# Chapter 4
# Ethical Dimensions of NBIC–Convergence

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## ABSTRACT

*One of the key trends in the development of technoscience is associated with the NBIC-convergence projects, which create not only unprecedented means for transformation of society and human but also raise the risks that require integrated approaches to ethical assessment and examination. Today, the foundations of the "NBIC-tetrahedron" have ethical projections in the form of nanoethics, bioethics, ICT-ethics, and neuroethics. However, their ability to discuss and resolve complex problems is limited. Technoethics can be considered a relevant way of combining different approaches to the ethical issues of converging technologies and science to discuss and solve not only actual situations but prospects as well.*

## INTRODUCTION

One of the key trends in the development of techno-science associated with a NBIC-convergence project, which was proposed by M. Roco and W. Bainbridge – organizers "Converging Technologies: Improving Human Performance" workshop in 2002, where a new stage in the science and technology development was designated as the New Renaissance (Roco & Bainbridge, 2002). NBIC-initiative identified two focus-attractors: the first placed the emphasis on the synergetic merging of nanotechnology, biotechnology, information technology and cognitive sciences at the nanometric scale, promising a stream of different technological innovations; the second focused on the change of the human, expansion of its performance. The latter caused a wave of enthusiasm among the adherents of the trans-humanist movement who saw it as a real tool for a transition towards a post-human future. Both vectors – economic-technological innovation and improvement of man – promised the global transformation of human and society in totality, opening up new horizons for the evolution of humanity as a consciously directed transformative process. However, the question of the nature of this evolution is fundamentally open. The complexity of the answer to this question is connected with the fact that initially NBIC-initiative has been instrumental and technocratic in nature, as indicated by many critics.

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The cumulative effect of technology convergence can create not only unprecedented transformation of society and human, but also the risks that require integrated approaches to ethical evaluation and social expertise. One of the relevant approaches is technoethics, proposed by M. Bunge in 1977.

As Bunge (1977) wrote

*The technologist must be held not only technically but also morally responsible for whatever he designs or executes: not only should his artifacts be optimally efficient but, far from being harmful, they should be beneficial, and not only in the short run but also in the long term.*

In formalizing technoethics as a contemporary field of research, R. Luppicini acknowledges

*Bunge brought to the forefront the core idea that technology should be moderated by moral and social controls and that the pursuit of such technology related issues requires special consideration and expertise, what eventually would become the field of technoethics. (Luppicini, 2008).*

After some time, new dimensions of responsibility and responsibility for the future in particular, became the basis for creation of ethics of a technological civilization by G. Jonas (1984). The discussion of many modern technologies has a clear prognostic vector, where expectations and fears, hopes and risks intersect. The unprecedented pace of innovation requires not only operational, but also balanced approaches, taking into account the existing experience of solving complex problems. In this context, technoethics, bringing together different moral projection in the development of technoscience in a single theoretical framework, has a great potential (Figure 1 Conceptual map of technoethics, Handbook of technoethics, 8).

This potential is of interest in the context of discussions about the "ethical myopia" described by S. Alpert (2008) through the example of neuroethics and nanoethics, which he sees as "trajectories of bioethical inquiry". From this point of view, technoethics can be seen as a way of preventing "ethical myopia" in the evaluation of NBIC-convergence, bringing together the potential of neuroethics, nanoethics, ICT-ethics and bioethics.

- **Bioethics:** Formation of bioethics in the middle of the 20th century can be seen as a kind of response to the development of new biomedical technologies (Jonsen, 1998; Hester, 2001; Callahan, 2012). The ethical issues that have arisen as a result of the development of reproduction, intensive care, transplant et al. technologies demonstrated that the matrix of traditional medical ethics are not able to answer the pressing questions. New theoretical approaches, ethical procedures and decision-making mechanisms emerged. Promises and prospects of medical innovations actualized predictor vectors in bioethics and expanded responsibility for the future, in terms of Jonas (Jonas, 1984). Formation of NBIC projects were an important step in the development of bioethical issues, in particular the human enhancement matters. In terms of G. Khushf, NBIC projects became a starting point, which marked the emergence of a new stage in the enhancement debate in bioethics (Khushf, 2005). The first phase of technological reshaping, associated with cosmetic surgery, "smart drugs", mood enhancers, sports doping, and growth hormones. Khushf focuses on five shared attributes of the first stage of the enhancement debate: 1) The enhancements are medical and require a physician to legally prescribe the treatment; 2) The enhancements are discrete; 3)