

Highlights

86 Tapping New Worlds of Ideas

Partnerships are important for companies striving to use the latest results of fundamental and applied research. In addition, firms have recently started to exploit other open innovation methods. Pages 86, 89.

92 All Charged Up

The Technical University of Denmark (DTU) is one of Siemens' most important partner universities. Priorities of a joint research agenda include ways of integrating electric vehicles into tomorrow's power grids and new solutions for drinking water processing. Pages 92, 95.

104 China's Model Future

Every year, 13 million Chinese move from rural regions into cities. Shanghai's Tongji University and Siemens are working together to develop Eco-City models that link environmental protection to urban growth.

108 An Oasis of Education

Siemens has co-founded an industrial collaboration program at King Abdullah University of Science and Technology (KAUST) in Saudi Arabia.

109 Underground Economy

Working with international research partners, Siemens is studying how CO₂ can be separated and commercially exploited. Pages 109, 111.

The concept of open innovation was first conceived about 20 years ago. Today it's an essential aspect of the work being done in research laboratories all over the world. Open Innovative is a company that specializes in development projects of all kinds. Managing director Diego is showing Johannes Quistorp how the company performs even the most complex tasks with the help of its knowledge network and the Internet.



Brazil 2020: A Brazilian company develops complex solutions for corporate customers all over the world. In its operations it combines the advantages of a gigantic global knowledge network with those of virtual space. That saves time and money and minimizes risk. A look at IT specialist Johannes Quistorp's first day on the job.

Unlimited Wisdom

Welcome to Open Innovative! I'm Diego, the Managing Director." A taxi has just deposited me at the gates of a slightly dilapidated beach house, and I can hardly believe my eyes. I'm a recent graduate of an interdisciplinary program in IT and engineering in Bremen, Germany, and not long ago I applied for a job with the global market leader in the area of open innovation (OI) in the city of Niterói in Brazil. To my amazement, I immediately got the job. Even in this virtual age it's still good form to show up in person for a job, so I've

flown to Brazil — partly because this country has always fascinated me.

I don't know what I expected the headquarters of a global market leader to look like, but this beach house is a disappointment. Nor did I imagine I would be meeting a man dressed in a Hawaiian shirt, shorts, and flip-flops, but there he is, slap-slapping his way toward me. Am I really in the right place? I did check the address on the card several times, didn't I? — But I'm brought back to the here and now when the man calls out, "You must be Johannes, right?"

I can only nod at this point, but Diego has already started to tell me about his company: "Open Innovative provides companies in every sector with research partnerships and development solutions of every kind — but of course you already know that. To achieve our aims, all we need are some smart employees, storage space, and computing power in the cloud — in other words, in virtual space." I begin to blush. It seems as if my new boss is reading my mind.

Diego leads me to a wing of the villa and places his palm against a security panel. The

door opens and we enter a room with a round table standing in the center. “This is our show-room,” explains Diego. He presses a button, which causes a three-dimensional hologram to rise up out of the table. The hologram shows a strange structure that seems to be a confused tangle of connected points and lines. “This is our trump card,” Diego tells me proudly. “It’s our gigantic knowledge network. Each of these tens of thousands of points stands for an amateur inventor, a scientist or a complete research institute that has registered on our Internet platform and will make its knowledge available upon request. The countless lines show how all of these points are communicating with one another. The center of the structure is our company, because this is where all the communications ultimately meet.”

“What’s actually new about that?” I interject. “Internet service providers have been applying this principle for years.” Diego nods in agreement. “You’re right, but our services go far beyond those offered by other OI providers. We don’t just help our customers to find individual solutions for various small problems. We also offer them the option of having us develop complete solutions of every kind for them.” He makes a steering movement and a camera that’s hidden somewhere obviously interprets it correctly, as the hologram of a virtual laboratory immediately appears. “I’ll show you a current example,” says Diego. “The United Nations has commissioned us to take models of eco-cities — in other words, plans for sustainable urban development with customized infrastructures — and to transfer them to virtual space in a way that is true to life. Then we have to harmonize their individual elements, such as transportation, water supply, and building technology, with one another down to the smallest detail and optimize their efficiency. Urban growth and environmental protection should go hand in hand.”

Diego once again makes a hand movement that resembles turning a page in a book, and the hologram shows some new details. “As with every commission, the customer sent us detailed requirements, including the maximum costs for materials and operation. We fed these figures into our knowledge network — including the amount of the award that will be granted for the best solutions. At that point we opened up a virtual laboratory on the Internet, as we do for every one of our projects. Depending on the complexity of the order and the knowledge they can contribute, individual Open Innovators who have registered with us can then log into these virtual labs, no matter where they are located. Our innovators can get the virtual components they need for their

work from an online database of products and processing techniques. This is where we also store information about the customer’s requirements. In the case of eco-cities, this information includes 3D models of individual infrastructure elements, including prices, the weather parameters of various regions, and the green requirements that must be fulfilled by construction materials. Using this information, our researchers can build up true-to-life models of everything in virtual space within a few weeks, test it, and optimize it.”

It’s clear to me how enthusiastic Diego is about these processes. “A particular highlight of this project was the infrastructure we created for the eco-cities,” he continues. “We had to integrate large and small power plants, renewable energies, electric automobiles, storage devices for heat and cold, smart buildings, and thousands of electric meters. Then we had to simulate consumer behavior in the region and connect the system up with further new solutions that we had developed in secondary projects.”

He points to parts of the hologram. “For example, major research institutes in Russia contributed their latest synthesis gas turbines, and a U.S. university had just developed a highly efficient method of CO₂ separation for this type of turbine. A brilliant architect from Madagascar suggested to us how we could use captured greenhouse gas to boost harvests in the agricultural areas he had built into his green high-rises. As you see, these are all very complex aspects that we have to optimize through the interaction of our worldwide experts. To make sure all these interactions proceed smoothly and that creativity and productivity go hand in hand, we need our administrators. And that’s exactly the job we want you to do. As part of a virtual team, you can of course do your work on any computer anywhere in the world.”

Diego notices that I can hardly wait to start my new job, and he decides to slow down my enthusiasm just a bit. “We’re going to start you off on an easy project. A hospital operator is looking for a university to work with on a pilot project involving knowledge databases for cardiovascular diseases. So we’re going to launch an ideas competition in which universities can submit their concepts to our network. You’re going to coordinate that project.”

Diego then adds with a smile, “But first, as your new boss I have to find out if you know how to surf.” I look at him in amazement. He laughs and points to the wall at the other end of the room. “I don’t mean surfing the Internet!” he exclaims. “Grab a surfboard — we’re off to the beach!”

■ Sebastian Weibel