ENGINEERING GLOBALIZATION IN SINGAPORE
THE IMPACT AND THE WAY FORWARD

e³ Seminar on Coping with Globalization

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SELF INTRODUCTION

Educational Background

- **Undergraduate Study**
  Trisakti University ; Jakarta, Indonesia 1996-2000 (BEng.)

- **Postgraduate Study**
  National University of Singapore (NUS) ; Singapore 2001-2002 (MSc.)
  Hokkaido University ; Japan 2002-2007 (MEng; PhD)

Working Experience

- **GistaIntiSemesta**
  Civil and Structural Consulting Firm ; Jakarta, Indonesia 1999-2000

- **Fermold Pte. Ltd**
  Precasting Company ; Singapore 2002

- **Land Transport Authority** ; Singapore (www.lta.gov.sg) 2008-2009

- **WorleyParsons Pte. Ltd.** ; Singapore (www.worleyparsons.com) 2009-now
• The Legend
  ~ The name of Singapore came from Sanskrit. Singa means Lion and Pura means City (Singapore= Lion City). Symbol of the city is Merlion (a mythical creature with the head of a lion and the body of fish)

• March of Empires
  ~ Till 5 AD, Singapore had been a regular route for traders traveling between China and India
  ~ In 7th -10th centuries, Singapore became the trading outpost of ancient Buddhist kingdom, Srivijaya
  ~ 13th century: Singapore came under the influence of Muslim empire of Malacca
  ~ In 1511, Malacca fell to Portuguese and the Dutch wrested Malacca from Portuguese in 1641

• Founding of Modern Singapore
  ~ Sir Thomas Stamford Raffles established a British trading post on the island of Singapore in 1819
● Development of Modern Singapore
  ~ Merge of Malaya, Singapore, Sabah and Sarawak forming Malaysia on 16 September 1963
  ~ Singapore became an Independent nation on 9 August 1965
  ~ From 1959 to 1990, Singapore was administered by Prime Minister Lee Kuan Yew
SINGAPORE in CHRONOLOGY

● **1965 – 1979**
  - Setting up industrial estate to promote manufacturing’s sector
  - Growing service industry for port and commerce
  - In mid 1970s, Singapore had become the 3rd largest oil-refining centre in the world
  - Investing heavily in education system that adopted English as language of instruction

● **1980s and 1990s**
  - Unemployment rate falling to 3% and average GDP growth of 8%
  - Upgrading to higher-technology industry such as wafer fabrication sector
  - Singapore Changi Airport was opened in 1981 making facilitating Singapore to be an important transportation hub and major tourist destination
  - In 1987, 1st Mass Rapid Transit (MRT) line was in operation

● **TODAY**
  - Total population of 5.08 million (as end June 2010) with 3.23 million are Singapore Citizens and 0.54 million are permanent residents
  - Unemployment rate of 2.3% (as in June 2010)
  - GDP growth of 18.8% in 2Q2010

Source: [www.singstat.gov.sg](http://www.singstat.gov.sg)
HIGHLIGHTS OF EVENTS

- **F1 Night Race**

- **Integrated Resorts**
  ~ Casino-based vacation resort
  ~ Licensed to Marina Bay Sands and Resorts World Sentosa

- **1st Youth Olympic Game (14 – 26 August 2010)**
Youth Olympic Games 2010
● About LTA
  ~ A statutory board under the Ministry of Transport, that spearheads land transport developments in Singapore
  ~ Mission: To provide an efficient, cost-effective and people-centred land transport system for different needs
  ~ There are 10 Groups in LTA: Corporate Communications, Corporate Services, Engineering, Innovation & InfoComm Technology, Policy & Planning, Rail, Road Projects, Road Operations & Community Partnership, Safety & Contracts and Vehicle & Transit Licensing

● Future MRT Project
  ~ Government will set aside S$60 billion to fund improvement initiatives of the rail network over the next decade (as announced by Prime Minister Lee Hsien Loong in his National Day Rally speech on 29 Aug 10)
● **About WP**
  - Providing Engineering, Procurement and Construction Management services
  - Providing services that covers the entire asset lifecycle: from identifying the opportunity to the operating phase.
  - Today, WP has 29100 personnel throughout 137 offices in 40 countries

● **Customer Sectors**
  - Hydrocarbons
  - Power
  - Mineral & Metals
  - **Infrastructure and Environment**
CIVIL ENGINEERING PRACTICE

- **Related Parties**
  - Design Engineers
  - QP (D) and AC
  - PE (Geo) and AC (Geo) for geotechnical aspect on underground building works
  - QP (Sup)
  - Professional Engineer Board (PEB)
  - Building and Construction Authority (BCA)

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**note:**

QP(D) = Qualified Person (Design)
AC = Accredited Checker
PE (Geo) = Professional Engineer (Geotechnical)
AC (Geo) = Accredited Checker (Geotechnical)
QP (Sup) = Qualified Person (Supervision)
What is GLOBALIZATION?
- A process of interaction and integration among the people, companies, and governments of different nations, a process driven by international trade and investment and aided by information technology
- Current wave of globalization has been triggered by policies that have opened economies domestically and internationally

Key factors
- Labor cost
- Availability of IT and/or Internet to allow global workforce
- Trend of people/corporations to become global

Some debates on GLOBALIZATION among Scholars
- once the first human stepped off the African continent (Pieterse, 2004)
- when global institutions were created in the 1900’s – a 20th century phenomenon (Bull, 2000)
- Localization vs Globalization – Borderless World (two cents worth)
- **Globalization Index**
  ~ a list of countries of the world sorted by their globalization, the global connectivity, integration and interdependence in the economic, social, technological, cultural, political, and ecological spheres

- **Singapore Globalization Index**
  ~ Economic Globalization No. 1 (Japan – No. 102)
  ~ Social Globalization No. 21 (Japan – No. 46)
  ~ Political Globalization No. 77 (Japan – No. 29)
  ~ Globalization Index No. 17 (Japan – No. 45)

Source: KOF Index of Globalization
KOF Swiss Economic Institute, ETH Zurich
The IMPACT

- In general, globalization has impacts on the environment, on culture, on political systems, on economic development and on human physical well-being in the societies around the world.
- In terms of engineering, engineers should not only solve direct problems but rather understand the context and carry the social responsibility.

Singapore Case

- The mobility of foreign talent coming into Singapore results in positive and negative impact.
- Positively, there will be a transfer of know-how, techniques and knowledge to the local people.
- On the downside, the local people will have to compete with these pools of foreign talent in the job market.
- On the cultural side, the new cultures brought by the foreign talent will merge into society making Singapore a global city where people from all around the world can live side by side with each other.
ENGINEERING GLOBALIZATION

- **UNIVERSITY Role**
  - In common, the impact of globalization will be channeled back to the academic world and prominently felt at the level of higher learning in view of its constant contact with the industries.
  - Therefore, universities need to reassess the adequacy of the existing curriculum in catering to the needs from globalization.
  - A general engineering education at the undergraduate level; a professional degree is emphasized only at the master's level.
  - More management-related subjects may be included in the undergraduate curriculum to equip engineers with skills to cope with globalization challenges.
  - Three important skills to prepare students in this globalization era: critical thinking, creativity and courage (Milliron, 2007).
  - One more additional skills will include ethics to make the student a successful global citizen, rather than only to become a successful global workforce (Rotermund, 2009).
• The WAY FORWARD
  ~ Globalization is an inevitable process. It had been there since ancient time (i.e. trading through silk road) and it is here to stay
  ~ Focus on the niche market. Understanding of local practice and know-how
  ~ Stimulate innovative thinking and entrepreneurial spirit
  ~ Continuing education, upgrading skills
  ~ Accreditation through Mutual Recognition Act (MRA)
REFERENCES

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   Available from: http://findarticles.com/p/articles/mi_qa3797/is_200507/ai_n14684575/
   [5 Sep 2010]
~ ASCE, 2006. The Vision for Civil Engineering in 2025
~ Rotermund, C., 2009. Meeting the Challenges of Globalization with Curriculum Change

Live as if you were to die tomorrow and learn as if you were to live forever
Mahatma Gandhi