Future Work/Technology Global Scenarios 2050

and National Workshops

Jerome C. Glenn, CEO
The Millennium Project

… Acts like a *TransInstitution*

60 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 2015-2016 State of the Future

2015-16
State of the
FUTURE

The Millennium Project

JEROME C. GLENN, ELIZABETH FLORESCU
AND THE MILLENNIUM PROJECT TEAM

A must read for any decisionmaker with a long-term vision.
Enrique Peña Nieto, President of Mexico

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Hazel Henderson, President, Ethical Markets

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Paul Werbos, National Science Foundation

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Eduardo Frei, Former President of Chile

Strategic Planning for the Planet... remarkably articulate and prescient.
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Everyone, and I mean EVERYONE, should read this incredible document, period!
Technological Forecasting & Social Change

The SOF report continues, year after year, to be the best introduction - by far- to a broad range of major global issues and long-term remedies.
Michael Marien, Global Foresight Books

Invaluable insights into the future for the United Nations, its Member States, and civil society.
Ban Ki-moon, Secretary-General, United Nations

Executive Summary   Purchase

Maybe…

…the greatest number of future-relevant facts, information, and intelligence ever assembled in one report.

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 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)

The Millennium Project

Futures Research Methodology
Version 3.0

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

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39 Chapters

1,300 pages

The largest collection of Internationally peer-reviewed methods to explore the future ever assembled in one source

Global Futures Intelligence System

https://themp.org

Inevitability of New Economics

- 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" surprise free forecast
- What can we do about this?

Future Work/Technology 2050 Study

1. Literature and Related Research Review
2. Real-Time Delphi
3. Three Global Scenario Drafts to 2050
4. Separate RTDelphi Feedback on each Scenario
5. Final Scenarios, Policy issues, and workshop considerations
6. National Workshops
7. Collect results of the national planning workshops, analyze & synthesize results
8. Final report for public discussion

What is Different About This Future Work & AI Study?

1. It is an international study with the participation of over 350 futurists, AI professionals, economists, and other related experts from over 45 countries.
2. It does not focus on just one country or one occupational group.
3. It does not just look at AI's & robotics' impacts on work, but also synthetic biology, 3D/4D printing, nanotechnology, VR & AR, and other future tech.
4. Longer-range: 2050 helps us look secondary & tertiary consequences and discusses cultural change
5. Creates three global scenarios to the year 2050.
6. National strategy workshops to stimulate long-range strategic thinking.
7. Compares national workshop results and feeds back to participating countries.
8. As a result, this study focuses on what to do, rather than know many jobs will be lost and when.
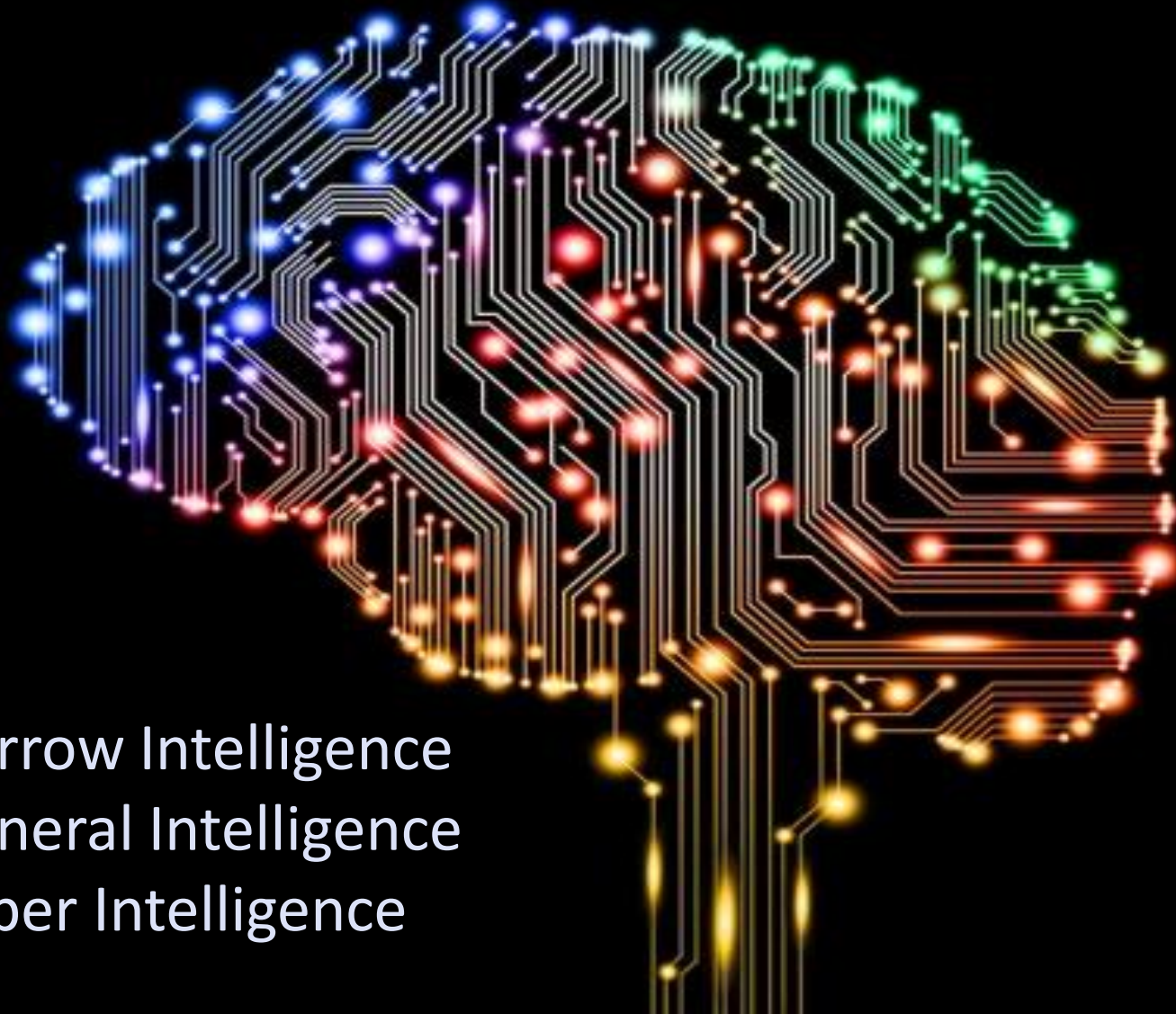
Three forms of Artificial Intelligence

1. Artificial Narrow Intelligence
2. Artificial General Intelligence
3. Artificial Super Intelligence

These three are often lumped together as AI

This confuses the discussion about AI

Next Technologies (NT) = all together:

Artificial Intelligence

Robotics

Synthetic Biology & Genomics

Computational Science

Cloud & Big Data Analytics

Artificial & Augmented Reality

Nanotechnology

IoT, Tele-Everything & Tele-Everybody, the Semantic Web

Quantum computing

Tele-Presence, Holographic Communications

Intelligence augmentation

Collective Intelligence

3D/4D Printing of Materials and Biology

Drones, Driverless Cars (and other autonomous vehicles)

Conscious-Technology

Synergies Among These

Synergies of photovoltaics, robotics, satellites, AI, drones, ICT, and genetic engineering

Global Work/Technology Scenarios 2050

1. It's Complicated - A Mixed Bag

2. Political/Economic Turmoil – Future Despair

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

Global Employment Assumptions
Workforce 3 billion 2000; 6 billion 2050

	Scenario 1 Business as Usual	Scenario 2 Political Turmoil	Scenario 3 Self-Actualization
Employed	2 Billion	1 Billion	1 Billion
Self-Employed	2 Billion	1 Billion	3 Billion
Unemployed or in transition	1 Billion	2 Billion	1 Billion
Informal Economy	1 Billion	2 Billion	1 Billion

Future Work/Tech 2050 Global Scenarios

Scenario 1. It's Complicated – A Mixed Bag

A business-as-usual trend projection of the increasing acceleration of change with both intelligence and stupidity characterized decisionmaking. Irregular adoption of advance technology; high unemployment where governments did not create long-range strategies, and mixed success on the use of universal basic income. Giant corporation's powers have often grown beyond government control, in this government-corporate, virtual-3D, multi-polar world of 2050.

Scenario 2: Political/Economic Turmoil – Future Despair

Governments did not anticipate the impacts of artificial general intelligence and had no strategies in place as unemployment exploded in the 2030s leaving the world of 2050 in political turmoil. Social polarism and political grid-lock in many forms have grown. Global order has deteriorated into a combination of nation-states, mega-corporations, local militias, terrorism, and organized crime.

Scenario 3: If Humans Were Free – the Self-Actualization Economy

Governments did anticipate the impacts of artificial general intelligence, conducted extensive research on how to phase in universal basic income systems, and promoted self-employment. Artists, media moguls, and entertainers helped to foster cultural change from an employment culture to a self-actualization economy.

Scenario 1: It's Competed – A Mixed Bag

- A business-as-usual trend projection of the increasing acceleration of change with both intelligence and stupidity characterized decisionmaking (or lack of decisionmaking)

- Irregular adoption of NT

- High unemployment where governments did not create long-range strategies to address NT impacts

- Mixed success on the use of universal basic income

- Giant corporation's powers have often grown beyond government control, in this government-corporate, virtual-3D multi-polar, complex world of 2050

Some More Elements of Scenario 1

- Personal AI/Avatars finding new markets/work on a daily basis
- Growth of synthetic biology much greater than expected and one key driver in economic growth, but also source of bio-disasters, new terrorist weapons, and income for organized crime
- Crowd sourced investments, sharing economy, and some UBI helped spread new wealth
- Some income gaps narrowed, still wide enough for migrations and social unrest
- NT used for good and bad, like the Internet today, increasing costs of security, and Anti-NT backlash
- Basic income experiments were more successful after the 2030s
- NT to augment human labor not replace all jobs
- NT Databases (Labor Unions, Business, Gov, collaborations)

Planes are different than birds, but both fly.

AGI/robots are different than humans, but both learn and seem conscious

Although this is a dumb photo, as AI/robots would not read a book in this old fashion way.

Will STEM Education (S&T, Engineering, Mathematics) Make a Difference?

After 2030, as AGI learns how to learn in general, simultaneously and world/wide?

Mixed focus on increasing intelligence, creativity, critical thinking, human relations, philosophy, ethics, values, and civics.

Scenario 2: Political/Economic Turmoil: Future Despair

- Political grid-lock increases political, economic, environmental migrations, which increases ethnic conflicts increasing fragmentation

- Protectionist concentration of wealth continues, organized crime and corporations grow beyond control, Internet is no longer trusted

- 3D/4D printing and renewable energy reduced international shipping and other trade systems

- Financial systems cannot support ageing societies and massive youth unemployment, leading to periodic financial crises

- ISTO fails as it becomes new medium for information warfare, and paranoia

- Governments did not anticipate the scale of NT; hence no strategies to address increasing mass unemployment

Some More Elements of Scenario 2

- Education systems unable to keep up with change

- No serious efforts to affect culture through the arts and media, instead more to keep the masses busy

- Lack of international S&T agreements, several synthetic biology and AI disasters, leading to neo-luddite revolts

- New political movements form to counter income gaps, unemployment, but most are unsuccessful, many survivalists communities living of the grid

- AGI 2030 unemployment explodes; political turmoil; growth of corporate power and organized crime fills the gap by 2050

- Fossil fuel and livestock consumption continues, CO_2 750 ppm, ocean currents change, coastal flooding, environmental migrations increases conflicts

- World order has deteriorated into a combination of nation-states, mega-corporations, local militias, terrorist groups, and organized crime.

Scenario 2 Jobless Migrations

Scenario 3: If Humans Were Free – the Self-Actualization Economy

- Governments <u>did</u> anticipate Next Tech (NT) impacts
  - Rolling long-range strategies to address future work/tech issues
  - Conducted research on how to phase in universal basic income
  - Promoted innovation and self-employment
  - Focused education on increasing intelligence, creativity, civics, critical thinking, human relations, philosophy, ethics, values
- Artists, media, computer game moguls, and entertainers helped to foster cultural change from an employment culture to a self-actualization economy, and crowd investing reduces income gaps
- Government as referee, participatory/anticipatory democracy supported by national collective intelligence systems

Some More Elements of Scenario 3

- While business, self-organizing adhocracies, transInstitutions, and tele-nations provide new economic-cultural self-actualization leadership
- Int'l S&T Org online collective intelligence, supports S&T investments in what replaces you, self-employment, AGI and cybercrime agreements
- The UN SDGs mostly achieved; new 2030-50 goals set – increasing intelligence, longevity, universal AGI access, etc.
- AGI begins around 2030; humans augmented with NT for co-evolution
- AI/AGI augmented geniuses and symbiosis; global AI/cloud quantum computing education/learning systems reduce much inequality
- Self-employed mentally healthy aging population not financial burden
- Personal AI/Avatars find markets, work, experience for self-actualization

Will our AI/Avatars wake us up in the morning with new work… each day?

One-Person Businesses

Find markets around the world for what you are interested in doing
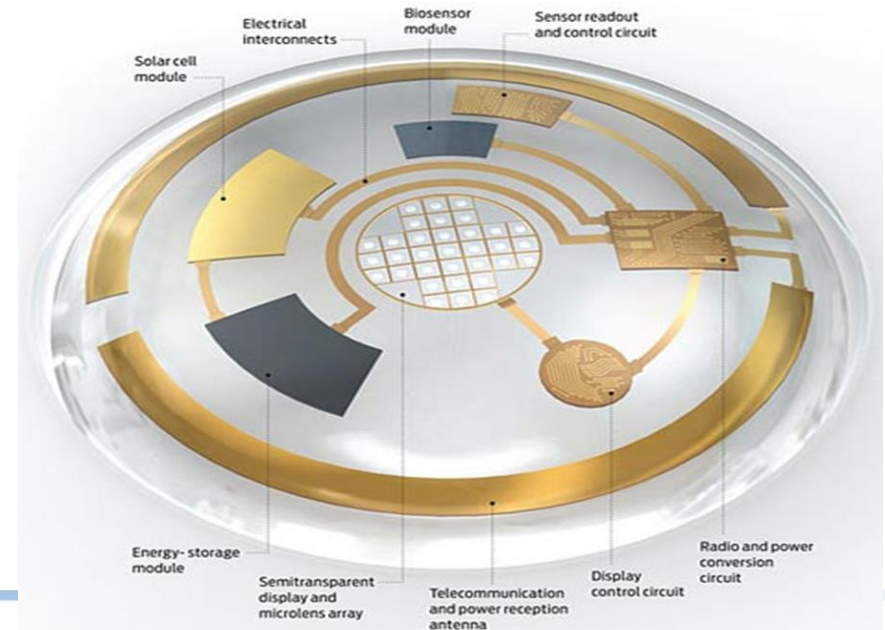
not non-existing jobs

What could this look like in 2050?

Steve Jobs and Bill Gates 1991

By **2030-2050** millions of people could become augmented geniuses, and what could they create?

If you can't beat AGI and ASI,
… why not join with them?
… and evolve together?
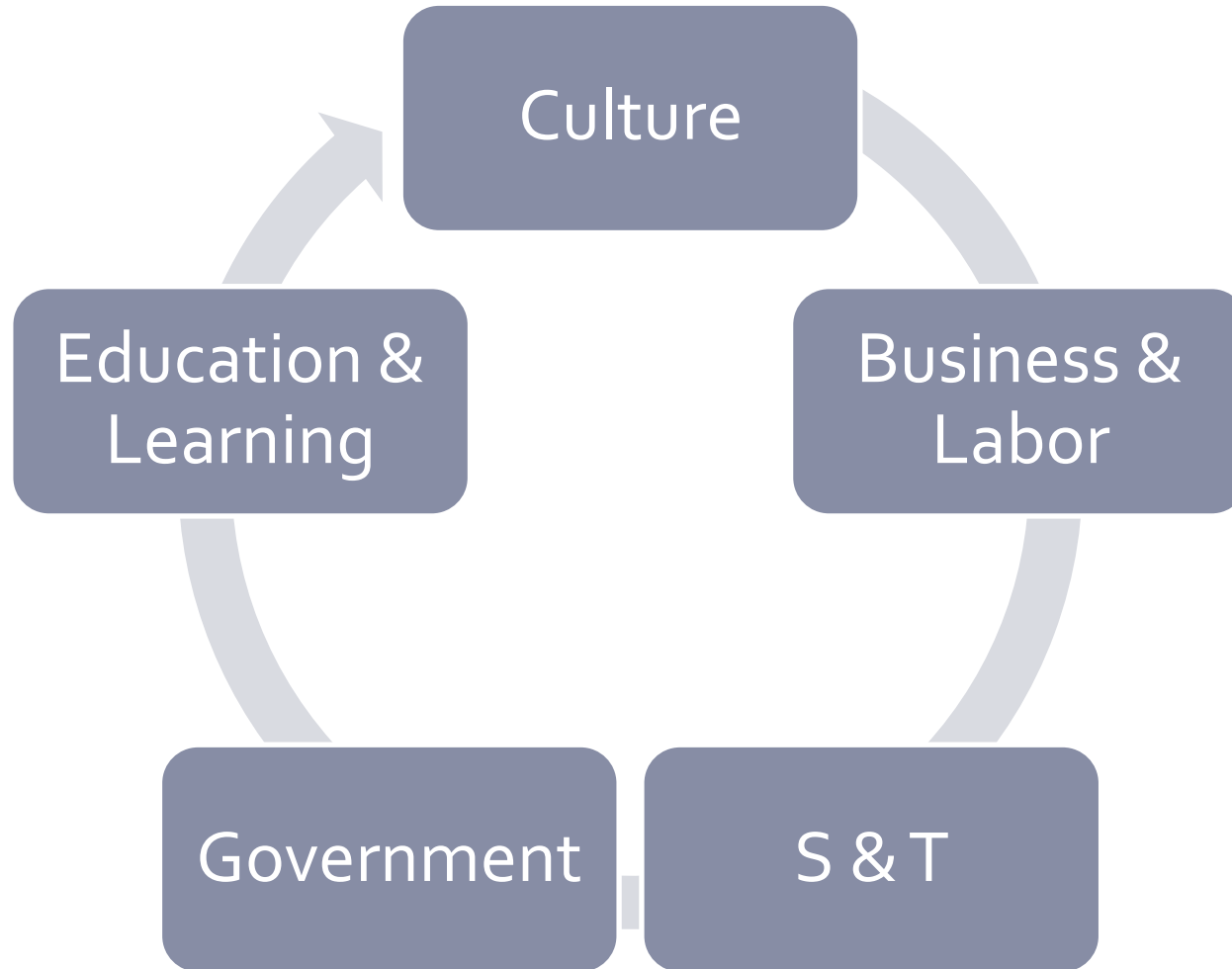
Future Work-Tech 2050 Workshops

Initial workshops	Initial planning	In negotiation	Exploratory talks
Finland	Argentina	EC (internal)	Australia
Germany	Brazil (Sao Paolo)	Peru	Croatia
Israel	China	Poland	France
Italy	Pakistan	Romania	Greece
Spain (Basque)		Sri Lanka	India
South Korea			Montenegro
			Slovenia
			Spain - Madrid
			Tunisia
			United Kingdom
			United States

Examples of Issues for National Long-Rang Strategy

1. **Education**: How should education, training, and learning systems change? And what strategies will make that happen?

2. **Government**: Will a guaranteed income program become necessary? What kind? When? Cash flow projections to show what is possible?

3. **S&T** (AI/Robotics/synthetic biology/nanotech) changes affecting work by 2025, 2035, 2050?

4. **Culture:** What changes in culture will be needed? culture that says jobs/employment is the source of self-respect?

5. **Business/Labor**: What should be the roles of private business in a national long-range strategy? Reducing income gaps and concentration of wealth.
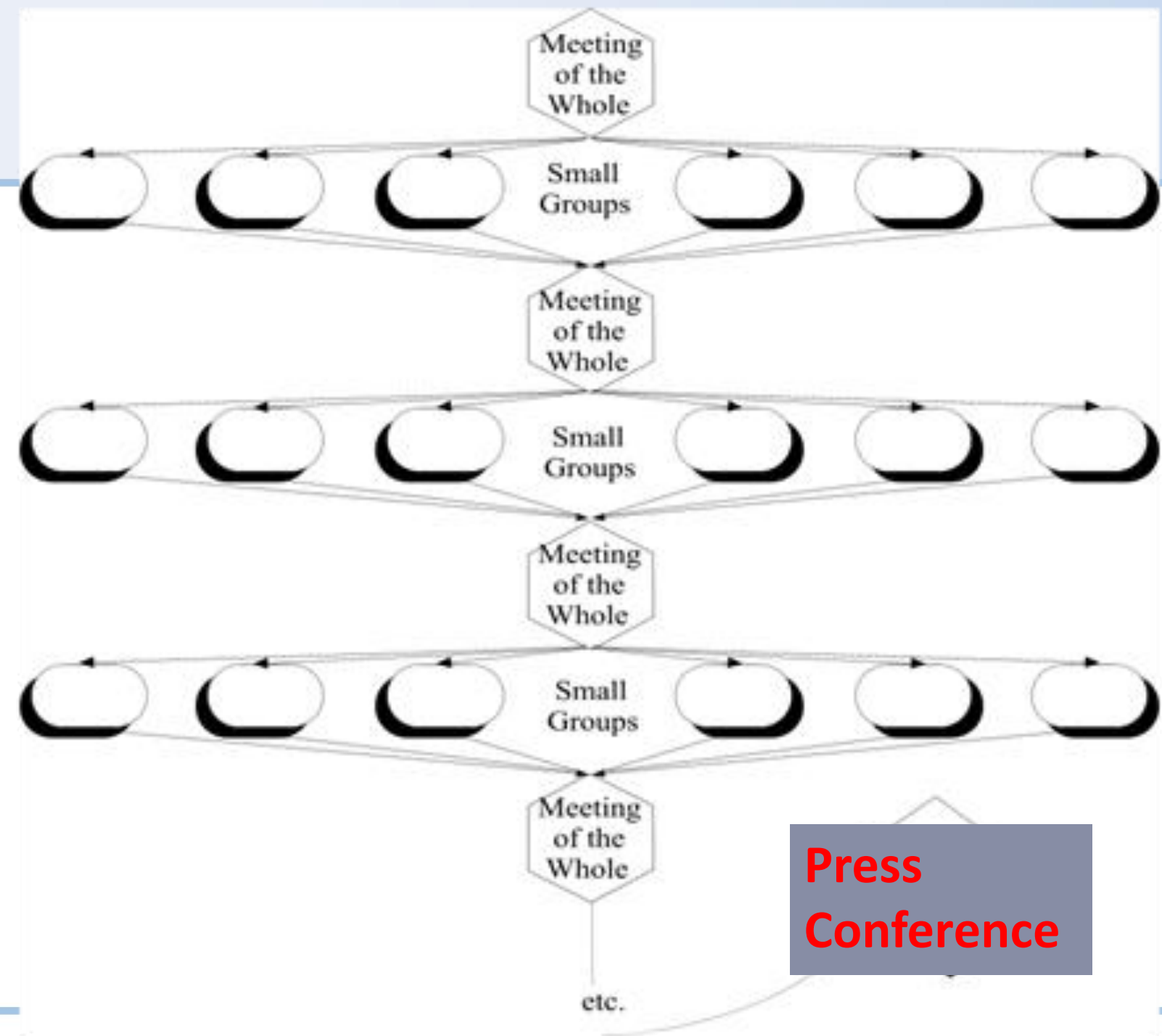
• These issues become the Workshops Groups

Workshop Discussion Groups

Charrette Workshop Process

From the whole to the parts – back and forth – so the parts are consistence with the whole set of strategies

Milano, Italy Work/Tech 2050 Workshop

Joint Charrette with Singularity University in Milano, Italy July 11th

Discussion Groups:
1. Educ./culture,
2. Government,
3. S&T
4. Bus&wWork

Seoul, Korea Work/Tech 2050 Workshop

Mini-Charrette with five discussion groups.

April, 2016

Discussion Groups:
1. Government,
2. Education
3. Culture
4. Business
5. Education

Some Considerations for National Strategy

Education/Learning:

- Make increasing intelligence an objective of education
- In parallel to STEM, create self-paced inquiry-based learning for self-actualization
- Begin shift from mastering a profession to mastering combinations of skills
- Increased focus on developing creativity, critical thinking, human relations, philosophy, entrepreneurship, self-employment, ethics, and values.

Government:

- Produce alternative cash flow projections for universal basic income (consider: License and tax AI/robots and their creations, reduction of tax havens, value added tax, and taxes on carbon, massive wealth growth from new technologies, minimum corporate tax, etc.).
- Work with other countries to establish the International S&T Organization (ISTO)
- Create and implement a global counter organized crime strategy
- Add TransInstitutional law in addition to for-profit and non-profit law

Some Considerations for National Strategy

Science & Technology

- Augment Movement – Tech to augment humans; not replace them
- What are the likely impacts of AI and AGI? When?
- Could synthetic biology create more jobs than AI replaces?
- Create ISTO (International S&T Organization as an online collective intelligence system not as a mew bureaucracy)

Culture:

- Arts, media, entertainment, computer games to explore cultural transition to self-actualization economy
- Media/Arts Alliance to create the "One Species" movement
- Invest into what replaces you.

Some Considerations for National Strategy

Business & Labor

- Invest in and promote Kickstarter-like crowd sourcing platforms to expand business startups and share the wealth of success
- Create personal AI/Avatars to support self-employment
- Individual augment genius apps
- International collaboration to create ISTO
- Synergetic intelligence, synergetic advantage and strategy as well as competitive intelligence, completive advantage and strategy
- Qualitivity as well as productivity
- Memes in advertisements to help create the cultural transition
- World Billionaires Club on Global Strategic Philanthropy
- World Cyber Game to explore self-employment
- New roles for labor unions – Augment Movement; NT Data base

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Global Futures Intelligence System:

http://millennium-project.org/millennium/GFIS.html

2015-16 State of the Future:

http://millennium-project.org/millennium/201516SOF.html

Futures Research Methodology 3.0:

http://millennium-project.org/millennium/FRM-V3.html