

## **A Conversation**

### **Breakthrough Technologies: Finding Them and Making Them Happen**

*John Magee, Arthur D. Little's Chairman of the Board, recently had a discussion with Bernard Lacomis, President of Arthur D. Little Enterprises (ADLE), about the process of developing and licensing new technology. ADLE is a subsidiary of Arthur D. Little that turns ideas – from many sources – into new products. The two men also discussed ADLE's successful development of the new Commercial-Advance technology, which allows VCR users to skip over commercials in prerecorded television programs, and ADLE's approach to protecting valuable intellectual property.*

**John Magee:** What's ADLE's current strategy for finding opportunities? Do you have particular sources or do you take ideas as they come, opportunistically?

**Bernard Lacomis:** We take ideas from a variety of sources – including out of the blue. Having the widest range of sources – inside and outside the company – is the best strategy. You can't know beforehand what's the best source for good technology, so if you restrict yourself, you restrict opportunities. In the last few years, we've tried to maximize the avenues available to us for new ideas – from ADL's own people to patent attorneys around the world. We emphasize that you don't need to be a rocket scientist to come up with a good idea.

**Magee:** Do you ever take technology that ADL has developed for a client and find new applications for it?

**Lacomis:** Many times companies come to us with that kind of opportunity. Just recently we talked to a company that's interested in using a new technology in only one industry. ADLE is probably better able than the company itself to explore additional uses for the technology because of our relationship with ADL's scientists and engineers.

**Magee:** This seems like a more proactive version of mining a company's patent portfolio.

**Lacomis:** *Yes*, and that idea is in vogue today. However, mining a company's patent portfolio is about as difficult as finding a needle in a haystack. We have an opportunity to do that for a company that holds mountains of patents in every corner of technology. The problem is that most companies want you to explore the opportunities at your own expense, so that you absorb the risk of finding an idea from which you can generate income.

**Magee:** And, of course, technology doesn't live in the abstract. You have to link technology with market opportunity to produce a successful product. Isn't it hard to invent products or see market opportunities in another company's portfolio?

**Lacomis:** *You* put your finger on the risk. Nothing is successful just because it's a technical advance; it's successful only because it's a business opportunity. Knowing which among various alternative technologies is the opportunity is the real skill. Many technologies may accomplish the same goal, but only one is the best in terms of business opportunity – only one will strike a chord among the right companies to exploit it.

**Magee:** I had a client some time ago that was examining its new venture strategy. In the course of my work, I talked to development directors in different divisions of the company. In one case, the development director said getting the patent is the hard part – any fool ought to be able to make money once he got the patent. Another director had a market research group inside R&D that worked with good customers to find out what issues they were struggling with. I think you can guess which sector of the business was most successful in developing new products.

**Lacomis:** Undoubtedly, a patent is only one step on the journey toward making money. More important is meeting a customer's need. The way we've developed the Commercial-Advance technology is a good example of the entire process. The original idea was good, but it has been improved greatly along the way to become a product that companies really want to license.

**Magee:** Where did the idea for Commercial-Advance come from? And how did you know it was an idea you could take all the way?

**Lacomis:** The idea came from an inventor named Jerry Iggulden, who had hired ADL in the past to promote another technology of his relating to infrared telecommunication. He became aware of ADLE's capabilities, and a year or two later he came to us with the idea of removing commercials from prerecorded programs. From the first time I heard about it, I felt there had to be a market for this if we could make it work at a reasonable price.

This is how the device works. While you're recording a television program on your VCR, Commercial-Advance collects the telltale „events“ of commercials (such as imperceptible black frames at the beginning and end of commercials). Sensors detect and store these events, and a post-processing algorithm analyzes them to determine the location of all the commercials on the tape. During playback, the system analyzes the signals for commercials and triggers a fast-forward mechanism. Only by going past the commercials during the recording process and looking back at the events can you find them. That was the key notion to making the technology work accurately.

ADLE did some research and put together a team of ADL engineers to prove the feasibility of the technology on a broad level. We were able to convince prospective licensee companies that it was a worthwhile technology and there was a market. Then we hired an outside firm to help us develop the technology further.

**Magee:** Why did you decide to license Commercial-Advance broadly and nonexclusively?

**Lacomis:** For a few reasons, the most important of which is that no one manufacturer has a substantial piece of the global VCR market. For example, the largest U.S. market shareholder is Thomson, with about 20 percent. They were the first company to license the technology for use in their VCRs. Because of the fragmented market, our price for an exclusive would have been very high. But Thomson never wanted an exclusive; they didn't believe that this particular feature would increase their market share by very much. They saw the power in everyone having the technology: it would boost everyone's sales of VCRs. So it was easy to go forward with nonexclusive licensing.

When we first went to major manufacturers in Japan, however, they were reluctant to jump on board. We had the notion that \$7-\$ 10 would be a tolerable manufacturing cost in this market. But actually that's a lot to absorb in a VCR, because it's a tight-margin commodity item and it's difficult to convince a manufacturer to put \$7-\$ 10 into a new feature.

**Magee:** And the other problem is that \$7- \$ 10 is just the manufacturing cost. By the time the company marks it up for overhead and the distributor and retailer mark it up, you're talking about adding \$50 or more to the cost of a VCR.

**Lacomis:** Right, and cost is a very important issue. After we got Thomson involved, we saw that for broad licensing we had to keep the cost down. Then we started opening our minds to many ways to do this, and month after month we'd come up with little short cuts. By saving on memory and simplifying the electronics, we got the cost down to \$2-\$3. Now we have an opportunity to make a custom-integrated circuit available to our licensees, which would bring the cost down to under a dollar. That price level opens huge mainstream volumes. Now it's easier for a manufacturer to put the technology in all its VCRs, not just the high-end ones. In a market where over 40 million units are sold worldwide each year, ADLE's strategy to generate high royalties is to increase the technology's penetration into the whole market. Commercial-Advance will soon become a necessary feature rather than a luxury feature in VCRs. We're well on our way to that goal.

**Magee:** Some people spend a lot of their energy and profits defending their inventions from competitors. How are you protecting Commercial-Advance?

**Lacomis:** We are, of course, obtaining worldwide patent coverage on the technology. But it's true, you never know when someone will step in and try to copy a product. However, we've done something in the Commercial-Advance program that we've never done before – we've combined trademark rights with patent rights. Everyone is being licensed on a nonexclusive basis, and everyone is building the market value of the Commercial-Advance trademark. Consequently, it doesn't pay for someone to come up with a competing product and incur the risks of marketability without the mark. Licensing from us would cost less and be less risky.

Through our licensing, we are creating value in the Commercial-Advance mark. For example, by setting up standards through licensing of the trademark, we have ensured that products having the Commercial-Advance feature made by all manufacturers are compatible with each other. You can record a television program on an RCA Commercial-Advance VCR and play it back on a Panasonic Commercial-Advance VCR with the assurance that the commercials will be skipped. There will come a time when the trademark itself will be as valuable as any patent.

**Magee:** What about going forward? Do licensees have cross-licensing agreements on any improvements they may make in the technology?

**Lacomis:** This is something we've learned from experience. The arrangement we've put in place using non-exclusive licenses has grant-back provisions; therefore, any improvement made by any of the licensees is licensable by us to other licensees and gets into the product broadly and quickly. Licensees appreciate this arrangement.

**Magee:** And to the extent that improvements are patentable, it builds life into the process.

**Lacomis:** Right. When you look at a technology, you have to look beyond its technical feasibility and ask, is it patentable? You can't make money with licensing unless you can protect the intellectual property. Since a single patent has a limited life, you can extend the life of your protection by continuing to build a portfolio of improvement patents. That is what nonexclusive licensing and cross-licensing provisions for improvements do for us.

We recognized early on with Commercial-Advance that we could get patents on this technology. Now we have several patents in the United States and many applications for patents pending all over the world, encompassing the basic idea and improvements. It would be difficult and expensive to avoid these. I feel the sum total of trademark, patents, know-how, and marketing value will drive this program and extend its life.

**Magee:** How do you ensure that your licensees are getting a good deal?

**Lacomis:** Every licensee has to feel that it's getting value for its upfront fees and royalties that it couldn't get anywhere else – and that the deal is fair. If we ask for higher fees or royalty rates from later participants, it's because they had a chance to sign on when the rates were cheaper, and coming in as a new licensee gives them benefits the first licensees didn't have: the market has been developed, the technology is better developed, and the intellectual property is more mature. Everyone can understand that.

**Magee:** Will we pursue further technical advances on Commercial-Advance?

**Lacomis:** We're constantly improving it. We're using a product development firm in California that has made significant contributions to improving the technology. In addition, they work with our licensees to transfer the improvements and to extend the technology into different geographical areas. This is a never-ending task.

There are already new improvements to the original. One is Movie-Advance, which allows people who rent videocassette movies to skip over so called „trailers“ or commercials for other movies. We also have a feature called Commercial-Advance Plus that will allow people with an archive of prerecorded tapes to edit the tapes for future viewing without commercials. That's a nice addition for households that have two VCRs, one with Commercial-Advance and one without.

**Magee:** Another successful licensing program for ADLE, the scroll compressor technology program, followed a different development path, didn't it? Wasn't scroll technology developed on a basic principle that was old and unpatentable?

**Lacomis:** Yes, the general idea of a scroll compressor went back to 1902. Our licensing royalties were built not on the basic idea but on practical improvements developed at ADL, which permitted scroll compressors to operate more efficiently and turned the concept into something that could be easily manufactured. It's not necessarily the person who comes up with a good concept who makes the money; it's the one who turns it into a commercial device.

**Magee:** The scroll program is now over 20 years old. How does it illustrate ADLE's strengths?

**Lacomis:** That program has been a model for us. We took an original concept that came from outside ADL and developed it further, generating new and improved technology at ADL and leveraging it through licensing. Every time we work on a new technology, we should be attuned to the long-term benefits of becoming technical experts in it. That is the real kernel of being able to generate a long revenue stream.

**Magee:** Another characteristic of the scroll technology was its potential breadth of opportunity, from industrial air compressors to in-tank fuel pumps.

**Lacomis:** That's true. It's a hard example to duplicate, because it has had applications in so many different fields. We're still finding new uses for the technology. We just completed a project in which scroll will be used as a disposable pump in a medical product.

**Magee:** A lot of people think that all you do is look for someone else's good idea, get a third party to pay for it, and then sit back and collect fees.

**Lacomis:** Would that that were true! First, we usually fund the development of the idea, which means we're absorbing the risk. And second, it's not just a matter of applying for patents and creating the initial licensing agreements. You have to improve the technology, apply for new patents, and keep the licensing revenues flowing over a long period, which usually involves multiple negotiations of agreements and maintaining good relationships with licensees. You have to monitor and sometimes discipline licensees if they are not living up to the agreements. At the same time, you have to be sensitive to their problems and be flexible in working them out. It takes a lot of work to generate a long-term income stream for both ADLE and the inventors. But, unless you do that, you'll fail in this business.

**Magee:** What do you think of the principle of making your own products obsolete?

**Lacomis:** That's the mark of a good company. I heard this quote at a conference recently: „The gazelle in Africa wakes up every morning knowing that it has to run faster than every lion, and the lion gets up every morning knowing it has to run faster than at least one gazelle.“ Today, if you don't keep running, you'll be out of business and you won't have anything to eat. If you can't improve your products every year or two, particularly in the high-tech areas, you won't be in business long. Each company should make its own products obsolete, always staying two steps ahead of its competitors. That's what gets that extra margin – for a product that's a little bit different and a little bit better.

*Bernard J. Lacomis is President and Chief Executive Officer of Arthur D. Little Enterprises, Inc., a wholly owned subsidiary of Arthur D. Little. His expertise is in the commercialization of new products and the protection of intellectual property rights.*

*John F. Magee is Chairman of the Board of Arthur D. Little, Inc. He served as President of the firm from 1972 to 1986 and Chief/Executive Officer from 1974 to 1988. He has worked on cases all over the world involving marketing research, production planning and inventory control, financial analysis, and economic regulation.*