



Managing Capital Expenditures: Not Just **Machines** Anymore

Feature Interview by Barry Matties

I-CONNECT007

In this interview, Barry Matties spoke with Peter Bigelow, CEO of IMI Inc., about the trickiness of managing CapEx in a company with limited resources. They discuss the importance of planning things out in advance while still being flexible, why companies shouldn't be afraid to invest in processes that may save them time and money, and why firms with ITAR customers may wind up spending as much on IT and cybersecurity as on equipment.

Barry Matties: We have been looking at the process of CapEx, how people go about deciding what they're going to spend their funds on, and the motivation behind it. When you're looking at CapEx expenditures, what's your approach to ranking or prioritizing where you're going to invest your money?

Peter Bigelow: Well, that kind of explains it all. I may not be the typical owner because we're a small company and I wish I had more capital

dollars. We spend about 8% of sales on capital, which is a large percentage, but in dollars it's not huge. I typically have something I must replace or something I want to buy new, and something which comes out of the blue. With this year as an example, we bought a new etcher and that was more of a replacement than an addition. We're also buying lab equipment, which is technologically advanced so, in my mind, it's not a replacement, but an addition. In past years, we've put in direct imaging (DI), which was an addition; we bought drill machines, which were a replacement; and you have that kind of a flow that goes on.

So, I look out a few years and say, "If I can average spending at so much per year, what are the major things that either appear will need to be replaced or appear to be newer technologies we should be embracing?" You work through a budget and then you move the pieces around based on the opportunity. A piece of equipment planned for two years out becomes available, so you move it up and push something else back out. You're doing a lot based on need. Then you have the things which you don't plan



Peter Bigelow

on, such as when a chiller dies and it shouldn't have, but it does, and you have to replace it.

One of the big expenses we've had over the last few years is NIST-800, CMMC, and IPC-1791—just security, cybersecurity, and all that goes with it. For us, that meant spending a lot of money on consultants, which is not really capital, but then basically redoing our entire IT and physical plant security systems, which was a major capital upgrade. I could argue, did we really need it all to run the business? No. But to be in the markets we're in, we certainly did. So, we spent a lot of money on what was an unforeseen expense. If you'd talked to me five years ago and said, "You're going to spend a few hundred thousand dollars on IT and security stuff," I would have said, "Really? For our company? I don't think so." But we have. And because we've done that, we are now IPC-1791 certified. I think we were the fourth fabricator in the country to get that certification. We're in good shape for the CMMC, if and when that finally rolls out, to be at least level three. We're hoping for level four. But that was all unexpected.

When you're looking at capital in a company our size with limited resources, you have

to plan it out and be flexible enough to move around priorities when things occur. If I were in an assembly business, which is quite different, that's dealing with an entire line. I'm guessing that you've got the same issue of needing to replace a line at some point with newer or better. But you're also probably looking at what mix of business am I quoting, and do I have enough capacity or capability for that particular mix? You're probably focusing more on the sales end of what you need vs. the operations of what you need. We all need more test measurement, verification, and

validation equipment. Everyone needs that, no matter what industry you're in. If I were a larger fabricator, I'd be doing what I'm doing, but on steroids. It's a lot more money, and a lot more complex.

Matties: You've mentioned a couple of things. One, it's a replacement strategy and you have end-of-life equipment that you must replace. When you look at replacement, you're usually either looking at adding the latest technology or adding capacity. But on the IT side, it's what you had to do to stay in the marketplace, so it really was a strategic expenditure that you made there.

Bigelow: Correct.

Matties: But you indicated that it was a surprise. Why was it a surprise?

Bigelow: The surprise was that, once you start to work on one aspect, it mushrooms into everything. As soon as we started working on making our systems "secure" to communicate in and out of the company, as well as interact with our customers and suppliers, it started a

domino effect that impacted virtually every piece of equipment we had in the plant. We had to have the internet, which communicates outside, made secure; and intranet, which communicates inside the facility, be able to quarantine information that was on older systems allegedly vulnerable to cyber hacking. Now it must be Windows 10 software and not anything older than that. We have DOS still running in our building. We have some of our old Excellon machines that work great, but the software is ancient.

We needed to find a lot of workarounds to make sure that the data coming in and out of the building was secure and nobody could get it. Once it was in the building, we had new protocols and, in some cases, new methods for communicating with equipment that was offline and safeguards to make sure that the offline data did not end up in an online environment. All that requires additional servers, and not just hardware, but process and procedure changes. That was what surprised me, because I thought it was going to be rather simple—we update the computers, we update the server, done deal. Instead, we discovered it required buying expensive stuff, like switches, servers, and all kinds of equipment which you don't think about; you don't think about the expense and it can begin to add up.

To update some of our equipment, we had to have new methods for when suppliers come in with a laptop and they want to update the software; in a secure IT environment, they can't do that. Now they must go through a different protocol, which none of them like because it's a real nuisance; we understand that, but you must do it. Even with equipment you don't think about, like controllers for heating and air conditioning, suddenly they have to be secure. It was just kind of a surprise. We're a small company; we don't have an IT staff that can race around and do it all, so we had to change how we operate.

We had to find an IT company which had expertise in security and compliance. Previ-

ously, we had someone who would come in and fix stuff, and he was wonderful, but he had no interest in worrying about whether it's HIPAA-compliant, SEC-compliant, or cyber DoD-compliant; he didn't want to do that. We had to bring in a firm and get them up to speed on what we do. All that time and effort was a surprise, and as difficult as it was for us, I'm sure every company in the industry is going through something similar. I really feel that it's a scalable expense. Whatever I spent, you could probably just take the company's sales and use the multiplier against our cost and it's probably going to be that kind of a cost for them. There's no cheap way out. I don't think there's any economies of scale.

The more facilities you have, the more lines you have, the more people you have, the more issues come up that need to be dealt with.

The more facilities you have, the more lines you have, the more people you have, the more issues come up that need to be dealt with. Now you're paying for licenses for everyone's email accounts, so they are able to two-factor authenticate everything they do. It's been extremely interesting. As you may know, I've been frequently on the Executive Agent calls and various IPC committees on 219B, 1791, and so on. I keep telling them I'm the poster child of the small guy, so if I'm telling you I can't afford to do it, or I can't do it, that means that there are a lot of other companies, maybe outside our industry, that are going to be in the same awkward position of having to make "Sophie's choice." What do you do next?



In March of this year, IMI installed a UCE (Universal) Alkaline Etching Machine to offer their customers world-class etching and line/trace tolerances.

Matties: For some of those companies, they're just going to wind up closing their doors, I would think. How can you survive if you don't have that infrastructure and security in place?

Bigelow: That's very true. I think it will force some smaller companies to decide to milk it and retire rather than try to keep going. We have some things we outsource; I think everybody in the industry outsources a process which they rarely need to do that's not worth putting in. In one case, it's literally a machine shop run by a dad and his son. They've made it clear that they're not going to do ITAR because it's too difficult for them. They just don't care. Unfortunately, the stuff we had been sending to them was ITAR, so we had to find a new supplier. We've got that kind of disruption going on. A lot of the companies that the military subcontracts to are going to say, "I don't want to do that to become ITAR, CMMC, etc., compliant

because you're too small a portion of my business to go through all of this."

I agree with that. But I also happen to think that a lot of the cybersecurity things which have come through on the DoD end of it, and including even IPC-7091, will be adopted by a lot of companies which are not military-centric. Anyone who's got intellectual property, in the medical world, or if you're in anything which is patent rich, I think they will need to have that kind of security system in place. They will have to belly up to the bar or have their suppliers do it to become certified or to comply. The bright side is that it may be required by more than just DoD-centric companies.

Matties: Now, shifting gears to paying for the CapEx. The cost of money is pretty cheap right now. Do you find this is a good time for finding capital and investing?

Bigelow: There's plenty of money available with leasing companies, banks, and so on. I'm a conservative guy. I don't want to leverage too hard because when there's a downturn, it can be devastating, so we're conservative on that. We try to spend a sizable portion of cash vs. borrowing and so on, but the money's available, for sure. I think that it bodes well for people spending capital. There are many who received PPP loans and they did not need to use the money for COVID purposes; that extra money can be used to reinvest. My neighbor is a restaurant equipment distributor. He said 2020 was a horrible year because everything was shut down. This year has boomed because everyone got the PPP money and they're redoing their restaurants to beef up their takeout, upgrade, and so on.

I have to believe other industries have had some of that opportunity to use PPP funds to spend on capital equipment as well. But there are indications interest rates will be going up. Between shortages, which are going to theoretically tick up the inflation level, and federal policy and government spending policies,



IMI's new purchase of a Micro-Vu Excel 661UC vision CMM has expanded their metrology capabilities in terms of accuracy, repeatability and speed.

interest rates will be going up. I think people are seeing that and thinking, "We've got a pretty good economy right now, so if I borrow more today, it will be a bit cheaper for me long-term than if I wait and do something further out." I think it's the publicly traded companies vs. privately held companies that have access to greater capital.

I have had this conversation with some who have done industry checks on circuit board fabricators; they are horrified because, of the approximately 200 companies left, 150 of them are not profitable. I said, "Well, they're probably all privately-held companies, so the number you need to look at is EBITDA, not profits, because you're spending the money on capital so you can take advantage of accelerated depreciation and not pay taxes. If you've got the EBITDA to do that, that's great, you're reinvesting." But publicly traded companies must beat to a different drummer so they may do things differently. A company like TTM, which has more access to capital than I would ever have, has a lot larger need for capital equipment, and is probably more strategic

in how they spend it, may find that they have internal restrictions that I don't have on how much they can spend on CapEx. Yet while I don't have those restrictions, the one I have is just simply that I don't want to spend too much money because I don't want to go broke.

Matties: Exactly. When you're looking back to the CapEx expenditure for a specific period, are you looking at a year in advance? What sort of horizon are you looking at when you're planning your CapEx?

Bigelow: Every year—which is coming up, probably in an October timeframe—I will put together a capital plan as a five-year outlook. For next year, I have my needs and wants, and I put that list together. Then the next year, I will probably have fewer needs and a couple of wants. Some of the needs might be from my want list in the earlier year and I work my way out. I always plug in a number for miscellaneous manufacturing and miscellaneous facility. We own our facility, so we must be aware of those CapEx needs as well. Something may happen that requires we do something to the building vs. spending on the manufacturing equipment side.

When I do this, it usually results in a huge number. I know what I can spend so sometimes I will blow the budget in one year and then the next year I cut back a little bit on what I spend, but I'm rolling the budget, working it where I need to. There are some items which for several years we kept pushing out, and there are some things which have popped into a year which we hadn't planned on. But by trying to look at it that way, being flexible and having conversations, we know what's about to break, what has broken, what new things we should be looking at, and we factor that in. As we are a small operation, we can all talk about it easily.

Matties: So, the replacement would be straightforward. You see what's aging, what's wearing

out, and you know what you need to replace. What other priorities are you looking at? Is it a bottleneck in your shop? A cycle time reduction? Increased yield? How do you prioritize the importance there?

Bigelow: I think there's always a bottleneck. Once I had a consultant who said that what they found fascinating about circuit board fabricators was that there was always a bottleneck, and it was never the same; the bottleneck is like a bubble; it kind of moves through. But, case in point, a few years ago, it became apparent that we were doing a lot more first article inspections (FAIs) than we'd ever done before. It was a growing trend. We realized we had to beef up our inspection area and the physical layout, as well as the equipment. We spent some money on CMM equipment, additional scopes, different types of computer software, and so forth. It was more like we identified a potential bottleneck that was soon going to really be a problem. Then we looked at other areas. In the wet process area, there are a few things we have on the list of things we want to do. They would add capacity, yes, but will also add capability.

When we invested in the DI, that was an interesting issue. Our photoplotter was dying and that was going to be a couple hundred thousand dollars to replace. But we also knew that the strength of this company was we could plate anything; and we do so. We can press anything. We're very good at mixing materials and shrink factors, but the weak link was our old registration equipment. That was the case where the DI was going to be a lot more expensive but appeared to be the direction we needed to go. We bit the bullet, put in a direct imaging system, and it was a phenomenal game changer in efficiency and time reduction; obviously, the level of accuracy and quality would improve so registration is our strong suit now.

That one was strategic. We had to do something because of replacement but decided to leapfrog forward and get ourselves in a better

position. I think there are probably a few other areas where we could do that as well; the technology is improving to a point where instead of doing what you did before, maybe go further. I look at our press; we have a fine press but looking forward I would really like something that could go maybe 80 or 90 degrees hotter so it could run some materials we can't run today. That's one where it's not high priority. It's on the B list, if you will. But when the time comes, it's going to probably be a radically different system than we have today because I want to be able to run materials we currently can't or that we have difficulty running at the current max of the system we have.

Matties: Have you considered an induction press?

Bigelow: We're thinking about where we need to understand how that works with PTFE materials and so on because that's the bulk of what we do. There's a lot of homework we have to do up front on what kind of press it is. Everyone's paradigm seems to be FR-4 and the variants of FR-4, yet we run very little of that. When we run it, it's often with another material so that's where we need to spend a little more time doing some homework on that. But we may go that direction. It's one of the technologies we're looking at.

Matties: By bringing in direct imaging, the DI system, you eliminated many process steps by doing that, so your cycle time certainly decreased in that regard. When you looked at that and you totaled the savings, did that inspire you to look for other technologies, for example, inkjet solder mask?

Bigelow: We never planned on savings. Everyone said we'd save some money and we always kind of figured, "Yeah, sure." It was a savings. I think that opened our eyes to the fact that there are places where you can make that kind of a change and get a lot of collateral benefit. We



IMI's recent capital expenditures include a laser depaneling machine.

do so much PTFE and we do very little solder mask. But we have been intrigued with some of the ink technologies that are out there. We've been intrigued with a lot of different things that look like they could be very beneficial. Do we have the volume for it? I don't know. But if we're going to make a change, should we just make the change and go from there? That's a battle I have: it may cost more, but if it has more capability, it should benefit us in other ways. Some of the people who are actually doing the process are more set on, "I don't want to change." You've got to balance all that around, too.

Matties: The old paradigms get in the way of some of the planning. People are stuck in the way that they do things, but when you look at DI as an example, sure, it was an expensive price tag. You chose to bite the bullet and the savings were greater than you expected. There are soft savings in there that you may not have even realized. For CapEx planning, we can't

let the price tag scare us away from some of these technologies. I think that is the message.

Bigelow: Absolutely. You must keep your eyes open for all the technologies coming down the pike. And, even if on the surface it appears to be either overkill or something that's not going to quite fit into your situation, you should take a hard look at it because sometimes a technology may have a lot more capability than it's being advertised to have, or the salesperson may not understand your business and where it might best fit in. You have to look at all of that. That's the exciting part, by the way, of capital spending. Every accountant will sit there and moan and groan that no matter how much you think you're saving, you're not saving enough and it's costing too much money.

But the exciting part is seeing what some of this equipment can do and how it can change how you operate. I tend to really like looking at equipment and seeing what it can do. I like going to shows and seeing everything. It's a little like when you go to a Home Depot. I know what all these things do but I'm not sure what I'd ever do with them. But you go to a trade show, and you see everything and say, "Yeah, I could use that. Maybe we should be considering something like this or that."

Matties: How involved is your sales and marketing team in your CapEx planning, generally?

Bigelow: Since I run sales and marketing, they're very involved. But to that point, we get requests from people on doing things which we can't do. I pay attention. If I'm getting enough inquiries, what will it take to do that? We do a lot of substrates here and we get inquiries all the time about aluminum, which

we do not process. I keep thinking, why not? What's the gate for doing that? There are some waste treatment issues which enter the picture and need to be thought through. Everyone who visits IMI asks, "Why aren't you doing flex? You guys are perfect for flex. You've got all the material handling because you're running very thin materials." Well, we spent a long time looking into flex and we concluded that for us, the tooling was going to be such a radical departure and that it probably was not the place to invest in growth with the limited resources we had available. But you went through a real exercise of what we had in place, if we could put everything together, and if we have complimentary processes. But it's the areas that you don't understand that are going to kill you. As we spoke to more people, they said that the tooling can absolutely kill you if you don't really understand it and do it well.

When you're looking at CapEx, the other side is the facility itself.

Matties: I think that's part of experience and wisdom, to understand and to have the discipline to know when to say no, because you can find yourself in a lot of trouble and a deep hole if you don't.

Bigelow: In this industry, we both know a lot of people who, over the decades, have made some strategic errors that ended up costing their businesses. I don't really want to be the next one who does that. We're still here, and I want to continue to be.

Matties: What year did you start your business, Peter?

Bigelow: I got into the circuit board business in 1992, back at Beaver Brook Circuits [Connecticut]. I came here in 2002 and bought the place in 2006. IMI is 50 years old this year, so we are also one of the oldest companies on the fabrication side in North America.

Matties: I visited your facility some years back, and I recall it was in a very cool structure. It seemed like it was an old store.

Bigelow: It's a whole grocery store, and the cool structure is where you parked your car underneath it, the front thing. We removed that several years ago because it was falling apart. We moved here in 1985 and bought the building that had been a grocery store and converted it over to manufacturing.

Matties: When you're looking at CapEx, the other side is the facility itself. There's always going to be more requirements for investment, changing floor plans, and that sort of thing. How do you weigh that into your mix of CapEx spending?

Bigelow: It's part of the equation. I must tell you that I always hate having to replace HVAC systems because, while I know we need it, it's very boring. I also know those types of things are going to need replacement periodically. We had to replace our roof at one point; that was very expensive, and it also sucked some money out of the operating business, but you have to do it. We pay rent and we try to have the rent account cover as much of the building needs as possible, but when we redid the whole quality area a few years ago to facilitate the changes taking place, the operating company footed that bill.

We were restricted with some walls that we could not move but we found a way around it. It's part of what you do. The floors and things like that, at some point have to be redone and you just factor it into that miscellaneous budget for facilities. The budget number is usually

big because if you replace an air conditioning unit, we're talking \$25,000 to \$30,000. Even in a small company you have to plan on probably \$40,000 or \$50,000 for all that in a given year. Some years you get away with almost nothing and you can spend that money elsewhere, but other years it's going to be more expensive.

Some years you get away with almost nothing and you can spend that money elsewhere, but other years it's going to be more expensive.

Matties: That's the way it goes. What about workflow? How do you utilize that space and change your workflow?

Bigelow: The configuration of our building is such that in that particular case, we have a space which is bigger than we need, but there's not much flexibility. In wet processes, we've successfully moved stuff around based on desired changes, but we're limited because it all has to tie into the waste treatment system. There are a lot of places with limitations. We have talked from time to time about doing a shuffle in the building and swapping departments around—maybe in a couple years because it requires a lot of planning and staging to be successful. As an example, we've talked about moving inspection into the area with the photoplotter that's no longer used, and then taking the current inspection area and making it strictly for electrical test and other processes which are not exclusively part of final inspection. In doing so, we would be able to put a significant

cleanroom in one of the areas which we'd like to have.

But that requires doing a shutdown when you can actually plan it. At the same time, we would redo the floors, which means you've got to bring somebody in for that. Those become big projects that may not cost a lot of money but are highly disruptive and require significant planning to pull off.

Matties: There's a big interruption in your daily process.

Bigelow: Yes, absolutely.

Matties: Good. Peter, is there anything else around CapEx that you feel we should share?

Bigelow: I think we've touched on pretty much all of it. Depending upon your size, the business you're in, if you're assembly, fabrication and so on, your challenges are going to be different. I think the thing which is essential is that you keep doing it. You can't say this year that you don't want to do something because the following year, it will cost you twice as much. Every business has replacements on a regular basis, and you just can't stop because it will cost you the same, but it will be much more difficult to fund it when you have to do all in one year vs. a little bit every year. You're kidding yourself if you think you can cut out capital spending. You need to do it with a discipline that gets you to a long-term goal, which should be success.

Matties: Whatever your motivation is, be it cycle time or yield or whatever, stick to your plan.

Bigelow: Correct.

Matties: Great speaking with you, Peter. Thank you for your time.

Bigelow: Thank you for the opportunity, Barry.

PCB007