

APPENDIX C. ABSTRACT OF THE CONVERGING TECHNOLOGIES WORKSHOP IN SÃO PAULO, BRAZIL, NOVEMBER 2011

With the support of the CGEE (Center for Strategic Studies of the Government of Brazil)and of the Program PROSUL (Brazilian National Research Council, or CNPq), an international symposium on “Converging Technologies” was held in São Paulo, Brazil, in the period of 24–25 November 2011. The symposium was co-sponsored by the World Technology Evaluation Center (WTEC, USA) that completed a survey on converging technologies with the participants and established a private passworded website with translations in English, to be included in an international study. Participants were scientists and members of STI (science, technology, and innovation) agencies of several Latin America countries. Two keynote speakers were especially invited to this symposium: Mihail Roco from the National Science Foundation (NSF, USA) and Maurits Doorn from STCorp (Netherlands).

On the one hand, the participants gave an overview of the initiatives proposed in their countries in the four areas (NBIC), as strictly defined in the converging technologies, i.e., nanotechnology, biotechnology, information technology, and cognitive sciences. The presentations attempted to highlight not only the stage at which these areas are in the Latin America, but also point out the strategic direction of research conducted in their countries. Although, in general, no country has reported the presence of research groups specifically grouped to work in all four areas of NBIC, some of the representatives could, at least, show the existence of isolated initiatives of groups combining two or three areas of the converging technologies. However, it was noticeable that the reinforcement of strategies of CT&I (i.e., “STI”), linking research with the need for socio-economic growth, will conduct the close emerging of NBIC activities in the region, specially focused in researches related to agriculture and livestock, energy, and environment, just to name a few.

The key presentation made by Professor M. Roco focused initially on a review of the original concept and the grounds on which the term "converging technologies" was build up where nanotechnology is the field whose contribution enables and facilitates the interaction between living organisms and devices designed for human beings. In this context, the term “converging technologies” refers to trends in or expectations of synergy in the development of these four scientific areas in order to strengthen them and, by combining them, creating new fields of application. Moreover, it was instructive to review the possible areas of knowledge that could benefit from the use of converging technologies in the search for appropriate solutions to their most pressing issues. But he advised that this working strategy should include changes in the governance of universities, research centers, companies, and government agencies to implement a transforming vision that needs to be inclusive and collaborative in the long run.

Mauritz Doorn from the Science & Technology Experts Group (STCorp, Netherlands) during his presentation pointed out that over the years, various actors took up the promises about nanotechnology and converging technology and their possible impact; the resulting discussions resulting in a considerable amount of hype and counter-hype about negative impacts. In his opinion, the hype and counter-hype discussion has drawn the attention away from actual realities in the field, and this has hampered learning and progress. At the same time, important qualitative changes are occurring, and the question is how actors can anticipate the changes in their respective fields. This can provide a starting point for actors to analyze the dynamics of converging technologies in their own fields of practice, enabling them to better anticipate changes and shape developments.

The discussions that followed the various presentations were very rich and vibrant—and the conclusions were not always convergent. In conclusion, it was extremely important to note that all agreed that the current idea of converging research extends to all fields of knowledge and that this new way of working important human issues could facilitate finding different solutions or similar solutions more quickly. According to Roco, converging technologies implies starting a research project from the problems to be solved using integrative approaches, not starting with the subjects and disciplines involved. It also involves the pursuit of common goals, shared theories, and shared approaches to work, the appreciation of the capabilities and achievements of people, and anticipating and managing opportunities and risks.