Short Cycle Management (SCM) Implementation: An Approach Taken at Motorola

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At Motorola, training has long been considered a key element in forging solutions to business issues. As such, training must be issue-focused in order to support the organization on its path toward excellence. What are some of the key strategic business issues driving Motorola, hence, training?

- Quality improvement. Motorola is committed to defect-free manufacturing. This will be achieved by having a design standard of ± 6 sigma.
- Total cycle time reduction. A cross-functional total business approach has been taken to reduce cycle times in everything we do. This includes manufacturing and non-manufacturing operations.
- Market sensitivity. Identifying and then meeting the specific needs of the customer in order to assure total customer satisfaction.
- On-time delivery. Meeting customer requirements by delivering low-cost, high-quality products, on time.
- Participative management reinforcement. Motorola has a process that encourages all employees to generate creative ideas for improvement and solutions to problems. The process is called the Participative Management Process (PMP).
- Strategic investment in people. Training which prepares people for the skills necessary in the future.

These key business issues focus on achieving short cycle time manufacturing and underline why Short Cycle Management has gained significance at Motorola. SCM grew out of an older production program called Improved Productivity Process (IPP).

"... Training must be issue-focused in order to support the organization on its path toward excellence."

Inventory reduction is viewed only as a catalyst to induce change, not as an end unto itself. In addition, the principles of SCM are applicable to all functions: from field sales to factory maintenance, purchasing to design engineering.

Motorola has invested significantly in building an awareness of what needs to be done to implement SCM. Two programs developed by Motorola Training and Education (MTEC) have had a tremendous impact in this area.

1. Manufacturing Cycle Management (MCM) is a three-day course which provides the basic concepts and techniques for increasing productivity through improved materials flow.
2. Motorola Management Institute (MMI) is a two-week program in world-class operations issues.

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Through the MCM and MMI programs, hundreds of managers have been given an increased awareness of SCM and the reduction of total cycle time. Many have begun experimenting with the concepts taught in these programs. However, questions concerning implementation of SCM prompted a request for development of a training program focused on the "how to do."

What—Development of a Training Program Focused on "Doing"

As a result of this request, MTEC has developed a program called the IPP "How To" Series. The series is based on the work done by Motorola as they have experimented with various SCM techniques and what we have been able to learn from experts. Illustrated in Fig. 1 are the seven modules which make up the series.

The IPP "How To" series is far more than a series of courses. It is a systematic, step-by-step process of tactics and strategies for analyzing and solving the specific implementation problems that confront a team. The intent of Fig. 1 is to show that all of the modules fit together and that by focusing on all of the topics, an organization will be better equipped to implement needed improvements to reduce total cycle time.

While the IPP "How To" series has just been described as a systematic, step-by-step approach, that is not to imply that it is rigid and inflexible. The series recognizes that each organization is unique. How an organization operates depends on the interaction of a specific group of people, machines, and processes.

Recognizing this interaction, the tools proposed in the series are intended to be flexible. They may and should be tailored to meet the specific needs of the organization using them.
Illustrated in Fig. 2 is a proposed implementation sequence for SCM. Examples of training programs at Motorola which support implementation and the target populations for these programs are illustrated as well (MCM and MMI have been discussed). Following is a brief explanation of each column.

**COLUMN I — Awareness**
- Top level management awareness and firm commitment to pursuit of SCM must be in place.

**COLUMN II — Begin to “kick tires”**
- Awareness must be driven throughout the rest of the organization at all levels. Management must take responsibility for the process and make sure everyone knows what is to happen and why.
- Begin to "try out" SCM concepts. This does not mean implementing a full blown pull system right away. "Try out" is as simple as conducting meetings before and after shifts, on the line, to discuss production problems of the day. Or, to achieve simplification and visibility, clean up production line areas and even non-manufacturing areas such as desk tops and paper flows in purchasing, personnel, etc.

**COLUMN III — Execute to plan — Continuously**
- Improve the production system
- Measurement and reward system
- Continuous customer/supplier in"

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**SCM Implementation Sequence**

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**MCM Self Study**
- MMI
- MCM
- SPC Modules
- IPP “How to” Series

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**Target**
- Total production
- Workplace organization

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**Fig. 2.** From awareness to "kicking tires" and executing to plan, a proposed SCM implementation sequence is shown.
COLUMN III—Execute to plan

- Begin implementation. The IPP "How To" series provides a formal, systematic approach to implementation.

The modules depicted in column 3 are positioned in a recommended implementation sequence. The first five modules focus on a tactical approach to implementation. Participation is in a work team which includes direct labor through middle management.

The focus of the two final modules is primarily strategic in scope. The modules are intended for a team of middle-to-upper level managers. In every case, the teams should have representation across functions and even across shifts where applicable.

Fig. 1. Step-by-step process of tactics and strategies for implementation problem solving is reflected in the IPP "How To" series.
Once undertaken, implementation of SCM is a continuous, never-ending process. It is not the program of the month and should not be approached as such.

There is one final concept associated with Fig. 2 which warrants discussion. That concept is: Once undertaken, implementation of SCM is a continuous, never-ending process. It is not the program of the month and should not be approached as such.

Following is a brief description of each module in the series. Keep in mind that as described earlier, implementation teams must go through these modules in order for the training to be effective.

- **Improve the production system**
  - Every step a product takes as it progresses through the production process is identified. This includes the identification and analysis of each element of cycle time. Provided then is a clear picture of the "as is" thus enabling an operation to plan for the "to be."

- **Workplace organization**
  - Through the use of specific tools, operators organize their individual workstations for the purpose of making problems visible. Visibility is achieved by bringing simplicity and consistency to workstation operations through standardizing work procedures. The tools assist in standardizing work procedures and focus on items such as tool and attachment location and removal of unnecessary WIP.

- **Total productive maintenance**
  - The purpose of this module is to eliminate machine/equipment downtime as a cause of interruptions in the flow. This results in increased, more predictable uptime of machines/equipment and greater control over the production process.

- **Changeover time reduction**
  - Reducing changeover times is a key to using smaller batch or lot sizes. The purpose of this module is to streamline the changeover time to the equivalent of one drumbeat in the production flow.

- **Group technology/material flow**
  - The focus of this module is on optimizing the flow of materials in order to manage products and processes more efficiently. This improvement is achieved by using several tools to identify similarities in the design and manufacture of discrete parts; then by taking advantage of those similarities.

- **Leveling production schedules**
  - A tactical approach to producing a level schedule is provided. However, the focus is on developing a strategy which will enable an operation to achieve a level production schedule. As such, it is important that a cross functional team composed of middle-to-upper-level managers work together to formulate a strategy. The tactics in the preceding five modules should have first been implemented.

- **Pull production system**
  - Presented in this module are the tactics for implementing a pull system. But, as in "Leveling production schedules," the focus is on developing a strategy. Again, a cross-functional team of middle-to upper-level managers works together. A list of prerequisite elements is provided for the team to consider as an aid to deciding where they should begin.

The training time required for each module is two days. Day one focuses on the tools and techniques and how to apply them. Day two is the kickoff of actually implementing what was taught on day one.

The instructor works with the team on day two to help the team through the start-up. The instructor’s responsibility on day two is to function less as a teacher and more as a facilitator. Thus, the instructor is working with the team to get them to begin to work on a problem or set of problems which are specific to the team’s work area. How the team members and the specific work area are identified will be discussed shortly.

From day two on, implementation of the module will be up to the team. At a minimum, the output of day two is an action plan detailing the team activities, with dates and responsibilities attached to these activities. The "How To" series is a guide to get the team started on the process of change.

This process begins well before the first module in the series is taught. Fig. 3 illustrates the implementation process for putting in place the two-day training event.

Before the event can happen, there must be a meeting between the client and a representative from MTEC. The purpose of this meeting is to assess expectations, and to ensure that a work area is chosen and an implementation team is identified and put in place.

The training focuses on immediately implementing what is learned in the classroom.

Once everyone understands and agrees what will take place and who will be involved, then dates can be set for the training event.

Built into all of the modules is a follow-up mechanism which is illustrated in Fig. 4. Its purpose is quite simply for a representative of MTEC to call the client, at a previously agreed upon date and time, to find out how the team is coming along.

If the team is experiencing difficulty, then arrangements can be made to bring the consultant, who was the instructor for the two-day
“How To” implementation process

Event, back to work with the team. If the team is progressing successfully, then perhaps additional training needs have been identified for which training can be provided.

Finally, the follow-up mechanism will allow MTEC to assess the effectiveness of the “How To” series and whether modifications or additions are required.

“To be truly successful at implementing SCM, everyone must participate. The organization must stop talking about it, roll up the shirt sleeves, and get started.”

Achievements

With any activity, once completed, specific outputs are desired. As mentioned earlier, the IPP “How To” series requires the participation of teams for the program to be effective. That is because the training focuses on immediately implementing what is learned in the classroom.
To be truly successful at implementing SCM, everyone must participate. The organization must stop talking about it, roll up the shirt sleeves, and get started.

Examples of several achievements by teams at Motorola which have implemented modules in the series are shown in Fig. 5. These examples illustrate the success an integrated team can achieve. At Motorola, there is now a process in place which will provide the tools and focus to guide a team on the path toward excellence.

SCM is Motorola's term for Just-In-Time (JIT) applied in a very broad sense.

TEAM ACHIEVEMENTS

**Improve the production system**
Communications Sector
MX Product Line
Plantation, FL
Actual and theoretical cycle time calculated
— Direct labor personnel collected data
Process steps identified
Action plan produced. Activities identified include:
• Rearranging, combining and/or deleting workstations
• Training
• Changes in job classifications
• Reduction of WIP dollars
• Control WIP
• etc.
Material flow through the final test area resembled a bowl of spaghetti. The material flow has been straightened, improving visibility through the final test area.

**Changeover time reduction**
Semiconductor Products Sector
Electronic Materials Operation
Phoenix, AZ
Mid Saw changeover time reduced from 38 minutes to 10 minutes.

**Changeover time reduction**
Communications Sector
Microelectronics Manufacturing Division
Plantation, FL
Standard product changeover time on Panaplace machines now fixed at one hour; was nine hours.

**Total productive maintenance**
Semiconductor Products Sector
Electronic Materials Operation
Phoenix, AZ

Circuit boards for MKV Saws #1 through #6 have been modified. The benefits derived from the modification are as follows:
— Changeover time for a saw was 15 minutes. The time is now two to five minutes.
— The maintenance technician always performed the changeover, which meant the operator waited anywhere from 10 minutes to four hours for the technician to do the changeover. Now the operator performs the changeover.

Operators were never expected to perform maintenance on their machines. The fear was that the operator might damage the machinery. Now, two operators are being trained in "Total production maintenance" procedures for MKV saws #1 through #6.

**Group technology/material flow**
Semiconductor Products Sector
Small Signal and Sensor Products Division
Phoenix, AZ
In Base Cell 2:
— Product movement consistent
— Confusion eliminated
— Product integrity protected
— Operator enjoys having full responsibility of the process.

These examples illustrate the success an integrated team can achieve. At Motorola, there is now a process in place which will provide the tools and focus to guide a team on the path toward excellence.

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Fig. 5.