SPEE SOCIEDADE PORTUGUESA PARA A EDUCAÇÃO EM ENGENHARIA

ETHICS AND SUSTAINABILITY IN ENGINEERING PRACTICE

SEFI Workshop, 2021-09-23

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- Ethics is receiving increasing attention in engineering curricula
- Scientists attempt to understand the world, engineers strive to change it
- Technologies are not neutral: they affect (positively or negatively) the environment and society
- Cost-benefit analysis is no longer enough
  - engineers have to ponder the consequences (impact) of their work: professional and ethical responsibility
  - the decision to develop a technology, and also the processes of design, production and maintenance are inherently ethical: responsible innovation

- Social responsibility of engineers is two-fold: passive (backward-looking) and active (forward-looking)

- Passive responsibility: if something undesirable occurred
  - four conditions are necessary for passive responsibility to hold:
    ✓ wrong-doing; causal contribution; foreseeability; freedom of action

- Active responsibility: the possibility of steering technological development, maximizing benefit and minimizing harm

- Two ways of ethically steering technological development:
  - inherently including and respecting societal values in the design of technological development: value-sensitive design (VSD)
  - assessing the potential consequences (impact) of technological development: technology assessment (TA)

- Sustainability (environment and society) has become a paramount societal value to be addressed and incorporated in VSD.
  - United Nations Sustainable Development Goals (UN-DSG) are currently a major reference for any engineer's activity
- The "Collingridge dilemma":
  - potential consequences (impact) of technological development are sometimes difficult (or even impossible) to predict
  - on the other hand, when negative impacts occur following implementation of technology, they are sometimes difficult (or even impossible) to reverse

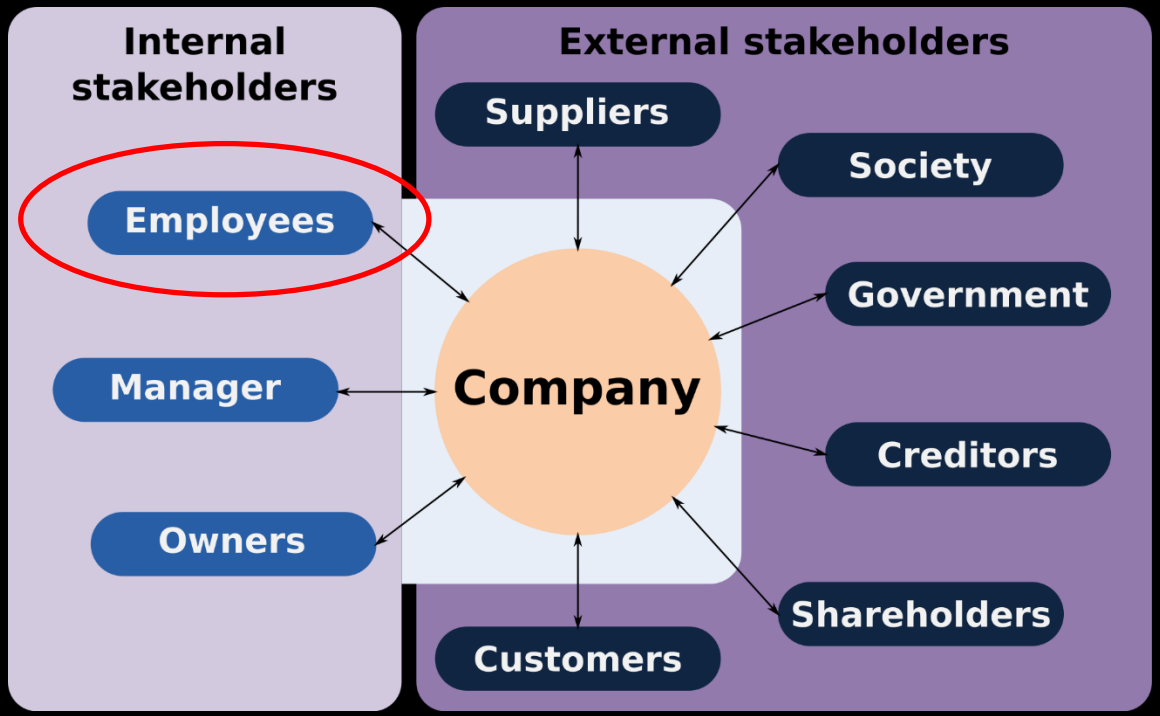
- To deal with the Collingridge dilemma, TA can be used in an iterative, trial-and-error way: the constructive technology assessment (CTA)

- CTA. How it works:

  - the design is implemented "step-by-step"
  - TA is applied in parallel with the design implementation
  - conclusions of TA are fed back to the design process
  - the design process can therefore be adjusted accordingly
  - CTA gives a larger say to all actors, namely stakeholders

- The context of social responsibility in Engineering

  - individual level: professional responsibility
  - company level: corporate social responsibility (CSR)
    - ✓actors:



source: Global Reporting Initiative (GRI)

- The investors' point of view – objectives (maximize ROI)
  - avoid negative impact on the value of the investment
  - tools are needed to support investment decision making
  - socially responsible investment (SRI)
  - sustainability risks: environmental, social or governance
  - environmental, social and governance (ESG): assessment criteria
  - several companies volunteer to be rated accordingly: ESG index
  - for that purpose, they report their own ESG achievements

- ESG: companies' assessment in an international context
  - each company uses its own ESG performance indicators (PI)
  - fair comparison at global scale requires global standardization
  - Global Reporting Initiative (GRI) is a standards organization
  - GRI provides standardized guidelines for performance reporting
  - GRI is an international, independent and free public good

- One suggestion for further discussion…
  - welcome back week (compulsory): induction week, with a module 0 (different in nature, for different students' levels)