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## The software industry through an academic looking glass

**T**here is a conversation beneath the surface of the consulting industry and behind the articles appearing daily in the business press. It is between academic economists, whose rambles are usually not widely circulated, and industry analysts, whose succinct quotes are.

The academics and analysts talk past each other most of the time. The academics do what they usually do best, study historical cases and second-guess old battle decisions. Most analysts think this activity is irrelevant to life. And market analysts mostly do what they do best, make pithy quotes and devise flow charts of industry structure and strategy. Most academics think this analysis is a little too shallow.

Let's face it. Each side is jealous of the other. Most of my academic friends secretly wish they could be—how do I say this?—more relevant. And, yes, most of the business analysts I know wish they had the time to do—what is the right phrase?—more thorough research.

In this column I talk about that rare instance when the conversation is useful, when neither the academic is irrelevant nor the analyst shallow. What does that look like?

It looks like the book, *The International Computer Software Industry, A Comparative Study of Industry Evolution and Structure*. This volume is edited by David Mowery, an accomplished economist at the Haas School of Business, UC Berkeley, and one of the country's leading scholars in technology policy. It was published late last year by Oxford University Press, one of the most respectable publishers of academic work.

This is not a book for those with no time for reflection. The goal of this book is to understand long term trends in the industry. That is what makes it interesting and unusual.

One may reasonably ask why anyone would want to edit a book on such a topic. Here's why:

First, the software market has become increasingly global. If we can understand why some firms managed to do well while others failed, it may help us develop better economic advice for developing firms. Second, the software market is an important growth component of the electronics industry. If we can understand why some country's firms managed to do better than others, then it may help us understand where governments help or hinder the development of their own domestic industry.

Don't take my word for it. Let's look at some specific essays and see what they say.

### A review

We all know what software does. It makes video games fun, PCs useful, and numerically controlled machine tools functional. It is also a peculiar commercial product. It must be standardized. It must work reliably. Yet, it must be customized by users or specialists for specific problems or unique applications.

In addition, it is among the least static markets in the US. The ground rules change more frequently than most technology markets. New hardware developments and new applications, not to mention Moore's law, change the market every few years—in some segments, every few months.

This complex situation frames 11 well-written essays. Each essay inspects the structure of the industry in a particular country. Each tries to understand how software markets evolve and how commercial forces alter the institutional boundaries that define products, suppliers, and buyers.

The book's first essay is by Ed Steinmueller. He puts forward an ambitious analysis of the rise of different US market segments. The essay has something provocative to say about every industry segment in every time period. It also introduces and applies many of the book's recurring economic themes (for example, the role of net-

works, the role of compatibility, and so forth). Different readers will find different parts of the discussion engaging, depending on the segment they want to follow. The essay is especially good at interpreting historical trends and comparing its interpretation against common perceptions (or misunderstandings, as the case may be).

Next, Richard Langlois and David Mowery focus on the US government's role in encouraging the growth of the software industry (as well as many other parts of the electronics industry). These authors focus especially on how NASA and the Department of Defense subsidized the software industry's development by paying for R&D. They do this by procuring advanced products and by subsidizing (in a variety of ways) the companies who develop software. Bits and pieces of this story lay scattered in many places, but this is the first time I have seen a succinct synthesis of the whole thing.

The third essay on the US, by Jonathan Khazam and David Mowery, analyzes the strategies and outcomes of firms that invested in RISC technologies. Unlike the previous two essays, this one is written in the tradition of extended case studies of high technology industries—where the aim is to teach managers and industry analysts about the nuances of firm strategy and structure. It analyzes the feedback from networks of software vendors to hardware designers, highlighting the role of interfirm relationships in shaping commercial success. It would not be surprising to find an essay like this in an MBA course on technology and strategy.

### Some international spice

American audiences may find the descriptions of foreign markets particularly novel, as it is difficult to find comprehensive analysis of software markets outside the US. For example, Yaunori Baba, Shinji Takai, and Yuji Mizuta describe Japan's software houses and their close ties to others organizations in a very intriguing essay. They argue that the software market should be understood in terms of the unique "hub" structure that organizes computer industry firms within Japan.

A complementary essay by Thomas

Cotrell focuses on the retarded development of a packaged software industry for PCs in Japan, despite an otherwise strong industry in many other segments. Cotrell examines why Japan's software firms pursue a paradoxical mix of cooperation on some issues and competition on others. He focuses on why it seems to be so difficult for Japanese firms to standardize software products for mass markets in which sellers do not personally know their buyers.

The international essays also include analysis by Franco Malerba and Salvatore Torrisi, who discuss Europe's software market, and Peter Grindley, who analyzes Britain's. Both try to understand the complex factors lying behind the uneven (and occasional) commercial success of European software firms. As with any analysis of non-American topics, it is rare to read such high-quality English-language analysis of these markets.

Valery Katkalo and David Mowery venture into unknown territory in their description of software markets in Russia, where the industry is emerging in spite of a unique institutional legacy. It focuses on the difficulties of developing high-technology markets in a non-western institutional environment. It's quite fascinating, much like reading travel literature about exotic destinations. This will make every US industry participant thankful for the comparatively minor institutional problems they deal with.

The last essay I'll mention, by Robert Merges, is about intellectual property in a comparative setting. It analyzes the different legal institutions enforcing property rights in software (or not enforcing it, as the case may be in some countries). As with many comparisons of legal regimes across countries, this essay must necessarily skim the surface. Those new to the topic will enjoy the well-written summary of the primary issues.

Readers interested in comparative themes should not skip the editor's introduction and conclusion. The introduction prepares readers for the remaining essays with essential structural detail, while the conclusion summarizes comparative themes more completely than the individual essays.

### The bottom line

Overall, the book aims to be both thorough and relevant. It develops new research questions and advances general lessons, while paying close attention to historical accuracy.

That said, this book is not for an industry analyst with a short-time horizon, or an obsession with the latest industry developments. There is not much discussion about networking software, and comparatively little on the Internet. Such omissions are unavoidable with publication lags, especially in an industry that changes so rapidly; hence, most of this is quite forgivable.

Let me put it another way. To make these essays relevant today, as a short-sighted industry analyst might put it, a sympathetic reader needs a bit of imagination to make the leap from older examples to the present. This is not too hard to do here, which is remarkable given all the hardships of putting together a project like this.

I thought the book made one minor organizational misstep. The essay about Russia, despite being entertaining, seemed in need of companion essays. If the topic is "the economics of the software firms in countries with developing economic institutions," then a thorough discussion needs more examples. Readers need information about software firms in the Bangalore region of India, the Brazilian firms before and after the lifting of tight import controls, or the Asian software industry outside of Japan, particularly in China.

While none of these essays will make immediate headlines, the book contains many insights that are worth the reader's effort. The language of this book should find its way into the consulting industry and market analysis of tomorrow, as well as many other future academic projects on the computing industry.

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