



Online Ethics Center
FOR ENGINEERING AND SCIENCE

Governance Subject Aid

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Year

2017

Description

A short guide to some key resources and readings on the topic of the ethics of governance in science and engineering.

Body

'Governance' refers to the process of governing and it encompasses the term 'government.' Government denotes the state and its institutions. In contrast, 'governance' refers to those entities as well as the formulation of rules and organization of social practices. Markets, governments, or networks may engage in governance over family, territory, or commercial enterprise and the governance may take the form of laws, norms, language or power (Bevir 2013).

Governance includes neoliberal reforms. Neoliberalism is an economic and political theory that advocates privatization of many state responsibilities and a regulatory structure that advances commercial interests (Harvey 2005). In the interest of drastically reducing the public sector, many nations began relying on the market, public-private entities, non-governmental organizations and networks to provide citizens with basic goods and services (Bevir 2009). With non-state actors taking on

state responsibilities, states have focused on auditing and regulating those entities.

In various nations (including the United States), federal agencies play a role in supporting and shaping scientific and technological research and development (R&D). Private for-profit and non-profit organizations conduct R&D with funding from these agencies or using their own resources. In exercising their governance responsibilities, the personnel of agencies and organizations (including managers and researchers engaged in R&D projects) may examine the issues and implications associated with research and development practices and results. They may consider benefits, harms, risks, and costs associated with them, engage stakeholders in assessing the activities and their likely results, and revise plans as appropriate. It is questionable whether governance is always accountable to the public or attentive to social justice and inclusiveness issues.

Governance of technology is also shaped by the dominant conception of technology. Philosophers of technology have been particularly critical of the conception of technologies as value neutral because it overlooks the possibility that certain technologies are value laden. Their use entails particular configuration of socio-political relations or they may have been designed to instantiate specific socio-political ends. The notion of technological determinism has also been critiqued by philosophers of technology. They have rejected the idea that the development and function of technologies is independent of their social context (Feenberg 2002).

For an extended discussion of different strains of philosophy of technology, including ethical and social dimensions of technologies, see entry in *Stanford Encyclopedia of Philosophy*, Philosophy of Technology, section 3 Ethical and Social Aspects: <https://plato.stanford.edu/archives/sum2016/entries/technology/#DevEthTec>

See also subject aids [Responsible Innovation](#), [Public Wellbeing](#), and [Sustainability](#).

Subject Overviews

Barben, Daniel, Erik Fisher, Cynthia Selin, and David H. Guston. 2008. "38 Anticipatory Governance of Nanotechnology: Foresight, Engagement, and Integration." In *Handbook of Science and Technology Studies*. Edited by Edward J. Hackett, Olga Amsterdamska, Michael E. Lynch, and Judy Wajcman, 979-1000. Cambridge: MIT Press.

http://cspo.org/legacy/library/090501F5DQ_lib_STSHandbookBarbe.pdf

Some new and emerging technologies have the potential to “remake social, economic, and technological landscapes.” As one such, nanotechnology provides an opportunity to take new approaches to the conduct of research evaluation and assessment incorporating a variety of stakeholders and potential users in shaping the directions and outcomes from this innovative development. This chapter provides an overview of the issues and approaches that can be brought to bear in considerations for its support.

Bevir, Mark. 2009. *Key concepts in governance*. Sage. Published on-line 2012. DOI: <http://dx.doi.org/10.4135/9781446214817>

The monograph introduces the technical concepts and policies of contemporary governance through short definitional essays. Each entry features a snapshot definition of the concept, a contextualization of the concept, an overview of relevant debates, and a guide to further reading. A substantial introductory chapter gives an overview of governance studies as a whole, orientating and guiding the reader around the issues that the concepts address.

Bevir, Mark. 2013. *A Theory of Governance (Studies in Governance)*. Global, Area, and International Archive. University of California Press. <http://escholarship.org/uc/item/2qs2w3rb>

The author integrates and updates previously published essays and advances a decentered theory of governance that emphasizes diversity and change in governing practices and the importance of historical explanations of these practices.

Feenberg, Andrew. 2002. *Democratic Rationalization: Technology, Power, and Freedom*. Scharff, R.C. and Dusek, V. eds., 2013. *Philosophy of technology: The technological condition: An anthology*. John Wiley & Sons.

Feenberg argues for the view that both radical technical and political change together is required if democracy is to exist in today’s states and governing institutions, including the institutions that produce the technologies on which modern societies depend.

Franssen, Maarten, Lokhorst, Gert-Jan and van de Poel, Ibo. "Philosophy of Technology" *Stanford Encyclopedia of Philosophy*. 2013, 2009. Edward N. Zalta (ed.) Access in the Fall 2015 Edition Archive.

<https://plato.stanford.edu/archives/fall2015/entries/technology/>

This entry contains an extended discussion of different strains of philosophy of technology, including ethical and social dimensions of technologies and their implications for governance.

Harvey, David. (2005). *A brief history of neoliberalism*. Oxford University Press, USA.

Through critical engagement with this history, the author tells a political-economic story of the origins of neoliberalism and its proliferation. He constructs a framework for examining its political and economic dangers and for assessing the prospects for more socially just alternatives being advocated by many oppositional movements.

MacKenzie, Donald and Wajcman, Judy. 1999. *The social shaping of technology*. Buckingham, England: Open University Press.

This second edition contains an introductory essay elaborating various pathways to the social shaping of technology and further contributions illustrating its main themes. The remainder of the volume contains essays on the themes of production, reproduction, and destruction - examining the social relationships that promote those ends.

Wajcman, Judy 1991. *Feminism confronts technology*. University Park, PA: Penn State University Press. Previewed August 7, 2017

<https://books.google.com/books?id=BtaiFSv09jMC&printsec=frontcover#v=onepag>

In this study the author challenges the assumption that technology is gender neutral and analyzes its influence on the lives of women. She argues that ideology and culture has promoted exclusion of women from developing technological skills. The political struggles over reproductive technology as well as technologies affecting domestic work, paid labor, and the built environment are the focus of this book.

Policy and Guidance

InterAcademy Council. 2012. *Responsible Conduct in the Global Research Enterprise*. <http://www.interacademies.org/33362.aspx>

A global research enterprise is emerging with millions more scientists and engineers working throughout the world than there were just two decades ago. Many countries now invest substantial sums in scientific, engineering, medical, social science and other scholarly research. Multinational research teams are on the increase. In this new global context, shared scientific core values and norms are important for both the research community and the broader public. Yet significant differences among countries have been revealed in the definitions of and approaches to the conduct of responsible research.

The world's national scientific academies are addressing these urgent issues through their representative international organizations, the InterAcademy Council (IAC) and the IAP – the global network of science academies. This report, sponsored by IAC and IAP, represents the first joint effort by the scientific academies to provide clarity and advice in forging an international consensus on responsible conduct in the global research enterprise. It acknowledges and draws on information and recommendations from the many national and international organizations that have issued guidelines and statements on the basic responsibilities and obligations of researchers.

Fisher, Erik, Roop L. Mahajan, and Carl Mitcham. 2006. "Midstream modulation of technology: governance from within." *Bulletin of Science, Technology & Society* 26(6): 485-496.

Public “upstream engagement” and other approaches to the social control of technology are currently receiving international attention in policy discourses around emerging technologies such as nanotechnology. To understand the implications of policy for research and development (R&D) activities, the participation of scientists and engineers is required. Their capabilities can be enhanced by broadening their perspectives on how to conduct R&D and what its results might be. This article reviews various historical attempts to govern techno-science and introduces the concept of midstream modulation, through which scientists and engineers, ideally in concert with others, bring societal

considerations to bear on their work.

McLeish, Caitríona, and Paul Nightingale. 2007. "Biosecurity, bioterrorism and the governance of science: The increasing convergence of science and security policy." *Research Policy* 36(10): 1635-1654.

Science and security policy increasingly overlap because of concerns that legitimate research might be misapplied to develop biological weapons. This has led to an expansion of security policy to cover broad areas of research and scientific practice, including funding, publishing, peer-review, employment, materials transfer, post-graduate teaching and academics' ability to design and perform experiments and disseminate research. Such changes raise policy concerns because many of the technologies used to produce biological weapons are 'dual use' and have legitimate peaceful applications. As a result, attempts to control the technologies can have negative impacts on socially beneficial applications. This paper explores recent changes in the governance of science and technology and contributes to future policy making by assessing the relative merits of understanding the development of dual use policy in terms of either technology transfer or technology convergence.

Bibliography

Laas, Kelly. 2016. OEC Emerging Technologies Bibliographies.

<https://onlineethics.org/cases/emerging-biotechnology-collection/emerging-biotechnologies-bibliography>

A set of partially-annotated bibliographies including biotechnology, brain implants, geoengineering, nanotechnology, robotics, and synthetic biology.

Racine, Valerie. 2017. OEC Emerging Biotechnologies Bibliography. Authoring Institution: Center for Biology and Society at Arizona State University.

<https://onlineethics.org/cases/emerging-biotechnology-collection/emerging-biotechnologies-bibliography>

A bibliography that includes books, journal articles and web sites looking at the ethics of emerging biotechnologies, and including sections on synthetic biology, CRISPR-Cas9 and other genomic editing technologies, and genetic screening and genetic modification in embryos. It includes a few more general references

to emerging technologies.

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