

GCRI INTERVIEW

Univ.-Prof. Dr. Marion A. Weissenberger-Eibl

Head of the Fraunhofer Institute for Systems and Innovation Research ISI; Chair of Innovation and Technology Management at the Institute for Entrepreneurship, Technology Management, and Innovation (EnTechnon) at the Karlsruhe Institute of Technology (KIT)

What are the key characteristics of a “Smart City”?

Cities – today already home to more than half the world’s population – are facing new challenges posed by current megatrends like climate change, the energy transition (*Energiewende*), and demographic change. “Smart Cities” attempt to meet these challenges by finding efficient solutions to them. This involves, for example, the use of new technologies to manage resources and energy more intelligently as well as the development of sustainable mobility concepts that can have positive impacts on innovation, environmental and climate protection, and peoples’ quality of life. The successful interplay of all of these factors is characteristic of a “Smart City.”

What are the biggest challenges and opportunities currently facing German cities transitioning to a sustainable, intelligent city model?

The biggest task of city redevelopment consists of adapting infrastructures that have often grown and developed over many centuries to rapidly changing complex conditions and requirements. A good example of this is maintaining a functioning water supply in cities that have experienced explosive growth over a short period of time. In this context, the Fraunhofer ISI’s Twist++ project develops concepts that adapt the older, pre-existing water supply and sewage disposal systems to the respective city developments.

What is your vision for the city of the future?

One positive vision is that cities of the future will be much cleaner, quieter, and greener than today’s cities and that the well-being of their residents will take center stage. The rise in electric car use in cities will mean that traffic will be almost noiseless and emission-free. New energy-efficient buildings will not only consume much less energy, but they will also actually contribute to generating power through the use of renewable energies like large-scale solar systems and will feed surplus power into smart grids. Much larger green spaces will give people the room they need to relax and recuperate and will enable fruit and vegetables to be grown close to where they are consumed. Even if these visions sound more like pipe dreams today, such issues are already being addressed by the Fraunhofer ISI together with other Fraunhofer institutes and external partners through the “Morgenstadt” (“City of the Future”) project. Research is also being done on water and transportation infrastructures for cities in the future.

Fraunhofer ISI clients hail from industry, politics, and science. Please describe one or two of the most interesting projects that you are currently working on.

It is really difficult to pick only one or two projects from the more than 380 conducted each year, all of which are fascinating in different ways. So I have selected two projects that fit the "Smart City" topic. In the "Regional Eco Mobility 2030" project, the Fraunhofer ISI together with other partners is researching concepts for efficient, urban individual mobility. The idea is to combine transportation options like electric bikes for short distances with small electric cars and conventional small cars for longer distances in order to improve mobility services in urban areas and to reduce emissions.

The "Learning Energy Efficiency Networks" is another exciting project, in which companies or city authorities are coming together under the supervision of the Fraunhofer ISI to share strategies for reducing their energy consumption. By drastically cutting electricity consumption, these organizations will save energy costs and boost their competitiveness at the same time.

What innovative technology do you think will have the greatest impact on urban life over the next decade? Why?

I don't think there will be just one dominant technology that will define urban life in the near future. Instead, I believe that a wide variety of very different technologies will interact to influence big city life. For instance, smart phone applications or networked cars could ensure that finding a parking space in major cities happens a lot more efficiently than is the case today. This would have a positive impact on traffic flow as a whole. Another example is lowering electricity consumption by constantly monitoring the actual demand. For instance, street lights could be equipped with sensors to determine whether lighting is really needed. It is especially important to always involve people in such initiatives because successfully implementing technologies and the Smart City concept ultimately depends on citizens' acceptance of the new technologies and their willingness to interact with them.