

WHAT THE MARKET ANALYST SHOULD KNOW
ABOUT MARKET DEVELOPMENT

By H. Sebel, Sydney

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You'll notice that, in the title of my talk, I've avoided the use of the word "research". When you steal a local competitor's design, it's called "copying" or "knocking off" but it is given the high fallutin' title of "research" when it's an overseas idea that you hope you're the first to put on the local market! Better still, if you are really creative, research is the combination of two overseas ideas!

Just before the end of the nineteenth century, the then head of the British Patent Office resigned because he believed there was very little left to invent and no future in his job. How wrong he was!

Prior to 1967, when the Australian Industrial Research and Development Grants Board was established, relatively little product development was carried out in Australia and much was derivative of overseas work. Grants are based on a percentage of a company's eligible expenditure and by 1970-71 grant payments had increased to \$16 million for the year, covering perhaps \$40 million of development work by local companies. In Australia investment in manufacturing plant and equipment is running at \$800 million per annum so that the level of industrial research and development is not an unhealthy one given the size of the market.

The grants scheme has always been structured in favour of large companies. One has to have a research department headed by an academically qualified research man and this has tended to rule out the more practical smaller companies. (This, incidentally, is now soon to be changed but it is a paradox that many of the more productive freelance Australian industrial designers do not, by themselves, currently qualify under the R & D Act.)

In 1972/73, \$75 million was spent by Australian firms on overseas royalties and copyrights. We don't know the split-up but clearly a very substantial sum was spent by Australian companies in paying overseas firms for industrial know-how. It was probably in some cases money well spent, because the time that can elapse from conceiving a product to the actual marketing of it can easily be two to three years. If you can cut this lead time in half or less, real money can be saved.

However, a big advantage of doing one's own product development – one is then not precluded from exporting by restrictions in the licence agreement. This is an important philosophy and one we have been trying to promote to Australian industry at large by means of the Sebel Design Awards which we have held in past years.

Broadly I want to emphasise that, if you can afford to develop your own ideas and products and, if you have the skills and know-how to follow the program through, then the world is your oyster!

In the past few years Sebels have developed in Australia these five chairs here. We now have licensees, either already manufacturing one or other of them or tooling for them in the UK, Germany and the European Common Market, the USA, Singapore and New Zealand. We are negotiating in several other countries too. So far the royalties we've received are not that huge but they are growing and it is non-investment, cool money coming into Australia, not going out!

The companies with whom we are working in this way overseas are not fools: they are substantial companies with good technical expertise. But they have accepted that to pay us a royalty to obtain a range of tried and true products without "bugs" to be ironed out, is a good investment for them and it's a useful source of income for us.

And now, I'd like to read from extracts of an article on Italian design in a recent overseas publication:

"In the early sixties, Italy stunned the world with a tremendous wave of new ideas about furniture. With joyous, sometimes humorous, forms and shapes, Italian designers explored new materials and showed the imagination to apply existing technologies to the fabrication of furniture. For example, they took an injection moulding machine and made the world's first injection moulded furniture in 1969."

"Many sophisticated Italian firms are keeping competitive by developing technology faster than their copiers can figure it out."

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And, quoting an Italian furniture manufacturer:

"We have real new designs when a new material is discovered."

This is precisely what is happening today here in Australia and particularly in the furniture industry.

It is rather difficult - not impossible, but difficult - to invent something new, utilising old materials and methods. But, with the development, mainly overseas, of new materials with special qualities and economics, new worlds of designs and products are then open to anyone brave enough to enter this uncharted territory.

Yes, one has to be brave. The costs of failure can be high and, indeed, this is precisely why, in some instances, it pays for a company in Australia to tie up with an overseas company who has mastered not only a new technology but has translated the concept into successful products.

As I said above, this can be considered as cheap insurance and can also help to leapfrog some expensive time delays and get a manufacturer into far earlier production than would otherwise be possible.

Of course, imported designs and technology cannot always be successfully translated into Australian terms. My company had such a situation several years ago when we were so impressed with an adjustable height hospital bed that was a great success in the UK that we obtained the Australasian rights. The initial costs weren't so great and there was an ongoing royalty.

But, when we started demonstrating the UK bed samples to hospitals in Sydney and Melbourne, we found that the UK standards were not really good enough to be acceptable out here and we then started fiddling around with the basic UK design.

After about a year of our own development, we decided that we'd have to go far away from the UK concept if the design was to be a success and we handed back the licence to our UK friends.

After a couple of years of further development, fortunately Grant subsidised, we found that, while we could technically make a most acceptable hospital bed, we could not do so at a price which would ensure a sufficiently large market. We have therefore left the project in limbo.

Now let's get back to that Italian firm who was quoted as being first in the world in 1969 to develop a one piece injection moulded chair. It's called the Kartell chair and I've brought one with me today which we've had in our factory "museum".

The next one piece chair to show you is the Bofinger design. This is made in Germany by the hot-pressed fibreglass process but in the same general style.

Then here's another European chair called the Panton chair. This is probably the most appealing from the appearance point of view but you can make up your own mind later regarding comfort and stability. This one was produced by the reaction foam process in urethane but subsequently this design was slightly modified to allow it to be injection moulded in ABS, I believe.

And then, there's the Artemide chair - an Italian design -- also injection moulded. I understand it is to be made here in Australia by the hot pressed fibreglass process but the comfort and stability are likely to be much the same as this sample.

And, lastly, here is the Sebel version which, for the time being anyway, we're calling, Integra.

After I've finished this talk, I'll be delighted for any of you to sit on these various chairs which I've just shown you. It'll be an interesting exercise and you will be able to judge for yourself how well our development department has performed on the project. Check the Integra for yourself and compare comfort, posture, overall dimensions (important for big installations) and stability.

Our Integra is to be injection moulded in ABS (acrylonitrile-butadiene-styrene). The prototypes^{are} made from fibreglass by the way but the final product will, of course, be beautifully finished on all surfaces. The Integra has actually been under development since December 1969. This was when my company first briefed designer Charles Furey to come up with some design ideas for one-piece chairs to take advantage of new plastics only then just becoming available and new injection moulding presses capable of producing large enough and heavy enough mouldings.

So, three years later, with some \$39,000 development costs under our belt plus some \$45,000 worth of tooling almost completed, we are now within a month or so from the moment of truth. We will soon know for certain how successful was the combination of design and material which we have developed as a team - Charles Furey, our own Development Department and our moulders.

We know the market is big enough to justify the investment but just how big is anyone's guess.

We believe the Integra dies will be capable of churning out a chair every 90 seconds or so. These huge and expensive moulding machines have to

work virtually 24 hours a day, 7 days a week, so that the theoretical output which is possible from just the one set of dies is about 900 chairs per day, 6000 odd per week or 300,000 or so per year !

This is, of course, an ideal set up for differential costing, especially for the export market and, all being well, we will have a real go at exploiting the unique characteristics of this one chair by selling it in many parts of the world.

Even overseas I don't know of more than perhaps a dozen competitive one piece chairs all told and I believe ours has the qualities to take them all on in the market place. The Integra is economical to produce, stacks compactly for shipping and storage, is extremely serviceable and applicable to a variety of uses indoors and outdoors in almost any climate. Add comfort and good looks and we believe we have a winning combination.

Just to round off the Integra picture, the sort of price we're thinking of selling this chair at, in quantities, could be as low as \$10.00 - or perhaps go up to \$15.00. This figure is, of course, subject to our being able to mould the unit in the expected grade of plastic. If we have to use a tougher grade of plastic (inevitably more expensive) or thicken up the mouldings, the price will go up. (One or two of the European chairs I've shown you have retailed at around the \$40.00 mark.)

We have designed the Integra to allow us also to mould it in a clear jewel-like plastic. There's a marvellous new material called polycarbonate that can be moulded in an amethyst, topaz or sapphire colour. This will be a premium priced variation that we'll probably be offering to the quality market.

And now, you might ask: "How do you go about designing a new chair, especially a plastic one like the Integra?"

I'll tell you the stages briefly. First of all we need a concept. Let's say we conclude that it is now technically possible with new materials and bigger new injection moulding presses to produce a whole chair moulded in plastic in one piece. The tooling would obviously turn out to be expensive but we now really like products which have complex technologies as well as industrial design protection. These invariably expensive technologies give us a built-in protective advantage, making it hard for our local competitors to gain quick "inspiration" from them or to produce their own version in under eighteen months.

Instead of having maybe one hundred potential competitors in Australia for a conventional chair manufactured in the ordinary way from steel tube, plywood and upholstery – often at prices which we find hard to match due to the low overheads of many of these smaller firms – we are now competing in this particular ball game with only two or three larger firms.

So, once the all important design concept has been established, a series of sketches is then produced and maybe hundreds of ideas are considered before a few which seem most promising are devised.

Then quarter full size models are made, possibly carved from rigid urethane foam. A quarter sized model of a big chair is less than 9" high, like this one – surprisingly small isn't it? – so it's easy to make up a dozen or more alternatives which can be studied in the round as it were.

This is when problems of stackability and mouldability start rearing their ugly heads because it's amazing how misleading a freehand perspective sketch can be in this way.

Often it's back to the drawing board and weeks of work – even months – can ensue until the right idea comes along. Sometimes – and this is a real danger – you work on an idea that is so darned logical that you find you've reinvented the wheel! Inadvertently, you've developed something that your local competition or a well known overseas company has already produced and which you've forgotten about or haven't seen until it's almost too late.

Assuming you have agreed that your quarter scale version is promising, you "go to clay". You build a ^{full size} wooden armature or skeleton and clothe it with automotive clay. You only worry about one face of the chair – the side you actually sit on. By covering your clay with a polythene sheet, you can sit on your prototype and check it for comfort.

The clay is firm enough to take a seated person and, if enough people test the seat, there is enough mouldability in the clay to indicate what modifications are necessary to suit a big variety of people. That's another story – one of posture and anthropometrics – which I won't dwell on today.

Having decided that the full sized clay form is pretty right, we then take a fibreglass model off it – almost certainly we'd take off several to prove how well the stacking is likely to work and almost certainly we'll find a host of problems to overcome that we didn't know existed.

So more clay, more fibreglass and so on for what seems to be an indefinite time. I guess we might have gone through twenty versions of the Integra in this way. Sometimes we carve from solid timber when we're fairly sure of general details and want to get down to fine variations.

But, when we have solved all of the problems and this involves calling in the moulders, the toolmakers, the plastic powder manufacturers, the posture experts and the architect consultants to pronounce upon the aesthetics, the colour consultants and the marketing experts, you do a final feasibility study and, if the figures look promising, decide to go ahead.

Then you make an exact timber model - really a pattern - slightly larger than the final moulding will be, to take care of shrinkage during the moulding process.

This the toolmaker mounts in what is called a Kellering machine which follows every contour on a 3-dimensional pattern and chews out solid steel to rough out the required shape from this huge block of specially forged tool steel. The set of finished dies for the Integra will weigh about 12.5 tons and take many months to machine.

There has to be a pair of dies made for the injection moulding process and each die has to be exactly matched with the other half. Costly and laborious hand work of the highest precision is involved, which takes many more months to achieve.

The molten plastic for the moulding is injected into the dies under tremendously high pressure; up to 22,000 lbs per square inch in fact. So that sheer brute force is required to keep the two mating halves of the die together in order to keep the plastic in place. Up to 2000 tons of locking force is used on the die halves. The forged tool steel used in the dies has obviously got to be really tough and is hard to machine, finish and polish; hence the lengthy processing time.

When the dies are completed they're tried out and, inevitably, as I said earlier, modifications are found to be necessary. This nearly always involves more hand work and costs and time.

So that's why these moulding dies are so expensive but, when they're finally right and are properly made, they're capable of turning out literally millions of mouldings from the one cavity.

I hope, with this Integra demonstration, I've been able to dramatise how new products come about by the availability of new equipment and/or materials.

It is clear that much new design - certainly in the furniture field - now arises because someone says: "Here's a new material - or a new process - what better products can we make with it?".

If one is in the furniture industry, naturally the products that eventuate tend to be furniture items. But there's also a great deal of cross fertilisation going on all the time and one would find it hard to foresee what one will be making, say, five years from now.

Gentlemen, I hope you're a little wiser now about product development. I hope I haven't made it all sound too easy because I don't want to tempt any of you to rush back to your home workshop and start work on a competitive chair to one of ours!

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BACK TO BETA

Financial Analysts Journal - January/February 1974

These articles in this recent issue of the journal published in the USA by The Financial Analysts Federation advance the discussion about market risk and the beta concept:

G.D. Levitz - Market Risk and the Management of Institutional Equity Portfolios.
 R.A. Levy - Beta Coefficients as Predictors of Return.
 W.L. Fouse, W.A. Jahnke & B. Rosenberg - Is Beta Phlogiston?

They are written independently and cover different aspects of the whole subject, but between them the articles provide arguments both for and against the rationale and usefulness of the beta concept. They will certainly be of interest to beta enthusiasts but may not make many new converts.

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