

The role of electronics in industry

The Slade Memorial Lecture 1974. J. Gorton, B.E.

When it was suggested that I could usefully give a lecture on the role of electronics in industry, my mind went immediately to a whole list of interesting applications which are now coming into use.

I decided to investigate various industries and find out how much they use electronics. The result was that I was swamped with information. Then, the more I thought about it, the more I realised that to tell a group like this how clever it is and how many of its ideas are now being used, would be quite ridiculous.

A lecture of this type should, if it can, serve a useful purpose and giving the industry a pat on the back would definitely not be very useful.

During my service with Philips, I frequently ran into serious problems in the professional electronic field and as I made contact with the various large industrial organisations, trying to gather information, I discovered that they too had their problems.

As a result, here is an examination of the role of electronics in industry, standing back a little with some ideas on how we could improve that role and how we could improve the image that we are presenting to the nation as a whole.

It is important that we should have the full support of the people of New Zealand and to obtain this, we must present a clear picture of great responsibility we carry.

Now, I wish to relate ourselves clearly to the overall business activity of New Zealand. As a starting point, let us first consider the gross national product. This for 1973 was approximately \$7,000M. Next, consider our exports, these are currently running at approximately \$2,000M of which only \$150M are manufactured goods.

Domestic electronics has a production output of the order of \$20M and the local manufacture of professional electronics is of the order of \$5M. Consumption of professional electronics is of the order of \$20M. Exports of electronic equipment are rising quickly and it is hoped will be of the order of \$7M in 1976.

These figures may all be too low but even if they are, it is obvious that in terms of size, electronics is not a big industry and we must take care that the nation and the Government do not look at us with size in mind.

Now we come to the point where I started this little exercise. Ask a few people in the right places, the right questions, and you will discover what role electronics is playing in industry.

Nearly all of our \$2,000M exports are now processed in some way and very quietly, all these processes are coming under electronic control. The machine may cost a million dollars and the control system \$10,000 but today's machine cannot possibly operate without its control system.

Motor speed controls, chemical controls, information collection and transmission, automatic weighing and hatching, automatic testing, and so it goes on. There is little point in my repeating it all here, as you know of all these things far better than I.

The only conclusion we can come to, and it is not at all a new idea, is that electronics is a small industry performing a vital service for New Zealand as a whole.

The point I wish to make is this, that this vital service to the nation is the electronic industry's greatest strength. This is where we become a corner stone for the country's largest export earners, making them the most modern industries of their type anywhere in the world.

The problem is that the country is not convinced of this fact and we must do something about it. Industry is not convinced that we can do what we claim, sometimes with a large degree of justification. The Government is not really convinced of our importance and perhaps at times, even we, ourselves, are not convinced of it.

What actions should we take to improve our performance and image?

Firstly, let us examine "hobbyism". Our industry, by its very nature, attracts enthusiasts; people who love to design and build their own things. It is our responsibility to supply the best and most reliable systems to our industry and this can only be done if we really know what is going on in the rest of the world. So all our Systems Designers must remember that they are not in the industry to prove how clever they are, but to help solve problems. If solutions have been found somewhere else in the world, then use them or at most, improve on them and in this way, solve the problem with minimum difficulty and minimum expense.

Secondly, let us consider the type of staff we require for this industry.

We need well trained Sales Engineers. An idea that seems to be somewhat foreign to our teaching organisations. Very few young men who have the necessary technical training have ever thought that it might be necessary to sell the use of electronics. Whenever I suggest to a young man, recently finished his training, that he might like to become a Sales Engineer, his face immediately registers disgust. I usually have a lot of talking to do to explain the difference between selling electronic systems and selling vacuum cleaners door to door. We must all remember that the Sales Engineer is the first link in the chain. He is vital to the industry and we should let people know of the importance of this activity. I make an urgent plea to all teaching organisations to bear this in mind and ensure that their students are aware of this requirement.

Then we come to the Systems Engineer. His task is primarily to make use of existing information and to offer a service to industry. Apart from a rather natural desire to do it all his way, we train people for this work reasonably well but our teaching organisations should ensure that students are aware of the importance of using existing information and equipment to the maximum.

Last, but certainly not least, we come to the Service Engineer. Here we have great difficulties. We again come up against the hobby problem, how to have people able to understand a wide range of electronic problems but willing to install and service equipment designed and manufactured by other people.

In countries where the total activity is much larger than in New Zealand, we can use staff of lower ability and training but specialising in a narrow field. But in little New Zealand, as usual, we expect the electronics serviceman to repair anything and everything. So it is frequently found necessary to employ a very high calibre of man to do this work well and this type of person is often very reluctant to be what he considers simply a serviceman.

I feel our industry should see this problem more clearly and by its attitude to training and in the work places, establish in the minds of all concerned, the tremendous importance of the serviceman's function.

As electronics is now taking over the main control functions in industry, failures are frequently major disasters. So much so, that Management's lack of confidence is inhibiting the increased use of electronics. We must make sure that the training organisations are fully aware of this situation and are able to ensure a full supply of suitably trained men.

Next, let us examine our training organisations.

Last year, at Canterbury University, Professor Kay gave this Ralph Slade Memorial Lecture and he took as his subject the problem of the closed loop of university training. The fact

that most teaching staff have had little experience of industry was causing him considerable concern. Now steps are being taken to give teaching staff experience either by loan to industrial activities or by actually being associated with an industrial activity related to the University. This development should be further encouraged for the benefit of industry, making better use of University brain power and improving the usefulness of its output. One would hope that the problem that I have just mentioned would become more obvious as teaching staff gain industrial experience and they will see for themselves, the step required to make improvements.

We must keep Government Departments and the people, in general, informed of the role which we are playing and will play in the future. There is no doubt, that a few years ago, people accepted the idea of an electronically controlled, world, but, as is often the case, it did not happen just then, and now the idea is rather forgotten, even by the industry itself. It now becomes the industry's responsibility to itself that it should shout from the roof tops that its skills are vital to the future of the country.

It has been argued that domestic electronic manufacture is not economic in this country and should be stopped. This, it is argued, would release technical staff to work in the field of industrial electronics and so improve present difficulties with staff shortage.

But, in fact, there is no doubt that without some domestic electronics activity, the long term development of industrial electronics would be greatly retarded.

Domestic electronics is an important training ground for our technicians, it makes the total industry much larger so supporting larger training programmes and management teams. Also, frequently supplying the profits used to build up an industrial electronics activity, which by its nature, is difficult to get going from its own profit.

Over the last few years, I have often felt that we, of the electronics industry, are slightly ashamed of being, in effect, a service to all other industry. We feel much more proud when we talk of brains intensive exports. This is quite natural but very dangerous.

We will develop and are developing brains intensive exports and some day it will be important. But today, we must remember where our great strength lies. Our strength is the role we play in all industries, in automation and control, to save manpower and to improve product quality. This strength gives us the power, if we use it, to achieve the other aims and objectives which we have.

When the Governments of the day are asking such questions as, what should we do and not do, because of the shortage of resources, and when these same Governments look at our output in dollars, they conclude that we are very small and unimportant. It is, at this time, that we are foolish indeed if we do not vigorously remind them of our vital role in the future success of every industrial activity in the country.