

Technology Transfer – Strategic Management in Developing Countries

By Goel Cohen, Sage Publications 2004, pp 336,
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This book deals largely with strategic technology planning and successful technology transfer at the national level. It does not deal with specific cases of failure and success. Instead it tries to develop a comprehensive general framework for quantitative and qualitative modelling of the complex process of technology transfer and its role in the task of development and nation building. National development goals, their technology implications, social, economic, political, legal and other country specific factors that condition the technology alternatives, choices of technology, the transfer process and the various processes that determine its successful use, assimilation, diffusion and improvement are all essential elements in Cohen's framework.

The starting point of this book is that developed and developing countries are significantly different from each other in the way in which technology is used. Developed countries have national systems in place that facilitate the development of technology and the diffusion of innovation. In these countries the connections between firms, industries, sectors, government, academia and various institutions are such that technology enabled innovation can happen easily and diffuse easily into the national system. Developing countries do not have such a legacy based on a system of natural evolution. Many developing countries not only do not have a large enough stock of technology but also do not have the necessary physical infrastructure and the required societal and institutional linkages that are so important for economic development. For many of them technology has to be acquired and grafted on to a national system that may not be in the best position to use such grafted technology optimally. The selection of appropriate technologies and their transfer are therefore inextricably connected to the specific national contexts in which they are to be used. If the process of technology transfer via national strategic planning and national technology planning does not take these connections into

account so as to optimise the fit between them, the transfer will fail. The book sets out to enhance our understanding of this complex process.

After a review of various ways of looking at technology – as an engineering process, an economic process, a social process – it makes the point that the required approach should obviously take all these into account. Cohen believes that technology can best be understood as a dynamic constantly changing system with four major components – Technoware, Humanware, Inforware and Orgaware. Using this concept of technology he then goes on to link this to a model of technology transfer. The transfer model involves a tripartite system comprising the host country, the recipient country and international intermediaries. For technology transfer to really have a major impact on the development process it should obviously go beyond the immediate production of a good or service. It has to be adapted, modified, improved, assimilated and diffused into the national system. The transformation potential of the transfer can only be realised when this happens.

Though in practice technology transfer takes place at the firm level, the model's emphasis is on the national system for technology development and transfer. This would mean that the larger macro development goals and objectives determine technology needs and priorities. The assumption is of course that all developing countries, in order to catch up, should necessarily start from a centrally planned development and technology perspective. These macro factors – economic, political, social, technological and institutional – are the most important determinants of successful dynamic technology transfer, and if they are not factored into the analytical framework used for decisions, technology transfer will not be successful.

Cohen makes a point that unless there is a good fit between the nature of technology, its mode of transfer and the recipient country's national capabilities for absorption, assimilation, diffusion and improvement – a complex dynamic process – the transfer of technology will at best have a marginal impact. Appropriate technology for transfer will have to be determined by the national centrally planned technology

system keeping in mind this fit. He provides an elaborate listing of all the factors that could affect this fit.

These ideas and models then lead on to the most important aspect of Cohen's focus which deals with the way in which all these systemic components, variables and linkages influence the way in which technology assessments are made at the national level. He provides an elaborate framework that incorporates the nature of technology, the processes associated with its transfer and their contexts, the various environmental and institutional factors in the recipient country and how these elements combine with the national development and national technology systems in determining which technology or sets of technologies should be chosen. The book then goes on to relate these sets of models to the larger issues of globalisation.

The book claims that its approach is aimed at providing a comprehensive overview that facilitates quantitative modelling of the process of technology assessment in the context of transfer of technology from the developed to the developing countries. There is no doubt that modelling the connections between technology and economic development at the firm level and its extension from the firm to the national level is a complex multidimensional problem. While many of these issues are addressed in a lot of detail and may be theoretically comprehensive, one gets the impression that the process of technology assessment and technology transfer is so complex and has to factor in so many variables that no ordinary person can successfully analyse and manage all of it. In the real world however many practitioners of technology management know these things happen all the time and many of these things happen quite efficiently. One way out of this could have been to combine theory with some practical applications of the theory in terms of case studies, illustrations or examples. There are some examples but by and large these do not address the concepts advocated. This would definitely hinder practical applications of the methodology and models to some extent.

Getting an overview of this entire process from the book is also not so easy. There are a lot of references to the works of various researchers in various parts of the book and this is certainly a plus point of the book. However it also makes it difficult for an application or practice oriented reader to get an easy-to-understand overview model of how this whole process works. There are technology models, transfer models, diffusion models and assessment models. How they connect up and how one can apply them is however not so obvious.

The approach adopted also makes a distinction between innovation typical of the more advanced countries and technology transfer characteristic of the developing countries. Though the ways in which the different actors, industries, institutions and governments are linked and connected will differ between developed and developing countries, the way technology is used and how it affects societies at the most basic level cannot be fundamentally different. A complex dynamic open systems framework might have been a better way to model this. In all fairness to the author this is easier said than done and the author has indeed tried to provide a way to address this complex problem.

The approach adopted assumes a central planning authority that decides on development priorities and related technology transfer and management strategies. In the case of major industries and their related technologies sufficient information and expertise may be available to the planning unit for a reasonable assessment. For emerging technologies in the early part of their life cycle, making this assessment is difficult for a central authority unless it is efficiently networked to entities that create and manage new technology. In such a situation should decisions be made centrally or should choices be distributed more widely amongst a large number of agencies and organisations? This issue is not as trivial as it sounds. Most technology planning systems especially for the developed technologies and industries are better handled by firms and industries that are involved in them rather than by a centralised agency as the Indian example of central planning will illustrate. The role of the planning agency is to act as a facilitator and a promoter rather than as an active decision maker. The technology agencies in the Indian context are all moving or at least trying to move towards this facilitator role. If this were so the Cohen approach only looks at a limited subset of the process of technology management, which encompasses both technology transfer and technology innovation.

As mentioned earlier the book covers the relevant literature well. The central ideas behind the various theoretical approaches are also addressed. From the viewpoint of the theorist this is good. However as mentioned earlier it is difficult to get an easy to use overall framework that can be applied. On the whole the book may be useful to researchers but maybe not so much to practitioners.

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