College: **Madisonville Community College**

Location: **Madisonville, Kentucky**

Practice: **Lean Manufacturing Simulation and Implementation**

Helping small manufacturers become more globally competitive

Year Started	*1995*
Budget	*$150,000*
Program Participants	*3,500 participants; 100 firms*
College FTE	*1,000*
Target Sector	*Manufacturing*
Staff Size	*15 total; 5 per simulation*
Structure	*Program is supported through Madisonville and other community colleges in western Kentucky*
Key Outcomes	*Corporate expansion* *Job creation and retention* *Increased productivity* *Local industry now nationally and globally competitive*

Introduction

In the global economy, industries must look beyond their immediate setting and take the steps necessary to remain competitive. One such step is known as lean manufacturing, or the Toyota production system. Lean manufacturing is an integrated research, education, and technology transfer system that systematically eliminates waste and minimizes cost by focusing on and improving the logistics of supply and distribution. Lean manufacturing allows for a streamlined "flow" and "pull" of manufactured products in response to specific customer requirements.

Benefits of the lean manufacturing system include:

- Lower production costs
- Fewer personnel
- Shorter time to field new products
- Higher quality
- Higher profitability
- Higher system flexibility

For the past five years, the Lean Manufacturing Simulation and Implementation Program at Madisonville Community College has been working to improve existing manufacturing technologies and develop new ones. The effort has helped expand existing industry and create new industry in rural Kentucky.

Program focus	Sector specific	Economic condition	Economic base Mfg	Agr	Svc	Target populations
Business services and training	*No*	*Growing*	*16*	*1.8*	*32*	*Existing workforce, general, small firms*

Service Area	*Crittenden, Hopkins, McLean, Muhlenberg, and Webster Counties*
Total Population	*111,000*
Median Household Income	*$24,000*
% Below Poverty Level	*19.1*
% Unemployment Rate	*7.9*
% Minority Population	*4.2*
% Rural Population	*72.2*
% High School Graduates	*59.3*
% College Graduates	*6.7*

Community Background

The economy of western Kentucky has long depended on the coal industry. Mine closings and layoffs in the early 1980s, however, prompted the region to reorient itself toward light industry and manufacturing. As a result, the economy has begun to rebound. For example, General Electric (the community's largest employer) recently increased its workforce and expanded its facility, and other firms are opening new facilities in the area.

Madisonville Community College (MCC), established in 1968, has helped the regional economy for over thirty years. It is one of 13 community colleges in the Kentucky Community and Technical College System and serves five counties in western Kentucky that are part of the service area of the Tennessee Valley Authority (TVA). They are: Hopkins, Crittenden, McLean, Muhlenberg, and Webster.

Madisonville, located in Hopkins County about 75 miles south of Evansville, Indiana, is a community of approximately 20,000 people. It has been able to retain a stable population base while transitioning from mining to manufacturing. However, it also has higher than average levels of unemployment, poverty, and vacancy (both commercial and residential). Indeed, the mostly rural area served by the college is one of the state's most economically disadvantaged.

Program Description

The lean manufacturing system was developed through a partnership between the Toyota plant in Georgetown, Kentucky and the University of Kentucky's Center for Robotics and Manufacturing Systems. The system focuses on improving plant layout and production to shorten the time between customer order and product shipment.

MCC began the Lean Manufacturing Simulation and Implementation Program in 1995 to help the area's manufacturing sector compete in the global economy by "implementing procedures and processes that reduce all forms of waste." By creating a program that efficiently focuses on the five key areas that drive production (cost, quality, delivery, safety, and morale), the program has gained a reputation outside Kentucky as a leader in education and training for the advancement of manufacturing systems and technology.

Production simulation begins with traditional plant layout, instructing participants in production improvement concepts and philosophies that focus on decreasing the time between customer order and shipment through the reduction of waste. Then participants are taught to use process mapping and value streaming to define the operations of their particular plants. This plan includes detailed roles, responsibilities, and duties required to implement lean manufacturing at any facility. The two-day course is designed for between ten and twelve main participants.

Various continuing education classes are offered to students, employers, and employees, including:

- Computer aided design
- Computer numerical control
- Electrical and mechanical engineering technologies
- Lean manufacturing implementation strategy
- Programmable logic controllers

The operating budget for the program is in the neighborhood of $150,000 per year and is supported through training fees and matching grants from the state of Kentucky. The Tennessee Valley Authority provided the original funding for the program.

Outcomes

Signs of the program's success include the expansion of the region's manufacturing industry. Lean manufacturing training has helped industry fill manufacturing jobs with skilled employees; this, in turn, has encouraged several firms to move to the region. As one person familiar with the program puts it, "It has been common for companies to train their entire workforce using this simulation. As a result, employees are better able to adapt to the rapidly changing manufacturing workplace." To date, more than 2,500 participants have completed the instructional simulations, conferences, or the semiannual institute offered at the college.

Strengths, Challenges, and Replicability

It is common to have multiple representatives from a single corporation, whether production, sales, accounting, quality, engineering, or purchasing, all in the same classroom. This diversity enhances the learning process by introducing a variety of perspectives to the same set of problems.

The strength and sustainability of the project is also increased through the various partnerships created. By partnering with the Tennessee Valley Authority, MCC was able to begin the program. By partnering with other community colleges throughout Kentucky, MCC is able to conduct seminars for the corporations outside its service area.

Opportunities to expand the program exist in any community with an interest in creating partnerships to perform workforce training—for manufacturing firms as well as those in other industries. The basic doctrines of lean manufacturing are efficiency and flexibility, which are applicable to any business interested in improving employee proficiency and overall business effectiveness.

For more information, contact:

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