

Annotated bibliography – expectations dynamics

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kornelia.konrad@web.de)

Arman Avadikyan, Patrick Cohendet, Jean-Alain Héraud (eds.), *The Economic Dynamics of Fuel Cell Technologies*, Berlin, Heidelberg, New York: Springer-Verlag, 2003.

Emphasize how heterogeneous networks emerge which carry visions and provide resources and efforts to work on them. Offer data for a number of countries. Some authors emphasize the hydrogen economy as a guiding vision (Leitbild).

Brown, Nik/ Rappert, Brian and Webster, Andrew, Eds. (2000). *Contested Futures - a sociology of prospective techno-science*. Aldershot.

Callon, Michel (1986). *The Sociology of an Actor-Network: The Case of the Electric Vehicle. Mapping the Dynamics of Science and Technology - Sociology of Science in the Real World*. Callon, Michel, Law, John and Rip, Arie. Basingstoke.

Callon, Michel (1987). *Society in the Making: The Study of Technology as a Tool for Socio-logical Analysis. The Social Construction of Technological Systems*. Bijker, Wiebe E., Hughes, Thomas P. and Pinch, Trevor J. Cambridge/MA.

Both: the motivating and coordinating role of socio-technical scenarios (e.g. societal visions) for actors involved in electric vehicle development; non-strategic role of expectations

Da Costa, Olivier, Mark Boden, Yves Punie and Maria Zappacosta, 'Science and Technology Roadmapping: From Industry to Public Policy', *The IPTS Report #73* (April 2003), 27-32.

De Laat, Bas, *Scripts for the Future. Technology foresight, strategic evaluation and socio-technical networks: the confrontation of script-based scenarios*, PhD Thesis, University of Amsterdam, 18-12-1996

Dierkes, Meinolf/ Marz, Lutz and Hoffmann, Ute (1996). *Visions of technology: social and institutional factors shaping the development of new technologies*. Frankfurt/Main. English version of Dierkes et al. 1992: *Leitbild und Technik; role of Leitbilder/visions guiding the shaping of technology and coordinating heterogeneous actors and heterogeneous knowledge fields*.

Dutton, William/ Blumler, Jay/ Kraemer, Kenneth (eds.) (1987), *Wired Cities – Shaping the Future of Communications*, Boston

Longer-term overview of visions, expectations, promises, scenarios, projects referring to "new" cable and telecommunications technologies.

Emirbayer, Mustafa / Ann Mische (1998): *What Is Agency?*, *AJS* 103/4, pp. 962-1023
Action-theory oriented model of time-orientation in action.

Evans, Robert (1999), *Macroeconomic Forecasting – a sociological appraisal*, London
SSK-analysis of "production" of economic forecasts.

Fleising, Usher (2001), 'In search of genotype: a content analysis of biotechnology company documents', *New Genetics and Society* 20(3) 239-254.

- FORMAKIN (2001), *Final Report of the Formakin Project (Foresight as a Tool for the Management of Knowledge Flows and Innovation)*, York etc: Science and Technology Studies Unit, University of York, Januari 2001. An EU-TSERP project led by Andrew Webster, Luis Sanz-Menéndez and Barend van der Meulen.
- Fortun, Michael (2001), 'Mediated speculations in the genomics futures markets', *New Genetics and Society* 20(2) 139-156.
- Franks, Felix (1981), *Polywater*, Cambridge: MIT Press.
From rumor and response, to temporary respectability & bandwagon effects, until the "Noes have it". Figures showing rise and fall of various kinds of publications.
- Fujimura, Joan (1988). "The Molecular Biological Bandwagon in Cancer Research: Where Social Worlds Meet." *Social Problems* **35**(3): 261-283.
Expectations as strategic resource; bandwagon effect
- Garud, R. & P. Karnøe (2001), *Path Dependence and Creation*, Mahwah, N.J.: Lawrence Erlbaum Associates.
- Geels, Frank W. (2002), *Understanding the Dynamics of Technological Transitions: A co-evolutionary and sociotechnical analysis*. PhD Thesis, University of Twente, 1 November 2002; Enschede: Twente University Press.
Part of the dynamics are hype/bandwagon/backlash for a few examples, and presents the graph (from Gartner.com) of technology trigger, peak of inflated expectations, trough of disillusionment, and slope of gradual improvement (p. 347-348, incl. historical examples). Also role of wide, cultural visions and promises, as with aircraft in the 1920s and 1930s.
- Geels, Frank W. and Wim A. Smit, 'Failed technology futures: Pitfalls and lessons from a historical survey', *Futures*, 2000, Vol. 32, No. 9., pp. 867-885.
"The reason that initial promises and expectations are too optimistic is *not* that forecasters or futurists are ignorant or shortsighted. Instead, the promises are strategic resources in promise-requirement cycles. Initial promises are set high in order to attract attention from (financial) sponsors, to stimulate agenda-setting processes (both technical and political) and to build 'protected spaces'. Promises thus play a role in the social processes that are part of technological development. This performative dimension of future images provides a complementary interpretation of the failure of some future speculations." (p. 881-882)
- Steven Glynn, 'Constructing a selection environment: competing expectations for CFC alternatives', *Research Policy* 31 (2002) 935-946
Nice paper about the debate and the various positionings, but little data on expectations. Idea of 'competing expectations' is important (and is a bridge between variation and selection) but is not really conceptualized.
- Hazen, Robert M. (1988), *The Breakthrough. The race for the superconductor*, New York: Summit Books
Chronicling the discovery, as Hazen (a key figure) experienced it. Up to the "Woodstock of physics" in New York 1987.
- Kemp, R. (1994). "Technology and the Transition to Environmental Sustainability." *Futures* **26**(10): 1023-1046.
Expectations as an element of regime shifts.

- Konrad, Kornelia (2002), *Zwischen schmalen Pfaden und offenen Horizonten. Zur Dynamik von Erwartungen und Szenarien in Technisierungsprozessen am Beispiel von Multimedia*. Inauguraldissertation Philosophie, Fachbereich Gesellschafts- und Geschichtswissenschaften der Technische Universität Darmstadt.
- Konrad, Kornelia (2003). *Prägende Erwartungen*. Berlin, Edition Sigma. *forthcoming*
 expectations in innovation processes, dynamics of expectations, agendas, visions/scenarios of use in innovation processes, construction and dynamics of scenarios of use, multimedia / interactive television / e-commerce
- Koselleck, Reinhart (1985), *Futures past : on the semantics of historical time*, Cambridge
 Discusses the historical change of the societal perception of the future. (Similar reflections *probably* in Luhmann, Niklas (1982), *The Future Cannot Begin*, in: Luhmann (ed.), *Differentiation of Society*, New York or Luhmann (1990), *Essays on Self-Reference*, New York)
- Lampel, Joseph, 'Show-and-Tell: Product Demonstrations and Path Creation of Technological Change', in Garud & Karnoe (2001), 303-327.
 Demonstration is an embodied expectation, and staged/performed (cf. technological drama). Part of an enactment process in which behavior of collectivities is changed through an envisioning process (306). In particular, envisioning interesting, promising technological paths (320).
- Lissoni, Francesco, *Technological Expectations and the Diffusion of 'Intermediate' Technologies*, CRIC (Manchester), Working Paper No. 8, August 1999.
 Refers to Rosenberg (1976) for 'technological expectations' (+ further references). These feed into strategic considerations which technology to adopt and when, and will often lead to choosing intermediate technologies rather than the most advanced ones. [Cf. Schaeffer on 'generations' and future chronology more generally.] A model for diffusion of mid-range technologies is constructed and tested for electronic colour pre-press industry. [An interesting contrast can be made with public rhetorics about the need to be at the frontier, and adopt the most advanced technologies.]
- Martin, P. (2001), 'Great expectations: The construction of markets, products, and user needs during the early development of gene therapy in the USA', in: R. Coombs *et al.* (eds.), *Technology and the Market: Demand, Users and Innovation*, Cheltenham, UK: Edward Elgar, 38-67.
- McMillan, Frank M. (1979), *The Chain Straighteners. Fruitful Innovation: the Discovery of Linear and Stereoregular Synthetic Polymers*, London and Basingstoke: MacMillan Press.
 HD Polythene and similar catalytically-made polymers as 'hopeful monstrosities' in the 1950s. Dynamics include promise and disappointment and recovery.
- Nowotny, Helga, and Ulrike Felt (1997), *After the Breakthrough. The emergence of high-temperature superconductivity as a research field*, Cambridge University Press.
 Discusses "euphoric phase" and "return to normality" and attendant reconfigurations of actors and knowledge; and the newspapers and their "HTS story".
- Panem, Sandra (1984), *The Interferon Crusade*, Washington, D.C.: The Brookings Institution.
 Brief study of interest in and support for interferon, and the advocacy processes involved in the funding of basic biomedical research.

- Pieters, A.H.L.M. (1986), *Het 'early promise' proces bij de ontwikkeling van Interferon*, Master's Thesis, University of Utrecht.
Compares US and Netherlands. After first articulation, there is a 'trigger' and a hausse, followed by assessment and decision-making, followed by evaluation and re-orientation.
- Pieters, Toine (1999), *Biology Meets Drug Development. The Biography of a 'Miracle' Drug, the Interferons*, PhD Thesis, University of Maastricht.
History of the research and research organization, standardization of the compounds and their effects, as well as the public presentation and responses, "Inflation of expectations" and "Doctoring the Media as Part of Modern Medicine's Expectations Trap".
- Plitzner, Klaus (Hg.) (1998), *Elektrizität in der Geistesgeschichte*, Bassum
Historical expectations and (symbolical) visions connected to the introduction of electricity.
- Pool, Ithiel de Sola (1983), *Forecasting the Telephone: A Retrospective Technology Assessment*, Norwood, N.J.: Ablex Publishing Corporation.
Classical source of quotes about expectations which were off the mark.
- Rappert, Brian (1999), Rationalising the future? Foresight in science and technology policy coordination, in: *Futures* 31, 527-545
Critical analysis of the "use" of foresight studies.
- Rettig, Richard A. (1977), *Cancer Crusade. The Story of the National Cancer Act of 1971*. Princeton, N.J.: Princeton University Press.
Advocacy by "benevolent plotters", builds on promising developments to be identified, especially when one wants to go for big money (a "moonshot" for cancer).
- Rip, Arie (2002b), *Challenges for Technology Foresight/Assessment and Governance. Report contributing to the STRATA area "Sustainability: R&D Policy, the precautionary principle and new governance models"*. Enschede: University of Twente.
- Rip, Arie (2002d), *Co-evolution of Science, Technology and Society. An Expert Review for the Bundesministerium Bildung und Forschung's Förderinitiative Politik, Wissenschaft und Gesellschaft (Science Policy Studies)*, as managed by the Berlin-Brandenburgische Akademie der Wissenschaften. Enschede: University of Twente, June 2002.
- Roelofs, Elsbeth M.G. (Dec 1996), *Vol verwachting van de brandstofcel. Een onderzoek naar de verandering van verwachtingen over de brandstofcelontwikkeling op micro-niveau*. Master's Thesis, University of Twente. Looks at US DoE Urban Transit Bus Program and Dutch National Research Programme Fuel Cells. Sees stable macro-expectations, under them different niches and promise champions, some strategic shifts.
- Schaeffer, Gerrit Jan, *Fuel Cells for the Future. A Contribution to Technology Forecasting from a Technology Dynamics Perspective*, PhD Thesis, University of Twente, 06-11-1998.
- Schot, Johan (1998). "The Usefulness of Evolutionary Models for Explaining Innovation - The Case of the Netherlands in the 19th Century." *History and Technology* 14: 173-200.
Expectations as an element of (historical) regime shifts.
- Schot, Johan/ Hoogma, Remco and Elzen, Boelie (1994). "Strategies for Shifting Technological Systems: The Case of the Automobile System." *Futures* 26(10): 1060-1076.
Expectations as an element of regime shifts.

- Schutz, Alfred (1962). On Multiple Realities. Collected Papers I, The Problem of Social Reality. Schutz, Alfred. The Hague.
- Schutz, Alfred (1964). Tiresias, or our knowledge of future events. Collected Papers II, Studies in Social Theory. Schutz, Alfred. The Hague.
Both analyze the role of anticipation in action.
- Van Lente, H. (1993), *Promising technology: The dynamics of expectations in technological development*, PhD thesis, Twente University, Delft: Eburon.
- Van Lente, H. & A. Rip (1998), 'Expectations in technological developments: An example of prospective structures to be filled in by agency', in: C. Disco & B.J.R. van der Meulen (eds.): *Getting New Technologies Together*, Berlin, New York: Walter de Gruyter, 195-220
- Verganti, Roberto (1999), 'Planned Flexibility: Linking Anticipation and Reaction in Product Development Projects', *J. Product Innovation Management* 16, 363-376.