DEPARTMENT OF INDUSTRIAL ENGINEERING

UNIVERSITY OF PRETORIA

BPM Education in Academia: Status, Challenges, and its Future

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Institutional Context – some facts……

- University of Pretoria celebrated its 100 birthday in 2008
- It has 40 000 students enrolled in under and post graduate courses
- Department of Industrial and Systems Engineering forms part of the Faculty of Engineering, Built and Information Technology (EBIT)
- The department offers :
  - 4 and 5 year degrees in Industrial Engineering : B.Eng (Industrial)
  - Masters in Industrial Engineering : MEng (Industrial)
  - Phd (Industrial engineering)
- 600 IE students at the department with on average 90 graduates completing per annum
- 7 Full-time and 15 part time lecturers

Strong recent and planned growth

Enrolled undergraduate students in the School of Engineering, 1983 - 2009 (2 March 2009: BINEB)
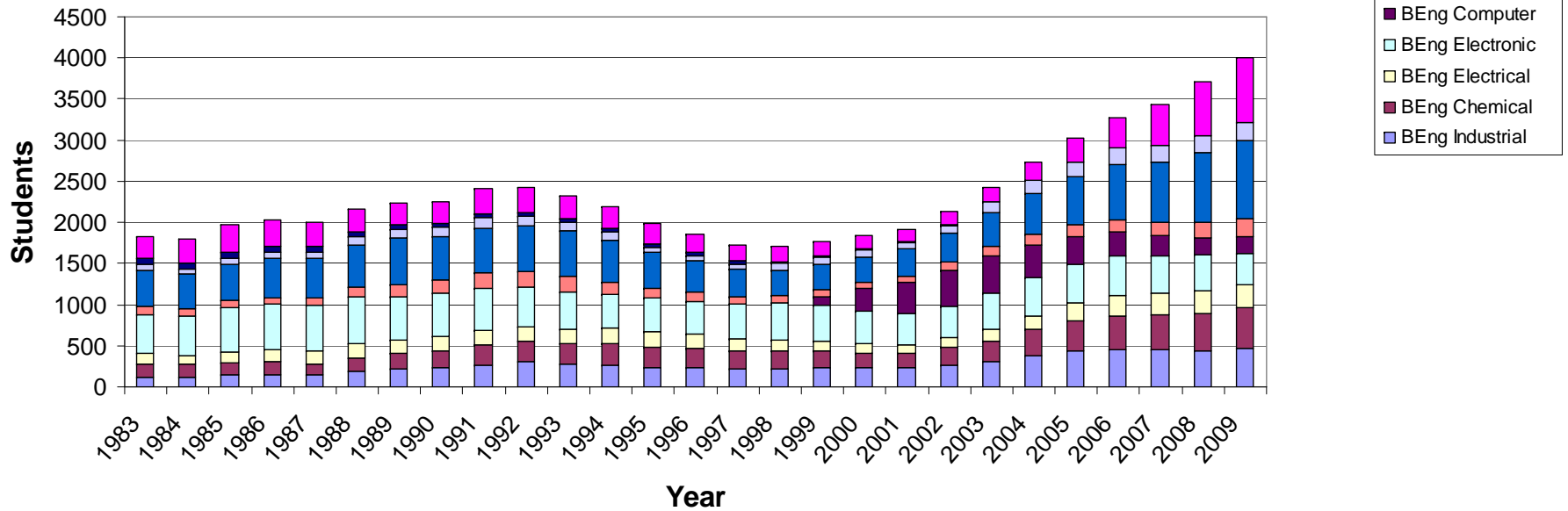
Institutional Context – more facts

- Largest IE department in South Africa, started in 1960
- Graduated +/- 1800 students in the past 40 years
- Professional:
  - Curriculum is accredited by the Engineering Council of South Africa (ECSA)
  - Through the Washington Accord the equivalence of our IE program is acknowledge in Australia, Canada, Ireland, Hong Kong, New Zealand, UK , USA, Singapore and Japan
- Continued education done through university owned trust CE@UP
- Contract consulting through university company – BE@UP
- Contract research through various University mechanisms such as Centre's of Excellence, Chairs, Institutes etc.

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1908 - 2008

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SA Science and Engineering Human Capital Positioning

Ratio of S&E degrees to 24-year-old population

Population per engineer

Adapted from Lawless (2008)
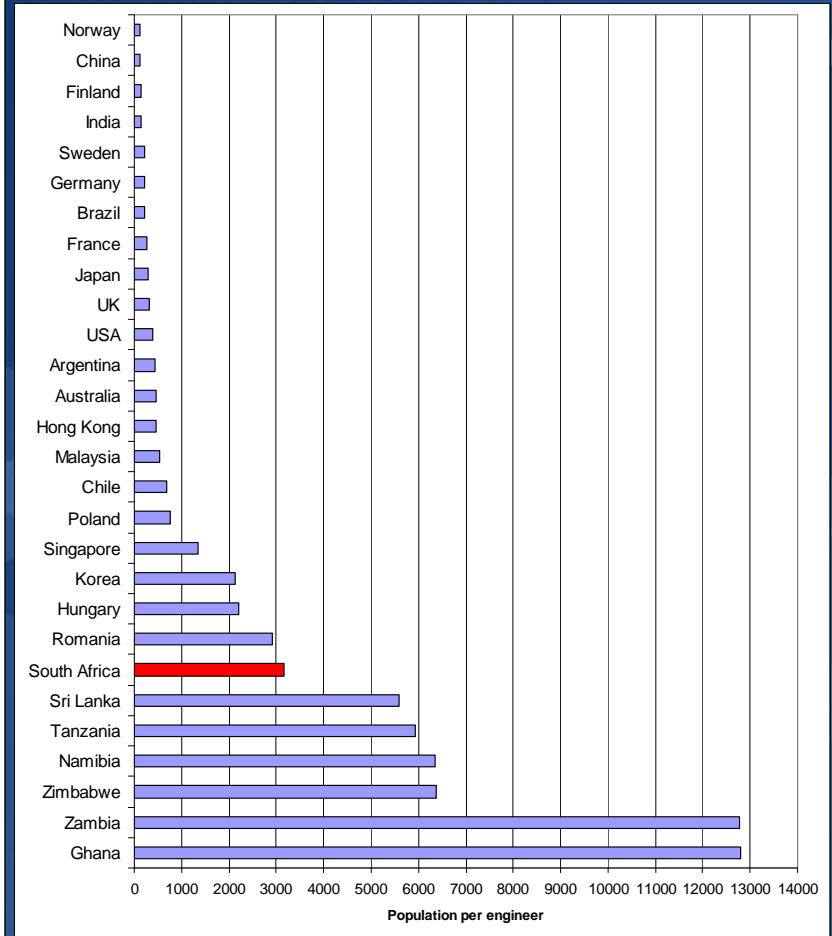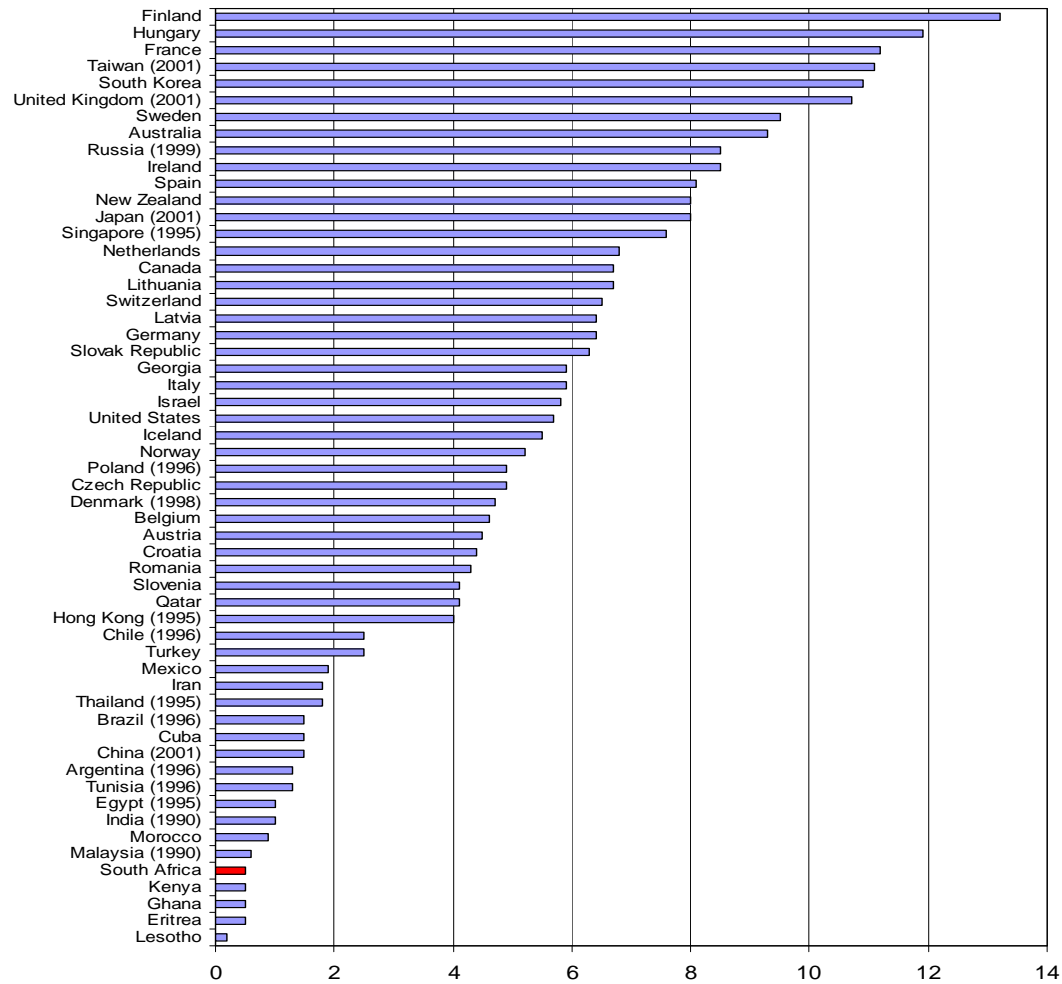
BPM Context

- What is an Industrial Engineer ?
  - "Balances Man, Machine and Money through business processes"

- **How do we define and see BPM ?**
  - BPM is the **newest process management theory** which views business processes as assets that can be managed and adapted in response to constant change. Without saying, the benefits of BPM arises from this ability that the organisation possess through the philosophy and tools (BPMS).
  - **Business process management (BPM)** is a strategy for managing and improving the performance of the business through the continuous optimization of business processes in a closed-loop cycle of modeling, execution, and measurement.

- Requires competencies of Business Engineering, Business Architecture and Optimisation.

Curriculum
~~Course~~ Details & Course Topics

Research
Consult
Contract
Research

R	Business Process Management **Siyaka**	Research Groups (BPM)
P	Post Graduate (Honours, Masters, PhD) – Business Engineering, Enterprise Architecture, Optimisation	

Y4	Operations Research	Professional Ethics, Labour Relations, Environmental Management, Business Engineering, Management Accounting	Systems Engineering	Project
Y3	Operations Research, Simulation Modelling, Engineering Economics	Business Law, Financial management, Operations Management, Industrial Logistics	Manufacturing systems, Facilities planning Computer-aided Manufacturing, Information Systems Design	6 week practical training per year
Y2	Calculus, Differential Equations, Dynamics, Engineering Statistics, Numerical Methods, Mathematics, Programming	Communication, Community based projects	Manufacturing & Design, Thermodynamics, Productivity	
Y1	Calculus, Physics, Linear Algebra, Computer literacy	Innovation	Electricity, Mechanics, Material Science	

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Optimisation	Business engineering	Business Architecture

P Post
R Research
Y Under

Curriculum fit (through a PEST view)

- **Political (P):** Our present dispensation is still more concerned about the legacy of "apartheid" – social state streams are becoming more evident as the newly elected president got his support from the unions as well as the stronger vocal role of the South African Communist Party in the new cabinet.

- **Economical (E):** SA lags in the "digital revolution"; 10 new undersea data cables are in process or being planned to link South Africa/Africa with the Europe for cheaper and more widely used broadband. A explosion in cheaper mobile and fixed data traffic is hoped for – SMART business processes !

- **Social (S):** In context of the Political issue; 10 million out of 40 million are living on state grants. The focus on scare skills & innovation platforms have been neglected in the past 15 years - this gap is now becoming a reality. Companies are starting to put projects on hold due to the lack of skills. In general the BPM space is occupied by rather questionable BPM skills as compared to what needed in context of the BPM definition (a.k.a. "Visio Mappers").

- **Technology:** To successfully implement technology strategies such as BPM, BPMS and SOA requires fundamental different management skills, strategies and capabilities. In our involvement with very large organisations we see the extreme GAP in BPM required capabilities to assist the organisation in managing BPM, based on best of breed BPMS.

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Research Topics for our BPM Centre of Excellence

- The original concept of the BPM centre was based on Antonie's Phd on a open methodology approach to business process meta models. In the past 15 years this has lead to the creation of the "business fractal" technology to address the difficulties of translating business systems into abstract models.

- More specific the BPM center focuses on building competencies in the following areas as joint effort between Post Graduates, Lecturers and Industry, being:

  - Process "Insight" for the development of business process strategies to align business strategy with BPM, BPMS, SOA, EDM initiatives.

  - Business Architecture Intelligence to support decision and design approaches in the creation of the blueprint design of the organisation's business management systems.

  - Process Intelligence as a technology to read, analyse and optimise footprints of SMART business processes.

- Our research projects and consultancy engagements have covered the above subjects to support BPM in a wide variety of South African companies.

Lessons Learned

- BPM is a complex science as it requires the balance of man, machine and money - it has to deal with the <u>intangible asset</u> – the business process !

- It requires a multi-disciplinary approach to make it work, that is at the best to have "Business Engineering", "Business Architecture" and "Optimisation" competencies. That is:
  - a) How do we engineer change in the business system (Business Engineering) ?
  - b) What does this blueprint design look like (Business Architecture) ?
  - c) Is it optimal (Optimisation) ?

- The level of current skills in the market place cannot generally fulfil the above, evident in asking the average business analyst to use the simulation capabilities of BPM tools such as Aqualogic or Tibco's Visual Studio.

- Industrial Engineering needs to understand this GAP and drive its overall training programs more aggressively towards BPM to close the GAP between business and IT.

- In the South African education context we are more faced with social issues and legacy than scare skills development and innovation – now bring BPM into this picture !

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Thank you

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