IT University of Copenhagen

Bilag 14

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Travel report, Singapore and India, 25/8 – 30/8 2007, Mads Tofte and Marie Gottlieb

The entire trip was comprised of 2 days in Singapore, meeting with various universities, research institutes, and the Ministry of Education, as well as 1 day in India, meeting with Tata Consultancy Services (TCS).

The Singapore part was arranged by IdeaFactory (http://www.ideafactory.com/), since the Managing Director and Partner of IdeaFactory, Tony Lai, has previously visited ITU and offered his services.

TCS in India have developed a Computer Based Functional Literacy Programme (CBFL), which can be used to teach adult illiterates to read within 40 hours. An ITU graduate, Malene Rasmussen, worked with TCS on her thesis on literacy in India, and ITU have previously had contact with Dr. Kohli, former deputy chairman and originator of the CBFL project, as well as TCS's representative in Denmark, Mr. Ragnar Norddahl.

Sunday 26 August

We arrived in Singapore late afternoon, checked into our hotel, and spent the rest of the afternoon/evening preparing for the meetings the following day. In the late evening we managed to get out for a short walk in the streets of Singapore to locate some very tasty Singaporean seafood.

Monday 27 August

We had a brief breakfast meeting with Tony Lai, and Eng Kiat from IdeaFactory, introducing ourselves and going over the 2-day programme provided to us by IdeaFactory. Eng Kiat was going to be our guide during our entire time in Singapore.

Meeting with Institute of System Science (ISS)

In the morning, we had a short 1-hour meeting with the CEO of ISS, Lim Swee Cheang. ISS is an institute under the National University of Singapore, mainly focusing on 2 areas, namely:

- Business & IT Alignment (providing continuous education of IT professionals, somewhat equivalent the Master/Diploma programmes at ITU)
- e-Government Leadership (appointed by the government agency Infocomm Development Authority (IDA))

Lim Swee Cheang gave us an overview of the history of ISS, and we in fact seemed to have some alignment with regard to training of IT-professionals.

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ISS was set up in 1981 as a technology training center for IT professionals, as well as senior executives and decision makers. In the 1980s, ISS conducted senior executive programs for all the senior leaders in all the ministries. In the 1990s, ISS conducted senior executive programs for the private sector. In the 2000s, ISS offers e-Government programs to Singapore and overseas senior executives. ISS now aims at industrial development (not academic). Lim Swee Cheang thinks of research as capability development. They now have a mixture of education, research, and consulting, with currently 10% of staff doing research.

Recent history is parallel to ITU in having lowest ever student recruitment in 2004/5, which have now grown to larger than ever. Lim Swee Cheang also shared with us that Singaporeans are loosing interest in educating themselves within IT, engineering and science, at least in the traditional fashion of 100% technical focus.

Regarding globalisation, ISS was set up to look inward, but have changed, and are now very interested in global interaction. Lim Swee Cheang stated that ISS has lost a lot of customers due to outsourcing to India and other places, and that the whole industry in Singapore is changing. As a result, globalisation has to be included in their strategy. For instance ISS does certification, but slightly different than before – now focusing on system architecture rather than just dot net programming etc.

Take-away

Mr. Lim Swee Cheang showed openness and interest in cooperating internationally. Since ITU and ISS have some alignment with regards to continuous education of professionals, it seems obvious to explore whether we can have some kind of cooperation focused on the ITU Master and Diploma programmes.

Meeting with the National University of Singapore (NUS)

In the late morning, we were visiting the NUS School of Computing, a productive and well-reputed school of Computer Science focused on core research and teaching within classical Computer Science disciplines.

A potential ITU-NUS alignment suffers from the fact that the arts and business corners of the ITU triangle did not appear to be emphasised in the NUS setup plus the fact that the Computer Science that goes on at NUS happens to have only small overlaps with the Computer Science that goes on at ITU. One of the possible overlaps is Databases, where NUS has a large group (and ITU a small one).

The School of Computing was established in July 1998. It has a department of Computer Science and a department of Information Systems, roughly 90 faculty and 1950 students in total (1500 undergraduates, 450 graduates, 300 research/PhD students, 150 MComp students). They have a big variety of research areas with databases and media among the largest.

The NUS staff gave us a presentation of a Graphics Processing Unit for Interactive 3D (visual simulations) creating real-time shadows (for games). NUS cooperates with US companies and the unit might be implemented in NVidia. Additionally, they presented a Jump Flooding Algorithm (JFA) (for games & geometry), which can be used for region calculating, to create soft shadows, and Geometry (they had a triangulation programme, which is 60% faster than Triangle). Lastly they presented their core areas of research with regard to programming languages and software engineering.

Regarding globalisation, the NUS staff expressed that they are currently looking for international partners for collaboration.

We discussed the Singapore-MIT alliance, and they explained that it is now moving into phase 2, with research cooperation moving into phase 3 (joint courses, joint programmes, students get to spend time in MIT for 6 months, co-supervised). NUS staff expressed satisfaction with the alliance, particularly because the Singaporean students on the programme are very sought after. They also noted that the programme

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involved less activity than expected, that the whole project is government funded, and that research funding is going to MIT.

NUS now have a new 5 year programme with CMU, starting in Singapore and continuing in CMU. It seems more similar to what ITU does – focused on new media.

Take-away:

There may be grounds for collaboration around specific Computer Science topics, e.g., databases and algorithms.

Lunch with IdeaFactory

After the two morning meetings, we had lunch with IdeaFactory. We were introduced to two additional staff including a Danish intern. We discussed the two meetings and had a general discussion about the educational sector in Singapore, with IdeaFactory staff being extremely helpful in sharing their knowledge, placing our recent experiences in a larger perspective.

Meeting with Nanyang Technological University (NTU)

In the afternoon we met with NTU, which is an established university (from 1955) with roughly 25.000 students. We started our visit with a walking tour on to the grass-roofed brand new designer building in the centre of the campus housing the School of Art, Design and Media.

After a major recent restructuring, NTU now has 4 colleges: Computing, Business, Science, Arts and humanities. Under the colleges are various schools, and apart from the purely technological schools, NTU now also is establishing 2 newer schools with a more "soft" profile – namely the School of Humanities and Social Science, and the School of Art, Design and Media. Additionally the Dean of NTU has expressed wishes to start a School of IT, Communication and Culture.

NTU expressed that there is a strong commitment in the NTU management to "break down walls" with a similar understanding of the connection between the corners of the ITU triangle.

With regard to teaching methods, apart from the typical coursework, hands on experience, group projects, and participation in competitions are emphasised. In addition to traditional programming skills, they teach problem solving etc. Teaching is regarded equally important to research, and researchers with no teaching skills cannot be employed at NTU. Like ITU, NTU uses student evaluations. NTU requires of staff to be innovative, and to believe in life-long learning.

Regarding global interaction, they have an undergraduate global Immersion programme, which lets students spend up to two semesters abroad. For post-graduates and Ph.D.s, the main global exposure is participation in conferences and Internships.

In particular, NTU, Georgia Institute of Technology (Georgia Tech), and the government agency Infocomm Development Authority of Singapore (IDA) are cooperating on two new integrated programmes where a Georgia Tech M. Sc. Degree (1 ½ years) is built on top of a NTU Bachelor Degree (3 years). IDA offers 10 scholarships a year for the programme. They have 4-5 times as many applicants as places. In theory more students can participate supporting themselves.

Another interesting external (non-international) cooperation is the NTU–Nanyang Business School Double Degree in Business & Computing.

NTU have a very interesting game lab working with AI, graphics technology, multimedia technology, etc. They collaborate with a company in HK, do R&D in Singapore, and production in China (Sends students to China to follow process). They have game engine development competences in-house. Extensive international collaboration on gaming including Japan Anime International, and they are in the process of expanding to Australia, Vietnam and maybe one UK university.

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Take-away

ITU and NTU seemed to have a lot of alignment with regard to both understanding of IT, and teaching methods. It is obvious to explore possibilities of further collaboration with regard to

- Computer games (NTU taking a more technical approach to Computer Games than ITU has done so far)
- Research on Eye-tracking
- Collaboration on teaching programmes / integrated degrees
- NTU students to apply for ITU Ph.D. scholarships
- Joint research programmes – designing joint programmes is a good way to establish collaboration between faculty
- Collaboration with regard to bachelor-level student projects

Tuesday 28 August

Meeting with Institute for Infocomm Research (I^2R) – under A*star

Tuesday morning, we went directly to visit I^2R, which is not a university, but a research arm under the national Agency for Science, Technology and Research (A*star), working closely with the economic development board (EDB) of the government.

CB stated that I^2R's perception of IT is somewhat similar to the ITU triangle, which will become evident when they move to their new building, Fusion Polis, a huge double skyscraper, which will house various research institutes and companies within science, business, and the arts!

I^2R demonstrated a very impressing value continuum of research, leading to product development, leading to commercialisation (done by a partner company).

I^2R works with industry partners on research (in cooperation with a large range of partners), Incubation, and on top of that, they provide help to SMEs (tech road mapping, tech advising, tech seconding).

I^2R showed us an impressing list of publications, awards, business spin-offs, etc. On average, they aim to have 1 patent filed a week. Examples of innovation include;

- Smart book-shelves (tagging books) – bookshelves with antennas – Amazon for library
- High speed Maritime Mesh network – Enhancing communication in sea
- Next generation content TV
- ICT for elderly
- Partnering with hospital
    - To make use of video tech to observe people with dementia
    - On rehab exercises
    - On handicapped, capturing brainwaves to enter information
    - They have a researcher who has done a Phd in eyetracking (gazing)

By the end of the visit, I^2R took us to their "future home" show-case room; an apartment filled with tomorrows technology, including; face recognition at front door, TV news software able to split up and index news items through text analysis, and speech-to-text technology, Video surveillance, RFID music shelve – tagging of CD box, to let box placed on regular shelve initiate music to be played form central computer/TV/audio unit etc. etc.

The research management of IIR was impressive. Despite the fact that there were more than 300 researchers employed doing very different things, there was a tangible overall, common vision and mission of all the research, the actual research fitted well with the overall vision and mission and finally,

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the "future home" was the concretization of it all, demonstrating in very concrete ways the practical applications of the research.

Take-away

Based on the impression of I^2R, it would make sense to explore possibilities of research interaction in the areas of tracking and eye tracking.

Lunch with the Ministry of Education (MOE)

We had lunch with MOE in a restaurant located in a beautiful colonial-style building housing the National Museum of Singapore.

We had an informal talk over lunch, during which we explained to them about ITU, and the purpose of ITU being in Singapore. MOE responded with interest and pointed out which universities in Singapore approximate our approach. We also discussed Singapore's approach to international collaboration including the Singapore-MIT alliance.

Meeting with Singapore Management University (SMU)

SMU was an exceptionally good match with ITU on several levels. SMU is a new University, like ITU, established in 2000 to introduce a different kind of university than NUS and NTU, but they have now already grown to a student population of 4800, with an intake of 1005, aiming to grow to about 6200. Current population is mainly undergraduates, but they are now shifting emphasis on to graduate programmes.

Like ITU, SMU moved to brand new city campus in 2005. The new building is equipped with very interesting classroom technologies, allowing remote lectures (video conferences), as well as inter-classroom interaction (incl. white boarding etc.).

SMU has implemented a very special teaching philosophy aiming at creating critical student with ability to think, solve problems etc.

- They teach small classes of around 40 students
- Students are placed facing each other with the teacher in the middle
- Highly interactive lessons
- Use of advanced technology for interaction (200+ classrooms, each with own server rack etc.)
- Peer learning – students teach each other
- Class room participation reflected in grating

Internationally, SMU has a strong cooperation with top US Universities, Schools, and institutes, such as Carnegie Mellon, University of Pennsylvania, University of Chicago, Swiss Finance Institute. They have worldwide recruitment of staff – with diverse professional backgrounds, and they have 130+ exchange programs with 40 partner universities, and target to have half of the student population going on exchange.

SMU emphasises student connection to the industry through career services, placement, internships etc.

Take -away

Clearly, there is a lot of alignment to be found between SMU and ITU both with regard to general philosophy and to organisational history.

SMU mentioned that they have a course in Global Software Project Management (with IS group Carnegie Mellon), where the students get to practise using computer supported collaborative platforms. They suggested that ITU should get in touch with the people running this course.

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SMU will additionally send us contact details to the person in charge of undergraduate exchange programmes.

Wednesday 29 August

Meeting with Tata Consultancy Services (TCS)

We arrived in India late night at 1 am and went straight to the hotel. The next morning we were picked up by the TCS driver 1 hour early for the meeting (by mistake), which resulted in a short sightseeing-drive around the city of Hyderabad.

At 9.30 am we met with the Executive Director of Business Systems & Cybernetics Centre, Dr. Nori. He gave us a presentation of the TCS involvement in the fight for literacy in India, introducing their Computer Based Functional Literacy Programme (CBFL).

The CBLF programme is designed to teach adult illiterates how to read within 40 hours. At this point in time more than 100.000 people have gone through the programme. However, India still have somewhere around 300 million adult illiterates, calling for a more efficient way of propagating the programme to needy areas/people. Additionally the programme can be easily adjusted to other languages, and can, as such, be applied to almost any country/area in the world with similar problems.

We spent all day with Dr. Nori discussing the successes and failures of the TCS approach, as well as the possibility for ITU to participate in propagating the CBLF.

We met with the other staff involved with the programme, both programmers and field workers. We got a demonstration of how the programme works, and received sample material to bring back home.

Take-away

TCS is open for ITU to explore new ways of utilising/propagating the CBFL programme, possibly involving the creative output and implementation skills of the ITU students (through competitions/projects).

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