

CONVERGENCE OF KNOWLEDGE, TECHNOLOGY, AND SOCIETY:

Beyond Convergence of Nano-Bio-Info-Cognitive Technologies

Convergence of knowledge and technology for the benefit of society (CKTS) is the core opportunity for progress in the 21st century. This study suggests a general process to advance creativity, innovation, and societal progress based on five principles: (1) the interdependence of all components of nature and society, (2) enhancement of creativity and innovation through evolutionary processes of convergence that combine existing principles and divergence that generates new ones, (3) decision analysis for research and development based on system-logic deduction, (4) the utility of higher-level cross-domain languages to generate new solutions and support transfer of new knowledge, and (5) the value of vision-inspired basic research embodied in grand challenges. Possible solutions are outlined for key societal challenges in the next decade, including support for foundational emerging technologies to create new industries and jobs, improving lifelong wellness and human potential, achieving personalized and integrated healthcare and education, and securing a sustainable quality of life for all. This report provides a ten-year “NBIC2” vision within a longer-term framework for converging technology and human progress outlined in a previous study of unifying principles across “NBIC” fields that began with nanotechnology, biotechnology, information technology, and technologies based on and enabling cognitive science (Roco and Bainbridge 2003).

This is truly an impressive body of work, which advances a transformative collection of concepts that could impact many areas of society and science. The ideas of this study area are exciting and the tasks set out are extremely challenging. It is important to move from abstract to concrete in carrying out the important steps forward advocated in this remarkable and groundbreaking study.

Prof. Tinsley Oden, Director, Institute for Computational Engineering & Sciences
The University of Texas, Austin (April 2013)

Increasingly, societal challenges are driving scientific and technological developments. The “Convergence of Knowledge, Technology and Society (CKTS)” study presents inspirational ideas behind the concept of convergence and identifies ground-breaking opportunities for human progress through such convergence. From the European Union’s perspective, its proposed Horizon 2020 multi-annual (2014–2020) framework programme for research and innovation represents an excellent example of convergence.

Christos Tokamanis, Nanotechnology and Converging Technologies
European Commission (May 2013)

*This book is a comprehensive overview of the convergence of knowledge, human, societal, and global challenges beyond the NBIC report in 2003. [Several] hundred ... leading world experts benchmarked the new concepts and transformative ideas. **The book provides a systematic and unified framework of the convergence to relevant policymakers, entrepreneurs, researchers, and even the general public.***

Jo-Won Lee, Hanyang University, Korea (June 2013)

*I refer to the first congress on Converging Technologies for Improving Human Performance that you co-organized in 2001, and also wrote the report about. I consider that event as an **historical landmark that has caused a new dynamic in the reflection on these new technologies within the broad scientific and governmental community.***

Frank Theys, Co-producer for public broadcasters ZDF/ARTE (Germany/France)
HUMAN (The Netherlands), and Lichtpunt (Belgium) (June 2013)