

# Relationship Between Kaizen Events and Perceived Quality Performance in Indian Automobile Industry

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## Abstract

Kaizen events are focused on improving the project, using a dedicated cross-functional team to a targeted work area, with specific goals, in an accelerated timeframe. Kaizen events have been widely reported to produce positive change in business results and human resource outcomes. However, it can be difficult for many organizations to sustain or improve upon the results of a Kaizen event after it concludes. Furthermore, the sustainability of Kaizen event outcomes has received limited research attention to date. This research paper is based on a field study of six kaizen events across five large scale automobile manufacturing organizations located in Chennai area. The research model was developed using the indicators of Kaizen events and the perceived quality performance factors. The model hypothesized that there is no correlation among the Kaizen Events such as Participation in Decision Making, Communication, and Respect for Top Management, Employee Involvement, Training & Education and Perceived Quality Performance. Furthermore, the model hypothesized that Perceived Quality Performance would mediate the relationship between Kaizen Events of the study. The study hypotheses were analyzed through correlation model. The kaizen event indicators i.e., Participation in Decision Making, Communication, and Respect for Top Management, Employee Involvement, Training & Education and Perceived Quality Performance that were most strongly related to each Sustainability Outcome were identified. Overall, this study advances academic knowledge regarding Kaizen event outcome sustainability. The findings also present discussion points so that practitioners may take precautions for long-term impact of Kaizen events and perceived quality performance in the selected organizations.

## Keywords

kaizen Events, Quality performance, Total Quality Management and Performance indicators.

## I. Introduction

Kaizen is a Japanese term, which means continuous improvement and aims at enhancing the operation under controlled working environment, kaizen events also aim at improving the process, so that workers yield efficient performance (Brunet et al., 2003). The word 'kaizen' is a combination of two Japanese words, 'kai' meaning to change, and 'zen' meaning to improve continuously. Kaizen has been proven as an effective tool for the change of working culture, working methods, and working experiences (Farris et al., 2009). Kaizen thrives by being adopted into the organizational culture. Successful implementation results in a cooperative atmosphere where everyone is aware of the key goals and measures of success. Kaizen is more than just a means of improvement because it represents the daily struggles occurring in the workplace and the manner in which those struggles are overcome (Kaizen Teian1, 1992; Kaizen Teian 2, 1992).

Kaizen, typically referred to as an event, is an intensive and focused approach to process improvement. This lean tool seeks operational perfection by eliminating waste–non-value added activities from the perspective of the customer.

“Kaizen event” is a focused and structured improvement project, using a dedicated cross – functional team to improve a targeted work area, with specific goals, in an accelerated time frame (Leterns, Farris, and Van Aken, 2006). In particular, Kaizen events have been associated with the implementation of lean production (Womack, Roos, and Jones 1990). Conducting the kaizen event helps to eliminate waste by empowering employees with the responsibility, time, and tools to uncover areas for improvement and to support change (Brunet et al., 2003). The benefits of kaizen events may be associated with both individual workers as well as the company performance. Kaizen has proven to be effective as an organizational improvement mechanism which supports employee development and improves the work environment (Farris et al., 2009). A successful kaizen event is the result of a well-planned and well-structured effort that provides base for determining the root cause of problems and implementing the solution. The purpose of this paper is to examine the relationship between the kaizen events and the perceived quality performance of the organizations, for the success and sustainability. Subsequent interpretation and analysis emphasized three types of involvement, including Participation in Decision-Making (PDM), communication, and training. Literature from the fields of lean, employee involvement, and participatory management were reviewed for this purpose. The research involved two stages, the first stage comprised two qualitative field studies to aid in the development of a survey instrument used in the second stage of research. In the second stage, surveys were administered and interviews were conducted at five organizations. Both managers and employees from the targeted process areas were interviewed at that time. The data was analyzed qualitatively and quantitatively at the individual and organizational level. First, the survey results were presented and the hypotheses tested using correlations analysis. This paper aimed to identify the relationship between the kaizen events and perceived quality performance for successful and sustainable development.

## II. Review Of Literature

Generally, Kaizen events use a cross-functional team of employees solely dedicated to the event for its duration (Minton, 1998; Bicheno, 2001). Many organizations have reported significant improvements – often 50% or greater – in key operating measures such as lead-time, floor space, Work In Process (WIP), throughput/cycle time, productivity, on-time delivery rate, and defect rate (Vasilash, 1993; Redding, 1996; Rusiniak, 1996; Sheridan, 1997b; Oakeson, 1997; Cuscela, 1998; Melnyk et al., 1998; Minton, 1998; LeBlanc, 1999; McNichols et al., 1999; Hasek, 2000; Creswell, 2001; Butterworth, 2001; Bane, 2002; Bradley & Willett, 2004; Martin, 2004). However, it appears that Kaizen events could be a vehicle to implement the concept of kaizen within an organization (LeBlanc, 1999; Kumar & Harms, 2004).

### A. Kaizen Event Indicators

#### 1. Participation In Decision-Making

The perception of participation in decision-making was defined as the extent to which participants perceive themselves as involved

in making decisions during the kaizen event. The perception of participation in decision-making was assessed using three items. These items were intended to measure the actual participation, the encouragement of participation by others, and the value of participation in decision-making as perceived by others. The wording used in the survey for non team-members was slightly different to make it more meaningful, but the concepts remain the same and for statistical purposes will be considered the same.

## 2. Perception of Communication

The perceived level of one-way communication from the organization to the employees regarding the kaizen event was measured using six items. In addition to the provision of an explanation of a kaizen event, the items assessed are , management's communication of the reason for having a kaizen event, the date and the duration of the event, the expected role of the employee, the impact on job responsibilities, and the goal of the kaizen event.

## 3. Training and Education

Training has been measured along several different dimensions. Kirkpatrick (1959a, 1959b, 1960a, and 1960b) broke it down into reactions, learning, behavior, and results. Alliger, Tannenbaum, Bennett, Traver, and Shotland (1997) proposed a framework extending Kirkpatrick's taxonomy to include two concepts within the criterion of reactions. These reaction variables are affective reactions, or the liking of the training, and utility judgments, the usefulness of the training for performance objectives. Within the aforementioned meta-analysis, utility reaction correlated somewhat with learning. Utility reaction correlated more highly with job performance than did affective reactions. They concluded that the utility reactions are better predictors of transfer.

This study was concerned primarily with the utility aspect of training and education, but also included an item to assess the liking of the training and education. In this study, the perception of the kaizen event training and education is measured with five items. These items are intended to measure the recipient's reaction to the overall effectiveness of the training, including his or her level of understanding of the training, the style and manner in which the training was delivered, the usefulness of the training, the amount of training, and the timing of the training. The intent was to measure only the training experienced by kaizen team members.

## 4. Respect for Top Management

Three items were taken from a scale created by Cook and Wall (1980) that was intended to measure trust in management which the authors defined as "the extent to which one is willing to ascribe good intentions to, and have trust in the words and actions of those in management" (p. 39).

## 5. Employee Involvement

Five items were adopted and some modified slightly from a seven item scale developed by Robinson and Rousseau (1994), which was modeled after a framework developed by Gabarro and Athos (1976). A one to five scale was used where one equaled strongly agree and five equaled strongly disagree. These items included: "I do not fully trust my employer" and "In general, I believe my employer's motives and intentions are good."

## 6. Perceived Quality Performance

A single item on both the team-member survey and the non team-member survey measured whether the kaizen event achieved its goal. In addition, a series of single item measures assessed a host of contributing factors to success or failure, such as the adequacy of the duration of the kaizen event, the appropriateness of a kaizen event given the scope of the problem, the necessity of a kaizen event, the efficacy of the team composition, the perception that the team-member's participation positively impacted the outcome, the perception that the facilitator presented the majority of the solutions, management intervention, the perception of knowledge sharing, the impact on workloads, and team bonding. Additional single item measures were used on the non team-member survey to assess the change in job responsibilities and the increase in daily workload resulting from the kaizen event. Three items were used to assess the overall impact on the non team-member's job. These items considered the flow of the work, the degree to which all information was considered, and the overall impact on the job.

## B. Theoretical Frame Work of the Study

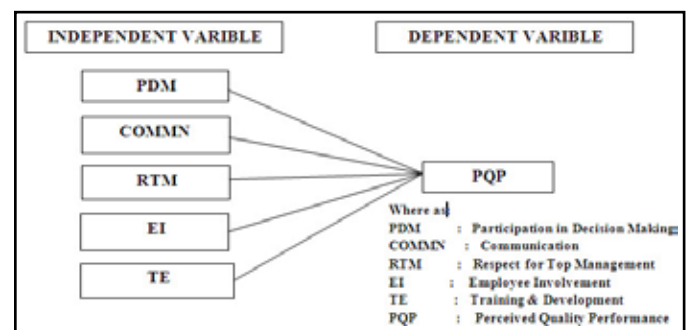


Fig. 1:

## III. Objectives of the Study

In this study the following objectives are formulated.

1. To study the impact of participation in decision making on perceived quality performance in the selected automobile manufacturing companies.
2. To study the impact of communication on perceived quality performance of the selected automobile manufacturing companies.
3. To study the impact of respect for top management on perceived quality performance on the selected automobile manufacturing companies.
4. To study the impact of employee involvement on perceived quality performance of the selected automobile manufacturing companies.
5. To study the impact of training and development on perceived quality performance of the selected automobile manufacturing companies.
6. To explore the relationships among Participation in Decision Making, Communication, Respect for Top Management, Employee Involvement, Training & Development and Perceived Quality Performance of the selected automobile manufacturing companies.

## IV. Hypothesis of the Study

While keeping in mind the above mentioned objectives, the following null hypotheses are formulated.

1. There is no significant impact of participation in decision making on perceived quality performance in the selected automobile manufacturing companies.

2. There is no significant impact of communication on perceived quality performance of the selected automobile manufacturing companies.
3. There is no significant impact of respect for top management on perceived quality performance on the selected automobile manufacturing companies.
4. There is no significant impact of employee involvement on perceived quality performance of the selected automobile manufacturing companies.
5. There is no significant impact of training and development on perceived quality performance of the selected automobile manufacturing companies.
6. There is no significant relationship among Participation in Decision Making, Communication, Respect for Top Management, Employee Involvement, Training & Education and Perceived Quality Performance of the selected automobile manufacturing companies.

## V. Methodology

The questionnaire is based on questionnaire used by Michele Kowalski Burch (2008) for measuring impact of various Kaizen Events and Determinants for sustainable development. The reason for selecting this questionnaire is that it was used to study the impact of same variables as in present study and was well tested on reliability and validity scales. Questionnaire that was administered consisted of five kaizen events which are Participation in Decision Making (3 items), Communication (6 items), Respect for Top Management (3 items), Employee Involvement (6 items), Training & Education (5 items) and Perceived Quality Performance (16 items).

The questionnaire was well tested by researcher on internal consistency and other measures. Cronbach Alpha Co-efficient reliability was conducted to test the reliability of the questionnaire and the Alpha value was found to be 0.742 which is acceptable. Each dimensions of Kaizen Events which was measured with the help of statements and responses to each statement were obtained on a five point Likert scale, ranging from 1 'Strongly Disagree' to 5 'Strongly Agree'

## A. Participants

The participants included kaizen event team members from five large scale automobile manufacturing companies of Chennai region. A total 615 questionnaires were distributed however 470 were received back making response rate as 76% and a sufficient sample size was collected for analysis of results.

## B. Procedure

Data was acquired through personally administered questionnaire.

## VI. Statistical Methods

Demographics are shown in a demographics frequency table (see Table 1).

Table 1:

Demographic factor	Description	Frequency	Percentage
Role in the Kaizen Event	Team Leader	123	26
	Team Member	347	74
Age	<25 Years	126	27
	26 to 35 Years	210	45
	36-45 years	123	26
	46-55 Years	11	02

Educational Qualifications	High School	43	09
	Intermediate/+2/ITI	314	67
	Graduation	113	24
Work Experience	<6 months	11	03
	6 Months to 1 Year	95	20
	1 to 5 Years	283	60
	>5 Years	81	17

The demographics are not used in the present study to find out their relationship with employee performance. The objective of Table 1 is to show composition of respondents to have a better understanding about their response and results for present study. Majority of the respondents are Team Members. Majority of the respondents hold an Intermediate/+2/ITI which at present is the minimum requirement to become team member in any automobile company.

## A. Correlation Matrix

Correlation matrix was used to verify existence of relationship between the independent variables i.e. Participation in Decision Making, Communication, Respect for Top management, Employee Involvement, Training and Development and the dependent variable Perceived Quality Performance.

Table 2: Correlation Matrix

	Mean	SD	PDM	COMMN	RTM	EI	TE	QP
PDM	12.56	2.75	1	.451**	.730**	.490**	.577**	.344**
COMMN	16.91	2.04	.451**	1	.525**	.477**	.528**	.411**
RTM	12.65	1.92	.730**	.525**	1	.355**	.306**	.492**
EI	20.11	2.81	.490**	.477**	.355**	1	.460**	.474**
TE	20.57	2.83	.577**	.528**	.306**	.460**	1	.320**
QP	51.78	5.79	.344**	.411**	.492**	.474**	.320**	1

\*\*Correlation is significant at the 0.01 level (2-tailed), \*\*p=0.01, n=470

SD=standard Deviation, PDM=Participation in Decision Making, COMMN=Communication, RTM=Respect for Top Management, EI=Employee Involvement, TE=Training & Education, QP=Quality Performance,

## VII. Discussion

It is evident from the Table 2, the value of the coefficient of correlation of dependent variable i.e., Perceived Quality Performance (PQP) with Independent Variable Participation in Decision Making (PDM) is 0.344 which means there is a weak positive correlation. The correlation coefficient of independent variable Respect for Top Management (RTM) with independent Variable Participation in Decision making is 0.730, this indicates that there is a strong positive correlation between them. In the same manner a weak positive correlation exists between dependent variable Perceived Quality Performance (PQP) and independent variables i.e., Communication (COMMN), Respect for Top Management (RTM), Employee Involvement (EI), Training and Education (TE) those values are 0.411, 0.492, 0.474 and 0.320 respectively. Looking at all the kaizen events of the study variables, the null hypothesis formulated were rejected. It is evident from the above results, implementation of kaizen events are impacting the perceived quality performance of the employees in the selected automobile companies in Chennai cluster. It is quite clear from the above table that all the study variables have weak positive correlation with one another. With regard to quality performance, it is observed that it has yielded a weak positive and significant correlation with all the five variables of

kaizen events reported by the participants of the study. Thus, it indicates that as implementation of Kaizen events improves positively, the perceived quality performance of the employees in automobile companies also increase significantly. Therefore, all the Kaizen Event Variables are found to be positive and significantly correlated with the Perceived quality performance factors. To implement the kaizen events, to attain the total quality in the system, there is a need to involve the employees in decision making, communication so that employees can easily involve into the system by giving utmost respect to the top management. It all can happen only through proper training and educational programmes to educate the employees.

### VIII. Conclusion

Automobile manufacturing companies are acting as a vital component of growing economy by contributing significantly for the development by creating employment for both urban and rural workforce and by providing much needed flexibility and innovation in the economy as a whole. If the Kaizen events are going to be implemented in a positive manner in automobile manufacturing companies, it will significantly contribute in their performance in terms of quality and employee satisfaction. Implementation of kaizen events has been adapted in many automobile companies but certain quality management practices observed to be weak and hence, need management attention. The findings suggest that the automobile manufacturing companies must initiate and practice TQM practices to enhance the quality performance and employee satisfaction. The study also revealed that implementation of kaizen events can bring the total quality in the system by minimizing the defective items. Therefore there is a great need to give more importance to implement the quality management practices like Kaizen Events and Six-Sigma practices. Hence firms must increase implementation of kaizen events in Indian automobile manufacturing companies to achieve continuous improvement of processes and increased level of employee as well as customer satisfaction.

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