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IMPLEMENTATION PRODUCTIVITY MANAGEMENT CYCLE WITH OPERATIONAL KAIZEN APPROACH TO IMPROVE PRODUCTION PERFORMANCE (CASE STUDY: PARS KHODRO COMPANY)

Abstract: *The aim of this study is Implementation of productivity Management Cycle with Operational Kaizen Approach to Improve Production Performance in Pars Khodro Car Corporation. In this intervention study, all 120 employees of the Pars Khodro Company's Brilliance Body Production Unit were involved. After implementation of 9 steps of Kaizen, Kaizen questionnaire was completed by the staff. The questionnaire of employee performance evaluation was completed by direct supervisor before and after implementation of Kaizen. Finally, the collected data were analyzed using descriptive and analytical statistics using SPSS22. The significance level was considered 0.05. In According to the findings, Kaizen has a significant effect on all functional areas of the staff (Pvalue <0.05). Without much financial investment and new technologies, using the existing facilities and relying on the capabilities and creativity of the organization's staff can be achieved more efficiency.*

Keywords: *Kaizen, Performance, Employees, Continuous Improvement, Pars Khodro Co.*

1. Introduction

Hgher quality products or products is always one of the main g111`oals of the industrial or service organization. In order to achieve processes that deliver higher quality products or services, only the use of new technologies will not be successful. If a system is not defined and applied to improve processes, with the exception of waste of resources and other work time. The Kaizen management system, rooted in the culture of Japanese organizations and institutions, has been modeled today in many industrial countries to increase productivity (Raeisi et al., 2009). Today, the great challenge facing developing countries is productivity, and it has been a matter of years since it has been trying to find a way to institutionalize this concept in its industrial and corporate community. The productivity management cycle is used by the Kaizen approach in most organization and industries. Kaizen is a simple, low-cost, and successful Japanese model that has been the key to Japanese success (Delavari, Forghani, & Mollahosseini, 2009; Kalva, Kumar, & Srinivasu, 2018).The implementation of Kaizen to does not require a lot of financial investment and more with the use of existing resources and rely on the creativity and ability of the staff of the Organization, can be a good pattern for increased efficiency of the organization. Kaizen's method is one of the fundamental initiatives to improve the

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efficiency and optimization of administrative, production, and service systems, and instead of enormous financial investment, it requires effort, commitment and most important of all is leadership (Paul Brunet & New, 2003). Due to speed of changes in the environment, the life of the organization has been endangered and threatened. Among those who want to ensure their own stability and improve their position in the future, should improve productivity (Berman, 2014). Manufacturing industries are now faced with the rapid change in customer needs, demands and tastes. In the meantime, in order to maintain competition and market share in this global market, continuous improvement of the production system processes is essential (Shingo, 1988). Continuing competition and increasing customer satisfaction standards are one of the endless drivers of organizational performance (Asaad, Saad, & Yusoff, 2015). The traditional Kaizen implementation starts with 5s. The main purpose of 5S is to create and maintain order and order in the workplace (Kobayashi, Fisher, & Gapp, 2008). 5S measures are one of the principles of creating a work environment that encourages quality and consistent work and continuous improvement of human communication that results in the effectiveness of the organization (Bednarek & Scibiorek, 2011). The 5S and Kaizen tools are widely used by the industry. However, many studies have not been carried out to evaluate the implementation of 5S and kaizen in the industry (Esfandyari & Osman, 2010). Execution of order and improvement is traditionally performed in all industries. The implementation of the 5S and Kaizen can regulate the implementation of order and improvement according to its principles, and various goals can be achieved under the Kaizen umbrella. The successful implementation of the 5S and Kaizen is not entirely dependent on the number of years of operation, number of employees and sales volume. Success or failure in implementing 5S and Kaizen for excellence in organizational performance is heavily influenced by senior management commitment. This is in line with the views of some researchers from the 5S and Kaizen (Asaad et al., 2013). The National Productivity Organization of Iran, in pursuit of the goals related to the promotion of productivity and the evolution of the administrative system laid down in the laws and regulations, and in particular the Cabinet of Ministers' Decree No. 3/8070 of 22 April 2000, has been used in various studies and activities. One of them is the design and implementation of a plan for organizing the productivity management cycle in implementing provinces using the continuous improvement approach (Gembakaizan). The implementation of this plan has started from Kerman province since the second half of 2002 and is currently underway in a number of other provincial departments. Considering the importance of performance indicators on improving the processes of manufacturing organizations, step by step implementation of Kaizen is one of the necessary strategies (Delavari, Forghani, & Mollahosseini, 2009). This study will also investigate the effect of deployment of operational kayaking model on improvement of performance indicators of Brilliance's body production unit in Pars Khodro Company. In Pars Khodro, there is a system of suggestions, and Kaizen's model is moving more and more into different sections of production and staffing. But the employees did not understand very well the concept of Kaizen and its impact on his performance have not been touched. In most cases, Kaizen is confused with innovation, and employees are looking for a great transformation in their units, sometimes frustrated and unsuccessful, ignoring Kaizen's pattern of small and continuous change. The basis for establishing a productivity management cycle is to production of thought by employee. The lack of most of our organizations is not money, equipment and materials, but the main deficiency is production of thought. We hope we can use all of the intellectual and practical capacities of the employee in this way.

2. Materials and methods

This research is based on the data collection method, an intervention research that is carried out with the launch of a scientific system and an executive model, and is carried out at the Pars Khodro Company's Brilliance Unit in 2018. The steps of this research are shown in figure1.

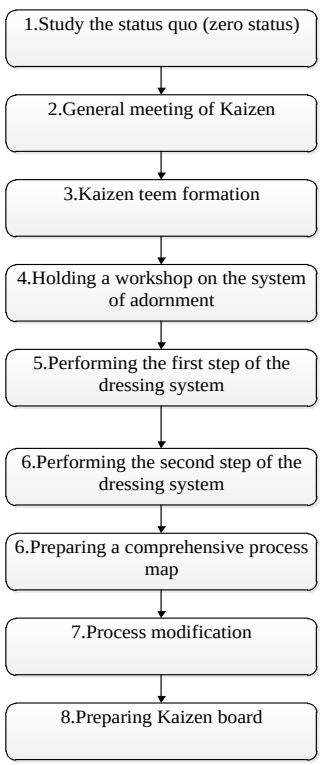

Figure1. Workflow diagram

In addition to material and tangible achievements, there were other subtle achievements, which will over time affect the organization's future processes and activities. Some of these achievements are: 1) The supremacy of employees, 2) Improve employee participation in improvement programs, 3) Staff familiar with problem-solving in the workplace, 4) Empowerment and employee self-esteem, 5) Creating a sense of importance and importance among employees due to the need to improve the working environment, 6) Improve staff satisfaction, 6) Meet the managers and staff of the hall with their methods of improvement and their cultural readiness for future improvements. The operational Kaizen template has now become part of the hall culture and Progress continues. The system's management has put forward suggestions that will encourage practical proposals that have led to improvement.

2.1. Samplingand measurement

In this research, the total population of the Pars Khodro Company’s employees is 120 employees. Therefore, the sampling method is census. The staff performance questionnaire and Kaizen have been used as a measurement tool. The Kaizen (Continuous Improvement) Questionnaire was developed by Shakib (2012) as a researcher of the translation and composition of several questionnaires And includes 31 questions (Shakib, 2016).

The performance evaluation questionnaires of the employees of Moghimi and Ramezan (2011) include 11 functional dimensions (work quality, work quantity, collaboration, job knowledge, reliability, timeliness and initiative, personal and personality development, and attitude and leadership) In order to determine its content validity after collecting the opinions of the experts and experts of the company, as well as the views of the professors, the necessary guidance and counselors were made and the respondents were reviewed and approved by providing the necessary explanations along with delivery of the questionnaire. Confirmatory factor analysis technique was also used to determine the construct validity using Liserel software. Cronbach's alpha coefficient was used for its reliability and its value was 0.89 and it was determined that the questionnaire has the necessary validity (Moghimi & Ramezan, 2011). Because the main objective of this research is the evaluation impact of operational Kaizen implementation on the performance of employees, therefore, we

need to evaluation employee performance before and after the implementation of the Kaizen. Before the start of the implementation of the Kaizen process, first was completed employee performance evaluation questionnaire by superior of each employee. After the implementation of the Kaizen process, Kaizen questionnaire was completed by 120 employees Pars Khodro Company's Brilliance Unit and for the second time was completed employee performance evaluation questionnaire by the same supervisors supra.

2.2. Data analysis

In this research, SPSS-22 software was used to extract descriptive of demographic characteristic and means of Kaizen dimensions. To compare means of performance dimensions after and before Kaizen implementation used Paired-Sample T Test. To investigate the association between demographic factors, Kaizen dimensions and employee performance after Kaizen implementation was used Linear Regression.

3. Results

The research coveres120 people participated in this study, the mean age of the subjects was 38.81 ± 3.80. Their demographic characteristics are as described in Table 1. Table 2 shows the average Kaizen score in all dimensions, with the average of the range of employee suggestions system being 34.12 ± 3.90.

Table 1. Demographic characteristics of the population studied

		N	%
Marital Status	Single	28	23.3
	Married	90	75.0
	Divorced or widowed	2	1.7
	Total	120	100.0
Educational Level	Diploma	46	38.3
	Associate Degree	55	45.8
	Bachelor	18	15.0
	Master	1	.8
	Total	120	100.0
Organizational position	Supervisor	5	4.2
	Skillful	5	4.2
	Manager	1	.8
	Head	2	1.7
	Expert	4	3.3
	Labor	103	85.8
	Total	120	100.0
Work experience	1-10	103	85.8
	11-20	17	14.2
	Total	120	100.0

Table 2. Mean Kaizen Dimensions

Kaizen dimensions	Minimum	Maximum	Mean	Standard deviation
The use of robot technology in production	14.00	20.00	16.96	1.99
Automation of activities (automation)	19.00	23.00	21.11	1.66
Order in the workplace(5S)	25.00	35.00	30.71	2.69
Collaboration between staff-management	24.00	35.00	29.23	3.66
Employee suggestion system	27.00	40.00	34.12	3.90
Total	119.00	152.00	132.15	7.33

According to Table 3, the average of all performance dimensions increased after Kaizen implementation, but the mean increase in the dimension of attitude was higher than the rest of the dimensions (7.9750 ±2.10vs 14.55 ± 1.26). There was a significant difference between the mean performance dimensions before and after the execution of Kaizen in the paired t-test.

According to the linear regression test (Table 4), the performance of employees after the implementation of Kaizen had a significant and positive relationship with age, work experience and all dimensions of Kaizen.

Table 3. Relationship between performance dimensions before and after execution of Kaizen

Performance Dimensions	Mean	Standard deviation	Pvalue
Reliability before Kaizen implementation Reliability after Kaizen implementation	13.09 17.09	1.89 2.02	.000
The Attitude before Kaizen implementation The Attitude after Kaizen implementation	7.97 14.55	2.10 1.26	.000
Quality of work before Kaizen implementation Quality of work after Kaizen implementation	10.17 18.49	6.07 2.68	.000
Initiative before Kaizen implementation Initiative after Kaizen implementation	7.18 11.10	1.65 1.18	.000
Judging before Kaizen implementation Judging After Kaizen implementation	5.53 7.10	.73 1.61	.000
Collaboration before Kaizen implementation Collaboration after Kaizen implementation	13.31 14.19	1.03 2.13	.000
Work quantity before Kaizen implementation Work quantity after Kaizen implementation	5.20 6.40	.96 .760	.000
Security before Kaizen implementation Security after Kaizen implementation	6.56 11.57	1.40 1.87	.000
Learning and personal development before Kaizen implementation Learning and personal development after Kaizen implementation	5.91 7.82	1.14 1.76	.000
the person before Kaizen implementation the person after Kaizen implementation	5.91 6.01	1.14 1.25	.000
Leadership before Kaizen implementation Leadership after Kaizen implementation	16.63 26.79	3.37 2.92	.000
Total performance before Kaizen implementation Total performance after Kaizen implementation	140.74 112.98	2.58 9.48	.000

Table 4. Relationship between demographic factors and Kaizen dimensions with employee performance after Kaizen implementation according to linear regression test

Model	95.0% Confidence Interval for B		Sig.	t	Standardized Coefficients	Unstandardized Coefficients	
	Upper Bound	Lower Bound			Beta	Std. Error	B
Age	.389	.080	.003	3.007	.34	.07	.23
Marital status	1.146	-1.158	.992	-.010	-.001	.58	-.006
Educational level	.321	-2.219	.142	-1.48	-.26	.64	-.94
Job	1.630	-.119	.090	1.71	.39	.44	.75
work experience	8.219	.768	.019	2.39	.60	1.88	4.49
Use of robot technology	.884	-.466	.040	.615	.16	.34	.209
Automating activities	4.738	-.045	.034	1.94	1.50	1.20	2.34
Order in the workplace	1.583	.186	.014	2.50	.92	.35	.88
Collaboration between staff-management	2.249	-.577	.023	1.17	1.18	.71	.83
Employee suggestion system	.415	-.780	.033	-1.88	-1.17	.41	-.780

a. Dependent variable: Performance of employees after Kaizen implementation

4. Discussion

According to the findings of this research, there is a significant relationship between Kaizen and employee performance in all dimensions and after implementation of Kaizen, the average performance in all dimensions has increased.

Hypothesis 1: Establishing the Kaizen Model Operational will increase the reliability of Pars Car Company employees in the body of the Brilliance. Due to Kaizen's implementation in field of the ergonomics, which was improve the fitness of operator with work and based on the four principles of moving economics (step-down, reduced mobility, easy-to-do operation, simultaneous operation), Operations become easier for the operators. Employees who initially thought that Kaizen's implementation was merely to increase production, with the implementation of these Kaizen's, improved participation in the field of suggestions.

Hypothesis 2: Establishment of the operational chimney pattern will increase the attitude of Pars Khodro employees in the body of the Brilliance. The average of this dimension has increased more than the other dimensions after the execution of Kaizen, and has almost doubled. Before the implementation of the Kaizen as in the present, based on the false impression that was common in the organization, only significant changes were evaluated and appreciated. The desired expert at the hall was looking for great changes and improvements to report to management, which was encouraged if the person or people were confirmed. Other employee who were generally line operators and less time to implement such improvements were disappointed and did not try to improve their work. Following the implementation of Kaizen with a new approach and emphasize to small and continuous change and monitoring this changes by management, has changed the attitude of the employee.

Hypothesis 3: Establishment of the Kaizen Model Operational Action Improves the Quality of Workforce of Pars Khodro Company. Maintaining and increasing the quality while increasing the production is a difficult task, with the implementation of the POKA YOKE (anti-error) in the body of the Brilliance. It was identified that stations with a higher probability of error or quality error, or the potential for quality problems, were detected, and with the implementation of POKA YOKE, the probability of error in them was close to zero. This led to an improvement in the body's negative scores in the daily perceptions of the Quality Unit by about 50%. This means that the average daily average score of 8 scores decreased to 4 negative scores per day. Also, the rework time was reduced by an average of 20 minutes per day, down 8 minutes a day, indicating an increase in the quality of work. Reducing production losses by as much as 57 percent is another proof of increasing the quality of work. Rahmanian and Rahmati Nejad (2013) in their study of the effect of Kaizen's implementation on the performance of the employees of the manufacturing companies intended to explain Kaizen and innovation along with the disclosure of the nature of its function and its role.

They said that Kaizen'sadvantage is clearto those who have already done so. Kaizen leads to more quality and greater productivity. Where Kaizen was first implemented, it clearly increased by 30%, 50% and even 100% or more, and this success was achieved without any major investment. Kaizen will lead to the reduction of the unstable point and will further manage the customer's needs and create a system for customer demand.

When this plan came to the final stages and the problem-solving process was rectified, all costs began to decrease. The pattern of use used in this study was an acceptable pattern associated with employee participation (Rahmanian & Rahmatinejad, 2014). The research by Kumar et al. was focused on the implementation of TPM with the help of Kaizen. The results of the TPM are obtained

at the car manufacturing workshop. The success of TPM depended on different columns such as 5S, Maintenance and Maintenance, Quality Maintenance, Kaizen, Health Safety and Runtime Environment. Generally, after implementation of TPM, adding china improved productivity and product quality (Kumar, Chauhan, Chaudhary, & Juneja, 2017). To improve the quality, the main principles of Kaizen PDCA, SOS, 5S rating, and root cause analysis were used by us. Using PDCA, the entire recovery process was planned sequentially, a corrective action was required. These measures are reviewed, calculated and analyzed, which can be implemented to improve.Using SOS, the process became standardized and the cycle time was balanced. Non-value-added activities were reduced

Therefore, the work environment and job safety improved. After executing Kaizen, the 5S score increased by 4%.The output function is highly dependent on the work environment.By improving the environment and by making clean and efficient, operators are motivated by themselves.So the output increased day by day.To produce high quality defective product removal is essential. Root defects analysis and corrective actions. After implementation of Kaizen, some defects have been reduced, the amount of repulsion reduced to reduce unnecessary costs. Therefore, Kaizen improves quality and reduces costs. By implementing Kaizen, the safety of job satisfaction and job recognition has been given to workers. This motivates them to facilitate work, sense of accomplishment, resulting in job pride, increased work skills, and self-esteem. After Kaizen n's implementation, the production line output increased by 33%. Kaizen thus improves efficiency by improving quality and reducing waste. Given that Kaizen's main motivation is increasing efficiency, effectiveness and quality. Kaizen's implementation was very beneficial for 3 months. It can be easily understood that, if a 3-month implementation of the Kaizen can improve line efficiency by 33%, what if Kaizen is implemented during the life of an industry. It's unfortunate for us to not pursue most Kaizen industries. They do not even know that Kaizen does not need to invest. By implementing Kaizen, 5s and other quality tools. The importance of Kaizen implementation or continuous improvement in the industry is known.

Hypothesis 4: The deployment of the Kaizen Model Operations will increase the staffing initiative of Pars Khodro Company's Brilliance Body Building. By executing the Kaizen, this freedom was given to employees who are allowed in their work area or workstation any changes that appear to improve the work, quality, safety, or ergonomics will be done by the head coordinator. With this discretion, personnel used their own creativity and initiative to make things easier, and innovative suggestions were provided by the staff. Most of which were capable of running with existing facilities, and some with the coordination of backup units Closed to the near future. Habidin et al., In relation to identifying Kaizen structures and operating efficiency for the automotive industry in Malaysia, showed that there is a relationship between the implementation of Kaizen's activities, the impact of the area of work, and the skill of employees on the efficiency of operations in the automotive industry. Many previous studies have shown that Kaizen is an operation that affects organizational performance (Habidin et al., 2016).

Hypothesis 5: The deployment of the Kaizen model will increase the judgment of the employees of Pars Car Company, the body of the Brilliance Company. Prior to Kaizen's implementation, it was generally believed that the decision was made on the various issues involved in the production process, whether it was the master or the supervisor of the production. Given the nature of the product line, in which the loss of seconds is very important, when the supervisor or the instructor did not have physical presence on the line, employees were able with least disturbing the production process to make

better decisions than the past. Generally, decisions in the production line are taken under stress. It seems to better decisions are made than in the past with more employee self-esteem. The downward trend in the production line stops reflecting this issue.

Hypothesis 6: Operational Kaizen implementation of the model increases Pars Khodro staff housing units are Brilliance. Participation, cooperation and teamwork spirit have increased between the production unit's staff and the production unit with other support units such as net machines, feed lines, technical services, etc. especially, when implementation of the Kaizen in the body halls need many employees such as Hanger construction for lifting parts at heavy-duty stations.

Hypothesis 7: Establishment of the operational chimney model increases the staffing level of the Pars Khodro Company in the body of Brilliance.

Increasing the production capacity from 9 units per hour to 12 units per hour shows that the amount of work has increased due to the Kaizen model and removed wasting time with appropriate allocate of work. The goal of Akter and colleagues from Kaizen implementation for continued improvement of the productivity in the apparel industry in Bangladesh, improve the effectiveness and efficiency of luggage manufacturing through system simplification, standardization of the process, reduce waste and increase recovery by using modern techniques such as Kaizen. (Akter, Yasmin, & Ferdous, 2015). Patel & Patange indicated that reducing and eliminating losses, improving guidance time, better use of space, better results in a production line are the key results of Kaizen's implementation. Several studies show that Kaizen tools are very effective in all companies for improving the process and waste reduction (Patel, 2017). Raeisi et al. (2009) from the establishment of a Kaizen model for improving the process in the Tehran Polytechnic Polyclinic Laboratory concluded that the establishment of the operational Kaizen model would improve the performance indicators of the processes, reduce costs, eliminate losses, make optimal use of resources, and also implement the dressing system in The laboratory has been studied (Raeisi et al., 2009).

Hypothesis 8: Operational Kaizen implementation of the model increases the security staff will be Brilliance Pars Khodro body unit. The participation of all employees in the implementation of Kaizen and the belief that each one can contribute to change and improve their personal habits, such as the order in which they are present and felt, are responsible for their equipment.

Hypothesis 9: The establishment of operational Kaizen increased learning and personal development of employees Pars Khodro is Brilliance body. The launch of Kaizen is associated with education and culture. In our organization, in most cases, Kaizen was confused with innovation, and everyone was looking for big changes in the organization. Kaizen's education and culture led to Kaizen's knowledge and continued improvement and increase Professional knowledge of the staff. The Kaizen implementation process led to OJT training in the field of Kaizen, Innovation, 5S, the fourfold movement of economics, and the assignment of work to employees, which increased the knowledge of the job and updated their knowledge. Delavari and colleagues' research indicate that the execution of the Kaizen model was positively and significantly affected by all aspects except the job knowledge. In other words, deployment of the Kaizen model of operation significantly improved the quality of work, the quantity of work, cooperation, reliability, timeliness and presence and innovation among the staff (Delavari, Forghani, & Mollahoseini, 2009). Boca explained that one of the main reasons for waste was lack of information, and employees simply did not know their job efficiency and effectiveness (Boca, 2011). According to Sharifi et al. (2008) study, there were significant differences between quality of work,

cooperation, punctuality, creativity and reliability before and after implementation of Kaizen (Sharifi et al., 2008).

Hypothesis 10: Establishment of the operational chimney pattern increases the scope of the staff of the Pars Khodro Company in the body of the Brilliance. The implementation of the principles of working environment management (5S) is one of the requirements and procedures for implementation of Kaizen, which employees were encouraged to implement. The third principle of 5S is cleanliness and cleanliness that is evident in the progression of the audit score by the 5S check list. The target set by the body management in the annual plan action is a score of 90%, which can be achieved after the implementation of 5S and its improvement by Kaizen's implementation of a score of 94%.

Hypothesis 11: Establishing a Kaizen Model The operation will increase the leadership of Pars Khodro Company employees in the body of Brilliance. By implementing Kaizen, the level of ability of the organization's staff is known to both managers and executives as well as to the managers of the product line, which can be used from each employee in relation to their capabilities in which area. Recoverable points are identified and they can be prioritized and implemented for proper implementation. The coordination between the production unit and the support units has increased for Kaizen implementation. The organization of working groups to increase the teamwork spirit among employees is easy and can be achieved by controlling and directing them to the specified path. The results of Asaad et al showed that there is a relationship between the 5S, Kaizen and the organization's performance, while the implementation of 5S was easier than Kaizen. The successful implementation of 5 S and Kaizen was strongly influenced by senior management commitment (Asaad et al., 2015). Kaizen implementation is a Kaizen management commitment and approach. Changes in these two factors can create different types of Kaizen implementation steps that matches the findings of Brunet& New study (Paul Brunet & New, 2003) .The Solomon study suggest that improving the productivity of small companies can be achieved through the implementation of Kaizen. Because small companies have shown improved productivity after the introduction of Kaizen and many of the concepts, components, elements and tools used to remove waste (Solomon, 2016).

5. Conclusion

In small companies, more stimulating force for the implementation of Kaizen, increase customer satisfaction, reduce the time to turn off the system, having a better and safe work environment through deleting or cutting down waste and the process of continuous improvement of the program there.

Research generally shows that there are many pitfalls on the path to improve efficiency that includes problems related to 5S activities, quality, issues related to materials and equipment, Waste production process, working time and the problems of leadership.

Some of the limitations of implementing Kaizen in the study include the limitations of the level and continuity of the educational programs, the participation of all the individuals in the company, incentives for workers to prove the additional value to encourage workers and employee resistance to change due to the sudden introduction of continuous improvement at work in continuous improvement programs.

As was ever seen, Kaizen philosophy is a new and unique production philosophy of that makes companies to improve their efficiency by reducing waste and improving the company's overall production activity. These principles can be implemented and improve the whole company without a large investment. Among the patterns and models that are imported from other countries, and often has encountered with the problem of localization and the coordination with the Iranian culture, the Kaizen model be native

easily and the employee of our organizations easily understand because of early returns.

Because the Kaizen do not need to high financial investment, it is possible to easily justify management system. In the meantime, see the results of it in a short period of time (in some cases a working day) makes motivate employees to continue improvement.

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