Industry Collaborations with the SMU (Singapore) School of Information Systems: Experiences, Lessons and Suggestions

08 December 2006
Prepared for
MIS Research Center
Carlson School of Business
University of Minnesota

Agenda
1. My background
2. Singapore and SMU
3. The School of Information Systems (SIS)
4. SIS staffing model and personnel
5. Case studies of SIS industry collaboration
   i. The SIS Board of Advisors
   ii. The undergraduate programme
   iii. The Standard Chartered Bank ilab@SMU
   iv. others
6. Q & A

My background: IT applications researcher & educator ➔ user & designer ➔ provider ➔ researcher & educator

Ph.D, 1983
Carnegie Mellon University
Engineering & Public Policy

Carnegie Mellon Univ.
* Asst. Prof
- Pittsburgh, PA USA

Fujitsu Ltd
Telecom (& FNC)
* Dir. Of Mfg. Eng
- Oyama, Japan
- Richardson, TX, USA

SMD Technologies
Chief Eng.
- Columbia, MD USA

IBM
Global Services
Biz Architect, Consulting
- Sgp., ASEAN
- AP

SMU
School of Info Systems
Founding Dean
- Singapore

The “little red dot”
One Degree North of the Equator

- Flight Times:
  - Hong Kong
    3 hours
  - Bangkok
    2 hours
  - Bali
    2 hours
  - Kuala Lumpur
    1 hour

We live here. It’s always warm and toasty!

SINGAPORE: East-West Fusion of Trade and People: Asian (Chinese, Malay, Indian) Eur-asian, Cauc-asian

SMU is located in the heart of the city

10 min walk
Design Images of the New SMU City Campus from 2002-2004

The Real Thing: SMU City Campus opened in July 2006

The School of Information Systems Building

Singapore MANAGEMENT University (SMU)
The School of Information Systems is SMU’s fourth school

Established Business School
Information Systems Dept/School

Established Computer Science Dept/School

Established Business School Information Systems Group/Dept

SMU

School of Business (2000)
School of Accountancy (2001)
School of Economics & Social Science (2002)

Law School (2007)

Established Business School Information Systems Group/Dept

Organizations are driven by business and technology disciplines.
- Heavily oriented towards social science, management & management science analysis methods and questions.
- Heavily oriented to creating new and/or fundamental analysis results for publication (per #2).
- Most of the research community has moved away from the design or development of actual software or solutions. Researchers and educators are focused on various types of impact analysis, and on optimal resource allocation analysis.
Three principles influenced the blueprint for the school

1. Three Pillar Integration

2. IT- Applications-Mgt Integration

3. Bridging between three levels of innovation

From the outset, SIS has worked with Carnegie Mellon faculty to design and establish the school

SMU-CMU Memo of Understanding
Signed 08 Jan 2003

Refocused Information Technology & System areas

SMU & SIS Staffing Model

SMU’s particular situation as a young early stage university
Case studies of SIS industry collaboration: Already going

1. The SIS Board of Advisors
2. The undergraduate programme
3. The Standard Chartered Bank (ILAB@SMU)
4. The former IBM Business Consulting Services Solution Center at SMU
5. The Singapore National Grid Effort, and the related Adaptive Enterprise @ Singapore programme (a collaboration across the Singapore government, universities and HP labs)
6. Joint efforts with SAP to increase tertiary student exposure to current and future generations of SAP’s enterprise solutions
7. Joint efforts with Oracle to mount a certification programme for the Architecture of Business Grids
8. The SIS PhD programme

SIS Board of Advisors Working Groups

- Undergraduate Scholarships
- PhD Programme Projects and Sponsorship
- Faculty Development
- Professional Programmes
- Undergraduate Student Quality & Attraction

Industry collaboration in the undergraduate curriculum, Internships and Projects

<table>
<thead>
<tr>
<th>Core Courses</th>
<th>Industry partner</th>
<th>Interesting interaction</th>
</tr>
</thead>
<tbody>
<tr>
<td>Business-IT Internship</td>
<td>Multiple companies</td>
<td>- Student internship assignments</td>
</tr>
<tr>
<td>IS Application Project</td>
<td>Multiple companies</td>
<td>- Student prep, project execution, feedback</td>
</tr>
</tbody>
</table>

Large and rich networks of industry relationships are needed for:
- interesting Business IT internships and projects
- to place students
- to attract students
Industry collaboration in the undergraduate curriculum, core courses

<table>
<thead>
<tr>
<th>Core Courses</th>
<th>Industry partner</th>
<th>Interesting interaction</th>
</tr>
</thead>
<tbody>
<tr>
<td>Computer as Analysis Tool (CAT)</td>
<td>Multiple companies</td>
<td>Student projects building spreadsheet based business models</td>
</tr>
<tr>
<td>Seminar for ISM Majors</td>
<td>Executives from multiple companies</td>
<td>Required Business-IT talks linked to the course</td>
</tr>
<tr>
<td>Information Security &amp; Trust</td>
<td>E-topp</td>
<td>Interactions with students in class</td>
</tr>
<tr>
<td>Architecture Analysis</td>
<td>Atos Origin (IT service company for Olympics)</td>
<td>Beijing Olympics “real” case study for course project</td>
</tr>
<tr>
<td>Requirements Modelling and Solution Blueprinting</td>
<td>Infosys</td>
<td>Use of INFLUX tool for requirements modelling</td>
</tr>
<tr>
<td></td>
<td>NTUC Income</td>
<td>Insurance process improvement “real” case study</td>
</tr>
</tbody>
</table>

Interesting interaction

- "Interesting interaction Industry partner"
Industry collaboration in the undergraduate curriculum, elective courses

<table>
<thead>
<tr>
<th>Course</th>
<th>Industry partner</th>
<th>Interesting interaction</th>
</tr>
</thead>
<tbody>
<tr>
<td>Enterprise Information Systems</td>
<td>SAP</td>
<td>Joint delivery of a course for 2 years</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Examples from SAP product specialists and consultants</td>
</tr>
<tr>
<td>Financial Services Business IT</td>
<td>OCBC</td>
<td>Project on using IT for multi-channel retail banking</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Experts to critique projects</td>
</tr>
<tr>
<td></td>
<td>Bloomberg</td>
<td>Financial information systems for trading and foreign exchange</td>
</tr>
<tr>
<td>Advanced Data Management</td>
<td>Oracle</td>
<td>Co-design of joint certification course for professionals</td>
</tr>
<tr>
<td>Grid Architecture &amp; Applications</td>
<td>Oracle</td>
<td>Create version for undergrads</td>
</tr>
</tbody>
</table>

SCB iLab@SMU Creation

- May 2005 - SIS briefing to SMU Board of Trustees on school design and activities
- July 2005 – SCB Business Unit Head (on SMU BoT) follows up with SIS
- Aug 2005 – Feb 2006: Drafting of collaboration agreement and negotiation on terms and agreement wording
- March ’06 – Legal agreement with SMU is signed
- May 29, ’06 – iLab opens doors
- SCB dedicated staff
- SMU focused staff (admin, instructor, Dean, project coordinator)
- Budget for projects (ex-people)
- Processes, including IP Management, are in place

Examples of Current Projects:

IT projects with SIS
- Instant Messenger Call Centre
- Voice Biometric Authentication for Priority Customers
- Digital Signing System for Bank Documents
- Automated Paper Forms Checking using OCR
- MySpace for the Bank – Corporate Collaboration
- Customer Driven Product Configuration System
- eKiosk – Self Service Virtual Teller

Economics projects with SESS

Marketing projects with LKCSB

What the iLAB Looks Like:

iLab@SMU is located @ Level 3, School of Info. Systems

iLAB Partnership between SCB and SMU

- While Lab is in SIS, agreement is university-wide:
  1. School of IS
  2. LKC School of Business
  3. School of Economics & Social Sciences
  4. School of Accountancy
  5. School of LAW (as of 2007)
- Projects
  - ~20 Projects initiated in 2006 (both business and IT)
    - 5 projects completed
    - ~15 projects in progress (~10 completed by Nov ’06)
      - multiple undergrad, 1 PhD and 3 faculty projects in progress
    - ~15+ projects in queue (SIS and SESS)
    - ~50+ being assessed from SCB

SCB iLab@SMU Benefits for SMU Students and Faculty

- Real exposure to corporate banking environment and challenges
- In-depth interactions with SCB experts in business & technology
- Projects are ambitious in complexity, scope, innovative content
- Access to real data
- Encourages opportunities and provides resources to explore and build innovation ➔ target to do more in the “RADICAL SQUARE”!
- Complimentary project streams from faculty
- Learn about using, creating and managing Intellectual Property
How the Standard Chartered iLAB@SMU impacts the spectrum of SMU efforts

Standard Chartered Bank

<table>
<thead>
<tr>
<th>iLAB@SMU</th>
</tr>
</thead>
<tbody>
<tr>
<td>School of Business</td>
</tr>
<tr>
<td>School of Social Sci</td>
</tr>
<tr>
<td>School of Accountancy</td>
</tr>
<tr>
<td>School of Law</td>
</tr>
</tbody>
</table>

- Each unit of SMU is learning how to work with the iLAB
- The bank is learning how to work with the iLAB
- Learning = trial, error, and adjustment...

SCB’s Operational Requirements & Challenges for iLAB

- Strong and visible sr. team leadership
  - Focus on Innovation strategy & innovation portfolio mix
- Embed Innovation into “business as usual”
  - Drive and support cultural change
    - Calculated risk-taking
    - Encourage experimentation and acceptance of “good” failures
    - Obtain / provide air-cover against “organizational antibodies”
    - Design appropriate Innovation metrics
    - Design Innovation-friendly rewards system
- Manage the “Creativity vs. Value-capture” balance
  - Ideas-to-Income (I2I) value stream
- Adopt the Network as the basic unit of Innovation
  - Innovation networks span people and knowledge outside SCB
    - Open Innovation model
    - Innovation platforms
    - Leverage Innovation Marketplace(s) whenever possible

Definition of Innovation

- In the SCB context, Innovation is:
  - △ in Business Model
  - and/or Technology
  - that is expected to have, directly or indirectly, material financial benefits for SCB

- High-impact Innovation is expected to occur at the intersection of Business Models and Technology change

Example of learning: early operating experience with student projects led to amendments to the legal agreement

- Agreement was crafted on basis of funded projects, endowments and research grants, internships
- Relevant changes to agreement made to cater for advisors to undergraduate course projects like IS480 in SIS and Senior Thesis in SESS
  - Removal of IP assignment T&Cs in Confidentiality and IP Assignment document;
  - Exception of non-compete clause in Main agreement;
  - Retention of project media and materials
- SMU - select media and materials
- SCB on site server for 4 years – all media and materials

Innovation Model

Open (versus Closed) Innovation Principles

- Open Innovation Principles
  1. Not all smart people work for us.
  2. To profit from R&D we must discover, develop and ship it ourselves.
  3. If we discover it ourselves, we will win.
  4. Building a better business model is better than getting to market first.
  5. We should control our IP, so that others don’t profit from it.

Closed Innovation Principles

1. The smart people in our field work for us.
2. To profit from R&D we must discover, develop, and ship it ourselves.
3. If we discover it ourselves, we will get to market first.
4. Building a better business model is better than getting to market first.
5. If we make the best use of internal and external ideas, we will win.
6. We should control our IP, so that others’ IP will not profit from our ideas.

From Chesbrough, “Open Innovation”, 2003
Vision for iLab as the center of an Innovation Network

- SCB can grow an Innovation Network centered around the iLab
  - iLab’s connections can span SCB, government institutions, private sector companies, universities and venture capital

Case studies of SIS industry collaboration: Already going

1. The SIS Board of Advisors
2. The undergraduate programme
3. The Standard Chartered Bank [iLAB@SMU](#)
4. The former IBM Business Consulting Services Solution Center at SMU
5. The Singapore National Grid Effort, and the related Adaptive Enterprise @ Singapore programme (a collaboration across the Singapore government, universities and HP labs)
6. Joint efforts with SAP to increase tertiary student exposure to current and future generations of SAP’s enterprise solutions
7. Joint efforts with Oracle to mount a certification programme for the Architecture of Business Grids
8. The SIS PhD programme

Other SIS industry collaborations

<table>
<thead>
<tr>
<th>Industry Partner</th>
<th>Joint Initiative</th>
<th>Status</th>
</tr>
</thead>
<tbody>
<tr>
<td>Adaptive Enterprise @ SG (Singapore IDA – HP Labs, related to National Grid)</td>
<td>Digital Media Portal project</td>
<td>- Phase 1 completing</td>
</tr>
<tr>
<td></td>
<td>SMU: business models</td>
<td>- Phase 2 discussions</td>
</tr>
<tr>
<td>SAP</td>
<td>Joint delivery of Enterprise Systems course</td>
<td>Working out details on 2nd, 3rd items.</td>
</tr>
<tr>
<td></td>
<td>SAP – SMU tertiary student certification</td>
<td></td>
</tr>
<tr>
<td></td>
<td>SAP/HP Enterprise Discovery Services Server</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Joint competency center focusing on end-user view of business process management</td>
<td></td>
</tr>
</tbody>
</table>

Case studies of SIS industry collaboration: Working out

- Details on 2nd, 3rd items.
- 4th item: under discussion

- Sun-setted
- Folding into new Enterprise Solution Innovation Lab

The SIS Ph.D. in Information Systems

**Career Prospects**

- R&D units
  - Research institutes
  - Corporate R&D
  - Government agencies
- Academic institutions
- Industry
  - Consulting
  - Industry analysts

**SMU Scholarships**

- Monthly stipend
- Tuition fee waiver

**SIS Focus Areas**

- Data Mgt & Business Intelligence
- Information Security
- Intelligent Decision Support Systems
- IS management (niche)
- Software systems, architecture

**Characteristics**

- Inter-disciplinary
- Applied research
- Industry relevance
Case studies of SIS industry collaboration: New initiatives
1. Collaboration with the Financial Services Sector to establish a professor masters for technology and operations professionals in the sector
2. New Labs & Centers

The new SIS Professional Masters Programme as of August 2007
Applicant Pool Sources: Working Professionals from

- Banking T&O
- Insurance T&O
- Securities T&O
- Supply Chain T&O
- Retail T&O
- Healthcare T&O
- Manufacturing T&O
- Military T&O

Financial Services T&O (focus of first and early batches)

Sector Targets for Job Placements or Career Advancement:
1. Expand banking & FSI specific courses
2. Add Supply Chain sector specific courses
3. Add courses for additional sectors

Proposed curriculum: Year 1 Launch

<table>
<thead>
<tr>
<th>Course areas</th>
<th>Types of Courses</th>
<th>Number of courses</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. General Management</td>
<td>1.1 Accounting for managers 1.2 Corporate Finance 1.3 Business management</td>
<td>3</td>
</tr>
<tr>
<td>2. IT &amp; Process Management</td>
<td>2.1 Decision Models for IT Management 2.2 IT Governance &amp; Innovation Management 2.3 IT Project &amp; Vendor Management 2.4 Global Sourcing Management</td>
<td>4</td>
</tr>
<tr>
<td>3. Sector Processes &amp; Solutions</td>
<td>3.1 Banking and financial sector content (concentrated in chosen sector)</td>
<td>4</td>
</tr>
<tr>
<td>4. Project (integrating across areas 1, 2, and 3)</td>
<td>4.1 Integrative capstone project running over 1 year + 4.2 Student must demonstrate deep competency in areas 2 and 3. 4.3 Done in conjunction with employer or sponsoring company</td>
<td>2</td>
</tr>
</tbody>
</table>

13 courses total

IT & Process Management Courses (offered by SIS)

<table>
<thead>
<tr>
<th>Course Name</th>
<th>Key topics</th>
</tr>
</thead>
<tbody>
<tr>
<td>2.1 Decision Models for IT Management</td>
<td>Decision model building &amp; analysis with spreadsheets  Analyzing the impacts of uncertainty and risk on decisions  Decision models for managing IT &amp; process resources</td>
</tr>
<tr>
<td>2.2 IT Governance &amp; Innovation Management</td>
<td>Governance including risk management  IT portfolio &amp; capability management  Innovation methodologies  Intellectual Property vs innovation and governance</td>
</tr>
<tr>
<td>2.3 Project &amp; Vendor Management</td>
<td>Project management fundamentals  Managing contracts, service levels and IP ownership  Managing risks of development &amp; delivery  Managing acceptance of project &amp; vendor deliverables</td>
</tr>
<tr>
<td>2.4 Global Sourcing Management</td>
<td>Evaluation of sourcing alternatives  Managing distributed development projects  Managing distributed delivery processes  Special managerial issues arising from global sourcing</td>
</tr>
</tbody>
</table>

All of these courses are designed in the context of developing and delivering IT & Process capabilities and services

Process & Solution Courses (offered by SIS)

<table>
<thead>
<tr>
<th>Sector: Banking and Financial Services</th>
<th>Key Contents</th>
</tr>
</thead>
<tbody>
<tr>
<td>3.1 FSI Products and Processes</td>
<td>Products from an operations &amp; process perspective  Workflows, transactions and approval process  Relationships and linkages across products and processes</td>
</tr>
<tr>
<td>3.2 FSI Architecture</td>
<td>Business &amp; Process Architecture  Applications Architecture  Information &amp; Data Architecture  Technology Architecture and Infrastructure (including special real-time infrastructure)</td>
</tr>
<tr>
<td>3.3 FSI Software &amp; Technology Solutions</td>
<td>Front office &amp; customer facing solutions  Middle &amp; Back office solutions  Data management, business intelligence &amp; analytics focus  Security, privacy &amp; trust focus  Information integration focus (both internal, external)</td>
</tr>
<tr>
<td>3.4 FSI Trends and Drivers</td>
<td>Impact of emerging technologies and standards (e.g. SOX, Basel 2) on Products &amp; processes, enterprise architecture &amp; enterprise solutions</td>
</tr>
</tbody>
</table>

Industry People We Consulted With on Programme Concept & Design
- Angie Monkfield, Vice President Application Projects, IT Services, SIA Computer Centre, Singapore Airlines – 14th Sep 2006
- Sunil Chandra, ex-CIO, Asia Pacific, Barclays Capital – 20th Sep 2006
- Susan Wee, Executive VP, IT, United Overseas Bank – 22nd Sep 2006
- Pooja Saxena, AVP and Manuel Lopez, Credit Suisse – 18th Oct 2006
- Mark Shearer, General Manager, IBM Systems & Technology Group (iSeries) – 29th Oct 2006
- Venky Krishnakumar, Former Citibank head of T&O, currently with Citibank’s Global Retail & Commercial Banking – 5th Oct 2006
- Ting Soon Lang, Executive Vice President, OCBC Bank Group – 2nd Oct 2006
- Steve Ingram, Former Head of TO & CIO and Head of DBS, now EDS – 1st Oct 2006
- Angeline Monksfield, Vice President Application Projects, IT Services, SIA Computer Centre, Singapore Airlines – 14th Sep 2006
- Nadathur Raghavan, Co-founder of Infosys and a member of SIS Advisory Series – 27th Oct 2006

Note: All of these courses are situated in the context of the banking industry, with selected contents of other parts of FSI Industries as required.
Singapore Government People We Consulted With on Programme Concept & Design

- Tan Hui Khim, Head, IT, Computing & E-Business, EDB – 18th Sep 2006
- Kenneth Kaw, Monetary Authority of Singapore, Manpower Division, 15 Nov 2006

SIS Research Labs & Centres: Existing, Underway, Desired

<table>
<thead>
<tr>
<th>A Lab Associated with Each Faculty Cluster</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Data Management &amp; Business Intelligence Lab</td>
</tr>
<tr>
<td>• Security &amp; Trust Lab</td>
</tr>
<tr>
<td>• Software Systems, Architecture &amp; Integration Lab</td>
</tr>
<tr>
<td>• Intelligent Decision Support Lab</td>
</tr>
<tr>
<td>• IS Management Lab</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Related labs or centres organized around integrative themes</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Standard Chartered iLAB@SMU (existing)</td>
</tr>
<tr>
<td>• Undergraduate Student Lab (existing)</td>
</tr>
<tr>
<td>• Enterprise Solution Innovation Lab (underway)</td>
</tr>
<tr>
<td>• Financial Services Solutions Lab (desired, for new professional masters programme)</td>
</tr>
<tr>
<td>• Centre for Advanced Business Intelligence (desired)</td>
</tr>
<tr>
<td>• Centre for Business Games &amp; Participatory Media (desired, sort of underway)</td>
</tr>
</tbody>
</table>

Interactive & Digital Media Research at SIS

- SMU Centre for Business Games and Participatory Media

<table>
<thead>
<tr>
<th>Business Games Lab</th>
<th>Participatory Media Lab</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Infrastructure development</td>
<td></td>
</tr>
<tr>
<td>• Research and teaching tools</td>
<td></td>
</tr>
<tr>
<td>• Peer production methods</td>
<td></td>
</tr>
<tr>
<td>• User studies and experiments</td>
<td></td>
</tr>
</tbody>
</table>

- SIS IDM

- IDM exploratory workshop