

Demands, Challenges and Tasks of a Prospective Technology Assessment

Reflections
and Considerations

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1. Diagnosis

► **Objective:** Not to reinvent the wheel, but to meet the challenges induced by the recent change of the innovation system; to enhance reflexivity, awareness and critique within and about the technosciences

► **The point of departure** of ProTA is a fourfold diagnosis:

1. **Technoscience:** science and technology are highly intermingled

2. **Ambivalence:** impossibility to distinguish between “positive” impacts and “negative” consequences

3. **Governance:** no clear outside planning and control; various actors on different levels

4. **Non-dichotomy:** dissolution of the science-society, science internal-science external, fact-value border

► These points questions **four kinds of assumptions** that are widely spread in TA: (1) innovation theory assumptions; (2) ethical-utilitarian assumptions; (3) action theory assumptions; (4) science concept assumption

2. The Concept of ProTA

- ▶ ProTA can be regarded as an **extension, expansion or widening of established TA concepts** by focusing on specific elements (somewhat) underexposed in the existing concepts
- ▶ ProTA is **surrounded by a family** of – at least in some aspects – cognate concepts such as Vision Assessment, Real Time TA, Constructive TA, Technology Characterization, and ITA
- ▶ Characterizing ProTA by its fourfold orientation
 1. **Early-stage orientation**; against Collingridge's dilemma; upstream engagement
 2. **Intention, potential and vision orientation**; e.g. agenda setting
 3. **Shaping and alternative-path orientation**; open the black box of sciences; ProTA as participatory research
 4. **Orientation toward the technoscientific core**; what is at stake? Critique of unrealistic vision
- ▶ This is an orientation framework for TA-scholars ...

3. Future Knowledge

- ▶ Although the concept of ProTA hardly considers the *future* explicitly, implicitly within the first three orientations **the future is ubiquitous**
- ▶ **Different kinds of conceptualization of the *future*** – based on a critical-analytical reconstruction of the scenario method, including discussions around forecast and foresight:
 1. Projective-predictive type of future knowledge
 2. Explorative-experimental type future knowledge
 3. Normative-teleological type of future knowledge
 4. Visionary-speculative type of future knowledge
- ▶ ProTA mainly refers to the **normative-teleological type** (linked inherently to the intention-orientation)
- ▶ In addition, ProTA also considers a plurality of futures (shaping-/alternative-orientation) and, accordingly, refers to the **explorative-exp. type**
- ▶ Also, **visionary-speculative future knowledge** is helpful insofar as it focuses on enabling a reflection about societal desirable (*cultural change* and *great transitions*): Earliness and intention orientation

4. Normative Fundament and Ethics

- ▶ **ProTA** is based on a normative fundament: TA needs ethics !
- ▶ Ethics is **NOT** about “good” and “bad” and not restricted to individual actors, as it might appear from a sociological perspective, but is to be considered as a reflection of common sense morality and habits ...
- ▶ **ProTA refers to**
 - Hans Jonas’ *principle responsibility* which is related to a “heuristic of fear”: “*preservation principle*” (Prinzip Erhaltung)
 - Ernst Bloch’s utopian *principle hope*, which addresses the “open horizon” of future: “*unfolding principle*” (Prinzip Entfaltung), aims at “alliance technology”
- ▶ **Core elements**
 - (*Content-based filled*) *deontological and virtue ethics*: imperative of responsibility, Jonas, approach-future-ethics (Zugangs-Zukunfts-Ethik)
 - *Discourse ethics*: space of opportunities/possibilities, unfolding principle, deliberate processes
 - *Utilitarian concepts* are indispensable, but play a minor role.

5. Examples

- ▶ The challenge for a Prospective TA **is not only the formulation of a convincing orientation framework** addressing the fourfold diagnostic analysis ...
- ▶ ... but also to show that **this concept is effectively applicable.**
- ▶ Although not all pressing issues and TA challenges can be tackled by the methodology of ProTA, however, a **broad variety of technologies** might be accessed and assessed, e.g.
 1. Nuclear technology research
 2. Energy research
 3. Nano-technosciences
 4. Synthetic biology
 5. Neuroenhancement-/ pharmaco-technology.

5. Example: Synthetic Biology

▶ „An emerging interdisciplinary field of research and development ...“ (DFG 2009)

▶ „**Synthetic biology is the engineering of biology**: the synthesis of complex, biologically based (or inspired) systems, which display functions that *do not exist in nature*. This engineering perspective [...]. Synthetic biology will enable the design of 'biological systems'.” (EU-NEST Group 2005)

1. Early-stage/earliness orientation
2. Intention, potential and vision orientation
3. Shaping and alternative-path orientation
4. Orientation toward the technoscientific core

▶ Project conducted by Arnim v. Gleich und Bernd Giese, U Bremen

Late-modern technology is based on self-organization

Technology



traditional

modern

late-modern

6. Summary

- ▶ Diagnosis
- ▶ ProTA underlines that prospective knowledge is feasible
- ▶ Four dimensions of the concepts of ProTA
- ▶ Underlining the teleological-normative and the explorative-experimental type of future knowledge
- ▶ Ethics and normative elements are indispensable: content-based deontological ethics plus discourse ethics
- ▶ To put at the center: What is really desirable!
- ▶ Examples underlines that ProTA is possible
- ▶ Criticism and Instrumentalism: Awareness and reflexivity
- ▶ ... contributes to open the black box of sciences ...

