

Future Technologies and Implications for Government Actions

Future Institute, National Assembly, Seoul, Korea

Jerome C. Glenn, CEO The Millennium Project

Agenda/Outline



- Brief introduction to The Millennium Project
- Strategies to address future and other technologies, impacts on economics and work
- Information warfare deterrence
- collective intelligence systems to support decisionmaking.

Areas for collaboration with The Millennium Project

Futures Research Methodology Training
Korean State of the Future Index
State of the Korea's Future Report
How to use the Global Futures Intelligence System
Development of Korean Futures Intelligence System
Use of the Work/Technology 2050: Scenarios and Actions report

... Acts like a *TransInstitution*



64 Nodes...and two regional networks in Europe and Latin America



are groups of experts 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.

The Millennium Project

Futures Research Methodology

Editors Jerome C. Glenn and Theodore J. Gordon With support from the Rockefeller Foundation

- 1. Introduction to Futures Research Methodology
- 2. Environmental Scanning
- 3. Text Mining for Technology Foresight
- 4. The Delphi Method
- 5. Real-Time Delphi
- 6. The Futures Wheel
- 7. The Futures Polygon
- 8. Trend Impact Analysis
- 9. Cross-Impact Analysis
- 10. Wild Cards
- 11. Structural Analysis
- 12. The Systems Perspectives
- 13. Decision Modeling

- 14. Substitution Analysis
- 15. Statistical Modeling
- 16. Technology Sequence Analysis
- 17. Morphological Analysis
- 18. Relevance Trees
- 19. Scenarios
- 20. A Toolbox for Scenario Planning
- 21. Interactive Scenarios
- 22. Robust Decisionmaking
- 23. Participatory Methods
- 24. Simulation and Games
- 25. Genius Forecasting, Intuition, and Vision
- 26. Prediction Markets

- 27. Using Vision in Futures
- 28. Normative Forecasting

Version 3.0

- 29. S&T Road Mapping
- 30. Field Anomaly Relaxation
- 31. Agent Modeling
- 32. Chaos and Non-Linear Dynamics
- 33. Multiple Perspective Concept
- 34. Heuristics Modeling
- 35. Causal Layered Analysis
- 36. Personal Futures
- 37. State of the Future Index
- 38. SOFI Software System
- 39. Integration, Comparisons, and Frontiers of Futures Research Methods
- ISBN-978-0-9818941-1-9



39 Chapters37 Different Methods

1,300 pages

Largest collection of Internationally peerreviewed methods to explore the future ever assembled in one source

Global Futures Intelligence System https://themp.org



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The Millennium Project

A global foresight network of rodes, internation, and software. Functioning as a more tank On behalf of humanity, not on behalf of a government, as more, or an idealogy Created to improve humanity's prospects for building a better future.

About



The 2015-2016 State of the Future



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Jerome C. Glenn, Elizabeth Florescu, and The Millennium Project Team

Preface Executive Summary Ch 1 Global Challenges Ch 2 2017 State of the Future Index **Ch 3 Future Terrorism & Deterrence** Ch 4 Work/Tech 2050 Scenarios and Workshop Strategies **Ch 5 Conclusions Appendix**



MP Futures Research... so far

- 1. African Futures Scenarios 2025, and UNDP workshop at the UN (1994)
- 2. Millennium Project Feasibility Study final report (1995)
- 3. Global Issues/Strategies four-round Global Lookout (Delphi) study (1996)
- 4. Lessons of History (1997)
- 5. Global Opportunities and Strategies Delphi (1997)
- 6. Definitions of Environmental Security (1997)
- 7. Futures Research in Decisionmaking (and checklist) (1998-99)
- 8. Global Normative 2050 Scenario (1998)
- 9. Environmental Security Threats and Policy Leadership (1998)
- 10. Current/Potential UN military doctrine on Environmental Security (1999)
- 11. Six Alternative Year 3000 Scenarios (1999)
- 12. S&T Issues over the next 25 years (2000)
- 13. Future Technological Implications for Society and the UN System (2000)
- 14. Analysis of UN Summit Speeches (2001)
- 15. Military environmental crimes and the role of the ICC (2001)
- 16. Management Implications of Future S&T 2025 Issues (2001)
- 17. New Military Environmental Security Requirements 2010-2015 (2001)
- 18. Global Goals for the year 2050 (2002)
- 19. Future S&T Scenarios 2025 (2002)
- 20. Emerging Environmental Security Issues for Future UN Treaties (2002)
- 21. Monthly Reports: Emerging Environmental Security Issues (2002-2011)
- 22. Middle East Peace Scenarios (2002-04)
- 23. Early Warning System for Kuwait Oil Company (2003-04)
- 24. Nanotech Military R&D Health/Env Research Prevention Priorities 2004-05)
- 25. Future Ethical Issues (2004-05)
- 26. Global Energy Scenarios (2006-07)
- 27. South Korea SOFI (2006)

- 28. Future of Learning and Education 2030 (2007)
- 29. Global Climate Change Situation Room for Gimcheon, South Korea (2007-2008)
- 30. Conceptual design for global energy collective intelligence (GENIS) (2008)
- 31. Status of Government Future Strategy Units (2008)
- 32. RTDelphi for UNESCO World Water Report (2008)
- 33. WFUNA Human Rights (2008)
- 34. Decision Criteria Evaluation of Global Environment Facility (2008)
- 35. South Korea SOFI and South African SOFI (2008)
- 36. Early Warning System PMO Kuwait (2008-2009)
- 37. Potential Future Elements of the Next Economic System (2009)
- 38. UNESCO World Water Scenarios project (2009)
- 39. Future of Ontologists (2009)
- 40. Future Hopes and Fears: a Kuwait Perspective (2010-2011)
- 41. Latin America 2030 Scenarios (2009-2011)
- 42. Egypt 2020 (2010)
- 43. Changes to Gender Stereotypes (2011)
- 44. Azerbaijan SOFI (2011)
- 45. Future Arts, Media, and Entertainment: Seeds for 2020 (2011)
- 46. Cooperatives 2030: Factors Impacting Future of Cooperatives and Business (2012)
- 47. Egypt's national Synergetic Information System (ECISIS) (2013-16)
- 48. Hidden Hunger: Unhealthy Food Markets in the Developing World (2013)
- 49. Vulnerable Natural Infrastructure in Urban Coastal Zones (2013)
- 50. FUTURES Dictionary/Encyclopedia (English and Spanish) (2014)
- 51. SIMAD and Lone Wolf Terrorism Counter Strategies (2014)
- 52. Czech Rep., Hungary, Poland, Slovakia, Visegrad Region SOFIs (2014-2015)
- 53. Water-Energy-Food Nexus in the Context of Climate Change (2015-16)
- 54. Pre-Detection of Terrorism Strategies RTDelphi, NATO Workshop (2015-17)
- 55. Future Work/Technology 2050 Global Issues, Scenarios, Workshops (2015-17)

Current and Previous Sponsors/Clients;

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- Alan F. Kay & Hazel Henderson Foundation (1996–2000)
- Amana Institute, São Paulo, Brazil (2004)
- Applied Materials, Santa Clara, California (2002–09)
- Argentina Ministry of Agriculture (2012)
- Azerbaijan State Economic University (2009-2016)
- City of Gimcheon (via UN Future Forum, So. Korea) (2009–10)
- Deloitte & Touche LLP, Cleveland, Ohio (1998–09)
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- Ford Motor Company (1996–97, 2005–06)
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- Ministry of Educucation and Presidential Commission on Education, Republic of Korea (2007)
- Monsanto Company, St. Louis, Missouri (1996–98)
- Montenegro Ministry of Science and Technology (2012)

- Motorola Corporation, Schaumburg, Illinois (1997)
- NATO, Brussels, Belgium (2016)
- Pioneer Hi-Bred International, West Des Moines, Iowa (1997)
- Rockefeller Foundation (2008–11; 2013)
- Shell International (Royal Dutch Shell Petroleum Company), London, UK (1997)
- UNESCO, Paris, France (1995, 2008–10)
- United Nations Development Programme, New York, (1993–94)
- United Nations University, Tokyo, Japan (1992–95, 1999–2000)
- Universiti Sains Malaysia (2011)
- U.S. Army Environmental Policy Institute, Arlington, Virginia (1996–2011)
- U.S. Department of Energy, Washington, D.C. (2000–03)
- U.S. Environmental Protection Agency, Wash., D.C. (1992–93, 1996–97)
- U.S. Department of Defense, Off of the Secretary
- Woodrow Wilson International Center for Scholars (Foresight and Governance) (2002)
- World Bank (via World Perspectives, Inc. 2008 and GEF Evaluation Office 2012)
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 - UNESCO
 - World Academy of Art and Science



Strategies to address future and other technologies, impacts on economics and work

Inevitability of New Economics, Changing social contract and human rights



- Concentration of wealth is increasing
- Income gaps are widening
- Employmentless economic growth seems the new norm
- Return on Investment in capital and technology is usually better than labor
- Future technologies can replace much of human labor Long-term structural unemployment is a "business as usual" or "surprise free" trend forecast

What can we do about this?

Future Work/Technology 2050 Study



- 1. Literature and Related Research Review
- 2. Real-Time Delphi on questions not asked or poorly answered
- 3. Three Global Scenario Drafts to 2050
- 4. Three Separate RTDelphi's for Feedback on each Scenario
- 5. Final Scenarios, given for Millennium Project Nodes
- 6. National Workshops to Explore Long-range Strategies
- 7. Collect suggestions from the national planning workshops, distilled in to 93 actions, assess all via five (5) Real-Time Delphi's
- 8. Final Report for Public Discussion

Next Technologies (NT): Imagine How NT Synergies Will Create New Businesses

Artificial Intelligence Robotics Synthetic Biology & Genomics **Computational Science Cloud & Big Data Analytics Artificial & Augmented Reality** Nanotechnology (two kinds) IoT, Tele-Everything & Tele-Everybody, the Semantic Web Quantum computing

Tele-Presence, Holographic **Communications** Intelligence augmentation **Collective Intelligence Blockchain** 3D/4D Printing Materials/Biology Drones, Driverless Cars (and other autonomous vehicles) **Conscious-Technology Synergies Among These**

Work/Tech Global Scenarios 2050



Each scenario is about 10 pages of detailed cause & effect sequences that illustrate decisions

1. It's Complicated - A Mixed Bag

2. Political/Economic Turmoil – Future Despair

3. If Humans Were Free – The Self-Actualizing Economy

Future Work/Tech 2050 Workshops



Initial workshops	Initial workshops	In planning	Exploratory talks
1. Argentina (2 and series)	11. Italy (2, and 3 rd in planning)	China	Australia
2. Bolivia (series)	12. The Netherlands (2)	El Salvador	Croatia
3. Brazil (Sao Paolo)	13. Mexico (2)	Peru (2030 study first)	Dubai, UAE
4. Bulgaria	14. Poland	Kenya	Egypt
5. European Foresight Network	15. Spain (3)	Pakistan	Georgia
6. Finland	16. South Africa	Romania	India
7. Germany (series)	17. South Korea (2)	Slovakia	Iran
8. Greece	18. Uruguay (series in progress)	Sri Lanka	Montenegro
9. Hungary	19. Venezuela	Zambia	Slovenia
10. Israel (2)	20. United States (2)		Turkey
			United Kingdom

Actions to Address issues in the Work/Tech 2050 Global Scenarios



Workshop Discussion Group	Actions Assessed	Additional Suggested Actions
Education and Learning	20	26
Government and Governance	22	26
Business and Labor	19	23
Culture, Arts, and Media	17	18
Science and Technology	15	25
Totals	93	118

Government and Governance (Top 5)

- Establish a national independent (as much as possible) technology forecasting and assessment agency to inform legislative, judicial, and executive functions of government about future technology and their impacts (a government Agency for the Future).
- The government, employers, and the labor unions should cooperate to create lifelong learning models including forecasts of future skills.
- Study how to prevent future conflict between technologically augmented humans (via, AI, genetics, electronics or other means) and non-augmented citizens.
- Training programs for politicians before governing.
- By 2050 introduce a global system for S&T knowledge sharing.

Establish a national independent technology forecasting and...
 Cooperation to create lifelong learning models and forecasts of...

22. Study how to prevent future conflict between technologically...
11. Training programs for politicians before governing and prototype...
21. By 2050 introduce a global system for resource sharing (all kinds:...
13. Establish an online platform for citizens offering their skills, services...
10. Apply AI to governance for decision-making to improve anticipation...
19. Create a new social contract between government and the governed.
4. Create public/private expert/citizen accessible national collective...

Create international standards for artificial intelligence anda...
 Create and implement a global counter organized crime strategy.
 Produce alternative cash flow projections for Universal Basic Income.
 Establish an International S&T Organization as an online collective...
 Develop a system of indicators and model to assess trajectories.

Make skills re-training vouchers available on-demand.
 Promote leisure, culture, tourism, and entertainment industries.

5. Establish national and international liability and regulatory...
 12. Include self-employment issues in political parties' agendas.
 8. Insure international coordination prior to implementing UBI to...
 16. Establish self-serving pension system with subsidies for those with...
 20. Develop governance for the future human.

9. Place a tax on robotic work, and other Next Technologies (NT).





Suggestions for Government



Information Warfare and Deterrence



Private Sector Competitive Intelligence

Government Organizations

Advanced Marketing Techniques

Information Warfare

Non-governmental Organizations

Transnational Organized Crime

Terrorist Organizations (Political, Ethnic, or Religious)



For further information



The Millennium Project

Info@Millennium-Project.org

Work/Technology 2050: Scenarios and Actions

http://www.millennium-project.org/publications-2/

State of the Future 19.1

http://www.millennium-poject.org/state-of-the-future-version-19-1/

Futures Research Methodology 3.0

http://www.millennium-project.org/publications-2/#method

Global Futures Intelligence System

http://www.millennium-project.org/projects/global-futures-intelligence-system/

Areas for collaboration with The Millennium Project



- Futures Research Methodology Training
- Korean State of the Future Index
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- How to use the Global Futures Intelligence System
- Development of Korean Futures Intelligence System
- Use of the Work/Technology 2050: Scenarios and Actions report





High Impact Integrated Strategies

Factors to Consider in Connecting Futures Research to Decisionmaking



- 1. Make sure leaders know what futures research is and is not
- 2. Include decisionmakers 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

Connecting Futures Research to Decisionmaking (cont.)

- 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 effects of action or inaction 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