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Frank L. Montabon, Michigan State University
Steven A. Melnyk, Michigan State University
Roger J. Calantone, Michigan State University

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KAIZEN BLITZ: INTRODUCING A NEW MANUFACTURING PROCEDURE BASED ON THE CONTINUOUS PURSUIT OF PERFECTION

Frank Montabon, Michigan State University, Room N461 NBC, East Lansing, MI 48824-1122
Steven A. Melnyk, Michigan State University, Room N327 NBC, East Lansing, MI 48824-1122
Roger J. Calantone, Michigan State University, Room N333 NBC, East Lansing, MI 48824-1122

ABSTRACT

This paper introduces and describes the Kaizen Blitz, a new approach to system improvement now being used for attaining significant improvement in both shop floor and office productivity. The presentation concludes by examining the various research opportunities that this development has uncovered.

INTRODUCTION

Since the early 1980s, American firms have begun to question and challenge existing methods of organizing the production process and of planning and scheduling manufacturing. These changes have occurred in response to such developments as Just-in-Time Manufacturing (Hall 1983; Hay 1988), Lean Manufacturing (Womack and Jones 1994), Time-Based Competition (Stalk and Hout 1990), the Agile Enterprise (Goldman et al 1995, Nagel and Bhargava 1994), and Kaizen (Imai 1990, 1986). Underlying many of these developments, especially those embodying Kaizen or continuous improvement procedures, is the assumption of long implementation processes in which incremental changes are combined with an emphasis on a "journey" of on-going improvement. For many American firms, this approach has been simultaneously highly attractive (because of the promise of an on-going stream of benefits) and a source of concern. This concern can be potentially attributed to the long implementation times and lack of real short term performance outcomes. However, based on the recent work of Womack and Jones (1996a, 1996b), a new approach is emerging within industry. This approach has been called a number of different names - "Rapid Kaizen," "Kaibank Blitz," Kaikaku, Compass, (McNichols 1997, Womack and Jones 1996a) and "Kaizen Blitz" (the term selected and used within this study).

What this approach does is to merge the long term perspective of Kaizen with the introduction of regularly scheduled workshops or events (typically scheduled between once a month to once every quarter). These workshops are highly action oriented, very focused, and are driven by the achievement of significant productivity improvements. What is interesting about these events is that they are managed by the employees most familiar with processes and current problems, and that there is a lack of extensive planning. As the management of one American firm has put it, these events are based on the view of "Ready, fire, aim."

Kaizen Blitzes are being used increasingly at firms such as Toyota (where the procedure originated), Honda, General Motors, Chrysler, Lear Corporation, and Masco Corporation/MascoTech. There are several features that make Kaizen Blitzes highly interesting. The first is that significant benefits have been reported as a result of the regular use of these events. Second, these events have become used as a means of changing corporate culture in firms. Third, these events have not only been applied to the shop floor but also to various design and staff activities.

However, being a new procedure, there is a great deal that we do not know about the ultimate impact and effectiveness of Kaizen Blitzes. This proceedings paper introduces the concept of a Kaizen Blitz and discusses some of the major potential research issues that must be studied for researchers and managers to gain a better appreciation of Kaizen Blitzes and their impact.

This paper is driven by two objectives: to create awareness of this new development and to create research interest in it.

KAIZEN BLITZ – UNDERSTANDING THE CONCEPT

A Kaizen Blitz is relatively straightforward. It begins with a management team doing an assessment of the target department or area. The purpose of this assessment is to develop familiarity with the operations, understand the nature of operations, and to identify the major or critical processes. Once this assessment has been completed, there is an executive introduction to the tools and concept of a Kaizen Blitz. This typically takes the form of a four hour seminar. In the next step, the management of the targeted area, department or firm is required to participate actively in a Kaizen Blitz (done in another area, department or firm). These steps lead up to the first introduction of the Kaizen Blitz (such undertakings are referred to as events).

Unlike the traditional implementation of Kaizen, a Kaizen Blitz is brief, action oriented, highly focused and
owned by the employees. A typical event usually takes place within a three and a half day time period, beginning usually on a Tuesday morning and ending at Friday afternoon with a presentation to top management of the various projects and the results obtained. Within this time period, the employees are formed into teams. They are introduced to concepts such as Kaizen, Just-in-Time Manufacturing and to processes and tools such as setup reduction, process flow analysis and the 5-S Program. The formal training portion is completed within a six hour time span. The workers next go out on the factory floor and do the analysis and implement the tools they have just learned about. They focus on specific areas or processes.

For the next two days, the employees analyze existing processes, identify problem areas within these areas, propose changes, predict the impact of these changes on the resulting processes, and implement these changes. An interesting feature of this implementation process is the immediacy of action. That is, any change that has been identified and approved by the group is immediately implemented. The only major constraint is that the changes not require any major funding or capital requests. Equipment layout is changed as required (this does dictate the involvement of facilities management). After the changes have been implemented, the new system is run and the resulting performance documented and compared with the old system. Typically, system performance is measured along with the following dimensions:

- Floor space occupied by the process being assessed;
- Operators required per day;
- Distance traveled by an order within the process;
- Work-in-Process Inventory (in piece count);
- Setup, as measured in minutes;
- Quality recommendations generated; and,
- Safety improvements implemented.

After the changes have been implemented and their impact assessed (facilitating a before and after comparison), the teams spend Friday mornings preparing for a presentation to top management. At this presentation, the groups describe their projects, identify the changes introduced and set out the improvements achieved. The final step is a celebration.

There are several features present within these events which should be recognized. The first is emphasis on training. These events place a heavy emphasis on training. In addition, they attempt to eventually ensure that the entire firm has been trained in the tools and procedures of Kaizen. Second, ownership of the projects belongs to the employees, not to management. This feature helps ensure success of the projects. Third, there is a high emphasis on action. The teams do not spend a great deal of time and effort thinking about what to do. Instead, they are encouraged to try out new and different approaches. If these fail, then the teams are asked what they learned from the failures. Finally, in many of the events observed by the research team, no employee was discharged by these events. Rather, any employee made unnecessary was converted into a trainer who would work with other areas and locations on the implementation of Kaizen Blitzes.

Kaizen Blitzes are not solitary events. Rather, once begun, they are regularly repeated. This practice has an interesting effect – it encourages a change in corporate culture. The employees, once they have been exposed to the ability to quickly change processes, and once they accept ownership for such projects, come to expect and demand change. They present new suggestions for changes; they become aware of waste. Combined with the presence of groups (which help to encourage acceptance of the need for change), the result is the culture of the firm begins to change.

**RESEARCH ISSUES**

Kaizen Blitzes are relatively new developments. To this point, interest in these events has been primarily operational in nature (i.e., how to implement them, what tools to teach, how to facilitate group dynamics). Yet, there are indications that this may be a fruitful area for future research which is interesting. The following are several of the potentially most interesting topics to study:

**Resolving the Kaizen Paradox**

Kaizen Blitzes uncover an intriguing paradox. As noted by Poole and Van de Ven (1989), a paradox, or a logically derived contradiction, is one of the most powerful vehicles for building theories. As mentioned earlier, many view Kaizen or continuous improvement implementations as lengthy journeys, where the journey, not the destination, is critical (see: Schaeffer 1996, Cheser 1994, Devaney 1993, Edosomwan 1992, Offodiie and Arrington 1992, Hamson 1991, Allaire 1990). Yet Kaizen Blitzes seem to focus attention more on the destination rather than the journey. The result is an interesting paradox: can both approaches simultaneously work?

**Exploring the Time Dimensions of Kaizen Blitzes**

The issue of time is critical to the Kaizen paradox. Time also finds itself at the center of other interesting Kaizen Blitz research issues. As mentioned previously, a Kaizen Blitz can be done very rapidly. This aids data-gathering tremendously, as pre-treatment and post-treatment
measurements can be taken within two weeks of each other. Thus, a great deal of data can be collected in a relatively short period of time. This allows for very comprehensive analysis of the impact of the changes introduced.

Investigating the Possible Presence of Diminishing Marginal Returns

It may be the case that successive Kaizen Blitzes experience diminishing marginal rates of return. That is, the marginal improvement of each successive Kaizen Blitz may be hypothesized to be positive but less in magnitude than the preceding events. As of now, this is unknown and needs to be answered. Once the curve is plotted over time, the rates of change could be studied in order to determine why they occurred. Perhaps the timing of successive Kaizen Blitzes helps determine the shape of the curve. The use of event history analysis to explain changes in the curve could prove fruitful. The study would be longitudinal in nature, in order to gather all the necessary data. This study could lead to a predictive/prescriptive model, which would help guide practitioners when setting up a schedule for Kaizen Blitzes.

Identifying Correlates of Kaizen Blitz Success

A critical issue to be studied are the markers or correlates of Kaizen Blitz success. One can think of a Kaizen Blitz as a bundle of attributes or independent variables, such as the type and size of firm, the specific Kaizen Blitz tools used, the type of products, the production process used (line, batch, etc.) and the experience of shop floor employees. All of these could be used in a correlation analysis. Structural equation modeling could be used as well, perhaps to combine these variables with the diminishing marginal returns curve mentioned above. This may well be the most important strains of this research, because it could lead directly to a predictive model of Kaizen Blitz success.

Assessment of Perceptions by Level in the Organization

This topic focuses on the issue of how the various levels (e.g., top management, middle management, shop management, employees) in the firm view this tool. It is likely that perception of this tool varies by level in the firm. This area could be a good fit for a qualitative study that would research how top management, middle management and shop floor personnel view this tool. Intuitively, one can say that the Kaizen Blitz is really in the hands of the shop floor employees, yet it is top management who has the most to lose if the program does not lead to an overall increase in organizational learning. The result is a potential for organizational tension.

Exploring Kaizen Blitzes in Non-Shop Floor Settings

The discussion in this article has shown Kaizen Blitz to be primarily used on the factory floor. Yet firms which are using this tool are beginning to use it in areas such as product design, order entry and purchasing. For each of these areas, many of the same research questions would apply. The issue of these other departments also adds another variable that can be studied. This is the order in which departments are chosen for Kaizen Blitzes. There could be a difference in overall firm success in the implementation of Kaizen dependent upon the order of departmental implementation. These are questions which will be answered as the Kaizen Blitz technique spreads to new firms and to new functional areas within those firms.

Reassessing the Applicability of Line Balancing Procedures within a Kaizen Blitz

There is a large body of literature in Operations Research which discusses line balancing (see: Zavadlav et al 1996, Kim et al 1996, Klein and Scholl 1996, Tsujimura et al 1995, Boctor 1995, Leu et al 1995, Eerger et al 1992, Hoffman 1992, Hackman et al 1989). The use of TAKT time in the Kaizen Blitz is a heuristic for dynamic line-balancing. Central to this balancing is the calculation of TAKT time. This defines the rate of output such that the rate of demand is balanced against the rate of supply. Practitioners of Kaizen Blitz use TAKT time to rearrange activities so that the sum of a set of activities is close to this TAKT time goal as possible. Like many heuristics, this one has its assumptions, such as the fact it ignores the effects of different product mixes. Also, to a great extent, TAKT time usage requires workers to make adjustments as they see fit, using whatever algorithm they believe is appropriate. This is quite different from some of the very systematic algorithms developed in operations research. It would be very interesting for researchers to compare this heuristic against the various techniques for line-balancing that have been previously developed. Not only will this research give us a general idea of the effectiveness of TAKT time, but it will help identify the conditions under which TAKT time dynamic line balancing is most effective.

References available upon request from Frank Montabon.