Cellular Manufacturing

Internet Performance Support System

Federal Manufacturing & Technologies

Maribeth C. Bohley and

Mary E. Schwartz

KCP-613-6029

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Final Report/Project Accomplishments Summary

National Machine Tool Partnership Agreement #96KCP1047

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Date: 9/28/97

Revision: 0

A. Parties

The project is a relationship between

AlliedSignal FM&T

Cincinnati Milacron

2000 E 95th Street

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PO Box 419159

Cincinnati, Ohio

Kansas City, MO 64141-6159

45209

B. Background

Cincinnati Milacron (CM) is a global leader in plastics processing machinery, mold making equipment and supplies, machine tools, composites processing systems, flexible manufacturing cells, metal cutting tools, metalworking fluids, grinding wheels, carbide wear parts and industrial magnets. Since 1884, the company has worked to become a world-leading manufacturer of metal cutting machinery. CM has more than 30 plants in North America and Europe, with joint ventures and licensees for manufacturing and marketing in Asia and South America.

In meetings between Cincinnati Milacron and AlliedSignal Federal Manufacturing & Technologies (ASFM&T), the need for a method of informing existing and potential users about the "cellular manufacturing" process was identified. Since Milacron's customer base is so extensive, covering the national and international markets, CM decided that a performance support system (PSS) should be available to customers and technical representatives via the Internet. They specified a PSS that would be seamlessly integrated into their existing web site. From this PSS, CM wanted government and industry customers to have access to simulated software that demonstrates the flexibility and benefits of cellular manufacturing.

C. Description

The objective of this project was to develop an Internet-based electronic performance support system (EPSS) for cellular manufacturing providing hardware/software specifications, process descriptions, estimated cost savings, manufacturing simulations, training information, and service resources for government and industry users of Cincinnati Milacron machine tools and products.

ASFM&T used expertise in the areas of Internet design and multimedia creation to develop a PSS for the Internet with assistance from CM's subject matter experts from engineering, manufacturing, and technical support. Reference information was both created and re-purposed from other existing formats, then made available on the Internet. On-line references on cellular manufacturing operations include

- definitions of cells and cellular manufacturing;
- illustrations on how cellular manufacturing improves part through-put, resource utilization, part quality, and manufacturing flexibility;
- illustrations on how cellular manufacturing reduces labor and overhead costs;
- identification of critical factors driving decisions toward cellular manufacturing;
- a method for identifying process improvement areas using cellular manufacturing;
- a method for customizing the size of cells for a specific site;

- a simulation for making a part using cellular manufacturing technology;
- a glossary of terms and concepts.

D. Expected Economic Impact

Cincinnati Milacron expects to find a more efficient use of personnel to address engineering challenges and spend less time explaining the process and benefits of cellular manufacturing. By running the simulated software portion of the PSS, users can review the cellular manufacturing process for producing their specific part at their local plant. This software solution allows machine operators to independently troubleshoot as well as visually test the possible methods for performing specialized tasks using cellular technologies. Availability of the PSS on the Internet will decrease manufacturing engineering costs at the factory and service support costs in the field.

E. Benefits to DOE

DOE can access this PSS via the World Wide Web and use it to identify machining processes that would be optimized through the use of cellular manufacturing. Contractors, manufacturing engineers, product designers, and machine tool operators supporting DOE programs, both inside and outside of the Nuclear Weapons Complex, can readily obtain information, test designs, and optimize manufacturing processes. DOE contractors can also use the PSS to determine the feasibility of and cost savings from utilizing cellular manufacturing for their site-specific machining tasks. Finally, this PSS can be used to identify areas in manufacturing where work processes can be improved through cellular manufacturing.

If utilized, this PSS can assist DOE in

- Maximizing productivity while minimizing capital costs.
- Reducing the costs of manufacturing products.
- Delivering more product in less time and for less money.
- Enhancing profits through higher productivity for a more secure business future.

F. Industry Area

Manufacturing (including Automotive, Aerospace, Machine Tool). The power of cellular manufacturing is in the ability to multi-task while monitoring and updating information from all of the processing equipment controls simultaneously. These communications are handled in the background while multiple operator and staging terminals communicate information to key personnel. This multi-tasking capability assures maximum resource utilization and takes cellular manufacturing far beyond the limits that stand alone production can achieve. The Internet PSS allows users to simulate this multi-tasking capability using part specifications from their own sites.

The machine tool industry will benefit from utilizing PSS models, like the one developed in this partnership, to increase the efficiency of engineering personnel and empower

production and support personnel to solve a greater range of manufacturing problems. The PSS will help improve existing manufacturing processes by providing key personnel with a tool for identifying best practices for specific production requirements. The PSS approach ensures validated procedural information is presented to all users in a consistent way, thereby minimizing variations in processes. The Internet delivery of the PSS ensures that cellular manufacturing information will be state-of-the-art and will be updated regularly to reflect technology advancements.

G. Project Status

The project was completed as scheduled.

H. Point of Contact for Project Information

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I. Company Size and Point of Contact

Raymond E. Ross, President and Chief Operating Officer

Cincinnati Milacron

Company size: 12,500+

1(513) 841-8100

1(513) 841-8120fax

J. Project Examples

This PSS is currently available to anyone at anytime via the Internet (http://www.milacron.com/MTG/Home_Page.htm) under automated cells.

K. Technology Commercialization

None.

L. Release of Information

I have reviewed the attached Project Accomplishment Summary prepared by AlliedSignal FM&T and agree that the information about this project may be released for external distribution.

Original signed by Kenneth 2-18-98
Wichman

Date

Name: Kenneth Wichman

Organization: Cincinnati Milacron

Title: Cincinnati Product Manager