



Universiteit Utrecht

Exam

Emergent Technology Dynamic

(GEO3-2265)

Ba Programme

Natuurwetenschap en Innovatiemanagement

Faculty Geosciences

University Utrecht

21 December 2011

10.00 – 13.00 Ruppert A

Professors:

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The exam consists of 3 open questions with the same weight.
Please be precise in your answers and write as readable as possible.

Question 1: the future of emerging technologies

- a) In a provocative essay Bill Joy argues that “the future doesn’t need us”. Give three arguments why this would be the case.
- b) What is ‘open source biology’? Discuss three possible consequences of this development.
- c) Van Lente and Rip discuss the importance of ‘mutual positioning’. Explain this concept. How does it contribute to the emergence of membrane technology?
- d) What are biomarkers and how could they affect the boundaries between disease and health in the future?

Question 2: measuring emerging technologies

- a) What is an ‘emerging irreversibility’? Discuss an example from the area of nanotechnology that you studied in the assignments.
- b) The concept of ‘articulation’ contains two directions. What are these two directions and discuss an example from your own area of nanotechnology.
- c) The economist Rosenberg concludes that “Even when a new process innovation passes the stringent test of reducing new average total costs below old average variable costs, it may not be adopted.” (.525) Explain why this may be sensible from an economic point of view?
- d) What is the funnel of interest that Van Lente and Rip (1998) introduce and how does this help to measure the strength of expectations?

Question 3: strategies for emerging technologies

- a) What is Constructive Technology Assessment and what are ‘de facto’ CTA activities?
- b) Schot and Rip delineate three strategies for the future of CTA. Which are these? Give a fictive example from the area of nanotechnology that you studied.
- c) Explain what Rinne envisions with ‘virtual innovation’ and how this would enable firm to prepare themselves for the radical innovations of emerging technologies.
- d) Alfred Nordmann warns against the ‘if and then’ syndrom? What is this syndrome and give three of his arguments why this should be avoided.

List of texts of Emergent Technology Dynamic 2011-2012

1. Joy, B. (2000) ‘Why the future doesn't need us’, *Wired*, April
2. Nordmann, Alfred (2007). If and Then: A Critique of Speculative Nanoethics *NanoEthics* 1 (1), 31–46.
3. Van Merkerk, R. and Van Lente, H. (2005), ‘Tracing emerging irreversibilities in emerging technologies: The case of nanotubes’, *Technological Forecasting & Social Change*, Vol.72, 1094-1111.
4. Rosenberg, N. (1976), On Technological Expectations, *The Economic Journal*, Vol. 86(343), 523-535.
5. Van Lente, H. en A. Rip (1998), ‘The Rise of Membrane Technology. From Rhetorics to Social Reality’, *Social Studies of Science*, Vol.28(2), 221-254.
6. Swierstra, T., M. Boenink, B. Walhout, R. van Est (eds). (2009), *Leven als bouw pakket*, Klement/Rathenau Institute.
7. Van Lente, H. and J. van Til (2008), ‘Articulation of sustainability in the emerging field of nanocoatings’, *Journal of Cleaner Production* 16, 967-976.
8. Schot, J and A. Rip (1997), The Past and Future of Constructive Technology Assessment, *Technological Forecasting & Social Change* 54, 251-268.
9. Rinne, M. (2004), Technology roadmaps: Infrastructure for innovation, *Technological Forecasting and Social Change*, Volume 71, Issues 1-2, January-February 2004, Pages 67-80