Britain Picks Wrong Way To Beat the Japanese

An analysis of Britain's Alvey program shows that support for precompetitive research does not equal economic success

London—THOSE WHO BELIEVE GOVERNments can boost economic competitiveness by supporting "precompetitive" research will find little comfort in the just published official evaluation of Britain's Alvey program. A 5-year research effort that cost the government £200 million ($360 million), the program was Britain's answer to Japan's fifth-generation computer project: an attempt to bring together university researchers, computer companies, and electronics manufacturers in consortiums that would develop the generic technologies needed to strengthen Britain's fragmented information technology industry. But the report finds that although many of the research goals were met, companies never rushed to the market with the fruits of their work. Indeed, 4 years after the program ended, the British information technology industry is in worse shape than ever.

The basic premise of the program—that companies would be willing to share precompetitive research with their rivals—was wrong, according to Luke Georghiou, executive director of the University of Manchester Program of Policy Research in Engineering, Science, and Technology. The report, authored by Georghiou and University of Sussex policy researcher Ken Guy with backing from the Department of Trade and Industry and the Science and Engineering Research Council, also faults the program for concentrating too narrowly on research. And even Alvey's former director now concedes that the effort was ill conceived.

"Companies don't like collaborating with their competitors," Georghiou told *Science*. "In Alvey, 70% of the participants worked not with their rivals but with companies that had complementary skills," he says.

The findings echo those published in February by the U.S. National Academy of Sciences' Government-University-Industry roundtable, which found that rival companies prefer to form direct links with universities rather than risk losing competitive advantage by participating in consortiums.

The planners of the Alvey program—named after John Alvey, chairman of the planning committee—misunderstood the Japanese programs they were trying to imitate, Georghiou says. "They thought the Japanese all clubbed together for pre-competitive research. This was a very attractive idea to conservative politicians in the United Kingdom who thought it would enable them to be seen doing something without interfering with the market. In practice, the Japanese companies that participated in joint research had even bigger in-house research programs going at the same time," he says.

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British companies, in contrast, were spending only tiny sums of their own on next-generation technology.

When groups with complementary skills got together in the Alvey program, unexpected problems cropped up. Although technological goals were reached in the four key areas of software engineering, integrated circuits, artificial intelligence, and man-machine interaction, the companies did not then compete in the marketplace—instead they became more dependent on each other. "Each partner tended to be providing an essential component," Georghiou says, "with the consequence that if one partner went out of business there was a strong chance of losing an essential part of the work."

That in turn increased the need for further government programs that would help the transition to product development. But the government was opposed to providing help for "near market" research and never provided the manpower training programs that would help the results of the Alvey program diffuse through the information technology industry.

"What the British government failed to understand is that while research programs are a necessary condition they are not a sufficient one," says Derek Roberts, now provost of University College London and formerly head of research at the General Electric Company (GEC)—the program's largest commercial participant with £20 million in government funding. "Alvey was very good at encouraging collaboration, but was less successful than it should have been because it stopped too rapidly.... Even with outstanding R&D, you will still fail if you are incompetent in marketing, or have a lousy sales team. It was naive to assume that by encouraging technology all other benefits would necessarily flow," says Roberts.

Brian Oakley, former director of the Alvey program and now chairman of Logica Cambridge, part of Britain's biggest software group, says the West has still not really understood how Japan achieves success. "The lesson we failed to learn from the Japanese was that their research centers tend to be staffed by people from companies on short-term secondments who then go back to their firms to develop the technology for the market, fighting furiously as they do so. In the UK, staff are allowed to stay, get stale, and grow old," says Oakley. "The trouble is, companies don't want to spare their best people," he adds.

Oakley believes that the expectation that a research project alone was sufficient to cure Britain's industrial ills was nonsense. "The UK was foolish enough to think that prosperity can be based simply on research—a belief which stems from the Second World War when radar was wired together by scientists in the evenings," he says. "But research is not enough, governments must create the right industrial climate." High interest rates—triple those in Japan—were what really killed Alvey's prospects, says Oakley. In fact, economic conditions in the United Kingdom deteriorated so rapidly during Alvey's span that many of the companies involved in the project were swallowed up or went bankrupt. Of the five semiconductor makers that were involved at the outset of the project, only one was left by the end.

Not everyone agrees that Alvey was a failure, however. GEC's Roberts says that the program did make UK technology more competitive. "If it had not been for Alvey, then I believe the situation would have been far worse," he says. Sandy Walker, manager of collaborative projects at International Computers Ltd, Britain's biggest computer maker until its recent takeover by Fujitsu, says that "the perception that Alvey has failed is due to people having far too high expectations. You can't expect a £200-million applied research program spread over 5 years to achieve the Japanese miracle. It takes a great deal more." ■ JANE BIRD

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