Tech Ethics for Sustainable Development

William E. Kelly, P.E., Ph.D. (Retired)

Abstract

Science, technology, and innovation (STI) are expected to underpin achievement of most if not all of the Sustainable Development Goals (SDGs). The importance of ensuring ethical research and practice in artificial intelligence (AI) has been receiving the most attention recently but ethics must be and be perceived by all stakeholders to be a core value in all STI research and practice sectors. Codes of ethics so called soft law instruments are an important tool but probably are not sufficient for protecting the public against unethical practice. Part of the reason is codes of ethics unless incorporated in government regulation lack significant penalties and are not enforceable. To ensure ethical practice some forms of hard law will be needed for example licensing or certification of researchers and practitioners, or certification of products and systems. There is no shortage of resources available for teaching and learning about tech ethics including extensive resources in the UN system. Tech ethics needs to become a core theme for the UN's Technical Facilitation Mechanism if the important role that technology must play in achieving the SDGs is to be realized and recognized and accepted by all stakeholders.

Introduction

One expectation for the Science and Technological Community Major Group in Agenda 21 was to ensure the availability of appropriate ethical principles and codes of practice and to promote their use.[1] In 1992, the concerns and focus were environment and environmentally friendly technologies and traditional fields of science and engineering. Today the concerns are for high tech and its societal and economic impacts. This calls for updated codes of ethics and practice and updated approaches to ethics in science and technology if the important role that technology must play in sustainable development is to be realized and accepted by society. We have learned a lot about STI from the COVID experience, but it is very clear that the society's acceptance of new technologies is still problematic.[2]

Background

Agenda 21 highlighted the need for environmental stewardship to reduce impacts on human health and the environment, for managing natural resources, and for agriculture. Partly in response, the World Federation of Engineering Organizations (WFEO) developed its Model Code of Ethics[3] and later Model Codes of Practice for Sustainable Development[4] and Principles of Climate Adaptation. WFEO is currently in the process of updating its Model Code of Ethics.

Today's engineering codes of ethics and practice give appropriate attention to the impacts of technology on the environment but the broader impacts of technology - economic and social - are only indirectly addressed.

Also, there is broad agreement that codes of ethics and practice are needed for the entire tech community not just for engineering. Many technology practitioners

[1] Agenda 21 https://sdgs.un.org/publications/agenda21
[2] Editorial: The Real Technology Revolution: Technology Justice https://link.springer.com/article/10.1057/s41301-019-00230-3
[3] WFEO Model Code of Ethics https://www.wfeo.org/code-of-ethics/
[4] WFEO Model Code of Practice for Sustainable Development and Environmental Stewardship https://www.wfeo.org/the-code-of-practice-for-sustainable-development-and-environmental-stewardship/

are not engineers or scientists and may have had little or no exposure to codes of ethics and practice in their education and training. Also, the tech community is much broader than engineers and technologists and includes lawyers, entrepreneurs, and business leaders. All of society is the tech stakeholder community.

The area receiving the most attention currently is artificial intelligence (AI); see e.g., Chapter 2 in the DESA Resource Guide ON ARTIFICIAL INTELLIGENCE (AI) STRATEGIES.[5] AI researchers and practitioners include formally educated engineers and scientists but also practitioners with no formal education.

New and updated codes of ethics and practice, so called "soft law" are needed but other approaches including hard law instruments are also needed. It would also be desirable to make stewardship part of the culture of technology for the human-built environment as it is for the natural environment.

The Engineering Change Laboratory has developed its Tech Stewardship program to do this.[6] Tech stewardship is a movement for sharing and mutual support with the goal of ensuring that tech practice serves societal needs in an ethical way.[7] The Tech Stewardship Practice Program (TSPP) builds capacity to practice and supports practitioners.[8] Transforming engineering and technology practice to make tech stewardship the new norm is a key to achieving the SDGs both to support development and implementation of the needed technologies and to ensure stakeholder acceptance and support.

The World Commission on the Ethics of Scientific Knowledge and Technology (COMEST) was set up by UNESCO in 1998.[9] COMEST works in several high-tech areas. Part of its work program for 2022-2023 is to "... address the topic of the Ethics of Climate Engineering, including its importance for the sustainable development agenda." The Secretary-General's Roadmap for Digital Cooperation outlines some of the human rights challenges to overcome to exploit the full power of AI in achieving the SDGs.[10] The challenge of financing digital public goods is recognized but probably equally important are ethical procurement practices for all public goods.

The UN has made good progress on this with its anti-corruption programs that civil society organizations have cooperated on.

ISO Standard 37001 Anti-Bribery Systems (soft law) is an example of what can be done to support ethical procurement practice.[11] The American Society of Civil Engineers (ASCE) has recently published a report on procurement practice for sustainable infrastructure.[12] Sustainable and resilient infrastructure systems critical to the world's growing cities depend on digital sub systems. The World Federation of Organizations (WFEO) Committee on Anti-Corruption is supporting a number of international efforts.[13] One of those activities is an online anti-corruption training module with the Global Infrastructure Anti-Corruption Centre (GIACC). [14]

UN agencies have extensive resources for ethics education. UNODC has a free module series on integrity and ethics[15] One of the modules is on "... methods and approaches to strengthening integrity in the public sector." Another UNODC module series is on anti-corruption.[16] These modules are part of GRACE - Global Resources for Anti-Corruption Education and Youth Empowerment.[17] The UN Institute for Training and Research (UNITAR) has a

[5] UNDESA UNSG Resource Guide ON ARTIFICIAL INTELLIGENCE (AI) STRATEGIES https://sdgs.un.org/documents/resource-guide-artificial-intelligence-ai-strategies-25128
[6] Tech Stewardship https://programs.techstewardship.com/
[7] FAQ Tech Stewardship https://programs.techstewardship.com/pages/faq
[8] FAQ Tech Stewardship Practice Program https://programs.techstewardship.com/pages/faq
[9] UNESCO COMEST https://www.unesco.org/en/ethics-science-technology/comest
[10] UN Secretary-General's Roadmap for Digital Cooperation https://www.un.org/en/content/digital-cooperation-roadmap/
[11] ISO 37001 Anti-Bribery management systems https://www.iso.org/iso-37001-anti-bribery-management.html
[12] ASCE Sustainable Procurement for Infrastructure https://www.asce.org/publications-and-news/civil-engineering-source/article/2020/12/07/sustainable-procurement-the-first-step-toward-sustainable-infrastructure
[13] WFEO Committee on Anti Corruption http://www.wfeo.org/committee-anti-corruption-sdgs/
[14] WFEO GIACC Short Course on Anti-Corruption http://www.wfeo.org/committee-anti-corruption-sdgs/
[15] UNODC Module Series on Integrity and Ethics https://grace.unodc.org/grace/academia/module-series-on-integrity-and-ethics.html?lf_id=
[16] UNODC Mosule Series on Anti-Corruption https://grace.unodc.org/grace/academia/module-series-on-anti-corruption.html?lf_id=
[17] UNODC GRACE https://grace.unodc.org/grace/en/index.html

wide selection of free courses for the public.[18] UNITAR will have a course for a fee starting in spring 2023 on ethics in public finance.[19]

Ethics education for engineers, technologists, and technicians is a requirement in the International Engineering Alliances (IEA) Graduate Attributes and Professional Competencies.[20] The latest version was developed by IEA with the support of WFEO and UNESCO. Accreditation criteria for members of the IEA must ensure that graduates of accredited programs achieve the expected ethics knowledge and competence. There are extensive resources available to support ethics education in engineering and technology. An example of a free online resource is the Online Ethics Center at the University of Virginia formerly at the U.S. National academy of Engineering.[21]

As suggested earlier, soft law - codes of ethics - will not be sufficient; appropriate regulation is needed. The concern is that the penalty for violations of codes of ethics - typically loss of organizational membership - is not a sufficient deterrent to unethical research and practice. Licensing that embodies a code of ethics or practice is one approach that is used in engineering. In this case, conviction of an ethical violation following due process can lead to loss of license and the loss of the right to practice in a jurisdiction.

Certification of tech researchers and practitioners is another approach. Professional certifications are common in many tech sectors. Certifications can be accredited, and companies and government agencies can require service providers to use only researchers and practitioners with appropriate accredited certifications.

Approaches other than licensing and certification for individual researchers and practitioners are needed and are being explored. Approaches include voluntary- consensus standards for tech products and systems, and voluntary third-party conformity assessment for tech products and systems.

Recommendations

- The UN should partner with the STC MG to promote tech ethics education for students and practitioners.

- The UN should make the ethical practice of science, technology, and innovation a core message for the Technology Facilitation Mechanism.

- The UN should consider using its conventing power to bring together member states and all stakeholders to chart best ways of ensuring ethical tech research and practice across all sectors.

[18] UNITAR Free and Open Course for the Public https://www.unitar.org/free-and-open-courses
[19] UNITAR Ethics in Public Finance https://unitar.org/courses/ethics-public-finance-2022-4341

[20] IEA Graduate Attributes and Professional Competencies https://www.ieagreements.org/assets/Uploads/IEA-Graduate-Attributes-and-Professional-Competencies-2021.1-Sept-2021.pdf
[21] UVA Online Ethics Center (OEC) https://onlineethics.org/