FACE TO FACE

Technology Forecasting at J&J

An Interview with Jonathan Rosen, PhD
Vice President, R&D, Codman & Shurtleff, Inc., a Johnson & Johnson Company

Since congressional passage of the Technology Transfer Act of 1986, industry interest in technology transfer has increased dramatically. But the potential for cooperative research agreements with federal and university research laboratories far exceeds the current level of activity.

Codman & Shurtleff, a Johnson & Johnson Company, believes technology transfer is important to a company's long-term strength. Jonathan Rosen, vice president of R&D for the Randolph, MA–based neurosurgical device company, says the key to a successful program is technology forecasting.

MD&DI: What role does forecasting play in technology transfer?

ROSEN: Forecasting really is the key. You have to know what you want before you go through your business development or internal R&D group, or any other resource. The purpose of forecasting is to identify emerging technologies, both short and medium range. That's how you move forward. If you keep doing the same things, the field will pass you by. Forecasting keeps you in the middle of the wave longer. It gets down to picking an accurate time frame for the availability of a technology.

For example, I may forecast that an optic fiber will become available between one and five years from now. Within that four-year span, I may forecast that it will become available sooner if certain developments come to pass, later if they don't. The trick is to figure it out before it happens.

You can mobilize your forces quickly to evaluate whether a technology is what it's cracked up to be, how far along it is toward development, and what resources you need to bring it in and take advantage of it.

MD&DI: What is J&J's corporate expectation for company-wide technology forecasting?

ROSEN: The corporate expectation is that each J&J company in its own way will be responsible for technology forecasting, or mechanisms through which the organization becomes aware of technological changes in its area of interest that may affect its business. For example, if a drug can be administered more effectively by a transcutaneous patch than orally, and we're in the oral drug business, we're sensitized by that development. It's both an opportunity and a concern. We examine process and product technologies as well as developments in clinical science, and we make strategic planning decisions based on that information—decisions regarding the games that are being played and which ones we want to participate in.

MD&DI: Where do you get your information?

ROSEN: First, there are on-line data bases of all kinds. Someone here at J&J recently counted 5000 that were health-care related, ranging from pure scientific literature to financial and competitor analysis, patent information, demographics, epidemiology studies, biostatistics, environmental information, and updates on legislation.

Basically, all the information that's published or in the public domain that is accessible legally and ethically is fair game.

The computer side is just one piece of the puzzle. We aggressively use freedom of information. Then there are focus groups, scientific advisory boards, committees, councils, and consultants. Also, we attend scientific and clinical symposia and conferences. Basically, all the information that's published or in the public domain that is accessible to us legally and ethically is fair game, and we keep careful and rigorous control to make sure it stays on that side of the line.

MD&DI: Once you find an area you're interested in, what's next?

ROSEN: The first time you access the information, it's to define the technological borders of your field of interest and compare it with your current strengths and limitations as a company. The next step is to decide whether you're going to give something the full treatment or not. A full-fledged due diligence analysis could conceivably cost hundreds of thousands of dollars, or it could amount to a 15-minute search on a computer. It all depends. In any case, you can't afford to do that for the heck of it.

MD&DI: What is involved in a full-fledged due diligence analysis?

ROSEN: It amounts to getting a complete background on the technology by answering these kinds of questions: How important is the technology? What is the state of the art? Who are the leading research groups? How close to fruition is their research? Who are your potential competitors?

Technology forecasting should be the number one objective of the whole organization.

MD&DI: How does technology forecasting interface with the strategic planning process?

ROSEN: There's an absolute explosion of available new technologies, more than any corporation can handle or absorb. And so you have to establish some criteria for selection. That's where planning from a technology perspective rather than a more traditional market-based strategic plan comes in. The use of available technologies, independent of which companies are sponsoring them or the competitive environment, is often a very practical and creative way of looking at the world and the future. Near the end of the technology forecast, the strategic planning effort—which is more an analysis of the competitive environment, the growth markets, and the part you want to play in them—follows on. When strategic planning follows technology forecasting, it can usually be made very complementary from the standpoint of identifying and pursuing technologies that are emerging over the short and medium range.

MD&DI: What would you say is the greatest barrier to technology forecasting and transfer?

ROSEN: We're all working very hard to do the best possible job of finding technology transfer opportunities and assessing them. But in a strange way, this tremendous opportunity is also our greatest limitation. So much exciting development is available in health care right now that it's extremely difficult to make good choices. Moreover, the pace of development is outstripping the decision-making process. From the time you recognize an opportunity to the time you're able to bring the resources to bear and effect a technology transfer, that technology has moved on a couple of notches. So making good decisions as quickly as possible is becoming more and more critical. The key is in the planning cycle—doing your homework ahead of time. Because if you read about an opportunity in the *Wall Street Journal*, for example, and then begin your evaluation of whether or not you're interested, it's too late.

MD&DI: Once your choice is made and you decide to bring your resources to bear on a particular technology, how do you decide whether you will develop it internally or acquire it through transfer mechanisms?

ROSEN: That's why I'm here. One of the responsibilities of the director of research is to be a primary decision maker on the issue of inside versus outside development of technology. And it's a tough question. Basically, it's a complex mixture of matching your own resources against what's available and the timetable for the technology's development. Then, of course, there's a hard-core business analysis that goes on as well. How much is it going to cost? What will your return be? You can do a cost-benefit analysis of inside versus outside R&D and get pretty far. And we do that. It's part of the full-fledged due diligence, and it can take several months to do a good job. You have to decide if that's how you want to spend your time.

But even if 90%, for example, of your technology is developed outside, it's ultimately the company's responsibility to develop a technology base. Somebody inside has to know if you're doing a good job or not. No matter which way the pendulum swings, you've got to be an expert in your business to be effective in making decisions over the long run. You can't swing so far to the side of contract research that you give up your ability to evaluate your success. And that's the responsibility of the whole board of directors—not just of the research director.

MD&DI: How important is technology forecasting to the overall operation of a medical device company?

ROSEN: In my mind, technology forecasting should be the number one objective of the whole organization. It's an absolutely vital first step in charting the course of the company. As I've said, most areas of health care are in a tremendously growth-intensive period, and we're flooded with new opportunities and technologies. If you look out at the horizon in any of the areas we're working in, health care will be provided in fundamentally different ways than it is now. It's obvious that these changes will have an enormous impact on our business over the next two decades. —D.H.

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