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Challenges and Achievements of Kaizen Implementation: Lessons from Manufacturing Firms in Ethiopia

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Abstract: *The successful implementation of kaizen will reduce costs, increase productivity, reduce delivery time and increase flexibility in meeting customer requirements. Despite, the benefit of Kaizen's implementation and success stories of many companies that were investigated by past studies, there were many companies failed to achieve kaizen event objectives in their organizations. The purpose of this study was to find out demanding challenges and achievements of kaizen implementation. The study was carried out by a descriptive survey method. A simple random sampling technique was used to select 313 respondents. The data collected through the questionnaire was analyzed through the statistical package for social science (SPSS). First, the data were analyzed with descriptive statistical analysis to provide frequency and percentage for the interpretation of respondents. Then, mean and standard deviations were calculated to find out the challenges and achievements of kaizen implementation. The findings of the study indicated that top management's low commitment and interest, poor coordination among employees and top management, insufficient budget for kaizen projects are found to be the most demanding challenges to successful kaizen implementation and because of kaizen implementation firms witnessed improvement in the quality of the product, decreased costs of production, and increased productivity.*

Key Words: Kaizen, Muda, 5S, Challenges, PDCA.

1. Introduction

Most industries are currently encountering a necessity to respond to the dynamic of customer needs, desires, and tastes. For manufacturing industries, to remain competitive and retain market share in this global market, continuous improvement of manufacturing system processes has become a necessity. Competition and continuously increasing standards of customer satisfaction have proven to be the endless driver of organizations' performance (Mohd et al., 2015). Kaizen represents a continuous improvement involving everyone in the organization from top management to workers. In Japan, the concept of Kaizen is so deeply ingrained in the minds of both managers and workers that they often do not even realize they are thinking Kaizen as a customer-driven strategy for improvement. This philosophy assumes according to Imai that "our way of life – be it our working life, our social life or our home life – deserves to be constantly improved". The term Kaizen was first introduced by Imai and has been used in the management context. It is defined as a development strategy that

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involves all of the personnel in the company, from senior management to operational employees (Imai, 1982).

For manufacturing industries, to remain competitive and retain market share in this global market, continuous improvement of manufacturing system processes has become a necessity. Competition and continuously increasing standards of customer satisfaction have proven to be the endless driver of organizations' performance (Asaad et al., 2015). Kaizen represents a continuous improvement involving everyone in the organization from top management to workers. In Japan, the concept of Kaizen is so deeply ingrained in the minds of both managers and workers that they often do not even realize they are thinking Kaizen as a customer-driven strategy for improvement. This philosophy assumes according to Imai that "our way of life – be it our working life, our social life or our home life – deserves to be constantly improved". According to Khan (2011), when kaizen is applied as an action plan through a consistent and sustained program it teaches employees to think differently about their work. According to Boca (2011), successful implementation of kaizen will reduce consumption and costs, increase productivity, reduce delivery time and increase flexibility in meeting customer requirements. Despite, the benefit of Kaizen's implementation and success stories of many companies that were investigated by past studies, there were many companies failed to achieve kaizen event objectives in their organizations.

1. Objectives

- To find out the most demanding challenges of successful kaizen implementation among manufacturing organizations in Ethiopia.
- To examine the achievements of kaizen implementation among manufacturing industries.

2. Review of Literature

2.1. Definitions and Theoretical Concepts of Kaizen

The word Kaizen indicates a process of continuous improvement of the standard way of work. It is a compound word involving two concepts: Kai (mean change) and Zen (mean for the better). Kaizen is a system of continual task by an organization to improve its business activities and processes with the goal to continuously improve the quality of products and services so as to meet the ultimate satisfaction of customers (Reddy and Karim, 2006). Maarof and Mahmud (2016) also stated that kaizen is a Japanese philosophy that encourages small improvements made as a result of continuous effort. It requires the participation of everyone in the organization from the top management to floor shop employees. The long-term improvement is achieved by having the employees working gradually towards higher work standards. According to Titus et al. (2010), the concept of Kaizen is also known as a strategic method that increases productivity, quality, efficiency, and safety. Improvements through Kaizen have a process focus.

There are a number of kaizen implementation tools that can be used as a part of continuous improvement methodologies. These are housekeeping (5S), Waste (MUDA) eliminations, PDCA (Work Standardizations), Teamwork, the 5 Why techniques, Lean manufacturing,

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Quality Control Circles (QCC), Total Quality Management (TQM), Toyota Production System (TPS), Kanban system, Visual Mapping (VM) and Poke-Yoke (error proofing). However, the challenges and achievements identified in this study were related to the four techniques i.e. 5S, Waste elimination, PDCA, and Teamwork.

5S techniques: The term "5S" is derived from the first letters of Japanese words referred to five practices leading to a clean and manageable work area: Seiri (organization), Seiton (tidiness), Seiso (purity), Seiketsu (cleanliness), and Shitsuke (discipline) (Imai,1986).

Waste (MUDA): Womack and Jones (2003) identified the major types of MUDA (wastes) which includes; production of goods that needs rework, production of goods above required amount, unneeded production process, unnecessary movement of workers, raw materials, semi-finished and finished products, workers and machine idle and waiting time due to unbalanced production process and machine breakdown and production of poor quality goods and services that do not meet customer expectation.

PDCA: It is a never-ending process and is better explained and presented by the PDCA cycle (plan-do-check-act), known as the Deming cycle (Deming Institute, 2016). Ahmed & Hassan (2003), suggested using Deming's PDCA which is an excellent technique in monitoring and problem solving for continuous quality improvement where any bright ideas of individuals can be accommodated. According to Muhammad (2015), in the PDCA cycle, the first step is planning which is concerned with setting up quality objectives and monitoring the process. In the second step, data are collected and problems are recognized. In the third step, the problems are examined and analyzed. Finally, steps are followed to eliminate the problems to attain quality objectives.

Teamwork: Inamizu et al. (2014), asserted that through a small and effective work team organizations, can achieve a high level of productivity even under a period of a rapid increase in production that exceeded its production capacity limit. According to Delbridge et al (2000), even one can't understand lean production without understanding the details of the team leader's roles and behaviors. Since the cross-functional team leaders play a central role in a lean production system.

2.2. Challenges of Kaizen Implementation

A number of previous studies attested to the challenges on the implementation of Kaizen events (Imai, 1986; Kerrin, 1999; Robinson and Schroeder, 2004; Lidia, 2011; García et al., 2013; Ghazali and Fatimah, 2016). According to Robinson and Schroeder (2004) some organizations have failed to motivate their employees to participate in the Kaizen activities due to the absence of compensation or reward, lack of proper training for the employees and long delays in getting the suggestions processed Hence, for successful implementation and success of kaizen culture, the top management should develop a reward system that would recognize the effort done by their employees and managers to ensure Kaizen success (Imai, 1986). García et al. (2013) the failures of kaizen events are associated with organizations' internal constraints that impede the effectiveness of the implementation of the expected outcome of the activity. According to them, poor cooperation among employees and management and also the defiance of employees towards the changes in the working system

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are the barriers for the failure of kaizen implementation. According to Ghazali et al (2019) challenges faced by the organization in implementing Kaizen include factors such as the lack of ability to manage the continuous improvement itself, the resistance to changes and lack of motivation among the employees due to the poor reward system. Therefore, a key aspect of improvement of organizational capabilities is on-going training throughout the knowledge-based organization. As well as providing the practical benefits of people with the knowledge needed for bringing about change, the provision of training also shows people that they are valued (Kerrin, 1999). On the other study conducted by Lidya (2011) in Kenya manufacturing companies, the following factors are sorted out as causes of failure for kaizen such as; employee resistance to towards continuous improvement practices due to untimely introduction of change at the workplace, lack of resources to run the activities, lack of focus due to business pressure and lacking of understanding on the need to change are also challenges to Kaizen implementation.

With regard to studies conducted in Ethiopia related to Kaizen; in the study conducted by Getu (2016) on African Union Commission Head office located in Addis Ababa the capital city of Ethiopia; the major causes of to bring the desires Kaizen outcome are; lack of technical knowledge and skill by staff members, lack of resources including budget deficit and lack of awareness among top management. According to him, Kaizen has failed to bring about radical changes in all aspects of the African Union Commission as intended on the design. Whereas, according to Tadesse (2014) the frequent loss of top management of the organization, absence of sufficient awareness creation programs to employees and lack of availability and accessibility of Information Communication Technology infrastructures by employees are reported as the main causes of failure for successful Kaizen implementation at Entoto Poly Technic Cluster College which is found in Addis Ababa City Administration, Ethiopia.

2.3. Outcomes of Successful Kaizen Implementation

According to Dobi (2007), many Japanese management philosophies succeed simply because they are good management practices and they can be successfully implemented elsewhere since they lack cultural bias. Kaizen is one of the major contemporary Japanese management philosophy. It starts with the hypothesis that any organization has some type of problems and the problem can be solved by establishing a corporate culture in which everyone acknowledges these problems without any external influence. The main underlying assumption of the Kaizen strategy is that management must seek to satisfy the customer and serve customer needs if it is to exist in business and make a profit. Further, he states that one of the most important aspects of Kaizen has been its special focus on process and it has generated a process-oriented way of thinking and a management system that supports and recognizes worker's process-oriented efforts for improvement. This is completely different from the Western management philosophy of examining workers' performance strictly based on their results and not recognizing the efforts made. Therefore, continuous improvement in quality, cost, and flexibility are crucial in Kaizen to eventually increase customer satisfaction and productivity. Sidhu et al (2013) studied the 5S kaizen methodology implementation

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strategy by using the PDCA cycle for continuous improvement of the manufacturing processes in the agriculture industry in India. The empirical finding from the case study clearly indicates that the implementation of 5S Kaizen methodology reduced cycle time by 8.5 minutes per machine in the assembly i.e. before, 5S the assembly line cycle time was 50 minutes per machine and after 5S implementation, the assembly line cycle time is 41.5 minutes per machine. Jadhav et al (2014) studied the implementation and effectiveness of the kaizen PDCA cycle to improve productivity in an electronics manufacturing company in India. The finding from the case study shows the average production of conical vibrators reached up to 5100 pieces per shift and before the implementation, the average production per shift was 3900 pieces. Specifically, the efficiency of the feeding bowl improved, CDI flattening machine productivity and production speed was increased. According to them to further increase the lean transformation success employees should develop a high level of commitment and promote better work standard procedures. On a descriptive study conducted by Jalu (2015) at Ethiopian Finca Sugar factory, Kaizen contribute the following positive results such as cost reduction, obtaining additional income, decrease downtime, defects reduction, increasing labor productivity by reducing time loss for searching for tools, additional space obtained, defect improvement, lead time improvement, clean working environments creation, teamwork and motivation of workers development, health and occupational safety workers improvement, increasing labor employee participation, knowledge obtained on how to meet quick delivery to reduce costs. In addition, the company gains more than 123 million birrs from kaizen implementation within two years.

3. Methods

3.1.Research Design

The study was carried out by a descriptive survey method. According to Leedy and Ormrod (2005), "Survey research involves acquiring information about one or more groups of people perhaps about their characteristics, opinions, attitudes, or previous experiences.

3.2. Sample Size and Sampling Technique

The total population of the study was 10, 187 employees working under 30 manufacturing firms in Ethiopia and the sample size is 313. Zikmund's sample size determination method was used to determine the appropriate sample size and a simple random sampling technique was used to select sample respondents.

3.3. Sources of Data and Data Collection Method

The primary sources of data were collected through a structured questionnaire from selected sample respondents.

3.4. Method of Data Analysis

The data collected through the questionnaire were analyzed through the statistical package for social science (SPSS) 23 software. The data were analyzed with descriptive statistical

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analysis to provide frequency and percentage for the interpretation of respondents. Then in order to answer the two objectives of the research i.e. to find out the most impressing challenges and achievements of kaizen implementation the collected data were once again put into descriptive statistical analysis to provide the mean and standard deviation.

4. Results

4.1. Gender, Age and Level of Education

When we examine the gender of respondents 164(75.9%) were male and 52(24.1%) were females. In terms of age out of the 216 responding employees, 143 (66.2%) were between 18– 34 years range, 44(20.4%) were under the age range of 35 – 50 years and the remaining 29 (13.4%) of respondents were between 23 – 25 years range respectively. Further, when examining the level of education significant number of responding employees has a university or college degree, TVET Diploma, college diploma which accounts for 71(32.9%), 65(30.1%) and 41(19%) respectively. Whereas, the remaining 26(12%), 10(4.6%) and 3(1.4%) certificate, second degree and 12 complete and below respectively. Therefore, from the above analysis, we can easily conclude that the manufacturing sector employment was dominated by the male which takes the lion share i.e. 76% among sample organizations and the participation of females in the productive sector is significantly low in sampled manufacturing organizations. In addition, the majority of 143 (66.2%) and 136 (63%) of employees were under the productive age group between 18-34 years range and the achieved first degree or TVET diploma respectively. the implication of this is that the participation of educated youths in the manufacturing sector is relatively high in the sampled companies. Table 1 details the summary of respondents' demographic profile.

Table 1. Respondents Gender, Age and Education Level

Item	Description	Frequency	Percentage
Gender	Male	164	75.9
	Female	52	24.1
	Total	**216**	**100**
Age	Between 18-34 Years	143	66.2
	Between 35-50 Years	44	20.4
	Above 50 Years	29	13.4
	Total	**216**	**100**
Level of Education	12 Complete and Below	3	1.4
	Certificate	26	12.0
	TVET Diploma	65	30.1
	College Diploma	41	19.0
	First Degree	71	32.9
	Second Degree and Above	10	4.6
	Total	**216**	**100**

Source (Survey Questionnaire, 2018)

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4.2. Challenges of Kaizen Implementation

Kaizen is one of the contemporary change instrument which needs high commitment and cooperation of all employees without any distinction from shop floor employees to top-level management of the organization. There are many challenges that influence the successful implementation of any kind of change including kaizen. Among the impressing challenges for the implementation kaizen low commitment of top management and employees, absence of sufficient budget, lack of adequate modern information-sharing mechanisms and knowledge about how to sustain the change are the coined as the major factors. Top management's low commitment and interest" rated first with a mean of 3.99/5 and deviation of 0.97, "Poor coordination among employees and top management" rated second with am mean value of 3.86/5 and standard deviation of 0.802 and "insufficient budget for kaizen projects" rated third with a mean of 3.82/5 and a standard deviation of 1.113 as the major challenges for effective and successful implementation kaizen among others. Resistance of the department/section head scored a mean of 3.7/5 with a standard deviation of 1.034, insufficient time to implement kaizen activities scored a mean of 3.66/5 with a standard deviation of 1, lack and/or accessibility of information communication technology by employees scored a mean of 3.54/5 with a standard deviation 1.163, lack or absence of awareness creation programs scored a mean of 3.53 with a standard deviation of 0.956 and finally Employee resistance have a mean value of 3.38/5 with a standard deviation of 1.153 respectively. Therefore, when we examine the scale of challenges of kaizen implementation it indicates that the overall average is positive with a mean of 3.7/5, which implies that all the items influence the implementation of kaizen in the organization. However, relatively there was a high deviation among respondents in some of the factors such as; lack and/or accessibility of information communication technology by employees (SD = 1.163), employee resistance to the change (SD=1.153) and insufficient budget for kaizen projects (SD=1.113). This is maybe due to higher officials and employees of the organizations view the challenges from a different perspective. A number of studies have been done to identify challenges for change implementation in general and specifically kaizen related barriers. The results of these prior studies are also in line with the findings of this research. Seblewongel (2015) come up with similar findings related to the challenges of kaizen implementation in Almeda Textile manufacturing company in Ethiopia. According to her lack of commitment among management and employees, organizational structure, insufficient budget, and ineffective communication system are the main obstacles for the implementation of kaizen. Similarly, the survey result of Assefa (2017) on the factors affecting continuous improvement identified low commitment of top management, motivation, and participation of employees the major factor influencing the implementation of kaizen continuous improvement programs in the garment industries. Also, barriers to implementing Kaizen are outlined by Liker and Meier (2006) in The Toyota Way Field book. The authors note that some industry professionals perceive Kaizen events too fast-paced and narrow in focus, which they view as taking away from a company's broader vision. If there is no ownership of the Kaizen event process and tasks, then follow up tasks are less likely to be done. This could create perceived

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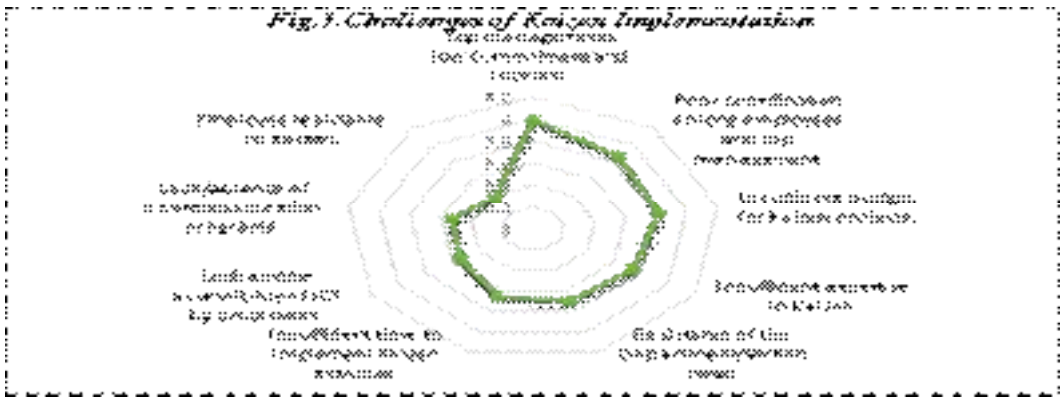
barriers to future Kaizen events. The authors cite other barriers to Kaizen events related to being able to sustain Kaizen, including the barriers of not affecting cultural change and going back to traditional work practices. These findings suggest that if Kaizen events are not incorporated into a larger vision and culture of continuous improvement, and if company officials do not follow up on and sustain Kaizen, then managers and production employees will be more likely to perceive barriers to implementing Kaizen. The following table 2 presents the summary of mean, standard deviations and variances related to challenges to kaizen implementation.

Table 2. Challenges of Kaizen Implementation (Over All Mean Average = 3.7)

Items	N	Mean	Std. Deviation	Variance
Top managements low commitment and interest.	215	3.99	0.97	0.878
Poor coordination among employees and top management.	215	3.86	0.802	0.644
Insufficient budget for Kaizen projects.	215	3.82	1.113	1.24
Insufficient expertise to Kaizen.	215	3.74	0.969	0.939
Resistance of the Department/Section Head	215	3.70	1.034	1.070
Insufficient time to implement Kaizen activities	215	3.66	1.00	1.01
Lack and/or accessibility of Information Communication Technology by employees.	215	3.54	1.163	1.352
Lack/absence of awareness creation programs.	215	3.53	0.956	0.914
Employee resistance to Kaizen.	215	3.38	1.153	1.329

Source: Survey (2018/19)

The above result lead to the conclusion that the support and commitment of higher-level management, the cooperation among employees, availability of sufficient budget and time, sufficient awareness creation programs and workshops and accessibility of modern information sharing technologies are the main impressing challenges for sustained and successful implementation of kaizen as a continuous improvement on the work in all aspects.



Source: Survey (2018/19)

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4.3. The Post Kaizen Implementation Achievements

According to Gupta and Jain (2014), Kaizen events implementation presumes that; it's a low-cost practical approach for continuous improvement, found problems as an opportunity for further improvement, creates an environment where employee recommendations are highly appreciated, and work gets easier where kaizen events are regularly and successfully done. In general, the outcomes associated with the successful implementation of Kaizen events are; the creation of an enjoyable workplace, improved employee job satisfaction and morale and enriched work experience and help to bring out the best in every person. Also as stated by Desta et al (2014) a well-established kaizen strategy can help companies to control cost, minimize unneeded movement of workers, work defects and improve workers' skills through creating a supportive work environment. Table 3 below summarizes the means, standard deviation, and variances of respondents' results related to the effectiveness and achievements of kaizen so far. The analysis of this factor is grounded on five measurement scale. With regard to the results obtained post kaizen events "Improvement of product quality" was rated first with a mean of 3.93/5 and deviation of 1.075, "Decreased costs of production" was rated second with am mean value of 3.92/5 and standard deviation of 1.34, and "Increased productivity" was rated third with a mean of 3.86/5 and a standard deviation of 1.247 as the main successes obtained post kaizen implementation. "Made the working environment enjoyable and clean" scored a mean value of 3.79/5 with a standard deviation of 1.119, "Improved employees' innovative capability" scored a mean of 3.75/5 with a standard deviation of 1.131, "Improved teamwork effectiveness" scored a mean of 3.63/5 with a standard deviation 1.353, "Customer satisfaction dramatically improved" scored a mean of 3.56/5 with a standard deviation of 1.208, "Increased sales revenue" have a mean value of 3.54/5 with a standard deviation of 1.249, "Improved our competitiveness" have a mean value of 3.51/5 with a standard deviation of 1.249 and "Improved employees job satisfaction and motivation" ranked last with a mean of 3.36/5 and a standard deviation of 1.26 respectively. Therefore, when we examine the scale of post results of kaizen implementation it indicates that the overall average is positive with a mean of 3.68/5. The implication of these result is that companies have so far due to kaizen implementation able to improve quality of products, productivity, employee's innovative capability, teamwork effectiveness, motivation and satisfaction, sales revenue, customer satisfaction by making the working environment enjoyable and clean and decrease the cost of production. However, when we further examine the result of the standard deviation of the items it ranges from 1.075 to 1.353 which indicates a significant difference among responses. This high variation may be due to the difference in the effectiveness of kaizen practices among sampled companies. Some companies have so far achieved a remarkable improvement in all aspects as relative to others and it was evidenced by personal observation of sampled companies during data collection. The following table 3 details the summary of the above result.

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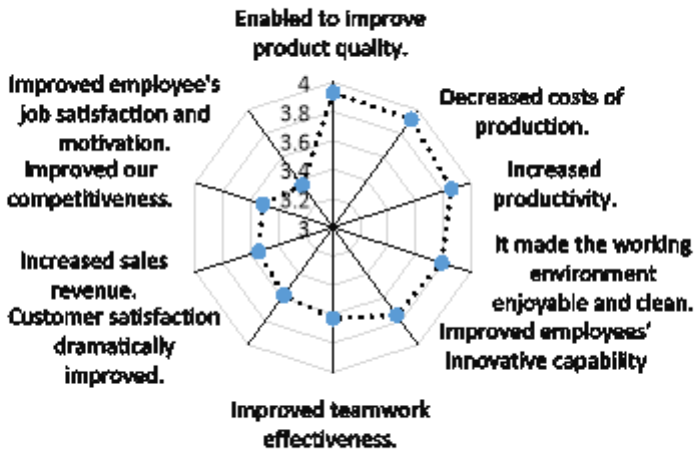
Table 3 Effectiveness of Kaizen Practice (Over All Mean Average = 3.7)

Items	N	Mean	Std. Deviation	Variance
Enabled to improve product quality.	215	3.93	1.075	1.155
Decreased costs of production.	215	3.92	1.340	1.797
Increased productivity.	215	3.86	1.247	1.554
It made the working environment enjoyable and clean.	215	3.79	1.119	1.253
Improved employees' innovative capability	215	3.75	1.131	1.280
Improved teamwork effectiveness.	215	3.63	1.353	1.832
Customer satisfaction dramatically improved.	215	3.58	1.208	1.460
Increased sales revenue.	215	3.54	1.296	1.679
Improved our competitiveness.	215	3.51	1.249	1.559
Improved employee's job satisfaction and motivation.	215	3.36	1.260	1.587

Source: Survey (2018/19)

Fig.2 Post Kaizen Implementation Achievements



Source: Survey (2018/19)

5. Conclusions

Despite the fact that numerous organizations comprehend the need to execute Kaizen in their work environment, not all organizations are effective with their usage. In this study, the most impressing challenges identified for effective kaizen implementation are the following. Top management's low commitment and interest, poor coordination among employees and top management, insufficient budget for kaizen projects, head of department/section resistance to the change, insufficient time to implement kaizen activities, lack and/or accessibility of information communication technology by employees, and lack or absence of awareness creation programs. In spite of the previously mentioned confronting hindrances for

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compelling usage, kaizen contributed to the following outcomes. Improved quality of the product, decreased costs of production, increased productivity, made the working environment enjoyable and clean, improved employees' innovative capability, teamwork effectiveness, employee motivation and satisfaction, sales revenue, customer satisfaction.

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