

A Second Finnish Transformation?

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Finland's image shifted in the 1990s from that of Soviet supplier and basic forest products provider to that of telecommunications leader and sophisticated equipment producer. It seized an opportune moment in the global electronics industry and the process of European integration to accomplish a significant structural change of its economy. Finland's growth was rapid as Nokia, and its associated cluster of firms, became a major player in the world communications industry and the forest products industry modernized, becoming ever more competitive in product and equipment.

The 1990s was a transition as an electro-mechanical era of Walkmen and VCRs gave way to an era of digital products -- computers, networks, and, and of course, mobile telephony. The European decision to establish a single GSM mobile standard, building on the Nordic mobile roaming system, facilitated a remarkable build out of demand for mobile communication. Nokia's took advantage of the possibilities, creating globally competitive products, marketing, and production systems.

But now is a new era. The two pillars -- ICT and Forest products -- may not be sufficient to sustain growth and employment. Finland's success depends heavily, perhaps too heavily, on Nokia. Nokia faces new challenges in a digital era of mobile broadband data networks and new mechanisms of value creation. It will have a tough fight to maintain its current dominant market, and will require innovative strategy to build position as the markets evolve. Even if Nokia, which has grown well beyond Finland, succeeds in the face of these challenges, this does not automatically imply that Finland will succeed as well. Nokia certainly cannot rest on its laurels. Neither can Finland. Instead both will have to do it again.

Let us situate Finland's choices now within the evolution of production and competition systems of the 20th century. The initial 20th century production revolution was mass production, high-volume output of standard products made with interchangeable parts using machines dedicated to particular tasks and manned by semi-skilled labor. Competition was amongst the lead companies producing and distributing the final product -- be it Volkswagen, Ford, Phillips, or RCA. Each was at the core of a vertically integrated production system. The most important challenge to mass production came from Japan as that country's automobile and electronics firms burst onto world markets in the 1970s. An interconnected set of Japanese production innovations loosely called *flexible volume production* or *lean production* underpinned their stunning world market success.

The Wintel era of the 1980s and 1990s was a transition between an electro-mechanical and a digital era.¹ It was the moment of the American comeback in electronics and Finland's emergence. Wintelism as a code word points to the shift in competition away from final assembly and vertical control of markets by final assemblers. It reflects the sudden importance of the constituent elements of the product in the final market competition: the Windows operating system and Intel processors as an example. Hence the name, Wintel. Wintelism then saw new terms of competition and, linked to that, a new model of production. Consider the PC. What part of the value chain confers the most value added and leverage in the market? Much of the added value is in the components or subsystems, the chip and screen. This has several implications.

First, competition in the Wintel era is a struggle over setting and evolving de facto product market standards. Components and subsystems are built to generally agreed standards that emerge in the marketplace, and thus part of their value lies in the standards, in partially open but owned standards that create de facto IP-based monopolies or dominant positions.

Second, products are increasingly built as modular systems in which components and subsystems can be clearly defined, and, hence, outsourced. The result is cross-national production networks. This strategic and organizational innovation, what we might now call supply chain management, means that even production of complex products can become a commodity service that can be purchased in the market. The strategic weapon for many companies moves from the factory to the management of the supply chain.

Third, the core engineering skills moved to chip-based systems given functionality by software. The range of production skills to produce an optical film camera is much greater than to produce a digital camera, whether in a cell phone or not.

Now as we enter a digital era the mechanisms for creating value are changing again. This era is characterized by a new set of tools, Tools for Thought. "Information technology builds the most all-purpose tools ever, tools for thought... These tools for thought amplify brainpower in the way the technologies of the Industrial Revolution amplified muscle power."² Let us consider some of the consequences for value creation.

First, management of information is critical. Information about consumers serves to segment the market, identify which consumers are willing to pay for what. Products and prices can then be tailored to the newly identified market segments. Prices can be fitted to nuances of demand. Airline seats, or soft drinks in a dispenser, can be priced to fit shifting demand as travel picks up or the weather gets hotter. Microprocessors can give consumer durables such as refrigerators distinctive features.

Second, the line between service and product blurs. Fundamentally new business models are required. Accountancy is a personal service; unless you put the rules the accountant follows into a program and sell it on a disk. In the United States we call that product Quicken. Put the rules on a server and access them over the web, and you are selling a network-based service. IBM was once a product company that used its market

¹ Michael Borrus and John Zysman "Globalization with Borders: The Rise of Wintelism as the Future of Industrial Competition," in *Industry and Innovation*, Vol. 4, Number 2, Winter 1997.

² Steve Cohen, Brad DeLong, and John Zysman "Tools for Thought: What is New and Important about the 'E-conomy'" (Berkeley: BRIE, 2001).

dominance and price power to provide distinctive service support; now it is becoming a service company embedding its products into services and networked service offerings.

Third, network based services become critical. The networks and even the hardware may see moments when distinctive new products can capture temporary rents; but innovation itself is becoming a commodity. This makes learning from and about advanced data networks critical, and the regions with leading edge users creating and learning from leading edge networks have an advantage.

Finally, production will be at once a commodity that can be moved anywhere in the world, and a strategic asset that must be carefully integrated with development. Hence the notion I have heard from Nokia and others of an initial factory to stabilize production as a strategic part of innovative development teamed with production logistics that can rapidly move production to lowest cost sites or to meet local market demand. Those, such as Nokia who have mastered this, will have an advantage.

What are the implications of the emerging digital era for Finland? *First*, Finland's traditional strengths may not be enough. Nokia's substantial capacities will be challenged. For example, capturing value from network-based services will be a necessity. European leadership in mobile networks may have been a precondition for Nokia's success. But Europe may not have that network leadership in the next round. Certainly, the 3g-auction debacle has slowed deployment of mobile broadband in Europe, while the emergence of WiFi networks raise questions about the underlying mobile technology trajectory and the appropriate business models for capturing value from mobile broadband internet. As important, a variety of Asian nations are building out innovative infrastructure with the hope that they can create distinctive advantage. *Second*, for Finland to sustain its growth, innovative globally competitive firms must emerge from outside the forest products and telecom sectors. But there are not going to be any silver bullets. As certain as it is that biotechnology and nanotechnology will transform our lives over the next generations, they will not alter our industries in the next decade. The broad array of firms in the fabric of the Finnish economy will have to step forward to innovation and global competition. A diverse pool of entrepreneurial talent and the institutions to support it will be required. The good news is that modularized production in cross national supply chains that emerged with Wintelism creates many opportunities. A firm need not be a giant to compete in global markets; it can be either specialty supplier or implement innovative designs through contract manufacturing. One thing is certain; another structural transformation as significant as that in the 80s lies ahead; and it will require industrial and political imagination to succeed.