

# Collaborating with Competitors on Technology Development

*Chris Floyd*

Until quite recently, corporate enthusiasm for joint ventures, alliances, and outsourcing partnerships of all kinds stopped short at technology development. Why collaborate with competitors if you could gain a unique advantage by developing technology yourself? Today, however, with technology complexity increasing and lead times shrinking, CEOs are having to rethink how they manage technology. As we discuss in our new book, *Managing Technology for Corporate Success*<sup>1</sup>, they need new approaches for integrating technology and strategy. In particular, they need to make full use of the best technology available – whether it resides inside or outside the company.

That's why many leading global companies – including Honda, IBM, Intel, and Siemens – are now collaborating with direct competitors to develop technology. In each case, participants are committing resources in exchange for influence over how the resources are applied, as well as access to the output.

If you are sharing technology development with a competitor, or thinking about doing so, you need to be clear about *why* you want to participate and *how* to maximize the chances of success.

## Why Collaborate?

We recently surveyed companies engaged in technology collaboration across the electronics, biotechnology, metals, automotive, and oil sectors. Our survey confirmed that managers see three principal reasons for collaborating: to cut costs and individual risk, to strengthen collective industry position, and to unite against a threat.

**Cutting Costs and Risks.** In many industries, the cost of innovation is prohibitive for companies acting alone. For British Aerospace, for example, to develop a twin-engined version of its Avro regional jet would have cost more than the group's market capitalization. Even arch-rivals Boeing and Airbus (the latter itself a collaboration), are considering working together on the next generation of super jumbos.

In other capital-intensive industries, the costs of innovation are equally daunting. In metals processing, Pechiney is one of only a few companies worldwide that is developing aluminum smelting technology with supporting licensees. Everyone benefits. Pechiney shares the cost of development through the license fees; licensees gain access to technology they could not otherwise afford. And the extended user base generates more feedback than Pechiney could develop on its own. In consequence, the technology is evolving fast and cost-effectively.

In the semiconductors market, speed of development is the challenge. Every five years sees a new generation of dynamic memory chips. Since development and capital plant costs exceed the likely revenues of each major player, no company can go it alone. That is why Siemens and IBM got together in 1989. Toshiba joined them in 1994, and other partners are under consideration. A single team drawn from each of the partner companies operates mainly on one site. The arrangement works because the participants trust one another – and because they know that unless they collaborate, they might all have to exit. In the pharmaceuticals and biotechnology industries, success depends on picking winners from a wide range of options. Collaboration reduces individual risk, augmenting the portfolio without increasing costs.

**Strengthening the Collective Position.** In digital television, internet trading, computer operating systems, and other technology-led sectors, no legal international standards yet exist. To succeed, you have to ensure that your approach becomes the de facto standard, e.g., the VHS video standard that triumphed over Philips V2000, or Microsoft at the expense of Apple.

The winning standard is the one with the most industry support. Not surprisingly, companies collaborate to create a club that can distance itself from the competition and protect its own activities. In theory, what they are doing comes close to contravening antitrust and antimonopoly laws. In practice, if partners abide by company law and ethical behavior, it seldom crosses the line.

It's important to note that collaborations don't always attain their objectives. IBM, Apple, and Motorola, for example, developed the PowerPC chip as an alternative to Intel, expecting to be able to knock Intel off its preeminent position, secure Apple's role as a computer manufacturer, and enable IBM and Motorola to generate the volumes to stay viable as chip manufacturers. Unquestionably, the PowerPC has won business for the three partners, but it is not yet the industry standard.

**Resisting a Common Threat.** Faced with a big enough external threat, companies bury their differences. Losing a small local competitive advantage and surviving becomes more attractive than beating the competitors but losing to the external threat. Take the pooling of resources by the world's dry battery manufacturers to develop battery recycling technologies: the company that produced the first viable recycling technology would have gained a huge advantage. But the set-up costs were too high; players realized that unless they worked

together, environmental pressure would hurt them all.

In the United States, manufacturers in the automotive industry have worked together on motive-power technologies to stay on the right side of environmental legislation. USCAR, set up by Ford, GM, and Chrysler with government support, has been particularly successful, developing fuel-cell technologies to replace the gasoline engine. Arthur D. Little's fuel-cell group is playing a prominent role in this effort, as evidenced in our recent announcement of the first-ever gasoline-powered fuel-cell electric engine for the automobile, which will allow new vehicles to get 80 miles per gallon of gasoline with near-zero emissions of regulated pollutants (see the story on page 84 of this issue of *Prism*.)

In Europe and the United States, the rail companies have pooled test facilities to compete against road and air transportation. Any one of the railroads could use the shared knowledge to gain a small competitive advantage. But the costs of test tracks and collision test rigs are so great, and the competitive advantage delivered so small, that joining forces to fight the bigger enemy suits everyone.

### **Creating a Venture**

As in any joint venture, you need to choose your technology partners with care, thinking through your own motives – and theirs – for collaboration.

Obviously, you want partners whose strategic aims and company cultures are similar to yours. Finding them is not easy. Consider the collaboration between Fujitsu, Tandem, and Anamartic in the 1980s on silicon wafer technology. Superficially, the partners had similar aspirations for a product that would give them a competitive edge. On closer inspection, however, their goals were very different, as published accounts make clear. Anamartic, the smallest partner, wanted a platform for a long-term business and a permanent relationship; Tandem wanted a short-term alliance to grow its products business; Fujitsu saw the alliance as a way of regrouping its own skills before moving forward alone. In time, the differences created tension, and the collaboration collapsed, amid recrimination, in 1993.

Japan's Honda and Britain's Rover, then owned by British Aerospace, also had different intentions when they got together. Rover, which was in trouble, wanted Japanese technology and working practices and needed new models. Honda wanted European manufacturing capacity, market channels, styling, and engineering design. But, longer term, Honda was looking to become a self-contained business in Europe, while British Aerospace saw acquisition as essential to Rover's long-term survival and to its own exit from the sector. The collaboration dissolved, and British Aerospace sold Rover to BMW.

Technology collaboration works best when partners are similar in nature and have similar strategic intentions and aspirations. For example, when IBM, Siemens, and Toshiba started talking, they were large, successful-firms, recognized for technical strength and business acumen. All three were known as long-term players, and all wanted to be in the Dynamic Random Access Memory (DRAM) business. They were compatible, and DRAM has become a long-term collaboration.

You need to think about not just what's in the venture for you, but what's in it for your partner. An unscrupulous or misguided partner can exploit the situation, and one partner's mistrust can cause the venture to fail. (See „Trust and the Prisoner's Dilemma,“ on the next page, for an idea of what can go wrong.)

### **Making It Work**

Arthur D. Little's work around the world suggests four guidelines for long-term collaboration. All are centered on the goals of the venture and downplay individual interests:

- Create trust throughout the partner companies.
- Accept imbalances in power and influence.
- Be pragmatic about funding and intellectual property.
- Bring something to the party.

**Create trust.** Building trust is essential. Most partners invest the time to make sure boards and senior managers are comfortable with each other. But middle and junior managers need to trust one another too. And here many companies face difficulties. People may have spent much of their working life thinking about beating their competitors. Now, overnight, they have to collaborate with yesterday's enemies. Hardly a surprise then that many managers pay lip service to the new rules in public while denigrating them in private with their teams. When the engineering arm of a water utility was put into a joint venture with a commercial contractor, for example, many of the utility's managers saw a conflict with the ethos of public service and their view of private contractors as uncaring and financially driven. To make the venture work, top management had to demonstrate its own commitment and take practical action to foster trust: intensive communication, multipartner teams, and removal of a few staff members who were creating barriers. Many collaborations face similar difficulties; why

should a Rover engineer, brought up to see Japan as a threat to the U.K. automotive industry, cooperate with Honda? Or a top silicon team from Siemens share technical knowledge with IBM? In these circumstances, encouraging collaboration takes time, effort, and persistence.

### **Trust and the Prisoner's Dilemma**

Collaboration works only if all parties agree that their individual interests are best served by working together. But in most competitive collaborations, each partner could choose to take advantage of the others. The advantage might be less than that from full collaboration, but will outweigh the loss that would result if one of the other partners chose to be selfish. This tension is known as "the prisoner's dilemma," from classical game theory. Imagine two prisoners facing execution for murder. Each is told that if he alone pleads guilty, he will face jail for five years, while the other will be executed. If both plead guilty, both face life imprisonment. If both plead not guilty, the prosecution case collapses and both will be

released. Each prisoner faces a difficult choice; plead guilty to protect himself, or plead not guilty and place his life in the hands of the other prisoner. If only they knew how the other would plead, both would plead not guilty. Since they do not, they both plead guilty.

The same logic applies in business. If you and your competitors collaborate, you will all gain. If you exploit the situation, you will gain some advantage and reduce the risk of being exploited by others. However, if everyone tries to exploit the situation, you all lose. Only if you trust your partners and they trust you will you commit fully.

### **Accept imbalances in power and influence.**

Success, as in any business enterprise, depends disproportionately on a few senior managers. These people must have the respect and loyalty of those who work for them and the trust of the sponsoring partners.

Siemens/IBM/Toshiba recognize the importance of top project managers who can reconcile the demands of the partners, while achieving the best collective result. When, for example, engineers lobby for test facilities and pilot production sites that suit them, senior project managers have to be seen to be even-handed. At the same time, for the sake of their own careers, they have to retain the respect of their own companies.

Putting the best people to work, rather than using collaboration as a training ground for inexperienced staff, is key. As one junior person from a failed collaboration said, „ I learned an enormous amount from working on this project with our Japanese competitor; I'm not sure I added any value, though!“

Insisting on equal representation at all levels is a mistake. It implies lack of trust and, worse, leads to inefficient use of resources. Partners must select the best people to work on the project on the basis of skill and experience, regardless of origin. Despite the possible loss of control, in entrusting part of their future to the venture, partners have to trust everyone who works on the project to do a good job.

In addition, the partners need to leave people to get on with it – making it an exception to refer controversial decisions to an arbitration panel with equal representation.

**Be pragmatic about funding and intellectual property.** For 10 years, two industrial groups with complementary skills invested tens of millions of dollars in developing a world-beating new technology. Close to the point of commercialization, the ownership of one group changed, and the new owners decided to withdraw. In exchange for any claim to intellectual property, they wanted their entire investment to be repaid. The partner disagreed, arguing that the investment should be written off, as it had as yet failed to deliver, or be repaid out of royalties if the technology lived up to commercial promise. While the lawyers worked out a compromise, competitors eroded the technology lead, reducing the chance of a commercial return to either partner.

Most technical collaborations dissolve over the years, as strategy or ownership changes. When they do, battles can start over who owns what and who paid for what, particularly in relation to key patents or expensive test-

facilities. Even during the collaboration, one partner may want to use knowledge gained from the joint activity for an activity outside the agreed range.

Agree in advance what to do if problems arise. Stick to simple rules, relying on trust and fair play as much as on legal contracts. If you are going to worry about being exploited, why even think about sharing your technical secrets?

Rules that we've seen work well include the following:

- All patents belong equally to all partners for the lifetime of the patents.
- All patents belong equally to all partners for the lifetime of the collaboration; partners who leave relinquish all rights.
- All partners contribute resources equally, and costs are written off as incurred.
- Partners own shares in the collaboration; on exit, these must be offered to remaining partners at an independently assessed value.
- Partners do not calculate and charge to the project all overhead costs; you are in this to develop technology, not to make a profit on your partners' efforts.
- Change of ownership causes a partner to relinquish all rights.

**Bring something to the party.** Above all, you need to bring something to the party. Consider the supplier of automotive components who went into three collaborations in three years, on new materials, on computeraided engineering, and on thermodynamic design. In each case, it was the weaker partner. When it tried to set up a fourth collaboration, prospective partners had lost interest, realizing that the company had nothing distinctive to contribute. In the best partnerships, the partners' core technology competencies are complementary. Whether your core competencies are manufacturing technologies like Honda's, design skills like Rover's, semiconductor lasers like Philips', or applications understanding like IBM's, you need to know where your core competencies lie and what other competencies your partners need to provide. You also need a clear technology strategy, so that you continue to grow your competencies to remain a desirable long-term partner.

The results generated by Siemens, IBM, and Toshiba, by the U.S. automobile industry, and by many others show that technology collaboration works. The issue for most companies today is not whether to collaborate, but on what and with whom.

<sup>1</sup> See Chris Floyd, *Managing Technology for Corporate Success*, Gower 1997.

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