

Editor's Comments

The notion that MIS can be conceived as a powerful competitive tool reinvigorating a firm's competitive posture and changing industry structure has received considerable attention in both the academic journals and popular press in the past four to five years. To the extent that this work has focused general management's and information management's attention on examining more clearly and enthusiastically IT's impact on the firm, it has been all to the good. To the extent that it has resulted in managers developing an imbalanced view of where and how this technology can be used within the firm and thus warping investment priorities, it is potentially dangerous. In my judgement, there is considerable danger that a portion of this second scenario has been and is transpiring.

In a recent three-day seminar for the senior management of a sophisticated, large, high-technology manufacturing company, I was struck at the excitement and enthusiasm expressed by the group on how the technology is impacting various firms' marketing, inbound logistics, outbound logistics, after-sales service, organization structure and control systems. Considerable efforts were made by the participants in sessions lasting into the wee hours of the morning to apply these notions to the specific situation in their firm (little had been done in these areas in the past by many parts of this firm). As part of the seminar, the Director of Manufacturing Planning gave a highly articulate one-and-a-half-hour pitch on how technology had and would continue to impact the manufacturing and product development activities of the firm. These future projects' potential strategic impact on the firm were enormous both in terms of reducing operating costs and substantially increasing the firm's flexibility to respond to competitive market conditions. The presentation was notable for its lack of impact on the group's thinking and for their continuing deliberations. It was simply seen as more of the same old boring, complex "support" stuff. Unfortunately, this reaction is by no means atypical. In an increasingly service-oriented world, the lack of interest in improving efficiency and effectiveness of technology development and manufacturing is of concern.

The MIS academic community also appears to be guilty. Neither this journal nor other MIS journals are being flooded by papers dealing with how IT is impacting management issues of product development and manufacturing. In a western world dominated by productivity problems, this is deeply disturbing and indeed, appalling (our Japanese competitors err in the other direction to a fault). In my judgement, this lack of emphasis on research and teaching about IT's impact on the manufacturing and product development activities in a firm's value chain will retrospectively appear remarkably myopic. An example that partially addresses this issue is my school. Because of recent hiring decisions, not only has the systems portion of the manufacturing area been strengthened in the past several years, but the MIS area has focused on faculty candidates whose interests are on IT technologies' impact on manufacturing processes and product research/development efficiency and effectiveness. Both the school's curriculum and the research program are being altered.

The potential impact of this kind of focus is shown in examples from a recent review of a major manufacturing firm's strategic applications implementation portfolio:

- Redesign of the firm's production facilities in one plant to permit direct scheduling of batches (as small as one item) directly off customers' orders. The system has produced a 50% reduction in lead times and a 50% reduction in work-in-process inventory.
- Introduction of a bar-coded assembly kit which had doubled the firm's capability to make changes in its manufacturing schedules with no commensurate increase in cost.
- Introduction of a new computer-controlled assembly machine which can move among 10 different items with zero set-up time. Response time to orders has been halved, while inventories have been significantly reduced.
- Direct CAD links to numeric control machines and laser printers to improve development time by 30% and give instantaneous documentation for users.

Other applications focused on the improvements in quality of design, improved process control sampling procedures, etc. IT has been making and will continue to make dramatic improvements in the cost and quality of many firms' manufacturing and R&D activities. Failure to reach for those applications in an MIS planning process is dangerous. Further, the rate of change is accelerating.

Why has this area not received the same attention from MIS researchers and the public press? Several possible reasons come to mind:

1. Dramatic improvements in a firm's cost structure and flexibility to adapt create just as real entry barriers as an IOS; however, although being a low-cost producer has long been a time-honored way to compete, it is not more exciting to talk about an American Hospital Supply than it is to talk about cost reduction.
2. Factories are often physically unattractive and very technologically forbidding places in which to do research. Unravelling what is happening in a manufacturing setting is often a messy, ambiguous, and unstructured task. Consequently, hypothesis testing in a controlled university lab filled with students may appear more elegant although the results may not be easily transferable to the real world. (Shosanna Zuboff's recent work, "In the Age of a Smart Machine," is an example of the remarkable insights which can be wrung from such work.) Further, detailed mastery of the manufacturing technology and its environment (often a difficult task) is a necessary ingredient to understanding IT's potential impact.
3. Talking to scientific developers about their work is often jargon-filled and very complex. Further, assessing the real impact of a technology on a designer's performance even post facto is an extraordinarily complex task.

In summary I suggest:

1. Manufacturing and research and development applications of IT are at least as important as those in other aspects of the value chain even if the end outputs do not seem as exciting. The technology's art-of-the-possible is changing so fast that even two-and-a-half-year old research and manufacturing equipment may be dangerously obsolete. For the practitioner the question is, "Are we unconsciously avoiding those critical investments because of risk aversion and the complexity of justification?"
2. In the past, this field has been the arena of some remarkable fiascoes and cost overruns that have left deep managerial scars. Those failures, however, should not be considered a prologue for the future. Both the art-of-the-possible and the new implementation realities and processes deserve careful consideration.
3. These issues deserve as much research and analysis as has been given to how IT impacts the other aspects of the firm's value chain. Practical insight into these issues offers a major contribution to both practitioners in their firms as well as to national competitiveness.