



## Testimonial



**Tamas Haidegger, BME, Hungary**  
Alumni of Experience@Singapore: Engineering & Technology, 27 to 31 August 2009

The whole story began in April I applied for an offer at out jobfair from Contact Singapore, a governmental organization to attract international labor force to Singapore. Three of us were chosen from BME to participate in the Experience@Singapore programme, the organized professional trip to many factories, institutes and companies. It sounded extremely fascinating from the very beginning! Eszter is a recent chemical engineer graduate, Peter is electrical engineer starting a post-degree in biomedical engineering, and I was selected as a graduating PhD student.

We were given plane tickets, they reserved accommodation, and I also arranged some further professional and private meetings while in Singapore.

We took off late from Ferihegy airport to Frankfurt, but we still managed to catch out connecting Qantas jumbo jet. This was my longest flight ever, but just passed really quickly and uneventful. I was glad to see the first island after the ocean and then Kuala Lumpur, the tropical jungle and finally Changi airport. The first moments in Singapore made me feel like in Japan: everything is modern, crowded, clean and well organized, and also, they drive on the left. It turned out quickly that Singapore is quite different from Japan, e.g. in the weather. It is hot and humid. As our guide put it: Singapore also has four seasons: hot, very hot, extremely hot and damn hot. Besides, they are crazy about air conditioning, and always cooling rooms down to 15-17 C, making it very easy to catch a cold despite the generally good weather. Singapore is soon celebrating its 44th anniversary, reaching the top of the world within such a short time.

As all guidebooks put it, Singapore is great for shopping and dining. We were given amazing food throughout the week, as a proof of this. Singapore has 4 ethnic groups: majority is Chinese (71%), Indian, Malay and the rest.

Our accommodation, Hotel Orchard, was located on the posh Orchard Road, the 5th avenue" of Singapore – full of shops, hotels and fancy restaurants. First night, we walked out to the famous district of Little India. The official programme began on Monday morning, we got two amazing guides (Rich and Gary) who accompanied us all along. It quickly turned out that we three are the only non-Asians in the group joining 16 Korean and 21 Chinese students. This made it a wonderful intercultural experience at the same time.

First, we visited the office of Contact Singapore in downtown (Raffles City towers), given a little introduction to the organizers, the scope of the whole Experience@Singapore programme. People from EDB explained more the history of the country identifying the key issues lead to success. Lunch was Teochew porridge all-you-can-eat, after which we all touched the water of the immense Fountain of Fortune.

The Singapore Government invested huge efforts to provide appropriate housing to its citizens; we toured the 1st, 2nd and 3rd generation HDB (Housing Development Board) flats. Next came the URA City Gallery, presenting the major construction projects of Singapore under preparation. They plan (and do) the significant extension of the financial district by many new skyscrapers, while also reclaiming land from the sea.

In the afternoon, we tasted some bizarre desserts in the local hawker (food court), and finished the programme at a Chinese lobster restaurant. Later we met with my local friend from Hopkins, Zhenglong and we had a nice walk all along the Singapore river, that is covered with bars, clubs and restaurants. At the bay entrance, a huge Merlion statue spits water (half lion-half mermaid), the symbol of Singapore.

Tuesday began very early with visits to the three major petrol companies. First was the world's biggest oil company, ExxonMobil. They have been present in Singapore for over 100 years, and now planning to open their second oil refinery increasing their current 1.7 million barrel/day capacity by 50%. With investment totaling 7 billion dollars so far, ExxonMobil has created a major logistic hub here, servicing 40 countries with petrol and chemicals.

Next came Modec, the world leader in oil rig and pumping station builder (with a 15% market share) they have already sold 165 units, each for 0.5-1B USD. Their major profile is building/retrofitting FPSO ships (Floating Production, Storage and Offloading vessel) allowing the pumping from even 2000 m depth. Before visiting the petrol industry's cluster in Singapore, situated on the man-created Jurong Island, we filled our stomachs with delicious dim sum food, and peaked out at a nice observation tower from the top of Jurong hill. Shell Chemicals Seraya is located on Jurong Island, along with all the other representatives of the field. There is very strict entry policy, enforced by armed military police. The Shell factory here produces a wide range of lubricants, oils, plastics. Beyond given presentations, we toured around the huge factory/refinery by bus.

Later in the evening, we visited the world's first Night Safari. Beyond the must-have boutiques, restaurants, shows, they also have 115 different species of animals. We got to see a lot of them, but unfortunately they were not a lot more active than during the day. In the next days we were overloaded with great tours to companies in electronics and biotech. On Thursday, we first visited MediaTek, the world's 5th biggest IC manufacturer, and leader in control boards for optical drives. They have a development center in Singapore that has just been enlarged.

The no 1. of the IC sector, Qualcomm was next, that company specialises in mobile control boards. (They now plan to enter the market of sub-notebooks with their new Snapdragon smartbook.)

Qualcomm is no. 16 on Fortune's 500 list, and has an annual revenue of 1.8B USD, of which they reinvest 22% to R&D. We got a thorough introduction to their global test facility in Singapore that is brand new. They have million dollar equipment for individual, functional, environmental and fault testing of chips. The automated bootloader tester was also very impressive.

Third stop was probably the most fascinating, a closeup view on a silicon wafer integrated DRAM factory, Tech Semiconductor Singapore. The company is mostly owned by Micron, and produces approximately 10% of the world's ICs. They opened this factory in 1993 with a 300 M USD investment, and more recently retrofitted it, having the world's first 300 mm diameter wafer production chain. The factory is entirely automated, robots are running on ceiling mounted rails to deliver the wafer to the different workstations. The total capacity is 1000 wafers/day, each containing 800 1GB DRAM memory modules. The total time of manufacturing can take up to a week as it has more than 600 steps.

We finished the day at a Malay restaurant, then went to Chinatown meet some Hungarians studying here, and later joined the group at the most hip dance club of the region: the Zouk.

The programme continued with a visit to Fusionopolis, getting introduced to the head organization of R&D: A\*STAR. Their budget is more than 5B SGD per year, and A\*STAR is also the coordinator of 14 research institutes. In the proximity of Fusionopolis lies Biopolis that was created to (successfully) attract international biotech companies to Singapore. We had a lunch at the canteen of the National University of Singapore, then headed to the far east shore of the island, to visit the biotech cluster. Schering-Plough is here since 1997 with other pharma companies, running an API (active pharmaceutical ingredient) factory. We saw the huge containers, feeders, reactors and crystallizing chambers. The biggest challenge is to avoid explosion hazard from static charging of the powder.

Later we returned to Contact Singapore's headquarters to meet with representatives of hiring companies. Most impressive was the great talk with Mr. Tan, former managing director of AMD Singapore. One of the very best was the night ride we took on the Singapore Flyer that is currently the biggest Ferris wheel in the world. The harbor and the financial district looked gorgeous from 165 m above. Next to the Flyer we saw the pit stops of the Formula 1 being built for the September Grand Prix. An Indonesian dinner followed and then we dropped by the Merlion statue, and later to Bugis market to get some souvenirs. In the end, we checked the beautiful colonial style building of Raffles hotel and went home.

The last day just came too early. The professional programme was about sustainable development and renewable energy. Singapore is very proud of its water management. Fresh water is one of their most limited resources, currently a huge portion of their daily need (1.3M m3) is supplied through pipes from Malaysia. As the prices are getting higher and also for strategic reasons Singapore decided to get independent. They plan to collect 70% of the total rainfall by 2020, already getting 10% of their need from desalination plants, and notably, they have NEWater. This means the purification and reuse of waste water. They have 4 operating factories producing 10% of the daily need, but plan to extend that to 30% by 2011. The purification has three steps: ultrafiltration (for particles bigger than 0.004 um), reverse osmosis (above 0.0001 um) and finally ultraviolet irradiation for safety. The water is clean, potable, although used by the industry 95%.

Next was GE Water, laboratories of General Electric at Fusionopolis. GE has a "GE Eco Imagination" initiative with a 1.5B USD budget to support the development of sustainable development strategies. They invented the reverse osmosis membrane as well. Currently, they are setting up a high-tech microbiology lab for water inspection.

At lunch, the Hungarians were given a unique chance to meet with an A\*STAR representative to learn about international cooperation, grant and scholarship possibilities. The final company of the week was VESTAS, the world's leader in wind turbines. They install over 5000 plants a year, and predict that wind will give 40% of all energy needs by 2040. As Singapore does not have sufficient wind, they have a 300 head research office, created with a 500M SGD investment. They are always looking for new engineering solutions, e.g. VESTAS was first to build an off-shore (sea-based) windfarm. More recently, they moved towards the paradigm of "open innovation", sharing their knowledge even with the competitors for the sake of the development of the field.

We toured the new Marina Barrage as well, that created Singapore's 16th fresh water reservoir (and sport facility) on the Marina channel, and also protects the city from floods. It has 6 of the world's largest pumps to secure the flow of the river, each pump capable of filling an Olympic size pool in a minute. We got an introduction to the history of environment protection in Singapore at the local museum, and had fun at the rooftop with the group photographing.

The closing of the programme took place at CS' office, by thanking the week to the organizers and sharing our memories with them. Had great food and group photos again. We had to say good bye to many of our new friends who went home that night. (Including the other two Hungarians.) With a couple of Korean guys we went to one of the largest malls – VIVO City near Sentosa island to look around, and finished the day with a cocktail on the seaside.

It was a wonderful week, we learnt a lot about the country and effective administration and business organization. We are grateful to all the organizers providing us the great Experience@Singapore programme.

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