

GEORGIA MANUFACTURING TECHNOLOGY SURVEY 1994

Summary of Results

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ABSTRACT: This report summarizes a survey of 1,180 Georgia Manufacturers with 10 or more employees. The results address manufacturers' problems and needs, technology uses and business practices, customer and other manufacturer relationships, use of assistance sources with a focus on Georgia Tech's Industrial Extension Services, and business and economic outcomes.

In the fall of 1994, Georgia Tech researchers conducted a survey of manufacturers with 10 or more employees in the state; 1,180 completed surveys were received. Key findings are summarized below (weighted by industry and size).

Problems and Needs

Human resources and training, manufacturing process, and environmental and health and safety were the three most commonly mentioned problems by Georgia manufacturers. Small manufacturers, with 25 or less employees, were more likely to mention market development and access to financing as problems.

Technologies and Techniques

The most commonly used "hard" technology was personal computers or terminals for non-manufacturing purposes, used by nine in ten manufacturers. The most commonly used "soft" technology was business or strategic plans, used by seven in 10 manufacturers. ISO 9000 certification was most often mentioned in manufacturers' plans, followed by data collection devices and doing business electronically. The average plant reported using eight of the 24 hard and soft technologies in the survey. The top 5 percent of hard and soft technology users reported using twice that amount. Manufacturers in the electronics and instruments industries were more avid technology users than those in other industries. Plants employing 100 or more employees used twice the number of technologies than those with 25 or less employees. However, the top 5 percent of small firm technology users have similar levels of usage of soft technologies to the top 5 percent of large firm users.

Although Georgia is known as a "branch plant" state, 84 percent of the plants reported that their investment decisions are made in Georgia. 84 percent of manufacturers said they conduct some type of research, development, and engineering activity. More than 60 percent conduct:

- Manufacturing engineering and process improvement
- Customized design of existing products
- New product development or prototyping

Customer and Other Manufacturer Relationships

Nearly 84 percent of manufacturers often compete on high quality.

- Seven in 10 said their major customers have established quality performance requirements.
- Four in 10 said that they often have two or more customers with different quality requirements
- Three in 10 said major customers often give short-term contracts
- Only two in 10 said major customers often provide direct assistance to improve quality or solve technical

problems.

Manufacturers with less than 100 employees were less likely to report receiving assistance from major customers. Although 40 percent of the manufacturers said they subcontract or outsource work, only 16 percent of production value, on average, is subcontracted or outsourced. Nearly half of this subcontracting work goes to other Georgia firms. 28 percent of Georgia manufacturers ship to defense agencies, prime contractors, subcontractors, or U.S. Department of Energy agencies or contractors. The average manufacturer ships only 5 percent of production value to defense agencies or contractors. However, for 5 percent of the firms shipping to defense agencies, these agencies and contractors account for at least 65 percent of their sales. Manufacturers in metalworking/machinery and electronics/instruments industries were more likely to ship to defense agencies

Roughly half of Georgia's manufacturers reported participating in some sort of inter-firm collaborative activity. Manufacturers with 100 or more employees were considerably more likely to participate in inter-firm activities than were smaller firms. The most common inter-firm activity was identification of shared industry problems and needs. Manufacturers were most interested in quality assurance/ISO 9000 user groups.

Use of Assistance Sources

Use of assistance sources is prevalent among Georgia manufacturers. 47 percent used some type of private source (e.g., consultant, vendor, or other private organization) between 1991 and 1993. 27 percent used some type of public or non-profit program between 1991 and 1993. Georgia Tech and Georgia Power Company were the most common sources of assistance used. Roughly 70 percent of all manufacturers using public or non-profit sources also used some type of private source. It is possible that the public sources act as a resource link to private organizations. Public/non-profit assistance tends to be of shorter duration than private assistance.

Business and Economic Outcomes

The average (median) manufacturer reported the following operating and economic characteristics for 1993:

- 17 percent of employees use computers weekly, 5 percent more than 1991
- 10 days lead time, unchanged from 1991
- 3 percent scrap rate, unchanged from 1991
- .5 percent customer reject rate, unchanged from 1991
- \$224 training expenditure per employee, \$35 dollars more than 1991.
- 42 employees in 1993, up 7 percent from 1991
- average wages of \$22,460, an increase of 6 percent from 1991
- annual sales of \$4 million, 20 percent higher than 1991 sales
- \$13 sales per inventory (inventory turns), up 6 percent from 1991
- virtually no exporting activity, unchanged from 1991
- productivity (value-added per employee) of \$27,078, a 9 percent increase over 1991.

Manufacturers with higher rates of computer usage and lower scrap rates in 1993 had higher levels of productivity, controlling for plant employment size and industry.

Georgia Tech Industrial Extension Service

Between 1991 and 1993, roughly one quarter of the manufacturers were assisted by Georgia Tech Industrial Extension. Plants that have been assisted by Georgia Tech's Industrial Extension Service were more likely than plants not assisted by Georgia Tech Industrial Extension Service to:

- have lower levels of value-added per employee, but greater gains in employment and wages between 1991 and 1993
- use or plan to use new technologies and techniques
- conduct manufacturing engineering and process improvement, and new product design or prototyping.
- ship products to defense agencies

- have higher increase in percentage of employees using computers weekly between 1991 and 1993
- have improved scrap rate reduction between 1991 and 1993
- have lower customer reject rates.

The survey suggested that firms investing more in technology and quality may accrue faster sales and employment growth, but also be less profitable in the short term, implying that being a "best practice" company is not cost-free. In the future we would hope to identify tangible long-term benefits.