June 2013

Julius Bär

From insight to action

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What will the world be in 2050?

We try to answer this question time and again. Everywhere. In Switzerland, in Europe, and anywhere else. It concerns people in cities, in the countryside and from all professional backgrounds and ages. This time we have posed the question to young people. The answers are astonishingly manifold. They are the common thread that guides you through this magazine.

"In the year 2050, I think that robots will help disabled people to move and walk. They will also help us to manage our job like being a cleaner and cleaning people's houses."

Katja, 11

"In the year 2050, we will have a communicator in one of our ears and a microphone in one of our teeth providing us with a navigation system, mobile phone and internet."

Justin, 11

"In the year 2050, I will go to work with a jet pack and I will fly into my office and land in my chair at my desk."

Sofia, 11

An insight
into the life of a pioneer

Recorded by: Sabine Hunziker Schmid
Photography: Starmind

Pascal Kaufmann studied biology, specialising in brain research. Now he is creating a network linking together the best brains in the world with the help of his company Starmind International AG.

Roboy, the robot from the Artificial Intelligence Laboratory at the University of Zurich, is a state-of-the-art humanoid computer. Pascal Kaufmann is one of his 'fathers'.

“The human brain contains billions of networked brain cells. Starmind networks people in the same way.”

Pascal Kaufmann

The human brain contains billions of networked brain cells. Starmind networks people in the same way. The brain works as a monitor visualising know-how hotspots within the company.

“We sell artificial brains for large corporations. We do this by providing companies with self-learning systems applying latest insights from neuroscience. Just like the brain of a newborn baby, our ‘brain’ starts learning what the company knows from day one upon its installation. It grows with every new task it carries out – gaining expertise in providing solutions and becoming increasingly efficient. The aim of this system is to ensure that every employee who raises a question will receive exactly the right answer within minutes – from the cleverest minds in the company. Our Starmind system works incredibly simply: you enter your question and some relevant keywords into the search engine. Brain technology then forwards the question to up to five experts who are most likely to know the answer. These are not just any random people, but the top five proven specialists on the subject available within the company – the ‘starminds’. They then answer the question or ask for more details and narrow down the topic until they can come up with exactly the right answer. Solutions can be rated on a scale of one to five stars. This rating ensures the quality of the answers.

Beneath the question/answer exchange on the surface, there lies a complex algorithm which combines expertise from artificial intelligence and social networks. This is essential in order to ensure that the Starmind system sends questions to the right experts, i.e. those who are capable of answering them. For this purpose, the system analyses information about the company’s employees: details about their interests, for instance, or answers to previous questions and the quality of these solutions. The system is therefore constantly learning and mapping out who knows what.

A fount of knowledge

People have to feed the system – this is essential in order to enable the company ‘brain’ to grow. The way in which the system is initialised is therefore of crucial importance. Traditionally, we start with a selected group of 200 to 300 people. Each employee receives 5 questions from a catalogue of 50, and the system uses the activities resulting from these questions to build up an initial profile of each employee. If employees are unable to answer a question themselves, they can recommend experts – which also contributes to the system’s learning process. Furthermore, an employee – let’s call her Alice – might perhaps be reluctant to say ‘I’m an expert in this area’ herself. Yet if 15 people say that they would go to Alice with this type of question, then our system learns that and memorises Alice as a know-how hotspot. If the system now asks Alice a question, she will happily answer it, as it relates to her specialist area. However, Alice might be faced with a particular question and think ‘Anna has better expertise to answer this’, and choose to recommend Anna instead. Again, the system learns from this. These first few answers and recommendations form the basis for an initial network, which then expands automatically. This is not unlike how the brain of a newborn child is initialised – and it is the way Starmind functions too.

As an incentive for people to contribute to the company brain, the name of the author is shown underneath each solution. This offers experts a chance to make themselves known, beyond their own department and the site where they work. The keenest minds soon become apparent. The people asking the questions, however, remain always anonymous. This is important, as it gives people the confidence to ask questions without any fear of making a fool of themselves. And to add a third point, quick and precise answers naturally encourage further use of the system.

The most intelligent minds

The idea for a system of this kind came to me out of necessity. I was in the USA, researching at the interface between the organic and the technical world – between brain and machines. As a brain researcher, when examining the intricacies of machines I often thought: ‘If only I had a brain which I could ask questions and which knew who was an eminent authority on this topic. That would save a lot of time.’ That set the ball rolling, and sparked the idea of connecting talent on a global scale. For research purposes, I therefore set up the Student Research Opportunities Program (SiROP) talent network, linking together the top students from elite universities. That is the history behind Starmind with roots at the Swiss Federal Institute of Technology in Zurich (ETH).

Technology was important for the development of the system, of course. All I had was the idea and a few concepts I had drawn up, and I had been wondering: ‘What do I need to do now?’ That much soon became clear: I had to find a genius of a programmer to realise my idea. Instead of advertising the position, I hunted around the SiROP talent network for an outstanding programmer – and Marc Vontobel’s name came up everywhere. He caught my eye in this network of talent because he had already written umpteen solutions and won numerous awards. So I contacted him and offered him 50 Swiss francs in exchange for a little of his time. We then met in Zurich, where I presented my vision of constructing an artificial brain to him. He was immediately fired up by the idea. This is how Starmind was born and how the two founders of Starmind came together. We set up the company and have been working with the cleverest minds ever since – which is why the company is called Starmind and not Bettermind. This is our formula for success: collaborating with the very best all over the world.

The knowledge coordinators of the future

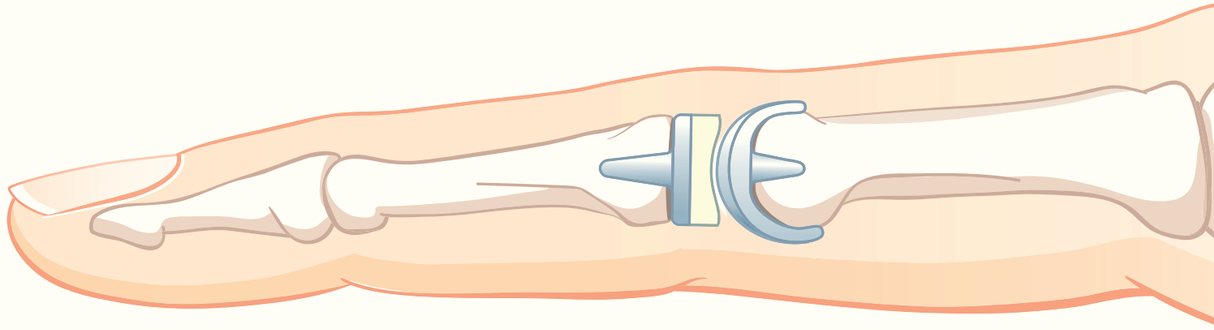
We soon have managed to link people together in a global network quickly and simply. And armed with the knowledge contributed by so many brains, a company will be unbeatable. The notion that the person at the head of a company is the person who knows the most is obsolete. In fact, the distribution of knowledge often runs inversely to the hierarchy of the organisational chart, meaning technological upgrades will be essential in the future: it is a matter of how quickly I can extract existing expertise from my company’s own ranks. This will be the key to success, which is in our vision why every company needs a company brain.

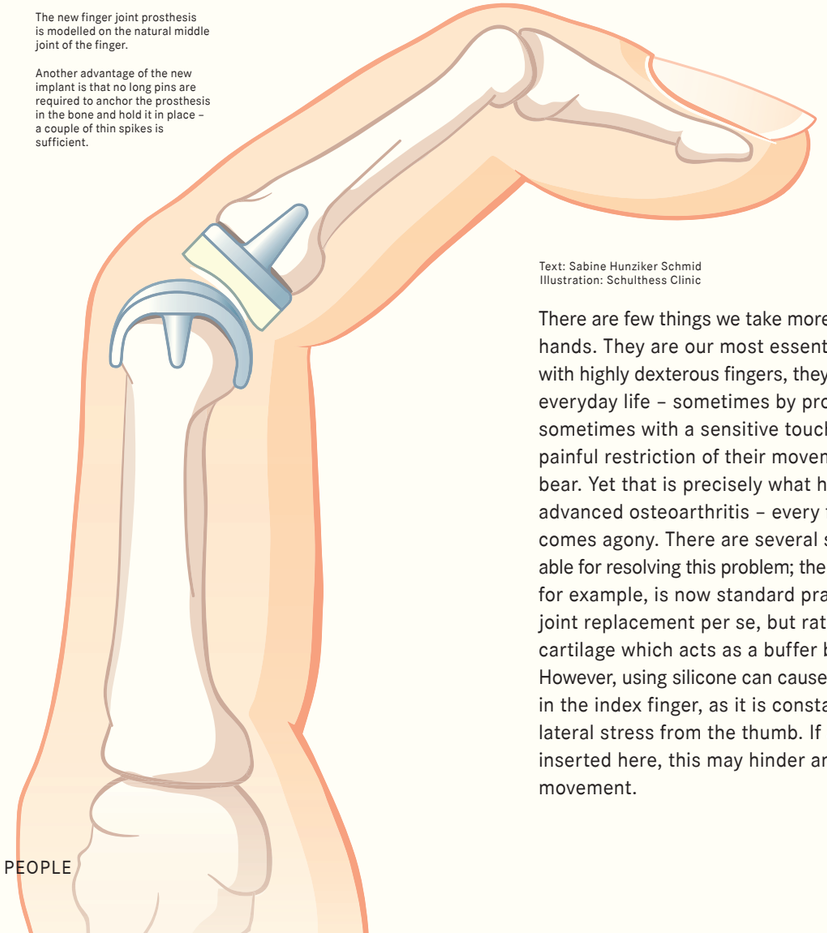
Maybe one day we will all wear a pair of glasses or lenses onto which all the questions and answers I need to know can be projected. This offers advantages in discussions with clients, for example, because the client thinks: ‘That Pascal Kaufmann is very well prepared; he seems to know everything. He knows the group figures for my company, all the important facts about me, and what people are saying about me on Facebook. He is a competent man.’ With these glasses, I will have a kind of control station on hand to guide me – a bit like an air traffic control tower coordinating flight information to guide a plane. I would love to have 20 to 30 experts available to support me during an important conversation. I would love to be armed with the power of 1,000 brains in my pocket.”

Pascal Kaufmann has a Master’s degree in Biology from ETH Zurich, specialising in neuroscience. He also chose to study economics and business administration as subsidiary subjects.

Keeping a finger on the pulse

Pain in the knuckles can be excruciating. Medication provides temporary relief, but does not offer a permanent solution. Any dreams of playing the piano have already been given up anyway. If anyone in this situation could have three wishes, one of them would probably be for a new joint – and doctors at Zurich's Schulthess Clinic have developed just the thing.





The new finger joint prosthesis is modelled on the natural middle joint of the finger.

Another advantage of the new implant is that no long pins are required to anchor the prosthesis in the bone and hold it in place – a couple of thin spikes is sufficient.

Text: Sabine Hunziker Schmid
Illustration: Schulthess Clinic

There are few things we take more for granted than our hands. They are our most essential tool. Equipped with highly dexterous fingers, they help us get through everyday life – sometimes by providing strength, sometimes with a sensitive touch. This makes any painful restriction of their movement all the harder to bear. Yet that is precisely what happens in cases of advanced osteoarthritis – every finger movement becomes agony. There are several surgical options available for resolving this problem; the use of silicone joints, for example, is now standard practice. This is not a joint replacement per se, but rather a kind of artificial cartilage which acts as a buffer between the bones. However, using silicone can cause problems – especially in the index finger, as it is constantly subjected to lateral stress from the thumb. If a silicone implant is inserted here, this may hinder any possibility of movement.

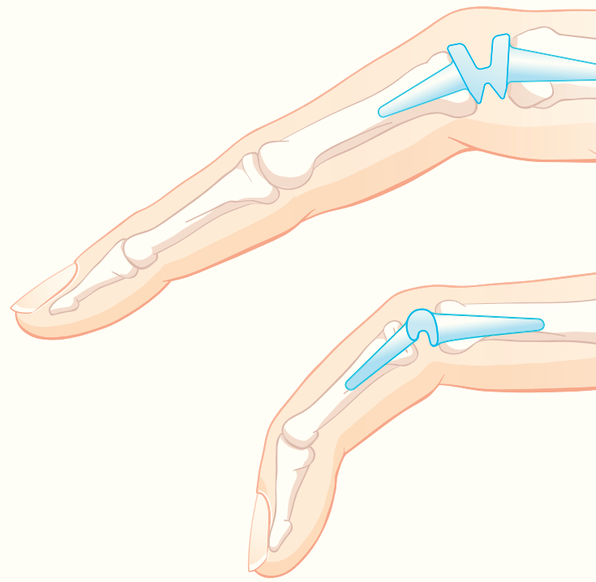
Steady fingers

Now there is a new option available: the finger prosthesis developed by Schulthess Clinic in Zurich. This implant for the middle joint of the finger is made of metal on polyethylene, and is the result of a concept developed jointly by leading hand surgeon Dr Stephan Schindele and Chief Physician Daniel Herren. Their motive for developing the finger prosthesis was to improve the situation for their own patients, particularly with regard to the stability and mobility of the index finger. As experienced doctors, they are well aware that the more anatomically shaped a joint is, the better it will function. They had therefore been mulling over the idea of a kind of miniature knee joint for fingers for a while, but it was not easy to find someone to develop and construct this joint. After all, the finger joint market is small, and development costs money. Eventually, however, they managed to persuade a German company in Tuttlingen to come on board – a company which belongs to a biomedical group and is very actively involved in the hand surgery market.

Ways and means of development

Now the development could get underway. The implementation of the concept was computer-based right from the outset, as Stephan Schindele and the specialist designed the joint in a process rather like constructing an Identikit image. Together, they then set about improving the specifications. Commenting on this, Schindele quotes a former supervisor of his: "A surgeon can only be a good surgeon if he is good at drawing." These designs were used as a basis for producing the first models, which were then improved further. This was followed by extensive laboratory tests at the Zurich University of Applied Sciences in Winterthur, which were designed to investigate whether, for example, the artificial joint would even stay in place if it were embedded in artificial bone or whether it would break off straight away. Only when all the tests had been run without any problems was the new joint deemed ready to be tried out on humans – or more specifically, on cadavers.

All development work and tests are documented on a continuous basis. This is a requirement, and it involves submitting an application to the Ethics Committee, but the effort has been worth it: the newly developed joint has now been used 25 times at Schulthess Clinic, as part of a study which has been running for two years – the final stage in the development process. The results have been meeting expectations: the artificial joint, which is embedded in the bone using just a couple of thin spikes, connects well to the existing bone. It provides better lateral stability and also restores mobility to between 60 and 70 %.



Conventional silicone implants

Dieter Meier is half of the legendary electronic duo Yello and a conceptual artist of some repute. He is spending an increasing amount of time on his organic farm in Argentina.

Text: Dieter Meier

Cry for me Argentina

The Meier family treated itself to a small waterside holiday home on a peninsula in the upper part of Lake Zurich at the start of the 50s. Every Saturday when school was over for the week, Mum would be waiting by the fountain opposite the school gates in a packed Alfa Romeo Giulietta Sprint. Balz and Dieter would rush down the steps, the gang would all be in the car by the stroke of twelve, and away they would go. We looked forward to the rowing boat with its outboard motor, the fishing skills of Bombeli, who managed to land a fantastic pike every three years, the camp site with its wooden changing rooms, where you would creep behind bushes to catch the briefest glimpse of naked ladies' skin through the gaps between the boards, Wiener schnitzels the size of manhole covers in the restaurant at Bächau, but most of all Max, the chief farmhand at a magnificent farmyard, who treated us like adults and let us play with all kinds of equipment. The turning point for me, however, was sitting on my own – a mere kid – behind the steering wheel of a tractor and pulling the manure tank across the fields.

I first went to Argentina in 1973 to visit a friend's farm and spent time roaming the broad fields and meadows on an old nag, something my modest riding skills could just about manage. The memories of the country remained with me for all of 23 years.

In 1996, I returned to the pampas once more, as if under a spell, with my mind firmly set on buying a plot of land, growing organic produce and breeding cattle. As I was completely out of my depth and did not even know how to go about buying land, which is tricky enough in itself (more than 20 criteria come into play), I sought the help of Argentinian specialists. These were prepared to tackle the challenges of organic farming, which, unlike more radical exploitation of nature using chemicals and gene manipulation, is more of an ongoing dialogue with the natural world. It took many years to develop the soil and to find the right balance of crops which could thrive symbiotically. I had the good fortune with Ojo de Agua to find an estancia in a fairly unique landscape where racehorses had once been bred. The location also offered the advantage that the fields used for grazing had never been contaminated by chemicals, which meant the certification process for organic farming did not last the usual five years. Ojo de Agua was granted organic certification to both EU and Swiss standards after two years, and I was able to export the products to Europe. I would use the following example to illustrate just how well suited Argentina is to all types of farming: on the pampa húmeda (wet pampas), the perfect mixture of grasses for cattle breeding grows the whole year through and the quality of the water cannot be beaten. There has never been any industry in the area. The animals are free to roam during summer and winter alike.

The average farm covers 1,000 hectares and feeds 1,000 cattle. A single gaucho supervises everything, his job is to move the fences around each day so the grass is not munched away below two hands or so from the ground and thereby ensuring it grows back just right. The only possible way to use the many hundreds of millions of hectares of pampa húmeda to feed mankind is to convert the grass into the meat it produces, which is easily the best in the world in terms of both taste and health. Unfortunately, however, the immeasurable riches of Argentina, which also extend to natural resources ranging from oil to uranium and the most abundant fishing waters in the Atlantic, have not always benefited the country. You could compare the situation to a spoilt heir coming into a massive fortune. Once the Indians had been rooted out, an irresponsible upper class suddenly found itself in possession of huge estates and proceeded to exploit both land and people as shamelessly as the aristocracy in Europe. During the 1940s, the third-rate tinpot general, Mussolini idoliser and radical populist Juan Domingo Perón was able to seize power as a direct consequence of this irresponsible oligarchy and indirectly pocket the proceeds from the country's agriculture.

"When I float above the megalopolis of Buenos Aires in a plane, I look forward with trepidation to my next encounter with this beloved country."

Dieter Meier

The Peronists operate a system of redistribution to which the farmers have to contribute with 35% of their harvest. Thanks to these 'retenciones', billions of pesos are rolling into the state's coffers each year. These proceeds are then used to create evermore civil service jobs with the sole aim of maintaining a power base, rather than developing the country. As a result, one of the world's richest nations reels from one inflation-driven crisis to the next, since not even Argentina, despite being blessed by nature, can afford to feed an enormous welfare system which is the base of the political power.

Given all this, any trip to Argentina, which you dearly love despite its problems, brings a few worries with it, and this year is no different. Following Ms Kirchner's re-election as president for the second time with 54% of the votes, rule by decree is expected to be the norm, with legal certainty continuing to take a battering. Inflation already stands at almost 30%, the money presses are running hot and erratic import and export restrictions are hurting the economy. Mr Kirchner, who during his own presidency radically regrouped the Peronistic power structures partly around his own family, commented on the bond owners who lost 75% of their investment: "Only an idiot would invest in Argentina."

Exporting my organic beef, wheat or maize, even though nobody in Argentina is much interested in organic products, is getting more difficult and sometimes even impossible. But like anyone in love, I remain a helpless case, hoping the object of his affection will one day come to her senses. "I cry for you, Argentina, mi amor," when I float above the megalopolis of Buenos Aires in a plane and look forward with trepidation to my next encounter with this beloved country, which lurches in ten-year cycles – because of its riches, crazily enough – from one catastrophe to the next. I would implore any of my compatriots to visit the love of my life at the earliest possible opportunity.

INSIGHT JULIUS BAER

Potential to grow food

The United Nations estimates that the world's population will grow to 9.5 billion people by 2075. To feed an extra 3 billion people puts today's food value chain under scrutiny. Yet population growth is not the only challenge. The uncertainty surrounding the effects of climate change, soil pollution and the loss of arable land to urbanisation will make growing crops more difficult. The resources to grow food are finite but we believe that we will be able to feed the world going forward. There is still the potential to grow more food and with the past years' increases in food prices, the focus has moved to areas where this potential is thought to be found: South America, Asia and Africa. (nro)