

42611 - Theory of science in engineering



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## Assignment 12 Reflection

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## **Reflection**

### **Science driven innovation and engineering**

Science is an integrated part of engineering, as it is very helpful to quantify the effectiveness of solutions. With proper scientific knowledge production, the problem can be clearly defined with clear conditions for failure and success, which is an essential tool when trying to solve a problem.

### **Development in a bubble**

Technological development does not exist in a bubble. There are many actors when considering the development of technology and innovations. Politics, norms, culture, ethics, morals, sustainability considerations, safety issues, inclusiveness etc. are all important things that should be considered, as they can have a profound effect on the design, implementation and adaptation of technology.

### **New domains**

With the expanding fields of AI and machine learning, possibilities expand much faster than anticipated if laws and regulations are considered. It is especially important to consider dual uses and their potential to enable malicious actions. Technological progress in "newer" domains should be done slowly and methodically to avoid undesirable circumstances, to avoid potentially destructive impacts. In the same vein as nuclear technology, with the emergence of efficient and low emission power production, it also introduced nuclear bombs.

### **Social influence of technology and innovation**

People's lives are filled with technology, and it shapes the norms and expectations of the role of humans. In addition, the needs of people drive technological progress.

### **A world of complexities**

The world is complicated AF. Technologies and innovations bring about more consequences than one could conceive. Some consequences are positive, such as solving problems and satisfying needs, but others are negative. Sometimes the consequences can be observed immediately, whereas other times they can only be observed years later. Technology when applied often, has some sort of direct positive impact, but there are also a lot of indirect consequences caused by for example production, distribution, use and disposal.

### **A system of finite resources**

The world we live in can be considered a system of finite resources, and if this is not considered, it can lead to actions that mess with and change the system in undesirable directions. Technology and innovations should be framed within a sustainable perspective, such that solutions keep working and do not cause a greater amount of problems elsewhere.