Taking the Next Step Forward for the Telecom Sector and Academia

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Current collaboration model between Telecom Industry and Academia

NUST-SEECS Students’ Market Placement

- Higher Education & Research: 34%
- Telecommunication: 27%
- Software Companies: 22%
- Banks & Govt Institutes: 11%
- Misc: 6%

Higher Education & Research

Software Companies

Banks & Govt Institutes

Misc
Current collaboration model between Telecom Industry and Academia

Telecom Industry Lifecycle

University

University Student Lifecycle
Current collaboration model between Telecom Industry and Academia

Telecom Industry Lifecycle

Planning ➔ Rollout ➔ Expansion ➔ Maintenance

University Student Lifecycle

- Planning: University student
- Rollout: Graduation
- Expansion: Deployment of technology
- Maintenance: I work for food!
The 21st Century

- Cost cutting and Process Re-engineering are not sufficient to provide competitive advantage
- Today’s society requires dynamic thinkers able to solve complex, real world problems
- Creativity, Energy and Innovation are powerful drivers of building and managing growth
Knowledge and Economic Growth

- For all the human history, the source of success has been the control of natural resources—land, gold, oil etc. Suddenly the answer is

  “KNOWLEDGE”

- The world’s wealthiest man owns nothing tangible—no gold or oil, no factories, no industrial processes, no armies. For the first time in human history the world’s wealthiest man owns

  “KNOWLEDGE”
IPR and Job Creation

- During the last two decades of last century, US economy created over 21 million NEW JOBS

- Almost 95% of these jobs were created by 15% of small Technology firms

- At the same time, the Fortune 500 companies eliminated 3.5 million jobs
Japanese IP Typhoon Still Not Even a Tropical Storm! (II), Terry Ludlow, IP frontline.com, Feb 2008
IBM increased patent revenue an amazing 5,000%  

– $30 million in 1990  
– $1.5 billion in 1999  

• Source: IBM Annual Report 1990 – 2000
Ford increased its patent revenue 2,000% in only two years after creating its patent management program.

• Source: "Rediscovering Corporate Treasure", Knowledge Management, May, 2001
Patent Licensing @ TI

♦ Texas Instruments
– First of the semi-conductor manufacturers to adopt active patent management
– Receives over $500 million of patent revenue annually
– More net income than it earns from manufacturing.

• Source – 2001 "Markets in Intangibles: Patent Licensing", Gu and Lev, ibid; and "Corporate Officers and Directors Can Be Liable for Mismanaging Intellectual Property"
Telecom Industry is not exploiting the true potential of Academia

- Hiring graduates is **only one aspect** of a mutually-beneficial collaboration between the telecom industry and academia.

- **Academia has lots more to offer** in terms of:
  - A large, concentrated pool of highly-qualified faculty members that can solve significant R&D problems for the Telco industry.
  - A large user base of students, staff and faculty that can test new products and services being rolled by the Telcos.
  - Computing infrastructures that can be used for high-end experimentation.
  - Hi-tech telecom Laboratory infrastructure.

- A sustainable collaboration model is to develop indigenous products by involving academia in R&D activities.
R&D Activities at NUST
School of
Electrical Engineering and
Computer Sciences
NUST is offering cutting-edge services and products to the industry

- High-tech startup companies incubated at NUST are now offering cutting-edge products to the international market

- Four companies are located just within the NUST-SEECS building

Baltoros
www.baltoros.com

Swam Technologies

Crafty Pixels design studio
Product Description:
We designed real-time deployable DPI algorithms that can detect encrypted p2p traffic of BitTorrent, EMule, Skype, Winny and Share.
The algorithms worked before and after NAT with accuracies of 85-100%.
These algorithms are in production now.
Product Description:
Designed and developed an OS virtualization and cleanup environment
A Linux based hypervisor was developed to manage a hardware/BIOS-independent Windows 7 based vertical system
This system is now in production
1.3 Billion USD Company

Product Description:
We are developing dynamic emulation environments for Cavium’s chips.
Our current Pakistani Telecom clients

Innovation Center

Vision

- R&D in Wimax Applications
- Testbed for CPE testing and design solutions
- Provide expert advice on complex issues involving technological challenges
In the Quest of New Horizons

Research groups @ SEECS

“...a dynamic world-class research culture is vital for the acquisition of new knowledge and health of universities. It is also crucial to the economic growth and social cohesion.”

[Source: HEC Website.]
Department of Computing

• **DELSA** - Data Engineering for Large Scale Applications
• **SSRG** - Semantic Systems Research Group
• **HLH** - Health Life Horizon
• SEECS Distributed & Grid Computing
• High Performance Computing
• **SMART** - Smart Machines And Robotics Technology
• **OPTRA** - Open Source Performance Testing Research and Analysis Group
Department of Communication Systems Engineering

- Center for Applied Networks Research
- **GRAF** - Group for Research in ASIC and FPGA
- NUST-SEECS Networks Research Group
- **WISNET** - Wireless and Secure Networks
Department of Electrical Engineering

- **AMSG** - Analog Mixed Signal Group
- **CoNNekT** - Core Communications and Networks Research Lab
- **CEIA** - Center of Excellence for Industrial Automation
- **Cognet** - Cognitive Network Research Lab
- **SRG** - Systems Research Group
- **SAVE** - System Analysis and Verification
- **VISPro** - Vision Imaging & Signal Processing
International Research Collaborations

SEECS enjoys extensively woven joint research and collaboration with some of the elite centers of excellence all over the globe including high profile universities and research nodes in USA, UK, France, Japan, Sweden, Switzerland, Korea, and China.

International Collaborations expose numerous opportunities which include:

- SEECS’ students get a unique exposure by visiting these world-class research labs, both for short and long-term projects.
- Exchange visits of faculty and students
- Funded Research projects
Patents Filed

- Syed Ali Khayam, Shirish Karande, and Hayder Radha, "Header Estimation to Improve Multimedia Quality over Wireless Networks," USPTO


status : {patent pending}
Startups

• SWAM
• Crafty Pixels
• Baltoros
The next step forward....

- The Telecom industry is still not exploiting the full potential of the skills and resources available in Pakistani universities.

- The next step is to develop a fruitful and sustainable collaboration between the academia and telecom industry for real-life product development that is commissioned by the Telcos and research carried out at the universities.
Thank You
Questions and Comments