

## Engineers and Society 11/12 S1

### Section A

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- b. iii
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- e. ii
- f. iii
- g. iii
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- i. ii
- j. iv

### Section B

3a. Before independence, the President was called Yang Dipertuan Negara. After split from Malaysia, the name had changed to President, which holds the role as Head of State.

Before 1993, the President of Republic of Singapore was chosen by Parliament. Following the amendments to the constitution enacted in 1991, the Presidency became a popularly elected office.

Under the newly enacted constitution, the President

- possesses veto powers, provides checks on Government's financial budget or nation's reserves.
- Mandate to carry out the custodial role to safeguard the integrity of the civil service
- Further check on government proposals to detain the persons under ISA and to issue the restraining orders under the Maintenance of Religious Harmony Act.
- Veto powers on protection of past reserves, appointment of key personnel and ISA detentions, CPIB investigations and any restraining order in connection with the maintenance of religious harmony

Major contributions of a past President of Singapore

S.R. Nathan

- open up the nation reserves in 2008/2009 to help Singapore coping the recession and stimulate the job opportunity - Job Credit Scheme

3b. Operation Cold Store was a security operation launched in Singapore on February 1963, in which at least 111 anti-government left wing activists were arrested and detained including the key members of Barisan Sosialis. The operation was authorized by the Internal Security Council, which comprised reps from British Colonial, Malaysian Federal and Singapore government (anti-communist)

At that time, Singapore was a self-governing state and preparing for the merger with Malaya to form Federation of Malaysia. Pro-communism Lim Chin Siong, who strongly opposed the merger, led a group of left wing activists and formed Barisan Sosialis, wishing to form Singapore a socialist state.

Singapore Trade Union Congress was also split into Singapore Association of Trade Unions -SATU (pro-BS) and National Trade Union Congress NTUC which pro-PAP.

Malaya's strong anti-communist policy managed to contain the communist influence but Singapore had substantial influence of communism. Fearing of communist resurgence, Tunku Abdul Rahman insisted Singapore to get rid of communism before the merger and the arrestees were detained under the Prevention of Public Security Order.

SATU was deregistered after the leaders were arrested and NTUC became the main trade union in Singapore since then. It remains closely with PAP and many of its union leaders being PAP's MP.

### 3c. Main conclusions

Limits to Growth – if the present growth trends in world population, industrialization, pollution, food production and resource depletion continue unchanged, the limits to growth of the planets will be reached within the next one hundred years. The most probable result will be a rather sudden and uncontrollable decline in both population and industrial capacity.

#### Limits to Growth: The 30-Year Update

- Since 1972, no significant changes in the policies that drive growth in population and industrial production. The use of resources and generation of pollution are above sustainable level.
- Decline is still most probable future

#### Earth Carrying Capacity, determined by

- Standards of living
- Technology
- Food
- Water
- Energy
- Metals, mineral
- Waste assimilation
- Disease
- War

#### Simple suggestion to avoid scenarios as predicted by Club of Rome Report

- Adoption of sustainable development in business and industries
- Stay within the defined "Planetary Boundaries"

### 3d.

System – any group of interacting, interdependent, related parts that form a complex and unified whole with a collective purpose, maintain its existence through interaction of its parts, complex, dynamic and inter-dependent.

System thinking – Process of understanding how things influence one another other within a whole, way of thinking about, and a language for describing and understanding, the forces and interrelationships that shape the behaviour of the systems.

System thinking in Iceberg analogy (draw iceberg diagram)- basis of system thinking is the holistic approach of seeing the system as a whole. In system thinking, one will try to use causal diagrams and other system thinking tools to seek for solution which create change thoroughly. This is because they will change the structure of the whole system (iceberg), understand the whole iceberg and bringing changes to it.

System thinking to solve sustainable development issues

NeWater

- Source and sink
- Singapore, scarce of land and limited space for water storage and catchment
- Water treatment is done onto the waste water(sink) supplied from the household
- Treated water (source) goes back to the household and create the continuity of the supply
- Sustainable development

4a. Anti-corruption and value integrity and service to society

- CPIB to investigate the case related to corruption, to keep administration of the government integrity
- Public and personal security are provided with top class education, producing a safe and good integrity society

Meritocracy – which value people based on the knowledge and skills rather than their family background

- Attract foreign talent regardless of where they came from, by giving scholarships, building a conducive environment for them to work, live and play
- No “guan xi” is playing around in the administration of the government, transparency and fairness of administration

Pragmatism – focus on performance and results

- Encourage SMEs to withdraw from the area of business which is not vital to Sg
- Greater use of ICT, privatization and corporatization of the companies to be profitable
- Setting clear objectives and milestone, deciding on what to do in now and future

Market force

- Flexibility in changing the economy (plan)
- Diversification of economy ranging from education hub to tourism, R&D
- Capital market development and venture capital industry, knowledge based economy

Multi racialism

- Mix culture of multi racialism which is harmony and attract the foreign investors from where the races come from E.g. China and India, Europe to invest in Singapore

#### 4b. Five component of Total Defence

- Military defence
- Economy defence
- Civil defence
- Social defence
- Psychological defence

#### Psychological defence

- Will and courage, spirit of oneness, loyalty and commitment
- Patriotism, altruism and idealism
- Self-confidence building, risking life to protect Singapore's integrity and sovereignty
- Steadfast in national belonging, sense of destiny on nationhood
- Evolve national ethos
- How to beef up psychological defence?
  - Step up national education for all citizen
  - Participation in security exercise
  - Heighten threat thru mass media and publicity
  - Undertake more social and community programs to foster greater sense of psychological awareness and national wellbeing
  - Giving houses for the citizens such as HDB to let them have stake and if there's a war going on, they will fight for their home and country

#### 4c. China success may be derail due to :

- Taiwan's issue – any miscalculation by two parties could bring about conflicts which will be disastrous consequences in the region
- Rapid urbanization
- Widening difference in incomes, growth rate and quality of life between wealthy coastal cities and poor inland provinces
- Problems btwn majority ethnics Han and minorities in Tibet, Xinjiang, and Qinghai
- Difference in values and aspirations btwn well-educated youngsters and better global exposure, which influenced thinking takes place
- Aging population due to one-child policy
- Corruption in administration

#### 4d. Globalization influence on

Economic – Increase standard of living (countries trade and open door to foreign investment-free trade-variety of goods to choose from-better quality life), increase the competition among nations (investment from MNC), widening gap between the rich and poor (rapid development in developed countries-MNCs attract investment, skilled labour and resources away from poor areas), development of e-commerce

Social- Getting know foreign culture, loss of local culture due to domination of western brand in local market, unemployment due to insufficient control of globalization

Environmental-deforestation and related problem, global warming, environmental management, depletion of natural resources, concern over profit vs protection of environment .

## 2a. US

- Consumers prepared to buy standardized item, led to mass production
- Technologies convergence – common technologies needs
- Innovative development of machine and to produce standardized interchangeable parts
- Railway open

## Germany

- Bismarck created state owned railway to open internal market
- Expand foreign trade in export of industrial products
- Promoted education relevant to industrialization
- Manufacturers set up integrated industrial research lab

## France

- Set up of 1<sup>st</sup> engineering school Ecole Nationale des Ponts
- Specialized army corps of engineers was set up
- Ecole Polytechnique was established

## 2b. Strategies by Government to strengthen the technologies capabilities

- Strategic development and funding of 15 research institutes and centres in 5 broad categories: biomedical sciences, chemical and related sciences, electronics, information and communication technology and manufacturing and automation
- R&D grant – to promote and coordinate university and industry R&D
- Technology acquisition – to help industry upgrade by acquiring the relevant technologies
- Technology sourcing – to help industry access and exploit emerging technologies from high-tech innovation “hot-spot” like USA, Israel through licensing, manufacturing or joint ventures
- Technology capability planning – to focus the finite R&D resources so as to avoid costly overlaps and to create an awareness of capability gaps

## 2c. Lesson of safety in Titanic

- Do not ignore danger warning
  - Warnings about presence of icebergs were ignored
  - Messages were sent to Titanic by other ships providing warnings about the icebergs in the path of Titanic
    - Warning messages would have been recorded and passed to the relevant officers including captain
    - But warnings were ignored
- Provide for means of safe exit
  - Insufficient number of lifeboats was provided
- Do not blindly believe false claim

- Titanic was thought to be unsinkable and was thought to be true.
- Ship moved at a fast speed and ignore warnings, not taking great cautions

\* 2d. Two ethical theories to convince the manager that bribery to get the contract is an unethical act

- Virtue ethics
  - Should know and maintain the justice within corporations, government and economic practice but not bribe to get the big order, not fair to other competitors
  - Respect other competitors rights to compete to get the order
- Duty ethics
  - Do not cheat
  - Obey the law
  - Bribe is against the law, so it is an unethical act