Factors Required for Successful Implementation of Futures Research in Decision Making

for the

Army Environmental Policy Institute

By

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Executive Summary

The purpose of this report is to identify and discuss the reasons for success or failure in the use of futures research in reaching timely decisions. Several techniques were used to achieve this purpose, futurists, business planners, and scholars were surveyed via a three-round "Global Lookout" questionnaire; decisionmakers and policy advisors were interviewed; correspondence among futurists was conducted individually and via group email (listserv); and selected articles were reviewed. In addition, the futures research experience of the two authors of this report provided useful background.

Futures research is the systematic study of possible future conditions. It includes analysis of how those conditions might change as a result of the implementation of policies and actions, and the consequences of these policies and actions. Futures research can be directed to large or small-scale issues, in the near or distant future; it can project possible or desired conditions. It is not a science; the outcome of studies depends on the methods used and the skills of the practitioners. Its methods can be highly quantitative or qualitative. Its purpose is **not** to know the future but to help us make better decisions today via its methods which force us to anticipate opportunities and threats and consider how to address them.

"Foresighting activities cause impacts to organizations (or society) in a variety of ways most of which are extremely difficult to measure. As a result, foresighting organizations tend to rely on high-level buy-in and public legitimization as signs of their effectiveness."[1]

Firm examples of timely decisions in response to early warnings from futures research are difficult to identify. Fortunately, there are some notable exceptions. Forecasts of ozone depletion led to the timely decisions in the Montreal Protocol. Human rights forecasts by the KGB led to Perestroyka. Population forecasts led to family planning. AIDS forecasts led to massive research and prevention programs. Forecasts in the books such as *Silent Spring* and *Limits to Growth* stimulated many environmental protection programs.

Futures methods and perspectives are also useful to decisionmaking by creating alternative futures and choices that add to conventional wisdom. For example, futurist Herman Kahn (pioneer of alternatives thinking via alternative scenarios and Genius Forecasting[2]) proposed an alternative scenario that identified a gap in US defense: all the early warning systems in the US and Canada looking north would be irrelevant if the USSR decided to launch missiles over the South Pole.

In addition to informing decisionmaking, futures research can be used to change priorities, provide a context for understanding the meaning of the present, change attitudes of organizations. The National Academy of Science reported that *thinking ahead also helps to*

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[1] Skumanich and Silbernagel. *Foresighting Around the World*, Battelle Northwest National Laboratory, 1997
[2] These and other futures research methods are available in the *Futures Research Methodology* (500 pages) on CD-ROM by the Millennium Project.

improve intelligence and brain functioning. If so for individuals, then by extension, so too for organizations. The future cannot be known, but future possibilities and consequences can be explored, and based on such considerations, decisions can be made to influence the outcome of events and trends. Clearly it is better to be forewarned than not.

The following table shows the information flow of this report:

Table 1

Sources of Information for this report	→	Findings	→	Conclusions and Recommendations
Correspondence with Futurists and review of articles to identify and write examples of futures in decisionmaking		Impediments to the use of Futures Research		Factors required for the timely use of Futures Research in decisionmaking
Interviews with decisionmakers and policy advisors		…including the moral issues with the decisionmaker		Recommendations for institutional usage of Futures Research
Questionnaires to Global Lookout Panel		Information found to be useful in the timely use of Futures Research		
Experience of the Authors				

More than 250 futurists, scholars, business planners, and policy makers from over 50 countries participated in the questionnaires and interviews for this study. Representatives in ten locations around the world translated and distributed the questionnaires and conducted interviews in Rome, Moscow, Buenos Aires, Aspendale (Australia), London, Teheran, Beijing, Cairo, Madurai (India), Tokyo, and Olomouc (Czech Republic).

The interviews asked policy makers to think about situations in which early warnings were given and timely actions followed. For those situations they were asked to identify the type of information that had been important to effective decisionmaking. The questionnaires asked the "Global Lookout Panel" to assess the results of the interviews, and to provide additional illustrations of information about the timely use of early warnings.

A request was also made via the AC/UNU Millennium Project's two Internet listservs for examples of futures research that was used in timely decisionmaking. In addition, private correspondence was established with professional futurists asking for examples of successful use of futures research in timely decisions. Literature searches followed the input from the listservs and private correspondence to create the examples of successful usage presented in Chapter 1. The authors' experience in futures research augmented and interpreted these inputs to this report.

The Global Lookout Panel identified and rated the following (via the questionnaires) as the top ten *impediments* to timely use of early warnings:

1. **Institutional:** the fact that no one has responsibility to act; lack of adequate coordination among responsible ministries and agencies; institutional inertia

2. **Financial:** lack of funding or the fact that the people who ought to pay are unwilling to do so

3. **Disinterest in the future:** near term issues gain more attention than those that have more distant future consequences

4. **Planning inadequacy:** lack of a long-term view

5. **Personnel:** lack of decision skills - decisionmakers do not understand the complexities of the issues about which they must decide

6. **Strategic:** lack of clear-cut strategy and goals, lack of coordinated actions among actors

7. **Complexity:** lack of understanding of the magnitude of problems; lack of models showing complex interdependence of events and policies; lack of understanding of consequences of actions; stereotypical thinking

8. **Political:** the action interferes with national interests or it has been proposed by a political opponent; lack of involvement of regions, corporations, and specific groups

9. **Information:** lack of accurate, reliable and sufficient data and information, or the uncertainty of the risk; conflicting information; lack of coordinated scanning

10. **Lack of consensus:** differing interests and ideology among key actors, politicians, public, and particularly lobbying groups

These factors are discussed in both Chapter 3 (Results of the Interviews), and Chapter 4 (Results of the Lookout Panel).

Barriers to the use of futures research in timely decisionmaking can also include *moral factors*. Those identified and rated as the greatest *moral impediments* were:

- Insufficient attention to the needs of future generations
- Caring about the well-being of only one's own group or nation
- Corruption of political leaders, policy makers, corporate leaders
- Waste
- Greed and self-centeredness
- Economic inequities
- Lack of a holistic view of the world; fragmentation among many people
- Undue pressures from lobbying groups
- Lack of respect for the environment
- Non-action, the most server corruption; honor in leadership is to assume responsibility
- Lack of compassion and tolerance for others

These moral factors that affect decisionmaking are discussed in Chapter 4.

The Global Lookout Panel identified and rated the following as the top fourteen *factors that contribute* to timely use of early warning information:

1. Information that demonstrates unequivocally that a crisis is pending;

2. Knowledge about what is possible: how science and technology might affect the outcomes of decisions;

3. Education of decisionmakers and opinion shapers on issues of long-term significance, rather than those of short term populist interest;

4. Simple, clear, precise information in political, cultural and social (non-technical) terms, connected to goals and strategies;

5. Sufficient information about what is required to implement various policy options, e.g. manpower, systemic effects, technological change, etc.;

6. Information about how a contemplated decision may affect stakeholders;

7. Information about the success or failure of other institutions that have similar problems and have attempted to implement policies; inspiring success stories;

8. Use of indicators;

9. Testimony of eminent scientists;

10. Information about probability and risks associated with issues and their policy solutions;

11. Attention paid to the issue by the media;

12. Accurate projections of computer models;

13. Creation and use of accurate simulations and training, which make clear the consequences of actions;

14. Clarity of forecasted condition without action and technical feasibility of proposed action;

The results of the panel's rating of these factors are in Chapter 4, along with examples of these kinds of information used in timely decisionmaking.

An organization conducting futures research to improve timely decisionmaking should learn from the key lessons below. These key lessons are drawn from the examples of successful application of futures research described in Chapter 1, plus the results of the questionnaires, interviews, review of articles, and augmented by the authors' experience:

- leaders or decisionmaker(s) to whom the information is addressed should know what futures research is, be interested in the process, and have requested the activity;

- futures research should have a formal connection to the organization's strategic planning process that is understood by all involved;

- use at least one formal method that is understandable to all involved;

- information should not be limited to quantifiable projections, but include rich subjective descriptions of alternative futures that makes future possibilities more real for the decisionmaker(s);

- in part, this information should come from a formalized early warning system. Such a system should collect judgments from a carefully selected group of international experts about possible early warning signs of potential importance to the decisionmaker. It should formalize monitoring of relevant Internet web sites, listservs, seminars and professional meetings, and periodically contact futurists to collect scenarios and forecasts prepared by other organizations and analyze these to determine consequences of the projections;

- all those involved should understand that futures research provides a framework for thoughtful discussion, rather than predictions;

- in addition to more analytic methods, some form of workshop should be included to give time for individuals to integrate the concepts in their thinking in a group setting, and the decisionmaker(s) should participate;

- producers of futures research and decisionmakers should be integrated into the overall process as much as possible;

- it should not be a one-time event, but an on-going process of feeding information to the decision process and responding to feedback from impacts.

This report recommends the use of the factors and key lessons listed in this executive summary and discussed in the following chapters as a checklist to guide the preparation and delivery of information for more timely and effective decisionmaking as presented in the final chapter.

A future-oriented Dutch publication captured the essential value of futures research when it titled its work "Wise Before the Event." Such wisdom before the event should shorten the time between early warning and effective decisions.

1. Examples of Futures Research used for Decisionmaking

This chapter shares ten examples of successful uses of futures research in timely decisionmaking, as one source of information to identify factors required for successful implementation of futures research in decisionmaking.

Futures consulting continues to be a booming growth industry. More and more organizations from all over the world - public, private, commercial, nonprofit, public interest, or special interest - have discovered that it is not only desirable, but also possible, to do foresight effectively, and to use information about the future to guide their actions in the present. Some futurists believe it helps to reorient and change the attitude of an organization. It helps to make the individuals within the organization to be better aware of change and their options to address the changes.

Depending on how one defines "success", as well as how one defines "foresight", there could be many success stories - many, differing examples which could be given to substantiate the claim made above. Some people consider foresight to be successful if it helps an organization avoid a danger it might not otherwise have avoided or to take advantage of an opportunity it might otherwise not have known about. Others consider foresight successful if it helped a firm beat a competitor or to secure greater market share. Some organizations rely on external futures consultants to point out dangers and opportunities. Other organizations (far fewer, but an increasing number) develop an internal foresight capacity for themselves. Some believe successful foresight points out exceptional developments, while others believe that while useful foresight should point out unusual situations, it is best when vision and foresight become part of routine decisionmaking.

The examples of the use of futures research in decisionmaking that are presented below describe applications in different types of organizations, for different purposes and in different circumstances.

Most examples are related to strategic planning. In such cases, futures research is used to try to identify future developments that afford opportunity or threaten the viability of plans, and the consequences - both intended and unintended - of contemplated actions.

One example is given of competitive analysis. Here futures research is used in an attempt to understand what competitors might do, given the anticipated evolving circumstances so that counterplans can be established at the earliest time.

Another example is given of futures research for stimulation of innovation. Here it is used to help establish the range of the possible to facilitate the selection of development goals by the initiating agency.

In performing the research leading to these descriptions, an effort was made to include reference to the means used to overcome any impediments to initiation and use, although this information

is usually not readily available. The descriptions also include a reference to the players involved, and the desired outcomes.

1.1 Futures in the Virginia Judiciary: A Continuing Success Story[3]

    1. Focus: State
    2. Sponsor: Government agency (executive branch)
    3. Application Domain: Strategic Planning
    4. Techniques Employed: Visioning, Environmental Scanning, Participatory Methods

Impediments: There were no impediments to be overcome. A respected Virginia Judge heard futurist James Dator give a talk. The Judge who was on the board of the new State Justice Institute (SJI) secured funding for "Futures and the Courts". He got the Virginia Court of Justice and court administrator to apply for the funds and received a SJI grant; set up the judiciary's Futures Commission, which did its works over two years, resulting in the process described below. The key was an initial study which produced a mission statement and outlined 10 visions for the state judiciary; leaders who understood what foresight is and is not; expectation that the study would produce operating guide lines.

Players involved: Academics, representatives of the judiciary, and a group of people broadly representative of the state of Virginia.

Desired outcomes. Visions that could be used to develop action items and operating recommendations.

Measures of success: Approximately 70% of the actions recommendations have been adopted, the work continues with scanning and an annual updating process; creation of a Futures Commission which will reassess the future with citizen and professional input.

The Virginia Judiciary case has many features that proved to be beneficial in the design and outcome of this work:

1.   Visionary and continuing leaders who understood what foresight is, and is not (especially that it is not fortune telling; not "predicting" the future), and who expected foresight to help guide daily routine decisions;

2.   An initial visioning process which brought all (or representatives of all) of the stakeholders in the organization together in a lengthy and sustained processes which resulted in a clearly-articulated and widely-shared vision for the preferred future of the organization;

3.   A broadly-participative and iterative process which then used that vision to develop a detailed strategic plan for the organization;

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[3] Prepared by Professor James Dator, University of Hawaii, as a special contribution to this report.

4.   Administrative decisions and actions, which then defined each of the strategic goals as specific tasks which were then assigned to specific people (or offices), with specific targets for completion, and sufficient budget and personnel assigned. These tasks are then monitored until they are completed;

5.   An ongoing internally-led process which regularly scanned the environment of the organization for new challenges and opportunities which might impinge on the vision and/or the tasks, which information was then evaluated by senior administrators, and the previously-assigned tasks modified as deemed appropriate;

6.   Occasional scans contracted from external sources, which were then internally evaluated and used to make necessary changes;

7.   And the entire visioning process was itself revisited at appropriate (perhaps ten-year) intervals, again in a broadly-participative and extensive way.

Chief Justice Harry Carrico, Circuit Judge John Daffron, Executive Secretary (the chief court administrator) Robert Baldwin, and Judicial Planner Kathy Mays (later joined by Beatrice Monahan) provided the initial and continuing leadership for the activities from the 1980s. The State Justice Institute (a federal funding agency) in 1987 supported the creation of a judicial futures commission, chaired by Robert M. O'Neil, President of the University of Virginia. This Commission carried out extensive and intensive futures activities throughout the State, and eventually developed a mission statement and a set of ten visions for the future of the Virginia Judiciary. These were formally presented to a group of people broadly representative of the State of Virginia who gathered, in 1988, in the historic Rotunda, designed by Thomas Jefferson, on the campus of the University of Virginia.

The Commission's Report, *Courts in Transition*:

"...offered ten visions to serve as a foundation for the courts of the next century and to paint a picture of the preferred future for the courts. Likewise, 131 specific recommendations were developed to provide a sense of direction for the future. The report then was presented to the Judicial Council of Virginia. The Council is the Virginia judiciary's highest policy-making body.... Following wide distribution of the report within and outside the court system and a comprehensive review by the Council, 90% (118) of the Commission's recommendations were adopted.
        "Very importantly, the Council then selected a sub-set of the recommendations to be implemented within the next biennium. These recommendations formed the basis of Foresight 2000: The Judiciary's Strategic Plan for FY 1990-92. Approximately 70 percent of the action items selected for implementation during this time frame have been accomplished. Among others, the direct results include: 1) the establishment of alternative dispute resolution programs within the court system to expand the types of forums in which the public can choose to resolve legal disputes; 2) the introduction of numerous automated systems to link court system data bases with attorney's court-related agencies, and the public, for improved efficiency, accountability and convenience in using the courts; 3) the passage of legislation to create a

family court system to provide a more effective and more comprehensive means of addressing family disputes; and 4) the establishment of a consumer research and service development project. The purpose of this latter project is to provide continuous information to decisionmakers within the judiciary from citizens, litigants, and others on the substantive law changes and new products and services they desire from the courts." (Kathy Mays, p. 33)

Foresight 2000 has been updated by the judiciary planning staff every two years to coincide with the budget cycle. The themes outlined in Virginia's Courts at the Millennium: 1999-2001 Strategic Plan Themes, as identified by environmental scanning, consumer research, and constituent research, are "1. Surrounded by Technology: Life in the 21st Century; 2. Keeping Pace with Change; 3. Providing Justice in an Increasingly Segmented Society; 4. Fulfilling the Service Imperative; and 5. Therapeutic Justice: Redefining the Role of the Courts."

It is doubtful that so many of these accomplishments would have been attained without the careful accounting and monitoring process, which the Virginia Judiciary also developed and put in place. As Kathy Mays describes it:

"To help ensure that the judiciary's plans for its preferred future actually are realized, the state court administrator's office maintains an annual management planning process. Through this process, responsibility for assisting the local courts in implementing the specific action items contained in the up-dated strategic plan is divided among the office's various departments. Without this means for accountability and follow-up, there would be no way to translate the full strategic plan into annually obtainable objectives. The importance of this implementation process cannot be over-emphasized. And, as has been demonstrated time and again in planning efforts, the absence of such a link invites 'pie in the sky planning' as opposed to pragmatic agenda setting for the courts." (Kathy Mays, p. 34)

A flow chart of the overall activities just described, as developed by the Virginia Judiciary, and titled, "The Judiciary's Strategic Planning and Management System," is shown in Figure 1

Appendix E contains several attachments related to the "Futures in the Virginia Judiciary: A Continuing Success Story". Attachment One shows the Mission Statement and the ten Visions from the Strategic Plan for Virginia's Judicial System, originally promulgated in 1988. Attachment Two shows the Objectives and Tasks associated with just one of those Visions (Number Four) as an example of the objectives and tasks assigned for each of the ten visions. Attachment Three is a page from "The Special Projects" spread sheet for FY '95, and Attachment Four is a page from the Project Monitoring System computer printout, showing who is assigned to each task, how many hours are to be devoted to it (and were actually spent on it) and a start and finish date for each task.

A new Futures Commission, which seeks to reassess the future anew with increased citizen and professional input indicated on the flow chart in Figure 1, is anticipated as the foresight cycle begins again.

Figure 1

The Judiciary's Strategic Planning and Management System

Consumer Research	Constituent Input	Futures Commission (Once a Decade)	Environmental Scanning (Continuos)
- Citizens - Consumers - Stakeholders	- Judges - Clerks of Court - Magistrates - Bar	- Mission - Vision - Values	- Emerging Trends - Trend Analysis - Future View

Analysis Consumer and Constituent Research Update of Emerging trends Plus Legislative Mandates	Sept-Dec. Even Years March, Odd Years

Identification of Major Themes, Findings and Issues	April, Odd Years

Venture Teaming with Consumers and Constituents for Idea Generation, Identification of Options, and Recommendations for Service Improvement	May-June Odd Years

Present Research, Options, and Recommendations to Judicial Council for Adoption of Strategic Plan for the Judiciary	July, Odd Years

Adoption of Annual Operating Plan
For State Court Administrator's Office

IMPLEMENTATION IN THE COURTS

Continuous	EVALUATION	Continuous

1.2 USAID: Jamaica 2015 as input to USAID/Jamaica's Country Strategy Plan[4]

1. Focus: National
2. Sponsor: Government agency
3. Application Domain: Strategic Planning
4. Techniques Employed: Environmental Scanning, Snowball Delphi, Scenarios, and Vignettes
5. Impediments: disbelief in positive change and value of looking at longer-range futures

Keys to overcoming impediments: Strong support of the futures thinking by the USAID Mission Director and involvement of local participants.

Players involved: Futurist consultant, staff of the sponsoring organization (USAID), and a cross-section of Jamaicans.

Desired outcomes: Creation of a country strategy plan, to be used for allocation of USAID funds.

Measures of success: Resulted in a modification to USAID's Jamaica development strategy.

Figure 2

Jamaica 2015 Report
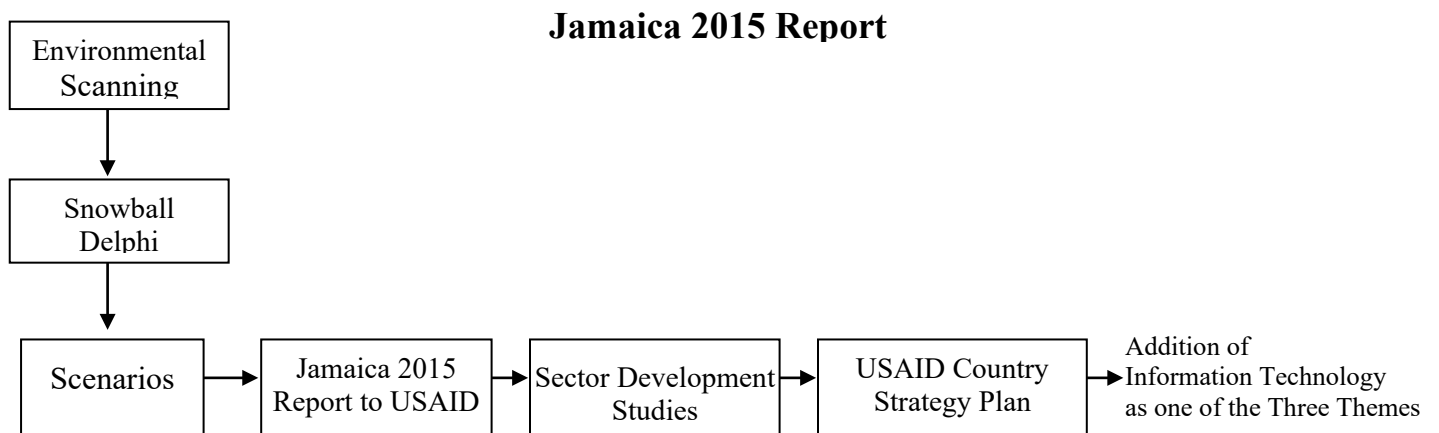
The USAID Mission Director for Jamaica visited Santa Fe Institute. As a result, she was interested in bringing a futures perspective to their planning.

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[4] Jerome C. Glenn. *Jamaica 2015: A Discussion of Possibilities, Policies, and Strategies*, Washington, DC:USAID, 1995

USAID creates a "country strategy plan" for each country in which it works. This plan is the basis for the allocation of funds and programs. The USAID Mission in Jamaica contracted a futurist in 1995 to produce a report on the future of Jamaica that was used as a common reference by sector consultants (agriculture, education, etc.) to revise the country strategy for Jamaica. The report called *Jamaica 2015: A Discussion of Possibilities, Policies, and Strategies* lead to the introduction of information technology as an "overarching theme" (along with donor coordination and community development) to the USAID/Jamaica program which focuses on economic growth, environmental management, and increased opportunities for disadvantaged youth. The information technology theme is to be considered in each of these programmatic foci. About ten percent of their five-year program budget was allocated to this new theme.

During the two weeks given the futurist to work in Jamaica, several methods were used:

1.   **Environmental Scanning** via the use of a range of reports, government data, articles, and listening to talk radio shows to identify a preliminary set of trends and issues to prepare the futurist to conduct a Snow Ball Delphi through a series of interviews.

2.   **Snow Ball Delphi** asked: a) what were the forces that shaped Jamaica over the last 20 years; b) how are they likely to change over the next twenty years, c) what policies and developments could alter these; and d) what new developments or forces are possible to shape Jamaica by 2015. The Snow Ball Delphi was conducted as a series of interviews based on the accumulation of previous responses. It began by interviewing several senior staff within USAID to involve them in the process early. This helped identify key documents to study, and which Jamaicans to interview. These initial interviews also collected their judgments about trends, potential futures, and other factors that could shape the future of Jamaica in 2015. These judgments were then used as the basis for interviews with a cross-section of Jamaicans. The snowball "effect" is from sharing the previous views with the next interviewees and using their suggestions as to the next people to interview. Interviewees were assured that no attributions would be made.

A standard **Delphi** with repeating questionnaires asking panelists to offer and rate positions is an objective process. But a Snowball Delphi is more subjective, because the interviewer is developing the on-going synthesis from a linear sequence of interviews. Hence, the interviewer must be knowledgeable about the subject. The Snow Ball Delphi produced a rich array of information used to write a set of scenarios.

3.   Three **scenarios** to the year 2015 were produced:

        Business-as-usual: extension of current trends and dynamics

        Tele-Jamaica: connecting Jamaicans working overseas to the development process at home

        The Pits: unlucky conditions and unwise policies from current dynamics

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The scenarios made clear that policy intervention was necessary, because business-as-usual resulted in an undesirable future. These scenarios packaged a large amount of information in digestible pieces that demonstrated that the most cost-effective strategy was information technology (IT) based. In addition to giving the *Jamaica 2015* report to the sector consultants, USAID required that they also address how IT could affect the future of their sector in Jamaica. As a result, IT became one of the three themes to be included in each of the three elements of USAID Jamaica's development strategy. To further develop this new area of USAID/Jamaica programming, the futurist was contracted a second time to give further detail to the TeleJamaica scenario with several **vignettes** - stories within a scenario to give greater detail to illustrate concepts within an overall scenario. The vignettes were used to identify and prioritize the initial set of development activities under the IT theme of their strategy.

1.3 The Shell Case[5]

1. Focus: Organizational
2. Sponsor: Corporate
3. Application Domain: Strategic Planning
4. Techniques Employed: Scenarios[6]
5. Impediments: First generation scenarios were rejected because they provided little basis for managers to exercise judgment; management at first was blinded to the inevitability of some changes that were made to seem more likely by their inclusion in plausible scenarios.

Key to overcoming impediments: Broadening of scenarios by including world forces external to the corporation and separating uncertainties. Demonstration of an impending crisis. Acceptance by management.

Players involved: Planning staff of the corporation and outside consultants

Desired outcomes: Creation of scenarios that informed planning.

Measures of success: Positioned Shell to handle the oil shocks better than its competitors.

Shell International Petroleum Company (Royal Dutch/Shell Group) began using scenarios prior to the 1973 oil shock. It was developed within the company by Pierre Wack and Edward Newland. This approach helped Shell anticipate the rise and subsequent fall of oil prices. In the mid-1980s, Shell began creating scenarios focusing on the future of the Soviet Union because it was a major competitor in the European gas market. Shell's success with scenarios spurred utilization of this technique in the private sector.

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[5] Peter Schwartz. *The Art of the Long View*, New York: Doubleday, 1996
[6] Exerts from Theodore J. Gordon and Jerome C. Glenn. *Methods of Forecasting*, "Scenarios", *African Futures*, Washington, DC: UNDP, 1994.

Their story is:[7]

Pierre Wack recounts the process through which he came to understand the necessity for the scenarios, so grounded in the "outer space" of the world outside the corporation - a world of supply and demand, shifting prices, new technologies, competition, business cycles, and so on - to come alive in "inner space", the manager's microcosm where choices are played out and judgment exercised. Three decades ago, in the early days of their work with scenarios, Shell planners initially developed "first generation" scenarios which simply quantified alternative outcomes or obvious uncertainties (for example, the price of oil may be $20 or $40 a barrel in a given year). Managers found such scenarios to be useless for long-term planning and decisionmaking, as they provided nothing more than a set of plausible alternatives that included no reason to assume that one or another would come about, offering no basis on which managers could exercise their judgment. Such scenarios resembled the straight line forecasting that Shell and other companies had engaged in for years, and ultimately rejected as inadequate for the complexities of the contemporary world.

Back at the drawing board, the Shell planners, led by Wack, zeroed in on the notion that there are forces at work in the world that seem well-nigh inevitable, unstoppable save by a major miracle or worldwide disaster that would mean the end of life as we know it. They called such forces *predetermined elements,* and sought in their futures planning to identify such elements and carry them through each of the scenarios they developed, sorting them out carefully from *uncertainties.* The art of scenario development, they found, revolves around careful research out in the world to identify the predetermined elements, and only then to weave stories around the interaction of these predetermined elements with the myriad of uncertainties future-seers must face.

For example, in the early 1970s, a period of recession in the oil industry because of low prices resulting from an oil surplus after the development of huge fields in the Middle East, Shell planners began to look at the world from the point of view of the oilmen of the Middle East whose countries small and sparsely populated did not have the means to absorb all of the wealth flowing into them from their one valuable resource. That growing surplus of cash would have to be reinvested, but where? No bank holding, or piece of real estate could appreciate in value as fast as the oil in the ground, especially if less oil were produced in order to keep the price high. Thus the Shell team was able to predict the emergence of OPEC and the rising price of oil as *predetermined elements* for the 1970s, forces that would drive *the global system.* Repercussions of these predetermined elements would of necessity involve shock waves to the economies of countries dependent on oil imported from the Middle East.

Uncertainties involved various countries' likely attempts at solutions, such as price freezes, or simple inaction, which would result in an energy crisis. So the Shell planners presented to top management, in 1972, a set of scenarios which took these predetermined elements and uncertainties into account. These scenarios varied so sharply from the implicit worldview then prevailing at Shell - *explore and drill, build refineries, order tankers, and expand markets* - that the planners realized they were unlikely to be taken seriously. So they constructed another set of "challenge scenarios" that postulated a continuation of present trends and business as usual.

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[7] Robbie Davis-Floyd. "Storying Corporate Futures", *International Journal of Future Studies*, Vol 1, 1995-97

These challenge scenarios included "miracles" in exploration and production, such as the discovery of major new fields in non-OPEC nations, willingness on the part of oil producers to deplete their resources at the will of the consumer to keep prices low and no natural disasters or wars that would generate a need for spare production capacity. The sheer improbability of these events forced the Shell management to realize that their business - as usual mentality - was blinding them to the inevitability of the coming changes. As a result, during the 1970s Shell was better positioned to handle the oil embargo and the dramatic rise in oil prices and in the power of the OPEC cartel than many of its competitors.

In the early 1990s one of the scenarios written by the Shell planners foresaw the likelihood of a rapid arid dramatic decline in the price of oil as the result of the discoveries of new fields outside of the OPEC sphere of influence, in combination with the energy conservation measures increasingly taken by consumers who did not want after the debacle of the 1970s, to remain overly dependent on imported oil, and who were increasingly aware of the finite nature of "non-renewable" resources such as oil. Positioning itself accordingly, Shell rose from fourteenth to second place among the oil multinationals during the mid-1980s as prices fell and other companies heavily over-invested, lost billions.

1.4 The Mont Fleur Scenarios[8]

1. Focus: National
2. Sponsor: Private Foundation for Government
3. Application Domain: Strategic Planning, Public Ethics
4. Techniques Employed: Scenarios, Participatory Methods
5. Impediments: Political inertia

Key to overcoming impediments: Involvement of local participants, all political parties, and the media; prevailing feeling of crisis.

Players involved: Team of scenario writers who conducted workshops with interest groups to develop the scenarios.

Desired outcomes: Peaceful resolution of South African political differences.

Measures of success: Brought together opposition political parties; stimulated a national agenda and discussion, and may have contributed to peaceful resolution of differences in South Africa.

The Mont Fleur scenarios take their name from the Mont Fleur conference center outside Cape Town where a diverse group of 22 prominent South Africans met in 1991 (three years before the end of Apartheid) with a team of scenario writers from Shell Oil Company to create four scenarios. Funded by a private foundation, the scenarios were intended to "stimulate debate on how to shape the next ten years" for South Africa. This is one of the few examples available

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[8] Drawn from special contribution for the report from Olugbenga Adesida, The Knowledge Network, Abidjan, Cote D'Ivoire, and Verne Wheelwright, University of Houston, Clear-Lake

where futures work has been done in very visible public forum, and impacts could be seen both in the short and longer term.

One of the first successes of this project was to bring together the people and ideas from the extremes as well as the center, including the South African government, the African National Congress (ANC), the Inkatta, and the far right wing extremists. The discussions were facilitated by Adam Kahane, a Shell employee at that time. The key axes to create the scenario space were political settlement and economic policy. The outputs were series of papers and a very effective video presentation of the scenarios. The results were four scenarios:

1. *Ostrich*, in which a negotiated settlement to the crisis in South Africa is not achieved, and the government continues to be non-representative.

2. *Lame Duck*, in which a settlement is achieved but the transition to a new dispensation is slow and indecisive.

3. *Icarus,* in which transition is rapid but the new government unwisely pursues unsustainable, populist economic policies.

4. *Flight of the Flamingos*, in which the government's policies are sustainable and country takes a path of inclusive growth and democracy." (www.gbn.org/scenarios/fleur/fleurintro.html)

In a very simple manner (using cartoons and bird fables) the scenarios highlighted the dangers ahead if a political settlement was not reached between the anti-apartheid movement and the Government. It also indicates the impact that bad economic policies could have on the future of South Africa. The scenarios were credited with nudging the National Party towards a negotiated settlement and convincing the ANC about the need for a sensible economic policy.

The scenarios were published in a 14 page insert in *The Weekly Mail* and *The Guardian Weekly*, major South African newspapers. Over the rest of the year, the team presented the scenarios to more than 50 influential groups throughout South Africa. A thirty-minute video presenting the scenarios was also released.

After the completion of the exercise, it was presented to all the major groups in South Africa, including the ANC and the apartheid Government of the day. The Mount Fleur scenarios exercise was an example of futures studies as a change agent and a tool for changing mind-sets. President Nelson Mandela of South Africa, then the leader of ANC requested to be shown the video more than twice as did then President De Klerk, the Cabinet, leaders of the ANC and other associations. A road show was undertaken in and outside of South Africa to present the scenarios. It was also shown to the World Bank and in several European capitals.

The success here is that the scenarios became widely discussed in South Africa at all levels, including taxi drivers and talk radio shows. The extent of the influence of the scenarios is not measurable, but seven years later we know that South Africa made a peaceful transition to representative government. It could have been much different.

1.5. Strategic Planning for the OPM Finance and Insurance Company[9]

1. Focus: Organization
2. Sponsor: Philanthropic
3. Application Domain: Strategic Planning
4. Techniques Employed: Scenarios, Gaming, Participatory Methods
5. Impediments: Political inertia

Key to overcoming impediments: Involvement of executives in a series of workshops that let them take "ownership" of the scenarios; belief that old norms were disappearing and a new and uncertain regime was emerging.

Players involved: The consultant company as well as executives from throughout the company.

Desired outcomes: A cohesive basis for planning in a rapidly changing world.

Measures of success: The scenarios have been distributed company-wide as a learning exercise for company personnel to nurture strategic thinking; in addition, scenarios were used by senior management to develop core strategies for the corporation.

Figure 3
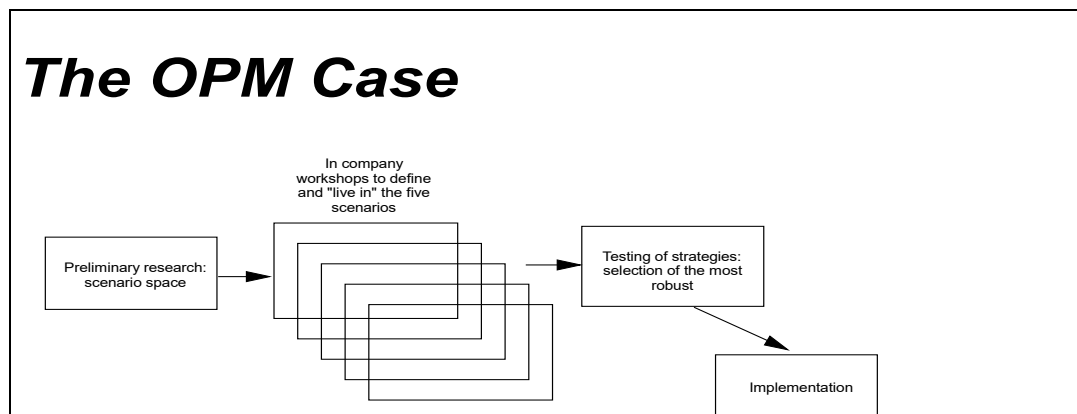
OPM (this real company has been given a fictitious name) was experiencing a rapid and fundamental shift in two aspects of its business environment Significant deregulation had taken place and the telecommunications and information processing technologies upon which it depended were changing at an unprecedented rate. New competitors with new products presented OPM with fundamentally new opportunities and risks by attracting the first-time attention of a whole new range of customers in a market rapidly becoming global. OPM's managers needed a fresh look at their medium (3-5 year) and long-term (10-15 year) goals and strategies. A perceived fundamental shift in the business environment, therefore, was the key

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[9] Quoted with permission of author from Charles W. Thomas, "Learning From Imagining the Years Ahead", *Planning Review*, May/June 1994.

motivation for taking up scenario-based planning. That understanding affected portions of the project as it proceeded - particularly the people involved, the topics addressed in the scenarios, and the kinds of workshops that were run. The fundamental need to more effectively manage the uncertainties in the future business environment remained the principal goal of the process.

In many ways this was a classic scenario planning assignment. The culmination of intensive interviews and a rigorous workshop process defined five plausible but very distinct future business environments (scenarios) focused on the planning needs of OPM. Those scenarios were developed in refined detail, each sufficient to suggest its own unique set of opportunities and challenges relevant to OPM business needs. Each scenario narrative was about ten pages and included a future history of social, economic and political events that quite plausibly led the reader from 1990 to 2005. Each narrative provided rich detail about business and society in 2005 and contained a significant number of scenario-contingent forecasts of employment, labor productivity, interest rates, federal deficit, and other indicators that corresponded to the assumptions and key forces for change in that scenario.

In several workshop settings the senior management team of OPM was introduced in detail to the scenarios (some were already quite familiar with them, having worked in the development process). The workshops were designed to let executives experience each scenario as if it were real and help them to plan and operate the company in that particular future.

Once the executive team learned to "live" in a scenario and temporarily make it their "real world", the next step was to use it to "stress-test" current corporate strategies. How effective is today's strategy set in "their" world of 2005? That provided the foundation from which the team crafted new goals and strategies to respond to the characteristics of their scenario. This process was repeated, though not always with the same people, in each of the scenario worlds. At the end of that process, OPM had five sets of scenario-contingent goals and strategies fine-tuned to ensure OPM competitive advantage in the five alternate scenario environments.

The next step in the process was a synthesis of lessons learned from each of the scenario excursions. This was in effect, a search for the elements of the goals and strategies that were robust enough to be viable across the range of scenarios examined. The usual goal is to consider whether there is a core set of strategies that will work no matter how the future evolves. In this case something extra emerged. The planning "trips" taken by the management team into a number of very different future environments lead several executives to question the very definition and purpose of their firm. To survive they had to consider exactly what business they should be in and what role they wanted for themselves.

Based on this work, the senior management team developed a set of core strategies and they have continued to use scenario back-drops to test and amend those strategies. Primarily those strategies resulted from scenario-derived insights into how their customers' needs and expectations would be changing. A new segmentation scheme has been adopted, and an entirely new set of services and marketing approaches has been initiated.

A program has also been instituted to acquaint people at all levels of the corporation with the scenarios. Corporate staff are introduced into each of the various futures worlds but less as a

planning exercise and more as a learning exercise. The program is encouraging and nurturing strategic thinking throughout OPM. Among other results, it has improved employee morale and led to some locally initiated new business ventures.

1.6 An Example of the Use of Futures Techniques for the Stimulation of Innovation

1. Focus: Organization
2. Sponsor: Corporate
3. Application Domain: Stimulation of Innovation
4. Techniques Employed: Morphological analysis, Delphi, Participatory Methods
5. Impediments: Internal disagreements and lack of communications between two divisions

Key to overcoming impediments: Involvement of executives in workshops; use of techniques that separated hard information and judgments from the originators of the information and judgment.
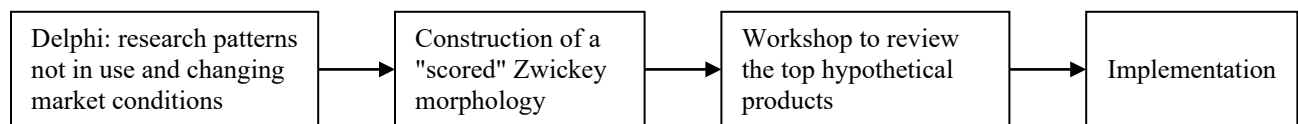
Players involved: The consultant company as well as executives from appropriate divisions.

Desired outcomes: A set of new products based on proprietary technology already owned by the company.

Measures of success: New products based on existing proprietary technology were identified and pursued by the appropriate divisions.

Figure 4

The Innovation Case

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┌─────────────────────┐   ┌─────────────────┐   ┌─────────────────┐   ┌─────────────────┐
│ Delphi: research    │   │ Construction of │   │ Workshop to     │   │                 │
│ patterns not in use │ → │ a "scored"      │ → │ review the top  │ → │ Implementation  │
│ and changing market │   │ Zwickey         │   │ hypothetical    │   │                 │
│ conditions          │   │ morphology      │   │ products        │   │                 │
└─────────────────────┘   └─────────────────┘   └─────────────────┘   └─────────────────┘
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The marketing department of a consumer products company was frustrated by its company's lack of new products. There had been some great market successes in the past but recently, it seemed, the flow had stagnated. Yet the research department of this company was well endowed and they were turning out patents at a fair clip. Somehow, the patents did not manifest themselves into new products. How, they asked, can we get the ball rolling again?

A Delphi questionnaire was prepared and sent to people in research, in marketing, and in their advertising agency asking on the one hand for descriptions of proprietary inventions on which new products might be built, and on the other, the products that seemed to be most needed on the basis of recent market research. In the analysis of these data, the top new product candidates were listing, and in the fashion of the Zwickey morphology, dissected into subsystems and subsystem elements. For example, a new soap might have subsystems of odor, texture,

surfactants, etc. Each of these in turn were broken down into all possible means of accomplishment. The number of possible permutations was very high.

However, each of the subsystem elements was "scored" according to the possibility of being proprietary (from the Delphi) and meeting forecasted changing market conditions and changing consumer needs. These scores were used in a computer program to rank order the permutations by level of overall attractiveness.

A workshop was held which all contributors to the Delphi attended. The top rated hypothetical products were discussed in detail and "invented" by the group. They found that patents already on the shelf had excellent potential applications and further development programs were designed and implemented. Communications between the market and research personnel improved.

1.7 Entry Strategy Based on Analysis of Competitive Possibilities[10]

1. Focus: Organization
2. Sponsor: Corporate
3. Application Domain: Strategic Planning, Competitive Analysis
4. Techniques Employed: Environmental scanning, numerical modeling
5. Impediments: Uncertainty that someone from outside the industry could understand the nuances of competition and could generate sufficient information from available sources

Key to overcoming impediments: Involvement of executives who will use the data; demonstration that useful information could be obtained.

Players involved: The consultant company as well as executives from appropriate divisions.

Desired outcomes: Insight into potential market niches unfilled by competitors.

Measures of success: Development of a new product that filled a market niche moves.

Competitive analysis by a company within an industry is an attempt to use futures research techniques to forecast how a competitor might act or react to changing circumstances. Thus this activity involves gathering information about the competitor's products and markets from publicly available sources, and inferring a decision process that might also be in place when the competitor is confronted with changing circumstances in the future. Although large corporations dedicate significant resources to competitive intelligence, business intelligence is a crucial asset for new firms poised to enter developing markets. Through competitor analysis of established firms, new companies gain knowledge that leads to market-share and success.

As an example, a start-up company, the New York Bulb Company, employed competitive analysis. As a small manufacturer and distributor of light bulbs to businesses and residences

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[10] From NY Bulb Press Release 5/12/98; NY Bulb Internet site: www.nybulbs.com and The Futures Group web site: www.tfg.com

across the New York Metro area, New York Bulb discovered that General Electric's and others' standard light bulbs had a shorter life-span just in the greater New York area. Company research and testing showed that New York City's power supply was to blame for the shortened life spans of these traditional light bulbs. The city's electrical infrastructure is the nation's oldest: voltage fluctuations are common. These power surges cause damage to traditional light bulbs designed to operate at a consistent voltage. The end result: standard incandescent light bulbs only last 750 hours in the city that never sleeps.

In order to solve the problem and fill this niche, The New York Bulb Co. developed a multi-support filament that compensates for New York City's voltage fluctuations. This new design modification to a century-old product resulted from analysis of customer needs and already-existing market information. The newly designed New York Bulb has a 3500-hour life span-four times the life of an ordinary incandescent light bulb. Lower cost-per-hour, as well as less frequent installations of these long-life bulbs helped The New York Bulb Co. capture the city's market for light bulbs. According to a New York Bulb Co., General Electric has lost more supermarket shelf space recently in New York City than it has in the past fifty years combined.

New York Bulb demonstrated that industry knowledge paired with competitor analysis helps niche product development, filling a market need.

1.8 The Slidell Priorities Convention[11]

1. Focus: Local
2. Sponsor: Government
3. Application Domain: Strategic Planning
4. Techniques Employed: Visioning, Participatory Methods, and Strategic Planning
5. Impediments: Institutional Inertia

Key to overcoming impediments: Involvement of local citizens; the mayor was the champion.

Players involved: Stakeholders.

Desired outcomes: A strategic plan for Slidell, LA.

Measures of success: Vision is being pursued, witness the issuance of bonds for key projects and construction of transportation and convention facilities. Also a new feeling of community.

In early 1985 Salvatore Caruso was elected mayor of Slidell, Louisiana. In November of that year he convened a meeting of 524 citizens (stakeholders) representing every segment of the community for the purpose of establishing priorities for strategic planning of the city's future, and creating a vision for that future. After filling out a long questionnaire dealing with city

[11] Submitted by Verne Wheelwright, Department of Studies of the Future, University of Houston, Clear-Lake, Texas

priorities, they were divided into thirty groups where they discussed revenue sources for the city as well as commercial/industrial development. Following the convention study groups were formed among the city employees and among the general citizenry.

Among the quantifiable benefits resulting from this strategic planning/visioning exercise have been a $31 million bond issue used for drainage, flood control, water and infrastructure. A park-and-ride facility was constructed for the benefit of commuters working in New Orleans, a result of recognizing Slidell's position as a bedroom community in the need of better transportation solutions. A new water tower has been constructed on the south side of Slidell which improves both water pressure and circulation in that area. A new convention center is in the works now. A sizable non-quantitative benefit has been the development of an attitude of community among the citizens.

It is interesting to note that this strategic planning and visioning project originated with the mayor (a member of the World Future Society) and was carried out under his direction. There was some assistance from the University of Louisiana particularly with the analysis and tabulation of the survey results.

1.9 San Angelo Regional/Urban Design Assistance Team (R/UDAT) Project[12]

    1. Focus: Local
    2. Sponsor: Professional Association
    3. Application Domain: Strategic Planning
    4. Techniques Employed: Visioning, Participatory Methods
    5. Impediments: Institutional Inertia

    Key to overcoming impediments: Involvement of local citizens; concern about current directions of change.

    Players involved: Stakeholders; academics; architects who convened the sessions (but stood to benefit from the results).

    Desired outcomes: A strategic plan for San Angelo.

    Measures of success: Vision is being pursued, witness construction of new facilities, changes in real estate values, new feeling of community.

The Regional/Urban Design Assistance Team (R/UDAT) is a program of the American Institute of Architects. In 1992 a R/UDAT team met with a group of San Angelo citizens who were concerned about their deteriorating city. Several meetings involving hundreds of citizens followed, bringing out the concerns of the citizens about their heritage (Fort Concho), their ethnicity (equal parts Hispanic, Afro American and Caucasian) and the future of their community.

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[12] Submitted by Verne Wheelwright, Department of Studies of the Future, University of Houston, Clear-Lake, Texas

The meetings led to a vision and then to a workable comprehensive plan. City Hall came aboard reluctantly then became a strong part of the team, raising $2.7 million which was then leveraged to $10 million plus private investments. With those funds the city completed the key elements of their plan: celebration Bridge, a pedestrian Bridge which links parts of the city separated by a river, bringing the community closer together; a park near Celebration Bridge, an area that had previously been vacant land; a visitor's center at Fort Concho; renovation of the old Santa Fe railroad depot; restoration of the formerly vacant Cactus Hotel; an assortment of restorations and civic improvements.

As a result of this community effort property values have increased thirty percent in three years, and vacancy rates are very low, plans are in the works for a community center, a fine arts museum and permanent farmers market. The American Institute of Architects considers the San Angelo project to be the most successful R/UDAT (Regional/Urban Design Assistance Team) project ever. As to the question, "Is this a successful futures project?", we would have to qualify our answer. Yes it was successful. Yes it included visioning and strategic planning, but the "futuring" was guided, at least in part, by the architects who hoped to win the contracts for the physical facilities that resulted. At first glance, that may appear to taint the results, but in fact it is little different then strategic planning in a corporation with the effort guided by management who plans to profit by increasing productivity. Information about R/UDAT may be found at http://www.aiaonline.com

1.10 National Foresight Programs [13]

1. Focus: National
2. Sponsor: Government
3. Application Domain: Strategic Planning
4. Techniques Employed: Environmental Scanning, Delphi, Scenarios
5. Impediments: For large scale projects, funding can be an issue; credibility of results; and - for some countries at least - aversion to planning at a national level.

Key to overcoming impediments: Involvement of key persons, support of government.

Players involved: Government agencies and large expert samples.

Desired outcomes: Background information for R&D and industry; in some countries, agendas for government sponsored research.

Measures of success: The number of countries that have instituted such exercises and incorporated the results into national plans.

Government foresight programs are, in general, systematic efforts to identify promising technology and science directions that may have importance to national policy. Many governments undertook,

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[13] Many of the references in this section come from the special issue of *Technology Forecasting and Social Change*, January, 1999 devoted to Foresight programs.

then dropped such projects, but now interest is again high and foresight programs now exist in Japan, Central Europe, Holland, Australia, UK, France, Spain, Italy, Korea, Finland, and elsewhere. Governments that have begun more focused studies include China, Singapore, Costa Rica, and Russia. Furthermore similar programs have been initiated by international organizations, including United Nations Educational, Scientific, and Cultural Organization (UNESCO), the Forward-Studies Unit of the European Commission, Organization for Economic Cooperation and Development (OECD), the Africa Futures project of United Nations Development Program (UNDP), and others. The principal tools of these studies are Environmental Scanning, Delphi and scenarios.

Perhaps the earliest example of this genre is the very large scale Delphi study undertaken by the Japanese in the early 1970s in which they asked a panel composed largely of scientists and engineers to provide judgments about the timing of technological advances and inventions. The time table produced by this study guided technology policy in that country, at both the governmental and industrial levels, and the study has been repeated continuously at five year intervals ever since.[14]

Terutaka Kuwahara recently described the scope, design and impact of these studies.[15] He summarized the studies as follows:

Technology Forecast Surveys

	Survey period	Fields	Topics	Forecasted period	Effective responses
First survey	1970-71	5	644	30 years to 2000	2,482
Second survey	1976	7	656	30 years to 2005	1.316
Third survey	1981-82	13	800	30 years to 2010	1,727
Fourth survey	1986	17	1,071	30 years to 2015	2,007
Fifth survey	1991	16	1,149	30 years to 2020	2,385
Sixth survey	1996	14	1,072	30 years to 2025	3,586

Most Delphi studies assume that relatively small sample sizes will produce useful answers; the studies are not taken to produce statistically valid data but rather are assumed to yield judgments of a particular expert group. The Japanese studies, on the other hand, involved thousands of respondents. The studies covered essentially all science and technology fields, including materials and processing, electronics, information, life science, space marine science and earth science, resources and energy, environment, agriculture, forestry, and fisheries, production and machinery, urbanization and construction, communication, transportation, health, medical care, and welfare.

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[14] Both authors of this report have consulted with Japanese agencies on these studies; Gordon for the first large scale study in 1970 and Glenn more recently.

[15] Terutaka Kuwahara. "Technology Forecasting Activities in Japan", *Technological Forecasting and Social Change*, January, 1999.

Kuwahara describes the process, which is under the direction of the Science and Technology Agency (STA):[16]

> Prior to a survey, a technological forecast Steering Committee is formed, with 13 subcommittees set up around it. The leader of each subcommittee is a member of the Steering Committee.... Leaders of technological fields and subcommittees are appointed by the National Institute of Science and Technology Policy, which implements the surveys, after consultation with expert groups and the appropriate ministries/agencies.... More than 100 senior researchers are involved in the design of the survey and in the analysis of the results. They have responsible and effective positions in their institutes, universities, and enterprises. Furthermore, approximately 3,000 researchers participate in the survey as respondents.
>
> The surveys have been financed by a research fund controlled by the Council for Science and Technology for use in policy planning, with the survey results submitted to the council as a report.

He reports that the work indeed facilitated decisionmaking in Japan:

> As it is such a large-scale survey conducted on a regular basis, its findings are widely used by the Council for Science and Technology and various ministries and agencies as basic data for the formulation of national science and technology policy, as well as for the industrial sector.
>
> Let us add two selected policy cases... The foresight activities on early earthquake detection were always corrected toward the further future in subsequent STA forecasts.... Yet even before the Kobe disaster, which was completely unforeseen, foresighting activities kept this issue on the agenda in technology policy, admittedly on a low level.... In 1993, before the Kobe earthquake, a special measures law for earthquake disaster prevention passed the Diet. The research and development budget was at about 16 billion yen in 1996. Foresight studies and the constant shifting of realization times were helpful in pointing to the unresolved issues in years of no earthquakes.
>
> The second example is solar cells, which have been a top Japanese priority for many years. The forecasts were initially delayed, but since the mid-eighties, they have been stable. Clear impacts of STA foresighting on MITI's priority programs are visible. Some firms overdid their research and development investment because they were as optimistic as the early forecasters but MITI backed this overinvestment and thus accelerated the real progress - a case of self-fulfilling prophecy? Also based on the forecasts, diverse regulation opportunities helped get mass production started. Judging from these observations, Delphi results in Japan not only are considered learning techniques-that is, sources of valuable general insight for policy makers and managers - but also in some important cases have triggered action plans, even in cases in which the time estimation was not very accurate.

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[16] Ibid.

The designs and results of several foresight studies conducted by government agencies in other countries are reported below:

In the **Netherlands** two government organizations have been involved in formalized future studies: the Ministry of Economic Affairs which performed a Delphi-like study of leading edge technologies, and the Ministry of Education and Science. Within the Ministry of Education and Science was established a Foresight Steering Committee. Here the foresight process is constructed to assure that priorities in S&T make contributions to society and that priorities take account of the characteristics of the field in the Netherlands. The method used is primarily scenarios. More quantitative methods of the past have given way to qualitative approaches. Studies are sectoral and detailed (e.g. nanotechnology). The goal of much of this work is not prediction (as in the case of the Japanese work) but is designed to stimulate discussion and to "influence national and other strategies." [17]

In **Germany**, foresight work generally has the objectives of: "direction setting, determining priorities, anticipatory intelligence, consensus generation, advocacy, and communication and education."[18] The principal agency responsible for coordination at the national level... contracts for the performance of the work. Several different methods have been used. One study, "Technology at the Beginning of the 21st Century", used relevance tree techniques to identify critical technologies (see Case Study 2.6: *An Example of the Use of Futures Techniques for the Stimulation of Innovation* which employed a morphological approach); another major study was built on the Japanese experience and used their data as the basis for a large scale Delphi to forecast developments that could contribute to the formation of S&T policy. A second such Delphi exercise is now underway. The studies are viewed as providing information for political choices.

Austria's work is coordinated by the Ministry of Science, Traffic and Arts. The method employed is Delphi. The general objective of foresight work is to promote innovation.

In **Hungary**, foresight studies have been discussed but not yet implemented; when the studies are performed they will focus on strength and weaknesses in Hungarian science and technology and utilize a Delphi inquiry modeled after the UK foresight work.[19]

A large-scale foresight program is also underway in **Britain**. The objectives of this program were stated as follows:[20]

> "(a) to increase UK competitiveness, (b) to create partnerships between industry, the science base and government, (e) to identify exploitable technologies over the next 10-20 years; and (d) to focus the attention of researchers on market opportunities and hence to make better use of the science base.

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[17] Knut Blind, Kerstin Cuhls and Hariolf Grupp, "Current Foresight Activities in Central Europe," *Technology Forecasting and Social Change,* January, 1999, pp 13-36.
[18] Ibid, refering to Martin, Ben and Irvine, J. *Research Foresight: Priority Setting in Science*, London: Pinter, 1989.
[19] Ibid.
[20] Ben Martin and Ron Johnson, "Technology Foresight for Wiring Up the National Innovation System: Experiences in Britain, Australia, and New Zealand", *Technology Forecasting and Social Change,* January, 1999, pp. 37-54.

The program has been organized by the Office of Science and Technology (OST) in cooperation with other government departments, and has involved extensive use of consultants[21]. It has been overseen by a Steering Group made up of leading figures from industry, universities, and government. In addition, 15 panels (again consisting of experts from industry, academia, and government) have directed the foresight efforts in different sectors.

The program has had three main phases. In the first "pre-foresight" stage, a number of "Focus on Foresight" seminars were held to explain to the industrial and scientific communities what foresight is and why it is important, and to seek their views on how best to carry it out. A "co-nomination" exercise was also conducted in which experts were asked to identify other experts in their area. The resulting database was used in helping to determine the membership of the sector panels, and in constructing a pool of experts on whom each panel could draw for information and advice.

The second stage was the main foresight phase. In this, panels began by holding discussions to set the scene in their sector and to identify strengths and weaknesses. They also consulted with their pool of experts, as well as engaging in wider consultation through regional and topical workshops. In addition, a major Delphi survey was carried out with questionnaires being sent to some 7000 experts. All these information sources were drawn upon by panels in identifying technological priorities for their sector. Each panel produced a preliminary report which was circulated for comment and then revised.... They began by analyzing the sector in terms of its scope, characteristics, contribution to GDP and so on, before benchmarking UK strengths and weaknesses. They identified the main trends, driving forces, barriers and challenges, and analyzed a range of scenarios. Next, they examined a range of technological opportunities for making contributions to wealth creation or improved quality of life. Each report then narrowed these down to a list of priorities together with a set of key recommendations for their implementation and for future technology foresight in the sector."

In **New Zealand**, an increase in budget for S&T triggered a discussion of priorities for directing the expenditures. The foresight study involved a series of expert panels, each identifying strengths and weakness and opportunities and threats within their areas of expertise; each of the panels produced a report. In addition a quantitative economic analysis was performed to evaluate the public return of research funds. Other studies are planned.[22]

Australia's program was extensive.

"The major foresight exercise in Australia was carried out between 1994 and 1996.... The study was to be a demonstration exercise designed to increase the orientation of Australians toward managing the future and to show that there are robust mechanisms available to help achieve that goal. It set out to examine possible national and global changes over the next 15 years and to identify Australia's key future needs and opportunities which rely on, and could

[21] Georghion, L., "The UK Technology Foresight Programme," *Futures*, 28, 1996., referred to in Martin and Johnson, op. cit.
[22] Op. Cit., Ben Martin and Ron Johnson

be affected by, scientific developments and the application of technology. The aim was to provide an information base that would enable government and industry to make better informed and longer-term decisions on the development and application of science and technology (S&T).

The methodology was based on the assumption that building rich pictures of alternative futures, combining trends (expected futures), scenarios (possible futures), and visions (preferred futures) should provide a basis for assessing the ability of the current S&T system to meet future national needs in a variety of external circumstances. From this assessment, critical "levers" for change were identified... six Key Issues… were established; innovation and entrepreneurship, a technologically literate society, capturing opportunities from globalization, sustaining the natural environment, continuous improvements in community well-being, and building a forward-looking S&T system. Trend analysis and scenario construction were combined in a roundtable involving about 50 "stakeholders," broadly chosen, for each issue. In addition, in-depth foresight studies were conducted through live partnerships, involving more than 20 major Australian organizations, on urban water life-cycles, broad-band communication technology, neurodegenerative diseases in the aged, shipping, and youth. Each partnership selected and applied their own foresight methodology, under guidance… and produced a set of recommended actions.

The project has demonstrated that foresight is a useful tool in helping to agree and move toward national goals for the future.... As in other foresight programs, the [study] has also shown that foresight can help to build consensus, assist communication between different groups, and act as a focus to developing a longer-term commitment and visions of the future... Nevertheless, although the value of the ASTEC foresight process has been widely acknowledged, the direct outcomes have, to date been somewhat limited. The priorities for action... have largely been implemented or examined in a low key manner... An explicit commitment to continued foresight has not yet been forthcoming, although there has been undoubtedly a marked rise in the use of foresight processes, and in particular scenario planning."[23]

Several foresight studies have been conducted in **France** at the national and regional levels. One major study replicated the large scale Japanese and German Delphi's. It found:

"that the French culture of *prospective* tends to favor methods of scenarios rather than Delphi: instead of looking for consensus about big trends, specialists of foresight tend to think in terms of contrasting but internally coherent scenarios.... (In addition) many experts stressed the missing normative dimension. For certain technological innovations, instead of answering on the probability of occurrence they would have preferred to give their opinion on the desirability."[24]

One of the other studies resulted in an assessment of technologies "critical" for France, and that work was instrumental in the allocation of industrial research subsidies.

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[23] Ibid.

[24] Jean-Alain Heraud and Kerstin Cuhls. "Current Foresight Activities in France, Spain, and Italy", *Technological Forecasting and Social Change*, January, 1999, pp. 55-70.

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Given these case studies, what conclusions can be drawn? Certainly there are not enough cases here to form any conclusions that have statistical validity, but at least a few inferences appear. (In the following analysis, the national foresight programs are treated as a single entry.) Examples within the ten cases represent a broad range of levels: corporate, local, state, and national; and a broad range of sponsors: corporate, government agencies, private foundations, and professional associations. Most of the cases were examples of futures research applied to strategic planning, but product innovation and competitive intelligence appeared as well.

Taken together, the techniques were:

Technique	Applications
Participatory methods	6
Scenarios	5
Visioning	3
Environmental scanning	4
Delphi (and Snowball)	3
Morphological Analysis	1
Numerical Modeling	1
Vignettes	1
Gaming	1
Strategical Planning	1

Of course other choices would have yielded other distributions of methods, but this distribution may not fall far from the mark: participatory methods are important to eliciting support for such studies (as indicated below) and scenarios are popular as a means of exploring alternate strategies. Morphologic analysis is not well known and while numerical modeling is very important, it is used for special purposes that are not reflected in the choice of cases.

It is very instructive to examine the impediments stated for the cases. We see echoes of the impediments identified by the Global Lookout Panel and the interviews in these cases (see Chapters 3 and 4). Institutional, financial, planning inadequacy, and political factors are all represented.

Among the strategies for overcoming impediments, there was consistency across studies of vastly different sorts. Fully half of the cases stated that involvement of the decisionmakers or participants was a key element in the initiation and success of the projects. In addition, factors aiding in implementation were the existence of apparent crises and a priori acceptance of the process by persons who would be involved in the implementation.

The desired outcomes ranged from the selection of new commercial products to the peaceful change of governments; from influencing public awareness to determining government policy. And measures of success included visible action resulting from the studies, the success of products in the market, and the cohesive views of the future that such studies engender in organizations.

2. Worldwide Review of Foresight Institutions by Pacific Northwest Battelle National Laboratory for the U.S. Department of Energy

In 1996-97, the Department of Energy (DOE) commissioned Battelle Northwest National Laboratory to study outstanding "foresighting" programs, review their common aspects, and synthesize the lessons learned from them. DOE was considering creating a formal foresight capacity and wanted to learn from the experience of others prior to its own design. Both the AEPI and the Millennium Project were included in the seven that Battelle selected; several of the other national programs have been discussed in the previous section. The Battelle report provides information germane to the current report; and therefor it is summarized below. [25]

Methods: Battelle found that several methods were used in the cases they studied; principally: Trend Analysis and Emerging Issues Scanning, Delphi, and Scenario Construction.

Focus: For many of the cases, the focus was on science and technology -

"either as the sole subject of inquiry or as one of the main driving forces of the future. However the way this focus is expressed varies rather significantly across these various programs, with Japan representing one end of the spectrum (a focus on specific science and technology breakthroughs with less direct attention to the broader social context) and with Australia representing the other (a broad focus on defining social, political, and environmental needs of the future and determining how to influence science and technology to meet those needs)...."

Areas of Agreement: In all cases the underlying assumption was that the future is essentially unpredictable; therefore none viewed themselves as seeking "accurate" predictions, but rather sought ranges of plausible outcomes. Many saw the process itself as providing the payoff for the activity since it tended to create a framework for discussion and induce flexible thinking.

Impacts. Battelle found that

"Foresighting activities cause impacts to organizations (or society) in a variety of ways most of which are extremely difficult to measure. As a result, foresighting organizations tend to rely on high-level buy-in and public legitimization as signs of their effectiveness."

Requirements for success. The Battelle team found that success could be enhanced by recognizing the following:

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[25] Skumanich and Silbernagel. *Foresighting Around the World*, Battelle Northwest National Laboratory, 1997

- The need for staffs with one or more individuals perceiving a need for their organization (or society) to consider future issues and to prepare for future opportunities challenges and obstacles.

- Program champions who are effective in getting a program started, although programs can also be started by more general efforts.

- Proving responsive to "client" needs (e.g., decisionmakers or societal needs in the case of national efforts)

- Involving the relevant participants in the process

- Experiencing some kind of legitimizing process"

Chapters 3 and 4 build on and extend these requirements and will be integrated in Chapter 5: Conclusions and Recommendations.

3. Results of the Interviews

This chapter shares the views of decisionmakers and policy advisors – the recipients or consumers of futures information – about the problems they have encountered with the use of early warning information in their decisionmaking. This second source of information provides richer, subjective information to the impediments to the successful implementation of futures research in decisionmaking, and hence, a source of key lessons learned for Chapter 5: Conclusions and Recommendations.

Seventy-four interviews were conducted with decisionmakers and policy advisors via Millennium Project Node chairs around the world.[26] The interviews asked:

1. The types of impediments that could delay action.

2. For one or two previously identified global issues or opportunities the impediments that they thought could delay specific actions.

3. Characteristics of information that could lead to more timely decisionmaking.

4. The moral and ethical issues that could affect the will to act.

The interview protocol was designed to produce qualitative and judgmental information that could be used by the study team to structure the questionnaires and to identify promising sources for more detailed work.

The interviewees were presented with a list of possible impediments to the timely use of futures information in decisionmaking. They were also asked to add to the list. The given list included:

1. **Financial** impediments, such as lack of funding or the fact that the people who ought to pay are unwilling to do so.

2. **Institutional** impediments, such as the fact that no one has responsibility to act.

3. **Political** impediments, such as the action interferes with national interests or it has been proposed by a political opponent.

4. **Cultural** impediments, such as roles of men vs. women, racism, or ethnocentrism.

5. **Psychological** impediments, such as the fear of making a mistake or looking silly.

6. **Information** impediments, such as the lack of reliable and sufficient data and information, or the uncertainty of the risk.

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[26] Appendix A contains the full interview protocol used in this portion of the study and Appendix C lists the names of the people interviewed, as well as those who responded to the questionnaires. As can be seen, these people were in decision making roles and represented some 50 countries.

The interviewees added several categories:

7. Educational impediments

8. Impediment from lack of policy maker professionalism

9. Non-financial resource impediments

10. Planning system impediments

11. Moral and Ethical Issues

Using these categories, the interviewees provided many examples and extensions, which are illustrated below.

Financial impediments

Certainly this is an important problem in large projects. Agenda 21 has not been implemented all over the world because of financial reasons.... The poorer the country is, the more important financial impediments become.

Political leaders use the excuse of financial impediments to justify their inaction. It's a matter of priorities, not money.... Money is being used for secondary and silly projects, and does not reflect visions.... In Slovakia there was a chance to create a nation-wide discussion to create a new vision of a sustainable society, but politicians and policy makers have their own interests connecting with power.

Increasing democracy increases budget accountability; hence, we have to be more responsible on financial matters. Previously, we spent on what ever we wanted.... Resource allocation is based on a model of society that is decades old and does not reflect current society; secondly, the requirement for greater financial accountability actually reduces flexibility.

Too often political institutions only express interest in problems to get money from the state budget. They are less concerned if it is a priority for society as-a-whole or if they are proposing the correct solution. Ministries want the more expensive approach, which is very often less effective. For example, the Russian-American space project is not financially efficient.

I do not think that there are inadequate resources; it is how we use what we have. A great part of our resources is spent on the development of the military complex and more middle-level developed countries are involved in this.

Institutional impediments

Sometimes the legal systems do not exist upon which to base the action. We also need new safe international channels, through which sensitive information can travel that also provides protection to sources of information. Such channels exist in the national systems, but not in the global systems.

Institutional impediments are less important in authoritarian regimes.

The lack of institutional and legislative infrastructure is blocking investment into Russian industry…. Banks have money, but there are not many channels, which transfer financial resources to small and medium sized companies. As a rule, banks deal with solid, big clients. There should be some transitional institutions between banks and companies. Also, there is no protection for investors' rights, which hampers investment.

Why are space opportunities and achievements not implemented in other spheres of activity and in industry? I think that one of the reasons is the isolation of our space agency's activities from the Ministry of Economic Affairs and the Ministry of Industry.

The lack of coordination also affects the time between a problem's emergence and implementation of appropriate actions.

International political institutions serve the interests of a small part of the population and keep the interests of a couple of nations in the focus. The attempt of some nations to build the world in accordance to their own model and interests will not be successful and is a very dangerous illusion. Partnership of civilization is a model of policy development and implementation of the new millennium, but international and national political institutions do not understand it.... Many developing countries lack the necessary organizations and groups, such as NGOs.

Although it is true that coordination yields better assessments and solutions to social problems, which are most of the time very complex and ill structured, such coordination is one of the hardest objectives to achieve. The problem lies in part in the flawed process of structuring complex problems; the visibility of the problems that each government institution deals with (for example, trading with a neighbor may be higher on the political agenda than the problem of aging minorities).

Political impediments

Short-term election pressure prevents decisions on long-term issues.... Early warning and action advice should include political trade-offs (Chines energy requirements vs. Global Warming).

Political early warning time horizons are shorter than the lead-time of general humanitarian and social problems. Political early warnings should lead immediately to quiet UN talks to identify solutions. We need to create and use more than just political-

diplomatic methods to resolve conflict and then we should be more selective about the methods we use. For example, the Czechoslovakian example was resolved through the World Court through a three years process that reduced the ethnic emotions in the issue. Other conflicts have been resolved by local courts, which removed the political issues. Legal methods should be used more.

The early warnings come without advice on the ultimate trade-offs. As a result, they are hi-jacked by single-issue groups, and governments find it very difficult to adjudicate between the various interests, which do eventually emerge. These issues are not black and white, or even shades of gray, they are often apples versus pears. There is a wide range of uncertainty.... There is no mechanism for arriving at global views - where the emerging key issues are now all global. Even the G8 are, in the context of WTO, in conflict. Ironically, the G9-99 have been more constructive in implementing WTO policies.

Any problem is interdisciplinary and could be solved more effectively and rapidly if different actors are involved from the start.... If we distribute this information post factum then industry and regions need time for adaptation of achievements, but if they are involved from the beginning, then it could shorter time as well as improve financial possibilities.

Consensus among different actors and transparency of policy itself have a great impact and reduce the confusion as to who has the responsibility for implementation.

I don't think China has political impediments.... The centralized leadership and pluralistic economy will cause conflicts, just as in the current China.... If suggested actions are in conformity with ideology and the key positions of national/international policy, then these actions are accepted. In this case, all of the obstacles play a secondary role.... Contradictions can be solved, financial resources can be found.... Ideology plays the key role. Policy makers will only use the results of this questionnaire that is in conformity with ideology.

Political instability hampers the development of coordinated actions and inhibits the formation of a common view of our present and future.

The problem does not seem to be one of having the information about the early warning, but of recognizing its importance vis a vis the position, interests, motivations, and beliefs of the particular stakeholders. If the decisionmaker or stakeholder does not feel some kind of threat, it may not act upon the information.

Cultural impediments

Cultural impediments have to do with inconsistencies or conflicts in the systems of shared beliefs, values, customs, and behaviors that people use to cope with their world and with one another. People will therefore, chose a decision that is in line with his/her

beliefs, values, customs and behaviors, that seems logical in that person's or group's worldview. A cultural impediment is then relative.

The impediments do not stem from gender roles such as men vs. women or from racism, but the meaningful distinction is based on community size... Small communities are at a great distance from the sources of information, therefore they are more conservative and resistant to changes.

Stereotypes play a very important role at every level of thinking. In order to conform to new realities, one should change their own stereotypes of thinking and behavior.... We are all in a transition to a knowledge-based society. In order to move forward one should understand what is changing around us, what is my (or my corporation's or my country's) place in these new conditions, what should be changed and how we should change ourselves, our strategy, our models of thinking, our tools and methods.

The stereotypes of thinking which have been formed within industrial society hamper the development of adequate actions and have resulted in ineffective distribution of financial resources, political barriers and weak political institutions. The strongest obstacle is the paradigm of thinking of industrial society.

Psychological impediments

Psychological impediments are reduced by information that reduces the uncertainty of response to a decision.

Some decision-makers do not listen well. For example, an early warning was given to Stalin that stated that the war would begin in 1941, but he didn't believe it and said, "No, it will start in 1942." In this case, a two-track approach might have been necessary.

Many of political leaders are interested in good jobs, but they are lax about their work. In this respect a great number of countries of central and Eastern Europe are taking on the characteristics of banana republics.

Western society has lost the sense of evolution toward goals.… The cult of leisure has been starting to dominate and at the same time attitudes toward work are changing.... Motivations of people push or hamper the implementation of actions.... Lack of a sense of sacrifice, materialistic attitude.

I do not think that fear of making a mistake should be at the top of the list. Instead, the lack of confidence and morality, and ideology play the key roles. In addition, the loss of goals and ideas, which form the background for building policy at different levels as well as the building of family and the lives of people are key.

Information impediments

The most important way to reduce the time from information to action is to give precise information with only the essential information distilled and transmitted by a person who is trusted by the policy maker, but who is external to the usual political-governmental personnel system. The actions suggested to address the early warning should be connected to national objectives and strategy, and communicated in political, cultural, and social terms, not technical terms. Make an information system rather than trust in personal expertise.

In-depth understanding of the problem itself is already 50% of successful solution of a problem…. Provide information that reduces uncertainty of response to a decision.... Well-explored problems provide the opportunity to develop adequate actions, to understand the consequences and mutual influence and interdependence of actions, and different alternative approaches to the problem's solution. But this is more and more difficult to do: problems become more and more complex; one may observe a lack of information about uncertainty of consequences.... Complexity theory can also help to develop effective actions and mechanisms.

Modeling of different influencing events and their interdependence could provide an in-depth view into the problem and actions. It gives the opportunity to keep the problem under control and to develop adequate mechanisms of regulating, to explore the sequences of actions, linkages between different branches of development in their evolution. Such network modeling gives rise to new ideas, analysis of priorities, and clarifies resource requirement.

Too often previous early warning signals have proved to be unreliable.... I would like to add: the need for an inventory of capabilities which nations and regions have as well as their targets and priorities.

Educational impediments

Some leaders are not educated enough to understand the significance of the early warning.... As democracy emerges, it will be important for the public to be educated.... I want to stress the educational impediment that is very evident in developing countries.

I think there is an important role for science and education and even NGO's to help form policy makers' world outlook. It could help them understand the new conditions of change, to adapt their actions to ideology, perhaps even to affect ideology itself.

Impediment from lack of policy maker professionalism

There are three factors here: professionalism of policy makers and their competence and responsibility.... As a rule, policy makers solve current problems. This does not mean that they do not understand long-term problems and long-term consequences.

Non-financial resource impediments

Resources may be an impediment: both natural [resources] and talent.… One of the more important impediments is technology. There is an absence of interdisciplinary technologies in the fields of physics, chemistry and biology…. Lack of human expertise…. Indolence… The value is not perceived.

Planning system impediments

Planning on the Western model: new cars manufactured but not new roads…. Long-term strategy is needed. If one does not have a long-term strategy, it is hard to develop and evaluate current actions and resource distribution.... Too often policies are oriented to the solution of current "hot" problems.... Developing countries tend to rely on several individuals rather than create a regular information system for early warning.... Countries should have an inventory of capabilities to more quickly know what can be done.

General Comments

Political early warning time horizons are shorter than the lead-time of general humanitarian and social problems. Political early warnings should lead immediately to quiet UN talks to identify solutions.

Early warnings that go public and include very sensitive information can make problems worse. Yet, it is necessary to make some kinds of early warnings public like information about nuclear issues and human rights. Policy makers need a sufficient depth of personnel to provide early warning information. It is difficult for the public to understand why preventive actions cost less than solving the problem when it occurs.

Examples of where early warnings were effective

Gorbachev was told that human rights was a growing issue that would not go away. Glasnost was the response.... Early warning about the long range impacts of AIDS lead to large infusions of research money and global education efforts.... The early warnings about nuclear terrorism and the international system are responding reasonably well to create cooperative procedures.... Early warning about the ozone hole led to the Montreal Protocol.

4. Results of the Millennium Project Lookout Panel

This chapter presents a third source of information obtained via questionnaires on the factors required for successful implementation of futures research in decisionmaking. The Global Lookout Panel identified and rated impediments, including the ethical barriers to use of early warning from futures research decisionmaking as well as the information that has proven effective.

4.1 The questionnaires. The Global Lookout Panel was given three rounds of questionnaires. This international panel was composed of futurists, scholars, business planners, and policy advisors. They were selected on the basis of their publications, interests, expertise, and recommendations of the ten Millennium Project Nodes around the world. This inquiry was not intended to be a statistical survey, but rather an effort to gain insight into perceptions and concepts about the use of futures research in decisionmaking. The participants are listed in the Appendix C.

The **first round** of the questionnaire series asked about ethical issues related to timely use of early warnings. Building on the answers to the first round and the interviews, a **second round** questionnaire asked about: Impediments to timely decisionmaking and methods for reducing these impediments; the usefulness and availability of various types of decision relevant information; and the role of moral and ethical issues in decisionmaking and suggestions for methods by which these issues might be addressed.

The **third round** focused on evaluating new suggestions collected in the second round regarding: impediments to decisionmaking; information that could facilitate timely decisionmaking; and means for correcting moral and ethical impediments. It also explored the practicality and effectiveness of the methods suggested by the respondents for addressing the moral and ethical issues raised in the earlier rounds.

The second round asked panelists to judge the relative importance of each of the impediments on the extended list from round 1 and the interviews, according to the following instructions:

> The panel was asked to imagine two or three situations with which they are familiar, in which early warning was available but effective action was delayed. What were the causes? The panel was asked to provide their judgments about importance, according to the following scale and situation:

> 5= Almost totally responsible   2= Somewhat involved but other reasons were more important
> 4= Mostly responsible   1= Not involved or only a minor contributor
> 3= Important but shared responsibly with other reasons

4.2 Decisionmaking Impediments. The responses, including those evaluated in Round 3 are rank ordered by average importance and appear below:

Table 2

Impediment	Imp.
2. Institutional: the fact that no one has responsibility to act; lack of adequate coordination among responsible ministries and agencies; institutional inertia.	*3.90*
1. Financial: lack of funding or the fact that the people who ought to pay are unwilling to do so.	*3.89*
19 Disinterest in the future: near term issues gain more attention than those that have more distant future consequences.	*3.81*
16 Planning inadequacy: lack of a long-term view.	*3.77*
7. Personnel: lack of decision skills - decisionmakers do not understand the complexities of the issues about which they must decide; lack of professionalism of policy makers; lack of trained personnel; lack of an inventory of national and regional capacities; reduction of brain drain.	*3.73*
12. Strategic: lack of clear-cut strategy and goals, lack of coordinated actions among nations.	*3.69*
11. Complexity: lack of understanding of the magnitude of problems; lack of models showing complex interdependence of events and policies; lack of understanding of consequences of actions; stereotypical thinking.	*3.63*
3. Political: the action interferes with national interests or it has been proposed by a political opponent; lack of involvement of regions, corporations and specific groups.	*3.63*
6. Information: lack of accurate, reliable and sufficient data and information, or the uncertainty of the risk; conflicting information; lack of coordinated scanning.	*3.60*
14 Lack of consensus: differing interests and ideology among key actors, politicians, public, and particularly lobbying groups in society.	*3.60*
28. Paradigm lock: not being able to see or accept that there may be a completely different world view	*3.59*
22. Responsibility: personal desire to avoid responsibility for decisionmaking; not wanting to rock the boat.	*3.41*
25. Absence of a sense of urgency; thinking that someone else will take care of it.	*3.40*
30. Influence of prior mistakes made by other powerful actors, e.g. international institutions like the IMF, the UN agencies, powerful states influencing policy in other countries.	*3.28*
10. Communication: inadequate reports - unduly complex or too long for decisionmakers.	*3.24*
17 Lack of receptiveness: lack of a crisis atmosphere; conflicts between effective actions and ideology of policy makers and between proposals and tradition.	*3.24*
29. Over focus: picking a small do-able project at the expense of the bigger picture.	*3.24*
24. Lack of tools for integrating future estimates into daily decisionmaking.	*3.20*
8. Resources: lack of required natural resources, including biological resources; lack of adequate technology transfer, particularly between developed and developing countries.	*3.05*
23. Inadequate intercultural communications and media exposure.	*3.04*
27. Lack of rewards for action that pays off in the long term (vs. short term rewards).	*2.99*
9. Legal: lack or inadequacy of necessary laws and appropriate regulations.	*2.98*
18 Moral lapses: loss of morality in decisionmaking; taking the easy way rather than the right way.	*2.93*
15 Complacency: public complacently; the growing cult of leisure; materialism; lack of a sense of dedication and sacrifice and changing attitudes about the value of hard work.	*2.86*
21 Inadequate time available to study the issue; press of other matters.	*2.85*
13 Technological: lack of required technology or unwarranted trust in technology.	*2.82*
26. Benefits of taking action not clearly articulated.	*2.81*
20 Criminal activities: corruption and bribery.	*2.72*
5. Psychological: the fear of making a mistake or looking silly.	*2.54*
4. Cultural: roles of men vs. women, racism, or ethnocentrism.	*2.34*

4.3 Form of Information Needed for Successful Use and Examples

Using information derived in the decisionmaker interviews, the respondents were asked to judge the usefulness of various kinds of information used in decisionmaking and to give examples. Their average responses were (where 5= extremely useful and 1= likely to be counterproductive):

Table 3

Information Type	Usefulness	Examples
1. Information that demonstrates unequivocally that a crisis is pending.	*4.44*	*6 hour weather forecasts* *Mettur Dam release* *Species depletion* *Ozone hole* *Forecasts depicting the potential spread of AIDS, cancer, etc.*
17. Knowledge about what is possible: how science and technology might affect the outcomes of decisions	*4.08*	*U.S. Office of Technology Assessment providing policy recommendations to Congressional staffs.*
19. Education of decisionmakers and opinion shapers on issues of long term significance, rather than those of short term populist interest	*3.91*	
16. Simple, clear, precise information in political, cultural and social (non-technical) terms, connected to goals and strategies	*3.80*	*The Apollo project in the USA in sixties.*
13. Sufficient information about what is required to implement various policy options: e.g. manpower, systemic effects, technological change, etc.	*3.80*	*Technology assessments of 2nd order social and environmental consequences.*
18. Information about how a contemplated decision may affect stakeholders	*3.68*	
6. Information about the success or failure of other institutions and countries that have similar problems and have attempted to implement policies; inspiring success stories.	*3.62*	*Privatization process in former socialist countries - e.g. voucher privatization* *Asian financial crisis* *Polish experience of "shock therapy" was studied by Russian before implementation of " shock therapy" in Russia in 1992* *IMF used its experience in Lat. America for the development of recommendations for Russian reforms.*
5. Development and popularization of appropriate indicators; coordination of indicators among institutions that rely on cooperation to design and implement policy.	*3.62*	*Municipal air quality* *Flow of financial resources* *Currency reserves* *Human Development Index in UNDP Human Development Report.* *Bulletin of Atomic Scientists clock showing time to doomsday* *State of the Environment reports* *Russian Central Bank and Ministry of Finance system of indicators reduced to a common methodology.* *Socially responsible investing. e.g. Domini social 400 index.*
2. Testimony of eminent scientists.	*3.61*	*Montreal Protocol* *Natural calamities* *AIDS forecasts* *IPCC's influence in global warming debate* *Manhattan Project* *Acid rain in eastern Canada/northeastern USA* *Population forecasts*
11. Information about probability and risks associated with issues and their policy	*3.56*	*EPA regulations of removal of lead from gasoline* *Quarantines for infectious diseases*

solutions.		*Warnings about potential for AIDS spread* *Nuclear warfare risks and START actions* *Global warming* *Security strategy of Central European countries and their efforts to join NATO* *Contraceptives, tobacco, some medical technologies*
14. Attention paid to the issue by the media.	*3.55*	*TV images of famine in Somalia affected decision to get involved.*
3. Accurate projections of computer models.	*3.44*	*Weather forecasts* *Forecasts of spreading epidemics* *Global climate models* *Population forecasts*
20. Clarity of forecasted condition without action and technical feasibility of proposed action	*3.41*	*Nuclear winter* *Acid rain*
12. Creation and use of accurate simulations and training which make clear the consequences of actions.	*3.40*	*Flight simulators*
4. Intended actions of other ministries, countries or decisionmakers.	*3.39*	*International police information* *Sustainable development strategies of other countries.* *Most examples in this category come from the intelligence community:* *- the Israeli assessment of a future nuclear weapon threat from Iraq* *- the Israeli pre-eruptive air strike on the OS Iraq nuclear reactor* *US strikes on Afghanistan and Sudan as a result of the assessed threat from Osaman bin Laden*
7. Popularization of issues through public communities, business, research institutions, individuals under leadership and guidance of government.	*3.38*	*Agenda 21*
15. A set of long-term scenarios, ranging from dreadful to positive.	*3.18*	*The Shell scenarios* *World Bank* *Demographic forecasts were used (as one of the sources of information) for the planning of the system of education development in USSR*
8. Popularization of visions showing the consequences of and possible outcomes of the issues; cooperation between artists (e.g. Spielberg) and futurists.	*3.16*	*Jurassic Park* *Seven Years in Tibet* *Toffler's forecasts of migration* *Sagan's nuclear winter* *Russian Government was going to change the river bed of some Siberian rivers. Developed scenarios of the consequences of this action) and wide discussion of this issue by media blocked the action of Government*
10. Information about (or derived from) corporate lobbying that could influence decisionmaking by institutions and governments.	*3.01*	*Can't think of a single lobbing effort linked to early warning of an issue. All lobbing examples that came to mind had negative results. (Lobbying is) mostly narrow, self-interested disinformation without full disclosure.*
9. Knowledge about criminal activities that could adversely influence decisionmaking by institutions and governments.	*2.90*	*Colombian and Mexican narco cartels and its political parties financing and penetration. Clinton & Lewinski affair and its adverse results to Republican party.* *Construction of nuclear power plants (e.g. Temelín in the Czech R.)* *US tobacco industry and lobbing.* *Middle East governments lobbying in Washington D.C. for financial and military aid*

Clearly, the suggestions by the panel included some key current issues that served to illustrate the belief that futures research, as embodied in the information forms listed, was used in a wide variety of applications.

4.4 Moral and Ethical Issues. Moral and ethical considerations affect the uses and usefulness of futures research for several reasons:

1. Futures research is often used to examine the potential consequences of alternative decisions. This evaluation involves judging which outcome is potentially "best" not only from the standpoint of economics, but from an overall perspective, which involves value-based judgments which are inevitably tangled with moral and ethical issues.

2. Rarely are decisions that are informed by futures research of the right vs. wrong or legal vs. illegal sort. Those kinds of decisions are simple to weigh: take the right and the legal and reject the wrong and illegal. Most often, decisions informed by futures research involve trade offs between two or more "right" alternatives and/or involve elements that have conflicting impacts on various groups. Futures research techniques can be used to examine these conflicting interests and their potential evolution.

3. Sometimes decisions that seem correct for the short-term, have negative consequences for the longer term. These temporal trade-off between short and long term issues can be explored using futures research.

4.. The Millennium Project Lookout panel said that the loss of morality in decisionmaking often impedes decisionmaking and that because of such lapses decisionmakers sometimes take the easy solution rather than "the right way." So, even though foresight might provide insight leading to a beneficial decision, without moral integrity, other less appropriate actions might be chosen.

5. Many of the barriers to the use of foresight are driven by moral factors, thus understanding what those moral factors are necessary to overcome the barriers. Some of the most prominent examples of barriers (from the Lookout Panel) that have moral overtones are:

> *Barrier: Disinterest in the future; near term issues gain more attention than those that have more distant future consequences.* This is an example of a trade off between **NEAR-TERM and LONG-TERM,** where what's good for now is at odds with what's good for the future. Take, as a single case the question: "How can sustainable development be achieved for all?" To realize sustainability of almost any sort requires that sacrifices or limits be placed on current consumption in order to achieve later bounty. How much sacrifice? By whom?

> *Barrier: The (decision under consideration) interferes with national interests.* This is an example of a **TRUTH VS. LOYALTY**, dilemma where one's allegiance to a person, nation, or idea is challenged by one's understanding of what honesty or integrity

demands. Take as an example the problem often faced by the media: divulging the truth about security strategies may endanger security; yet the media believe they have an obligation to report fully; should they truncate their reporting in the interest of loyalty to their countries and beliefs?

Barrier: Lack of required natural resources, including biological resources; lack of adequate technology transfer, particularly between developed and developing countries. This is an **INDIVIDUAL VS. COMMUNITY** dilemma where needs of the self (or small group) and the needs of the community (or large group) are both right and mutually exclusive. An example of this case is "How can everyone have sufficient clean water without conflict?" Or to put it in individual versus community terms, to what degree should the individual curtail water consumption in the interests of the community? Or to what degree should a nation control its consumption in the interests of other downstream countries?

Although the panel did not define a barrier that fits this final category, another example involves a trade off between **JUSTICE AND MERCY,** where the stern demands of law and the clear need for compassion both need to be considered. South Africa provides an illustration of justice versus mercy: the truth court in which confession of previous crimes, no matter how heinous, and wrongdoing, provided the basis for forgiving and mercy, and punishment, retribution, and justice for those crimes was put aside.

To explore the complex relationship between barriers to the use of futures research and moral and ethical issues, several questions were included in the Lookout Panel inquiry.

In the first questionnaire, a list of issues such as "Lack of honor and lying" was presented and the panel was asked to judge the importance of such issues in their country and in the world. The respondents were asked to add to the list. The composite list was presented to the panel in the second and third rounds and similar judgments were requested for the newly added items. The scale used was:

>   5= of overwhelming importance
>   4= of great importance
>   3= of modest importance
>   2= of some importance
>   1= trivial

The table below presents the panelists' judgments about the importance of moral issues involved in decisionmaking in their countries vs. the world:

Table 4

ISSUE	My Country	World
10. Insufficient attention to the needs of future generations.	3.87	3.95
28. Caring about the well-being of only one's own group or nation.	3.78	4.04
16. Corruption of political leaders, policy makers, corporate leaders.	3.75	3.91
1. Corruption in government.	3.74	3.97
9. Waste.	3.70	3.63
6. Greed and self centeredness.	3.68	3.65
2. Economic inequities.	3.67	4.05
21. Lack of a holistic view of the world: fragmentation among many people with a more or less holistic view.	3.65	3.61
18. Undue pressures from lobbying groups.	3.60	3.63
14. Lack of respect for the environment.	3.59	3.95
17. Non-action, the most severe corruption, Honor in leadership is to assume responsibility.	3.56	3.54
22. Advertising may promote inappropriate products and purposes of "overconsumption.".	3.52	3.60
7. Lack of compassion and tolerance for others.	3.49	3.57
27. Unwillingness to understand a culturally different awareness of same issue.	3.46	3.98
26. Fear and mistrust from history.	3.39	3.66
3. Lack of honor and lying.	3.35	3.47
19. Infiltration of organized crime and criminals into government and business.	3.29	3.61
15. Lack of means for educating about morals and ethics.	3.29	3.50
12. Lack of transparency in decisionmaking.	3.27	3.52
20. Alienation of people from self and nature.	3.26	3.31
24. Lack of common agreement about ethics and morals; it changes with advancing knowledge and socio-economic conditions.	3.20	3.22
23. Lack of role models.	3.05	2.91
5. Disrespect of authority.	3.00	3.06
13. Barriers to freedom of inquiry.	2.98	3.66
4. Lack of respect for women's civil rights.	2.78	3.71
11. National sovereignty used to cover human rights abuses.	2.74	3.52
8. Godless-ness.	2.56	2.69
25 Undue pressure from fundamentalist groups.	2.49	3.09

4.5 Interviewees comments on Ethical Barriers

The interview respondents also had some comments to make about moral issues; some key points are listed below:

> ...corruption in government is a great impediment. But more common impediments are the corruption of some leaders (policy makers or officials) and lack of responsibility….
> They do not have a long, all-aspect viewpoint, they disregard long-term benefits, (and) they

do not consider the interest of future generations…. We should advocate a new ecological ethics which encourages the harmony between human and human, and human and nature…. The will to act is interconnected with clarity and transparency, of aims with adequate priorities. If the aim is not clear, also the impulse is missing…. Transitional periods are periods of crises in ethics too. That is why (ethics are) a key problem today.

This examination of morals and ethics leads to certain recommendations for organizations that are considering the implementation of foresight activities:

1. As illustrated by the comments of the interviewees and the Lookout Panel during the analysis of moral and ethical impediments, there is general recognition that most decision situations involve a short term focus and that long term issues are usually of lower priority. A justification for implementing futures research activities is therefore to satisfy the need to devote some continuing effort to the study of the long-term consequences of decisions made on the basis of short-term issues.

2. Implementation of foresight activities can help overcome several moral and ethical impediments to effective decisionmaking. For example:

Table 5

Moral and Ethical Impediment	Futures Research Considerations
Caring about the well-being of only one's own group or nation; lack of compassion and tolerance for others	*Well done futures research examines the potential impacts of decisions on various groups and actors*
Corruption of political leaders, policy makers, corporate leaders.	*Corrupt leaders may try to inhibit futures research since corruption may rise to the top of the list of political and societal issues*
Lack of transparency in decisionmaking	*Futures research techniques often involve making explicit the steps required for policy implementation, thus transparency is enhanced.*
Greed and self centeredness	*When futures research is used in planning it is often necessary to develop normative- that is, desirable, futures. It becomes obvious when these images are lopsided.*
Lack of means for educating about morals and ethics	*Futures research is an educational tool. It can involve many people in an organization in a common exploration of possible futures and their comparative benefits. In such systems, participants usually begin to share a common sense of the future and the correctness- including the moral correctness- of possible actions.*
Lack of common agreement about ethics and morals	*As this study shows, there are large areas of agreement that transcend national boundaries; this demonstrates that futures research may be a link in reaching international agreements that depend on common ethical beliefs and images of the future.*

3. Similarly, overcoming the impediments to the implementation of foresight activities can involve moral and ethical issues; for example:

Table 6

Impediments to Implementation of Futures Research Programs	Moral and Ethical Consideration
The fact that no one has responsibility to act; lack of adequate coordination among responsible ministries and agencies; institutional inertia.	*Diffuse responsibilities often makes initiation of a foresight activity difficult. Diffuse responsibilities in this area often exist because no one has included future considerations in their missions and charter, which, by their nature are value-laden statements. Therefore, an initial step for AEPI and others is assure that their mission include a future focus*
Disinterest in the future: near term issues gain more attention than those that have more distant future consequences.	*A clear example of the moral issue of trading off long term interests for short term exigencies; to overcome this moral barrier, decisionmakers can be shown successful case studies, participate in prototype studies and be encouraged to revise charters and mission statements to make the need for futures work explicit.*
Personnel: lack of persons who can implement foresight programs	*Not only experience in foresight is required, but when outcomes involves important uncertainties and potential value conflicts, persons conducting futures studies should be skilled in values research or values issues. There are few enough of such persons. Therefore, organizations contemplating such systems should be involved in training in both futures studies and values.*
Complexity: lack of understanding of the magnitude of problems; lack of models showing complex interdependence of events and policies; lack of understanding of consequences of actions; stereotypical thinking.	*Resolution of value dependent issues is a complex process. Values are rarely stated explicitly, even in futures studies, but when they are, the seeds of future conflict can often be discerned. Recommendation: make sure that systems apt to deal with value laden issues make values explicit where possible.*

5. Conclusions and Recommendations

The central objectives of this study were to identify:

- the generic factors that prevent timely use of early warnings from futures research;

- the factors that contribute to timely use;

- obstacles and barriers that were overcome in successful cases;

The previous chapters identified and discussed these factors. This chapter brings together the conclusions from these chapters into a recommended checklist as a guild on how to enhance the likelihood of successful implementation of futures research into decisionmaking.

It is not reasonable to expect that all of the following recommendations can be implemented in every application of futures research for decisionmaking. Nevertheless, the more of these that can be done, the greater the likelihood of successful implementation of futures research in decisionmaking will be.

1. Make sure leaders or decisionmaker(s) to whom the information is intended know what futures research is and is not, are interested in the process, have requested the activity, and all those involved in the process are clear about the objectives and mission of the activity. Ideally, this would include a statement of what the decisionmaker(s) would consider to be a successful outcome.

2. Confirm that futures research has or will have a formal connection to the strategic planning process that is understood by all involved and that they understand that futures research provides a framework for thoughtful discussion, rather than predictions.

3. In addition to the decisionmaker(s), identify and work with a champion of the activity within the organization.

4. If the decisionmaker(s) lack the knowledge or do not understand the complexities of the issues about which they must decide, include workshops or training during the research. As appropriate use simulations or models showing complex interdependence of events, policies, and consequences of actions that can challenge stereotypical thinking. If possible, include discussion of the moral barriers to timely decisionmaking.

5. Integrate the producers of futures research and the decisionmaker(s) into the overall process as much as possible.

6.   Information should not be limited to quantifiable projections, but include rich subjective descriptions of alternative futures that makes future possibilities more real for the decisionmaker(s).

7.   Include diverse different interests groups and key actors in the research process to make sure that the information is created about how a contemplated decision may affect stakeholders and to reduce subsequent political impediments. Enlist the support of people in this process who will use or be affected by the activity.

8.   If there is a lack of clear-cut strategy and goals for the futures research to address, then include this as an issue in the research.

9.   Determine who has the responsibility to act on the information, if no one, then make this an issue in the research, and if appropriate, bring this to the news media. Similarly, determine if there is adequate coordination among responsible departments, if not, then make this an issue in the research as well.

10.   Include the decisionmaker(s) in the research process to counter any lack of a long-term views and shot-term dominance over more distant future considerations.

11.   Use at least one formal method that is understandable to all involved.

12.   Provide information that demonstrates unequivocally that a crisis is pending to counter institutional inertia.

13.   Include knowledge about what is possible, such as technological changes, to counter disbelief that change is impossible. Include information about the success or failure of other institutions and countries that had similar problems and have attempted to implement policies. If possible cite inspiring success stories.

14.   Make options or recommendations simple, clear, and precise and deliver them in political, cultural and social (non-technical) terms, connected to goals and strategies.

15.   Demonstrate the technical feasibility of recommendations including required personal, institutional, and technological changes to counter decisionmaker's fear of failure.

16.   Connect the costs to the benefits of the recommendations to increase the willingness to pay. Decisionmakers and political leaders have used "financial impediments" as an excuse not to act; but tend not to see finance as the primary reason for inaction.

17.   If the information and data are inaccurate, unreliable, conflicting, and/or insufficient, then expose the problem, collect best judgements, and suggest ways of making decisions within the uncertain environment.

18.   If possible, include the intended actions of related institutions, lobbyists, decisionmakers related to the recommendations.

19.   Develop and popularize appropriate indicators in coordination with other related institutions in the design and implementation of policy recommendations.

20.   Use testimony of eminent scientists, including information of their estimates about probability and risks associated with issues and their policy solutions.

21.   Clarify the forecasted condition with and without action, as set of long-term scenarios, ranging from dreadful to positive.

22.   Establish linkages to other similar activities in government and industry, here and abroad, so that diverse inputs are possible and inputs can flow from non-conventional sources.

23.   Be innovative in the method of presenting findings to avoid information overload.

24.   In addition to more analytic methods, include a workshop toward the end of the research to give time for individuals, including the decisionmaker(s), to integrate the concepts in their thinking in a group setting.

25.   Consider how to include the media in the issue in consultation with the decisionmaker(s). Examples include making the research available on the Internet, holding press conferences, opening communications with public communities and other research institutions, and even consider how to popularize the work via cooperation between artists (e.g. Spielberg) and futurists in film, television, and other media.

26.   Make the work continuous and cumulative so that what is learned in one iteration is carried over to the next. It should not be a one time event, but an on-going process of feeding information to the decision process and responding to feedback from impacts.

Figure 5

Generic On-Going Process of Foresight
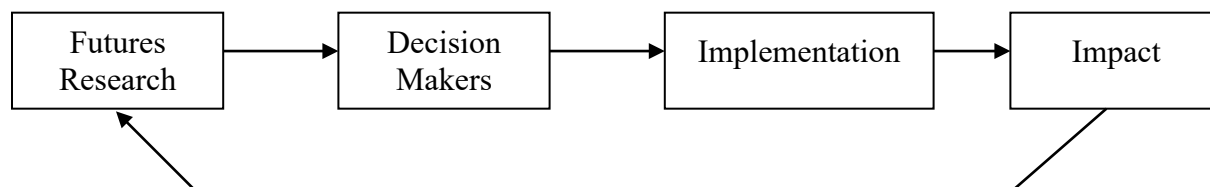
APPENDICES

Appendix A: 1998 Global Lookout Study - Interview Protocol

1. Contact those you interviewed last year about the global opportunities - who you think will be the best to interview this year. Ask them if you can share the results of the interviews with them AND interview them about how to reduce the time from early warning to implementation of the actions suggested and the ethical implications involved. Attached is the list of all those interviewed last year to help you know which opportunities were addressed by which policy maker you interviewed. The opportunities, actions, with interview comments distilled from last year are about 50 pages. It can be downloaded from http://millennium-project.org/millennium/opport-98.html. It is much faster for you to download it from our web site, but if you prefer, I can send it to you as an attached file.

2. If possible, prior to the interview send just the relevant opportunity(ies) with the associated actions and comments that the policy maker addressed last year. Enclose the new Millennium Project flyer and you might add your contact information on the back of the flyer between the photos and the "For further information" section.

3. Assuming that not all those you interviewed are appropriate for this year's interviews, invite new decisionmakers who are in a position to response to early warning. You might also consider some you interviewed on the global issues two years ago.

4. For those you interviewed about the issues two years ago, send them the relevant issue, actions and comments from the 1997 State of the Future plus the flyer. They should have received a copy of the 1997 book previously.

5. Begin the interview by reminding the policy maker that The Millennium Project is conducting a set of interviews around the world with carefully chosen leaders in government, corporations, UN organizations, and NGOs to **focus on impediments that may delay action.** As they know, too often early warnings are clear, but decisions are not made and even if made, implementation can be too slow. **The purpose of the interviews is to learn how to shorten the time from early warning to appropriate action and to understand the ethical issues involved.**

6. **If the policy maker participated** in 1997 or 1998 interviews say: You were a participant in an earlier part of the study; now, based on the judgments that you and others contributed, we intend to examine some of the impediments to effective policy action and some of the ethical considerations that may affect decisionmaking.

7. **If the policy maker is new to the study** say: In our studies over the past two years early warnings about issues and opportunities have been discussed with over 100 policy makers who have expressed their views on actions to address them. In this interview, we would like to examine some of the impediments to effective policies and some ethical considerations that may

affect decisionmaking.

8. Remind them that their comments and the comments of other participants in these interviews **will not be attributed**. Let them know that name will be included in the appendix of the 1999 State of the Future, but specific statements will be attached to their names, unless there is a specific quote they would like included and attached to their name.

9. Assure them that they do not have to answer all the questions. To answer all the questions in each part would take too long. The questions are just a guide to help get the key insights of the decisionmaker.

Tell your policy or decisionmaker that this interview has **four** parts:

First, we will ask for your **judgments about general factors** that may impede and or speedup timely response to early warnings.

Second, we understand that policy impediments may depend on both the situation and the institutions involved. Therefore, in the second part of the interview we will ask about **factors that may delay or speedup the implementation** of specific actions addressing specific global issues and opportunities that you select.

Third, we will ask about the **characteristics and form of information** that has led to more timely decision-implementation in the past and **that you believe could promote more timely responses** to early warnings in the future.

And last, we will ask about the **ethical issues** that can affect decisionmaking.

Part 1.

We believe that there are at least six types of impediments to action:

1. **Financial impediments** such as lack of funding or the fact that the people who ought to pay are unwilling to do so.

2. **Institutional impediments** such as the fact that no one has responsibility to act.

3. **Political impediments** such as the action interferes with national interests or it has been proposed by a political opponent.

4. **Cultural impediments** such as roles of men vs women, racism, or ethnocentericism.

5. **Psychological impediments** such as the fear of making a mistake or looking silly.

6. **Information impediments** such as the lack of reliable and sufficient data and information, or the uncertainty of the risk.

Can you add other categories of impediments? What are some examples within these categories? In general, how can the time between early warning and policy implementation be reduced?

Part 2.

As you know, the Millennium Project involves over 300 futurists, scholars, and policy advisors from 60 countries who have identified a set of key future opportunities and issues.

> (If you interviewed him/her last year, then share the interview comments from the opportunity(ies) that were discussed last year - preferably you have sent this to him/her before the interview.)

> (If you interviewed him/her two years ago, but not last year, then do the same as above, but share the comments from the issue that they discussed two years ago that was published in the 1997 State of the Future).

> (If he/she has not been interviewed for the Millennium Project before, then invite him/her to select on opportunity or issue and then share the relevant actions and comments.)

(The complete set of opportunities, actions, and range of comments on each from the interviews of last year will be sent in a separate file. You already have the issues in the 1997 State of the Future.)

For those one or two issues or opportunities that you have selected, please look at (or read to the policy maker) the set of actions that he/she has judged to be most effective. Please tell us what impediments you think could delay taking action, what might speed up implementation, and if there are moral or ethical issues involved. (Put the action number of the issue or opportunity with each comment in your notes to us.)

Part 3.

Now we would like your judgments about the characteristics and form of the early warning information that has lead to more timely decision-implementation in the past. One example is the early warning about the ozone hole and the Montreal Protocol. Please think of other situations when early warnings were given and timely actions followed. Was it due to:

1. Information that demonstrated, unequivocally that a crisis was impending ?
2. Testimony of eminent scientists ?
3. Projections of computer models.
4. Intended actions of other countries or decisionmakers?
5. Others ? Please explain.

Now, what **other sort** of early warning information would you like from futurists? **What form** should it take so that decisions and implementation can be more timely? **Who** should provide it?

What can be done to help assure its availability?

Part 4.

During the interviews last year, we heard several times that, "We don't need more early warning systems. We have plenty. NGOs, newspapers, national intelligence services, think tanks, scientific academies, etc. What we need is the will to act." What moral or ethical issues that affect the will to act in a timely way? Is it:

1. Corruption in government or business ?
2. Lack of honor of decisionmakers ?
3. Deterioration of patriotism ?
4. Disrespect for authority ?
5. Lack of compassion for humanity?
6. Insensitivity to the needs of future generations ?
7. National sovereignty vs human rights ?
8. Other reasons ?

Interviewer thanks the interviewee and reminds them that they will get a copy of the results of all the interviews and other research of the Millennium Project in the 1999 State of the Future that should be out in mid-1999. Make sure that his/her name, title, and organization are written correctly so that they can be listed correctly in the report and that their preferred address to receive a copy.

Remember, it is always wise to try this interview protocol on a friend or colleague first before conduction your actual interviews.

Write the interviews and sent to jglenn@igc.org with a copy to theogordon@compuserve.com and acunu@igc.org as soon as it is written. Please do not send them all at the same time at the end. The last interview should be sent by 8 July 1998.

Appendix B: 1998 Global Lookout Study Questionnaires

Overview of the 1998 Lookout Study and Invitation

22 May 1998

Dear Colleague:

On behalf of the Millennium Project of the American Council for the United Nations University in cooperation with the Smithsonian Institution and The Futures Group, we have the honor to invite you to participate in the 1998 Lookout Panel.

This activity is a world-wide effort to collect and synthesize judgments about emerging global issues and opportunities that may affect the human condition. The Project provides information to decisionmakers and educators to add focus to important issues, clarify choices and improve the quality of decisions. It does this by making future opportunities and dangers more explicit and by identifying a range of views from around the world on actions to address them.

Previous Lookout Panels identified developments that may have important future implications. These panels have involved about 300 people who identified and rated almost 300 developments. These developments have been distilled into 15 Global Issues and 15 Global Opportunities with a range of views from policy makers about actions to address each. The results, together with other work of the Millennium Project, was published in the 1997 State of the Future and soon to be published in the 1998 State of the Future. Those who respond to this questionnaire will receive results in a complimentary copy of the 1999 State of the Future.

While it is not necessary to examine the previous developments, issues, opportunities, and actions to complete the enclosed questionnaire, you may view them at the Project's Web site at: http://millennium-project.org.

This year's 3-round Global Lookout Study is designed to build on the Project's previous studies, and add new insights. Participants will be listed in the 1999 State of the Future, but no attributions will be made. Please answer just those questions in your areas of expertise and greatest interest. It is not expected that you answer all the questions.

In parallel to this questionnaire, a set of interviews will be conducted among policy makers to identify impediments to timely response to early warnings and ethical implications of suggested actions. The results of these interviews and the enclosed questionnaire will flow into the second round, which will be sent to you. In the second round you will be asked to comment on the suggestions made in the first, as well the impediments to effective actions identified in the interviews. Please contact us with any questions: jglenn@igc.org. We look forward to your responses.

Sincerely yours,
Theodore J. Gordon and Jerome C. Glenn
co-directors, AC/UNU Millennium Project

The **first round** has five questions:

1. How have previously identified developments changed in importance and likelihood
2. What are the most important new developments that should be added
3. How have previously identified global opportunities changed in importance and likelihood
4. How have previously identified global issues changed
5. How important are suggested ethical issues and What new ones should be added

The **second round**, which will follow in about two months, will be based on the responses to this questionnaire and the interviews that are being conducted in parallel.

Some weeks later, a **third** round will feed back the most relevant ideas from earlier rounds for your information and further comment. The results will be published in the *1999 State of the Future*. All those who respond to this questionnaire will receive a complimentary copy.

* * *

Please complete the questionnaire and return it to us by **26 June 1998.** Please respond by e-mail to jglenn@igc.org otherwise fax to (202) 686-5179 or mail to:

The Millennium Project
American Council for the United Nations University
4421 Garrison St. NW, Washington, DC 20016 USA

No matter which mode of response you choose, please include your name and post mail address, and - if possible - your electronic mail address, phone number, and fax number.

If you have not already done so, please send us a copy of your resume (and whether it can be added to those on the Millennium Project's homepage) and any other information about yourself and your work that you feel is relevant. You can download an electronic copy of this Round 1 from http://www.millennium-project.org/millennium/rd1-98.html.

Question 1.

How have the developments rated to be the most important in 1996 and 1997 changed in importance and likelihood ?

The table on the following page lists the developments identified and rated to be the most important by the 1996 and 1997 Global Lookout Panels. The average responses about importance and likelihood are placed next to each development. If you believe that the importance and/or likelihood of some of these have changed over the last year or two, then please provide your judgements in the next two columns, using the scale below. In the final column, rate your experience with the development. If specific events or new trends have lead you to conclude that change has taken place, then please list them in the space provided below the table.

Since many developments have been suggested previously by earlier lookout panels, we understand that your suggestions may overlap with the prior lists. In our analysis of the responses we will be looking for developments that were omitted earlier or may have changed in likelihood or importance. For reference, we present a few developments (some in combination and some with slightly modified wording) that were judged to be most important by the 1996-97 panels. Please add other items to this list and provide judgments about the likelihood and importance using the following scales[27]:

Importance	**Likelihood**
5 = Urgently important or extremely beneficial.	5 = Almost certain by 2025
4 = Important or beneficial	4 = Likely
3 = Modest importance	3 = As likely as not
2 = Unimportant	2 = Unlikely
1 = Trivial	1 = Almost impossible by 2025

In the final column please provide your assessment of your own expertise in the area of the development according to the following scale:

Experience
5= Working in the field; know it well
4= Have reading knowledge in the field
3= Generally acquainted with the field; informed layman
2= Have some interest in the field
1= Have heard about this development

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[27]   For those of you who recall the old scales, a word of explanation is in order. In both 1996 and 1997, the Project used low numbers to indicate high likelihood and high importance. Since this had the potential for confusion, the system has been changed so that high numbers represent high likelihood and importance. The numbers in the tables have been converted to this convention.

Table 7

Developments of Highest Importance identified and rated by the 1996 and 1997 Global Lookout Panels	Prior Import	Prior Liklihd	Import 1998	Liklihd 1998	Exper-tise
1. *Movement toward sustainable development; restructuring of economies: decrease of polluting industries and production processing, increasing services; improving efficiency with less workforce; the concept of sustainability affecting politics and national decisionmaking..*	*4.59*	*3.78*			
2. *Widespread adoption of a long-term perspective; corporate, political, and personal behavior taking needs of future generations into account..*	*4.57*	*3.17*			
3. *High population growth among certain poor nations and people; the potential for food scarcity among these nations and people.*	*4.56*	*4.58*			
4. *Increased scarcity of fresh water*	*4.53*	*4.32*			
5. *Threat of regional nuclear conflict when more and more countries and potentially terrorist groups will have access to weapons of mass destruction.*	*4.49*	*3.70*			
6. *Diminishing global population growth rate, due to improved literacy, empowerment of women, diminished infant mortality, improved, inexpensive contraceptives, and effective family planning.*	*4.47*	*3.82*			
7. *The widening economic gap between the "haves' and 'have nots" within /between countries*	*4.46*	*4.42*			
8. *An emerging peace paradigm; the promotion of peaceful co-existence.*	*4.45*	*3.39*			
9. *Expanding science frontiers: new theoretical principles leading to great improvements in energy, engines, information systems, geophysical devices, material processing, medical devices, etc.*	*4.43*	*3.57*			
10. *Globalization: increasingly clear demand for global thinking, responsibility, global ethics, approach, effort, action and results.*	*4.42*	*4.13*			
11. *Transitions from authoritarian regimes to democracies*	*4.42*	*3.60*			
12. *Development of techniques for non violent conflict resolution.*	*4.41*	*3.53*			
13. *Ecologically based agriculture; science-technology and information replace large consumption and waste of energy and material in agriculture.*	*4.39*	*3.66*			
14. *Improvement in North-South problems*	*4.37*	*3.38*			
15. *Destruction of the environment, especially loss of biodiversity.*	*4.36*	*4.04*			
16. *The use of solar energy, wind or other alternate sources to replace fossil energy sources.*	*4.33*	*3.77*			
17. *Increasing resistance to antibiotics.*	*4.32*	*4.43*			
18. *Nuclear terrorism and proliferation posing far more of a threat to the survival of the human species than is generally appreciated.*	*4.32*	*3.51*			
19. *Doubling of the demand for energy in less than 30 years as a result of population and economic growth*	*4.31*	*3.90*			
20. *New age of enlightenment; changes in global frames of reference and philosophies, e.g. coping with the vicious circle of interacting population growth, unlimited economic growth and environment degradation.*	*4.31*	*3.32*			
21. *Industrialization of China, India, etc., increasing the load on the environment by a factor of five to ten.*	*4.29*	*3.86*			

For those developments that have significantly changed in importance, about which you wish to comment, please list what has caused the change:

Item #   What has caused the change?

Question 2.

What are the most important developments that should be added?

Please suggest a few future developments that you think plausible and are likely to have significant impact on the human condition by 2025. These may be positive or negative developments, but should have the potential to change the human condition globally.   The developments you suggest should not yet be generally known outside of your field, or have potential that is not yet generally realized or is misunderstood. Please briefly describe the likely consequences of each development by the year 2025.

2.1 Development:

Consequences by 2025:

2.2 Development:

Consequences by 2025:

Please take more space if you need.

Question 3.

How have previously identified **Global Opportunities** changed in importance and likelihood?

The following table lists global opportunities grouped from the most important developments rated by the 1997 Global Lookout Panel. Please provide your judgments about whether these opportunities are increasing or decreasing in promise using the following scale. Over the next ten years do you think the opportunity will become:

> 5 = much more important.
> 4 = more important
> 3 = remain about the same
> 2 = less important
> 1 = much less important

For those developments that you expect to change significantly in importance, please explain why. The project is interested in vectors of change. In the middle column provide your assessment of your own competence and expertise in the area of the opportunity according to the following scale:

5 = Working in the field; know it well

4 = Have reading knowledge in the field

3 = Generally acquainted with the field; informed layman

2 = Have some interest in the field

1 = Have heard about this development

Table 8

Global Opportunity	Impor tance	Exper -tise	Reasons for Significant Change
1. Achieving sustainable development.			
2. Increasing acceptance of long-term perspectives in policy making.			
3. Expanding potential for scientific and technological breakthroughs.			
4. Transforming authoritarian regimes to democracies.			
5. Encouraging diversity and shared ethical values.			
6. Reducing the rate of population growth.			
7. Emerging strategies for world peace and security.			
8. Developing alternative sources of energy.			
9. Globalizing the convergence of information and communications technologies.			
10. Increasing advances in biotechnology.			
11. Encouraging economic development through ethical capitalism.			
12. Increasing economic autonomy of women and other groups.			
13. Promoting the inquiry into new and sometimes counter intuitive ideas.			
14. Pursuing promising space projects.			
15. Improving institutions.			

Question 4.

How have previously identified **Global Issues** changed in importance and likelihood?

The following table lists global issues grouped from the most important developments rated by the 1996 Global Lookout Panel. Please provide your judgments about whether these issues are increasing or decreasing in promise using the following scale. Over the next ten years do you think the issue will become:

5 = much more important	2 = less important
4 = more important	1 = much less important
3 = remain about the same	

For those developments that you expect to change significantly in importance, please explain why. The Project is interested in the vectors of change.

In the middle column provide your assessment of your own and expertise in the area of the issue according to the following scale:

5 = Working in the field; know it well	2 = Have some interest in the field
4 = Have reading knowledge in the field	1 = Have heard about this development
3 = Generally acquainted with the field; informed layman	

Table 9

Global Issue	Impor-tance	Exper-tise	Reasons for Significant Change
1. Population is growing most where people can least afford the necessities of life.			
2. Scarcity of fresh water in localized areas of the world.			
3. The growing gap in living standards between the rich and poor threatening to become more extreme and divisive.			
4. The growing threat of new diseases and reemerging diseases, and immune micro-organisms.			
5. Diminishing of the capacity to decide (as issues become more global and complex under conditions of increasing uncertainty and risk).			
6. Terrorism, growing in intensity, scale, and threat.			
7. The adverse interaction between the growth of population and economies with environmental quality and natural resources.			
8. Inequities and the changing status of women.			
9. The increasing severity of religious, ethnic, and racial conflicts.			

10. Information technology holds both promises and perils.			
11. Organized crime groups becoming sophisticated global enterprises.			
12. Economic growth bringing both promising and threatening consequences.			
13. Aging nuclear power plants around the world.			
14. The spreading HIV pandemic.			
15. The changing meaning of work, unemployment, leisure, and underemployment.			

Question 5:

What are the most important Moral and Ethical Issues we face today with the greatest future implications for humanity? Please rate the list below using the following scale and add what you believe to be more important moral or ethical issues in the space provided.

Importance:

5 = of overwhelming importance	2 = of some importance
4 = of great importance	1 = trivial
3 = of modest importance	

Table 10

Moral or Ethical Issue	Importance in my country	Importance in the world
1. Corruption in government and business		
2. Economic inequities		
3. Lack of honor and lying		
4. Lack of respect for women's civil rights		
5. Disrespect of authority		
6. Greed and Self-centeredness		
7. Lack of compassion and tolerance for others		
8. Godless-ness		
9. Waste		
10. Insufficient attention to the needs of future generations		
11. National sovereignty used to cover human rights abuses		
12. Lack of transparency in decisionmaking		
13. Barriers to freedom of inquiry		
14. Lack of respect for the environment		
15. Lack of a means for educating about morals and ethics		

Additional Moral and Ethical issues affecting the future of Humanity:

Thank you for your participation in Round 1 of the 1998 Global Lookout Panel of the Millennium Project.

***

The Millennium Project - 1998 Global Lookout Study
Round 2

23 October 1998

Dear Colleague:

On behalf of the Millennium Project of the American Council for the United Nations University in cooperation with the Smithsonian Institution and The Futures Group, we have the honor to invite you to participate in the second round of the 1998 Global Lookout Study.

The 1996 and 1997 Lookout Panels identified developments that may have important future implications. These panels have involved about 300 people in 60 countries who identified and rated almost 300 developments. These developments have been distilled into 15 Global Issues and 15 Global Opportunities with a range of views from policy makers about actions to address each. The results, together with other work of the Millennium Project, were published in the *1997* and *1998 State of the Future*. Those who respond to this questionnaire will receive the results in a complimentary copy of the *1999 State of the Future*. Your comments will not be attached to your name - no attributions will be made without permission, although participants' names will appear in the report.

The **first round** of the current study had two parts: 1) a **questionnaire** to the Global Lookout Panel to identify new developments, changes in the importance of global issues & opportunities, and global ethics; and 2) **interviews** with policy makers and experts to identify impediments and aids to timely response to early warnings and the ethical issues involved.

The enclosed **second round** is built on the results of the questionnaire and interviews. It poses five questions, requesting your judgments about:

1. Impediments and aids to timely policy making
2. The nature of decision relevant information
3. Reasons why certain developments, issues and opportunities seem to be changing in importance
4. The likelihood, importance and your experience about newly suggested developments
5. Important moral and ethical issues in decisionmaking

Please follow the instructions on the next page and return your questionnaire by 23 November 1998. Based on the results of this second questionnaire, a third and final round will include the most relevant ideas for your further comments. We look forward to your responses.

Sincerely yours,
Jerome C. Glenn and Theodore J. Gordon
co-directors, AC/UNU Millennium Project

The Millennium Project - 1998 Global Lookout Study
Round 2 Instructions

Please answer just those questions that are in your areas of expertise and are of greatest interest to you. While it is not necessary to examine the previous developments, issues, opportunities, and actions to complete the enclosed questionnaire, you may view them at the Project's Web site at: http://millennium-project.org.

You can return your responses in several ways:

1. Since faxes that include hand written responses may be difficult to read, please consider sending your response by email to make sure your views are recorded correctly. You can download this questionnaire from http://www.miliennium-project.org/millennium/rd2-98.html. In this way you can fill out the questionnaire on your computer and then send it back by email.

2. You can type your answers without the text of the questions and send an email, fax, or letter. For example:

> *Question 1.*
>   1. #
>   2. #
>   3. #
>   etc.
> *Questions 2.*
>   1. #   Example -------------
>   2. #   Example -------------
>   etc.

3. You can put your responses on the enclosed questionnaire and send it by airmail or fax.

Which ever way you choose, please send your responses so that they can be received by 23 November 1998. If you have not already done so please send us a copy of your resume (and whether it can be added to those on the Millennium Project's homepage).

The Millennium Project - 1998 Global Lookout Panel Round 2
Questionnaire

Question 1: Impediments to Action

In Round 1, policy makers were interviewed and asked to list factors that they thought might affect the timeliness and effectiveness of response to early warnings and the information that they thought could promote more timely responses. You are now asked to review the answers they have provided so far, add to the set, and provide insights you might have for reducing these impediments.

The following table presents a list of types of impediments to decisionmaking and subsequent actions that have been identified so far. We recognize that impediments to decisionmaking might be situation-dependent, but as you think back over key decisions that were not made in a timely fashion, please consider whether the items in this list were at least partially responsible. Please provide your judgments about the relative importance of these impediments according to the following scale:

> 5= Almost always involved when important decisions are delayed
> 4= Quite often involved in delays
> 3= Might be a factor but other factors need to be present, as well
> 2= Other reasons are usually more important
> 1= Not usually involved or only a minor contributor

Please add other types of impediments that you think important, to the bottom of the list.

Table 11

Types of Impediments to Timely Response to Early Warning	Import ance
1. **Financial**: lack of funding or the fact that the people who ought to pay are unwilling to do so.	
2. **Institutional**: the fact that no one has responsibility to act; lack of adequate coordination among responsible ministries and agencies; institutional inertia.	
3. **Political**: the action interferes with national interests or it has been proposed by a political opponent; lack of involvement of regions, corporations and specific groups.	
4. **Cultural**: roles of men vs. women, racism, or ethnocentrism.	
5. **Psychological**: the fear of making a mistake or looking silly.	
6. **Information**: lack of accurate, reliable and sufficient data and information, or the uncertainty of the risk; conflicting information; lack of coordinated scanning.	
7. **Personnel:** lack of decision skills - decisionmakers do not understand the complexities of the issues about which they must decide; lack of professionalism of policy makers; lack of trained personnel; lack of an inventory of national and regional capacities; reduction of brain drain.	
8. **Resources**: lack of required natural resources, including biological resources; lack of adequate technology transfer, particularly between developed and developing countries.	
9. **Legal**: lack or inadequacy of necessary laws and appropriate regulations.	
10. **Communication**: inadequate reports - unduly complex or too long for decisionmakers.	
11. **Complexity**: lack of understanding of the magnitude of problems; lack of models showing complex interdependence of events and policies; lack of understanding of consequences of actions; stereotypical thinking.	
12. **Strategic**: lack of clear-cut strategy and goals, lack of coordinated actions among nations.	
13 **Technological**: lack of required technology or unwarranted trust in technology.	
14 **Lack of consensus**: differing interests and ideology among key actors, politicians, public, and particularly lobbying groups in society.	
15 **Complacency**: public complacently; the growing cult of leisure; materialism; lack of a sense of dedication and sacrifice and changing attitudes about the value of hard work.	

16 **Planning inadequacy**: lack of a long-term view.	
17 **Lack of receptiveness**: lack of a crisis atmosphere; conflicts between effective actions and ideology of policy makers and between proposals and tradition.	
18 **Moral lapses**: loss of morality in decisionmaking; taking the easy way rather than the right way.	
19 **Disinterest in the future**: near term issues gain more attention than those that have more distant future consequences.	
20 **Criminal activities**: corruption and bribery.	
21 **Inadequate time available** to study the issue; press of other matters.	
22.	
23.	

Question 2: Information Leading to Decisionmaking

In the interviews with policy makers, that preceded this round, the interviewees were asked to think about situations when early warnings were given and timely actions followed. For these situations, the interviewees were asked to identify the type of information that had been important to effective decisionmaking.

Please provide your judgments about these answers (which have been augmented by comments of the reviewers of this questionnaire) and add other types of information that you think would be useful to decisionmaking. You are asked for judgments about the usefulness of this information, if available and to add to the column of "Examples cited". In answering these questions, please select examples from your own field of expertise. Please use the following scales:

Usefulness if available

5= extremely useful, if it could be produced
4= clearly of great benefit
3= likely to be of moderate use
2= probably not worth the effort
1= counterproductive; would extend decision time

Also, please add other entries at the end of this table and in the final column.

Table 12

Information Leading to Decisionmaking	Usefuln. if avail.	Examples Cited
1. Information that demonstrates unequivocally that a crisis is pending.		6 hour weather forecasts; Mettur Dam release; Species depletion; Ozone hole
2. Testimony of eminent scientists.		Montreal Protocol; Natural calamities; AIDS forecasts; IPCC's influence in global warming debate
3. Accurate projections of computer models.		Weather forecasts; Forecasts spreading epidemics
4. Intended actions of other ministries, countries or decisionmakers.		International police information
5. Development and popularization of appropriate indicators; coordination of indicators among institutions that rely on cooperation to design and implement policy.		Municipal air quality; Flow of financial resources; Currency reserves; Human Development Index from the UNDP Human Development Repor
6. Information about the success or failure of other institutions and countries that have similar problems and have attempted to implement policies; inspiring success stories.		Grameen Bank; Internet-based entrepreneurs
7. Popularization of issues through public communities, business, research institutions, individuals under leadership and guidance of government.		
8. Popularization of visions showing the consequences of and possible outcomes of the issues; cooperation between artists (e.g. Spielberg) and futurists.		Jurassic Park Toffler's forecasts of migration
9. Knowledge about criminal activities that could adversely influence decisionmaking by institutions and governments.		
10. Information about (or derived from) corporate lobbying that could influence decisionmaking by institutions and governments.		
11. Information about probability and risks associated with issues and their policy solutions.		
12. Creation and use of accurate simulations and training which make clear the consequences of actions.		
13. Sufficient information about what is required to implement various policy options: e.g. manpower, systemic effects, technological change, etc.		
14. Attention paid to the issue by the media.		TV images of famine in Somalia affected decision to get involved.
15. A set of long-term scenarios, ranging from dreadful to positive.		
16. Simple, clear, precise information in political, cultural and social (non-technical) terms, connected to goals and strategies		
17.		
18.		

Question 3: Differences in Perceptions Between the Current and Earlier Panels

In Round 1, the panel was asked about the importance and likelihood of previously cited (1996 and 1997) developments. In some instances, the panel's judgments about likelihood were appreciably different from earlier perceptions. (No appreciable changes in importance were noted.) Listed below are those developments, for which perceptions about likelihood have changed appreciably. Where possible, please note whether or not you agree that shifts have taken place and then a few possible reasons for such shifts. For comparison purposes, the prior averages are shown in parenthesis. The scales range from 5 = "almost certain by 2025" to 1 = "almost impossible by 2025."

Table 13

Development seen as becoming more likely	*Do you agree?* *If so, why might the change have taken place?*
9. Expanding science frontiers: new theoretical principles leading to great improvements in energy, motive engines, information systems, geophysical devices, material processing, medical devices, etc. (1997= 3.57; 1998= 4.17)	
Developments seen as becoming less likely	*Do you agree?* *If so, why might the change have taken place?*
17. Increasing microbial resistance to antibiotics. (1996= 4.43; 1998= 3.88)	
3. High population growth among certain poor nations and people; the potential for food scarcity among these nations and people. (1996= 4.58; 1998= 3.95)	

In Round 1, respondents also were asked to judge whether the issues identified in 1996 and the opportunities identified in 1997 were becoming more or less important on a scale in which 5 was "much more important" and 4 was "more important." Those issues and opportunities that received a score of 4 or 5 are shown below. No issue or opportunity was seen as becoming less important. Please indicate whether you agree and indicate why you think the changes may have occurred.

Table 14

Opportunities Seen as Becoming More or Much More Important	Do you agree? If so, why might the change have taken place?
1. Achieving sustainable development. (1998=4.23)	
10. Increasing advances in biotechnology. (1998=4.14)	
8. Developing alternative sources of energy. (1998=4.11)	
9. Globalizing the convergence of information and communications technologies. (1998=4.06)	
3. Expanding potential for scientific and technological breakthroughs. (1998=4.03)	

Table 15

Issues Seen as Becoming More or Much More Important	Do you agree? If so, why might the change have taken place?
2. Scarcity of fresh water in localized areas of the world. (1998=4.12)	
10. Information technology holds both promises and perils. (1998=4.03)	
7. The adverse interaction between- on the one hand- growth of populations and economies and- on the other- environmental quality and natural resources. (1998=4.02)	

Question 4 : Importance and Likelihood of Newly Perceived Developments

Round 1 also requested suggestions about newly perceived developments that might have important consequences. Many of the developments from round 1 repeated those suggested by the 1996 and 1997 global lookout Panels. Only those that were not duplications are listed below. Please rate these newly suggested developments using the following scales:

Importance	Likelihood
5 = Urgently important	5 = Almost certain by 2025
4 = Important	4 = Likely
3 = Modest importance	3 = As likely as not
2 = Unimportant	2 = Unlikely
1 = Trivial	1 = Almost impossible by 2025

In the final column please provide your assessment of your own competence and expertise in the area of the development according to the following scale:

5= Working in the field; know it well
4= Have reading knowledge in the field
3= Generally acquainted with the field; informed layperson
2= Have some interest in the field
1= Have heard about this development
x= Have not heard about this development

Table 16

New Developments	Imp	Likelih	Exp.
1. Local failures in electronic/ communications systems affecting the whole world; e.g. Y2K and satellite paging system failures.			
2.Growing uncertainty in world economy resulting from deregulation and globalization.			
3.Return to old values, ideas, ethnic associations, spirituality, metaphysics, and religions- both traditional and non-traditional- as a result of the pace and scope of change.			
4. Deterioration of urban infrastructure of major cities (e.g. bridges, roads, natural gas pipes, etc.)**.**			
5. Requirement for young people to complete two years of local or global community service.			
6. Evolution of new effective means of inculcating values such as TV programs that depict desirable behavior and relationships.			
7. Privatization of genetic research, including patenting of human genetic information.			
8. Interaction with extraterrestrial intelligence (in one form or another).			
9. Ability to select a baby's gender before birth.			
10. Return to traditional and natural technologies (such as alternative medicine).			
11. International manned Mars's exploration.			
12. Development of a thorough understanding of zero-point energy physics (ambient energy that pervades space).			
13. Demonstration of solar power satellites beaming power to Earth.			
14. Development of anti-aging (and even rejuvenation) technology to render most of body extremely long-lived.			
15. Spread of nuclear weapons.			
16. The rise of new technologies for the production of food, including genetic augmentation of plant properties, new irrigation, and possibly new factory grown and manufactured foods.			

17. Major advances in desalination.			
18. Availability of computers that "understand" natural language and solve everyday problems faced by ordinary human beings.			
19. Ability to copy any natural product with an exact synthetic copy.			
20. Islam providing a global peace paradigm, working hand in hand with democracies.			
21. Appearance of new concepts of social classes: e.g., a society of knowledge and inhabitants of dual cities.			
22. Political confrontation between the US and the emerging superpower, China.			
23. Attempts by governments to use "social engineering" to control violence in society through by capturing the "hearts and minds" of the population.			
24. Change in view of what is natural vs. synthetic and hence need to conserve different global resources.			
25. Growing use of communications networks by dissidents to make their points well known to the world at large.			
26. New and recurrent psychiatric diseases.			
27. Human beings becoming more at home with machines; ever more sophisticated "machines" replace some human interactions.			
28. Development of quantum computers, leading to unprecedented abilities to model global environmental and economic systems.			
29. Diminishing boundaries between different fields of knowledge.			
30. Scarcity of oil around the year 2020 because of depletion of existing stocks - increased consumption worldwide.			
31. Global depression resulting, for example, from collapse of financial institutions, deregulation, and inadequacy of solutions provided by international financial safety net institutions such as IMF.			
32. Water becoming more and more a source of negotiation, solidarity or conflict among nations and even regions.			

Question 5: Role of Moral and Ethical Values

In both the interviews and questionnaire, a question was included about the role of moral and ethical values in decisionmaking. The list below is presented in the order of importance as determined by the panel. Please list actions that you think might address the issues and rate the newly suggested moral and ethical issues using the following scale:

> 5= of highest importance
> 4= of great importance
> 3= of modest importance
> 2= of some importance
> 1= trivial

Table 17

Original List: Moral or Ethical Issues	Import in my country	Import in the world	How might the moral or ethical issue be addressed?
Insufficient attention to the needs of future generations	3.9	4.0	
Corruption in government	3.8	4.1	
Greed and self-centeredness	3.7	3.7	
Economic inequities	3.7	4.1	
Waste	3.7	3.6	
Lack of respect for the environment	3.6	4.0	
Lack of compassion and tolerance for others	3.5	3.6	
Lack of honor and lying	3.4	3.5	
Lack of means for educating about morals and ethics	3.3	3.6	
Lack of transparency in decisionmaking	3.3	3.6	
Barriers to freedom of inquiry	3.0	3.7	
Disrespect of authority	3.0	3.1	
Lack of respect for human civil rights (especially women's)	2.8	3.7	
National sovereignty used to cover human rights abuses	2.8	3.6	
Godless-ness	2.6	2.7	

Table 18

Newly Suggested Moral or Ethical Issues	Import in my country	Import in the world	How might the moral or ethical issue be addressed?
Corruption of political leaders, policy makers, corporate leaders.			
Non-action, the most severe corruption. Honor in leadership is to assume responsibility.			
Undue pressures from lobbying groups.			

Infiltration of organized crime and criminals into government and business			
Alienation of people from self and nature.			
Lack of a holistic view of the world; fragmentation among many people with a more or less holistic view.			
Advertising promoting inappropriate products and purposes; promotion of "over-consumption."			
Lack of role models.			
Lack of common agreement about ethics and morals; it changes with advancing knowledge and socio-economic conditions.			
Undue pressure from fundamentalist groups.			

* * *

The Millennium Project - 1998 Global Lookout Panel
Round 3

Dear Colleague,

On behalf of the Millennium Project of the American Council for the United Nations University in cooperation with the Smithsonian Institution and The Futures Group, we have the honor to invite you to participate in the third and final round of the **1998 Global Lookout Study**.

The 1996 and 1997 Lookout Panels identified developments that could have important future implications. These two panels have involved about 300 people in 60 countries who identified and rated almost 300 developments. These developments were distilled into 15 global issues and 15 global opportunities with a range of views from policy makers about actions that might be taken to address each. The results, together with other work of the Millennium Project, were published in the *1997* and *1998 State of the Future*. Those who respond to this questionnaire will receive the results in a complimentary copy of the *1999 State of the Future*.

Although participants' names will appear in the appendix of the report, comments will not be attached to names. No attributions will be made without permission.

The first two rounds of the current study, and the interviews, focused on impediments and aids to timely policy making:

1. The nature of decision relevant information
2. Reasons why certain developments, issues and opportunities that were identified earlier, seem to be changing in importance
3. Newly suggested future developments that seem likely to raise global issues or opportunities.
4. Important moral and ethical issues in decisionmaking.

In this third and final round, your judgments are requested about some of the information generated earlier.

Please follow the instructions on the next page and return your questionnaire by 20 January 1999. The analysis, based on the results of this and previous questionnaires, as well as the interviews will appear in the *1999 State of the Future* which should be available by mid-year. We look forward to including your views.

Sincerely yours,
Jerome C. Glenn and Theodore J. Gordon

Please answer just those questions that are in your areas of expertise and are of greatest interest to you. While it is not necessary to examine the previous developments, issues, opportunities, and actions to complete the enclosed questionnaire, you may view them at the Project's Web site at http://millennium-project.org.

You can return your responses in several ways:

1. Since faxes (that include hand written responses) may be difficult to read, please consider sending your response by email to make sure your views are recorded correctly. You can download this questionnaire from http://millennium-project.org/millennium/rd3-98.html. In this way you can fill out the questionnaire on your computer and then send it back by email.

2. You can type your answers without the text of the questions and send an email, fax, or letter. For example:

Question 1	*Question 3*
1. #	1. A. #
2. #	1. B. #
3. #	etc.
etc.	

Questions 2
1.   #   Example
2.   #   Example
    etc.

3. You can put your responses on the enclosed questionnaire and send it by airmail or fax.

Whichever way you choose, please send your responses so that they can be **received** by 20 January 1999. If you have not already done so, please send us a copy of your resume (and indicate whether it can be added to those on the Millennium Project's homepage).

The Millennium Project - 1998 Global Lookout Panel
Round 3 Questionnaire

Question 1: Impediments to Action.

In Round 2, respondents were presented with a list of 21 factors that could affect the time of response to early warnings, that were generated by the Global Lookout Panel in the Round 1 questionnaire and interviews with policy makers. These participants were asked to review the list, judge the relative importance of each item, and to add new factors to the list. The results are available at http://millennium-project.org/millennium/rd2-res.html and will be included in the *1999 State of the Future*.

Listed below are other factors that were **newly** suggested in Round 2. Please judge the relative importance of these impediments using the scale below. We recognize that impediments to action will be situation-dependent, but as you think back over key decisions that were not made in a timely fashion, please consider to what degree the items in this list were at least partially responsible.

5= Almost always involved when important decisions are delayed   2= Other reasons are usually more important
4= Quite often involved in delays   1= Not usually involved or only a minor contributor
3= Might be a factor but other factors need to be present as well

Table 19

Additional Impediments Suggested by Respondents in Round 2	Import.
22. Responsibility: personal desire to avoid responsibility for decisionmaking; not wanting to rock the boat.	
23. Inadequate intercultural communications and media exposure	
24. Lack of tools for integrating future estimates into daily decisionmaking	
25. Absence of a sense of urgency; thinking that someone else will take care of it	
26. Benefits of taking action not clearly articulated	
27. Lack of rewards for action that pays off in the long term (vs. short-term rewards)	
28. Paradigm lock: not being able to see or accept that there may be a completely different world view	
29. Over focus: picking a small do-able project at the expense of the bigger picture.	
30. Influence of prior mistakes made by other powerful actors, e.g. international institutions like the IMF, the UN agencies, powerful states influencing policy in other countries.	

Question 2: Information Leading to Timely Decisions

The previous rounds and interviews in this study asked respondents to think about situations when early warnings were given and timely actions followed. The list of 16 situations or aids to timely policy decisions were identified and rated. The results are available at http://millennium-project.org/millennium/rd2-res.html and will be included in the *1999 State of the Future*. Shown below are just the ***new*** suggestions from Round 2. Please provide your

judgments about the usefulness of the types information listed and provide examples of where that information seems to have been used. In answering these questions, please use the following scale:

Usefulness if available

5= extremely useful, if it could be produced   2= probably not worth the effort

4= clearly of great benefit   1= counterproductive; would extend decision time

3= likely to be of moderate use

Table 20

New Suggestions About Information Leading to Decision	Useful -ness	Examples Cited
17. Knowledge about what is possible: how science and technology might affect the outcomes of decisions		U.S. Office of Technology Assessment providing policy recommendations to Congressional staffs.
18. Information about how a contemplated decision may affect stakeholders		
19. Education of decisionmakers and opinion shapers on issues of long term significance, rather than those of short term populist interest		
20. Clarity of forecasted condition without action and technical feasibility of proposed action		Nuclear winter Acid rain

Question 3. Ethics and Decision Making

In both the interviews and questionnaire, a question was included about the role of moral and ethical issues in decisionmaking. Panelists were asked to judge the importance of these issues (in their country and the world) and to assess how the moral issues might be addressed.

Presented below are the average judgments about importance and the panelists' suggestions about how the moral issues might be addressed. For reference, the scale that was used for importance in Round 2 is shown below.

Now, in this round, you are asked to review the suggestions about how the moral issues might be addressed and your judgments about whether the suggestions seem practical and whether, if followed, are likely to be effective in easing or eliminating the issues. The suggestions from round 2 are listed for each issue. Please enter your judgments in the final columns, using the following scales:

[Note: The numbers in brackets, at the end of the issue, signify the issue's position in the questionnaire of Round 2]

Importance	Practicality	Effectiveness
5= of overwhelming importance	5= Entirely practical	5= Likely to be extremely effective
4= of great importance	4= Could be implemented in most cases	4= Likely to be effective
3- of modest importance	3= Could be implemented in some cases	3= As effective as not
2= of some importance	2= Could be implemented in a few cases	2= Generally ineffective
1= trivial	1= Can't be done anywhere	1= Likely to be counterproductive

Table 21

Moral or Ethical Issues	Import in my Country	Import in the World	How might the moral or ethical issue be addressed?	Practica lity	Effective ness
1. Insufficient attention to the needs of future generations (1)	3.9	4.0	A. Teach future needs, economics, and life skills from pre school up		
			B. Require two years community service		
			C. Create positive and negative scenarios and simulations of social and economic conditions, present to the media, to increase political acceptance		
			D. Promote inter-generations interactions		
			E. Use games to generate awareness		
			F. Set up a Ministry of the Future, responsible for long-term national strategy		
			G. More use of forecasting and indicators linked to mass communications		
			H. Generational accounting and presentation of issues as generational		
			I. Designated spokesperson for future generations in legislature		
			J. Promote appropriate language		
2. , Corruption in government (2) Corruption of political leaders, policy makers, corporate leaders. (16)	3.8 3.6	4.1 3.7	A. Provide adequate pay and retirement for police and public officials		
			B. Prevent officials from hiding their money abroad		
			C. Strengthen anti-corruption laws, and judicial and law enforcement systems		
			D. Guarantee freedom of the judiciary		
			E. Expose and increase punishment; very high financial penalties		
			F. Introduce parliamentary codes of ethics		
			G. Introduce intelligent plans of rotation in all public employment		
			H. Promote open government (transparency)		
			I. Set up a supra-national panel to define clear corruption criteria and support national initiatives through financing, expertise, and technical support		
			J. Public election campaigns laws at an international level		
			K. Require broadcasters to give free air time for candidates, and reduce advertising time		
			L. Restrict government power		
			M. Revitalization of civil service		
			N. Introduction of "detector of lying"		
			O. Public control for the actions of policy makers		
			P. Mass media exposure		
			R. Voluntary codes of conduct		
			S. Reinforce time for introspection		

3. Greed and self-centeredness (3)	3.7	3.7	A. Encourage a revival of religion		
			B. Role modeling by parents, teachers, stars, politicians		
			C. Ask the Lord to intervene and strengthen the basic covenant		
			D. Initiate a plan requiring a year of domestic and a year of community service in unfamiliar cultures		
			E. Search for and endorse common values		
			F. Introduce sessions for meditation inside the schools		
			G. Education in morals and ethics: formal, non-formal (media, advertising, entertainment)		
			H. Reach a deeper understanding of the nature of greed		
			I. Reduce the disparity of incomes and inequities, which influence children		
			J. Recognize that greed is not necessarily a problem		
			K. Promote stories about altruism, love, cooperation and self-discipline		
			L. Public denunciation		
4. Economic inequities (4)	3.7	4.1	A. Take big money out of politics		
			B. Establish a multi-national tax system		
			C. Ease the debt crisis of developing countries		
			D. Support education and other capacities in developing countries		
			E. Create a movement towards a global social security system so that every human being is assured a certain minimum level of 'affluence'		
			F. Recognize that inequities are inevitable; but promote economic health and safety nets		
			G. Establish systems such as job rotation to help assure full employment		
			H. Promote growth		
			I. Restructure capital market, increase ESOPs, community investment and micro-credit		
			J. Public prosecutors to present and review at shareholders meetings		
5. Waste (5)	3.7	3.6	A. Use media and educational systems to help change the situation		
			B. Place more emphasis on the environment, economics and life skills in education starting in the lowest public school grades		
			C. Emphasize 'reuse' and 'repair' rather than 'recycle'		
			D. Create a new ethos of recycling		
			E. Focus on supply side (better packing)		
			F. Tax wastes		
			G. Waste by countries is dangerous; therefore, attack the problem on an international basis		
			H. Shift advertising messages from consumption to conservation		
			I. Extend value added tax to affect material recovery		

			J. Encourage local resource recovery/reuse businesses		
			K. Re-orientation of social values		
			L. Establish surplus material exchanges		
			M. Support improved technology		
6. Lack of respect for the environment (6)	3.6	4.0	A. Popularize values compatible with sustainable living		
			B. Place more emphasis on the environment, economics and life skills in education starting in the lowest public school grades		
			C. Create stirring or emotional public service ads		
			D. Introduce advanced environmental training of policy-makers		
			E. Support figurative, musical and other arts centered on nature		
			F. Increase awareness of human dependence on ecosystems via mass-media and educational systems		
			G. Create more hiking programs in every city		
7. Undue pressures from lobbying groups (18)	3.6	3.6	A. Tighten lobbying laws		
			B. Regulation of lobbying activities at the national and international level		
			C. Encourage courageous media scrutiny of lobbying activities		
			D. Initiate limits on spending in political campaigns and contributions		
			E. Limited-term political service, no elections		
			F. Public internet polling		
			G. Lobbying only in public licensed monitored areas		
8. Lack of compassion and tolerance for others (7)	3.5	3.6	A. Education towards tolerance starting at very early age; including values such as love and tolerance		
			B. Strengthening of religious, moral/ethical values through interdenominational coordination and cooperation		
			C. Reduce poverty, inequities and sharp polarization of incomes; these tend to make people cruel and intolerant		
			D. Create role reversal experiences in education and through games and media		
			E. Forbid or moderate violence on TV and Internet		
			F. Parental guidance		
9. Lack of honor and lying (8)	3.4	3.5	A. Teach loving humankind, integrity, dignity		
			B. Endorse frank discussions on the role and nature of honor in the classroom to boardroom		
			C. Inculcate the idea that leadership must demonstrate complete integrity		
			D. Require media norms in terms of violence and what is depicted as acceptable behavior		

			E. The issue is imbedded in the spirit of a society; promote an attitude - through education, public programs, and media - that shows society need not passively accept immoral and unethical behavior		
			F. Equal penalties under the law		
			G. Public denunciation		
10. Non-action, the most severe corruption. Honor in leadership is to assume responsibility (17)	3.4	3.3	A. Require to extent possible, public accountability and transparency.		
			B. Encourage peaceful popular indignation		
			C. Introduce morals and ethics in education		
			D. Mass Media exposure		
11. Lack of a holistic view of the world; fragmentation among many people with a more or less holistic view (21)	3.3	3.3	A. Encourage education in futures studies, morals and ethics, and philosophy		
			B. Provide means such as community service for increasing personal experience with other cultures		
			C. Greater push towards world federalism		
			D. Creation of international projects of importance and drama, e.g. manned mission to Mars, with a multicultural team		
			E. Place New Age messages in a wider context of poverty, disease and violence		
			F. Initiate consumption based taxation		
			G. World education system		
12. Lack of means for educating about morals and ethics (9)	3.3	3.6	A. Change priorities of educational systems so that morals and ethics courses can be included in curricula		
			B. Establish courses in religious and pseudo-religious institutions to emphasize the need for moral and ethical behavior		
			C. Strong interventions by the UN to support education		
			D. Examine and promote emergent moral behavior from small self-sufficient communities		
			E. Mentor young people outside the educational system		
			F. Encourage families to educate children about values		
			G. Use Internet, media to portray moral and ethical behavior		
			H. Train more moral and ethics teachers		

13. Lack of transparency in decision making (10)	3.3	3.6	A. Develop sets of publicly visible decision criteria for economic, management, political, and social challenges/problems and require politicians show how the criteria are addressed		
			B. Reinforce media responsibility to examine otherwise closed decision processes		
			C. Create freedom of information legislation in essentially all countries		
			D. Reinforce the freedom of news media to cover all aspects of political affairs		
			E. Through feedback loops, transparency can cause problems (e.g. finance policy triggers expectation of inflation, and the expectation itself, super-inflation); therefore moderate expectations about absolute transparency		
			F. Support the NGO Transparency International		
14. Advertising promoting inappropriate products and purposes; promotion of "over-consumption" (22)	3.2	3.4	A. Expand the US Food and Drug Administration (FDA) concept to other products and services with more enforcement power		
			B. Initiate early and continuous education in economics to dramatize the waste in the over/conspicuous consumption		
			C. Promote international truth in advertising laws		
			D. Create a popular movement in which consumers patronize socially responsible companies		
			E. Present positive examples of appropriate consumerism in media		
			F. Truth-in-advertising assurance set aside (see UN Human Development Report)		
15. Infiltration of organized crime and criminals into government and business (19)	3.1	3.4	A. Tighten laws and enforcement in this area		
			B. Intensify surveillance of organized crime and criminals		
			C. Legalize victim-less crimes, certain drugs		
			D. On an international basis, help assure the independence and security of the judiciary of nations		
			E. Give international courts enforcement powers		
			F. Strengthen Interpol		
16. Lack of common agreement about ethics and morals; it changes with advancing knowledge and socio-economic conditions (24)	3.1	3.1	A. Research into the common and shared values of all cultures		
			B. Strengthen religious and other moral/ethical values through interdenominational discussions		

			C. Placement of emphasis on moral and ethical issues in religious education		
			D. Teach the falsity of this, i.e. there is common agreement		
			E. Development of critical approaches in education and mass media		
			F. Perform research, study and diffusion of a universal, scientific culture		
			G. Wider circulation of already ratified UN conventions on human rights, labor, etc.		
17. Barriers to freedom of inquiry (11)	3.0	3.7	A. Develop means for participatory democracy (e.g. Internet town meetings)		
			B. Encourage greater freedom of the judiciary		
			C. Reproduce C-Span in other countries: an outside info-channel		
			D. Strengthening the courts to challenge political shields to inquiry		
			E. Encourage peaceful popular indignation of secret decision making		
			F. Create legal control over the authority of political parties		
			G. Pursue non-regulation of communication systems		
			H. Collect and disseminate good and bad examples from around the world		
			I. Implement freedom of information laws		
18. Disrespect of authority (12)	3.0	3.1	A. Elect and appoint politicians and decision makers who command and deserve respect		
			B. Place educational emphasis on reasonable norms starting in the lowest grades		
			C. Educate judges on moral/ethical values		
			D. Emphasize family and community rather than the individual		
			E. Restore the position of 'the sage' in modern context		
			F. Support people who are authors of something good, and then give them visibility: create heroes		
			G. Parental guidance education		
			H. Sometimes is a good thing		
19. Alienation of people from self and nature (20)	3.0	3.0	A. Encourage education for leadership decision making for all professionals and managers		
			B. Popularize vacations on self-sufficient agrarian communes to create an understanding of and affinity between the producer and consumer of goods and services		
			C. Increase the number of opportunities to relearn the importance of the natural world		
			D. Recognize and teach diminished materialism: the paradigm shift in social sciences and economics		
			E. Spend more time outdoors		
			F. Provide more leisure		

20. Lack of role models (23)	2.8	2.7	A. Elect role models to government; promote them		
			B. More emphasis on parenting and early start and continuing education in leadership, morals and ethics and decision making skills		
			C. Identify, publicize and honor men and women heroes		
			D. Emphasize in media what is good in human nature, interesting about the human experience, people who have done something extraordinary		
			E. Elect Philosophers		
			F. Models are there, we need to see and recognize them better		
21. Lack of respect for human civil rights (especially women's) (13)	2.8	3.7	A. Pressure the international community to respect human rights; uphold international conventions on human rights		
			B. Promote female literacy		
			C. Challenge male abuse of power in decisionmaking processes		
			D. Introduce human rights in early education		
			E. Promote affirmative action		
			F. Encourage cultural diversity. Western ethnocentricity maybe conflict oriented		
			G. Require media to moderate violence and display values that encourage human rights		
			H. Do not over emphasize minorities' rights, as it may have an opposite reaction		
			I. Equal protection under the law		
			J. Promote economic opportunities for women		
			K. Biographies of women's life as models		
22. National sovereignty used to cover human rights abuses (14)	2.8	3.6	A. Expose as aberrant and make consequences serious and known (e.g., sanctions)		
			B. Grant greater enforcement power to the UN		
			C. Foster a strong push for the freedom of media and international reporting of abuses		
			D. Create a new horizontal ecumenical religion		
			E. Promote world court and criminal court		
			F. International law enforcement		
23. Godless-ness (15)	2.6	2.7	A. Encourage individual enlightenment: faith is an issue which each person must "solve" individually		
			B. Seek divine intervention		
			C. Coordinate activities among denominations		
			D. Endorse extensive religious education		
			E. Teach morality and ethics in primary school		

			F. The ecumenical movement taking an active role in world issues		
			G. Foster concept that moral decisions can be independent of religion		
			H. Let it happen		
			I. Intensify the role of religion in public life		
24. Undue pressure from fundamentalist groups (25)	2.4	3.0	A. Publicize extremism as fringe, not moderate		
			B. Define 'undue pressure', and create new legislation to deal with it		
			C. Intensify scrutiny and publicize intent of such groups		
			D. Encourage mass media to reveal bad cultures and support good cultures		
			E. Promote multiple perspectives, tolerance, acceptance through education		
			F. If oppression of others, then should be prosecuted		
			G. Stop small arms trade		

Additional suggestions of Moral and Ethical Issues:

Table 22

Moral or Ethical Issues	Import in my Country	Import in the World	How might the moral or ethical issue be addressed?
25. Fear and mistrust from History (26)			
26. Unwillingness to understand a culturally different awareness of same issue (27)			
27. Caring about the well-being of only one's own group or nation (28)			

The results from Round 2 about changes in importance of developments, issues and opportunities, are available at http://millennium-project.org/millennium/rd2-res.html .

Thank you for your participation. You should receive a copy of the results in the *1999 State of the Future* by mid - 1999.

Appendix C: List of Participants and Demographics

Figure 6

Regional Demographics
Total Respondents: 249

Sectorial Demographics
Total Respondents: 249
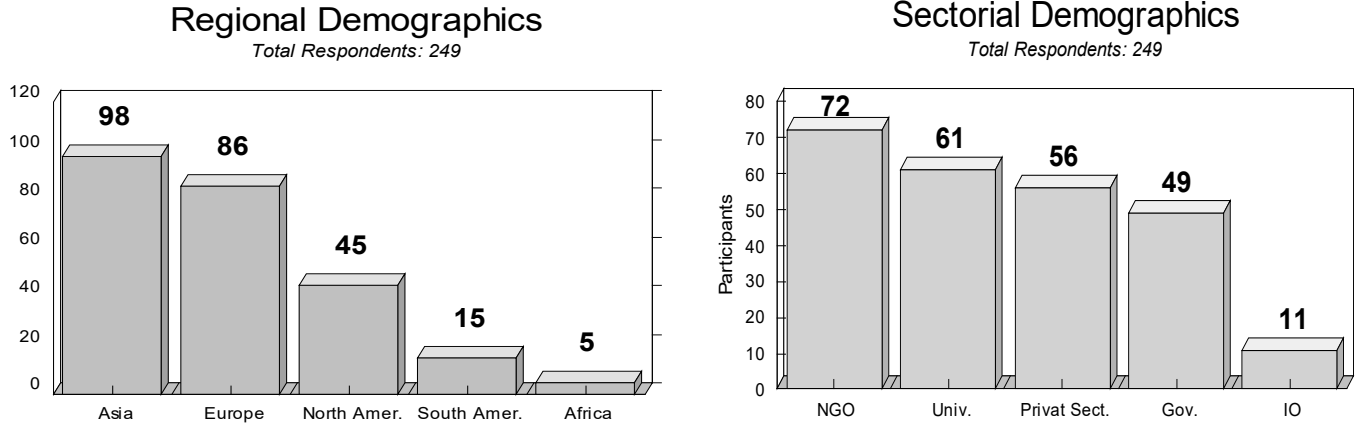
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Appendix D: Background on Futures Research

D.1. Comments on Methods[28]

Futures research and decisionmaking are entwined. Every decision involves some idea or expectation about the future. Unfortunately, decisions are also made with little conscious attention to the forces that can shape success or failure. Therefore, some structure is in order to provide prospective to the methods of futures research and the activities involved in decisionmaking.

Forecasts are unavoidably inaccurate and incomplete. Despite these limitations, futures research has been useful in decisionmaking for two reasons: first, because there is no better alternative and some information about the future, however impaired, is probably better than none (although this could be argued), and second, because methods have been derived that aid in decisionmaking despite the shortcomings of forecasting (e.g. scenarios). The methods are, in general, systematic, but in no sense is the field of futures research a science, that is its methods do not require statement and validation of hypotheses, the standards of professionalism are essentially ad hoc, and except for a few projects, the information which comprises the field is rarely accumulated.

Futures research is the systematic study of possible future conditions. It includes analysis of how those conditions might change as a result of the implementation of policies and actions, and the consequences of future conditions on individuals and groups in society. Futures research can be directed to large or small-scale issues, in the near or distant future; it can project possible or desired conditions. It is not a science and the outcome of studies depends on the methods used and the skill of the practitioners. Its methods can be highly quantitative or qualitative. Its purpose is to help decisionmakers anticipate opportunities and avoid threats.

When futures research methods are applied to the study of competition in industry, the field is known as business intelligence: projecting likely moves of competitors. Government intelligence, information about the likely intent and actions of other nations, may also use futures research techniques for analysis.

In futures research, quantitative or qualitative methods may be used to produce normative and exploratory forecasts. Thus all of the methods listed in Figure 7 can be classed as being either quantitative or qualitative, and being applicable to normative or exploratory forecasting (or both). The matrix presented in Figure 7 serves as a simple taxonomy of the methods of futures research. All of the methods below are designed to evoke some understanding of future possibilities.

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[28] Some material in this section is derived from Theodore J. Gordon, "The Prospects for Accuracy and Completeness in Forecasting," *Technology Forecasting and Social Change*, forthcoming (1999) and Jerome C. Glenn (ed), *Futures Research Methodology*, CD-ROM, Washington, DC: AC/UNU Millennium Project 1999.

Figure 7
Taxonomy for Futures Research Methodology

Method	Quantitative	Qualitative	Normative	Exploratory
Agent Modeling	/////////////////////			/////////////////////
Complexity based models	/////////////////////			/////////////////////
Cross Impact Analysis	/////////////////////			/////////////////////
Decision Models	/////////////////////			/////////////////////
Delphi		/////////////////////	/////////////////////	/////////////////////
Econometrics	/////////////////////			/////////////////////
Environmental Scanning		/////////////////////		/////////////////////
Futures Wheel		/////////////////////	/////////////////////	/////////////////////
Genius Forecasting		/////////////////////	/////////////////////	/////////////////////
Morphological Analysis		/////////////////////	/////////////////////	
Participatory Methods		/////////////////////	/////////////////////	
Regression	/////////////////////			/////////////////////
Relevance Trees		/////////////////////	/////////////////////	
Scenarios	/////////////////////	/////////////////////	/////////////////////	/////////////////////
Science Road Maps		/////////////////////		/////////////////////
System Dynamics	/////////////////////			/////////////////////
Tech Sequence Analysis		/////////////////////	/////////////////////	/////////////////////
Time Series Forecasts	/////////////////////			/////////////////////
Trend Impact Analysis	/////////////////////			/////////////////////

Five of the techniques however deserve an additional sentence or two because they are new and not yet widely known, or because they may appear to lie outside of futures research, should be included.

- **Agent modeling** involves the construction of computer models in which "agents" populate the screen and are given certain, usually simple, rules of behavior. As simulated time flows, the agents interact according to the rules, which may include procreation and passing "genetic" traits from one generation to the next. By observing the way the lifetimes play out, conclusions can be drawn about social behavior, at least to the degree that the individual rules permit such extrapolation.[29]

- **Complexity modeling** involves use of the concepts of non-linear dynamics in the modeling of complex systems. The field stems from the physical sciences, and its concepts have been used in analysis (and forecasting the behavior) of social systems. Take the transition in Russia from Communism and a planned economy to democracy and a market economy. The characteristics that this transition has in common with a complex system operating in its chaotic regime include: history being a poor indicator of the future, the spontaneous emergence of some self organized sub-elements, the inability to predict the next points on the course of the system's evolution, and the difficulty of determining the effects of actions

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[29] One of the best known examples is *Growing Artificial Societies: Social Science from the Bottom Up*, Brookings, 1996.

designed to influence the course of the system. While these similarities are suggestive, the distance to creating a quantitative model that somehow describes how Perestroika in the Soviet Union led to the strengthening of the Mafia, growth in corruption, economic instability and inflation, and social difficulties in Russia is great indeed.[30]

- **Environmental scanning** is the systematic search of current developments, usually through detailed review of selected formal and informal publications, of current developments and trend shifts that suggest that future changes may be brewing.[31] Although this technique is widely practiced, it is included in this list because, strictly speaking, it is a monitoring of the present, not a system for imagining the future and because it is so relevant to the cases studied here.

- **Morphological analysis** is a method for stimulating innovation. In that sense it is a technique for asking what is possible in the future in a given field. The technique was first illustrated in a search for new kinds of jet engines. It begins with subdividing the system of concern into its major subsystems: in the case of jet engines these might be thrust mechanism, fuel, oxidizer, etc. Then, in turn, each of these subsystems are described in terms of all possible alternatives: for example, the thrust mechanism could be turbojet, ramjet, pulsejet, propjet. The oxidizer could be atmospheric oxygen, liquid oxygen, another chemical source, etc. The fuel could be liquid or solid. Having exhausted the possibilities under each subsystem heading, the alternative approaches are assembled in all possible permutation. For some of the possible combinations, real life systems exist. For others, they do not. Some of these others will be patently impossible; but others at least raise the question "why not". And in attempting to answer this question new inventions are stimulated. [32]

- **Science Road Maps** describes a technique pioneered by the Motorola Corporation and pursued by Santa Fe Institute. In this approach, a "road map" of the potential future developments of a given field of science is laid out in much the same manner as a PERT chart, with developments interconnecting and demonstrating how progress in one area could trigger downstream developments in another. This approach is also useful in competitive analysis (if we don't develop it, they might) and selection of R&D projects[33].

Just as the methods of futures research can be listed and categorized, so can the **aspects of decisionmaking**. Decisions can be viewed from several different viewpoints:

1. a *values perspective* is involved in judging whether the expected outcome of a prospective decision is good or bad. What seems good to one person may seem bad to another, depending on the values they hold.

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[30] From a proposal prepared by the Millennium Project, Washington, DC, and members of the Center for Science and Industrial Policy, Moscow.

[31] Theodore J. Gordon and R. W. Pratt Jr. *Environmental Scanning*, The McGraw Hill Handbook of Modern Marketing, Victor P. Buell (ed) New York: McGrow Hill Book Company, 1986.

[32] F. Zwickey. "Morphology of Propulsive Power," *Monographs on Morphological Research*, No. 1. Pasadena CA., Society of Morphological Research, 1962

[33] An example can be found at: Brian Foster, David Williams and Andrew le Masurier. *The PPARC Science Road Map - laying out the potential*, http://www.pparc.ac.uk/news/roadmap/rdintro.html

2. a utility or *rational perspective* can be used. In this approach, one decision may be better than another, if it meets certain rational criteria better than its alternatives. A sub-discipline of operations research and economics probes decisions from this standpoint, using schemes such as portfolio analysis to make risk explicit and proportional to return, and rules such as *mini max* - minimize the chances of maximum loss.

3. the field of *judgment heuristics* deals with the quirks of human decisionmaking, focusing particularly on risk taking and probability judgments. Judgments are often strangely impaired by predilections that are either genetic or environmentally implanted and place an otherwise objective consideration of decision options onto a distorted playing field.

4. the field of *cognitive science* creates models of decisionmaking from the standpoint of the inductive thought processes involved; these models are often applied to computers as well as humans.

Futures research and decisionmaking come together in any planning enterprise. Ideally, futures research lays out what might be and planning selects and implements that which seems desirable. The interplay between these activities can be sketched as in Figure 8.

Figure 8

The Relationship Between Forecasting and Planning
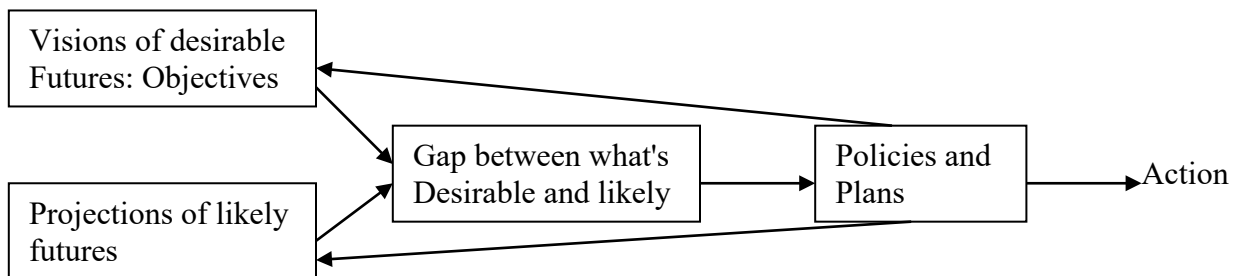
The box in the upper left of this diagram, *a vision of desirable future objectives* represents normative forecasting; the box in the lower left, *projection of likely futures*, represents exploratory forecasting. The process of *planning* requires analyzing the gap between the two futures: that envisioned and that desired (central box) and creating *candidate policies* that might close the gap (right hand box). The creation of these policies is the locus of decisionmaking and is subject to the limitations and strictures mentioned above: moral considerations, utility, judgment heuristics, and cognitive processes. Those policies can affect the future in two ways: by changing expectations about what's possible to achieve, or by changing the forecast about what's likely. When a policy is found that reduces the gap, action should follow.

D.2. Some Thoughts on Foresight[34]

Futures Studies can be placed on a continuum in comparison with: reacting, muddling through, administration, prediction, forecasting, planning, "outlook"/"lookout", strategic risk-management, foresight(ing), futures studies/research, science fiction, fortune telling, spiritual revelation.

A very important question in distinguishing futures work is "When does 'the future' begin?" How far "forward" in time can before first encountering "the future?" For example, where does "administration" end and "planning" begin, and then "foresight" begin, etc.? Different groups define those boundaries differently, and indeed the boundary is no doubt different for different classes of actions, depending on the life-cycle of the object of concern, for example.

Another continuum useful in distinguishing foresight from other future-oriented work might run from considering a single "most likely" future; to high/medium/low futures of a single theme/variable; to the development of best case/worse case scenarios; to the concept "an alternative future" (meaning "alternative to the what most people think the future will be," thus perhaps a kind of "preferred future"); to genuinely "alternative futures" (meaning true alternatives to the present as well as to "the most likely" future); finally reaching actual futures research with its insistence on the term "futureS" rather than "THE future" along with the envisioning and movement towards "(a) preferred future(s)"

Another mark of futures work includes the importance of consciously articulating and distinguishing between "images of the future" which underlie all future orientation, even that which believes it has no conscious future orientation at all. So also is the use of (and/or faith in) primarily quantitative methods vs. primarily qualitative methods.

Some people believe that the success of futures work is best measured by whether consciousness has been raised/changed, or not, while others insist that that is not enough and that actual actions have to be taken more or less directly from the use of foresight for it to be deemed "successful." Some note, however, that "the future has a long fuse" and that direct action may be taken, but not immediately, so that "consciousness raising" is thus probably the best proximate measure of a successful futures activity.

Whether the external environment around an entity is taken as given, or is itself problematic, is an important distinguishing feature between foresight (which problematizes the environment) and other future-oriented work (which takes the external environment as granted)

In addition, some activities demand longer time horizons--military, space, energy, transportation, insurance. It may be easier and more imperative for such organizations to be future-oriented and to want to use futures research. Others (such as the typical manufacturer and retailer), can be quite successful for a long time--maybe forever--without considering "the future" at all; just be observant and adaptive; muddling through will do except in major system breaks.

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[34] This Appendix is extracted from material written by Dr. James Dator for this project.

Whether one takes a strictly "free market" laissez faire, libertarian approach, or whether one assumes a totally centrally-planned economy and society, foresight is still needed. Foresight is not something "socialists" do but "capitalists" do not, or vice versa.

LIBERTARIAN FORESIGHT If each private economic entity engaged in and/or used foresight, then (according to Libertarian assumptions) that would aggregate, via the invisible hand, to the closest approximation possible of foresight for the commonweal. No strictly "governmental foresight" would be necessary, or desirable.

CONSERVATIVE FORESIGHT. On the (slightly more visible) other hand, under "maximum privatization/ that government is best which governs least" type assumptions, governments might buy and use foresight supplied by many competing private producers.

LIBERAL FORESIGHT. Under assumptions of the desirability of a more proactive system of governance which seeks to intervene and act on behalf of the common good, each government unit might either engage in foresight or have ready access to foresight produced by one or more other governmental units. All governmentally-produced foresight should be available freely to any citizen, and itself subject to democratic control.

Each governmental unit and individual citizen should also have the opportunity to buy privately-produced foresight (however, some privately-funded futures research might be owned entirely and kept secret by the funder).

AUTHORITARIAN FORESIGHT. Finally, according to certain totalitarian assumptions, the government might have a monopoly on foresight, requiring all units of society, including economic sectors, to use the foresight provided by government experts alone. All private (or foreign) foresight would be forbidden.

D.3. Does Futures Research Help Decisionmaking? Two Views

The Project asked professional futurists and policy makers to identify examples and experience in the uses of futures research in decisionmaking, in four ways. The first two have already been described: in depth interviews with policy makers and the Lookout Panel. The second two methods were:

> A request was made via the project's two Internet listserves for examples of futures research and futures studies used in decisionmaking.

> Private correspondence was established with professional futurists asking for more detail about projects in which they might have been involved.

In many instances, participants in this aspect of the study suggested publications of theirs and others that were made available via hard copy and on various web sites (see Appendix F). The team followed up these leads and this activity is reported in this section.

The Millennium Project listseves were invited to comment on "cases that illustrate how futures research has helped improve policy." These listserves are made up of several hundred people: professional futurists in one instance, and people who expressed interest in the future in the other. The results of the on line discussion were surprising. One camp said policy making always considers- formally or informally- the future. A second camp said they had been searching for such examples for years and had failed to find that futures research had contributed significantly to policy making. As an example of the first position, one professional futurist said:

The first camp argued that future orientation is inevitable, unavoidable and is almost always a part of decisionmaking. A correspondent taking this position said:

> All decision and policy making which is goal oriented, with the relatively minor exception of cathartic choices in their pure form, are based in part on images of the future of probably outcomes of different options including doing nothing. Therefore, all structured and organizational policy making includes some arrangements for more or less systematic exploration of relevant contingent futures.
>
> Prime illustrations include the constant use of "intelligence estimates" in security and external relation choices and the constant use of economic models in many economic decisions.
>
> Indeed, most of the literature dealing with policy making, descriptive-historic as well as prescriptive takes up the use of "futures", sometimes well and sometimes badly so, but still usually explicitly.
>
> This is even more pronounced in the very large literature on "planning" in all its forms, where "futures" in one way or another are a main concern -- both predictively and as a target for impact.
>
> Therefore, I am not sure about the "point" in seeking literature on uses of futures in policy making.[35]

And another futurist responded:

> ....images of the future guide **all** goal-oriented decision or policy making. I would strengthen the statement you make to:
>
> All decision and policy making which is intended to achieve values set by the parties who will be subject to the decision or policy, is based on visions of the future, expressed or implied, which arises from each option presented, including doing nothing. Other decision and policy making is conducted by trusting elite individuals or groups to perform such an analysis emotionally without reference to external, shared models that the parties affected can verify, and is restricted to situations where the risk of sharing the information is (perceived to be) greater than the risk of choosing an undesirable

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[35] Listserve correspondence, Yehezkel Dror, Nov. 25, 1998

outcome.[36]

But the other view held:

> The issue is critical, and it would be good to pinpoint real examples (of policies where futures research) made a difference. I might say that, over the last year, I have looked in the literature and in conversations for examples in one area: the SRI/Shell Oil/GBN approach to scenarios. I have not found a single case, including Shell's, in which policy choice flowed directly from the scenarios. Other important values were achieved, at least partially, but not this--which I take to be the basic reason for doing FR.[37]

And another professional said:

> As you know, it is VERY difficult to "prove" that futures activities result in effective subsequent action. I know of no good study which has done that (do you?), and certainly have no clear evidence in anything I have done over the past 30 years.

> Indeed, I have submitted funding proposals to …...... for four years in a row...... to engage in a study to find out if indeed the ten years of .... foresight........(much of which I have been very directly involved in) has in fact resulted in anything significant and lasting. "Does the future matter"? is one way I phrased it.....

> So I can't honestly answer your question. And, as I looked over what other people sent in to you, I don't think they can either, in spite of their claims.[38]

> Unfortunately, policy making is usually impervious to futures studies. Predictions of the future can usually be picked apart and disregarded. Time horizons can be impossibly short. All the futures studies on global warming have not yet moved US policy in the directions recently endorsed by the administration...Political pressures are more important than futures studies.

> Which introduces another methodological problem: some of the best futures work is based on an organization (or person) stating, and working towards, a preferred future, very broadly stated, while other is based on scanning for highly specific problems/opportunities and trying to avoid/obtain them; others yet is aimed specifically at monitoring competitors in order to stay/get ahead of them in market share, for example, and much futures work seems to be just some person having a bright idea which may or may not be used to form policy and guide action (most of the material I have been sent has been of failures, not successes, or of possible, but certainly not conclusive, successes).[39]

Why this dichotomy? During the preparation of this report, the Millennium Project engaged the

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[36] Listserve correspondence, Craig Hubley, Nov. 26, 1998
[37] Private correspondence, Wayne Boucher, Nov. 28, 1998
[38] Private correspondence, Jim Dator, Nov. 25, 1998
[39] Private correspondence, Jim Dator, March, 1999

services of a professional futurist to identify and validate case studies. In the end, the futurist abandoned the research- at least for the time being. He gave several reasons for doing so:

1. Most material on the subject simply states that success was achieved but is short on real evidence.

2. Business examples are often proprietary.

3. There is no adequate typology for classifying the cases and their methodology.

5.   Only very few foresight activities are carried out in house by trained professionals who are knowledgeable in the methods of futures research.

D.4. Individual Decisionmaking as a Mirror of Socio Political Decision Making

That futures thinking is pervasive and implicit in socio-political decisionmaking is borne out by studies of decisionmaking by individuals drawn from cognitive psychology and neurology. Holland et. al. for example, suggest that individuals make decisions based on mental models held in their brain that are "transient, dynamic representations." These models are of the "if--then" sort. For example, if a deal offered seems to be too good to be true, be cautious about accepting it because it is likely not to be true. Or if faced by life threatening situations, then react to protect self and family. Such models are used to make predictions about the need for and consequences of individual actions. The models are predictive, based on experience, and are modified as new learning by the individual takes place. The models lead to rules for decisionmaking and rules become "a network of interacting, competing, not necessarily consistent hypotheses" In the contest between conflicting hypotheses, the rule that leads to successful prediction "is strengthened, ... increasing the likelihood of its use in the future...." and those that lead to error are "modified or discarded.... Predications about the attainment of goals will normally be the most powerful source of feedback." [40]

It is easy to make the assumption that this vision of decisionmaking by individuals parallels the processes of socio-political decision making used by leaders or groups. Paraphrasing Holland et. al., one could say: decisions are always based on explicit or implicit models. Such models are used to make predictions about the need for and consequences of action. The models are predictive, based on experience, and are modified as new learning takes place. The models lead to rules for decision making and sometimes the rules are not necessarily consistent. In the contest between conflicting hypotheses, the rules that have led to successful results in the past are used more frequently and those that have led to error in the past are rarely used again.

In this analogy, political necessity in socio-political decision making is parallel to self preservation in individual decisionmaking. Sometimes in the social sphere other factors weigh more heavily than political necessity, as other factors are sometimes more important than self preservation for the individual.

This parallel between the processes of induction in an individual and in socio-political

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[40] John Holland, Keith Holyoak, Richard Nisbett, and Paul Thagard. "Induction", MIT Press, 1989. p.16. Suggested by Paul Werbos in conjunction with studies of the editor into the decision process.

decisionmaking can be carried further. Individual decision making is often befuddled by psychological inconsistencies. For reasons that have not yet been discovered, the mind sometimes thinks in patterns that appear to be irrational.[41] Good bets that make sense in economic terms often seem risky; risky ventures sometimes seem like sure things. The way a question is posed affects the answer. Beliefs are formed by first impressions. Value is assigned where none exists. We depreciate mentally to avoid admitting a loss. We are very reluctant to cut losses on loosing projects. We value our self esteem and will go to great lengths to avoid admitting that we have acted in a way that was less than ideal. We invent and believe the explanations we invent for our poor performance. We ignore or do not believe information that contradicts our beliefs. We are overconfident. The list is longer, but it is clear that what appears to be intrinsic in individual decisionmaking is mirrored in the distortions of socio-political decision making.

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[41] Most of the examples of irrationality in decision making come from the work of Amos Tversky and Daniel Kahneman who have been exploring this intersection between economics and psychology by have groups of people make choices under varying experimental circumstances. Their work dates to the early '70's. and they stimulated and contributed many articles, papers and books to this field, generally called Judgment Heuristics. For an early paper see, Tversky, Amos and Kahneman, Daniel, "Judgment under Uncertainty: Heuristics and Biases," *Science*, 185 (1974), 1124-1131.

Appendix E: Attachments related to "Futures in the Virginia Judiciary: A Continuing Success Story" example

Attachment1: Mission Statement and the 10 Visions from the Strategic Plan for Virginia's Judicial System

Mission
To provide an independent, accessible, responsive forum for the just resolution of disputes in order to preserve the rule of law and to protect all rights and liberties guaranteed by the United States and Virginia Constitutions.

Vision 1
In the future, all persons will have effective access to justice, including the opportunity to resolve disputes without undue hardship, cost, inconvenience or delay.

Vision 2
In the future, the court system will maintain human dignity and the rule of law, by ensuring equal application of the judicial process to all controversies.

Vision 3
In the future, the judicial system will be managed actively to provide an array of dispute resolution alternatives that respond to the changing needs of society.

Vision 4
In the future, Virginia's judicial system will be structured and will function in a manner that best facilitates the expeditious, economical and fair resolution of disputes.

Vision 5
In the future, the courts of Virginia will be administered in accordance with sound management practices which foster the efficient use of public resources and enhance the effective delivery of court services.

Vision 6
In the future, the court system will be adequately staffed by judges and court personnel of the highest professional qualifications, chosen for their positions on the basis of merit and whose performance will be enhanced by continuing education and performance evaluations. Lawyers, who constitute an essential element in the legal system, will receive a quality pre-professional and continuing education befitting the higher professional and ethical standards to which they will be held, and the need to become increasingly service-oriented in their relationships with clients.

Vision 7
In the future, technology will increase the access, convenience and ease of use of the courts for all citizens and will enhance the quality of justice by increasing the courts' ability to determine facts and reach a fair decision.

Vision 8
In the future, the public's perception of the Virginia judicial system will be one of confidence in and respect for the courts and for legal authority.

Vision 9
In the future, the impact of changing socioeconomic and legal forces will be systematically monitored and the laws of Virginia will provide both the substantive and procedural means for responding to these changes.

Vision 10
In the future, the judicial system will fulfill its role within our constitutional system by maintaining its distinctiveness and independence as a separate branch of government.

Attachment 2: Objectives and Tasks associated with Vision 4

Vision 4
In the future, Virginia's judicial system will be structured and will function in a manner that best facilitates the expeditious, economical and fair resolution of disputes.

Objective 4.1
To structure the judicial system in a manner that best enables the prompt, fair and cost-effective resolution of disputes.

> Task 4.1.1
> Propose legislation to expand the jurisdiction of the Court of Appeals to include all civil appeals with a commensurate number of judges and staff to handle the increased workload.

> Task 4.1.2
> Propose legislation to authorize the Chief Justice to designate and temporarily assign any judge, with his or her consent, to sit at any trial court level.

> Task 4.1.3
> Conduct a study of the venue statutes to identify jurisdictional distinctions which, if eliminated, would make access to courts more effective.

Objective 4.2
To simplify legal procedures to enhance judicial effectiveness and efficiency.

> Task 4.2.1
> Continue to seek adoption of legislation to provide that, when a preliminary hearing is held, establishment of probable cause at that hearing will be sufficient to initiate a trial in the circuit court without indictment by the grand jury.

Task 4.2.2
Develop and conduct a pilot test using videoconferencing for appellate arguments, based on the experiences of other judicial systems and the needs of Virginia's appellate courts.

Task 4.2.3
Monitor the joint study on local rules being conducted by the Senate and House Courts of Justice Committees.

Objective 4.3
To create a single trial court with comprehensive jurisdiction for the handling of legal issues relating to children and families.

Task 4.3.1
Secure funding to establish the family court in Virginia.

Attachment 3: a page from the "1998 - 1999 PPMS Special Projects " spread sheets

Attachment 4: This is a page from the Project Monitoring System computer printout, showing who is assigned to each task, how many hours are to be devoted to it (and were actually spent on it) and a start and finish date for each task.

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Sources used for the case "Futures in the Virginia Judiciary: A Continuing Success Story":

Courts in Transition. A Report of the Commission on the Future of Virginia's Judicial System, Supreme Court of Virginia, 1989.

Foresight 2000: A Strategic Plan for the Judicial System of Virginia. Supreme Court of Virginia, (Biannually since 1990. Current version is FY 1998-99.

Future View. A Quarterly Newsletter of Trends and Issues. Judicial Planning Department, Office of the Executive Secretary, Supreme Court of Virginia (since 1992)

Kathy Mays, "Futures Research and the Judiciary: Virginia's Experience," Futures Research Quarterly, Spring 1994, Vol. 10, No. 1, 31-35.

The Public as Partners: Incorporating Consumer Research into Strategic Planning for Courts, Judicial Council of Virginia 1994.

Virginia's Courts at the Millennium: 1999-2001 Strategic Plan Themes. Judicial Planning Department, Office of the Executive Secretary, Supreme Court of Virginia, April/May 1999.

Appendix F: Web-sites related to Futures Studies

➢ Adamantine Studies on the 21st Century: http://www.adamantine.co.uk/ - Books for tomorrow, published today.

➢ Future Oriented Complexity and Adaptation Studies (FOCAS) at the Network University of the Green World. : http://muratopia.org/

➢ Futures Forum: http://www.planet-tech.com/futuresforum/ - on line conference

➢ Futures Studies Education: http://www.eou.edu/ps/webfs.html –listings of faculty and programs in Futures Studies

➢ Futures Study Center: http://www.futures.austbus.com/ - gives you services, ideas and resources about the future.

➢ Futures Survey: http://www.tmn.com/wfs/fsurv.htm - monthly guide to the literature of social change, new technologies, futures studies, policy-making, environmental studies, organizational renewal, and related cross-disciplinary fields.

➢ Global Foresight Associates (GFA): http://www.lava.net/~gfa/ - is a network of professional futurists dedicated to providing organizations and communities with the tools to face the future. Must join (annual membership $35) to view all the sites.

➢ Global futures foundation: http://www.globalff.org/ - Global Futures works with major corporations, governments, and advocacy groups to resolve conflict and create opportunity

➢ Great Thinkers & Visionaries on the Web: http://www.lucifer.com/~sasha/thinkers.html - list of people whose ideas on how and where the world is - and should be – evolving

➢ Hawaii Research Center for Future Studies: http://www.soc.hawaii.edu/~future/ - information resource

➢ Ideology and Utopia: Better Worlds in Speculative Fiction : http://www.changesurfer.com/Acad/SFBib.html - list of books

➢ Institute for Alternative Futures: www.altfutures.com - AF helps organizations and communities clearly understand the accelerating pace of change and focus their energies on clarifying their highest aspirations.

➢ Institute of Future Studies for Development, IFD http://www.ifd.or.th - is an independent academic research institute created for the purpose of communicating

➢ International Space University http://www.isunet.edu/ - course work description with focus on space.

- Mercury Center: http://www.sjmercury.com/ - Knight Ridder

- National Media Lab: http://www.nml.org/ - To ensure that the U.S. Government leads the world in information superiority by working with commercial industry to catalyze, influence, and exploit emerging information technology and products that satisfy government needs.

- New Civilization Network: http://www.newciv.org/ncn/ncnintro.html - global network of people visualizing a better world and working on building it.

- On the Horizon: http://sunsite.unc.edu/horizon - informs educational leaders of the implications of change in the external world and provides recommendations for action to address these implications.

- Others: http://www.others.com/contents.htm - a forum for the critical and objective exploration of other cultures, ideas, concepts, philosophies and arts and sciences based upon other truths and epistemologies.

- Planet Science: http://newscientist.com/ - magazine 'New Scientist'

- Principia Cybernetica Project: http://pespmc1.vub.ac.be/ - computer-supported collaborative development of an evolutionary-systemic philosophy.

- Rocky Mountain Institute: http://www.rmi.org/ - o foster the efficient and sustainable use of resources as a path to global security.

- Search for Extraterrestrial Intelligence (SETI): http://www.seti-inst.edu/ - The SETI Institute serves as the home for scientific research in the general field of Life in the Universe

- The Club of Rome: www.clubofrome.com – think tank

- The Institute for Advanced Interdisciplinary Research: http://www.systems.org/HTML/welcome.htm The Institute strives to deliver to its clients strategic advantage in the global inter-linked economy monitoring at the state of the art in computer and communications technologies.

- The OECD Forum for the Futures: http://www.oecd.org/sge/au/ - is committed to an interdisciplinary approach and a systemic perspective as the most appropriate way of effectively tackling longer-term future challenges in a world of increasing interdependence and accelerating change

- The OECD Future Studies Information Base: http://www.oecd.org/sge/au/5ifpbase.htm - provides details on a selection of books, papers and articles claiming to provide the key to understanding the 21st century.

- Strategic Futures International: http://www.sfutures.com/web-lnk1.htm - Finding who is

doing what, and where, in forecasting, futures research, strategic management (Incl. Models and methods)

➢ The Santa Fe Institute: http://www.santafe.edu/ - draws scientists from universities and research institutions throughout the world to pursue broad research problems. Much of the work focuses on the science of complexity

➢ The UK Foresight Programme: http://www.foresight.gov.uk - looks at possible future needs, opportunities and threats and deciding what should be done now to make sure that we are ready for the challenges of future

➢ The Why Files: National Science Foundation: http://whyfiles.news.wisc.edu/index.html – magazine

➢ The World Futures Studies Federation (WFSF): . http://www.fbs.qut.edu.au/wfsf/nfwfsf.htm - strives to be a forum where the stimulation, exchange, and examination of ideas, visions, and plans for alternative, long-term futures can take place.

➢ University of Houston (Institute of Futures Research): http://www.cl.uh.edu/futureweb/ - MS program in Future Study

➢ World Futures Society: www.wfs.org – publishes monthly and quarterly periodicals.

➢ Worldwatch Institute: http://www.worldwatch.org/ - inform policymakers and the public about emerging global problems and trends and the complex links between the world economy and its environmental support systems.