

## Book Reviews

**Schienstock, Gerd (ed.):**

**Embracing the Knowledge Economy: The Dynamic Transformation of the Finnish Innovation System.**

**Edward Elgar: Cheltenham, 2004. 325 pages, ISBN 1-84376-307-9**

In its early phase, innovation studies took national models and institutional variations as their natural starting-point. Not so anymore. In the recent overview of innovation research (The Oxford Handbook of Innovation, edited by Jan Fagerberg, David C. Mowery & Richard R. Nelson, Oxford 2004) the role of national institutions in innovative processes is downplayed. Instead, firms and sectors dominate the analysis, as do global technological systems and regional agglomerations. The nation-state seems to have been hollowed out and lost much of its influence on economic change.

Despite the current preoccupation with the global and the regional as the spatial foci of innovation studies, many interesting national experiences worthy of analysis remain. The Scandinavian system of innovation regulation represents one such experience, where the role of the state is central in all major aspects of the innovation process. The Finnish example is a particularly interesting case of the design of a complete system of regulation of innovation including policies and programs for R&D, regional development, universities-industry collaborations, and a transformation of the societal discourse on growth

and employment. These themes are taken up in a highly topical and comprehensive study, edited by Gerd Schienstock. The volume includes virtually all relevant aspects of the Finnish “innovation miracle” of the recent decade. It includes well-written and informative chapters on branch-level trends in information technology, services and mature industrial sectors. The book also covers reforms of the education system, of research and university policy, and of regional development programmes. Altogether, the book is an exemplary case study, guided by an optimistic, if not uncritical, view on the stability of the Finnish innovation-institutions nexus.

As is well known, Finland was severely hit by the economic recession in the early 1990s. Instead of coping with the downturn with the traditional measures, such as currency depreciation, state subsidies, or wage-cutting, Finland embarked on a strategy to build a competitive and innovative economy to sustain welfare state expenditure and to create high-wage and qualified employment. This growth strategy was built on the collaboration between state, society and markets.

The first successful expression of the

strategy was in the ICT area. Although Nokias spectacular success from almost bankruptcy in the early 1990s to global market domination in cellular telephony today can be attributed to government regulation to only a limited extent, public policies did play a major role in coordinating resources and actions within the ICT sector. As an example, an R&D director of Nokia claimed that the National Technology Agency (Tekes) is a binding force which stabilizes research activity in this turbulent environment (as quoted in Ali-Yrkkö and Hermans' contribution to the book). Nokia is in itself a major technology policy actor, with an extensive network of supporting companies. Such networks seem to have been stabilized and coordinated through public policies, creating denser and more durable linkages between Nokia and other actors in the domestic ICT sector.

ICT is clearly a key to the remarkable transformation of the Finnish economy. The other ideal typical knowledge economy sector, biotechnology, has yet to grow. The Finnish bio-industries are much smaller than the ICT sector and have no industrial locomotive playing the role of Nokia. The main change here so far has shown in the knowledge base and in small firm formation. For the biotechnology sector in Finland, the new innovation strategy took shape in the form of major public support for R&D in universities, research institutes and in the private sector. The strengthening of biomedical research is remarkable, by any standards, and Helsinki is now a leading European city for bio-research, a position it did not hold a decade ago. Another element in the growth strategy for the bio-industries, covered in Bruuns

contribution to the book, has been cluster programs to create and sustain regional agglomerations of bio-industrial activities. These cluster support schemes included not only research funding to academic centres, but also regional development support, infrastructural investments, network programs for academic-industry collaboration, and so on. Furthermore, the government devised sectoral technology development programs to enhance the interaction between the bio-industries and the traditional strongholds of the economy, such as forestry, but also with the food and pharmaceutical industries, as taken up in Palmbergs contribution to the book.

What emerges from the lucid analysis of the Finnish experience is the central role played by the state in orchestrating resources, supporting investments, creating networks linking public and private actors and devising future strategies for the bio-industries (including cross-sectoral interaction). The state was instrumental in expanding a previously relatively weak public research system, in bringing into existence a venture capital sector, and in correcting the fragmentation of the business system. There is an expectation that the government orchestration of resources and knowledge flows between public and private actors will create new industrial pillars in the Finnish economy, such as biotechnology, but also that there will be increasing interaction between high-tech sectors and the traditional industrial strongholds.

Finland represents an interesting path-shaping experience in the knowledge-based economy, far from neo-liberal visions of an unregulated economy. Instead, the transformation of the Finnish economy has been based on a broad

mobilization of social interests towards new social and economic goals, not compromising the welfare state tradition but reinventing its material basis. So far, the result is spectacular. Schienstock and his co-authors give an excellent portrayal of the institutional renovation of Finland in its the first decade as an innovative society, a rare example of an innovation system developed by design rather than by default.

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**Robin Williams, James Stewart and Roger Slack:  
Social Learning in Technological Innovation: Experimenting with  
Information and Communication Technologies.  
Edward Elgar: Cheltenham, 2005. 288 pages, ISBN 1-84376-729-5**

New technology shapes society, organizations and everyday life. At the same time, technologies themselves are shaped throughout their design and use. But how does this mutual shaping take place? *Social learning in technological innovation* is a timely contribution to this core topic of science and technology studies. The book integrates, complements and critically evaluates the understanding of design and uptake of new technology in innovation studies and science and technology studies. In doing so, it emphasizes the recent upsurge of studies in appropriation and consumption of technology. In part A, the authors introduce what the “social learning” perspective entails for ‘understanding the process of innovation in the application of ICTs’. Part B explores the implications of this understanding under the heading “rethinking innovation models and technology policy perspectives”.

The book results from a large EU project “Social learning in multimedia” that examined the design, use and trials set-up for multimedia technologies in late 1990s through 23 case studies in seven European countries. While these studies form the backbone of analysis, the emphasis of the book is in mapping out the generic process of innovation and concepts for understanding it. The cases are presented as page-long vignettes, as they are published elsewhere as two other books, reports, and articles. While this scarcity of empirical material is helpful in keeping the process descriptions and conceptual discussion clear, it does give away some of the sense of grounding and intricacy of the models and concepts.

The authors argue that there is a “design fallacy” in technology studies. In their concern with how technology affects organizations, work and the life

of people, early work (such as Bijker *et al.*, 1987; Akrich, 1992; Akrich, 1995; Woolgar, 1991) placed an over-emphasis on the design of technology prior to its market launch. This was perhaps due to the strong concern with how technology affects organizations, work and life of people. However, the result was narratives that tended to emphasize the impact and immutability of designers' prior visions and designs. This led to seeing problems in the use of technology as an indication of failure of prior design and consequently, demonizing designers as omnipotent manipulators of users. Reciprocally, it has supported heroizing any users deviance from the designers script as creativity. The authors argue that such "narrative bias" results from studies resorting to temporally limited snap-shots of a technology's life-cycle. Biased models flourish when design, development, marketing, implementation, appropriation and domestication of technology are studied in separate studies using different methodologies.

The authors argue that this state of affairs has overshadowed more sophisticated models of innovation. They further argue that it ignores possibilities of intervention by overlooking the whole scope of times, places and actors involved in the shaping of technology during its entire life-span. The book addresses the findings of such a broader scope under four foci: process and space for social shaping and social learning, implications for technology design, the appropriation of technology and conduct and management of experiments in new digital technologies.

Contrary to recent hype, the authors reject the view that user-centred design or any other explicit technique at repre-

senting users in prior design could become the sole sufficient guarantee for achieving successful technology. "[O]ur integrated social learning model shows that design is not a one-off act, but is part of iterative series of activities, informed by earlier design practice and feedback from appropriation and use of other systems (earlier technologies in this application domain; similar technologies in related domains)" (110). This is illustrated with multimedia products, that are "configurational technologies" in that they come into existence only as a combination of various basic components, delivery systems, applications and products, their content programs, as well as user practices intertwined with other technologies.

The above considerations are condensed in the notion of "social learning": S&TS should not only concern itself with how new technology is socially shaped, but elaborate and support how designers, users, sales people, and agencies concerned with regulation and promotion of technology can learn and interact in creating socially acceptable, commercially viable, and desirable technologies.

A central argument in the book is that the kinds of learning, the parties involved and the dynamics related to this learning vary depending on the technology and the domain in which it is being used. The book offers four main models or constellations for clarifying the dynamics between design and use. Without going into further detail, all these models in their own way emphasize that prior design is always more or less unfinished, and can, for better or worse, invite the relevant stakeholders to learn ways of accepting and appropriating it. Much of the relevant knowledge, such as

details of eventual uses, relationships with other artefacts, identities of final users, is largely unknowable to designers and prospective users before they gain experiences from actual use.

This view of design as configuration shows the relevance of studies on appropriation and domestication of technology employing cultural studies, gender, and ethnographic perspectives. At the same time, it offers a healthy reminder that these lines of research are in danger of reproducing the truncated, even biased narrative structures and entrenched perceptions of design and use if they fail to explore the implications of various appropriation processes beyond the local sites. The impact back to producer companies and regulatory bodies must be examined as well. While social learning happens simultaneously in multiple venues, it is often the mediation, learning and barrier crossing between designers, various users, regulators and other stakeholders through which new technologies gain their impact on society. This goes for technology as commercial product, generic design as well as a domesticated thing.

This observation leads the book to the conduct and management of digital experiments that could be helpful in speeding up learning and interaction between parties. In the 23 cases studied, most experiments veered towards modes of verification and control instead of diversification and experimentation. Not co-incidental was the virtual absence of systematic and organized bringing of users together with supply-side players. The authors provide an instructive discussion of the reasons for this, ranging from industry traditions to practical difficulties to the availability of alternative

ways to represent users in design.

A noteworthy facet of the book is that the authors stress the relevance of grounded concepts from balanced case accounts. However, the book's plea for such conceptually oriented case-studies covering the entire biography of a technology in detailed fashion is just what it leaves for others to accomplish. Nonetheless, the integrative and clarifying work conducted by the authors is timely and a highly needed resource for people involved design, use, research or evaluating and experimenting with new technology.

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