

Technology Assessment (TA)

ESD.85

Oct 24, 2005

Learning Objectives

- ❑ Examine very different approaches to forecasting technological change
- ❑ Achieve understanding of amount of technological change forecasting that is done
- ❑ Achieve understanding of importance of use perspective (and time horizon of interest) on method chosen for technological change forecasting
- ❑ Appreciate the multi-dimensional nature of practical technological change forecasting
- ❑ Examine technological determinism, construction (social determinism), economic determinism and other approaches

Agenda

- Overview of TA
- Student Presentations (5 min)
- Chris Magee – Ford and Hybrids
- Discussion

Overview of TA

- History of Tech Assessment (TA)
- Types of TA
- Purpose of TA
- Methods of TA
- (in)Famous Examples

History of Tech Assessment

- 1950's –
 - RAND
- 1964 World's Fair
 - “Electricity Too Cheap to Meter”
- OTA (1972)
- Other Govts. (UK, Germany, France)

Types of TA

- ❑ Forecasting
- ❑ Impact Assessment
- ❑ Scenario Analysis

Purpose of TA

- Awareness
 - Provide Warnings
 - Informational
- Strategic
 - Develop Plan for Specific Actors
- Constructive
 - Shape the Development Path
- Backcasting
 - Find Pathway to meet Goals

Methods of TA

- Scenario Analysis
 - Agent Based Models
 - System Dynamics
 - Decision Analysis
- Trend Extrapolation
 - Statistics and Regression
- Expert Solicitation
 - Delphi
- Roadmapping

Infamous Examples

I think there is a world market for maybe five computers.

- *IBM Chairman Thomas Watson, 1943*

Infamous Examples

Computers in the future may have only 1,000 vacuum tubes and perhaps only weigh 1 1/2 tons.

- *Popular Mechanics*, 1949

Infamous Examples

640K ought to be enough for anybody.

- *Microsoft Chairman Bill Gates, 1981*

Futurama's UnderSea City

Photo removed for copyright reasons.
Model of undersea city from the 1964 New York World's Fair.

Bell's Picture Phone

Photo removed for copyright reasons.
Bell Telephone's prototype PicturePhone, from 1964 New York World's Fair.

Infamous Examples

Everything that can be invented has been invented.

- *Charles H. Duell, Commissioner, U.S. Office of Patents, 1899*

TA Paradigm?

GARBAGE IN---GOSPEL OUT

- *Fairchild Research and Development,*
1969

References

- Porter, Alan, et. al., “Technology Futures Analysis: Toward Integration of the Field and New Methods”, *Technological Forecasting and Social Change*, Volume 71, Issue 3, March 2004, Pages 287-303
- Jan Van Den Ende, Karel Mulder, Marjolijn Knot, Ellen Moors and Philip Vergragt, “Traditional and Modern Technology Assessment: Toward a Toolkit”, *Technological Forecasting and Social Change*, Volume 58, Issues 1-2 , 6 May 1998, Pages 5-21
- Porter, A. and Detampel, M., “Technology opportunities analysis” *Technological Forecasting and Social Change*, Volume 49, Issue 3, July 1995, Pages 237-255
- Roger C. Herdman and James E. Jensen, “The OTA story: The agency perspective” *Technological Forecasting and Social Change*, Volume 54, Issues 2-3 , February-March 1997, Pages 131-143, Special Issue: Technology Assessment: The End of OTA.
- Bruce Bimber and David H. Guston (Eds.), “Technology Assessment: The End of OTA”, *Technological Forecasting and Social Change*, Volume 54, Issues 2-3, Pages 125-308 (February - March 1997)
- 1964 World’s Fair: <http://naid.sppsr.ucla.edu/ny64fair/map-docs/technology.htm>

References

- ❑ Porter, A., et. al., *Forecasting and management of technology*, New York: Wiley, c1991. Ch 6-14.
- ❑ Makridakis, S., Wheelright, S., and Hyndman, R.. *Forecasting: Methods and Applications*, 3rd Edition, Wiley, 1998.
- ❑ H.A. Linstone, M. Turoff, (eds.), *The Delphi Method: Techniques and Applications*, 2002, Available at: <http://www.is.njit.edu/pubs/delphibook/index.html>.
- ❑ McClean, J. “Simulation Modeling”, *Handbook of Futures Research*, Jib Fowles, ed., CT: Greenwood Press, 1978.
- ❑ Johan Schot and Arie Rip, “The past and future of constructive technology assessment”
- ❑ *Technological Forecasting and Social Change*, Volume 54, Issues 2-3 , February-March 1997, Pages 131-143, *Technology Assessment: The End of OTA*.
- ❑ O.H. Bray, M.L. Garcia, *Fundamentals of Technology Roadmapping*, SAND97-0665, Sandia National Laboratories, Albuquerque, NM, 1997, Available at: <http://www.sandia.gov/PHMCOE/pdf/Sandia%27sFundamentalsofTech.pdf>.