



Critical success factors for human resource outcomes in Kaizen events: An empirical study

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ABSTRACT

Kaizen events are an increasingly common organizational improvement mechanism aimed at work area transformation and employee development. While many anecdotal design prescriptions exist, there is little empirical evidence of which input and process factors are most strongly related to Kaizen event outcomes in practice. This paper uses results from a field study of 51 events in six manufacturing organizations to identify the set of input and process factors that most strongly relate to the development of employee attitudinal outcomes and problem-solving capabilities in Kaizen events. These results are used to develop guidelines for organizations and identify directions for future work.

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1. Introduction

The study of improvement programs has long been a focus of the operations management (OM) and industrial engineering community (e.g., Chan et al., 2005; Dar-El, 1997; Guimaraes, 1997; Gunasekaran et al., 1994; Hales and Chakravorty, 2006; Herron and Braiden, 2006; Launonen and Kess, 2002; McIntosh et al., 2001; Van Landeghem, 2000; Vits and Gelders, 2002). Recently, lean manufacturing (Womack et al., 1990) has become a—if not *the*—dominant improvement paradigm, leading to a variety of studies examining this topic (e.g., Matusi, 2007; Panizzolo, 1998; Simons and Taylor, 2007; Warnecke and Huser, 1995).

Within lean manufacturing, one increasingly utilized mechanism is the *Kaizen event*, a focused and structured continuous improvement project, using a dedicated cross-functional team to address a targeted work area, to achieve specific goals in an accelerated timeframe (usually

1 week or shorter) (Farris et al., 2008b). In addition to potential, direct improvements in the target work area, Kaizen events are purported to serve as a “just-in-time” training mechanism for participating employees (Drickhamer, 2004a), helping these employees develop new problem-solving capabilities and increased motivation to participate in future improvement activities. However, despite their popularity and potential benefits, Kaizen events have not been widely studied to date (Bateman, 2005; Melnyk et al., 1998). Many guidelines for Kaizen event design exist, primarily in the practitioner literature; however, these guidelines do not appear to have been tested through empirical research. Until the determinants of Kaizen event outcomes are well understood, organizations will not be able to systematically manage Kaizen events to consistently achieve positive results. This paper presents findings from a field study of 51 Kaizen events in six manufacturing organizations, where multiple regression was used to test the relationships between Kaizen event input and process factors and employee attitudinal and problem-solving capability outcomes. Findings are used to develop design guidelines for organizations using Kaizen events and to lay a foundation

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for future research. Section 2 reviews the literature related to this topic, Section 3 presents the research methodology, Section 4 presents results, and Section 5 discusses study findings, limitations, and directions for future research.

2. Literature review

2.1. Employee development within lean manufacturing

Samson and Whybark (1998) issued a general charge to the OM and industrial engineering community to put more focus on “softer” human resource issues, and recent research suggests that many are answering this call (e.g., Jun et al., 2006; Kathuria and Partovi, 1999; Korhonen and Pirttila, 2003; Polychronakis and Syntetos, 2007; Tranfield et al., 2000). In lean manufacturing research, human resource practices, such as employee participation in continuous improvement programs, cross-functional teams, employee training, and job rotation systems, are acknowledged to form core components of a lean manufacturing program, at least in theory (e.g., Dankbaar, 1997; deTreville and Antonakis, 2006; Niepce and Molleman, 1996; Panizzolo, 1998; Shah and Ward, 2003, 2007; Warnecke and Huser, 1995).

Several studies have reported a relationship between the degree of implementation of human resource practices and lean manufacturing success (Huber and Brown, 1991; Matusi, 2007; Olorunniwo and Udo, 2002; Sawhney and Chason, 2005; Schonberger, 2007). Other work has addressed the relationship between lean implementation and employee satisfaction. Findings have been mixed, with several authors suggesting a negative relationship between lean implementation and employee satisfaction (e.g., Bailey and Rose, 1988; Delbridge, 1998; Delbridge et al., 1992; Fucini and Fucini, 1990; Klein, 1989; Parker and Slaughter, 1988; Sewell and Wilkinson, 1992), while others argue that the relationship is positive (e.g., Adler 1993a,b; deTreville and Antonakis, 2006; Womack et al., 1990), null (Huber and Hyer, 1985), or ambivalent (Jackson and Mullarkey, 2000; Shafer et al., 1995). In addition, the majority of this work has been theoretical or anecdotal, rather than empirical. (Notable exceptions include Huber and Hyer, 1985; Jackson and Mullarkey, 2000; Shafer et al., 1995.) Further, potential reciprocal effects between specific lean implementation activities and employee outcomes do not appear to have been systematically investigated. Positive attitudinal outcomes from specific lean implementation activities, such as Kaizen events, could increase employee commitment to the lean program as a whole, ultimately improving the program’s success and sustainability (Adam et al., 1997; Co et al., 1998; Keating et al., 1999). Similarly, participation in Kaizen events or other problem-solving activities could help to develop operations employees’ problem-solving capabilities, which is crucial to the success of lean systems (Biazzo and Panizzolo, 2000; Brown and Mitchell, 1991; Dankbaar, 1997; Huber and Hyer, 1985; Safayeni and Purdy, 1991). Thus, the relationships between lean production implementation activities and employee outcomes are not fully understood, and additional research is

needed to determine which lean system designs produce the most positive outcomes.

2.2. Kaizen event research literature

Kaizen events appear to have originated with Toyota, who purportedly used them to train their suppliers in the 1970s (Sheridan, 1997). However, they did not become popular in the US until the 1990s (Schonberger, 2007) and do not appear in the literature until that time. Key publications from the current research literature on Kaizen events are summarized in Table 1. In addition to the limited number of studies, there is no clear agreement on which factors determine either initial outcomes or results sustainability. The methodologies used in the studies also present certain limitations. Three studies, Bateman and David (2002), and Bateman and Rich (2003), and Miller (2004), do not focus on the relationship between input and process factors and event-level outcomes, but instead on Kaizen event program-level effects. Half of the remaining studies (Farris et al., 2008b; Montabon, 2005; Patil, 2003) are based upon the analysis of a single event, while Bradley and Willett (2004) based their conclusions on interviews with participants from 12 events in a single company, Doolen et al. (2008) studied two events in a single company, and Melnyk et al. (1998) do not link their conclusions to the study of any specific events. Only Bateman (2005) studied multiple events within multiple organizations. All of the studies except Doolen et al. (2008) and Farris et al. (2008b) focus on the relationship between event characteristics and technical performance outcomes, without empirically measuring human resource outcomes. Finally, most of the studies rely heavily on qualitative data and do not include investigation of the quantitative relationships between outcomes, input factors and process factors. Doolen et al. (2008); Farris et al. (2008b) and Patil (2003) quantified certain outcomes, input factors, and process factors in their studies but, due to their small sample sizes, only very limited conclusions about quantitative relationships can be drawn. Only, Bateman (2005) empirically investigated the quantitative relationships between work area and organizational characteristics and the sustainability of event outcomes across a larger number of events. Thus, there is clearly a need for additional empirical research on Kaizen events.

2.3. Kaizen events in the context of team effectiveness research

A Kaizen event team represents a specific type of team—a short-duration (generally, 1 week or shorter), dedicated project team—which does not appear to have received much attention in empirical research, although teams in general have been widely studied (e.g., Campion et al., 1993; Gladstein, 1984; Hackman, 1987; Hyatt and Ruddy, 1997; Katzenbach and Smith, 1993; Kolodny and Kigundu, 1980; Pinto et al., 1993; Sundstrom et al., 1990; Vinokur-Kaplan, 1995). Furthermore, as Pagell and LePine (2002) note, there are relatively few empirical studies of

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