of the Delphi technique study were used by the university managers as a key input to developing the Environmental Policy Implementation Plan. The features that made the Delphi technique useful were identified as anonymity, encouraging exploratory thought and developing innovative ideas, achieving consensus, serving as an educative tool about environmental issues and being a tool for empowerment (Wright 2006).

2. Public health: estimating the incidence of *Salmonella* poisoning

What was the context for the integration?

Despite food poisoning through food-borne *Salmonella* infection being an important public health problem, in the United Kingdom in the mid 1990s, official statistics were not able to provide an accurate estimate of the incidence of infections. It was agreed that the official data significantly underestimated the true incidence, but experts' views differed about the level of underreporting.

What was the integration aiming to achieve and who was intended to benefit?

The Delphi technique was used by Henson (1997:197) to: a) 'reconcile differences in expert opinion and provide more reliable estimates of the incidence of food-borne *Salmonella*'; and b) to identify expert opinion about the effectiveness of the available measures for control of the infection. This dialogue method was chosen because it was, in the view of the person who implemented the study,

a recognised technique for reconciling differences in group judgements where there is inherent uncertainty as to the actual state of the world.

In this case, the group consists of experts on food-borne *Salmonella* in the UK. The aim is to generate data which may overcome acknowledged problems with published statistics. (Henson 1997:196)

Who did the integration, how was it undertaken and what was integrated?

The Delphi study was initiated by conducting a workshop in which seven experts in food-borne *Salmonella* infection examined the issues to be covered in the survey. They did so using the nominal group technique, discussed below. The workshop identified the precise wording to be used in the Delphi study questions.

Some 62 experts (their areas of expertise were not specified) in food-borne *Salmonella* infection, identified by workshop participants, were then invited to be part of the Delphi study, and 42 of them agreed to do so. Five Delphi rounds were conducted during a seven-month period, with three exploring the experts' judgments of the incidence of infection and all of them exploring the effectiveness of control measures. This was done by means of questionnaires, but further details were not given.

The first question was: 'What would you estimate to be the total number of persons ill due to infection with non-typhoid *Salmonella* in the UK from all sources (food and non-food), over the course of one year?' The second asked what proportion of infections participants thought was food-borne and the third invited them to identify the proportion of cases by type of food. For each question, they were asked to advise how they produced their estimates and any difficulties they encountered in doing so. The results of the first and second rounds were fed back to participants, showing them the median, minimum and maximum responses from the whole panel and inviting them to revise their estimates of incidence.

In round one, participants were also asked to list the control strategies available for reducing the incidence of food-borne *Salmonella* infection. In round two, they were asked to refine the list and in round three the refined list was presented along with the question, 'Taking each control strategy in turn, consider how effective it would be at reducing the total incidence of food-borne non-typhi *Salmonella* in the UK?' This question was repeated in the fourth and fifth rounds, with the findings of the previous round fed back to participants.

What was the outcome of the integration?

An important outcome of the process was the narrowing of the range of estimates for the incidence of infection, as participants reflected on the median and range of responses to the incidence questions. Regarding the effectiveness of control measures, one approach (food irradiation) was identified by the panel as being particularly effective. Considerable disagreement remained, however, about which other measures were effective, even after three rounds considering this

question. The author concludes that this is not really problematic as the Delphi study 'provides a good summary measure of expert opinion in an area which is characterised by great uncertainty' and 'the spread of responses provides a good indication of the range within which we can expect to find the actual state of the world' (Henson 1997:203).

3. Security: developing a new medical school curriculum addressing bio-terrorism

What was the context for the integration?

Since the 11 September 2001 attacks on the New York World Trade Centre and the Pentagon in the United States, responding to the medical sequelae of bio-terrorism and biological warfare incidents is no longer considered solely the province of emergency medicine specialists. Rather, it is seen as something that all healthcare providers need to be prepared to handle.

What was the integration aiming to achieve and who was intended to benefit?

Medical educators in the United States set out to develop new medical school curriculum guidelines relating to bio-terrorism so as to equip the next generation of medical graduates to be able to respond to this threat. They used an internet-based Delphi survey to identify the educational objectives to be covered by the curriculum guidelines (Coico et al. 2004).

The Delphi technique was chosen for this purpose because, in the views of those who wished to develop the new curriculum guidelines, it 'can provide a relatively rapid means of gaining a consensus on complex issues' (Coico et al. 2004:367).

What was being integrated?

This consensus came through the integration of the judgments of a group of experts in microbiology and immunology, who were engaged in medical education in US universities. Some 89 per cent of panellists had PhD degrees, 7 per cent were physicians and 77 per cent were involved in medical curriculum development. Two-thirds rated their expertise concerning bio-terrorism, biological warfare and bio-defence as 'strong' or 'moderate'.

Who did the integration and how was it undertaken?

A total of 237 people were invited, by email, to join the Delphi panel and 64 (25 per cent) participated in one or more rounds. The Delphi process comprised three internet-based rounds using 'a dynamic Web-based questionnaire' (Coico et al. 2004:367). The responses were captured from the web server onto spreadsheets. Before the first round, participants provided demographic information including self-assessment of their expertise in bio-terrorism.

Previous workshop discussions had produced a list of six content-related curriculum categories for bio-terrorism teaching and learning: general issues,

bio-defence, public health, infection control, infectious diseases and 'weaponizable toxins' (Coico et al. 2004:368). These were put to the participants in the first Delphi round, and they were asked to add knowledge, skills and attitude objectives to the list of educational objectives. They were also asked for suggestions about any content areas that seemed irrelevant to the project. In round two, the responses to round one were fed back to participants and they were asked to assess, for three identified levels of medical training, the relative importance of each objective. The results of round two were fed back to the panel in round three in the form of percentage endorsed figures, and they were asked to identify their top five curriculum objectives in each category. They were also asked to rate the usefulness of nine different methods of teaching/learning and assessment of bio-terrorism and bio-defence topics.

The products of round two were also passed to an independent expert committee to obtain their views. This separate, independent committee had members who were experts from other professions and disciplines concerned with the issues being addressed by the panel. Its function was to receive the panel's findings and consider their implications.

What was the outcome of the integration?

Although the authors of the paper reporting on this project stated that they would have benefited from a higher participation rate, they felt that the Delphi technique 'provided an opportunity to explore bioterrorism-related curriculum issues in depth' (Coico et al. 2004:372). The outcome was the inclusion, in the US Medical Licensing Examination, of approximately one-third of the educational objectives identified through the Delphi study.

4. Technological innovation: developing professional association policies and practices for shifting from paper to electronic communications

What was the context for the integration?

The Institute of Electrical and Electronics Engineers (IEEE) describes itself as the world's leading professional association for the advancement of technology, and the largest, with more than 365 000 members in more than 150 nations (<<http://www.ieee.org/web/aboutus/home/index.html>>). In the late 1990s, it identified the need to establish policies and procedures governing its transition from hard copy to electronic communication and dissemination of information within the institute and beyond it. Indeed, in 1996, it adopted the slogan 'IEEE: networking the world'.

What was the integration aiming to achieve and who was intended to benefit?

The institute used the Delphi method to assess the benefits of and obstacles to its transition to electronic communications. It saw this method as a

technique that is considered appropriate when the research purpose is to glean and synthesize expert opinion about complex issues and to identify recommendations for addressing them. The technique is frequently used in exploratory research and in efforts aimed at technological forecasting, including technological trajectories and the impacts of technological change...Use of the method in this research project has allowed the researchers an opportunity to pool a wide range of expert opinion in order to arrive at a series of focused predictions that may guide the IEEE's approach during this significant transition period. (Herkert and Nielsen 1998:80)

Who did the integration, how was it undertaken and what was integrated?

A pool of institute members—the exact number was not reported—was identified by the project managers and invited to participate in the study. They came from five areas: institute leadership and staff, institute technical activities representatives, institute regional activities representatives, customers and 'informed others'. Forty agreed to participate in the study and 30 provided demographic information and responded to round one. (It is not clear if the Delphi questionnaires were distributed and returned electronically or in 'pen-and-paper' format.) In round one, participants were asked to assess:

1. the potential contribution of electronic communication and information dissemination in fulfilling the institute's strategic planning goals and objectives that did not rely explicitly on the use of electronic media
2. the impact of electronic communication and information dissemination with respect to the five strategic planning goals and objectives that relied explicitly on the use of electronic media.

They were also invited to provide open-ended commentary on the benefits of and obstacles to the use of electronic media (Herkert and Nielsen 1998:82–4). A round one example question was:

Products and Services Objective: Make all IEEE information products and databases of value to members available in electronic form as quickly as possible.

I agree; making products and databases available in electronic form as quickly as possible is a valuable objective.

I disagree; making products and databases available in electronic form as quickly as possible is not a valuable objective.

Discuss your answer in the space provided below.

In round two, the panellists were given a synthesis of the obstacles to the Institute's increasing reliance on electronic communication derived from round one and were asked to identify the 10 obstacles that each respondent considered most problematic. In round three, they were provided with a list of the 11 major obstacles identified in round two and asked what actions the Institute should take to benefit maximally from electronic communications while avoiding its potential pitfalls. Content analysis was conducted on the responses to round three to identify the path forward.

What was the outcome of the integration?

This application of the Delphi technique resulted in the IEEE identifying six key factors affecting the adoption and use of electronic media:

1. characteristics of the IEEE as technology initiator;
2. characteristics of the potential individual adopter;
3. characteristics of the potential organizational adopter;
4. characteristics of the technology;
5. outcomes, and
6. characteristics of the contextual environment. (Herkert and Nielsen 1998:95–6)

This finding, combined with a content analysis of the panellists' qualitative responses, enabled the investigators to develop a range of recommendations for consideration by the executives of the Institute to guide it in embracing electronic communication methods.

Commentary

The Delphi technique is generally implemented by means of pen-and-paper, email or web-based questionnaires, or by one-on-one interviewer–interviewee questionnaires. This means that it does not entail face-to-face dialogue. Instead, a 'conversation' occurs by means of responding to the questionnaires and sharing all the participants' responses, one with another. What are missing are the additional communication cues—verbal and non-verbal—that occur in face-to-face dialogue. Here, the focus is on the contents of the message, the real wording, rather than the other features that constitute human communication. Nonetheless, we classify it as a dialogue method in that the iterations in the process have features similar to two-way communication in the face-to-face situation.

All four case examples applied the Delphi technique reasonably closely to the 'ideal type'. The number of iterations used varied, with three of the examples utilising three rounds and another (the public health example) five rounds—an unusually large number. This also demonstrates how it can be implemented flexibly, depending on the topic, the participants, resource considerations, and so on.

Most commonly, the method is used with a group of peers: experts with relatively equal status, a more-or-less common knowledge base and a shared epistemology. This was the case with the public health and security examples, all the participants in which were experts. In contrast, the first example illustrated the participation of three stakeholder groups, none of which was particularly expert on the topic. The fourth example demonstrates the method's use among a fairly diverse range of participants.

As a method of research integration, it is especially useful for complex problems about which uncertainty exists and for which expert judgment is needed to deal with this uncertainty. The problems are typically multifaceted and demand insights derived from different types of knowledge, experience and information. This means that the problem being addressed needs to be tightly defined and the questionnaires must deal explicitly with boundary issues. It is a highly task-oriented process, seeking answers to a tightly defined problem.

As the examples illustrate, the method is highly adaptable in terms of its contents. We are aware of at least one example of the method being given a title that reflects the contents being judged—namely, the 'Ethical Delphi' (Millar et al. 2006, 2007). This is not so much a methodological variant as the application of the standard Delphi technique to a particular content area—in this case, concerns about ethics and values.

This method, unlike those discussed above, relies very much on the people (the research integrators) who manage the process to make the syntheses and judgments. They develop the questions, score the responses and identify the conclusions, their validity and reliability and their utility. This allows for strong focus on the task (in contrast to unfacilitated face-to-face group processes where the focus can be readily diverted).

Origins and genealogy

The Delphi technique had its origins in the early 1950s' Cold War between the United States and the Soviet Union, when the RAND Corporation was commissioned by the US Department of Defence 'to apply expert opinion to the selection, from the point of view of a Soviet strategic planner, of an optimal US industrial target system and to the estimation of the number of A-bombs required to reduce the munitions output by a prescribed amount' (Dalkey and Helmer

1963:458). Its title refers to the Delphic Oracle, reflecting the fact that it was originally used as a forecasting technique with respect to science and technology.

Since then, the Delphi technique has been used many thousands of times in diverse sectors addressing a huge array of questions. Although the originators did not situate it (in their 1963 paper) in any particular body of theory, subsequent scholars have attempted to do so. A wide range of traditions in Western philosophy has been invoked in this context, with one schema, presented by Mitroff and Turoff (1975), demonstrating that the method can be understood through the Lockean Inquiring System (the basis of much empirical science), the Leibnizian Inquiring System (the basis of much theoretical science), the Kantian Inquiring System (which combines both of these approaches) and the Singerian-Churchman Inquiring System.

Scholars have concluded that there is no single school of philosophy that best captures the theory underlying the Delphi technique (Mitroff and Turoff 1975).

Further reading on the Delphi technique

Adler, M. and Ziglio, E. (eds) 1996, *Gazing Into the Oracle: The Delphi method and its application to social policy and public health*, Jessica Kingsley Publishers, London.

Delbecq, A. L., Gustafson, D. H. and Van de Ven, A. H. 1975, *Group Techniques for Program Planning: A guide to nominal group and Delphi processes*, Management Application Series, Scott, Foresman, Glenview, Ill.

Linstone, H. A. and Turoff, M. (eds) 1975, *The Delphi Method: Techniques and applications*, Addison-Wesley Publishing Company Advanced Book Program, Reading, Mass.

Future search conference

Description

Future search conferences (and the related search conferences) have been conducted in various parts of the world since the late 1950s. They are large-group planning conferences, using face-to-face dialogue to develop plans, including the identification of action steps. They begin with a focus on visions and use these to guide the proposals for action.

The implementation methods vary. Some proponents of this technique argue for limiting the number of future search conference participants to about 60–80, all meeting in one room and in active dialogue, on the grounds that more than this number means that productive dialogue is not feasible. Others are comfortable with far more participants. In these instances, participants are broken up into smaller groups and meet in separate break-out rooms, coming together for plenary sessions at which experts provide inputs. At the plenary session reporters for the smaller groups also provide feedback to the other participants. The tasks of the conferences are expressed as ‘The future of...’.

The Future Search Network has documented a number of conditions for the success of future search conferences. They include:

- getting the ‘whole system’ in the room; invite a significant cross-section of all parties with a stake in the outcomes of the conference
- exploring the ‘whole elephant’ before seeking to fix any part; get everyone talking about the same world; explore the global context before focusing on local issues
- emphasising common ground and future focuses, while treating problems and conflicts as information, not action items
- encouraging self-management and responsibility for action by participants before, during and after the conference (adapted from material at <<http://www.futuresearch.net/>>).

The Future Search Network provides an example of a typical three-day future search conference, with the following stages identified. The network recommends a three-day schedule, as the two intervening nights provide time for participants to process or reflect on the events of the day.

Day 1, afternoon. *Focus on the past:* people make timelines of key events in the world, their own lives and in the history of the future search topic. Small groups tell stories about each timeline and the implications of their stories for the work they have come to do.

Focus on present, external trends: the whole group makes a ‘mind map’ of trends affecting them now and identifies the trends that are most important for their topic.

Day 2, morning. *Focus on present, external trends (continued):* stakeholder groups describe what they are doing now about key trends and what they want to do in the future.

Focus on the present: stakeholder groups report what they are proud of and sorry about in the way they are dealing with the future search topic.

Day 2, afternoon. *Ideal future scenarios:* small groups put themselves into the future and describe their visions—their preferred future—as if it has already been attained.

Identify common ground: small groups post themes they believe represent common ground for everyone.

Day 3, morning and early afternoon. *Confirm common ground:* the whole group meets to agree on common ground, integrating the diverse visions for the future elicited in the previous stages.

Action planning: volunteers sign up to implement action plans.

Future search conferences have been conducted in many different sectors, including commerce and industry, local communities, religious communities, schools and higher education, the environment, government, health care and human services. A recent example was the 'Bendigo+25 Future Search Conference', at which 'community members gathered to consider what kind of place Greater Bendigo would be in 2030. They worked together to develop a shared vision, values and key future directions' (City of Greater Bendigo n.d.).

Future search conferences are particularly useful in situations of rapid change (for example, changes in knowledge, society, technology, the environment) where various stakeholders can be expected to make different judgments about the implications of change for the future. Indeed, the first future search conference, held under the auspices of the Tavistock Institute (London) in 1959, provided an opportunity for two aircraft manufacturing companies that were merging to create Bristol-Siddley to integrate the different knowledge, technologies, practices and perceptions of the future held by the staff and managers of the two companies. The result was a new type of aircraft engine—one that is still in use today.

Because of its focus on the future, the future search conference has a strong emphasis on vision as part of the overall judgment. It helps clarify the visions of researchers and stakeholders and can draw them together into a shared vision for the future.

Example of its use in research integration

Public health: reducing the human and economic burden of Repetitive Strain Injury (RSI)

What was the context for the integration?

In the early 1990s, repetitive strain injury (RSI) was an important public health issue in many nations. It was characterised by an uncertain and ambiguous nature, the area was conflict ridden and many interconnected individual, organisational and societal phenomena were involved (Polanyi 2001).

What was the integration aiming to achieve and who was intended to benefit?

Polanyi's involvement in the field in Canada led him to conclude that

the need [existed] for various stakeholders involved with RSI to meet in a nonadversarial setting in order to communicate effectively and safely with one another. There was a feeling that there exists unnecessary conflict and division between groups, which could be overcome by effective dialogue and increased collaboration. Future Search seemed to provide an inclusive forum that could stimulate dialogue among researchers, policy makers, practitioners, and injured workers to build the innovation and collaboration needed to better prevent and treat these injuries. (Polanyi 2001:468)

The specific aim of the conference, as articulated by the design team and consultants (see below), was '[t]o stimulate collaborative action to reduce the human and economic burden of upper limb musculoskeletal disorders'.

What was being integrated?

Stakeholder groups were identified (designers and engineers, employers, ergonomists, healthcare providers, health and safety professionals, government officials, injured workers and their advocates, labour representatives, researchers and the media, the provincial compensation board and private insurers). Lists of individuals to be invited were developed from within each stakeholder group with the aim of maximising the diversity of conference participants. It was the judgments of these diverse groups of participants that were being integrated.

Who did the integration and how was it undertaken?

A team comprising a range of stakeholders was established to design the future search conference and it was funded primarily by the (Ontario) Institute for Work and Health. It engaged two consultants experienced in implementing this intervention to have carriage of the project.

The conference had 56 participants and was held over three days in May 1998 following the standard, staged approach advocated by Weisbord and Janoff (2000):

- reviewing the past
- assessing the present
- developing future scenarios (shared visions)
- reality checking and action planning.

What was the outcome of the integration?

The future search conference was evaluated systematically (Polanyi 2001) using the grounded theory method of Corbin and Strauss (2008). (As is commonplace with the evaluation of the application of dialogue methods, the research integration processes and outcomes of the conference were not evaluated.) The evaluation revealed a high level of participant satisfaction with its process and outcomes. The conference succeeded well in building common ground between the participants, with agreement that

(a) RSI is a 'real' concern for many and is having a serious impact both on people's lives and on economic costs, (b) RSI is complex and caused by several factors including individual behavior and conditions in the workplace, (c) all stakeholders need to work together to prevent and treat RSI through a systematic approach, and (d) further research is needed to identify and disseminate best prevention practices and treatments. (Polanyi 2001:473)

There was also agreement that action was needed on a number of fronts, including:

(a) the identification and transfer of best practices in prevention, diagnosis, and treatment, and the establishment of the economic benefits of taking action to prevent RSI; (b) raising awareness through education and training based on what is known about the nature, scope, and effects of RSI; (c) promotion of a multistakeholder process through which all parties have input into solutions and accept shared responsibility for the problem, and (d) the provision of appropriate incentives for action, although this meant very different things for different people (Polanyi 2001, p. 473)

It was not possible, however, to reach common ground on all the issues. Four remained unresolved:

- which approach is needed: legislated standards or voluntary action?;
- do we know enough to act?;
- the relationships between productivity and worker health, and
- the right to pain-free work (Polanyi 2001).

The conference agreed on a range of actions to be taken and a follow-up conference was held to review the implementation and outcomes of the actions agreed on.

The establishment of common ground and a degree of shared visions for the future, and the preparation of actions plans that involved multi-stakeholder collaborations, were seen by many participants to be key achievements of the conference.

Commentary

This method contrasts with some of the others discussed in that the conferences are frequently very large, sometimes including hundreds of participants. This provides scope for great diversity, including significant opportunities for researchers' inputs to the process and shaping its outcomes. In the example provided—concerned with finding a shared approach to RSI in Canada—researchers were among the 56 conference participants providing an opportunity for research insights and products to be integrated with the inputs from other participants. This research-based knowledge came from a number of disciplines and was integrated with the knowledge, perspectives and visions of other stakeholders, including people adversely affected by RSI.

Unlike some other dialogue approaches, future search conferences focus explicitly on developing action plans for implementation after the conference concludes, action plans that reflect the shared understandings, visions and common ground established in the conference itself.

The method has been used in diverse settings. In terms of research integration specifically, one can envisage it being used in research institutions where disciplinary barriers need to be addressed to produce an integrated approach to a program of research, based on a set of agreed goals and action plans.

Origins and genealogy

Eric Trist and Fred Emery developed the search conference approach (the predecessor of the future search conference) at the Tavistock Institute in 1959. Others have subsequently modified the initial model, with Marvin Weisbord and Sandra Janoff particularly prominent in recent decades as developers and proponents of future search conferences. Bryson and Anderson (2000) and Oels (2002) explore the similarities and differences between search conferences and future search conferences. They include the selection of participants, with search conferences limiting participants to people with the capacity to implement action plans rather than the broad cross-section of stakeholders in future search conferences; grouping, with large groups dominating search conferences and a mix of small and large groups in future search conferences; and the methods of handling conflicts, with time spent discussing and clarifying differences in

search conferences, whereas in future search conferences any disagreements are acknowledged but not discussed further.

Further reading on future search conference and search conference

Emery, M. and Purser, R. E. 1996, *The Search Conference: A powerful method for planning organizational change and community action*, Jossey-Bass Public Administration Series, Jossey-Bass, San Francisco, Calif.

Future Search Network 2003, *Future Search Network*,
<<http://www.futuresearch.net/>>

Weisbord, M. R. (ed.) 1992, *Discovering Common Ground: How future search conferences bring people together to achieve breakthrough innovation, empowerment, shared vision, and collaborative action*, Berrett-Koehler, San Francisco.

Weisbord, M. R. and Janoff, S. 2000, *Future Search: An action guide to finding common ground in organizations and communities*, Second edition, Berrett-Koehler, San Francisco.

Most significant change technique

Description

The most significant change (MSC) technique is a relatively new dialogue method for monitoring and evaluating complex interventions. Its main focus is on program improvement. It contributes to organisational change and targeting of services/activities towards the attainment of valued outcomes. It is highly participatory and has at its core the generation, analysis and use of stories. The technique is also known as ‘monitoring without indicators’ and ‘the story approach’.

Its main purpose is

to facilitate program improvement by focusing the direction of work towards explicitly valued directions and away from less valued directions. MSC can also make a contribution to summative evaluation through both its process and its outputs. The technique involves a form of continuous values inquiry whereby designated groups of stakeholders search for significant program outcomes and then deliberate on the value of these outcomes in a systematic and transparent manner. (Dart and Davies 2003:137)

The most significant change technique involves 10 steps (six or seven in earlier descriptions):

1. Starting and raising interest
2. Defining the domains of change
3. Defining the reporting period
4. Collecting significant change stories
5. Selecting the most significant of the stories
6. Feeding back the results of the selection process
7. Verification of stories
8. Quantification
9. Secondary analysis and meta-monitoring
10. Revising the system (Davies and Dart 2005).

A small number (three to five) of loosely defined domains within which the stories are located are selected—for example, ‘changes in the quality of life of the people affected by the program’. Stories are then generated by various stakeholders close to program implementation and knowledgeable about its outcomes within each domain using the question ‘During the last month, in your opinion, what was the most significant change that took place in the program?’. In one application to rural extension in Australia (Dart and Davies 2003), this was expanded by asking ‘What happened?’, ‘Why do you think this is a significant change?’ and ‘What difference has it made/will it make in the future?’.

The respondents—the producers of the stories—allocate their stories to a domain. It is useful to include as one of the domains ‘lessons learned’ as this tends to reduce the bias towards stories illustrating positive outcomes of the program. The stories are typically one to two pages in length.

Those managing the most significant change process and the program managers closest to the program implementation level (these may be the same people) then select the most significant of the stories and pass them up the organisational hierarchy. At each level, they are read, discussed and the most significant are selected. Feedback is given to the lower levels, particularly as to the reasons why individual stories have been accepted for passing up, or set aside. The process reduces a large number of stories considered important at the local level to a smaller set that are most important at a higher level within the organisation. The refined set is discussed by senior management or funding bodies and taken into account in subsequent strategy development.

Various techniques exist for verifying the stories and attaching quantitative indicators to them in situations where this is feasible and useful.

As a method for research integration, the most significant change technique can be applied to monitor and evaluate research integration in a wide variety of complex interventions, particularly when information on outcomes and the value base of the interventions are important. It has been pointed out that

The types of programs that are not adequately catered for by orthodox approaches and [which] can gain considerable value from MSC include programs that are:

- complex and produce diverse and emergent outcomes
- large with numerous organisational layers
- focused on social change
- participatory in ethos
- designed with repeated contact between field staff and participants
- struggling with conventional monitoring systems
- highly customised services to a small number of beneficiaries. (Davies and Dart 2005:12–13)

It is not as useful in situations in which the implementation processes and outcomes are straightforward and the causal paths connecting inputs and outcomes are clear. In these circumstances, more traditional quantitative indicators are often adequate.

One of the developers of the most significant change technique explains that ‘MSC can be conceived as a form of dynamic values inquiry whereby designated groups of stakeholders continuously search for significant program outcomes and then deliberate on the value of these outcomes. This process contributes to both program improvement and judgment’ (Dart and Davies 2003:140).

The most significant change technique is also useful at the following interfaces:

- research and policy—for example, assisting senior decision makers to understand their programs' outcomes and the values they reflect
- research and professional practice—for example, assisting professionals responsible for designing and implementing complex interventions to understand how they have been implemented and with what outcomes
- research and those affected by the research—for example, providing people's own descriptions and analyses of program implementation, outcomes and attribution of causality.

The most significant change technique is a useful dialogue technique when integration is desired across powerful and weak players—for example, high-level program managers or program funders, on the one hand, and field staff and people intended to be program beneficiaries, on the other.

Example of its use in research integration

Natural resource management: evaluating a multifaceted rural dairy extension project in Australia

What was the context for the integration, what was the integration aiming to achieve and who was intended to benefit?

Target 10 is an extension dairy project that operates in Victoria under the aegis of the Department of Natural Resources and Environment (<<http://dairyextension.com.au/>>). Target 10 has been operating since 1992 and has diverse stakeholders, including farmers, university researchers, government extension officers and industry groups. In the late 1990s, the key stakeholders used the most significant change technique as a component of the project's evaluation (Dart and Davies 2003).

Who did the integration and how was it undertaken?

The most significant change technique was applied in six steps:

1. pilot testing and familiarisation with the process
2. establishing the domains of change
3. establishing a reference group
4. establishing a method to collect and review the significant change stories
5. holding an annual round-table meeting for funders and others to review the stories
6. conducting a secondary analysis of all the stories generated by the project.

A simple form was developed to assist farmers and extension officers, in particular, to develop the stories. The Delphi technique was used with some 150 program stakeholders to develop the domains of change—namely, changes in on-farm practice, changes in profitability or productivity, changes in farmer

decision-making skills and any other significant types of change. After the establishment of a reference group, the staff and others involved through program committees were asked to write stories on the forms provided for that purpose. Few were forthcoming so stories were also captured from verbal presentations at meetings and transcribed onto the forms.

Each regional committee reviewed the stories coming from the field and selected one from each of the four domains for consideration at the regular two-monthly or three-monthly state-level meetings. In addition, they documented why they had chosen those stories. The selection process involved the stories submitted being read out at regional meetings and voted on by the participants as to their usefulness. Since a great diversity of views occurred about which were most useful, the stories were discussed in detail with the aim of attaining group consensus, particularly about the value of the outcomes described.

There was a 12-month process of developing and discussing the stories: extension staff and other program people discussed with farmers their most significant change experiences and documented them, the regional committees discussed and selected the best stories and this process was repeated at the state level.

What was the outcome of the integration?

At the final stage, the funders and other key participants in the program met to share their reactions to the 24 stories that had filtered up to them from the regions. Those discussions revealed great diversity in key stakeholders' reactions to the stories: the process demonstrated that they did not have a shared vision as to what Target 10 was intended to achieve for the dairy farmers or the dairy industry more broadly. After discussion, they were able to agree on one story that portrayed the types of outcomes that they all wished to see from the program and were happy about funding. This story was about a dairy farmer who attended a series of Target 10 courses, implemented what had been learned and, as a result, markedly increased the efficiency of use of farm inputs and gained confidence to move to managing a larger dairy farm.

What was being integrated?

At one level, the experiences of a diverse range of dairy farmers were being integrated. This occurred through them, and the extension officers who worked closely with them, documenting their stories and sharing them with their peers and people higher in the Target 10 hierarchy. More significantly, however, was the integrative work that occurred through discussing and judging the stories in terms of what they revealed about the most valuable outcomes of the program. This was a process of integration that occurred step by step at different levels in the program, until the winnowing process enabled the top level of managers to integrate their judgments to identify a single narrative that best captured the program's intended outcomes.

This method integrated the experiences, and judgments of them, of a diverse range of dairy farmers. In this case, it was also instructive to examine how the method synthesised some of the key components of those judgments—namely, visions, values and interests.

The process revealed, at the regional and state levels, that the various stakeholders—including at the middle-management level and the top-level funding bodies—had widely diverging visions as to what Target 10 was established to achieve. They differed in the values they placed on the various program outcomes, and this had implications for the whole program's direction. Through intense discussion of the stories, and voting on them, their separate visions as to what the program should attain were revealed, compared and tested. The process, grounded in the real-life stories of what people in the program considered to be the most significant changes, assisted the key stakeholders to examine their individual visions and their perceptions of what outcomes were most valued to produce a common, integrated vision for the program as a whole. Agreeing on the one particular story that encapsulated their shared perceptions was an important step.

Interests were also integrated through this application of the most significant change technique. The key stakeholders—funders, senior officers of the agriculture department, scientists and other university-based people—brought different interests to Target 10. The dialogue process of examining the stories of change helped make these interests explicit: able to be examined, compared, contrasted and weighed. The result was the attainment of a degree of consensus on desired program outcomes—in other words, a movement towards accommodating differing interests.

Commentary

The core of this dialogue method is tapping the experiences and judgments of people involved at different levels of an intervention, with respect to its outcomes. The method seeks to identify the most significant changes that have occurred and to provide information on what are seen as the causal pathways that have produced the outcomes. In this manner, it integrates the evaluative judgments of various players, along with the underlying interests and values that feed into these judgments.

It applies democratic principles by giving voice to program participants at all levels, and providing feedback from the senior levels to lower levels about the program outcomes judged to be most worthy or desirable.

Our example of its use in the Target 10 dairy industry extension project illustrates researchers as one group of participants interacting through dialogue with others (for example, government funding body representatives, dairy farmers themselves, extension officers, and so on). It can operate, then, at a variety of

interfaces between researchers and others, eliciting and judging the different perspectives of the various players.

While this is a strength as a component of a program evaluation, other evaluation techniques—not necessarily dialogic in nature—are also needed. These sometimes include quantitative performance indicators to supplement the most significant change technique’s narrative approach, and the use of the most significant change stories (along with other information sources) to develop the program logic. On the other hand, a strength of the method is that it can provide usable performance information in the absence of quantitative performance measures. This is particularly useful in complex, rapidly changing situations where the implementation of the intervention gives rise to emergent properties.

The Target 10 example is another illustration of how dialogue methods can be combined. In this case, the organisers used the Delphi technique with some 150 program stakeholders to clarify the domains of the program of change that would be explored in the most significant change project.

Origins and genealogy

The most significant change technique was initially developed by Dr Rick Davies to contribute to the evaluation of a multifaceted social development project on Bangladesh (Davies 1996). It was developed further by Davies and Dr Jessica Dart (<www.clearhorizon.com.au/>). Dr Dart has applied the technique in a number of situations in Australia.

The method has its origins in evolutionary epistemology, ‘a branch of epistemology that applies the concepts of biological evolution to the growth of human knowledge’ (Wikipedia Contributors 2009). As Davies and Dart (2005:73) explain:

[I]n cultural evolution, the meaning of a given event...may be interpreted in a variety of ways by people. Some of those interpretations may have a better fit with the world view of the people concerned, and thus become more prevalent than other views held in the past. Within this newly dominant view, further variations of interpretations may emerge, and so on.

The MSC process...was an attempt to design a structured social process that embodied the three elements of the evolutionary algorithm: variation, selection and retention, reiterated through time.

Further reading on the most significant change technique

Dart, J. and Davies, R. 2003, ‘A dialogical, story-based evaluation tool: the most significant change technique’, *American Journal of Evaluation*, vol. 24, no. 2, pp. 137–55.

Davies, R. 1996, *An Evolutionary Approach to Facilitating Organisational Learning: An experiment by the Christian Commission for Development in Bangladesh*, Centre for Development Studies, Swansea, Wales.

Davies, R. and Dart, J. 2005, *The Most Significant Change (MSC) Technique: A guide to its use*, Rick Davies and Jess Dart, Trumpington, Cambridge, United Kingdom, and Hastings, Victoria, Australia.

Clear Horizon, <<http://www.clearhorizon.com.au/site/index.htm>>

Most significant changes,
<<http://groups.yahoo.com/group/MostSignificantChanges/>> (includes a repository of files illustrating the application of the technique in 10 countries)

Nominal group technique

Description

The nominal group technique is used to assist participants in the process of pooling their knowledge and, particularly, their judgments to arrive at decisions that are acknowledged by participants as being a genuine product of the group dialogue process. Being highly structured, it facilitates participation by preventing the group from being dominated by particular individuals, as each contribution is of equal value.

The nominal group technique operates in four stages:

1. Generating ideas: each individual in the group silently generates ideas and writes them down
2. Recording ideas: group members engage in a round-robin feedback session to concisely record each idea
3. Discussing ideas: each recorded idea is then discussed to obtain clarification and evaluation
4. Voting on ideas: individuals vote privately on the ranking of the ideas, and the group decision is made based on these rankings (Dunham 1998).

The developers of the technique state that it is not designed for routine meetings or for negotiating or bargaining. Rather, its focus is '*judgemental* decision making' (Delbecq et al. 1975:5, emphasis in original):

The central element of this situation is the lack of agreement or incomplete state of knowledge concerning either the nature of the problem or the components which must be included in a successful solution. As a result, heterogeneous group members must pool their judgments to invent or discover a satisfactory course of action. (Delbecq et al. 1975:5)

Its specific purposes have been described as follows:

- To increase creativity and participation in group meetings involving problem-solving and/or fact-finding tasks
- To develop or expand participants' perceptions of critical issues within defined problem areas
- To identify priorities among selected issues within a problem area, considering the viewpoints of differently-oriented groups (Pfeiffer and Jones 1975).

The nominal group technique is taught and used widely in the context of group processes. As an integrative method, it is particularly useful for synthesising judgments where different types and extent of knowledge and/or a diversity of opinions exist on a problem or issue. Participants need to have a commitment

to dialogue and a willingness to accept the outcomes of the group process, even if the outcomes do not match the position they initially brought to it.

This dialogue method can be applied in two phases in research integration aiming to find solutions to real-world problems: knowledge exploration ('a search for major conceptual frameworks and broad insights') and solution exploration ('the refinement of broad insights by specifying components which should be included in the solution program') (Delbecq et al. 1975:124–5). One implication of this staged approach is that each stage can call on different participant or resource person expertise, with skills in broad conceptualisation particularly useful in the early stage, and technical expertise, to identify solutions, in the later stage (Delbecq et al. 1975).

Examples of its use in research integration

1. The environment: assessing environmental studies and geography students' views about fieldwork

What was the integration aiming to achieve, who was intended to benefit and what was the context of the integration?

British academics used the nominal group technique to assess the perceptions of environmental studies and geography students about the fieldwork components of their courses, and to review the alternatives to fieldwork implemented when the 2001 foot and mouth disease epidemic disrupted access to agricultural areas in the United Kingdom (Cousin and Healey 2003; Fuller et al. 2003).

What was being integrated, who did the integration and how was it undertaken?

Thirty-three final-year students from five universities participated. All were enrolled in programs that had a fieldwork component that had been withdrawn and had previous experience with fieldwork as part of their university education. The five universities were selected to represent a number of types of environmental science and geography programs, including large and small university departments and old and new universities.

The five groups (one from each university) each had three to 10 participants who volunteered to be involved, having found out about the project via posters and email promotions on their campuses. The nominal group technique was applied systematically, as recommended by Delbecq et al. (1975), to enable all participants' voices to be heard (without domination by a small number of powerful individuals) and, concurrently, to attain group consensus. A single facilitator conducted all five groups to maintain consistency. The stimulus questions used were:

Q.1 In the light of any previous fieldwork experiences, how could fieldwork have made this unit: a) better, b) worse?

Q.2 What impact do you think the loss or withdrawal of fieldwork had on your experience of the unit and understanding of the subject?

The group responses were categorised under 12 types of educational objectives derived from the theoretical literature: experiential, interest, technical, analytical/research, specific subject knowledge, holistic/transferable, assessment/workload, financial/resource, environmental, time, teaching/module delivery and social/group dynamic.

What was the outcome of the integration?

A high level of consensus was observed across the five groups. The findings of this application of the nominal group technique were that the environmental studies and geography students found fieldwork an 'overwhelmingly positive experience', and the many reasons for this were made explicit. The negative aspects (for example, the time and expense involved) were also explicated. These findings enabled the educationalists involved to draw conclusions and recommendations about the fieldwork components of their courses. In their papers, they have thoroughly documented how they implemented the nominal group technique and have discussed its strengths and weaknesses.

2. Public health: developing criteria to assess the appropriateness of innovative services in community pharmacy

What was the context for the integration?

Although community pharmacies are accepted as an important component of the mix of healthcare services, much variation exists in the amount, nature and quality of advice provided to customers by pharmacy sales staff about non-prescription medicines and the treatment of minor ailments.

What was the integration aiming to achieve, who was intended to benefit and what was being integrated?

The nominal group technique was used in the United Kingdom to develop criteria to assess the appropriateness (or otherwise) of pharmacy counter staff providing advice to their customers (Bissell et al. 2000). In this case, the technique was used to make explicit the knowledge of a group of experts and to synthesise their judgments on the criteria for assessing the appropriateness of advice provided by pharmacy staff to the public. The new understandings derived from the process could then be used for integrating the expert knowledge of people with experience in the pharmacy setting with academics' skills in developing assessment criteria and the workforce educational interventions flowing from their availability.

Who did the integration and how was it undertaken?

The first stage of the study entailed capturing information on advice giving by counter staff in 10 community pharmacies by means of audio recording, supplemented by direct observation. Stage two entailed using the nominal group technique to elicit expert opinion on the criteria to be used to judge the appropriateness of the advice given, owing to the absence of previous research and theory in the area. Participants were selected using a nomination approach: the researchers contacted people who they believed could identify who was most expert in the community pharmacy field. Ten people were nominated and invited to participate, and eight of these accepted the invitation. The stimulus question was: 'How would you assess whether a consultation between pharmacy staff and a consumer was (in)appropriate?'

The group identified 73 individual items considered important in answering the stimulus question and, through discussion, these were condensed into just 10 core criteria:

- the overall layout of the pharmacy
- the overall organisation of the pharmacy
- general communication skills
- what information is gathered by pharmacy staff
- how information is gathered by the pharmacy staff
- issues to be considered by pharmacy staff before giving advice
- rational content of advice given by pharmacy staff
- how the advice is given
- rational product choice made by pharmacy staff
- referral (Bissell et al. 2000).

The group determined that prioritising these was neither feasible nor necessary, and that all should be weighted equally.

What was the outcome of the integration?

Subsequently, the criteria developed through the nominal group technique were subjected to statistical analysis of their validity and reliability. The authors state:

The developed criteria will allow us to identify dimensions of both appropriate and inappropriate advice provided in community pharmacies and provide the basis for education and training initiatives identified as a result of the research. In addition, we suggest that this research is highly relevant to informing the content, structure and operationalisation of protocols and/or guidelines associated with the management of minor ailments and the sale of medicines through community pharmacies. (Bissell et al. 2000:359)

The authors stated that the core advantage of the nominal group technique for their purposes was that it removed the potential for bias derived from professional hierarchies that might occur in less-structured group interactions. They also pointed to some of the technique's limitations, especially (in this case) the potential bias derived from the methods used to select the participants and the small number of participants.

Commentary

These examples show how the nominal group technique combines some of the advantages of the Delphi technique and of face-to-face group interaction. Like the Delphi technique, it is structured in such a way as to give each participant an equal say, hence avoiding the power differentials that often impact on face-to-face group decision-making processes. In addition, operating face-to-face means that participants have opportunities, through verbal and non-verbal communication channels, to better understand the judgments expressed by other participants.

The examples also illustrate how this method is particularly useful in situations where decisions need to be made, but information is missing, uncertainty exists and judgments are required. The pooling of knowledge and ideas and the sharing of judgments produce an integrated product. These examples are limited, however, in that they do not illustrate clearly integration between disciplines and stakeholders as their focuses are specific, tightly defined participants. In the first example, these were stakeholders (students potentially affected by the decisions that would be made based on the outcomes of the nominal groups) and in the second a group of experts judging competing criteria of the appropriateness of a service to the community.

Like the Delphi technique, the method tends to be restricted in the range of stakeholders involved owing to the need for them to have a degree of common knowledge and background. On the other hand, the Delphi technique and the nominal group technique are frequently used when other stakeholders—for example, decision makers—want answers to specific questions. In these cases, the interface between the (expert) participants and the users of the technique's findings are clear, as are the modes of product utilisation. The method requires a fair degree of common epistemology among the participants, along with willingness to listen, openness to new ideas and a commitment to compromise and find consensus.

The success of the nominal group technique is dependent, in part, on having a skilled facilitator to assist participants to discuss the ideas generated and the explanations thereof. This is a research integration role, one that can be played either by a trained researcher or a professional facilitator well briefed on the issue being explored.

It works well when a range of disciplinary insights is to be integrated, as (unlike in the case of the Delphi technique) opportunities are provided for participants to explain, discuss and justify their ideas, revealing their sources in particular disciplinary perspectives.

Origins and genealogy

Andre L. Delbecq (from the University of Wisconsin, Madison) and Andrew H. Van de Ven (from Kent State University) developed the nominal group technique in 1968. They advise that '[i]t was derived from social-psychological studies of decision conferences, management-science studies of aggregating group judgments, and social-work studies of problems surrounding citizen participation in program planning' (Delbecq et al. 1975:7–8).

Further reading on the nominal group technique

Delbecq, A. L., Gustafson, D. H. and Van de Ven, A. H. 1975, *Group Techniques for Program Planning: A guide to nominal group and Delphi processes*, Management Application Series, Scott, Foresman, Glenview, Ill.

Dunham, R. B. 1998, *Nominal Group Technique: A users' guide*,
<http://courses.bus.wisc.edu/rdunham/EMBA/Fall_2006_Readings/TEAMS/dunham_ngt.pdf/>

Open space technology

Description

Open space technology (also known as open space dialogue) has been used for two decades as a method for facilitating dialogue among people keen to focus on an issue that is important for them, but for which the way forward is unclear. Its practitioners have demonstrated that, given commitment to the issues and acceptance of the process, open space technology can assist groups of people to identify and explore issues, identify opportunities for change and identify and set priorities among action steps to achieve desired goals. The approach is based on the theories of complexity, self-organisation and open systems (Heft n.d.).

Open space technology sessions can be less than one day long or continue for up to five days. The number of participants can be small (as few as five) or up to 2000 (Heft n.d.). They typically conclude with a written report, often produced before the final session, and frequently have follow-up communication activities between participants, such as blogs, email lists, and so on. One-day sessions, however, generally do not produce a report. Two-day sessions usually use the first day for intense discussions and the second day for report preparation. Three-day sessions usually have intense discussion on the first day, report preparation on the second and close attention to priorities and action plans on the third (Owen 1997a).

The facilitator of an open space technology session invites people to participate—people who are thought to be passionate about the topic and willing to work collaboratively with others on it. No agenda is prepared; instead, just a notice as to the topic or issue to be worked on.

The key elements of the setting are one or more circles of chairs, with circles being seen as the ‘fundamental geometry of human communication’ (Owen 1997b:5). The room has to be large enough to have a number of small groups sit in circles, and to change the configuration of circles as the process unfolds. Larger sessions will have break-out rooms. There also has to be ample blank wall space. Ideally, there is little else to clutter the space.

The facilitator provides a welcome and outlines the purpose of the activity: the themes or issues to be addressed. The four principles of the process are explained:

- whoever comes is the right people
- whatever happens is the only thing that could have
- whenever it starts is the right time
- when it’s over, it’s over (Owen 1997b:95).

The single law, the ‘Law of Two Feet’ (or the Law of Mobility) is explained: ‘If, during the course of the gathering, any person finds him or herself in a situation where they are neither learning nor contributing, they must use their two feet

and go to some more productive place'. The 'final admonition' presented is 'be prepared to be surprised' (Owen 1997b:98, 101).

The facilitator then asks people to come to the centre of the circle, introduce themselves and tell everyone else of one aspect of the session's theme about which they are passionate. The person records this aspect on a large sheet of paper along with their name and a suggested time and place for discussing the issue, before attaching the sheet to the wall. In this way, a first-draft agenda evolves. Owen (1997a) advises that the number of issues raised is usually about 30 for a group of 25–50 people and about 75 for a group of 100–200 people. Larger groups tend not to generate many more issues.

When all the issues for discussion have been posted, participants sign up for the groups with which they wish to be involved. At this stage, topics can be combined. Once this step is completed, the facilitator announces that she or he is departing, inviting the groups to get to work. The participants then gather in circles around designated topics. As each 75-minute discussion ends, people move to the next group of interest, and this process is repeated throughout the assigned period. The groups do not have facilitators; they run themselves. A group participant takes notes on each session and enters them into a computer at the end of the session. The reports from each session are progressively posted on the walls throughout the day and collated to create the open space report.

The whole group reassembles twice a day: in the morning for announcements and in the evening for 'news', as Owen (1997a) puts it. The afternoon session includes reflection on the day's activities. Before the final session, individuals usually take responsibility for follow-up activity, be it communication or action oriented.

Whether the judgments integrated by this method are expert or lay or a combination depends on the participants. Harrison Owen, the method's originator, states that 'Open Space Technology is effective in situations where a diverse group of people must deal with complex and potentially conflicting material in innovative and productive ways. It is particularly powerful when nobody knows the answer and the ongoing participation of a number of people is required to deal with the questions' (Owen 1997b:15). The process requires participants to shed their power roles in organisational hierarchies and interact as equals.

Example of its use in research integration

Public health: generating ideas and plans for the development of the United Kingdom's public health workforce

What was the integration aiming to achieve and who was intended to benefit?

Open space technology was used to integrate the judgments of a diverse group of public health practitioners and educators concerned about a large, complex domain of professional activity: public health workforce development in the United Kingdom (Brocklehurst et al. 2005:996). A national event was conducted at the University of West England to explore the ambitious, two-part question: 'In developing the public health practitioner workforce in England, what is needed, and how do we do it?'

Who did the integration and how was it undertaken?

In all, 34 people from 25 public health and education organisations participated. They were selected by the organisers from their own professional networks, using 'a mix of purposive and convenience sampling'. After the opening session, at which the two linked questions were posed, the participants identified and conducted 16 different discussion sessions. A written report came from each. Some of the sessions covered quite specific topics while others were more expansive. The themes included:

- Identifying skills practitioners need to help achieve national obesity targets
- Evolving community pharmacists into medicines managers and public health practitioners
- Assessing the impact of new national NHS pay and conditions strategy on emerging public health roles in primary care organizations
- Managing the tensions between increasing public choice and implementing potentially restrictive public health policies (such as smoking bans in public places)
- Developing public health practice beyond the National Health Service
- Liberating the minds of those who are 'supposed' to be public health practitioners but who appear resistant to broadening their role (Brocklehurst et al. 2005:997).

These are all topics where facts alone are not sufficient, but where judgment is needed to make progress. The self-selected discussion sessions linked like-minded people to develop a shared set of judgments about the current workforce situation, the options for progress and the most appropriate ways to move forward. The participants worked at their own paces to understand each other's positions and judgments, to explore them and to find common ground.

What was being integrated?

As noted above, the participants were selected through purposive and convenience sampling, drawing on the professional networks of the organisers of the event. The participants came from public health and education organisations, and from the public and private sectors. Further information was not provided.

What was the context for the integration?

In the opinion of some, government policy in the United Kingdom ‘has stimulated something of a renaissance in public health’ (Brocklehurst et al. 2005:996). While workforce development has been one part of this ‘renaissance’, relatively little has been done to increase the capacity and capability of frontline public health practitioners such as public health nurses and environmental health officers. A public health workforce development agenda would be one response to these needs, and the open space technology event was conducted as a contribution to developing it.

What was the outcome of the integration?

Two prominent outcomes of the open space event were identified:

1. participants subsequently convened a number of local and national workshops, involving open space event participants and others, focusing on the development of public health practice
2. the event organisers developed a simple conceptual framework for public health workforce development, based on the summary of proceedings from the open space event, and used this in decision making on follow-up workforce development strategy activities.

The integration of the judgments of experts that occurred through this process provided the basis for subsequent action to improve public health practice.

Commentary

Open space technology contrasts with the dialogue methods discussed above in being far less structured. The overarching topic is set in advance, the subtopics are generated by the whole group and free-flowing group processes operate from that point on. This means that all the participants have the opportunity—indeed, are encouraged—to set the agenda by defining the issues to be worked on. The underlying philosophy is that synthesis will occur through small-group discussions among people self-selected to address a topic about which they are passionate. Integration is taken to be an emergent property of the group process.

The method is used when the nature of a problem is reasonably clear, but uncertainty exists about the directions in which to travel to address the problem,

and the specific action steps to be taken. Diversity among the open space participants is a feature as it enhances the likelihood that viable, acceptable options will be identified and, through discussion leading to integration of judgments, agreed on. This means that participants can be experts, lay people or a combination of both. The opportunity exists for a range of stakeholders, including researchers, decision makers and members of affected communities, to be involved.

Our example from public health illustrates another of the system's features—namely, the implementation, after the open space event, of the action steps agreed on there, including active communication of its findings to various stakeholders and active, goal-oriented engagement with them.

Although the example provided illustrates well the standard application of the method, it does not go far in illustrating its utility for the specific purpose of research integration. One could readily envisage the topic being addressed by means of the open space technique, focusing on research integration, if the participants were public health workforce researchers and workforce managers who needed to make decisions about the future of the workforce.

Origins and genealogy

Harrison Owen organised an international conference of 250 participants in 1983 and was most frustrated by the experience, feeling that the benefits did not justify the effort involved in organising and running the conference. He was struck by the fact that everyone enjoyed one aspect of the conference: the coffee breaks. He determined to develop a dialogue tool that combined 'the level of synergy and excitement present in a good coffee break with the substantive activity and results characteristic of a good meeting' (Owen 1997b:3).

Owen ran his first open space conference in 1985 and, since then, especially with the publication of the first edition of his users' guide in 1992, the technology has been taken up and applied extensively. Open space technology has been used in commerce, government and community settings across the world, including a World Bank-sponsored Youth Open Space Dialogue on the topic 'How Do We Create a Better Future—The issues and the opportunities', held in Singapore in September 2006 over two days, with some 230 participants aged sixteen to twenty-four years (<<http://www.worldbank.org/>>).

Further reading on open space technology

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- Owen, H. (ed.) 1995, *Tales From Open Space*, Abbott Pub., Potomac, Md (case
studies of the application of open space technology; full text online at
<<http://www.openspaceworld.com/Tales.pdf>>).

Scenario planning

Description

Scenario planning—also known as scenario thinking or scenario testing—is a dialogue method for the integration of judgments that is widely used in business, military and government settings. It has a particular emphasis on dealing with uncertainties, specifically responding to the need of many organisations to plan for uncertain futures. Typically, the judgments of experts are integrated through this process.

Although there are several different ‘schools’ of approaches to scenario planning (Bradfield et al. 2005), we provide here a generic description based on those that emphasise dialogue. (Other approaches use computer modelling and/or scenario development by outside experts, rather than group dialogue processes.)

The method has been described in the following terms:

Scenarios are a way of developing alternative futures based on different combinations of assumptions, facts and trends...They are called ‘scenarios’ because they are like ‘scenes’ in the theater—a series of differing views or presentations of the same general topic. Once you see several scenarios at the same time, you better understand your options or possibilities. (Caldwell n.d.)

The goal of scenario planning is not to predict, but to gain foresight. It responds to the wise statement attributed to the French diplomat Talleyrand, ‘When it is urgent, it is already too late’ (quoted in De Jouvenel 2000:39), and works at the boundaries of knowledge. Scenario planning provides information to assist planners as they contemplate the forces that will shape their organisations and their performance in the future and how to be in a position to deal with, or benefit from, those forces in a proactive, rather than reactive, manner.

One authority (Caldwell n.d., drawing on Schwartz 1991) has identified eight steps in scenario planning:

1. identify the focal issue or decision
2. identify key forces in the local environment
3. identify driving forces
4. rank by importance and uncertainty
5. select scenario logic
6. flesh out the scenarios
7. identify implications
8. select the leading indicators and signposts.

Using scenarios involves a shift from defining managerial competence as knowing where we are now, where we will be in the future and having a clear path

towards goal attainment, to accepting that we cannot know the future but, nonetheless, need to address uncertainties about the future as part of managerial processes (Wilson 2000).

An important issue in scenario planning is translating the products of the exercise into strategic decision making as 'experience shows that actually using scenarios for this purpose turns out to be a more perplexing problem than the scenario development process itself. As in the larger domain of strategy, implementation...turns out to be the crucial issue' (Wilson 2000:24).

Thus, scenario planning has two aspects: the development of the scenario and the application of the scenario. As a dialogue method for integrating judgments, scenario planning is particularly useful in highlighting uncertainty. By combining known information about the present and, where relevant, the past with understandings and assumptions about future change, uncertainty can be addressed and harnessed for planning purposes. With its focus on organisational learning (rather than individual learning), it has a useful role where research and organisations interface, including the research–business and research–policy interfaces. Importantly, the locus of integration is beyond the research sector, with research products being among the inputs to the scenario planning process.

This method is particularly useful for integrating the judgments of several people to improve understanding, through the development of the scenarios, as well as assisting decision makers with those integrated judgments, through the application of the scenarios. The method enables decision makers, be they in policy, business or other areas, to test likely consequences of alternative actions and, in some circumstances, it can enable costly real-life failures to be avoided.

Examples of its use in research integration

1. Natural resource management: identifying possible futures for the Austrian food supply chain

What was the integration aiming to achieve and who was intended to benefit?

Scenario planning methods were used to identify possible futures for the Austrian food supply chain and the related driving forces for landscape change out to the year 2020 (Penker and Wytrzens 2005). The Austrian Federal Ministry for Education, Science and Culture chose the method because ministry planners were aware of the high levels of uncertainty and the lack of quantitative data available in these areas. They acknowledged that '[t]he main information available to deal with this uncertainty is the personal judgement of practitioners and experts within the food chain itself' (Penker and Wytrzens 2005:176). Accordingly, a scenario planning exercise was conducted to integrate the judgments of the various actors involved in food systems and landscape planning to produce well-grounded future scenarios.

Who did the integration, how was it undertaken and what was integrated?

Those responsible for the exercise first developed a conceptual model describing the interactions between Austrian society, the food supply chain and the landscape. The key agents in the model were agricultural producers, food processors, food wholesalers and retailers, and consumers. Two scenario planning workshops were conducted: 1) a one-day workshop involving 25 practitioners from these sectors; and 2) another involving nine scientists from various disciplines who met five times and engaged in a subsequent email conversation.

The practitioners' workshop was conducted in May 2002 and had the title 'The Austrian Food Chain in 2020 and its Landscape Impacts'. The dialogue techniques applied by the workshop facilitators 'endeavoured to structure and organise individual ideas, to contrast and discuss divergent statements, to stimulate the imagination of those involved, and to improve logical consistency' (Penker and Wyrtrzens 2005:179). The plenary and small-group discussions followed a number of steps:

- step one: identification of the relevant driving forces
- step two: weighting of the driving forces regarding their importance
- step three: formulation of long-term development options for each driving force
- step four: generation of two coherent scenarios
- step five: naming of the two scenarios
- step six: analysis of consequences and strategies
- final debate
- feedback and end.

The scientists' scenario planning exercise occurred subsequently. It was undertaken because limited attention had been paid to the scientific evidence in the practitioners' workshop.

Each group developed two intentionally divergent scenarios, recognising that the likely future would be somewhere between the two. The practitioners' first scenario was the 'liberal market scenario', in which international trade agreements were liberalised, European Union agricultural subsidies reduced, farmers were seen as destroyers of the environment and consumers' food purchasing behaviour was driven largely by marketing and price. Their second scenario was labelled the 'protective policy scenario', in which protectionism became more prominent in agricultural policies, animal welfare and environmental protection became more significant and small business was important in food marketing. The scientists' scenarios were a 'fast world scenario' and a 'slow world scenario', which emphasised the speed of change in agriculture and food policies and practices, along with different degrees of state control.

Integration occurred through the facilitated workshop discussions in which participants discussed their individual weightings of the forces for change and reached group agreement on them, enabling the participants to move to the next steps in the dialogue, covering options for the future, refining these to two contrasting scenarios and teasing out the implications of the scenarios.

What was the outcome of the integration?

The facilitators of the process concluded:

The scenario technique used [was] found to be a useful means of gathering and structuring diverse [sic] expert knowledge...scenarios can deal with uncertainty concerning the socio-economic driving forces of landscape change and therefore can be used as a preliminary step in formulating robust strategies for landscape management. (Penker and Wytrzens 2005:175)

It integrated the judgments of the practitioners to produce future scenarios but, importantly, needed a separate scenario planning exercise to make judgments about the applicability of the scientific data that the practitioners failed to address.

What was the context for the integration?

The scenario planning activity described here was a discrete module within a larger, interdisciplinary project called 'Fast Food–Slow Food: Food chain management and cultural landscapes'. The overall project was concerned with the impacts on the landscape of various patterns of food production and consumption, and aimed to identify sustainable ways of managing food chains.

2. Business: understanding the future of the international airline industry

What was the integration aiming to achieve and who was intended to benefit?

In the mid 1990s, British Airways realised that it needed to be better prepared to identify and interpret major changes in the environment in which it operated. It therefore initiated its first scenario planning activity in 1994 (Moyer 1996). The purpose was to ascertain and integrate the judgments of a large number of disparate experts within and outside the company about possible futures for the international airline industry and how British Airways should be positioned to benefit from the changes.

What was being integrated?

The process was initiated by the company's chief economist and implemented by a development team of eight staff from its Corporate Strategy, Government Affairs and Marketing Departments, along with an external consultant. A series of workshops to discuss the scenarios and their implications involved the

directors and senior managers responsible for implementing the company's business plan, and key customers. Further details were not specified.

Who did the integration and how was it undertaken?

The senior management of the airline supported the initiative as an experiment: to see if it made a useful contribution to the company's strategic planning. It was implemented in two phases: first, scenario development, and then scenario workshops. Scenario development was conducted through interviews and the analysis of interview data. A team of eight British Airways staff conducted individual interviews with more than 40 senior company personnel, five group interviews with staff specialists, as well as a small number of interviews with people outside the company.

Two scenarios (known as 'stories') were written by the development team members and documented in booklets and presentations. They were the 'wild gardens' scenario, in which 'global integration goes so far that it is impossible to build lasting new structures of governance to replace the old, crumbling structures', and the 'new structures' scenario, in which 'shared values and new ways of organizing are found which enable growth to continue in a manageable, rather than socially disruptive, way' (Moyer 1996:174). In this case, the integrative activity to develop the scenarios was undertaken by the eight-person scenario development team.

Phase two of the project involved the development team distributing the stories in written form and conducting workshops with British Airways staff throughout the company. In all, 28 workshops were undertaken, targeting senior managers responsible for major components of the company's business plan. The purpose was to provide opportunities for managers to learn about and discuss the scenarios and then to generate new ideas for strategic planning. Brainstorming the implications of the scenarios and other creative techniques (not detailed in the case report) were used to integrate the insights from the scenarios developed with the existing knowledge and judgments of the managers.

What was the context for the integration?

The international airline industry was severely disrupted by the recession after the first Gulf War, with many major airlines experiencing financial crises. This highlighted to senior management the vulnerability of British Airways to global economic cycles and the need to be prepared for future changes in the business environment in which it operated.

What was the outcome of the integration?

Individual business groups within the company used the processes and products of the scenario planning workshops to modify their business plans. The processes stimulated dialogue between various parts of the company, management and

the trade unions, increasing participants' understanding of the external influences on the company.

The senior managers of British Airways were pleased with the exercise, agreed to incorporate the scenarios generated into the company's strategic planning processes and to review, some time in the future, the value of developing new scenarios.

Commentary

Scenario planning contrasts with most of the tools discussed above in that it is applied most commonly in the business and policy sectors, rather than being used to address broad issues of concern to ordinary citizens. Typically, experts working inside these sectors use the method. They do not necessarily engage with researchers, and certainly do not normally engage with lay members of the community. Research products (data, information, knowledge, and so on) are, however, key inputs to scenario planning.

This is another approach designed explicitly to deal with uncertainty. While its focus is on organisational learning, interesting issues exist with respect to organisations' *use* of its products. Its products are scenarios that reflect the judgment of participants in the scenario planning exercises, but how these are used in decision making, or whether they are used at all, is an issue. The British Airways example is one in which the scenarios were carefully developed using research evidence and dialogue processes with stakeholders, and the products were passed on to senior management, but no evidence exists that they were used instrumentally in decision making.

The Austrian food-sector example is also informative in the context of research integration: the organisers of the exercise felt that the scenarios developed by the expert industry representatives inadequately incorporated scientific knowledge—research products—meaning that a second round of scenario planning was undertaken among scientists alone. This draws attention to the importance of designing scenario planning exercises, and facilitating the dialogue processes, in such a manner as to give due weight to the body of research evidence and to integrate it into the scenarios along with the judgments of participants.

Origins and genealogy

This dialogue method was first documented by nineteenth-century Prussian military planners with the approach being formalised by analysts at the RAND Corporation, the Shell Group and the French company SEMA in the 1960s and 1970s. Bradfield et al. (2005) provide details of the origins of the three main categories of techniques developed by these groups and their current manifestations.

Further reading on scenario planning

Bradfield, R., Wright, G., Burt, G., Cairns, G. and Van Der Heijden, K. 2005, 'The origins and evolution of scenario techniques in long range business planning', *Futures*, vol. 37, no. 8, pp. 795–812.

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Soft systems methodology

Description

Peter Checkland, the primary exponent of soft systems methodology, recently described it as

an organized, flexible process for dealing with situations which someone sees as problematical, situations which call for action to be taken to improve them, to make them more acceptable, less full of tensions and unanswered questions. The 'process' referred to is an organized process of thinking your way to taking sensible 'action to improve' the situation; and, finally, it is a process based on a particular body of ideas, namely *system* ideas. (Checkland and Poulter 2006:4)

It is usually implemented in groups. The contributions of expert facilitators can be beneficial, but are not essential once participants understand the techniques. It is also possible that 'a researcher can be used as an intermediary, interviewing people and ensuring that each stakeholder is exposed to other perspectives' (McDonald et al. 2005:39–40).

The core of the method is to integrate judgments by treating purposeful action as a system, an adaptive whole. Changing one part of the system (initiating one course of action) will create changes elsewhere in the system. What particularly distinguishes the approach is that it reveals and deals explicitly with the potentially differing world views of the participants, examining how these world views (*Weltanschauung*) underlie their judgments. Soft systems methodology seeks *accommodation* among different, sometimes conflicting, world views.

The key characteristics and seven implementation stages of soft systems methodology are listed below. Checkland and other practitioners emphasise, however, that it is not a mechanical, linear process. Rather, it is inherently iterative. It moves from finding out about a problematic situation to taking action in the situation, and does so by carrying out some organised, explicit systems thinking about the real world:

1. Workshop participants express their perceptions of the problematical situation in an unstructured form.
2. They then develop a 'rich picture', a visual representation of the situation in which people find themselves. This generally takes the form of drawings and connecting lines on sheets of paper, providing a kind of a map of the real world and its challenges.
3. Some human activity systems relevant to the situation are carefully named in 'root definitions'. The aim is to produce common understanding and agreement among participants with respect to each system. These explicitly name a number of features of the relevant systems, and test them, using

the acronym CATWOE, standing for customers, actors, transformation process, world view, owners and environmental constraints, as follows:

- customers: those who might be helped or harmed by action
- actors: those who could be involved in making the system work
- transformation process: identifying the 'raw material' that the system will transform into 'end products'
- world view: the world view underlying people's desire to create the transformation
- owners: those with the power to stop the system from working
- environmental constraints: the things that have to be taken as given.

Each root definition makes plain its world view—that is, the point of view from which the (human activity) system is described, since one person's 'terrorist' is another's 'freedom fighter' (the example Checkland uses most frequently).

4. Conceptual models of the systems named in the root definitions are built. They are models of purposeful activity considered relevant to debate and argument about the problematical situation. They are not at this stage thought of as practical designs. They usually take the form of a map of the activities needed to make the system operational. Activities are listed and their relationships made explicit.
5. The debate about the situation is structured by comparing models with perceptions of the real world: the initial rich pictures. The aim of the debate is to find some possible changes that meet two criteria: systemically desirable and culturally feasible in the particular situation in question.
6. An action plan is developed.
7. The action plan is implemented (adapted from Checkland and Scholes 1999; Midgley 2000).

Directly applying these seven steps is known as 'mode one' of soft systems methodology. 'Mode two', in contrast, is the application of the general idea of the methodology—namely, comparing models of the future with participants' understanding of the current situation, without necessarily following the seven steps. The principles are internalised, as Checkland and Scholes (1999) put it, leaving the practitioner free to use any methods that seem appropriate. The application of mode two has led to some confusion as to just what is meant by soft systems methodology (Holwell 2000).

Soft systems methodology is a mature, well-tested dialogue method that has been applied in many ways in many settings. It is not, as some have claimed, a simple substitution of objectivity with subjectivity in systems thinking. Rather, as Midgley clarifies, 'the emphasis is on *inter*-subjectivity: the acceptance of multiple worldviews and the evolution of mutual understanding through debate' (Midgley 2003:vol. 1, p. xxxvii, emphasis in original).

Soft systems methodology is particularly useful when a need exists to develop realistic action plans to address complex (social) situations in which people are confused about, or hold differing views about, the nature and origins of the problem, how it can be addressed and what goals are to be worked towards. The group process helps people to attain a shared judgment that can be the basis for action to overcome the problematical situation.

Example of its use in research integration

Security: determining the most appropriate counselling model for community agencies' responses to disaster in Northern England

What was the context for the integration?

A key aspect of responding to large-scale disasters is synchronised activity between many different agencies, but the necessary collaborations are difficult to develop, maintain and implement. The human service agencies of a county in Northern England were concerned that, in the event of a disaster, they would not be able to engage in effective multi-agency activity to provide counselling services to the affected populations. A working party had been meeting for 18 months attempting, without success, to develop a multi-agency intervention plan. The barriers to achieving their goal were the complexity of the task and the differences of opinion as to the most appropriate model to use: one based on professional counselling services versus one based on volunteer counsellors' contributions (Gregory and Midgley 2000).

What was the integration aiming to achieve and who was intended to benefit?

Two consultants were invited to assist, and decided that soft systems methodology would be helpful as the need existed 'to structure the problems and facilitate debate', to develop models of inter-agency collaboration and to integrate the conflicting visions as to how collaboration could be realised.

What was being integrated?

Representatives from 19 agencies concerned about providing counselling services in the event of a disaster participated in this multi-agency activity, including health authorities, the ambulance service, the fire brigade, police, the Police Welfare Service, Victim Support, CRUSE (a voluntary organisation offering bereavement counselling), the Samaritans, a local Association of Counsellors, the Emergency Psychological Service, the Council of Churches, university departments, Emergency Planning (County Council) and Social Services (County Council).

Who did the integration and how was it undertaken?

As mentioned above, representatives from 19 agencies concerned about providing counselling services in the event of a disaster were involved, meeting in three blocks of two days each, during a one-month period. The consultant facilitators used soft systems methodology's mode one, following the seven steps with some small modifications. They began with an exercise to explore the nature of a disaster and then moved on to produce 'rich pictures'. At this stage in the process, participants were not positive about where it was leading, as they had brought to light many difficult and interrelated problems, with no solutions being apparent.

In the next step, participants were asked to identify the systems that would be needed to establish and implement the multi-agency counselling network if a disaster occurred. Since many were identified, they were asked to select the most important and to explore them in more detail using the CATWOE approach described above (although root definitions were not developed). The next step (a departure from the standard mode one approach) was to engage in whole-system modelling, after which detailed conceptual modelling was done of six of the systems identified. More conceptual modelling was not possible owing to time constraints. In this way, participants were assisted to reach accommodation of their differing visions for how the agencies could collaborate in the event of a disaster. An action plan was developed and used as the basis of an application for funding to establish the multi-agency network.

What was the outcome of the integration?

The evaluation of the process addressed participants' learning from the soft systems methodology process and the contents of the model that had been developed. Participants were positive about the process and indicated that they had learned a lot about the needs and priorities of the various agencies, and about the soft systems methodology itself. With respect to the contents of the model, although no disasters had occurred in the county within the two years after the development of the model, one did occur in a neighbouring county. Counselling support was provided to the people in that area in an effective and timely manner—a good test of the arrangements that had been developed through the soft systems methodology exercise.

Commentary

Soft systems methodology is a less structured dialogue method than many others. Especially in its 'mode two', it is best seen as a process, an approach and a perspective, as well as a method. The example illustrated this in its flexible application of the standard six CATWOE steps.

It focuses on action within a systems perspective. The purposeful action analysed is a system itself interacting with other systems.

A core issue for this method is developing participants' understanding of multiple world views and identifying how to accommodate them. This is in contrast, for example, with strategic assumption surfacing and testing, which tries to change world views or produce a new shared one among participants.

Also significant is the method's focus on developing agreed action plans and implementing them, rather than concluding the process with a set of integrated judgments (for example, through a consensus development panel's deliberations) where the dialogue itself (rather than follow-up action) is a valued outcome.

We have not been able to identify a case example that shows soft systems methodology being used for research integration but are confident that it has real potential for this. For example, the method could be used by a team of researchers and natural resource management planners wishing to develop an evidence-based action plan to deal with a complex issue such as the withdrawal of irrigation rights from farmers in a small rural community. The differing knowledge, world views and perspectives held by these actors would need to be integrated to produce shared judgments of the likely impacts and trade-offs inherent in any action plan that they would develop.

Origins and genealogy

Checkland and, later, other systems scholars and practitioners developed soft systems methodology as a response to the limitations that they saw in the reductionist approaches of the natural sciences when these were applied to complex social situations. The dominant systems thinking approach at the time (the 1970s) was the 'hard' paradigm of systems engineering: defining the system of concern, defining the system's objectives, then engineering the system to meet those objectives (Checkland 1985). Soft systems methodology, in contrast, was developed 'because the methodology of systems engineering, based on defining goals or objectives, simply did not work when applied to messy, ill-structured, real-world problems. The inability to define objectives, or to decide whose were most important, was usually part of the problem' (Checkland 1985:763). Soft systems methodology was designed to overcome these limitations.

Further reading on soft systems methodology

Checkland, P. 1981, *Systems Thinking, Systems Practice*, J. Wiley, Chichester, Sussex.

Checkland, P. and Poulter, J. 2006, *Learning for Action: A short definitive account of soft systems methodology and its use for practitioners, teachers, and students*, John Wiley and Sons, Hoboken, NJ.

Checkland, P. and Scholes, J. 1999, *Soft Systems Methodology in Action*, Wiley, New York.

Midgley, G. 2000, *Systemic Intervention: Philosophy, methodology, and practice*, Kluwer Academic/Plenum Publishers, New York.

Endnotes

¹ It should be noted that other organisations also conduct consensus development conferences, many using that term and using various processes with varying degrees of similarity to the US National Institutes of Health's approach discussed here. For example, in 2005, a Consensus Conference on Cochlear Implant Soft Failures was held as part of the Tenth Symposium on Cochlear Implantation in Children in Dallas, Texas. Its consensus statement has been published in a medical journal (Balkany et al. 2005).