CONTRACT MANUFACTURING:

Small company, small market concerns

HARDLY A DAY GOES BY THAT SOMEONE WORKING IN A RESEARCH LABORATORY DOESN'T COME UP WITH AN IDEA FOR A NEW, IMPROVED TOOL TO BE USED IN THE DISCOVERY PROCESS.

Whether it's a new instrument, a new detection system, new process, or simply a new component that makes existing tools work better, researchers are never content with the status quo. The drive to get better answers and new discoveries faster and at a lower cost forces the marketplace to be ever evolving.

New tools, new solutions, and discoveries are rarely kept solely for the purpose of a single lab. The excitement surrounding an enhancement in improving the discovery process drives the innovators to share their tool and processes. Some develop the solution and let everyone know about it through publications while others try and commercialize their tool. Commercialization can be a rewarding outlet for many innovators. Commercialization should generate revenue for the person or group that developed the technology and it means many scientists can benefit from the standardized use of the new tool.

Commercialization can be done in the form of licensing the discovery and associated IP to a larger company that has complementary products in that application area. Some researchers seize the opportunity associated with their discovery to become entrepreneurs. They take their discovery, start their own company, and head down the pathway of bringing their product to market. The written instructions are easy to follow: have or get money, start a company, hire people to engineer and build the product, sell the product, and collect the profits. Too often the founders of these companies find reality never follows a simple flow chart. People are expensive and manufacturing a consistent, reliable product is not the same as designing one to two systems for their own use and often the money originally budgeted never covers the actual cost. Very often a new product comes to the market too early or is too expensive, doesn't deliver all the benefits promised, or simply is not profitable enough to sustain the company. I am confident that everyone in research today has some experience with a very promising product or technology that they bought as a tool and it just didn't quite live up to expectations. How often do we ask about a company that had a promising technology or product that suddenly is gone from the market?

The use of an outside manufacturing company as well as contracting out for certain services can be a very good solution for dealing with both internal and external challenges a start-up company faces.

Some companies survive these growth pains. They learn and adapt quickly to internal and external forces. They stay focused on their customers, their market, and their core competencies. Successful companies try and limit duplicating expertise internally when it can be acquired externally faster, more reliably, and at a controlled cost. Successful companies always ask: How can I get that done quickly and at a controlled cost? What do my customers really want and how can I best serve them?

Companies that struggle with growing pains don't ask many questions. They try to have all the expertise needed internally and drive their innovation. The company becomes a "not invented here" practitioner. The company management and key personnel are so focused internally, on handling every detail as well as managing the learning curve, that the external focus is limited. The company should be customer focused. Successful companies think two to three steps ahead. They try and get answers to questions like: What features are really neces-

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sary for the product launch? What are the competitive options? What benefit will the customers have from using our system?

When companies don't deliver on their promises, everyone suffers. It becomes harder for all the customers to get money for new technology and tools when the tools fail to deliver. Customers are increasingly demanding acceptance tests and performance criteria before purchasing expensive systems and new technology. Looking under the surface, there are four common external pressures new companies face when bringing equipment to the market.

- Too little money: The product was supposed to be completed in six months at a cost of only $100,000. Six months later and $400,000 into the development, the company founder realizes he needs help.
- Too complex: The company wanted to run lean and use outside manufacturing as much as possible. The challenge is many of the components are customized and the cost to prototype and manufacture each part is prohibitive. Additionally, there isn't enough expertise at the small shops to understand all the technical requirements.
- Too problematic: The product works when an experienced user runs it. The start-up time and complexity of operation limits the customer base.
- Too crowded: The product works great, but the market is crowded. Competition is quickly coming in with lower cost systems and the company finds themselves trapped in the middle of the market.

Internally, the company also has many questions to answer. How do you get your idea from concept to prototype to production to market and avoid major problems along the way? How many beta units should be produced? When will Generation II be released? Will it be backwards compatible to Version 1? What price will you have to charge to recover development costs while remaining competitive? How will you provide service for the units once they are sold?

CONTRACTING OUT

The use of an outside manufacturing company as well as contracting out for certain services can be a very good solution for dealing with both internal and external challenges a start-up company faces. Companies that specialize in providing contract manufacturing help develop, manufacture, and market better quality and more profitable product lines. Contract manufacturing companies are hired by a company that has a design, possibly a prototype, and a plan for what they need. For an agreed-upon price, the contract manufacturer then acts as the hiring firm's factory, producing and shipping either the entire unit or select subassemblies on behalf of the hiring firm. Contract manufacturing providers normally do not post their brand name on any product, and the rights to both the design and the brand name belongs to the originating designer.

Since contract manufacturing firms make their money on volume, the more manufacturing and more guarantees in the contract the lower the cost. For many start-up companies in the life science market, this becomes a dilemma as the builds are typically small and the products relatively complex. Contract manufacturing companies typically seek high guarantees for parts, have long lead time schedules, and charge for any changes to the design. Start-up companies have a dilemma. They don't have accurate figures to build in advance of orders, but they also can't wait six months for parts and assemblies to be delivered. Learning how to work effectively with a contract manufacturing company can help bridge the gaps and will improve the chances of a successful project.

CHOOSING A PARTNER

There are contract manufacturing companies that do work as a partner and offer an extensive variety of services. Vertically integrated companies exist that are great choices for companies with small, complex builds. These companies have all the resources within their four walls to machine parts, form metal, test electrical and mechanical specifications, do assembly work, and provide quality control. They bring all the value of one-stop shopping to the project. Finding the company that fits well with the needs of your company or project may take time and some resources. Be prepared to ask questions, ask for examples, ask for references, and invest in the process. Some companies can take an early prototype product, complete the design, create the documentation, and do the manufacturing. Other engineering and manufacturing companies are better equipped to handle just part of the process for a client. The start-up company may want to do final assembly and QC testing at their plant. They need and want select subassemblies built without all the added services. Small, local machine shops and manufacturing facilities may offer everything they need. Still other companies may provide services related to marketing and business development to expand the product use for markets outside of the intended application.

Sometimes different partners are needed for different projects and at different stages of a company's development. The full service partner who helps a company leverage their intellectual property and customer knowledge in the market may be the perfect choice for an innovator looking to commercialize their idea, but remain close to the science. Other companies are best served with picking and choosing the services needed, such as manufacturing review, cost reductions, assembly, inventory management, quality control, UL and CE compliance certification, and service. If there are no project managers, manufacturing engineers, and system engineers at the company then consider capturing the value of a full service company. Every

company can benefit from paying the lowest possible cost for the system provided quality and reliability are never sacrificed. The lowest possible cost basis allows customers to face less price pressure from competitors and have the product in the market longer. The higher margins improve the financial health of the company allowing for better investment in new products and more application support.

The use of contract services doesn't stop at manufacturing services. Companies can provide early product support including installation and field service on an outsourced basis. Removing that high overhead and variable costs in the early days allows companies to focus externally on customers and internally on sales and marketing.

I am presently working with a company that has a new detection system that they want to bring to market. They're a very technical, very capable company and were looking to have this product manufactured for them. They have much experience with contract manufacturing companies and never felt they were treated as any more than a vendor. The contract manufacturer would take their specifications as is, give them a price, and then build the product exactly to the specs.

As expected, the products always needed little tweaks and the CM was happy to get that done at $300 per hour for engineering time as well as the cost of replacing any parts already acquired. The life science company ended up paying for the project two or three times over before they got what they felt was a commercial product.

BRIDGING THE GAP

Working with a contract manufacturing company is new to many start-up companies. There is a different language, different goals, and an entirely different set of references. Understanding these differences and investing in communications will make the experience with outside contractors more successful. I'm not saying that every experience will be a positive one. That would be great if there was a way to guarantee that. Recognizing when a relationship and process isn't working is arguably more critical than recognizing when it is on target.

Maybe you only want or need a vendor relationship with the machine shop, engineering firm, or manufacturing company. Have you identified the project manager within your company? What is that person empowered to do? Even if your product could change the face of scientific research, save lives, and improve our world, the business person on the other side has the responsibility to make money for the company that builds this product. The contract manufacturer or shop may find satisfaction in working on your project, but they must make money if they want to run a profitable business. Many times their vision is simply to make a profit at the end of the quarter.

Make the investment in your company's success. Hire and use the right professionals to help your team understand the different language of manufacturing and QC as well as the ins and outs of establishing contracts with vendors. Engineers are not always experienced in manufacturing and QC processes. A mechanical engineer, EE, and manufacturing engineer all have different roles and training. A project manager is typically a specialized engineer who has the vision and responsibility for the entire project. Often, it's not effective to hire all the resources internally just to work with outside vendors. Consider using a consultant to help bridge the gaps. Invest in your internal people with as much training as possible so they can handle multiple roles. Learn from your partners.

Below are some dos and don'ts for working with a contract manufacturing company:

DO:

- Hire an experienced person early in the process so they have time to develop relationships and find the best fits.
- Seek out companies that are vertically integrated and can handle more than just one small piece of your business.
- Think through the process before meeting with manufacturers.

Ask the questions:

- What volumes are you really able to commit to?
- What are the payment terms I am comfortable with?
- What are the QC specifications and who is doing the inspection?
- What about parts supply, what is acceptable?
- What protection do I need for IP?
- What are the backup plans?

DON'T:

- Be dependent on one supplier for critical parts and components.
- Become the largest single customer for a small machine shop or engineering company.
- Trust someone else's QC.
- Believe everything will work out as planned.
- Believe people are too smart to do stupid things.

The use of an outside contract manufacturing company can help your company address the common problems you are likely to face externally. When done right, using a CM provides flexibility, price and cost controls, improved reliability, and a faster time to the market. Internal questions can be answered as your team has the time to focus on the customers and the market. Once answered, your CM partner can execute the task.

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