

ENGINEERS IN SOCIETY: ROLES, PROFESSIONALISM AND BEYOND

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BY

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1.0 INTRODUCTION

Contrary to the popular perception of life as an engineer, this talk will focus on different roles of, and played by, engineers. Not exactly life overwhelmed by calculations, designs (structural, hydrological, chips etc), drawings, supervision of construction etc. Life as an engineer is more than this, and sometime he (which should be taken to include “she”) plays roles which on first impression are not linked to their professional training. It is stressed that the training received as an engineer is part of the reasons which an engineer can display his versatility.

2.0 DIFFERENT ROLES OF ENGINEERS

2.1 Engineers as Managers

- Who is a manager? Someone who plans, organizes, coordinates, controls, executes, and achieves the objectives that are entrusted upon him.
- Career progression
- Are engineers good managers? E.g. Alfred Sloan of General Motors – electrical engineer
- The management gurus: many of them were trained as engineers!
- Michael E Porter – “competitive advantage” – aeronautical/mechanical engineer
- W. Edward Deming – “quality” - electrical engineer
- Joseph Juran – “quality” – electrical engineer
- Henry Mintzberg – “strategic management” – mechanical engineer
- Tom Peters – “Excellence” – civil engineer
- F.W. Taylor – “scientific management”, “time motion study” – mechanical engineer (?)
- Henry Fayol – “Industrial management” – mining engineer
- Henry Gantt – “Gantt chart” – mechanical engineer

2.2 Engineers as Scientists

- Science and engineering are interlinked; it would not be wrong to say that engineering is applied science. (Science is the theoretical foundation of engineering?)
- Paul Dirac – 1933 Nobel Prize Winner in Physics – trained as an electrical engineer

2.3 Engineers as experts

- E.g. Giving expert opinions in court as to what could have been the cause(s) of the issues in dispute: Highland Tower tragedy, Dingo baby case
- Forensic study

2.4 Engineers as politicians

- Almost the entire Chinese leadership are engineers!
- Dato' Ir. Jamaluddin Jarjis – electrical engineer
- Dato' Ir. Donald Lim – electrical engineer
- Dato' Fong Chan Onn – electrical engineer

2.5 Engineers as academics

- Need I say more?

2.6 Others

- Engineers as salesmen
- Engineers as entrepreneurs – Tan Sri Ir. Tajuddin Ramli, Tan Sri Francis Yeoh etc
- Engineers as lawyers?
- Etc.

3.0 ENGINEERS AND THEIR ENVIRONMENT

3.1 The economical and commercial environment

3.2 The social environment

3.3 The political environment: the globalised world

3.4 The cultural environment

3.5 The legal environment

Engineers do not operate in a vacuum, they are part and parcel of this society, they exist because there are reasons for their existence. They fulfill a need in society. The next question to ask is thus this: what is the expectation and relationship of engineers *vis-à-vis* the society for which they are a part? The idea of a professional.

4.0 PROFESSIONALISM

4.1 Who is a professional? What is a “profession”? 5 aspects:

- Nature of work: intellectual, mental vs. manual, specialized skills and knowledge
- Moral aspect: this goes beyond general honesty, integrity, codes of conduct and ethics, “self regulation”
- Collective organization: professional association, entry and competence, “accreditation” and “recognition”
- Status
- Impartiality and independence

4.2 Nature of work

4.3 Moral aspects

- IEM Code of Conduct; Regulations 23 – 33, Registration of Engineers Regulations 1990 Part IV; section 15 Registration of Engineers Act 1967
- Ethics e.g. bribery and corruption vs networking (“Guanxi”)
- Values
- Client’s interests vs. public interests

4.4 Collective organization

- Join IEM! Be an active IEM member!

4.5 Status: image of engineers

4.6 Impartiality and independence

4.7 “Powers” derived from being a “professional”: responsibility

4.8 Duties: moral and legal

5.0 THE MODERN ENGINEERS

5.1 Engineers owe responsibility to

- the general public: safety, environment
- direct consumers of the project
- fellow engineers
- clients e.g. government, industry

5.2 Engineers owe duty

- to themselves
- which are inherent in their works and institution to which they belong
- legal requirements: professional negligence
- contractual duties
- “the greater good”

5.3 A modern engineer, other than his own specialized knowledge, must also have exposure to other fields of knowledge and skills in order to be able to properly discharge his functions:

- communication and presentation skills: oral and written
- economics and finance
- law
- presentation of self!

5.4 Paradigm shift: engineers should not merely respond to need: they should create or anticipate the needs and be leaders of society. Foresights for “unfulfilled needs”.

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