Technology Transfer: A Shortcut in Danger of Short Circuit

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Abstract

At cocktail parties, in board rooms, at workstations, in classrooms, and in government offices, "technology transfer" is bandied about as if it were some natural phenomenon, a technological tsunami overwhelming everything in its path. Technology transfer, it is sometimes suggested, is an El Niño in business, government, industry, and even education decision-making, and for some it has meant disruption, dislocation, and danger. For others, technology transfer has been the vanguard of progress and an inexhaustible fountain of productivity, empowerment, and convenience. For all, "technology transfer" today is too often a personal shortcut in our communication that points to unintended meanings or implications. Just what is "technology transfer," anyway?

To move beyond knee-jerk advocacy or damnation of technology transfer on the questionable basis of faith, and to lay out a new dimension to the definition, understanding, and acceptance of technology transfer that is clear and understandable to any layman, is the purpose of this paper. It is based on a selective yet careful web search, since the Internet World Wide Web is a principal source for information in the growing debate about public policy issues.

The Luddites among us cannot be saved; those who champion technology transfer, however, can be reformed. All it will take is first a brief acknowledgment of the dilemma that we find ourselves in: our language (to which we somewhat arrogantly attribute precision and clarity as the language of "science") cannot keep up as a reliable instrument of mass communication. Second, we need more and plainer language as common reference points for widespread understanding of arguably one of the most important social, political, and economic trends of our time: technology transfer. And, finally, we must make plain what we are talking about. We must make plain what we say and what we mean.

That task is made more urgent by the fairly recent leap from cubicle-to-cubicle communication to commonplace continent-to-continent communication. This paper is built upon the premise that anything as important as technology transfer ought to be clearly understood by everybody. While it may be in the self-interests of practitioners of the arcane arts (e.g., physicians, engineers, bureaucrats, economists) to maintain a certain mystery and detachment, it is not in the public interest for "technology transfer" to be misunderstood. Indeed, public support and acceptance depends on understanding "technology transfer," those of us who are engaged professionally in technology transfer activities have a special responsibility to define our terms clearly and explain our work plainly.

What did "technology transfer" mean when that phrase was first coined? Who used it, in what contexts, and why? What does "technology transfer" mean today? Who talk about it, in what contexts, and why? What will "technology transfer" mean next year?

Lawrence Rudolph has given a succinct account of the early use of "technology transfer" (Rudolph.html). He begins with the federal government, naturally enough, because, at least thirty or so years ago, (1) that's where the technology was and because (2) that's where, like Willie Sutton's famous bank, the money was. Here is how Rudolph characterized the history of technology transfer:

Despite a Presidential Memorandum on Government Patent Policy issued by President Kennedy in 1963 and revised by President Nixon in 1971,
there was no uniform government-wide treatment of inventions [until] the Bayh-Dole Act of 1980 required agencies to adopt what was then referred to as a "title in contractor" policy for small businesses and nonprofit organizations, such as universities. Thus, small businesses and nonprofit organizations were given a statutory right to choose to retain title to inventions made during federally assisted research and development (R&D) so long as they were interested in patenting and attempting to commercialize those inventions... 

President Reagan issued a February 1983 "Government Patent Policy" memorandum, as a result of the Administration's lack of success in persuading Congress to expand the Act's coverage. Agencies not prohibited by statute were directed to treat all contractors, not just small businesses and nonprofit organizations, in accordance with the Act, thus expanding coverage to individuals and contractors of all sizes...

Few persons outside the federal government, and not many within, realize that three sections of Stevenson-Wydler [an Act that complemented Bayh-Dole] established rules for protecting and licensing federally owned inventions. Stevenson-Wydler required agencies to establish Offices of Research and Technology Applications (ORTAs) at their federal laboratories, and to devote a percentage of their R&D budgets to technology transfer. Another aspect of Stevenson-Wydler was the establishment of a Center for the Utilization of Federal Technology, which, in turn, coordinates ORTAs. This Center was established within Commerce, but, in 1986, was reassigned to what is now the National Institute of Standards and Technology (NIST)....

To implement the Federal Technology Transfer Act, President Reagan issued Executive Order 12591, "Facilitating Access to Federal Technology," in April 1987. It directed federal agencies to encourage cooperative research and technology transfer through their laboratories. It also required technology access and IP protection to be considered in negotiating R&D agreements with foreign individuals or governments. This requirement is important in efforts to persuade other nations to provide, in law and practice, effective protection for IP and to allow U.S. scientists and engineers into their laboratories....

The National Competitiveness Technology Transfer Act of 1989 amended the section governing CRADAs to authorize DOE GOCO laboratories to enter into CRADAs on the same basis as its GOGOs. It also created an exemption from the Freedom of Information Act for certain categories of information developed during cooperative research, permitting federal laboratories to withhold such information from disclosure for a specified period....

The American Technology Preeminence Act of 1991 made minor amendments to Stevenson-Wydler, e.g., extending it to legislative branch agencies and modifying required CRADA terms.

For our purposes, a review of the exhaustive history of technology transfer is unnecessary. Indeed, its history is notable only because of its exhaustiveness. From all this history, we may infer that technology transfer is more about ownership than it is about technology, and that technology transfer, strictly speaking, began as a legal concept but has expanded to cover, in one form or another, the entire relationship of the Government of the United States to those private individuals and private companies that choose to do business with it. As it happens, that includes just about everybody.

Let us take a look at an obvious player in technology transfer, the Federal Laboratory Consortium for Technology Transfer, which was formed a quarter of a century ago (FLC tdef.html). The FLC itself, it can be seen, has grappled with a meaningful definition of technology transfer:

Many definitions of technology transfer have been developed to suit the needs of the individual organizations or activities. The FLC, operating as a consortium of its members, maintains a definition which will accommodate all of its member departments and agencies, and their laboratories and centers. Within the FLC, technology transfer is defined as:

The process by which existing knowledge, facilities or capabilities developed under federal R&D funding are utilized to fulfill public and private needs. [Emphasis added.]

Although this process can be very simple or quite complex, it basically involves a technical resource (e.g., federal laboratory), a user (e.g., small business), and some interface connecting the two.

Even within the FLC, the approach used by the individual laboratory varies. Technology transfer remains part "science" and part "art," requiring an FLC representative to select an operating mode which works for him/her, the laboratory, and the clientele.

"Technology transfer" includes a range of formal and informal cooperations between federal laboratories and the public and private sectors. The purpose of the transfer is to strengthen the nation's economy by accelerating the application of federal laboratory technology and resources to private and public needs and opportunities. Product improvement, service efficiencies, improved manufacturing processes, joint development to address government and private sector needs, and the development of major new products for the