MULTITASKING MACHINES

(The Lean Machine of the Future is Here Today)

Steve Krar

Advances in information and machine technology such as CNC equipment, automation, and information processing make the job of justifying the equipment investment vital to a successful manufacturing operation. Surviving and even thriving is still possible for manufacturers if they use the right blend of technology, equipment, and people.

Rate of Change

The rate of change throughout the world in information and machine technology over the past 10 to 15 years has been almost more than the average person can comprehend. The world has changed more in the past 10 years than in the previous 50 years. CNC machine tools and information technology of all types have become more productive than they were only 10 years ago. To survive today businesses and manufacturers must use the best technology available to anyone in the world to deliver the highest-quality goods, at the lowest cost and at the time required by the customer.

Buyers Considerations

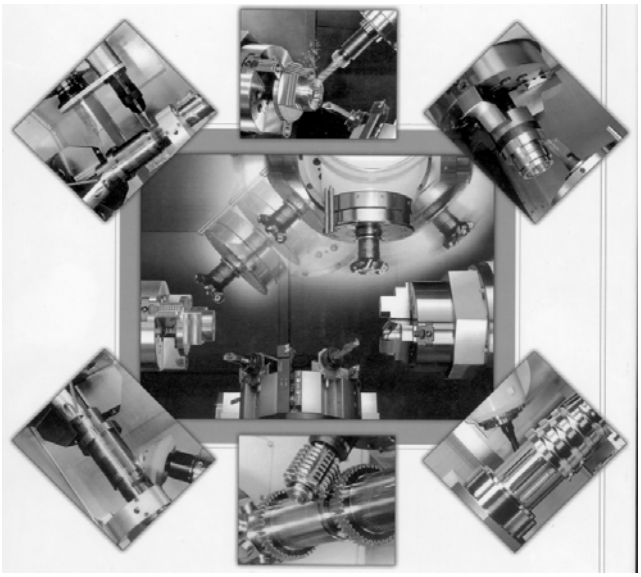
To maintain a competitive advantage, it is important to realize the benefits available from productivity improvement. These may come from faster metalcutting, more powerful and better programming, decreased scrap, faster setup time, automation and the advantages of information and communication technologies. Manufacturers in North America must have a plan that will make them cost and price competitive with any manufacturer in the world. Buyers of manufacturing technology have no choice but to buy ***smarter.***

MultiTasking Approaches Demand New Thinking

MuliTasking machines make up the most dynamic segment of the machine-tool industry today. Although a relatively small portion of the machine tool market, its sales are increasing dramatically as more manufacturers realize the benefits of single-setup machining of complex parts, the productivity advantages it offers and that builders are making them easier to use and more productive. Completing complicated parts in a single setup on one machine reduces work-in-process, cuts labor costs, and increases part quality by eliminating multiple fixturing.

Survival requires effort, concentration, and a plan. Most manufacturers regularly upgrade equipment and tooling when such opportunities present themselves. These companies concentrate significant time and effort supporting all the advances possible from a new piece of

equipment, when the real opportunity is to consider process change. It is the difference between ***"How can I cut this part faster?"*** versus ***"Is there a way to cut it that eliminates not only multiple setups and multiple machines, but entire steps?"***



Lean Machine

This one machine incorporates most of the Lean Tools and Principles, and eliminates much waste common with conventional machines and operations.

- **Time Delays** due to machine or human wait time are dramatically reduced since the machining operations are sequenced continuously.
- The **Work Setup** is usually confined to a simple fixture and the machining heads (top and bottom turrets) move into location from one step to the next in a fraction of seconds.
- **Part Quality** is greatly improved because the part is not subject to the errors of realigning a part at various locations.
- **Tool Changes,** which are controlled by the machining program, are literally done automatically in seconds.
- **Excess Motion Waste** such as bending, reaching, walking or movement during a manufacturing process are almost all eliminated.
- **Factory Floor Space** is conserved since the operations required to produce a finished part are completed in one machine and not six or more.
- **Transportation Wastes** are almost eliminated since a part stays in one machine from the beginning to the completion of a part.

From Days to Hours. For example, consider the advantage of processing an electrical generator component that would normally require a CNC lathe, vertical machining center, horizontal machining center, and vertical with special features, on a single multitasking machine in a single setup. Besides the change in production throughput from 47 hours to 6 hours and 43 minutes (600%+ improvement), consider the benefits this change brings to numerous aspects of a manufacturing operation:

- **Profit**: Cash flow considerably improves and the return on investment on machines and information technology is recovered quickly.
- **Lower Direct Expenses:** Machines are reduced from four to one, fixtures from six to one.
- **Lower Overhead:** Operators and attendant benefits are reduced from four to one.
- **Part Quality:** Going from six setups to one greatly reduces the potential accumulated precision error.
- **Lower Indirect Expenses:** Having a single machine uses less floor space, environmental impact is reduced, and movement of material through the plant is more efficient.

Making process change should be the mission of all manufacturers today.

Such thinking enables a company to change from forecast-based production to production-on-demand manufacturing while realizing significant reductions in in-process inventory; every phase of the business improves.