

Dr. Courtney Silverthorn
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National Institutes of Standards and Technology
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February 5 Comments on the Return on Investment Initiative Green Paper

Dear Dr. Silverthorn,

I submit this letter as a replacement of my January 9th letter, as at that time, I had not yet read the NIST GCR 18-017 report “The Economic Impacts of the Advanced Encryption Standard”.

Thank you for the impressive and thoughtful work that went into producing the Green Paper, and the opportunity to provide feedback on it. The document itself sheds light on federal technology transfer practices and policies and as such is inherently valuable.

I agree with the comments provided by AUTM and offer some additional comments labeled to correspond to the Intended Action “IA” reference.

In addition, I believe that there are leadership opportunities for NIST in facilitating the use of secure data (IA8 and IA9), and in advancing our methods for valuing cost saving technical advances (IA15).

POTENTIAL LEADERSHIP OPPORTUNITIES FOR NIST IN DATA POOLING

Digital security:

Kudos to NIST for the role they have played <https://www.nist.gov/publications/economic-impacts-advanced-encryption-standard-1996-2017> and continue to play <https://www.nist.gov/news-events/news/2019/01/nist-reveals-26-algorithms-advancing-post-quantum-crypto-semifinals> in encryption and data sharing standards.

Value creation by facilitating the application of deep learning to training sets:

In my experience, value creation is being delayed by a lack of experience on how to share and license data and training sets, in part because of valid privacy and confidentiality concerns, and in part because of reasonable uncertainty about “fair” use and “fared” use. The most relevant article on this topic I found so far is about artistic works “*Artificial Intelligence's Fair Use Crisis*” https://papers.ssrn.com/sol3/papers.cfm?abstract_id=3032076

This topic was discussed at the recent Boston LES meeting, and both practical as well as ethical issues came up. One panelist remarked that they were waiting for an “evolving consensus” on how to share, even temporarily (as is the case for use as a training set) certain data. The NIH played a key role in developing a consensus regarding materials transfers. I urge NIST to take a leadership role in developing a consensus regarding the secure, fair and “fared” uses of pooled data.

IA3C and IA3D, on expanding the need to apply for a waiver to foreign nonexclusive licenses:

These intended actions items are counterproductive, interfering with Goals 2 and 3 in particular, and will lead to an overall reduction in our returns on federal research investments.

Licenses with and without exclusivity serve very different roles in the innovation ecosystem.

As noted in the AUTM comments, nonexclusive licensing is often done when products are close to launch, or after they were introduced into the marketplace. Not surprisingly, nonexclusive licenses tend to be executed longer after the patents are issued or filed. The technologies literally are, as a group, more mature, and for whatever reason were not licensed closer to the time of initial conception and reduction to practice. In contrast, licenses with some exclusivity in them (exclusivity can be nuanced by technical field, market, geographical location, or any other term the parties define) act more as commercial development incentives, attracting private sector dollars.

Consequently, it is reasonable to incentivize domestic manufacture via prudent and thoughtful granting of licenses with exclusivity, as the licenses themselves are commercial development incentives for not yet developed technology. Since nonexclusive licenses for the most part are not development incentives, placing too many hoops between a potential paying nonexclusive licensee, who may already be commercializing or close to commercializing the product, may have no to little effect on the location of manufacture of the product, while depriving the technology owner of some revenue, the inventor of the satisfaction of knowing that their invention is commercially relevant, and potentially, in due course, an ability to build a more engaged, and domestically based relationship with the nonexclusive licensee.

IA3A and IA3B, on streamlining the waiver process:

Licenses with exclusivity in them tend to have enforceable diligence in them, - so called use it or lose it provisions. Nonexclusive licenses seldom do, and if they are present, are considerably weaker. Because of the diligence provisions, public availability may, under certain circumstances, be better served by a committed foreign licensee than by no licensee, or by an uncommitted domestic one. Thus, providing an opportunity to request a waiver to the domestic manufacture requirement for licenses with exclusivity in them is a reasonable and useful aspect of the technology transfer system.

IA4 and IA5:

Kudos to NIST for recognizing the growing importance of software, data and trade secrets to the U.S. economy, and for supporting expanding copyright protection available for federal laboratory software, and for taking steps to more uniformly and predictably secure and manage private sector trade secrets which may be shared with federal laboratories.

IA9, expression of concern:

I am not an expert on the reasons for there being such a large variety of technology transfer contract types, or the need for an even larger variety. However, a large and growing proliferation of contract types, (Appendices 1 and 2 of the Green Paper), adds to the confusion of potential

partners, and complicates Goal 5.

As a taxpayer, some of the terms in Appendix 2 are concerning, particularly if federal laboratories are being asked to produce commercial deliverables for funders.

Explain the need, if there is one, for additional contract types before further complicating the current situation, lest we never understand it enough to streamline, improve, or benchmark it.

IA13, 14, and 15, general:

We want and need a mix of customized measures by and for our community, and measures which are recognized as standard economic measures for national and international communication.

Approaches to valuing cost saving or cost avoidance technologies are less well developed than those designed to assess value creation. NIST may be uniquely positioned to take a leadership role in this area.

One of AUTM's strengths has been the engagement of its members. Updates to tools must include significant and ongoing input from the users the tools, including explicitly, federal laboratory technology transfer practitioners and AUTM member technology transfer practitioners. Updates to measures must include input from both the providers and the users of the data elements.

In due course, we, as a nation, should be aiming for a single system which evolves slowly, and which, in addition to tracking research inputs also tracks downstream results. The current list of things to count and observe; research expenditures, invention disclosures, intellectual property protection, license contracts, companies formed to commercialize technology, products or services introduced which use the licensed technology, and earned royalties is useful if incomplete. The existence of a single system does not preclude other approaches, -just that there should be a set of standard measures lest we leave ourselves with no basis of comparison.

Timelines, -how long things take, are a highly underutilized performance metric. They are objective and readily available. The issue has simply been indexing, or associating sequences of dates to form a commercialization narrative.

In due course, we should involve the Science and Engineering Indicator team and resources.

In due course, we should be aware of innovation metrics developed by the OECD and consider incorporating them. One interesting example is triadic patent families, patent families where there is a US, European, and Japanese family member. <https://data.oecd.org/rd/triadic-patent-families.htm> While these foreign patents may be an indication of foreign manufacturing, or sales, or use, or importation, they do provide revenue back to a U.S. entity, and are very interesting and useful indicators of trends.

Additional IA 13 recommendation:

I support the requirement to state the appropriate alphanumeric indicators of funding contracts on the face of patents so they are easily searchable and findable.

Additional IA 13 recommendation:

I support a single name for federal reporting entities. One of the challenges of simply finding and counting patents of universities and federal agencies is the profusion of names used by the same entity, due primarily to significant variation in abbreviations used.

IA14, A and B:

I express mild support creating such a portal, or potentially joining forces with AUTM and using AUTM's portal, particularly if the portal adds to inventor engagement. However, simply posting technologies, especially nonconfidentially, as they must be, in my experience is not particularly useful.

Inventors often have the best insight into potential commercialization partners, and so called rifle shot marketing is more effective than broad brush marketing. That said, anything which encourages interaction between the inventors and potential partners from the commercial sector is good, and often simply preparing the description for the posting engages the inventors in a way they may not have been engaged previously.

To the extent that the portal fosters engagement and involvement it is a plus. If instead it is seen as a compliance chore, it will accomplish little and decrease efficiency and time spent actually commercializing the technologies.

Personal interactions, such as those contemplated by IA11, are in my view, more important.

IA15:**Additional IA15 comments:**

Models and data evolve in concert, providing that consistent definitions are maintained, and only changed after a great deal of thought and discussion, and then well documented. AUTM has conducted a survey, with integral Instructions & Definitions, by and for its members for more than two decades.

From what I have been able to observe, the federal laboratories do not have an analogous effort, and this has frustrated efforts to gather meaningful data about federal laboratory technology transfer.

The federal technology transfer practitioners must have a say in the data elements they report and they must use consistent definitions. If this cannot happen, then all involved are wasting their valuable time.

From what I have been able to infer from Appendix 2 of the Green Paper, it appears that a significant form of federal laboratory technology transfer is privately funded contract research at the federal laboratories, -what a university would call sponsored research. Research associated with license agreements (for example, a requirement to fund work at the university could be one of the forms of diligence) used to be a data element in the AUTM survey. In part, because many technology transfer offices did not track the actual amount of sponsored research in their databases, this was dropped from the AUTM survey, though offices often chose to report it in

their annual reports as a sign of commercial engagement and overall contribution to the university research base.

Additional IA 15 recommendation:


At least on a trial basis, include total private sector contract research expenditures in federal laboratory metrics. If the contract itself is reported, whether as a CRDA, SPP, ACT, or other contract, type, and funds are paid from the for profit partner to the federal laboratory, this fact and the aggregate sum should be reported and acknowledged as an important indicator of commercial engagement (provided of course that confidentiality can be properly maintained).

Consider using Pajek diagrams to illustrate growing public private commercialization networks.

Consider using Pajek diagrams to illustrate the growing network of users and beneficiaries of NIST's cryptographic validation program. Providing confidentiality can be maintained, show the number of new and repeat users, potentially characterized by size, type or sector. Such an illustration could show the growth of secure data transmission and storage in the United States.

Thank you for your thoughtful consideration of these comments and for the vitally important work NIST does on our behalf.

Respectfully,



Lori Pressman