
Editorial

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Biographical notes: Rajesh Srivastava obtained his PhD Degree in Operations Management from The Ohio State University. He is currently on the Faculty of the Department of IS and Operations Management in the Lutgert College of Business at Florida Gulf Coast University. His work has been published in leading academic journals such as *European Journal of Operational Research*, *Journal of Operations Management*, *Decision Sciences*, *International Journal of Production Research*, and several other journals. His current research interests are in supply chain management, sustainable operations, manufacturing planning and control systems, and healthcare operations.

Richard M. Franza is Chair of the Department of Management and Entrepreneurship of Kennesaw State University's Coles College of Business. His primary areas of expertise are in Operations Management, Management of Technology, and Project Management. His main research areas are the strategic investment in production facilities, the intersection of operations and marketing, new product development, and technology transfer. He has previously, taught at the Air Force Institute of Technology and Bentley College. He is a retired US Air Force officer who managed research and development programs for the Strategic Defense Initiative program.

One of the most intriguing strategies implemented to enhance a nation's technological position is the active transfer of technologies, developed primarily for public purposes, to the private sector for new commercial products. This approach has been prevalent in many European and Asian countries, leading to an increased pace of technological development. In recent decades, research and development of technology in the public sector has led to several new and innovative technology applications in the private sector.

In the USA, the transfer of technology from the space program and military research and development into the private sector has yielded many technological innovations in industries such as healthcare, transportation, safety, and athletic equipment. This technology transfer has fostered job growth and the creation and growth of companies.

There are many reasons governments pursue technology transfer from the public to private sector. As noted above, such transfer can grow a nation's economy, with increased innovation, resulting in a higher standard of living for its people. Technology transfer is a means to both leverage limited government resources and to provide commercial companies new opportunities for growth and competitiveness. Commercial companies obtain access to newly developed technologies and basic research facilities from the nation's R&D agencies through technology transfer. The goal is to give commercial companies technical information that will help in the development of new and better commercial technologies and products for the public, resulting in a greater 'bang for the buck' from public funds. Lastly, some of the greatest scientific minds are employed by the public sector. Public to private sector technology transfer utilises the capabilities of these great minds to further the economic well being of their countries and the world.

However, how this transfer occurs is not always well understood or documented. Technological innovations that might have promising applications in the private sector often fail to get transferred. There could be several reasons for this failure. Often, knowledge about the technology is not disseminated well, so there is a lack of awareness regarding the technology. In other instances, the failure occurs at the incubation stage, because of lack of support. Yet again, in some instances, there are no effective channels for the technology transfer.

The goal of this special issue is to focus on the transfer of technology from the public sector (e.g., government, universities, public research foundations, non-profit laboratories) to the private sector. The existence of effective channels and models of technology transfer in this environment would greatly accelerate the application of several leading edge technologies.

There are nine papers which comprise this special issue. We have grouped these nine papers into four groups:

- generalised, macro-frameworks
- transfers from publically-funded research institutions
- transfers from universities
- transfers from military laboratories.

A brief overview of each of these groups and papers follow.

In the first generalised, macro-framework paper, entitled 'Management of networks involving Technology Transfer from public to private sector: a conceptual framework', Rampersad et al. examine the key factors that lead to the effective management of complex networks among universities, governments, and industries involved in technology transfer. These key factors are categorised as structural, cognitive and relational. The impact of these factors on network efficiency and effectiveness is assessed. Their framework provides a conceptual framework to manage public to private technology transfer networks and highlight the managerial implications for those

involved in such networks. In his paper, 'Intermediates in triple helix collaboration: the roles of 4th pillar organisations in public to private technology transfer', Johnson also takes a generalised look at public to private technology transfer. His work examines the role of intermediary organisations which help guide successful public to private technology transfer in light of the differing cultures, objectives and agendas of government, university, and industry players, which would comprise the triple helix.

Our second set of papers specifically examines the transfer of technology from publically-funded research institutions to the private sector. Lynskey, in his paper entitled 'Knowledge spillovers from public research institutions to the private sector: evidence from Japanese new technology-based firms', looks at how knowledge generated in publically-funded research institutions in Japan 'spills over' into the private sector to help create new technology-based firms. Several issues are examined in the study including proximity, measurement tool for spillovers, and the relationship between spillovers and innovation in Japanese new technology-based firms. In another country-specific study, Visalakshi, in his paper entitled 'Transferring Biotechnology in India: experiences and lessons', uses case studies to examine how the publically-funded biotechnology research in India can be better transferred to the private sector. He also examines the reasons for the low success rate of transferred biotechnology in the Indian context as well as factors that may have contributed to successful transfer. Finally, Inganäs et al., in their paper entitled 'Sponsored, contract and collaborative research: towards a model of science–industry knowledge transfer', examine the various forms of interaction between publically-funded research organisations and the private sector during technology transfer and recommend distinct ways of managing and organising the transfer based on the different forms of interaction.

The third set of papers looks specifically at university to private sector transfer. In their paper entitled 'University-affiliated Venture Capital funds: funding of University Spin-Off companies', Widding et al. examine the implications of the financial resources of University Spin-Off (USOs) companies on the success of university to private sector technology transfer. They suggest the role of University-affiliated Venture Capital Funds (UVCs) in improving the financing situation for USOs. While also concerned with university to private sector transfer, Kliknaite, in her paper entitled 'How proximity matters in Industry–University knowledge transfer', focuses on how to organise the balance between exploration and exploitation in industry-university technology transfer relationships.

Our final set of papers examines the transfer of technology from military/defense organisations to the private sector. Swearingen and Dennis, in their paper entitled, 'US Department of Defense technology transfer: the partnership intermediary model', focuses on the use of an intermediary organisation to promote the transfer and licensing of technology from the Department of Defense (DoD) to private companies. The authors discuss the issues that complicate DoD technology transfer to industry and the role of partnership intermediaries in improving the transfer volume and value. Lastly, in their paper entitled 'Evaluating the Return on Investment for Department of Defense to private sector technology transfer', Franza and Srivastava present a framework for a model that captures the macroeconomic effects and tangible and intangible returns of such transfers to support comparisons among competing transfer opportunities. Cooperative Research and Development Agreements (CRDAs) between the Air Force Research Laboratory (AFRL) and private firms are analysed using the proposed model to identify the best CRDA choice over a range of parameter values.

Each of these papers makes a unique contribution to the body of knowledge of public to private sector technology transfer. These papers have broken new ground likely leading to continued examination of this understudied, yet critical area of research. We are grateful to the authors who contributed papers to this special issue and the referees who critically reviewed these papers and provided excellent feedback to the authors.