

Impact of Kaizen implementation on performance of manufacturing companies' staff

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Abstract

Astonishing progress of Japan has made everyone think over policy, theme of work culture and management systems of these hard-working people. In the last analysis, improvement creation in field of cost quality and planning (rate of productivity and delivery time) is converted to a key and major factor. Kaizen is strategy of improvement based on needs and demands of the customers. Kaizen believes that employees of an organization should uninterruptedly think over improving and maintaining improvement achievements in their own organization but how much is their share in this movement? There are two different approaches to achieve progress: a gradual improvement (Kaizen) and improvement based on the great leap (innovation). Overall, Japanese companies prefer gradual improvement and the western companies believe in innovation. Now, in this article, we seek to answer this question: which of this view is implementable in Iran? Improvement means Kaizen and innovation; each company or organization use both Kaizen and innovation for its survival, growth and progress. Continuous improvement refers to the operation, process of achieving better productions and cost reduction in production and sales operation and as a strategic goal, it contains certain categories of total quality control, efficiency increase, effectiveness surplus, improvement promotion, cost reduction and elimination of defective items (wastes) from the productive process. Similarly, the managers will get involved in the base of the job and they will truly develop partnerships' level and solve problems using accurate view.

Keywords: Continuous Improvement, Kaizen, innovation, management, competition, cost reduction

Introduction

In case we intend to consider the manager's responsibilities, we find a long list that most of its items are located in sortable frames. Accordingly, scientists of management sciences have created some hypotheses that their most significant usage is to categorize or sort these duties. One of the approved hypotheses is Fayol hypothesis that considers the main duties of the managers are as follow:

Directing and leadership, organizing, planning, controlling and monitor and coordination

Although there are other hypotheses in this field, but Fayol hypothesis has been accepted as far as one of the most valid principles in management sciences and fields of the managers' duties considering mentioning and principal criticism of Tylor views. Since we accept Fayol principles as the most important duties of the managers regardless other existing views in this field, we want to review these principles from Kaizen view. According to Kaizen, management duties are divided into two main categories that are improvement and maintaining improvement. It is necessary to remind that the manager doesn't only mean official and organizational position that he meant and everyone who has a responsibility in the organization is assumed the manager or manger of that job. Today's organizational world is full of competition and challenges. High speed of changes and volatility of the environment put organization's life at risk and menace. Among all these, they want to guarantee their long stay and they think over their improvement in the market so that they have no way but choosing modern approaches.

In recent years, the movement of productivity and excellence has spread to Iranian organizations as well. Various motivations as competition, show, matching with the public, show-off, obligation and finally real evolution have resulted in different movements (Paki,

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2001). Considering the aforesaid issues, most of the successful organizations and companies in the world owe their productivity and organizational dynamics to using improvement systems (Masaki, 2001). One of these improvement systems is Kaizen which is defined as continuous improvement in organizational workplace and a view based on common sense in modern management. Masaki entered term of “Kaizen” for the first time in the management contexts and defined it as an improvement strategy that involves and activates all senior managers of the organizations and operational employees. Using Kaizen pattern in the various organizations in the whole world resulted in extremely high savings in costs of these organizations. Kaizen method is one of the fundamental plans to improve productivity and optimism of administrative, producing ad service systems (Zareh, 2005). And instead of huge investments, it requires attempt, commitment and leadership which lead to customer-orientation, their more faithfulness, having productive and satisfied workforce, higher income and lower costs that result in customer-orientation and more faithfulness, having efficient and satisfied workforce, higher income, lower costs and more profit. Mr. Honda from Honda Motors Co. says:” as far as the customer is concerned, quality is something that one product has it or not and there is no moderate way in this matter”. He also believed that role of management is to attempt continuously to produce better products with lower prices. Kaizen strategy can provide a systematic view to fulfill this objective. The Japanese managers are continuously looking for finding ways of improving systems and internal processes and Kaizen is used in some fields as relations of workforce, marketing management and relationships of goods distributors.

Middle managers, workgroup’s supervisors and workers actively participate in Kaizen. Japanese engineers are constantly reminded that if things do not follow the same process, no progress will be made. Kaizen is a Japanese term which consists of two words: Kai means change; Zen means a good mode. So that, Kaizen can be defined: a change toward being better.

This change has the following four main features:

1. Continuous and inexhaustible
2. Regular and gradual
3. Typically economical and based on minor modifications.
4. It’s based on public participation (Pour Khor-sand, 2002)

Kaizen philosophy is based on our life style as work, society and family focusing on achieving continuous improvement (Masaki, 2001). This concept is ordinary and clear for most Japanese so that they do

not understand even having it. In Japan, Prof. Deming submit the Deming Cycle which is considered as one of the main tools for quality control to gain continues improvement and it is famous as PDCA (Do-check-Act-Plan) meaning design (to make action for controlling results about what we had predicted and finally modifying action to remove all defects and errors).

This cycle is repeated and the product is always improving. However, this cycle principally moves upward around a cylinder because the product which has passed this cycle is qualitatively higher in ranking and all its defects have been removed.

After World War II, most Japanese companies were forced to work almost to start from scratch. Managers and employees were challenging new problems every day and they would get new improvements every day. In short, continuum of such companies depends on their endless progress, so that Kaizen became a life style for the Japanese. The Japanese were lucky at that time that various methods and tools could help flourishing Kaizen concept in Japan and it was announced in the late 1950 and in the early 1960 by certain experts as Deming and Jouran. Nevertheless, most of these systems concepts and new instruments which are being used widely today in Japan, were developed by the Japanese and it led to quantitative improvement, statistical quality control and total quality control in 1960.

Review of literature

Kaizen is a successful improvement pattern which has been conducted in various countries along with having successful results due to its fame. Therefore, it should be noted that Kaizen implementation requires being localized as any other strange pattern, so that it has been attempted in such local experiences to implement and submit this pattern as well as possible.

History of Kaizen in Iran

In 2000, coordinating with National Iranian Productivity Organization and Asia Productivity Organization, a five-day course on workshop of practical Kaizen was held for a couple of industrial units of Yazd. Nobody could assume that this workshop would be an advent of introducing a pattern for improving and producing in the country. Instructor and counselor of this workshop was ShwitchiY-oushida, Kaizen counselor and former deputy of Nissan Motors Co. This five-day workshop in which some parts of working processes of industrial units of the participant were selected and reengineered as a sample was effective on changing employees’ view

about peripheral issues, so that National Iranian Productivity Organization immediately put implementation of subsequent projects in other provinces on its agenda to be followed. In 2002, National Iranian Productivity Organization started Kaizen improving movement by implementing Management and Productivity Cycle project in five governmental organizations in Kerman and Kaizen was sent to the field of service and especially governmental organizations. Now, the movement of continuous improvement (Kaizen) in different industrial and service parts of Iran started and it continues to find its real position in improving productivity and the country's development.

Successful Experience of Kaizen in Central Polytechnic of Fars Oil Industry

Sharifi and Ghadrani in a successful experience, improvement efficiency cycle was implemented in the central polytechnic of Fars Oil Industry with an operational Kaizen approaches. 176 employees of this unit participated in this experience. This pattern is mainly based on the training programs and transmission of the key concepts and improvement methods for the employees which has been submitted in five stages as below:

- 1- Investment and culture making to prepare employees psychologically for acceptance and cooperation in project implementation
- 2- Formation of Kaizen committee containing 15 people which have main responsibility of Kaizen implementation.
- 3- Holding workshop of adornment system and Focus-PDCA with presence of the management, supervisors and members of Kaizen committee
- 4- Implementation of pilot project in acceptance unit
- 5- Spreading pattern to other units, complete settlement of the pattern and
- 6- Monitoring improvement activities

In this experiment, more than 60 wasting cases were identified and eliminated using scientific principles and methods as spaghetti, fish bone diagram and rating table. Moreover, crowd at the reception (which is normally one of the most crowded departments of the health care organization) has been reduced by 30 % which has a remarkable role in improving employee's performance and satisfaction in this unit. This pattern could enhance reliability of the conducted tests by 7 % (Sharifi, Ghorbani, 2005)

Statement of problem and significance of the research

Kaizen philosophy stays on this principle that human life including working life, social life and family life should be improved continuously and constantly. Kaizen culture and its interaction among the layers and various social organizations in Japan caused that factories are converted to universities and vice-versa, worker learns from manager and the manager takes advantages of the workers' ideas, researcher wears cardigan and comes to scene instead of sitting in Ivory tower and activists of production scenes think over improving their jobs and refer to the research.

Basic Definitions and Concepts

Kaizen: Kaizen is a combination of two words from one Japanese concept that its definition refers to a change toward better or continuous and gradual improvement. In fact, Kaizen stands on this philosophy that is not necessary to look for explosive or sudden changes for improvement of the organizations, but any improvement or reform will bring productivity enhancement if they are continuous and constant.

Continuous and gradual improvement using employee's participation

$$\text{KAI} + \text{ZEN} = \text{KAIZEN}$$

Kaizen and innovation: Improvement means Kaizen and innovation. Each company or organization uses Kaizen and innovation for its survival, progress and growth. Kaizen refers to the conducted partial expressions in the existing circumstance through endless attempts and innovation refers to the general conducted expressions in the existing circumstance through huge investment in technology with new equipment.

Objectives of the study

In Kaizen projects, it is expected from all employees in the continuous improvement activities as:

- All activities which are costly but do not produce any value (Muda), should be eliminated.
- All activities that are being conducted in parallel style (Muri) should be combined.
- Those activities which are necessary to complement and improve service quantitative level (Mura) should be added to the organization's activities. This movement or Mu3 movement forms base of workers' actions of Gemba Kaizen (practical Kaizen).

Kaizen is not a static theory but it is a concept inducing a practical and exclusive thought.

Kaizen characteristics and innovation

Each organization after being established should commence a constant attempt to maintain its existing situation. It is possible to suggest one

of these two cases (Kaizen or Innovation) considering economic situation, organizational objectives, type of production, quality of production and the existing social environmental situations in the organization.

Table 1. Kaizen characteristics and innovation

Row	Type of Variables	Kaizen	Innovation
1	Effect	Long-term and stable but non-thriller	Short-term but thriller
2	Speed	Small steps	Long steps
3	Time spectrum	Continuous and long	intermittent and short
4	Changes	Gradual and steady	Sudden with fluctuation
5	Cooperation	Inclusive	A number of elites
6	Views	Collectivism, collective, systematic	Extreme individualism, individual ideas and efforts
7	Methods	Maintenance and improvement	Category removal and recreation
8	Theme	Technical management, conventional and modern technology	Technologic innovations and new theories
9	Practical needs	Need to low investment and more attempt to maintain it	Need to more investment and low attempt to maintain it
10	Evaluation criteria	Process and attempt to get better results	Profitability of the service
11	Advantage	Appropriate for low-growth economy	Appropriate for a fast-growing economy
12	Directions	Population	Technology

Kaizen against innovation

There are two different approaches to achieve progress: a gradual improvement (Kaizen) and improvement based on the great mutation (innovation). Most Japanese companies prefer gradual improvements and western companies believe in innovation.

Senior management/ Middle management/ Admins/Workers
 Innovation
 Kaizen
 Maintenance

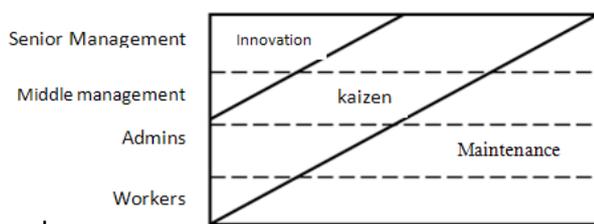


Figure 1. Impression of Japanese Management from job functions (maintenance, innovation, Kaizen) (Imani, 1995).

In the perceptions of the western managers, a few spaces have been predicted for Kaizen. Sometimes, another type of management which has been

shown in diagram 2 is found in the industry having advanced technology. Such companies start their jobs successfully and they grow swiftly. Moreover, they are also approved at the same speed due to reduction of initial successes or market decline. The worst companies are the ones in which nothing but maintaining is done. In such companies, there is no motivation for Kaizen or innovation and changing is only imposed through market situation and competition and the management doesn't follow any specific goal.

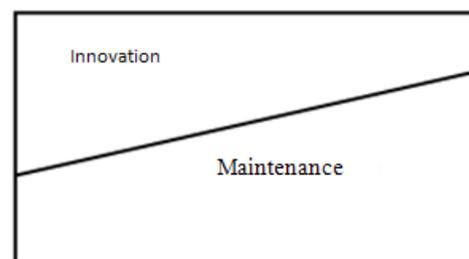
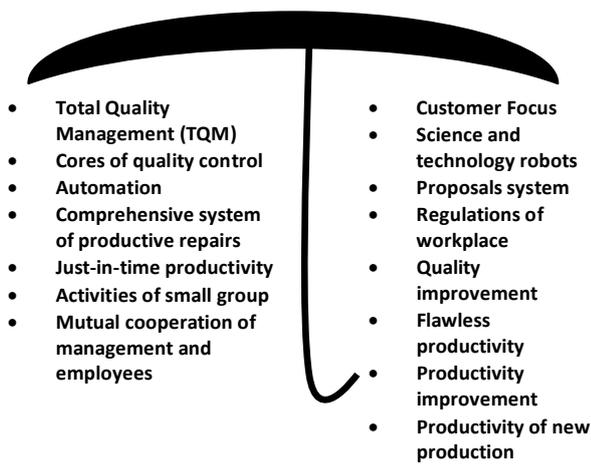


Figure 2. Job functions based on innovation

The most basic concepts of Kaizen

Kaizen is an umbrella-shaped concept including most specific Japanese management methods which have recently found international fame (Fig. 3).



- 1- Customer Focus
- 2- Long-term and system-oriented thinking
- 3- More emphasis on manpower and equipment
- 4- Participation of all organization members
- 5- Emphasis on process rather than outcome
- 6- A comprehensive quality control
- 7- Proposal system
- 8- Cores of quality control
- 9- Automation
- 10- Regulations of workplace

- 11- Comprehensive system of productive repairs
- 12- Quality improvement
- 13- Untimely and flawless productivity
- 14- Activities of small groups
- 15- Mutual cooperation of management and employees
- 16- Productivity improvement
- 17- Productivity of new production

Kaizen and QC (Quality Control)

Kaizen in a workgroup demonstrates constant cores of quality control and other activities of a small group which uses various statistical tools to solve problems. This constant view needs complete implementation of planning cycle, results evaluation and operations and it requires attempts of team members in order to identify problems, their reasons, experimenting and analyzing them and submitting solution. These attempts must result in standards establishment or new instructions. In June 1954, the Union of Japanese Scientists and Engineers invited Juran to speak at the seminar on quality control management.

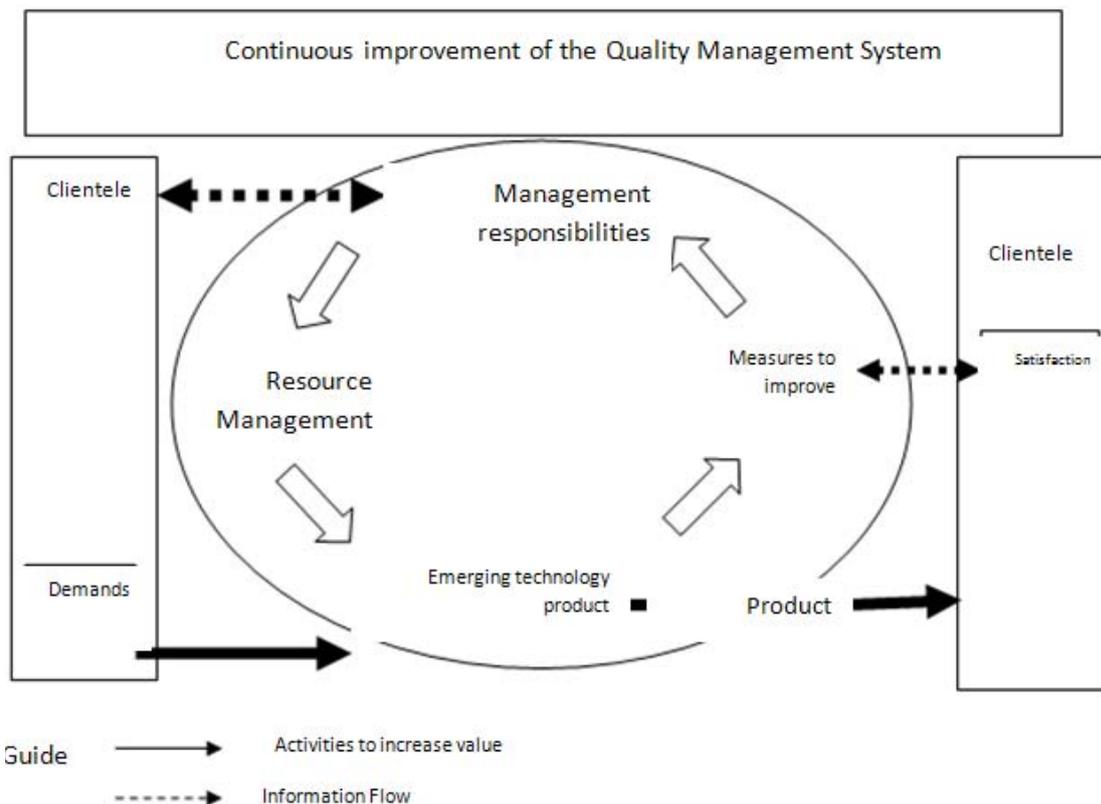


Figure 4. Process-based model of quality management system

It was the first time that quality control was studied after general management. In 1956, radio of short-wavelength of Japan allocated a part of its ed-

ucative program to quality control. In 1960, the first month of national quality control was held. At the same year, signs and flags of quality were officially

used. Pattern of a quality management system based on the process has been shown in figure 1.

Diagram 6 shows that the customers have an important role in determination of requirements or demands as inputs. Monitoring customer's satisfaction requires comprehensive information regarding customer's perception in this matter whether the organization could fulfill customer's demands or not? Kaizen and Total Quality Management (TQM) (Inclusive) is objective of TQM, efficiency improvement of the management in all levels.

Kaizen and Management

Management consists of two major factors: Maintenance and Improvement. Maintenance refers to maintaining activities of the existing standards in technology, management and operations. Improvement refers to the measurements that are used to improve these standards.

Model of Kaizen Management

Figure 5 demonstrates method of perceptions of the Japanese from duties:

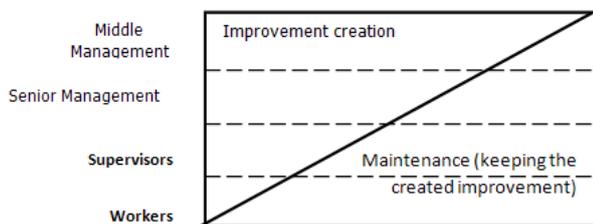


Figure 5. Kaizen Management Model

As it is observed, as we travel from the top levels of the management toward the lower levels, responsibilities of improving group is reduced and maintaining responsibilities are increased instead. As we find out from this diagram is that the managers of the higher levels should always spend a majority of their time improving the organization and maintaining duties should be assigned to the lower levels. How do they really act in our organizations? A manager who spends much of his time reviewing letter initials which have to be done by the experts, has never enough time to improve the organization. Therefore, Kaizen believes that an organization should always think over improving and maintaining improvement achievements in their own organization, but their shares from this movement has been demonstrated in the above diagram.

Deming tenet

Prof. Deming whose ideas were not considered much by the Americans in 1950, was accepted warmly in Japan and his proposal strategies for improving quality of Japanese goods made this country as one of the most advanced and superior countries in the World Economics.

Principles of Deming in his famous cycle have been shown in diagram 6.

The remarkable note of this circle is that the existing status is always the main subject for planning. After planning for passing the actual situation, the executive actions to achieve the predicted objectives will commence and its weak and strong points will be clear by evaluating method of implementing programs. In the last stage, modifying actions start for improving the conducted activities and this cycle continues similarly.

On the other hand, the existing situation is never completely satisfying according to the Deming tenet and we should continuously seek improvement of the situation. Another point is that implementation of the Deming Tenet commences always from planning and terminates to the planning once more. Namely, if a plan is adjusted and implemented (in case it faced a problem in implementing) we should think over modifying stages of plan implementation and we should finally make required actions for amending implementation process without wasting time.

Thus, we should plan for implementing other activities. The point is that if adjusting plan faces any problem while implementing, we are not allowed to easily interrupt the plan but also we should look for reasons of the plan's inability. In case we leave the adjusted plan for organization improvement undone, the main subject of the plan will be questioned again. In other word, this question will be raised that why we changed and improved the existing situation.

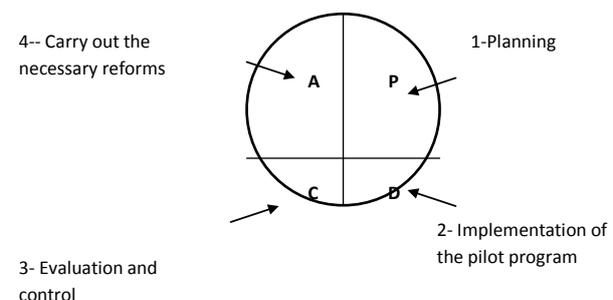


Figure 6. The Deming Cycle

As you can see, the base of Japanese thought for deciding and implementing the decision in the orga-

nization was the said stages above. It is noteworthy to mention that the Deming Cycle is followed interminably. Therefore, the common method (Kaizen) known as planning, implementation, evaluation and action can enhance the used processes.

How structural variables influence on innovation? Based on extensive research, we can express three statements considering the structural variables. Firstly, the mechanical structure have a positive effect on innovation because they have lower work expertise, less regulation and decentralization is more in them comparing with the mechanistic structures. Furthermore, it increases flexibility, strength, and fertility that make adoption of innovations easier. Secondly, easy access to frequent resources is a key factor for innovation. Resource frequency can enable the managers to spend money on innovation and accept failures. As a result, relationship between units assists breaking possible obstacles against innovation by accelerating in mutual action. However, none of these three variables can exist unless the managers are committed to these three factors.

Continuous improvement

If each manager of the successful companies is asked on what the senior manager emphasizes more. The response would be: Kaizen (improvement). Improving standards means to determine higher standards. After determination of higher standards, the management is responsible for monitoring new standards. The continuous improvement is merely possible through monitoring higher standards on behalf of the employees, so that maintenance and improvement became two inseparable components for majority of Japanese managers. What is improvement? Improvement means Kaizen and innovation. Kaizen is called to processed partial expressions in the existing circumstance through relentless efforts and so-called processed general innovation in the existing circumstance through vast investment in the technology with new equipment. As diagram 7 shows, the organization should continuously improve effectiveness of quality management system through application of quality strategy, qualitative objectives, audit upshot, data analysis, reforming and preventing actions and management revision.

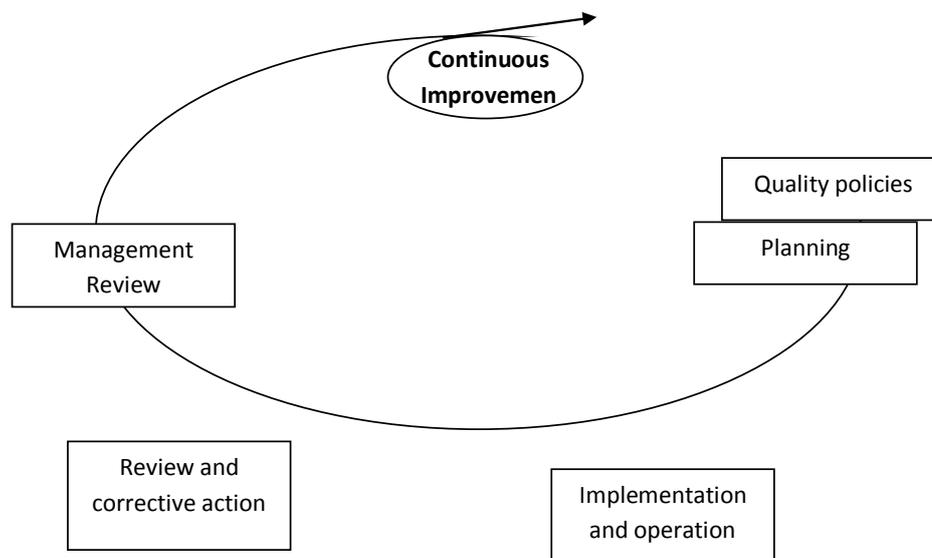


Figure 7. Continuous improvement

Twenty principles of management in Kaizen

- 1- Never say why. Think how to do it.
- 2- Don't be worried about the problem and just take action to fix it.
- 3- Don't be satisfied from the existing situation. Believe that there is always a better way.
- 4- If you make a mistake, immediately try to fix it.
- 5- Don't look for perfection to fulfill your objectives. If you are 60% sure about fulfilling the objectives, take an action.

6- In order to find out problem's root, ask five times " why" ?

7- Gemba is real place of error occurrence. Do not try to solve environmental problems at the workplace.

8- Use always little and modern information and data in order to solve the problem.

9- To solve problems, do not spend a lot of money. In case you cannot find a wise solution, you should ask your colleagues and use common wisdom.

10- Never forget the details and fine points. Most problem stem from such fine points.

11- Senior management support is not limited to words and promises. Management must have both tangible and evident presence.

12- Do not hesitate to assign authority to subordinates wherever is possible.

13- Never look for guilty. Don't judge hastily.

14- Visual management and information transmission are the best tools collectively to solve problems.

15- One-way communication command makes organizational problems more complicated from top to the bottom. The senior management should have a bi-

lateral relationship with lower layers of the organization.

16- Human has a variety of abilities. Use multi-skill patterns and job make wealth to flourish them.

17- Make merely the activities which brings added value for your organization.

18- Don't forget that 5t is base and foundation of creating high-quality productions.

19- To solve problems of your workplace based on workgroup's patterns.

20- Muda removal is an endless process. Don't ever get tired of it.

- Hierarchical structure of decision making in organizations:

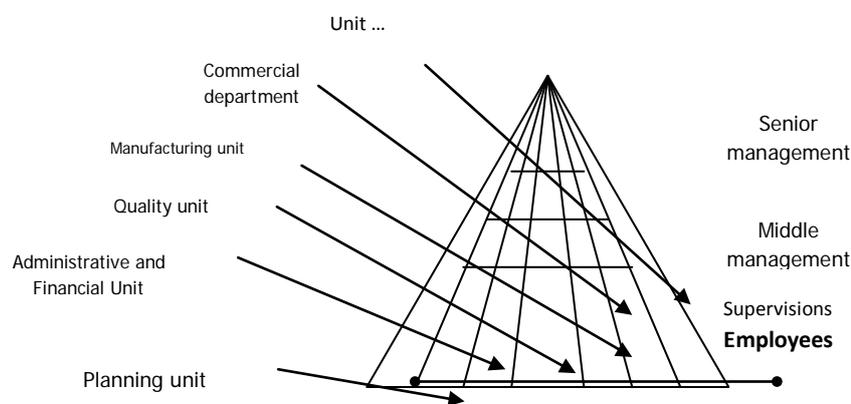


Figure 8. The hierarchical structure of decision in organization

Taylor can make an organization manageable through a systematic method by dividing duties and specializing activities of an organization in competitive situation of today's world that customers express the first word in determining type and quality of the aforesaid services and the world cannot fulfill them. Today, customers of organizations which produce public services have other expectations. They seek other services which have three features:

- Cheaper than private providers
- In a period of time quicker than private sector
- With a desirable quality for him
- In such circumstances, merely organizations that are familiar with modern methods of management and organization can meet customers' need and doing suitable changes compatible with fluctuations of the market.

Customers have normally no choosing right in this organization. In short, these organizations face some problems as below:

Hierarchical organizations practically construct invisible walls among their own employees by creating dif-

ferent departments and various management layers. In these organizations, there are various stations that some of them convert to bottleneck themselves. Everyone is responsible for their own job and they have no information about activities of their own colleagues. Circulation of information and documents are proceeding slowly in the organization. Similarly, the required information for decision-making in various layers of the organization get late to the hand of the managers and they don't have accuracy due to prudential sublimations. At the best situation, information is not updated and they have the least possible value for decision-making.

What should we do to meet needs of our customers in the organization? Is it possible to deform hierarchical structures and create new structures quickly? Experience of implementing changing techniques from the top and at once implementation in the whole organization prove opposite of this issue. The organization culture dominating most of the current organizations doesn't allow any fundamental changes happening. In the other word, management course is short in our organization and the managers

expect to find tangible results at a rational time. What should we do? Secret of success should be searched in improvement approaches which have pointed to.

Method of Implementation

This project intends to achieve the aforementioned objectives relying on the previous experiences by the aim of improving productivity, costs reduction, processes analyses, wastes elimination, optimization of workplace and submission of required trainings to the employees.

- 1) To study the existing situation (at zero situation)
- 2) General conference on Kaizen introduction
- 3) To form kaizen team
- 4) To hold workshop of adornment system
- 5) To implement the first step of adornment system
- 6) To implement the second step of adornment system
- 7) To prepare comprehensive map of processing
- 8) To modify process

It is an experiment over quality management and the sampling was done randomly. This re-

search evaluates establishment of functional Kaizen in a producing company before after intervention (Kaizen)and its evaluation has been done by SPSS software and all utilized variables are as below:

All variables are numeric and rating rank is from 1 to 5

Variable's name	Variable's name
Age	Former innovation
Gender	Former results
Background	Subsequent quality
Education	Subsequent quantity
Former quality	Subsequent cooperation
Former quantity	Previous quantity
Former cooperation	Previous cooperation
Former knowledge	Previous knowledge
Former trust	Previous time
Former time	Previous time

Functional aspects of Research Project

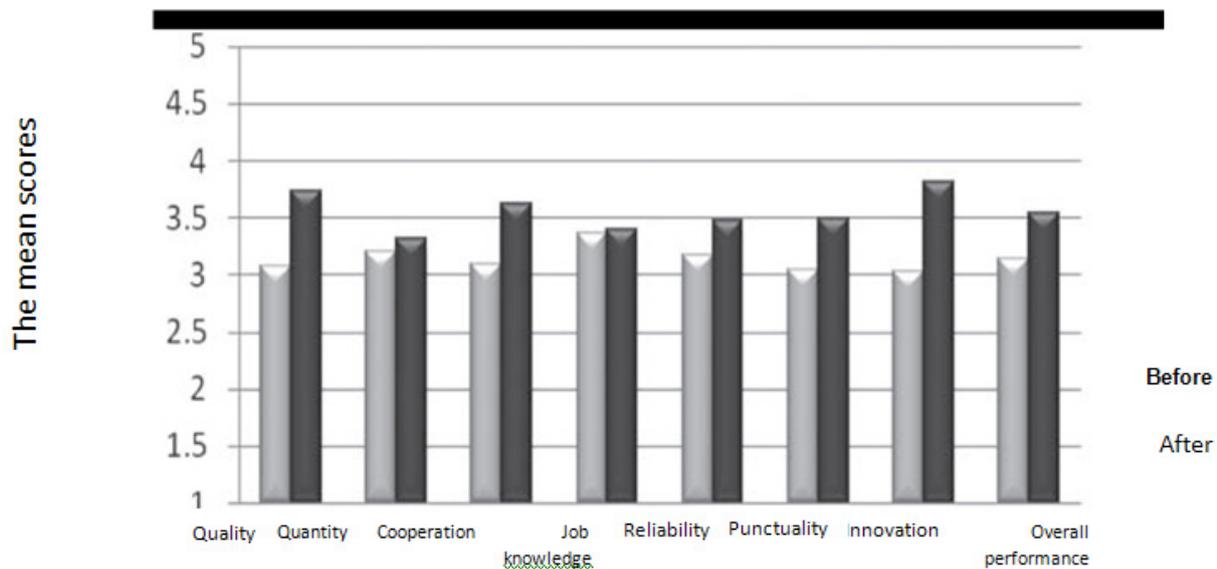


Figure 9. Evaluation of mean of seven functional aspects in employees prior and after Kaizen implementation

Conclusion

This study intended to explain Kaizen and innovation along with disclosure of nature of performance and its role. Advantage of Kaizen is obvious to whom that have already performed it. Kaizen leads to greater quality and more productivity. Where Kaizen was first implemented, the management clearly found an increase of 30%, 50% and even 100% or more in productivity and

this success was done with no major investments. Kaizen results in decrease of the breakeven point and forces the management to pay more attention to customers' needs and creates a system to consider customers' demands. Improvement means Kaizen and innovation; each company or organization use both Kaizen and innovation for its survival, growth and progress. Therefore, Kaizen refers to processed partial expressions in the existing situation through interruptible attempts and

processed general expressions in the existing situation innovations through huge investment in technology or equipment. After determination of higher standards, the management is responsible for monitoring new standards. Continuous improvement is possible merely through monitoring higher standards on behalf of the employees. So that, maintenance and improvement has been turned to two inseparable components for majority of Japanese managers. Kaizen with innovation: one of the striking features of Kaizen is lack of absolute need to complicated technology or the ultimate technologic achievements. In order to fulfill Kaizen, "Common Sense" is all which is needed. In contrast, innovation mostly needs much technology and a huge investment. All innovations can reflect a change, whereas all changes are not innovation. A change is result of creativity and innovation process. Moreover, general view at the beginning of this research was that in the workplace, there are Mudas or wasting cases that by eliminating them, costs can be reduced and improvement can be finally increased. By such critical view, implementation of the pattern starts and it was implemented step by step through certain stages. At the earlier stages, certain costs as spending time on training were imposed to the company, but the path will be leveled in the following.

When the plan approached the final stages and problematic processes got modified and all costs started decreasing. Implementing pattern which has been used in this study is an acceptable pattern which accompanies employees' participations. This pattern which has been designed based on the information, local and foreign experiments have been localized and they are compatible with national culture, so that application of this pattern and its implementation has been proposed in the

organizations and factories due to lack of ability of this pattern in reducing costs and improving productivity.

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