

Professional Deontology, Self-regulation, Globalization, Ethics and Immigrant Engineers

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Globalization

- Traditional Paradigm
- Always EXPORTED elements of:
 - Production
 - Education
 - Region specific
- Modern globalization
 - Unprecedented
 - Transforming location of technology, production, services
 - But also social and economic patterns
 - General and applicable to broader regions

Global Impacts and Our Preparations

Engineering Graduate produced per year

Country	Engineers
Canada	15,000
UK	34,000
USA	70,000
India	350,000
China	600,000

Country	Engineers
UK	34,000
USA	70,000
China	300,000
India	450,000

http://news.thomasnet.com/IMT/archives/2006/05/drowning_numbers_engineering_statistics_united_states_china_india.html

-Li, Peter S., the market worth of immigrant s educational credentials, Canadian public Policy, Vol. 27, issue 1, p-23-38, 2001.

-Bauder, H., Brain abuse or devaluation of immigrant labor in Canada, Antipode, Vol. 35, Issue 4, p-699-717, 2003a.

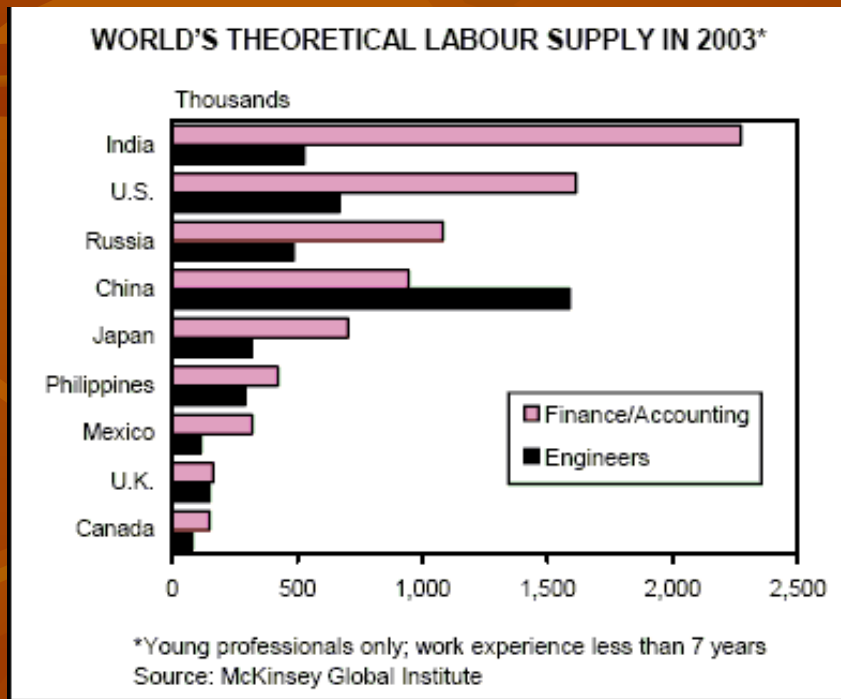
Engineering Graduates

Engineers in India 5 X Canada

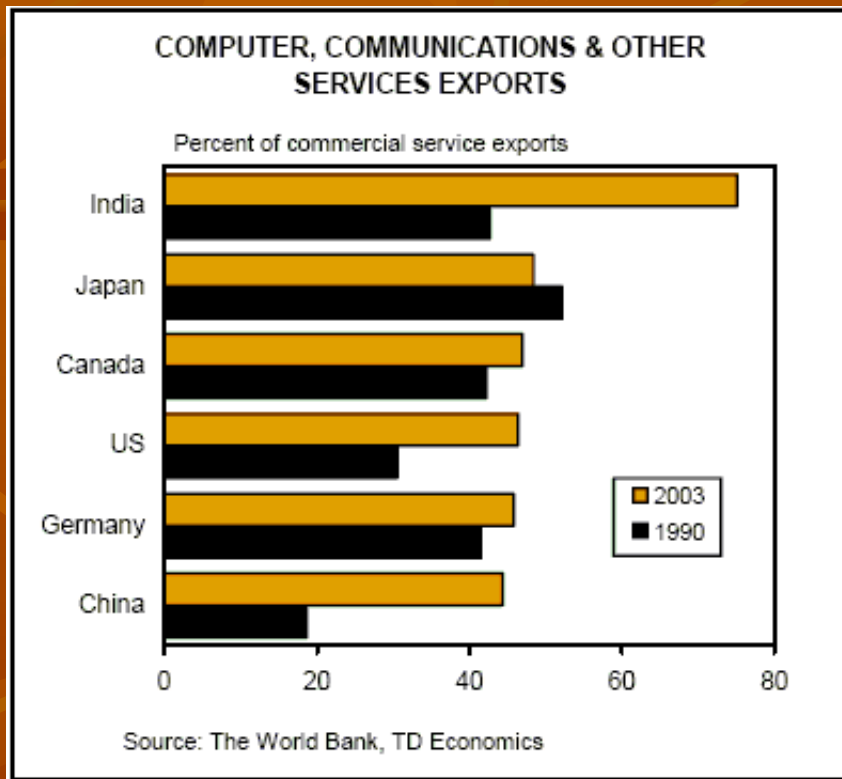
China 15 X Canada

To compete with these countries it is important for Canada to recognize the work experience of IEBs and put them to good use.

ELSE.... Next slide shows where we have ended



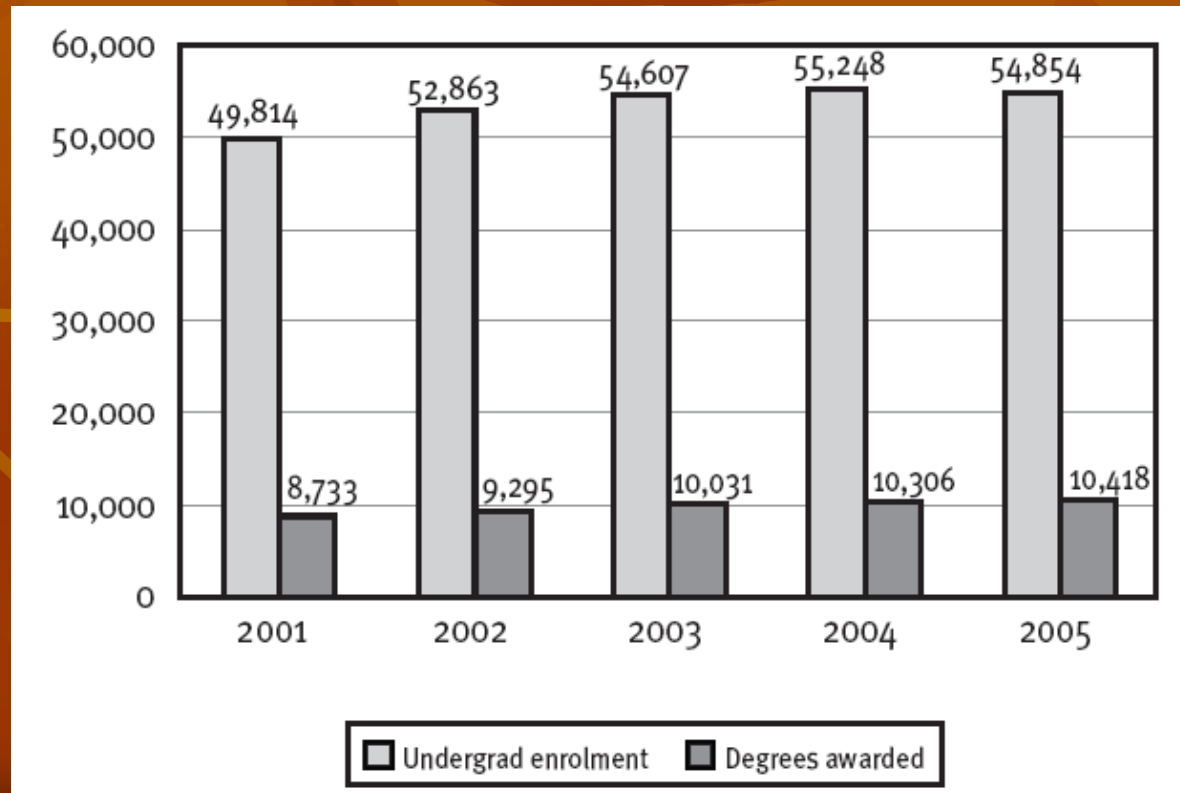
Engineering Export-Global Players



- Engineering export from India doubled
- Whereas export from Canada is stagnant
- Please ponder – is it because of IEBs driving cab ? or
- Are those engineers graduating from Canadian Universities disenchanted?

FULL-TIME UNDERGRADUATE ENROLMENT AND DEGREES AWARDED

- ❑ According to immigration Canada 15,000 engineers were admitted in 2000
- ❑ Student enrolment in undergraduate engineering programs in Canada over the five- year period from 2001 to 2005 was up 10.1%
- ❑ With a total enrolment of just under 55,000 full-time students



Immigrant engineer

- ❑ The number of immigrants arriving in Canada expressing a desire to work as engineers increased by 12-fold over that period
- ❑ From 1,300 in 1991 to 15,800 in 2001
- ❑ Once immigrant engineer arrived in Canada its foreign credentials and work experience are often devalued
- ❑ Approximately 25,000 internationally educated engineers settled in Toronto in 2000, 2001 and 2002 alone
- ❑ Assuming an average of approximately 20,000 engineers arriving as immigrants, per year
- ❑ For example, Immigration Canada reports 262,000 immigrants arriving in 2005
- ❑ There were approximately 80,000 men and 80,000 women of working age
- ❑ Of these, 18.8 percent of the men and 5.3 percent of the women self-declared as engineers, for a total of about 20,000 IEGs.

STANDARDIZATION VERSES INDIVIDUAL ASSESSMENTS

- Exporting production and education requires control and enforcement of standards
 - Transformation location, technology, production and services
 - But also social and economic patterns
 - Requires standardization

REGULATION VERSES INDUSTRIAL EXEMPTION

- Self or state regulation to maintain standards pertaining to a particular locality
 - Regulation to standardize for Broader regions
 - Greater role from NGO – FIDIC, CCPE, ICE, ABET, IEEE, AIEE etc.
 - Washington Accord, FEANI, Engineering Council

Defending self regulation vs. Standardization

- Canadian experience –what is the rationale?
- Reserved title – is this necessary?
- Reference checks – can these be instituted into a global process e.g. register of engineers
- Asian and African registered engineers
- What is the role of International Federation of Consulting Engineers (FIDIC)?

International Federation of Consulting Engineers (FIDIC)

- ❑ In the past several years, there has existed the dispute about the role of the engineer under International Federation of Consulting Engineers (FIDIC) standard conditions of contract
- ❑ FIDIC is conducting an in-depth inquiry into this issue as it prepares the FIDIC fifth edition
- ❑ The thesis begins with a history of the debate surrounding the pro-engineer provisions in the FIDIC fourth edition.
- ❑ Then it introduces the proposed alternatives to the engineer adjudicator model, some of which have already been adopted by other organizations that publish form construction contracts
- ❑ Through analyzing these alternatives, the thesis will put forward the writer's new conception of the reform of model so as to cast a brick to attract jade.

CASE FOR INDUSTRIAL EXEMPTION

- MAJOR BARRIER – 12 MONTHS IN CANADA EXPERIENCE
- RECOGNITION OF PRIOR EXPERIENCE
- LAW AND ETHIC EXAMINATION
- REFERENCE CHECKS

CASE FOR INDUSTRIAL EXEMPTION

- To present a comparison of professional engineering education all over the world
- To examine the current admission criteria employed by engineering regulatory bodies to make licensure decisions
- To understand how these criteria are applied to foreign trained applicants
- To accelerate the integration of immigrant professionals into the national economy

RATIONALE

WHY DOES LICENSING REQUIRE 12 MONTH IN-CANADA EXPERIENCE ?

- ☐ Be a Canadian citizen or permanent resident
- ☐ Possess an undergraduate (Bachelor's level) degree in engineering from a recognized Canadian university program
- ☐ Recognition of degree equivalency by the Engineers Canada
- ☐ Complete three or four years of engineering work
- ☐ A minimum of 12 months experience must be in a Canadian environment to ensure that you are familiar with Canadian codes and standards
- ☐ Write and pass a professional practice examination on professional practice, ethics, engineering law and liability

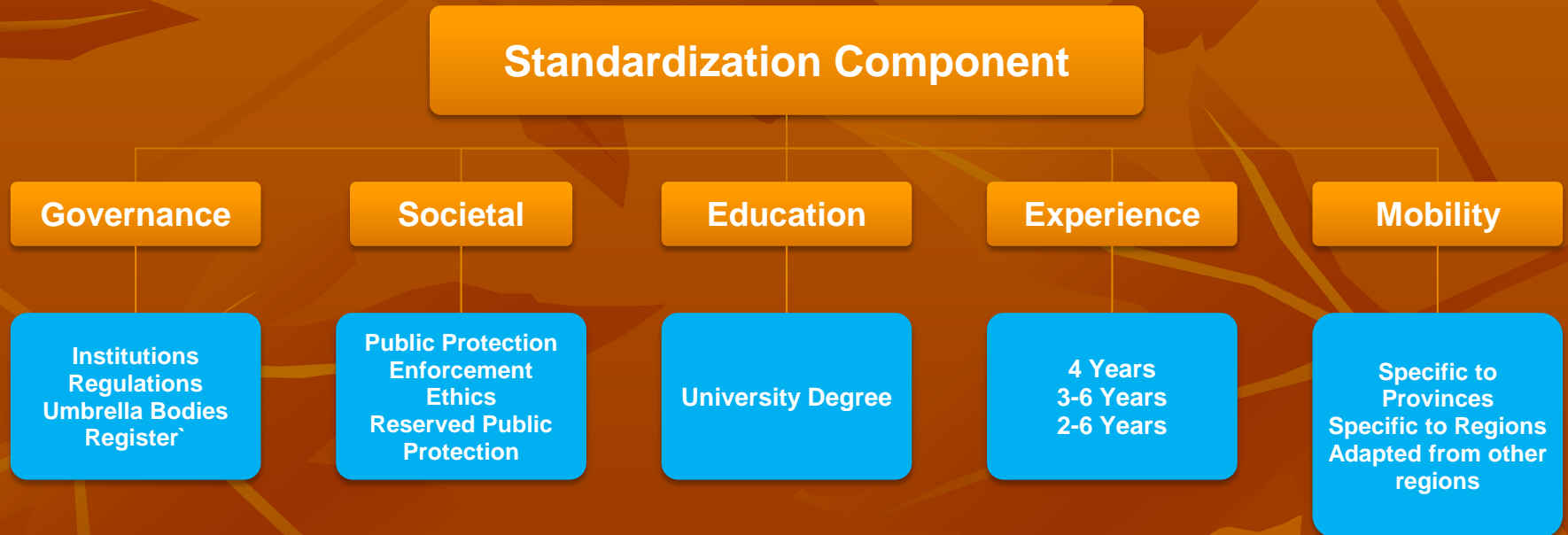
Regulatory constraints

- ❑ The professional rules of competence and good behaviour, engineers are bound by civil liabilities under the common law of contracts and torts and a host of regulations under statute and administrative law.
- ❑ They must not only abide by various safety and environment laws, but also product standards lay down legally or by industry standards associations.
- ❑ However, the membership under the following Organization :
 - (i) Engineers Australia
 - (ii) Member of the Society of Tribologist and Lubrication Engineers (STLE) USA.
 - (iii) American Society of Mechanical Engineers (ASME)
- ❑ Do not have as such constrained to appear for PPE and 1 (one) year experience inside Canada in their act and regulation .
- ❑ If somebody applied for membership and meet all criteria then automatically receive the 'Membership Certificate' from them.
- ❑ They are so open minded and accepted global and internationally recognized education and experiences.

Background Research

North America	South America	Europe (Western)	Europe (Eastern)	Africa	Asia	Australia Oceania
Canada USA Mexico	Argentina Bolivia Chile Columbia Mexico Peru	UK, Ireland Germany France Italy Austria Belgium Denmark Finland Greece Portugal Spain Sweden	Hungary Estonia Poland Czech Republic	Kenya South Africa Egypt	Japan Malaysia Singapore China Hong Kong Thailand India	Australia

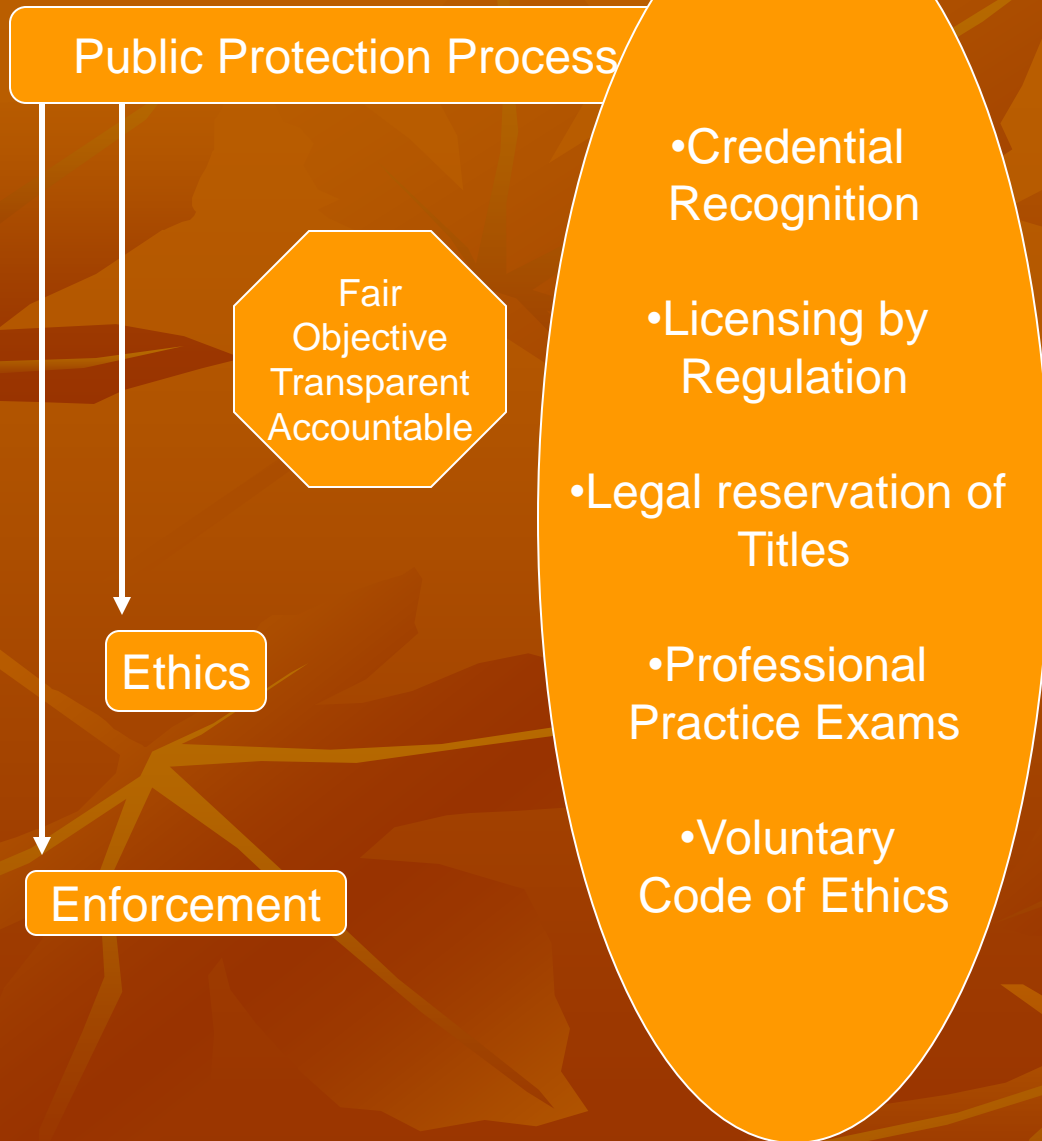
Quality Control of Engineering Practices



Governance-Global Trends

- A significant number of countries have an engineering act
- Most countries favor national or regional registers of engineers and registration Boards
- Most countries favor mutual recognition agreement
- Most countries have signed GATS which calls for liberalization of engineering services

Societal



Canada
Self governing, government
appointed, provincial regulator

USA
Regulation is at state level

Mexico
Regulation yet to introduce

**South America and
Caribbean, Eastern Europe
Regulations are under
consideration**

**Asia, Africa, Australia and
Oceania-not all countries
subscribe to these**

Engineering Education

- **University degree**
- 12 full time schooling year
- 4 years post secondary
- Specialized peer review accreditation, accreditation boards
- In Canada the accreditation is on an individual by individual basis
- In USA, this is on a program basis
- South America, Caribbean, Europe—National education standardization.
- Europe (western), Asia, Africa, Australia and Oceania-standardization and mutual recognition

Experience Requirements-Global Trends

- Length of experience 4 years in most countries
- A significant numbers of countries have no experience requirements
- Experience record is favored- training and supervision
- Experience report is favored-creative ability and technical knowledge
- Specialized peer reviews subject to the knowledge base of peers in Canada
- Professional interview/exam/design
- Mentoring

‘Canadian Immigration policy has been designed to identify and admit , the best and the brightest of highly educated and skilled immigrants’

Hon. Joe Volpe, Federal Minister of Citizenship and Immigration, quoted in laid-law 2005.

What is the basis of the above quotation w.r.t. other developed nations?

Mobility Agreements

Mobility	North America	South America	Europe (western)	Europe (Eastern)	Africa	Asia	Australia Oceania
Global	GATS	GATS	GATS	GATS	GATS	GATS	GATS
Inter-continental	Washington Accord		Washington Dublin Sydney -B.Conv.			Washington Accord APEC Engineer Agreement	Washington Dublin Sydney - Engineer Agreement
Inter-region	NAFTA		FEANI B.Conv.	FEANI B.Conv.			
National	National Bodies	National Bodies	National Bodies	National Bodies	National Bodies	National Bodies	National Bodies
Interstate	Mutual Recognition						
Inter-provincial	Provincial or State Institution						

Mobility Structures

Mobility	North America	South America	Europe (western)	Europe (Eastern)	Africa	Asia	Australia Oceania
Global							
Inter-continental			Specific to More than One region				Specific to More than One region
Inter-region			Specific to One region			Specific to One region	Specific to One region
National	National Bodies	National Bodies	National Bodies	National Bodies	National Bodies	National Bodies	National Bodies
Interstate	Specific to USA	Specific to One country		Specific to One country	Specific to One country		Specific to One country
Inter-provincial	Specific to Province (Canada)						

Comments on Self-Regulation Documents

- *Their legitimacy:*
 - Who is enacting, and how?
 - Who are the authors, and how are the people concerned by the rules consulted?
 - Is it (**there**) during the process any participation of users, consumers, ‘usees’ (affected people)?
 - What is the transparency of the elaboration procedures? How do the norms conform with the content of norms of higher rank? Where are the norms received, and by whom?
- *Their efficiency:* enforcement, complaint procedures, dispute resolution, sanctions,...

Conclusions

Government, immigrant service providers, regulators and employers must work together to design programs

- 1- facilitate mobility of engineering knowledge under global accords
- 2-Transferability of skills and experience under a global frame work
- 3-Standardization of engineering skills and facilitation of its transferability
- 4-Redesign licencing processes to remove social and cultural barrier



Thank You