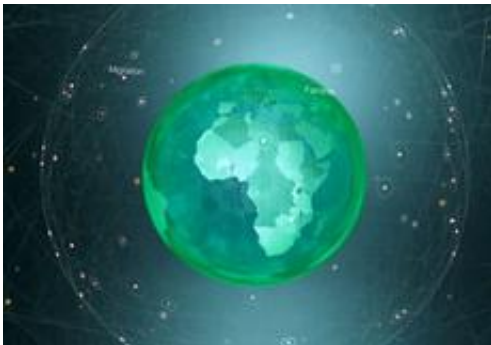


# Exploring the future with modern information technology

May 5 2011, By Peter Rüegg

---



Among other things, the 'FuturICT' project is looking to model what impact political decisions have globally on society, the environment and the economy  
Credit: [www.futurict.eu](http://www.futurict.eu)

European researchers are seeking to create a global computer model named FuturICT, a collective analysis platform for a better understanding of the world. The visionary idea is to design this knowledge accelerator in order to make better predictions about imminent techno-socio-economic crises and suggestions on how to alleviate or even prevent them.

Never before has mankind faced challenges as great as those of today. Climate change, destruction of the environment, conflicts, crises on the [financial markets](#), and many more, are all problems linked to human behaviour. They are not isolated from each other, but interconnected

with one another and interdependent in a complicated way. No human being can entirely comprehend this complexity, and much less foresee the consequences that social or economic activities will have elsewhere in the world.

A group of researchers, led by complexity scientist Dirk Helbing from ETH Zurich, has now proposed a visionary project, FuturICT, with which they want to address these big challenges. The project will develop a platform – the “Living Earth Simulator” – that allows techno-commercial-sociological-ecological systems to be simulated and analysed, to investigate, for example, how political or economic decisions affect our world. The [computer model](#) is planned to be capable of simulating systems on a global scale, considering interactions between up to 10 billion individuals.

## **A knowledge accelerator is needed**

Scientific project coordinator Dirk Helbing says, “We need this knowledge [accelerator](#) to enable better informed decisions that are to be made in a techno-socio-economic-ecological context.” The “Living Earth Platform” is designed, amongst other things, to help minimise, or even prevent, unwanted side effects. For example, bio-fuel production has unexpectedly led to food price increases by competing with the conventional use of cultivated acreages. The consequence was, and still is, social unrest in various parts of the world.

The fact that the time is ripe for this project is illustrated by the financial crisis, which caused dramatic losses within a very short time period and would have ruined whole nations without global intervention and the European rescue system stepping in. It shows that economists and financial specialists failed to recognise the imminent dangers early enough, and were unable to keep the risks sufficiently under control. This is also why voices calling for better models, particularly models of

systemic risks, are becoming louder.

However, FuturICT aims not only to recognise imminent financial or economic crises at an early stage, but also to link different areas together. Various “Crisis Observatories” dealing with financial markets, the real economy, epidemics, conflicts or environmental changes, will be integrated into one “Living Earth Platform”.

## **With EU flagships to new knowledge horizons**

The initiative still exists only as a research proposal submitted to the EU Research Commission. FuturICT currently stands in first place among the 26 submitted projects. It is planned that the winning project will receive one billion euros over ten years. The Commission will make the final choice in 2012. Until then, the researchers have time to work out their applications in detail, for which the EU Commission has provided 1.5 million euros.

One billion euros sounds like a lot of money. However, major projects in physics (CERN, ITER), the engineering sciences (Galileo) or biology (Human Genome Project) are often ten times as expensive, and up to now, the financial crisis has cost more than a thousand times as much. The duration and size of the project also put this figure into perspective: hundreds of researchers are taking part in FuturICT to fill the serious knowledge gaps about our techno-socio-economic systems, as quickly as possible.

## **A perfect example of interdisciplinarity**

The project’s alignment will be exceptionally interdisciplinary and will combine a broad spectrum of scientific expertise to overcome specialisation and ivory tower thinking. Computer scientists, ICT

experts, and complexity scientists are needed, as well as economists, sociologists, and experts in sustainability and systemic risks. The purpose of this collaboration is firstly, to lead to a new renaissance of the social and economic sciences and secondly, to lead to a harmonious, sustainable “co-evolution” of technology and society through the development of information and communication systems that adapt to their users’ needs.

Success in this venture needs, in particular, a modern platform that can record and analyse gigantic amounts of data, transfer them into computer simulations and make them usable by everyone. That is also why the term ICT, which stands for “Information and Communication Technologies”, appears in the project title. Operating the Living Earth Simulator needs data sets collected in real time, as well as new approaches to data mining.

The data sources can be population statistics, for example, as well as freely accessible Internet data. This also shows one of the difficulties that the researchers must deal with: how much and which data does this kind of model really need? Helbing assures that “we don’t collect just all the data that is available, otherwise one would drown in a sea of data.”

## **Big Science, not Big Brother Science**

FuturICT is definitely not intended to be a citizen surveillance instrument either, he explains. Quite the opposite: the scientists want to use this project to point out new pathways and solutions to enable better privacy protection in the digital age. Helbing says, “we have no interest in what individuals are doing, the aim is to understand the bigger picture.”

For example, FuturICT could inform us about the effects of the Japanese earthquake on the global supply and production network or on

social cohesion. Social upheavals, migration, conflicts – there’s a certain interconnection between all of them. Dirk Helbing says, “We want to use FuturICT to gain a better understanding of these relationships to enable better, more sustainable decisions in the future, because global interdependencies have increased enormously. Had we understood them, it is unlikely that a financial crisis of this magnitude would have emerged.”

The ETH Zurich professor and the research community behind FuturICT also aim to use the project and the planned participatory platforms to strengthen democracy. “Most of all, technological development should not endanger democracy”, he says. That is why FuturICT will, among other things, be concerned with how data that is freely available on the Internet can and should be handled. “There is still no consensus between the economy and society here.” He does not at all share the opinion that privacy is an obsolete concept in the digital age. He says, “a society cannot function without the privacy of the individual. The public and private spheres are two sides of the same coin; the public domain is definable only by drawing a boundary between it and privacy.”

## **Privacy and individual participation taken seriously**

Helbing points out the particular challenge is to develop new technical methods of data encryption, storage and processing that allow the kind of data mining that benefits individuals and society, but which also protects individual privacy and confidential commercial data.

Nevertheless, it must remain possible to inspect data in a limited, democratically controlled way where this is necessary to combat corruption and terrorism. Until now there has been a lack of technical solutions that can satisfy all three requirements.

Furthermore, Helbing stresses “the main priority is to find ways of giving back control of personal data to the user”. The World Economic

Forum is now making the same recommendation. He also emphasises that the research within the FuturICT project will have a strong emphasis on ethical questions and a clear code of values. He says, “FuturICT will give top priority to protecting sensitive data and will be fully transparent and democratically controlled. Among all the activities working with large volumes of data, this is the most transparent project. Without such a project it will hardly be possible to learn about the dangers of large data sets and to take effective action to protect society from these dangers”.

Finally, it is important to point out that FuturICT does not want to be a tool that is restricted to a number of privileged political or economic decision makers. Just like the Internet empowers individuals and small organizations with a global reach and unlimited access to information, the project intends to create a participatory platform allowing everyone to access and utilize the data and models developed by the project for their own purposes and applications.

Provided by ETH Zurich

Citation: Exploring the future with modern information technology (2011, May 5) retrieved 18 April 2024 from <https://phys.org/news/2011-05-exploring-future-modern-technology.html>

This document is subject to copyright. Apart from any fair dealing for the purpose of private study or research, no part may be reproduced without the written permission. The content is provided for information purposes only.