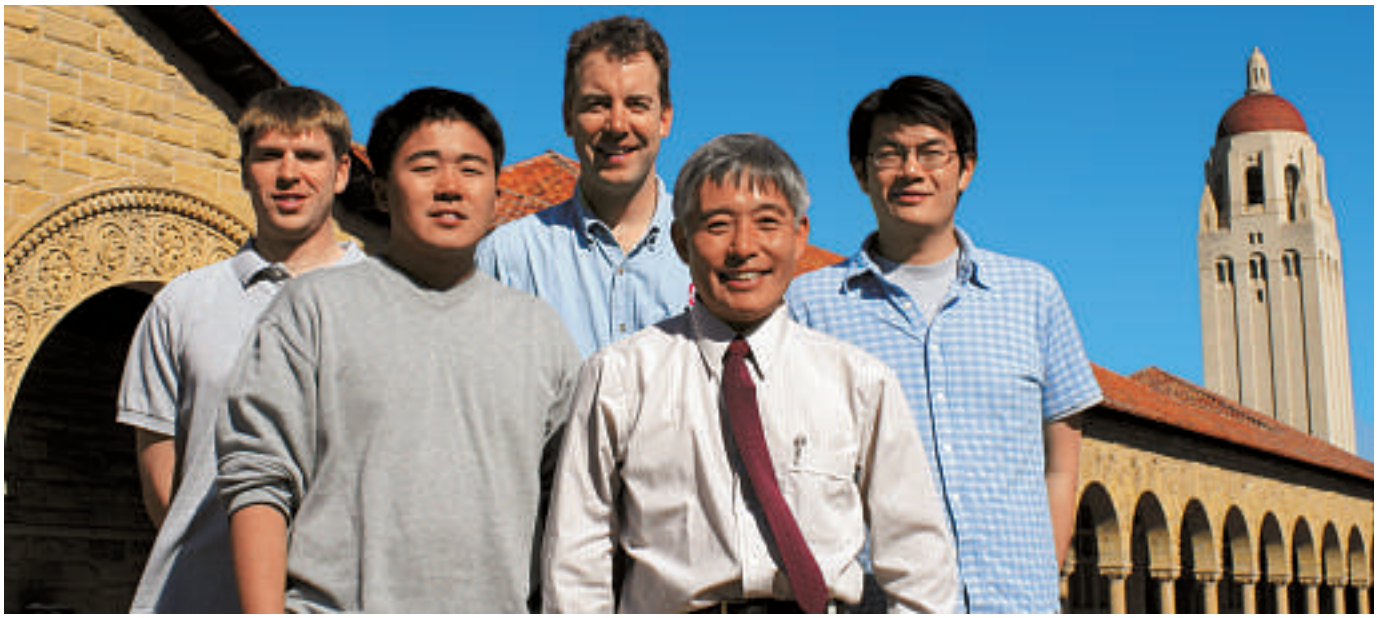
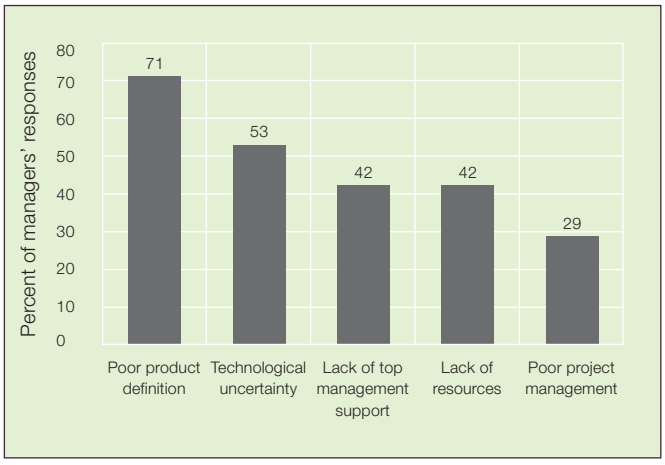
Case-based training for accelerating and error proofing the product development process. ABB teams up with Stanford University.



ABB's business success depends on its being able to develop and supply innovative, high-quality products that can compete in the global marketplace. Despite having a long history of launching successful products, getting the right products to market at the right price and time remains a perennial challenge and requires constant attention. The typical reasons for product development delays have been extensively researched (see figure on this page). There was strong evidence of similar factors affecting some of the product development projects underway within ABB during 2000–2001.

The engineering and manufacturing group within ABB corporate R&D concerns itself with analytical and computational techniques, computer-based tools and IT systems for improving the efficiency and effectiveness of the product development process. It has been in the vanguard of research in areas such as techniques for product variety management, product platform design, and distributed product data management.

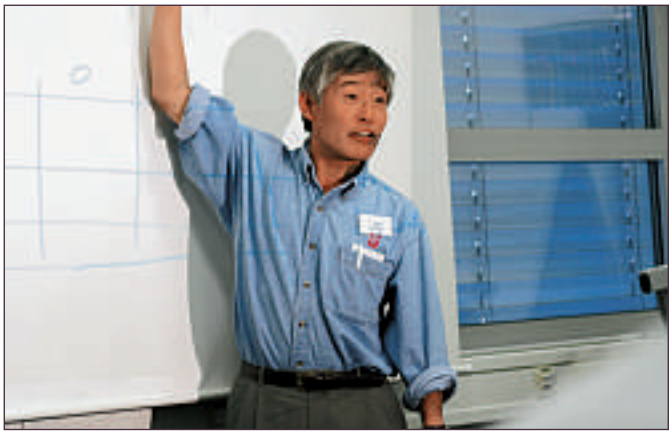


Typical reasons for product development delays
(Taken from 'Accelerating the development of technology-based new products,' by A. K. Gupta, D. L. Wilemon. California Management Review, 1990, vol 32, 24–44.)

A key element of the group's strategy is to collaborate with research teams at leading universities to conduct thought-leading research projects and to develop and offer appropriate training courses for key ABB managers responsible for bringing products to the market.

Since 1994, the Manufacturing Modeling Laboratory (MML) at Stanford University has been investigating structured methods ('design for X') used to support manufacturing companies in conducting product development effectively and efficiently. MML's recent focus has been on system products that require high levels of global customization as well as frequent updates due to advances in component technologies.

In 2001, ABB started working with MML to develop methods



that address the product definition phase of design and manufacturing. In the first phase key ABB managers received training in well-known DfX techniques such as Quality Function Deployment, Six Sigma, and Requirements Flowdown as well as specialized tools from MML such as Customer Value Chain Analysis and Project Priority Matrix.

However, in the view of ABB, this approach, while good, was less that satisfactory in achieving implementation of the methods in practice. It was felt that a case-based approach to training, which is typically used in business schools, would be much more effective in transferring know-how to the practicing engineers and managers. There was, however, a problem – a lack of suitable case studies that would be accepted within the strong technical culture of ABB. ABB and MML therefore decided to join forces and create such case studies in 2002.

In-depth studies of 12 product development projects from various ABB businesses were carried out. The team spent considerable time 'living' within these businesses and talked to people representing the full breadth of functions and departments involved. In 2003, two of these project descriptions were turned into cases for an interactive case-based training module. These were identified as the *Voyager case* and the *Avocado case*.

The *Voyager case* draws attention to the problem of inadequate risk management in product development, in particular the presence of elements of high technical risk in the critical path of a development project. Such risk ought to be eliminated by prior preparatory projects or be addressed in future generations of the product. The case also highlights the problems of frequent requirement changes impacting the development progress and the role a stronger management and better market knowledge can play in mitigating such situations.

The *Avocado case* focuses on the critical role played by proper resource allocation and resource management in ensuring a project's success, especially when external engineering resources are used. The use of external resources on a temporary basis is quite common in many of today's companies that have thinned their staffs during past cost reduction initiatives. The case also highlights the challenges faced in product platform development in the absence of such a mindset and commitment within the whole organization. Furthermore, it points up the benefits of using structured 'gated' process models in ensuring steady progress and first-pass success of a development project.

Both the Voyager and the Avocado projects turned out to be successful development efforts. ABB's diverse global businesses in system products provided a fertile ground for stimulating case studies that have led to effective teaching modules. These cases are serving as vehicles for developing new tools that bridge technology, manufacturing and business. The ABB Voyager case, in particular, has received outstanding reviews for its delivery at ABB, Stanford, MIT, as well as other global companies such as Toyota, Hitachi, Toshiba, GM and Nissan. Stanford considers these ABB cases as valuable additions to its curriculum as well as to its research program.

ABB is now continuing to work with Stanford to build on these cases and to create a 'product definition simulation game' that will increase the level of interaction in the training and teaching process. This aims to train current and future managers in addressing the myriad uncertainties involved in product definition and help them make robust engineering and manufacturing decisions. The ultimate goal of this training is to ensure the 'right products at the right price and at the right time, every time!'

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