

*Prospective and Futures Research:  
Tools and Concepts  
for organizational development and  
success in the XXI Century*

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# Outline

- The world is changing faster than people think
- A conceptual framework for understanding change
- Purpose and Philosophical Assumptions of Futures Research and Prospective Some Future Organizational Development Concepts
- Futures Methods
- Environmental Scanning, Future Intelligence Systems, Early Warning Systems
- Futures Wheel
- Cross-Impact Analysis
- State of the Future Index (SOFI)
- (trans)institutions, nodes, and other
- Some Futuristic Concepts
- futuristic organizational concepts and methodologies for corps, institutions, universities, and how to define strategies and policies.
- In addition to teaching and research, the Center for Prospective Studies of Univ to act as interface with others.

# The Future will be more ...than most people we think

Acceleration of change

...changes what we believe is possible

Computing everywhere, nano-bio-Info technology,  
and cognitive science is merging

This further accelerates the rate of change

...Which means we should change **AGAIN** what  
we believe is possible

# 25 Years ago there was no

- Internet, mobile phones, PCs (Apple IIE just out)
- EU, MERCOSUR, NAFTA, WTO, ICC, or NATO in Afghanistan
- Talk of globalization, cloned sheep, genetically modified food and drugs, stem cells repairing the body, or international space station.
- Asymmetrical warfare... and most believed that WW III would have destroyed the world by now
- No AIDS pandemic
- China and India to determined energy prices
- Self-fulfilling Moore's law by R&D Managers

# .....So, what surprises in the next 25 years?

- More than half the world spends more than half its time in cyber space
- Life extension begins to look like a realistic option while the aging population increases economic concerns
- Human intelligence becomes the competitive advantage in the global knowledge economy (personalized food, regressed stem cells re-inserted in the brain, genetic engineering, computer enhanced learning)
- Stem cells from cows and fish to produce meat
- Nanotechnology to reduce pollution and raise the living standards of the poor
- Solar Power Satellites for world's electricity needs without producing greenhouse gases or nuclear waste
- India and China are the axes of the global economy (if water/energy solved)
- Personalized food, genetic engineering, computer enhanced learning to increase mental performance
- We write genetic code like software code to create new forms of life, some merges with computational intelligence (AI)
- A global brain(s) emerging from Internet evolving into *Conscious-Technology*

# Conscious-Technology (*Post-Information Age*)

When the distinction between these two trends becomes blurred, we will have reached the

*Post-Information Age*

HUMANS BECOMING  
CYBORGS

BUILT ENVIRONMENT  
BECOMING INTELLIGENT

2030

2015

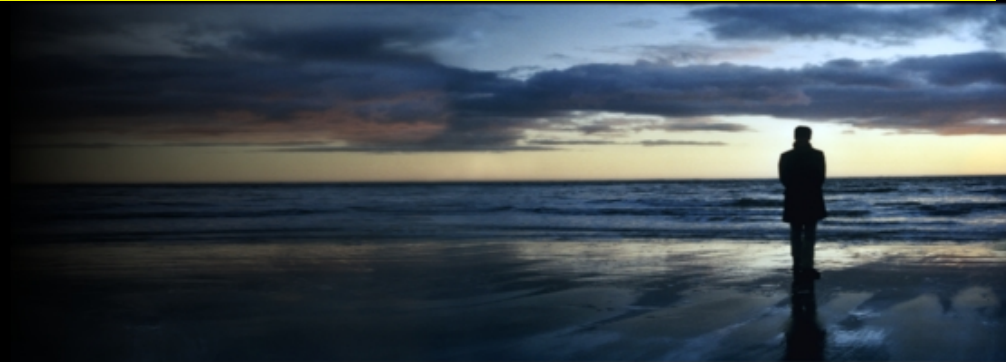
2000

1985



# Simplification of History and an Alternative Future

<b>Age or Era</b>	<b>Product</b>	<b>Power</b>	<b>Wealth</b>	<b>Place</b>	<b>War</b>	<b>Time</b>
<b>Agricultural/ Extraction</b>	Food/Res	Religion	Land	Earth/Res	Location	Cyclical
<b>Industrial</b>	Machine	Nation-State	Capital	Factory	Resources	Linear
<b>Information</b>	Infoservice	Corporation	Access	Office	Perception	Flexible
<b>Conscious- Technology</b>	Linkage	Individual	Being	Motion	Identity	Invented



# Purpose of Futures Research

- To systematically explore, create, and test both possible and desirable futures to improve decisions
- Provide a framework to help understand the present and its potential
- Expand mental horizons
- Enhance understanding of future markets – difference between short-term forces and long-term trends
- To understand the extent that policies can change trends

# Purpose of Futures Research (Continued)

- Enhance ability to act faster or earlier making the company more effective in dealing with changing financial conditions in the world (media lost \$billions by not understanding its opportunities back in the 1980s, and early 1990s.)
- Get early warnings which in turn give extra time to:
  - better understand threats & opportunities
  - develop more creative strategies
  - create new product opportunities
  - create and share vision for organizational change
- To help understand what might be, what could be, and what ought to be

# Philosophical Assumptions

- You cannot know the future with certainty
- A range of possible futures can be known
- Likelihood can be changed by policy
- Policy consequences can be explored
- Foreknowledge, probabilities, (sunrise vs stock market)
- Cross referencing methods is better
- Humans will have more influence on the future than in the past

# Some Future Organizational Development Concepts

- Evolution of management power: hierarchy -> networks -> nodes -> fields
- Complexity, chaos, attractors, self-organization, and emergence (when in increase and decrease input in the system)
- Management by Understanding
- Transinstitutions

# Conditions of a TransInstitutions

1. Board/Committee/Council: self-selected governments, corporations, NGOs, Universities but not a majority from any one institutional category
2. People who work in it or with it come from all these institutional categories, but not a majority of any one
3. Results affect all these institutional categories
4. Income from all these institutional categories except university (then take not give money)

The Millennium Project is  
experimenting with the concepts of a  
transinstitution and the evolution of  
networks to Nodes and Fields



... May become a *TransInstitution*



# Millennium Project Nodes...

are groups of individuals and institutions that connect global and local views in:



Nodes identify participants, translate questionnaires and reports, and conduct interviews, special research, workshops, symposiums, and advanced training.

# Futures Research Methodology

## Version 2.0



American Council for

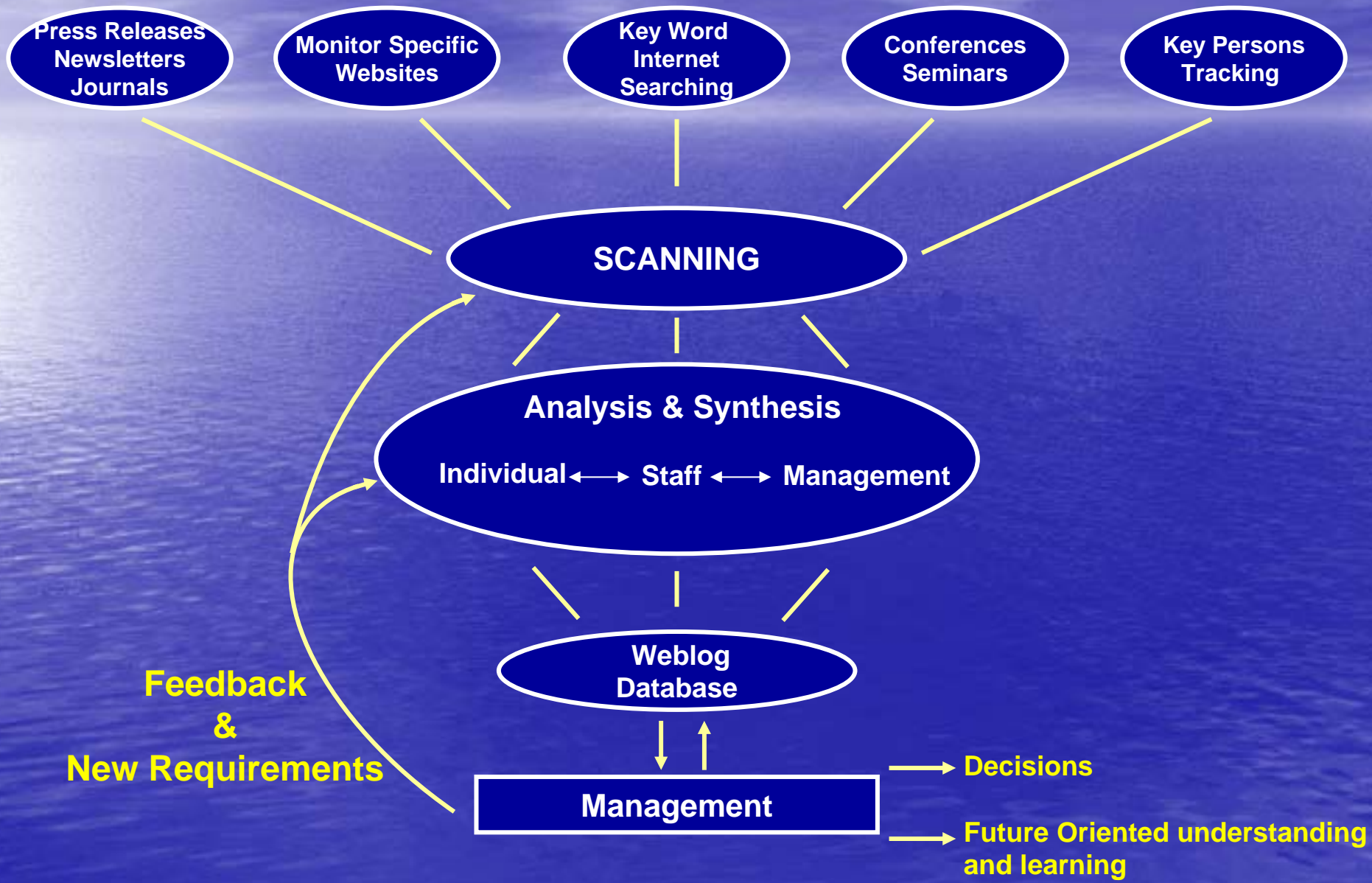


The United Nations  
University

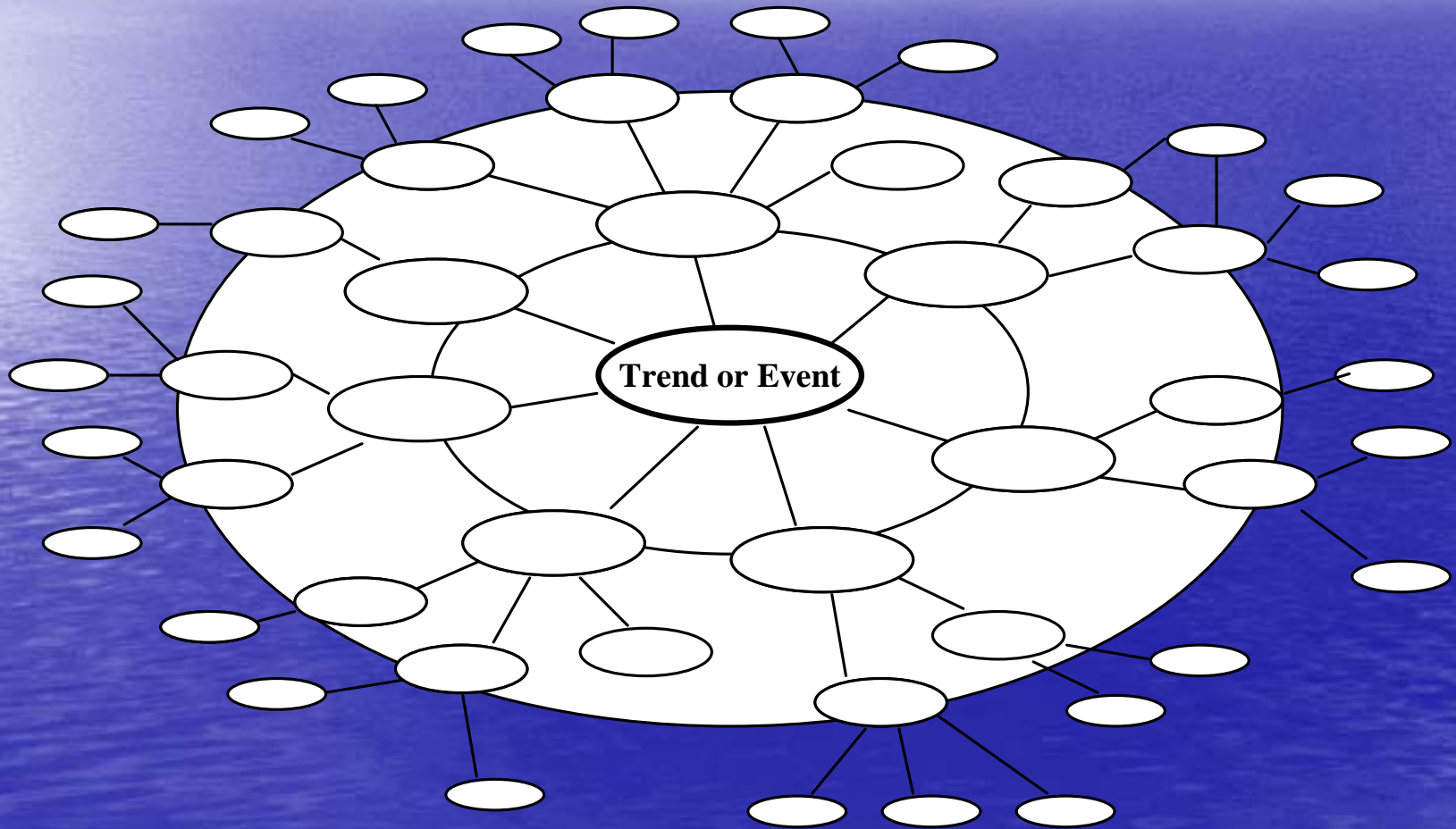
The Millennium Project

1. Introduction & Overview
2. Environmental Scanning
3. Delphi
4. Futures Wheel
5. Trend Impact Analysis
6. Cross-Impact Analysis
7. Structural Analysis
8. Systems Perspectives
9. Decision Modeling
10. Statistical Modeling
11. Technological Sequence Analysis
12. Relevance Trees and Morph. Analysis
13. Scenarios 13.5 Interactive Scenarios
14. Participatory Methods
15. Simulation and Games
16. Genius Forecasting, Vision, Intuition
17. Normative Forecasting
18. S&T Road Mapping
19. Field Anomaly Relaxation (FAR)
20. Text Mining for Technology Foresight
21. Agent Modeling
22. SOFI
23. SOFI Software
24. The Multiple Perspective Concept
25. Tool Box for Scenario Planning
26. Causal Layered Analysis
27. Integration, Comparisons, and Frontiers of Futures Research Methods

# Futures Intelligence System



# Futures Wheel



# Cross-Impact trends and/or potential future events

	Trend 1	Trend 2	Trend 3	Trend 4	Trend 5
Trend 1					
Trend 2					
Trend 3					
Trend 4					
Trend 5					

# Delphi





- Define questions, rating assumptions
- Select panel
- Distribution – Interactive, file, paper, RT
- Feedback to Round 2
- Options for interviews
- Options for fill in the blanks in scenarios

# Real Time Delphi (or RT Delphi)

- It is “round-less” but cumulative and based on feedback
  - *a participant can determine how many rounds or times they revise or add responses*
  - *Every time they come back to the on-line matrix, they can see new comments and ratings entered since they last signed on, and they can see their previous answers in relation to the others. They then have the ability to change their responses*
- Regional Planners can use an RT Delphi to:
  - *Systemically collect, store, feedback, and rate the best thinking from a range of the best minds that are not easily assembled in a meeting*
  - *Define and weight criteria for important & controversial decisions*
  - *Add and rate alternative decision options*
  - *Provide logic and traceability to decision making*
- *RT Delphi makes the approach asynchronous, and efficient*

# The Matrix

## CODE

Criteria >>>	Quality	Feasibility
Weights >>>	Avg.: 2 Responses: 25  <u>Rationale</u>	Avg.: 2 Responses: 23  <u>Rationale</u>
<b>Proposed Decision</b>  1...N	Avg.: 6 Responses: 24  <u>Rationale</u>	Avg.: 8 Responses: 25  <u>Rationale</u>

Criteria in this row

Average judgments of the group

Number of responses so far

Drop down menu

Your response;

**Red cells mean big difference**

Place for you to enter reasons and see others

Alternate solutions all remaining rows

# Definition of a Scenario:

A scenario is a story with plausible cause and effect links that connects a future condition with the present, while illustrating key decisions, events, and consequences throughout the narrative.

# A Scenario is *not*:

- A projection – although projections are included in a scenario.
- A discussion about a range of future possibilities with data and analysis – It is like confusing the text of a play's newspaper review with the text of the play written by the playwright.

# Classic Herman Kahn Scenarios

- Surprise-free, business-as-usual, reference, base-case scenario is a simple extrapolation of current trends and their interplay
- Worst case scenario based on mismanagement and bad luck
- Best case scenario based on good management and good luck.

# "Scenario Space" Defined by Axes

Axes Define "Scenario Space"	Global Political Stability	Global Political Turmoil
Many High Tech Break- throughs	Scenario 1	Scenario 2
Few High Tech Break- throughs	Scenario 3	Scenario 4

# Participatory Methods Matrix

	<b>SMALL GROUP (1-100)</b>	<b>LARGER GROUP (100+) (hundreds to thousands)</b>
<b>MEETING IN ONE LOCATION</b>	<b>Focus Groups, Future Search Conferences, Consensor, TeamFocus, VisionQuest, Simulation- Gaming</b>	<b>Charrette, Syncon, Simulation-Gaming, Voting</b>
<b>MEETING IN MULTI- LOCATIONS</b>	<b>Computer Groupware: Collaboratories, Integrated Multi-media, Simulation- Gaming</b>	<b>Option Polling, Syncon, Public Delphi, Simulation- Gaming, Voting</b>

# State of the Future Index (SOFI)

- “Whole future” index to show if the region is better or worse in 10 years
- Delphi to collect indicators for the better future.
- Select variables that have a 20 year data and project each 10 years
- Statistically define best and worse case for each variable in 10 years through a Delphi.
- This gives a range from “good to bad.” Each variable is projected through that range to get a number between the worse value and best value for the variable in 10 yrs.
- The numbers are added up to get the 10 year aggregate value for the regional SOFI.

# Variables for the Global SOFI

- Infant Mortality Rate (deaths per 1,000 live births)
- Food availability Cal/cp Developing Countries
- GNP per capita PPP (constant 1995 \$US)
- Percentage of Households w/ Access to Safe Water (15 Most Populated Countries)
- CO2 atmospheric, ppm
- Annual population additions millions
- Percent unemployed
- Literacy rate, adult total (% of people aged 15 and above)
- Annual AIDS deaths (millions)
- Life Expectancy (World)
- Number of Armed Conflicts (at least 1000 deaths/yr)
- Debt/GNP; Developing Countries (%)
- Forest Lands (Million Hectares)
- Number of People Living on Less than \$2 per day
- Terrorist Attacks
- Violent Crime, 17 Countries (per 100,000 population)
- Percent of World Population Living in Countries that are Not Free
- School Enrollment, secondary (% school age)
- Percentage of population w access to local health care (15 most populated countries)

# Report Card for the world

## Where are we winning?

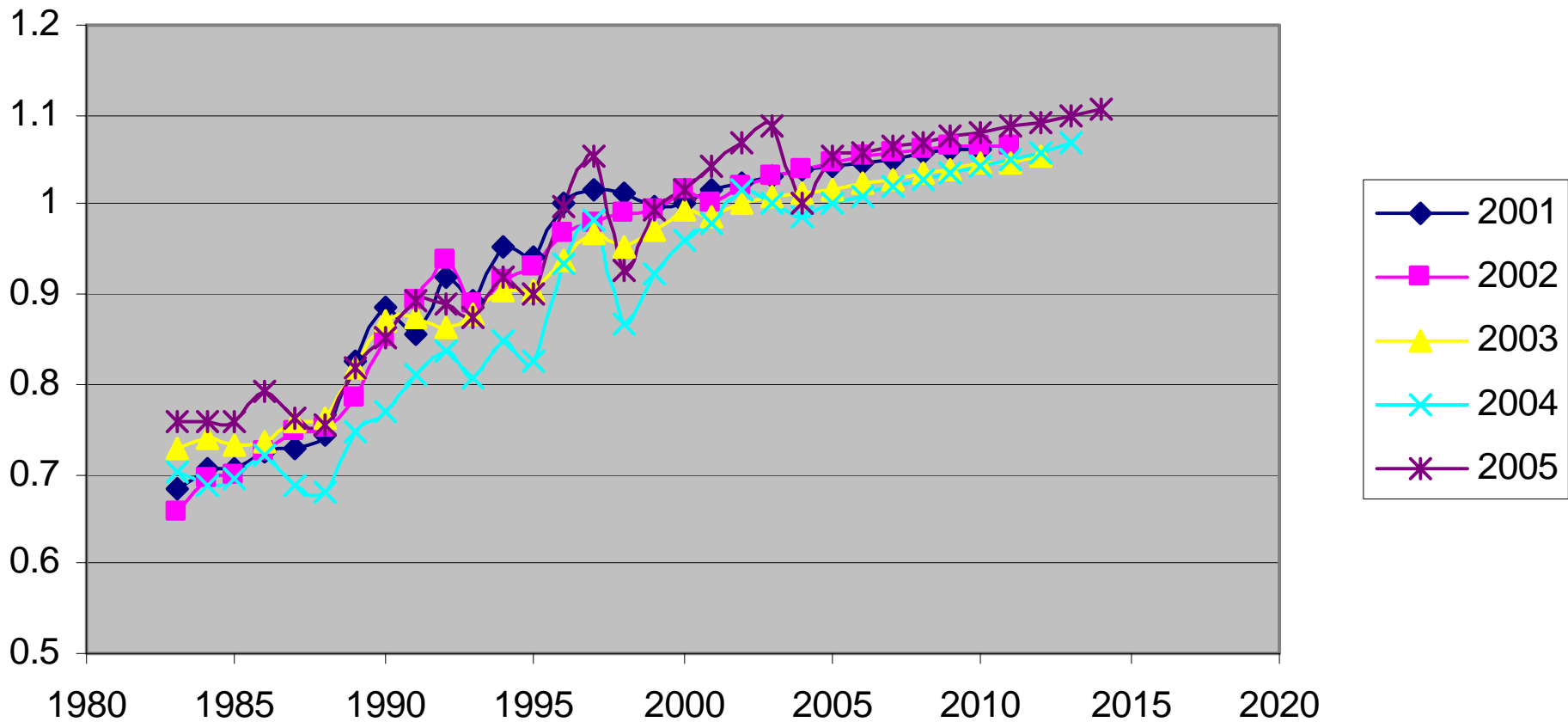
- GDP per capita grew
- Calories per capita increased
- Life expectancy grew
- Literacy grew
- Infant Mortality dropped
- Access to Fresh Water improved
- Access to Health Care improved
- School Enrollment Improved

## Where are we losing?

- Industrial CO<sub>2</sub> emissions grew
- Unemployment moved increased
- Forest Lands dropped
- Rich Poor Gap grew
- AIDs Deaths grew
- Developing Country Debt increased
- Terrorist Attacks

# Global State of the Future Index

## Comparison of SOFI's



# Millennium Project Global Challenges Assessment

1996-97  
**182 Developments**  
15 Issues  
with  
131 Actions

&

1998-99  
**Distilled Into**  
15 Challenges  
with  
213 Actions



**1999-2006**  
Global Challenges

- General description
- Regional views
- Actions
- Indicators

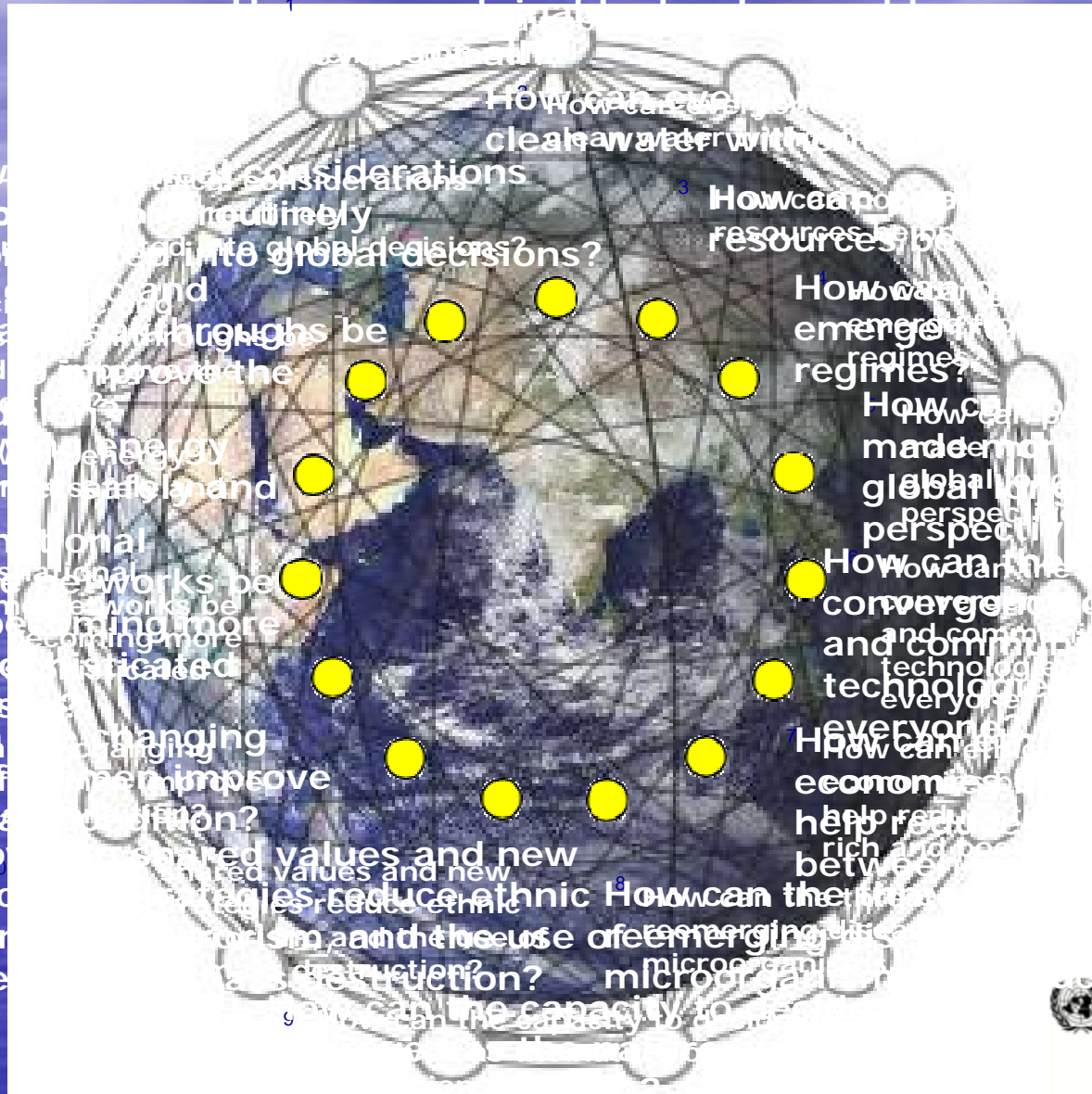
1997-98  
**180 Developments**  
15 Opportunities  
with  
213 Actions



**2000-2006**

State of the Future Index (SOFI)  
National SOFIs for American Countries  
SOFI Real Time Delphi

# 15 Global Challenges



How can we become more routinely incited to participate in global decisions?

How can scientific and technological advances be accelerated to improve the human condition?

How can growing demands for energy be met more efficiently?

How can transnational organized crime be stopped from becoming more powerful and sophisticated?

How can the status of women improve in the human condition?

How can we secure common values and new principles to reduce ethnic conflict and the use of emerging technologies for destruction?

How can we increase the capacity of institutions to change?

How can we clear water with the same energy?

How can we manage resources better?

How can we emerge from authoritarian regimes?

How can we make democracy more sensitive to global perspectives?

How can the convergence of information and communications technologies work for everyone?

How can we encourage market integration to help reduce the gap between rich and poor?

How can we reduce the risk of a global pandemic?

How can we improve the capacity of institutions to change?

How can we manage resources better?

How can we emerge from authoritarian regimes?

How can we make democracy more sensitive to global perspectives?

How can the convergence of information and communications technologies work for everyone?

How can we encourage market integration to help reduce the gap between rich and poor?

How can we reduce the risk of a global pandemic?

How can we improve the capacity of institutions to change?

# Generalizations for judging futurists and their research

	Feeling Powerful	Feeling Powerless
Pessimistic	Studies the Future to avoid it	Rejects Study of the Future
Optimistic	Takes Futures Research seriously	Pursues as Academic Interest

# Connecting Futures Research to Decision-Making

1. Make sure leaders know what futures research is and is not
2. Include decision makers in the process, connect to strategic planning
3. Include workshops and training for decisionmakers
4. Include interest groups and actors
5. If goals are lacking, include as an issue
6. Determine who has responsibility to act
7. Balance long-term and short term views
8. Use at least one formal method that all understand
9. Provide information that demonstrates a crisis
10. Include knowledge about what is possible
11. Make options clear; connect to goals and strategies
12. Demonstrate feasibility of recommendations
13. Include subjective descriptions of alternative futures

# Futures Research and Decisionmaking (continued)

14. Connect costs to benefits
15. Suggest ways of making decisions in uncertainty
16. Include intended actions of others
17. Develop indicators
18. Using testimony of eminent scientists
19. Project affects of action or non action in scenarios
20. Show technical feasibility to overcome fear of failure
21. Use computer models
22. Link to similar activities
23. Avoid information overload
24. Allow time for individuals to integrate concepts
25. Include media
26. Make work integrative and cumulative