

I. INTRODUCTION

Statistics show that there is a positive correlation between research, innovation, and U.S. economic prosperity.⁵ In general, R&D expenditures in the U.S. are increasing. Total U.S. investment in R&D was approximately \$264 billion in 2000. Since the 1980s, industry's investment in R&D has been increasing, reaching about \$179 billion in 2000. The Federal Government is a major sponsor of R&D in the U.S. providing approximately \$83 billion in funding in 2000 of which DoD's portion was approximately \$39 billion.⁶ The number of U.S. patents, including federal as well as non-federal, is continuing to rise reaching nearly 155,000 in 1998.⁷ Patent licensing revenue was well over \$100 billion in 1998 and experts predict that the licensing of patents is a practice still in its infancy. These experts also predict that revenues could exceed a half-trillion dollars within the next five years.⁸

Trends have emerged over the last several years that significantly affect the accessibility of DoD research to the private sector. DoD R&D, as well as that of the Federal Government as a whole, leads to the creation of new products and processes that can be patented and commercialized. Industry oftentimes prefers to leverage their own R&D efforts by exchanging ideas, accessing unique facilities, and building on the work the DoD labs have done.⁹ Licensing DoD technologies is a mechanism that industry can use to gain access to DoD inventions and then further develop them into commercial products. In licensing technology for commercial applications, it is envisioned that economies of scale will result, therefore decreasing the purchase price of components using the same technology for military applications.

The purpose of technology transfer is to make federally generated scientific and technological developments accessible to private industry and the state and local governments. The users are then encouraged to develop the technology further into new products, processes, materials, or services that will enhance the nation's industrial competitiveness or otherwise improve the nation's quality of life. Licensing DoD technologies, further developing them, and bringing them to commercialization is one means of accomplishing technology transfer.

Legislation is increasingly encouraging the licensing of DoD technologies by the private sector. Legislation that first impacted patenting activities in DoD was the Stevenson-Wylder Technology Innovation Act of 1980 which permitted DoD to negotiate license agreements for inventions developed in their laboratories. This act was followed by the Federal Technology Transfer Act of 1986 which authorized DoD laboratories to waive the right of ownership which the Federal Government may have to any subject invention made by a collaborating party, furthering the appeal of establishing working relationships between the private sector and DoD. The National Technology and Advancement Act of 1995 revised provisions regarding title to intellectual property arising from CRADAs allowing the collaborating party to choose an exclusive license for a pre-negotiated field of use for any invention developed under the agreement. Most recently, the Technology Transfer Commercialization Act of 2000 further improves the ability of Federal laboratories to license federally owned inventions by providing for public notification for at least 15 days before a license is granted. In addition, it requires that the applicant make a commitment to achieve practical utilization of the invention within a reasonable time and requires periodic reporting on the use of the invention by the licensee. It also sought to simplify the procedure for private industry to license federally developed technologies.

As part of a study¹⁰ conducted by David Roessner et al., industry Chief Technology Officers (CTOs) and R&D managers that were interviewed indicated that the greatest increases in interactions between industry and the Federal laboratories were in contract research, cooperative research, and licensing. These responses suggest that the legislative incentives intended to foster cooperative research with potential commercial applications are having a positive effect. The reasons given for the increase in interactions with Federal laboratories included the greater pressure on companies to look for outside expertise and technology as well as the increased aggressiveness by Federal laboratories in reaching out to industry.

Aside from the revenues that are realized by DoD laboratories by licensing their inventions, there is widespread belief that patenting and licensing promotes innovation and knowledge sharing. Inventions can build on one another, therefore leading to new innovations. The marketing of patents is an important function, for marketing not only brings in revenue to the laboratories in the form of royalties, but also incentivizes inventors by allowing them to share in the royalty income and promotes innovation from which new inventions can be born.

For this study DDR&E is interested in understanding what is being accomplished through the licensing of DoD technologies and the impact licensing is having on the DoD laboratory missions. It is inherent that the marketing of patents is directly related to the number of PLAs negotiated in a given year. Therefore, there is interest in learning what patent marketing approaches are being used in the various DoD labs and what successful approaches other Federal laboratories and academia are using that may be applicable to DoD. In addition, with declining laboratory budgets, it is not feasible that payment of maintenance fees on all patents can continue. Laboratories need to have a patent prioritization process in place to prune those patents that may not be in their best interest to have in their portfolio. Therefore, DDR&E is interested in documenting and sharing practices in this area.

It is the objective of this study to evaluate a sample of DoD PLAs to assess the benefits that DoD is reaping from the licensing of technologies to the private sector. In addition, this study will investigate a series of patent marketing approaches and identify those practices that DoD laboratories can learn from and adopt as appropriate. This report begins with a description of the PLA selection process as well as an outline of the data gathering methodology followed by an overview of technology transfer legislation and the trends in patenting and licensing in DoD. The importance of patent marketing, followed by a discussion of patent marketing approaches being used in academic and DoD laboratories, is also highlighted. Benefits to DoD from its licensing activities, findings associated with DoD licensing and patent marketing approaches, and general insights on licensing and patent marketing are presented. Summaries of each of the PLAs evaluated in this study, interview guides, Point-of-Contact lists, and a bibliography are provided in the appendices.

