

Appraisal of Alternative Methods and Procedures for Producing Regional Foresight

Paper prepared for the

STRATA – ETAN Expert Group Action

on

**"Mobilising the regional foresight
potential for an enlarged European
Union"**

European Commission - Research DG - Directorate K
May 2002
Brussels

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Introduction

This essay is a contribution to the STRATA study on Mobilising the Regional Foresight Potential. It presents an overview of methods that can be employed in Regional Foresight (RF), classifying them in terms of the specific functions they play. The intention is to provide a helpful orientation for those involved in planning, implementing, and reviewing RF exercises.

Methods that are covered include:

- action plans;
- benchmarking;
- brainstorming;
- critical/key technologies;
- cross impact analysis;
- Delphi method;
- demonstrators;
- embedding approaches;
- environmental scanning
- expert panels;
- Foresight units;
- issue surveys;
- mathematical and statistical modelling:
- mindmapping;
- morphological analysis;
- quantitative approaches in general;
- relevance trees
- scenarios and scenario analysis workshops;
- simulation gaming
- steering groups
- SWOT analysis;
- trend extrapolation.

The paper briefly outlines the main methods, their uses and requirements, and their limitations and challenges.

Regional Foresight Methodology: a crucible of methodology

The purpose of this paper is to provide a systematic and practical review of the range of methods used in regional foresight, and in related activities that could be adapted for, or used in regional foresight (e.g. national foresight, corporate planning, other instances of forward-looking analysis).

We take as the starting point the following propositions:

- ◆ The principles of Regional Foresight (RF) are identical to those for Foresight in general. The issues to which Foresight is being applied, and the resources that can be brought to bear on them, are liable to be quite different from those characterising national Foresight activities, however.¹
- ◆ The methods employed in RF are drawn from the methods used in Foresight in general. But the selection of methods, the implementation and configuration, will depend on regional specificities. In any case, there is no one best method, nor one all-purpose combination of methods.
- ◆ Technology Foresight is highly relevant for most is not all regions. But due to the different leverage that regions can exert over technological matters, technology-oriented RF will often focus more on local support and diffusion structures, rather than on upstream R&D policies. It may also often require more articulation at early stages with social policies than has *typically* been the case in national Foresight activities.
- ◆ A generic approach to describing Foresight can be helpful in examining issues of RF, including the methodological dimensions. The first accompanying diagram ([Figure 1](#)) graphically represents the particularities of Foresight as it has developed from the mid-1990s on.

In [Figure 1](#), Foresight is seen as the range of approaches developing out of the bringing together of three fields of activity. These components are:

- **futures** (forecasting, forward thinking, prospectives),
- **planning** (strategic analysis, priority setting), and
- **networking** (participatory, dialogic) tools and orientations.

There are already various intersections between each of the three pairs, and Foresight thus draws on traditions of work in long-range planning and strategic planning, horizontal policymaking and democratic planning, and participatory futures studies.

The links are probably strongest with futures studies. A current has long been apparent within this field - especially in some of the Francophone prospectives studies, but also in some participatory and even corporate futures work in the Anglo-Saxon tradition. In this current (or in these currents), there have been efforts for many years to develop ways of informing decision-making and mobilising broader parts of the stakeholder population around visions of the longer-term future. And many of the methodologies that are commonly associated with Foresight derive from this field, too.

From the futures field, we can derive the core prospective orientations of Foresight. It is concerned with:

- ◆ The **longer-term** - futures that are 10 years or more away, typically. There are some exceptions to this: especially for SMEs, looking a few years ahead may be stretching time

¹ See the FOREN [Practical Guide to Regional Foresight](#) for much more discussion of these points.

horizons considerably. Since Foresight is action-oriented (the planning link) it will rarely be oriented to perspectives beyond a few decades out (though where decisions like aircraft design, power station construction or other major infrastructural decisions are concerned, then the planning horizon may well be half a century).

- ◆ **Alternative** futures: it is helpful to examine alternative paths of development, not just what is currently believed to be most likely or business as usual. Often Foresight will construct multiple scenarios, sometimes as an interim step and sometimes as a major part of its output. In some cases there will be an effort to create what are variously known as positive visions, success scenarios, aspirational futures.

Foresight is tied to action and in particular to informing planning and priority-setting, and it placed great emphasis on network-building. Within the sphere of **Planning**, strategic and long-range planning have close ties to futures work in general, while participatory planning approaches are closely linked to networking. The field of planning covers methods used to achieve objectives into the future, usually with a short- or medium- range perspective. The old central 5 year plans of state socialism attempted to lay down in detail how these economies would progress; “indicative planning” as used in France and elsewhere provided a more general framework combining forecasts of what a mixed economy was likely to achieve with goals as to what were desirable targets (even if these were not completely under government control). Plans are routinely prepared by many organisations, both to reflect and guide overall strategies, and as management and monitoring tools for specific programmes and projects. Planning methods include, especially, those relating objectives to actions, to determining priorities among actions, and to prepare for contingencies. There is a continuing expansion of methods for risk management and other forward-looking inputs to planning. These are often supported by new IT-based tools – management decision aids, project monitoring software, risk analysis systems.

Networking is used here to cover a rather more heterogeneous span of activities. On the one hand there are approaches that are participatory or democratic, aimed at involving wider elements of affected communities in decision processes. These extend from “direct democracy” approaches that involve people in decision making (e.g. through referenda), through “deliberative democracy” which aims to institute dialogues about policy ends and means, to “consultation” processes that solicit views and encourage reflection, without necessary commitment to act on these input (which need not, in any case, be brought to any consensus). On the other hand there are approaches which are aimed at building networks so that key actors are better interlinked and can undertake action more effectively. Different sorts of stakeholder and expert may be brought together via meetings, or provided with ways of making contact with each other, so as to share concerns and strategies in respect of health, business or practically any other issue. Methods for recruiting and engaging people into communities of interest have been developed by commercial groups for a variety of commercial purposes, but also by public and voluntary organisations. Recent efforts at e-democracy and Group Decision Support Systems are seeing new IT applied to networking, through the Web and meeting facilitation tools.

Each of the three fields specified in [Figure 1](#) has its own range of methodologies, then. Many of these are specialised and arcane; some are well-known (at least their labels are well-known, if the substance is not always well-grasped). There are numerous guides and textbooks covering each field, they are the subject of training courses. Of the three, **planning** is uniquely professionalised and built into educational curricula; and it overlaps rather heavily with **management** more generally. All three of the fields have seen a proliferation of techniques and variants of techniques - often proprietary, and/or often promoted by particular consultants and users as **the** approach. In recent years, Information Technology has been used to augment many of these techniques. An encyclopaedia could be written on the range of techniques involved - and it would be out of date before it was printed.

However, it is not here necessary to review all of the methods that stem from the three fields. The task for this essay is to examine the methods that are relevant to the intersections between

the three fields, and the approaches that are particularly critical to the point at which all three come together to form Foresight. Because of the close links between Foresight and long-established futures methods, more of the methods to be discussed will have more overlap with futures studies than will be the case for the other two fields. The approach adopted below will be to categorise methods according to their operating at the interfaces between each of the three fields.

However, a second piece of analysis should be introduced in order to let us differentiate methods effectively. [Figure 2](#) depicts Foresight in terms of its **process** characteristics. ([Figure 1](#) presented more of a structural view.) The process depicted here is that typical of a Foresight programme or project. Using this as a framework, [Figure 3](#) goes on to indicate some of the methods that come into play in different stages of the Foresight process. At the centre of the Foresight cycle as presented here are methods of management, monitoring and evaluation, that apply throughout the cycle. On the periphery are methods more or less specific to individual stages.

**Figure 1 Fully-Fledged Foresight:
a triple base**

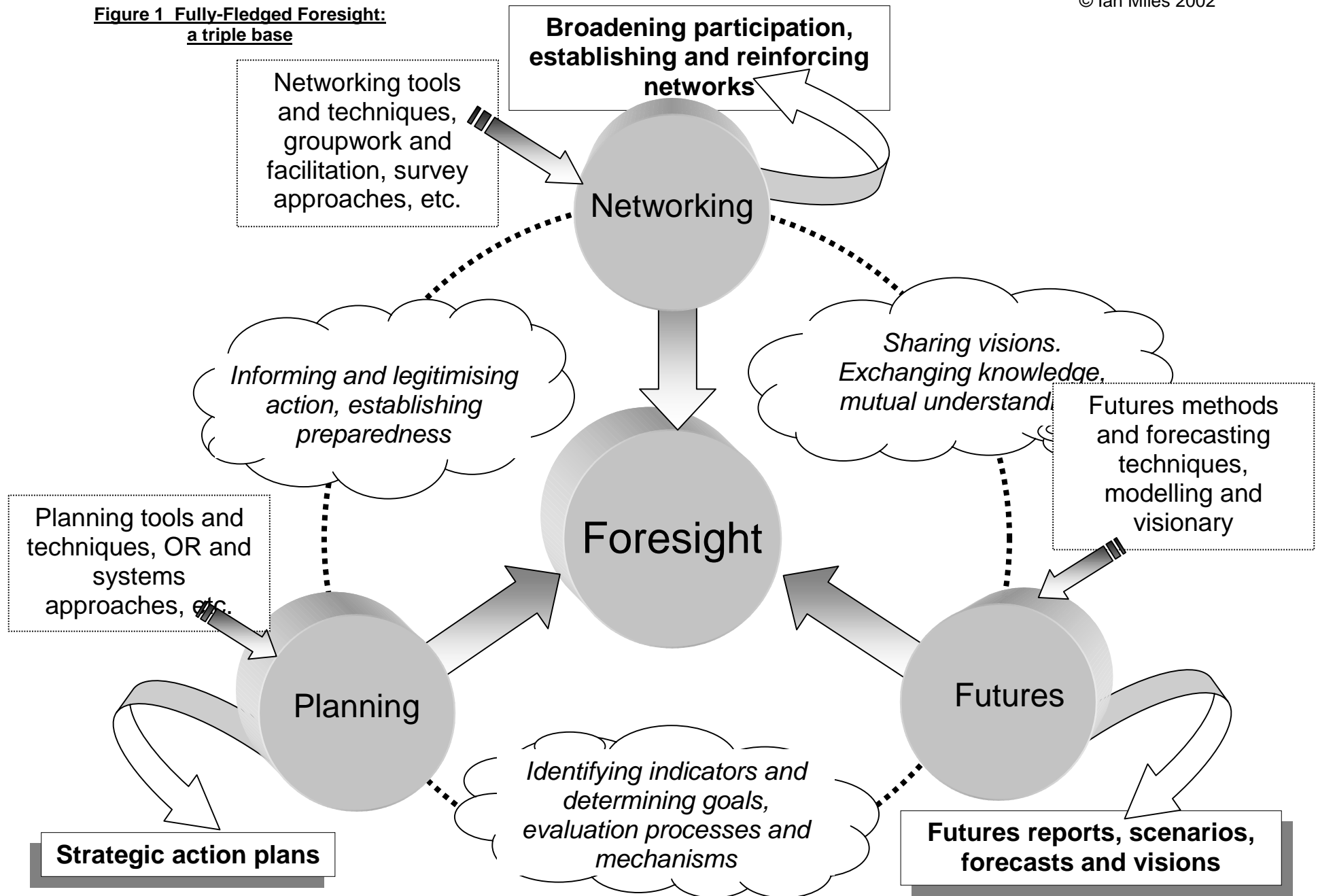


Figure 2 The Foresight Cycle

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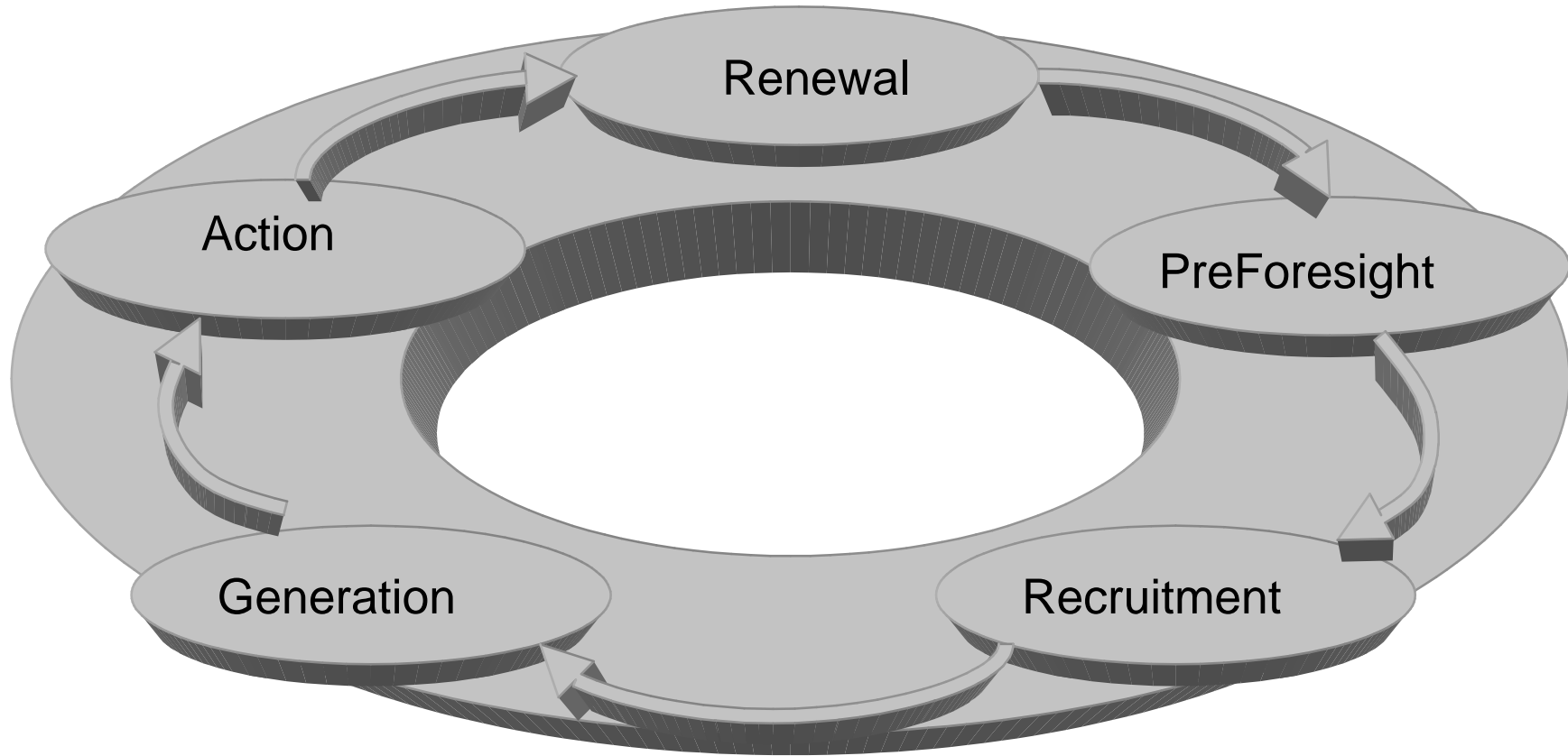
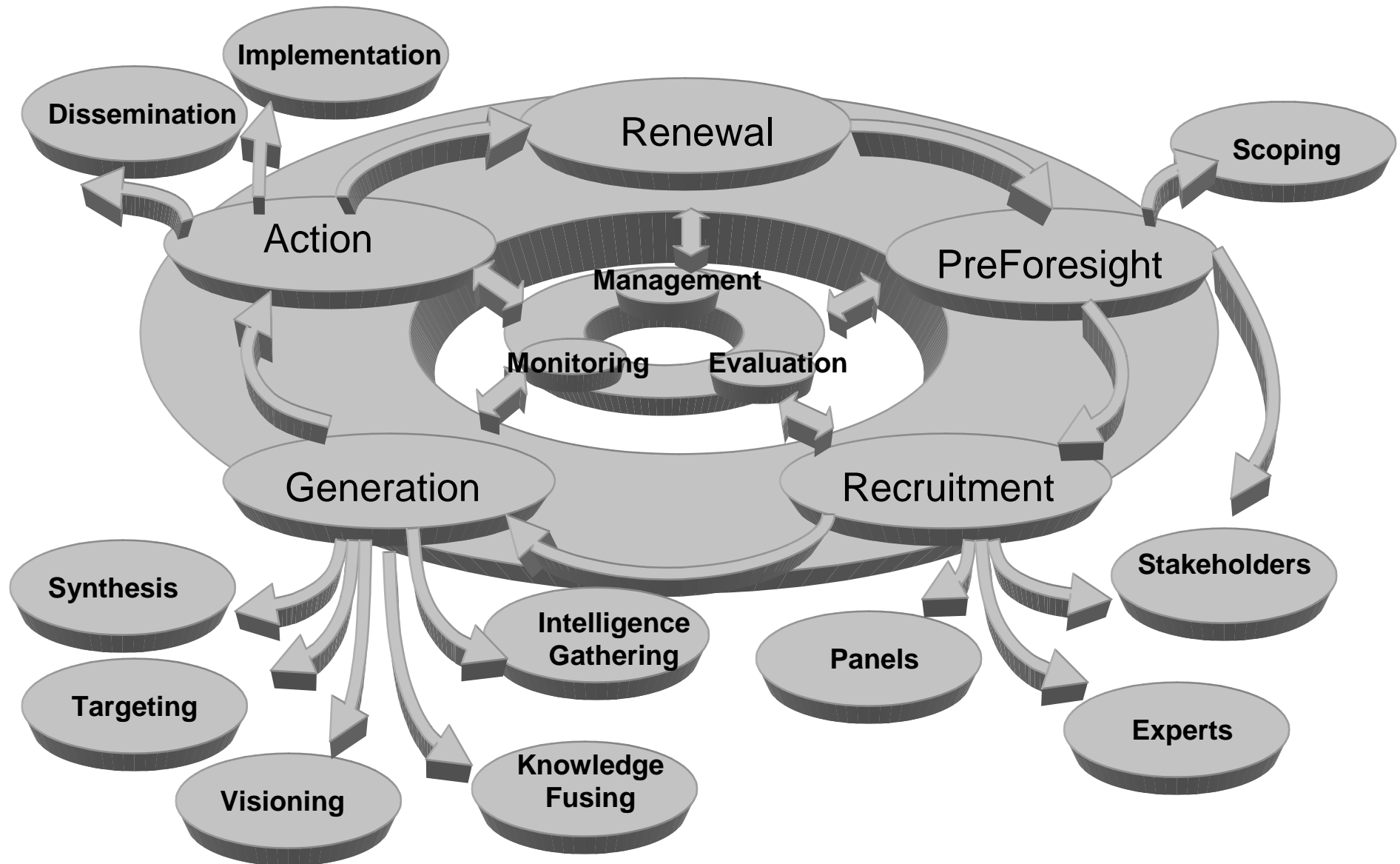


Figure 3 The Foresight Cycle: processes and methods

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An inventory of methods

The essay presents an account of tools and methods, organised both in terms of the stages identified here, and in terms of the overlaps between the three elements that constitute Foresight. We outline very briefly just what these methods are, and give examples of typical tools. We further explicate, briefly, their main strengths and weaknesses, and consider the issues that arise in applying them to RF.

Foresight exercises invariably use many different methods to accomplish the various tasks set out in [Figure 2](#). Accounts of existing programmes rarely explicate why one or other particular method was chosen. Often the presentations imply that this was simply the “obvious” (or even the “only”) choice. In practice, there are always many choices over both what method is used and how it is implemented. Even very familiar approaches like SWOT or Delphi are in reality open to a vast amount of interpretation: the principles set out in text books can be put into practice in numerous ways. It is remarkable how little discussion there has been of some of the critical decisions that have to be made.

Sometimes the choices have been decided upon in large part by the sponsoring organisations such as government ministries or regional development agencies. But such organisations are rarely involved with specifying many of the implementation details. And most often, many of the key decisions are made by steering groups and external contractors after the programme has already been set in motion, during the “preForesight” stage. We briefly discuss the use of steering groups and expert panels in the outline that follows.

This outline draws in part on work prepared for [The Practical Guide to Regional Foresight](#), and thanks are especially due to Fabiana Scapolo for her inputs to this. The author has drawn upon insights provided by many other colleagues at PREST in particular. This paper has not provided references, let alone a bibliographic guide to source material, in this draft. If considered useful, these can be added. But this is the sort of task known in English as “a piece of string” - in other words, it can be as brief or as extensive as one wants. [The Practical Guide](#) already provides pointers to much of the relevant material.

Methods for managing Regional Foresight (often management methods, but also some methods whose application lies in the overlap between Futures, Networking and Planning)

1a Foresight Management Framework: ROAME statements

Brief Description

A ROAME statement specifies:

- ◆ The overall Rationale for an RF exercise (why is it being undertaken?),
- ◆ Its specific Objectives (what is to be achieved?),
- ◆ Activities (what are the lines of action to be undertaken, what should particular lines be effecting and how?),
- ◆ The systems of Monitoring (are the steps intended to produce these effects being undertaken according to schedule, etc.) and
- ◆ The approaches to Evaluation (how far and how efficiently and effectively were objectives achieved?).

ROAME should be more than an abstract statement of hopes. It is intended to be an action plan that can help orient a programme from its earliest phases through its life

Issues Arising

This is found to be too formal a management tool in some organisations. It may be regarded as being too definitive, constraining of more experimental and learning processes (though ROAME statements can be prepared so as to allow for flexibility). The approach may be undertaken without sufficient commitment to following through its implications; it may be caught up in changing political circumstances that lead to change in objectives, etc.

1b Management of the Foresight Process: PERT and similar tools

Brief Description

Conventional project and organisational management tools can be applied to management of the day-to-day and longer-term agenda of the process. Techniques such as PERT and GANTT charts set out when activities are due to be initiated and completed, what resource flows there should be, etc. Typically activity and responsibilities will be distributed between a Steering Group and one or more Panels responsible for specific activities; these groups will typically be organised with chairs, secretaries, and (in the case of Panels) facilitators.

Issues Arising

These tools - which may be computer-based, or pen and paper based - are widely familiar. They are generally regarded as useful - if not essential - for the management of large projects. They are important for co-ordination of the work and responsibilities of different members of the management team. Care should be taken not to apply the tools in heavy-handed ways that could alienate the voluntary participants in Foresight. Development of goals and timetables should be a matter of consultation rather than imposition, and it is also important to communicate these goals and timetables to new participants, and to refresh understanding of them among team members who may become preoccupied with day-to-day problems ("not being able to see the wood because of the trees").

1c Monitoring and Evaluation

Brief Description

These activities are partially encompassed in the project management tools discussed above, and should be specified in ROAME statements. However, it is also vital to include activities such as: ♦ Establishment of systems to document Foresight processes and outputs; ♦ Evaluation of achievement of (and change in) objectives, management effectiveness, etc. This may be in real-time or after the main Foresight process (important given the long-term nature of many "impacts" and desired objectives of Foresight).

Issues Arising

Evaluation skills and capabilities need to be developed outside of the sponsoring and management organisations. It is useful for independent evaluation capabilities to be developed, with evaluators who are not heavily beholden to or reliant on specific clients, and who are able to draw upon experience and good practice gained from evaluation of different sorts of programme. Even then there is a danger of "capture" of the evaluators. "Real time" evaluators become participant observers, often and legitimately involved in changing the processes they are observing - this is a contribution to organisational learning, but should be informed by the principles of action research. "Post hoc" evaluation should not be confused with "success story" analysis: they are independent and complementary activities.

1d Steering Committee

Brief Description

A Steering Committee is usually employed in Foresight, not for day-to-day oversight but in order to develop the objectives, and focus of the exercise, specify the broad principles informing the methodological procedures and the work programme, and both frame and participate in the communication and dissemination processes. It is likely to produce overall synthesis reports and action plans, and review the deliverables from working groups.

Issues Arising

The Steering Committee is liable to be a key actor in gaining support from critical stakeholders (especially those in the sponsoring organisation, where it must liaise with a Foresight Champion - who may be a Committee member). It can play important communication and outreach roles - e.g. helping to identify and mobilise experts and other panel members. It is obviously vital that the Committee have high credibility and legitimacy, is not seen as being subservient to one or other interest group, and is visibly working with results of the participatory Foresight process (rather than imposing its own perspectives on it).

Methods useful in PreForesight and Recruitment - application mainly in the overlap between Networking and Planning

2a Methods to assist in Scoping Foresight processes

Brief Description

Scoping requires capabilities in assessing Foresight methods in general, knowing when RF exercises might be undertaken, with what orientation, and using what methods. A number of tools to help this have been developed in recent years: ♦ A published guide specifically tailored to RF is the **FOREN Practical Guide to Regional Foresight**, soon to be published in revised versions in multiple languages, and probably in an interactive web-based version. Other Foresight guides are in preparation, though many current publications really present narrower sorts of futures study. ♦ A Foresight training course has been run by PREST in Manchester on several occasions, sometimes for specific clients. Other training courses (usually for civil servants or entrepreneurs) have been launched from national Foresight programmes, by the programme organiser or by intermediaries. EU-sponsored courses are likely in the future.

Issues Arising

Scoping can play important roles in convincing a variety of actors of the merits of a Foresight exercise. Published advice has to be relatively generic; but nonspecific; expertise is required to translate this into useful practices in regions. Thus some face-to-face and experience-base training is liable to be most useful. Short courses can be tailored more to specific client requirements, but have not been developed, yet, with Regional Foresight at the fore. There may also be problems of accreditation associated with such courses. Experience with such guides and courses is liable to be relatively recent and undocumented. Existing futures and planning guides and courses may be "passed off" as RF-oriented.

2b Methods for Identifying and Locating Relevant Stakeholders

Brief Description

Methods here involve **search** through databases and web resources. "**Representative**" approaches can involve asking scholarly, professional and industry organisations for names. **Reputational** approaches (e.g. questionnaires asking informed sources to nominate particularly knowledgeable people in required areas of expertise. (Snowball surveys and conomination methods are particular versions of these.)

Issues Arising

The more formal methods are important for reaching beyond the "usual suspects", but conomination approaches are time-consuming. Any methods can be limited by the choice of initial informed

sources. In larger regions many new names may be generated, but in smaller regions there may already be little to learn since most players are already well-networked.

2c Consultation Workshops and Related Methods

Brief Description

While critical details of the Foresight exercise have to be decided on by the Steering Committee and management team, there is still much scope for wider consultation about the process - its key themes, methods, etc. A programme of meetings that can explain what is being planned and gather feedback on it can be a valuable input; other modes of consultation involve requesting written submissions, etc.

Issues Arising

Such approaches can be important in legitimising the exercise and helping to clarify its functions and alleviate misunderstandings about what is involved. This requires adequate preparation, and soundings to provide early warning of any political fault-lines that may be encountered.

Methods useful in PreForesight and Recruitment with application mainly in the overlap between Futures and Planning

3a SWOT ANALYSIS

Brief Description

SWOT (Strengths, Weaknesses, Opportunities, and Threats) analysis is used to provide background inputs to Foresight activities. Sometimes main Foresight activities will also result in analysis presented in SWOT terms - this may, for example, come out of Delphi studies - but more usually SWOT is less based on an assessment of the longer-term. SWOT is often presented in a 2x2 matrix, an overview of significant internal and external factors influencing strategies or possible futures. Positively or negatively. It is usually prepared by an expert team using a variety of data sources and often a programme of interviews. Opportunities and threats: are prioritised in terms of their importance and probability; strengths and weaknesses in terms of importance to performance to each factor, too. Graphical plots and other methods are used to select key factors. SWOT analysis is widely used, especially as a preliminary step in planning. The methods may also be used in workshops involving a wide range of participants.

Issues Arising

Failures in SWOT analysis often reflect inadequate definition or prioritisation of factors. This may be due to an absence of real expert knowledge; the reiteration of standard analysis by consultants unfamiliar with local specificities; political pressures of associated desire to downplay regional weaknesses. It is also possible to underestimate one's strengths. Repeated disappointments may lead to local "common sense" becoming fatalistic and supporting the view that a region is inevitably disadvantaged in certain respects, failing to examine any evidence that suggests the contrary.

3b Benchmarking

Brief Description

Benchmarking involves comparing the activities (process benchmarking) and performance (target benchmarking) of one's organisation or region, with those of similar entities elsewhere. Such comparisons have a long history, but interest in using the approach systematically has grown especially as firms have sought to compare themselves with examples of 'best practice'. This has been transferred to the sectoral and regional or national levels, and to a wide span of policies as well as purely economic ones. It offers learning opportunities ("how do they achieve that?"), as well as scope for setting goals ("we will be up to that level by the year 2010") and identifying likely competitive challenges.

Issues Arising

Benchmarking can be performed in a very reductionistic way, with performance in terms of individual indicators being abstracted from the systemic context of the organisation or region in question. It is

important to examine the topic area carefully, so as to identify the most appropriate issues around which to build indicators, and to examine which of various indicators might be most useful (e.g. it may be more appropriate in some cases to weight a "raw" indicator in terms of the population size or even the size of a population subgroup such as elderly people, small firms, etc.)

3c Environmental Scanning

Brief Description

The term "environmental" here does not just refer to the natural environment: it can mean the business, political, or technology environment, for example. The aim is to develop a view of where important developments are taking place, what trends need to be watched, who the key players are and might be. Methods used here are very varied: they include systematic analysis of media (and now of the Internet), perhaps using content analysis tools (to indicate emerging social attitudes and political movements), review of reports from financial analysts and specialised consultancies (to suggest emerging markets or business models); examination of specialised databases (e.g. patent or bibliometric data, to give warning of developments in science and technology).

Issues Arising

Many organisations routinely engage in such scanning, but most often it is conducted in a "one-off" fashion when a new activity is being planned. This may save costs, but reduces learning opportunities. It is possible to become too tied to specific methods and data sources, so that alternatives – especially paradigm-challenging ones – may be neglected.

Methods used in Foresight Generation (whose main area of application lies in the overlap between Futures and Planning)

4a Genius Forecasting

Brief Description

This uses the insights of a gifted and respected individual to provide a vision of the future. Such an individual will usually be drawing on the work of many colleagues, but be synthesising these ideas in a new way for the current circumstances.

Issues Arising

Readily dismissed as one person's viewpoint; few individuals have the span of knowledge required to cover a wide enough range of issues confronting the region.

4b Expert Panels

Brief Description

Working under the Steering Committee, Panels of sectoral and/or technological experts are commonly used to commission and synthesise Foresight analyses. Panels may make a general overview of regional issues, or be oriented to specific topics or sectors. They often play important roles in generation methods such as Delphi question formulation and scenario workshops. The main task of a RF Panel is usually that of synthesising a variety of inputs - testimony, research reports, outputs of forecasting methods, etc. - to provide a vision of future possibilities and needs for their topic areas. Implicitly or explicitly, methods must be employed to select and motivate the panel, assign tasks, and to activate them in the development and sharing of knowledge. Brainstorming and SWOT analysis are among the methods used in Panel work. Leadership and conflict management skills are required to maintain motivation and morale, and to resolve disagreements.

Issues Arising

Panel work is highly significant to Foresight Generation: ♦ The gathering of relevant information and knowledge; ♦ The stimulation of new insights and creative views and strategies for the future, as well as new networks; But also to later stages of the Foresight process: ♦ The diffusion of the Foresight results and its general approach to much wider constituencies; ♦ Helping to design follow-up action, promoting it, and overseeing its execution. Panels require open-minded and creative team workers, who speak as experts rather than as interest group representatives. Too narrow representation is liable to result in limited analysis, "capture" by interest groups. It is vital to retain legitimacy. Giving

panels too much autonomy can create difficulties for synthesis of their outputs, combining their scenarios, reaching shared priorities, etc.

4c Brainstorming

Brief Description

Brainstorming is a widely used group method, aiming to reduce inhibitions about generating “wild” ideas, and to stimulate creativity and novel viewpoints. While the term is given applied loosely, the original definition refers to a process involving: a period of freethinking, which is used to articulate and capture ideas, with no critical comments; followed by more rigorous discussion of these ideas, typically involving grouping them and prioritising the most important themes.

Issues Arising

Brainstorming is a starting point, and should not be expected to generate output that can be directly used in reports, etc. A skilled facilitator is required to reiterate and enforce the groundrules so as to maintain openness and prevent animosity - especially where participants are inhibited or liable to express ideas that are offensive to other group members. May be supported by computer tools, though classically implemented through use of flipcharts on which to capture ideas.

4d Mindmapping and Argument Analysis

Brief Description

Usually with the aid of computer and software tools, these are methods, requiring an experienced mediator to implement. They involve organising and visualising the subjects of group discussion, presenting these in ways that can help move the discussion forward. They involve grouping and linking ideas, drawing out the ideas expressed in the group.

Issues Arising

Experience with these methods is still limited, and conclusions as to best practice and best tools remain to be consolidated; software tools are also evolving rapidly. The value of this approaches depends very much upon moderator experience - and may be influenced for better or worse by ideas developed earlier.

4e Relevance Trees and Morphological Analysis

Brief Description

These probably the two best-known “normative forecasting” methods. They seek to identify the circumstances, capabilities, actions, and knowledge needed to achieve future objectives. **A relevance tree** subdivides a broad topic into increasingly smaller subtopics, in terms of a tree-like diagram. It sets out various aspects of a system, a problem, or solutions to a problem.

Morphological analysis involves mapping “all possible” solutions to a problem, so as to determine different future possibilities. It has been used for new product development and in constructing scenarios. Both methods are tools for thinking systematically about the topic of concern, and can generate unexpected possibilities and new thinking.

Issues Arising

These approaches require in-depth analysis, drawing on expertise in the problem fields, and involving lengthy and arduous work. The powerful intellectual stimulus they can provide may not require absolutely exhaustive analysis, but still considerable inputs of time and critical judgement are required..

4f Cross impact analysis

Brief Description

Cross-impact analysis is a method in which experts rate the likelihood of various events occurring - and the likelihood of each event occurring if each of the others does or does not occur. Statistical processing of the data results in assignment of probabilities to the scenarios resulting from the combinations of events.

Issues Arising

This overcomes one limitation of methods like Delphi, in that they treat events as completely independent of one another. But the method requires the experts to make a fairly large number of difficult judgements about combinations of events. And to limit the number of these judgements, only a few key variables can practically be examined (thus the choice of events is crucial).

Quantitative Analysis - general notes

Brief Description

Methods such as cross-impact matrices process expert judgements quantitatively, and some of the points made here apply to them. But many other methods represent issues in the form of quantitative variables (often supported by statistical data). A major incentive for this is that the information can be manipulated in consistent and reproducible ways, allows for precise comparison and estimates, checks on consistency, visualisation of data in graphs and charts, etc. in these ways. Quantitative methods are often used to provide some of the backdrop to a RF exercise, by indicating the range of assumptions we might have concerning key parameters, and thus informing scenarios and other approaches.

Issues Arising

The main problems with such approaches are: ♦ Danger of neglecting factors that are hard to represent numerically. ♦ Numeracy and similar skills are unevenly diffused: some people find it hard to read or work with data; and the most sophisticated quantitative methods require considerable expertise to apply and to deconstruct. ♦ There are dangers of “spurious precision”, where “guesstimates” are treated as more weighty than they deserve to be.

4g Trend Extrapolation

Brief Description

Trend extrapolation projects trends forward, usually by mathematical or statistical equation-fitting. Sophisticated methods of fitting logistic curves to data that are expected to evolve in a S-shaped pattern, envelope curve analysis to examine performance trends across generations of technology, and approaches to working from cross-sectional data to project time-series trends, are among the approaches used. Extrapolation can forcefully indicate the scale of change that would follow from a trend continuing into the longer-term; showing that small seeds may become big things, that ceilings are liable to be reached, that surprising developments may be confronted.

Issues Arising

It is important to identify what forces are driving a trend (and whether these will persist); and what assumptions about such forces are built into the extrapolation. Especially problematic are: ♦ Inferring a trend on the basis of cross-sectional comparisons or very limited time series; ♦ Assuming that ceilings will be reached at arbitrary points; ♦ Failing to assess underlying driving forces adequately; ♦ Failing to understand that enough of a quantitative change usually implies qualitative transformation.

4h Simulation Modelling (Mathematical and Statistical Modelling)

Brief Description

Computer-based simulation models represent a system in terms of variables and relationships between these variables, and can be used to project how the values of the variables will change over time, or under different circumstances. Such models have been developed most around relatively easily quantifiable issues, such as economic growth, employment, energy use, demographics and meteorology. Large-scale models require large teams to locate and analyse data, to formalise it in terms of the model. Simpler models may be used with quite basic PCs and simple programming languages and tools.

Issues Arising

Models necessarily rest upon assumptions made by human participants. A simulation model captures one representation of the situation under analysis. A major problem in the past was that this was not well-understood, and a continuing problem is that it can be difficult for nonexperts to identify and critique the assumptions built into large models. Modelling social, political and cultural change is difficult and contentious - identifying and finding appropriate data on key variables is problematic. Highly complex models can even be difficult for their builders to understand. Few models can cope with structural or qualitative changes, and some have unrealistic assumptions about economies tending to an equilibrium state.

Methods used in Foresight Generation whose main area of application is the overlap between Futures and Networking

5a Issue Surveys

Brief Description

Expert opinion may be surveyed by post or email to ask about what they consider to be important developments in their areas. Such surveys can be used to inform the development of Delphi studies or scenario workshops (see below). One approach has been to ask respondents to provide open-ended answers concerning what the major drivers and shapers are in their area, what sorts of problems and need these create, what sorts of solution and innovations might be applied to these, what sorts of research, knowledge, or capability might be needed to achieve these.

Issues Arising

This approach can allow many more people than are Panel members to contribute their insights, providing more time for reflective inputs. To elicit high-quality responses careful design of questions, and selection and motivation of respondents, are required. The mass of qualitative data that this approach generates can be hard to process and present, and care needs to be taken to allocate sufficient time and expertise to this task.

5b Delphi Method

Brief Description

Delphi involves a survey of expert opinion - most commonly about when particular developments might happen, and often also about possible constraints and facilitating factors economic or social implications, etc. (Many other types of Delphi are possible: e.g. to help identify and prioritise policy goals, for example, but these have been applied quite rarely.) Delphis are mainly conducted through postal surveys, but can be used within group meetings, and through computer- and Internet-based methods. The critical feature that makes Delphi different from other opinion surveys is that the survey is reiterated a number of times with the respondents receiving feedback on the structure of responses at previous rounds (and ideally information on *why* judgements were made). This is hoped to reduce dominance by the loudest or most senior figures, while allowing exchange of views and information.

Issues Arising

Delphi studies provide impressive results if conducted well, but require careful and laborious: choice of participants, preparation of questions, and provision of feedback. Some so-called Delphis do not reiterate the survey or provide adequate feedback to respondents. Drop out rates may be high. Delphi surveys are fairly time-consuming and labour intensive. The task of preparing the questions can be a very helpful exercise for illuminating shared views and points of disagreement as to future possibilities: thus it is unwise to replicate the topics used in other studies.

5c Scenarios And Scenario Analysis Workshops

Brief Description

Scenarios consist of visions of future states and paths of development, preferably organised in a systematic way as texts, charts, etc. Scenario methods enable us to build internally consistent pictures of future possibilities, so as to examine the implications of uncertain developments and

courses of action. Foresight exercises usually work with “multiple scenarios”, taking alternative courses of development into account; with “aspirational scenario” approaches (which are usually informed by a multiple scenario exercise) the focus is more on elaborating a vision of a desirable and feasible course of development, and the steps needed to realise this. Scenarios may be developed by taking a workshop through a systematic evaluation of trends, drivers, and alternatives, or by smaller expert groups, for example. The focus may more on “what if?” (extrapolative scenarios), or “how?” (Normative scenarios). Scenarios may also be used in modelling exercises to structure the operation of the model; or be derived from different model “runs”, where the model examines consequences of different assumptions.

Issues Arising

Scenarios can be useful communication tools, as well as ways of testing the robustness of policies and defining appropriate actions and indicators. They have to be presented in ways appropriate to the intended users. Scenario workshops can help participants gain “ownership” of scenarios as well as deeper understanding of issues. Drawbacks of scenario methods include:

- ◆ Tendency to perceive the scenarios as the only possible futures, rather as indicative of a spectrum.
- ◆ Some scenario studies imply that one scenario is “most likely” scenario, and others are minor deviations.
- ◆ Users may find difficult to deal with images of multiple plausible futures - or with many of these, at any rate (thus a maximum of four is common).

5c Simulation Gaming

Brief Description

These are role-playing exercises, where participants gain insight about the motives and options of the agents whose roles they are taking. By acting these roles within a structured framework, possible responses to emerging circumstances can be explored, and the interactions between the strategies of different agent examined. These methods have been used extensively for educational purposes and for military planning, with some experiments in relating simulation games to simulation models. The explosion of activity around computer-based role-playing games suggests that computer-mediated and even online simulation gaming could have a considerable future for more serious purposes.

Issues Arising

There is limited experience in using these methods in a Foresight context. It may be that their main functions are educating participants as to contingencies and motives. This enhanced understanding can be used in more conventional formal activities and outputs.

Methods used in Foresight Generation – mainly applied in the overlap between Planning and Networking

6a Critical/Key Technologies

Brief Description

This has much in common with SWOT analysis, and involves application of criteria to indicate the importance of particular technologies. Usually this involves panel work, drawing on interviews with industrial and research experts in the technologies concerned. In some instances, critical technology studies are at the heart of a Foresight-like process; in others they are used to help inform a wider process (e.g. as an input to scenario workshops).

Issues Arising

This method could in principle be applied to things other than technologies, including social innovations. In practice, this approach may tend to over-emphasise technological issues at the expense of broader socio-economic concerns. The method often lacks in transparency, with the criteria that are used not being particularly well-specified or clearly ranked against each other - this allows more flexibility for the panel to exercise its judgements (or prejudices).

Methods used in Foresight Action and Renewal (overlaps between Futures, Planning and Networking)

7a Action Plans

Brief Description

These are simply lists of actions that should follow from the identification of problems and possible solutions through RF. It is important to link actions to the people responsible for executing them, and to avoid setting goals that are unrealistic (either because of being too ambitious, or due to an absence of either political will or effective sanctions on the part of those responsible).

Issues Arising

Action plans should not be “wish lists”, nor should they simply specify end points and objectives. They should indicate actions and responsible agents, ways of monitoring progress, and indicators with which to assess the degree of success attained (“verifiable objectives”). Considerable skill and inside knowledge may be required to formulate these in terms which can be accepted by decision-makers.

7b Demonstrators

Brief Description

Rather than provide a list of numerous actions, it may be possible to incorporate a number of actions in a demonstrator project. This can be a highly visible instance of the application of Foresight to a regional organisation, and may arguably be particularly effective where technology or infrastructure issues are concerned..

Issues Arising

The time taken to establish a demonstrator, and for its impacts to become visible, may mean that the success of the demonstrator in increasing the visibility of RF may be limited. There are dangers of putting eggs into one basket, and it is thus important to build in monitoring systems that allow for learning and revision of plans.

7c Panel Embedding

Brief Description

The fostering of a “**Foresight culture**” means that a wide Range of economic organisations recognise the relevance of longer-term perspectives, and can initiate relevant Foresight processes when needed to guide action. Panel members can play significant roles in embedding Foresight in their own organisations. They can contribute to the development of RF capabilities by liaising with other organisations to see how far they are adopting the messages of the RF exercise. For example, panel members could share out responsibilities for monitoring the implementation of action plans, etc., by relevant parts of local government; they can provide briefings and inputs of other kinds.

Issues Arising

It can be very demanding of Panel members, especially unpaid ones, to maintain such a level of activity. They may benefit from the support of more “centralised” activities of one sort or another – Foresight Units, mini-RF exercises, etc.

7d Publications

Brief Description

Among the main formal methods of disseminating RF results are reports, books, newsletters, and an ever-expanding range of web-based publications; more rarely TV and radio programmes may play a role. These are most commonly produced either by the sponsoring organisation itself or (with more over independence) from the Foresight team itself. Existing media such as journals and newspapers may be activated to carry appropriate material..

Issues Arising

Such outputs need to be carefully tailored to their intended audiences. Professional skills in preparing the publications appropriate to specific media and audiences are required. It is especially important to keep journalists “on side”, since there is nothing they love more than problems and failures.

It is important not to let such “formal” outputs displace more informal means of communication, and not to assume that the capturing of results in publications is more important than more informal outputs in the form of improved networks and the embodiment of new knowledge in people’s practices and organisations’ approaches to issues. These may be harder to identify and quantify than documentation, but represent very important benefits.

7e Outreach, further training, etc.

Brief Description

Panels and other parties involved in RF will normally seek to hold public meetings, participate in regional and other workshops and conferences, and the like: they may also “roll out” RF more widely, to schools and colleges, and to all sorts of local organisation. They may recruit intermediaries – trade and industry associations, educationalists, consultants – to play roles in disseminating their messages, in training people to undertake their own Foresight, etc.

Issues Arising

It is important to build in opportunities for such action in the design of RF, rather than hope that they will emerge spontaneously in late stages of the exercise (when participants may feel that they are due for a rest!) It is important that these activities be as interactive as possible, rather than appearing as ex cathedra pronouncements about the future or the necessity of various courses of action.

7f Foresight Unit

Brief Description

A Foresight Unit (or more than one such unit) is a repository of knowledge and agent of training and advice on RF. It may provide information and analysis to update the reports and conclusions of RF activities. It may conduct smaller-scale RF exercises, or providing training activities, for particular sets of users (agencies, cities, etc.) on a more or less continual basis. It can organise regular meetings to support networks set up in the course of RF.. Such Units can help maintain Foresight capabilities in a region.

Issues Arising

A Unit requires substantial commitment, and may be overly dependent on a volatile source of funding. It may become moribund or proprietorial of RF in its region. One approach to forestalling this is to set up more than one centre of expertise on Foresight. This can have its own problems - the two may become locked in bitter rivalry and attempt to discredit each other's work and approaches, or they may form a cosy club, dividing work among themselves to suit their convenience more than the clients' interests. Whatever strategy is adopted, management procedures need to be in place to reduce such problems. And efforts to make the Unit(s) less dependent on one sponsor, and more open to funding from multiple sources - which cannot guarantee independence but which can increase its chances - are usually desirable.

Moving on: policy recommendations and needs for further research and action

This overview has covered a number of more or less informal methods – such as groupwork and panel activity – that are often neglected. Frequently, Foresight methods are reduced to futures and forecasting methodologies. These have received much documentation, but even so there is a woeful lack of systematic accounting for what constitutes good practice in their application – many important decisions required to implement them remain based on tacit knowledge. It is important to gain much more information on how both formal and informal methods have been used in RF. To date, we do have case study information on the use of methods in RF through, for example, the [FOREN Practical Guide](#) case studies, some detailed accounts of French prospective territoriale, and the experience being developed in FOMOF0 and other studies. But this is far from sufficient. More documentation and analysis oriented to establishing the lessons of Foresight methodology should be encouraged (perhaps in an extension of the present project?).

Second, it is important to raise awareness of the criticality of the informal methods employed in RF, and especially of their roles in preForesight, and in securing action and renewal of Foresight. The concentration on Foresight generation has led to a neglect of these elements. Additionally, attention to management and evaluation approaches is required. In all of these cases, it is important that attention be paid to the process and networking goals of Foresight, as well as to the production of formal outputs, reports, etc. There is a major challenge in consolidating methodologies in these fields – and in evaluating their application in particular circumstances.

Few methodologies can be employed “off the shelf”, and this is recognised in many RF exercises, where staff are either trained by consultants, or consultants are actively involved in the design and implementation of RF. It is apparent that some of these consultants are themselves learning about the techniques, while others are strong proponents of one or other specific method. It is probably inappropriate to set up a central register of consultants and training courses, but advice on how to select partners and how best to manage their inputs would be a valuable thing to develop. In addition to codification of such advice in the form of manuals or web resources, the creation of more for a where those actually or potentially involved in RF could network and exchange experiences and ideas would be very valuable.

One point noted on several occasions was the growing importance of computer and software aids in various parts of Foresight – within workshops, in Web-based consultations and surveys, and for dissemination and other purposes. The more novel of these techniques – tools to support brainstorming, mindmapping, and other forms of groupwork - display considerable promise. It is important to gather experience on these emerging and rapidly changing techniques, and to encourage experimentation with them. But the point remains that there is still inadequate documentation of what constitutes good practice in many of the more basic methods of RF.