

The third part of this industry is the microelectronics equipment manufacturing sector. Activity here focuses on product development in the industrial automation, production systems and robotics areas - 3 key areas that directly affect future manufacturing efficiency in Canada. Present sales in this field amount to \$30 million per year. About 90 per cent of production is exported. Less than 400 people now work in this sector, but growth potential is good. Of note are discussions among companies to promote cooperation in the development of next-generation products, particularly in robotics and manufacturing systems. This is an area where there are opportunities for entry by new companies.

Looking at microelectronics in total in Canada, it is clear that most companies are small, with sales of under \$10 million. The exceptions are those few vertically-integrated, large companies like Northern Telecom and Mitel. The microelectronics industry is involved in a wide range of activities covering all major fields. This activity, however, doesn't translate into large production volumes. Most programs terminate at the prototype or very small pre-production stage. There are several reasons for this. First, the technology in use by companies may be incomplete or the product development stops at pioneer stages. Second, companies may lack funding to go into volume manufacturing. Third, developments are often associated with specific systems that may not be, or never were marketed. Finally, many Canadian companies assign components and sub-contract manufacturing activities.

In contrast to Canada's focus on specialization, nichemanship and small-scale development, Japan's activities in electronics and microelectronics are massive. Japan accounts for nearly half of the world production of electronics. While broad Japanese electronics industry data does not break out substantial information on microelectronics on the same basis as Canada's industry sectors, it is clear that these sectors are a significant element of the present and future Japanese situation in electronics.

The relationship between Japan and Canada in microelectronics has traditionally been one of vendor to customer. Canadian exports to Japan amount to less than five per cent of what Canada imports from Japan. The situation is the same in terms of investment by Japan in Canada. The prime form of Japanese electronics investment in Canada is in television factories taken over by Japanese firms.