

Case Report

The Just-in-Time Production System Between Art and Philosophy Case Milk Production Complex Giplait Algeria

Wahiba Halimi, Nadjia Ziani, Farida Ghennani

Economics Department of Management, A. Belkaid University, Tlemcen, Algeria

Email address:

halimi_wahiba@yahoo.fr (W. Halimi), ziani_n_101@yahoo.fr (N. Ziani), faridaghennani@yahoo.fr (F. Ghennani)

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Abstract: Japan, as an economic country, lacks the natural resources that lead to economic and commercial growth. This lack have led Japan to create a system that meets its needs and to cope with its limited resources, trying to make the best use of its status. So it is began with fighting excesses in all its forms and end with adopting what we call the just in time production system. This article deals with the problem of production management, exactly the just-in-time production system, a Japanese system also known as Toyotism, with his tools in application to the milk production.

Keywords: Just-in-Time System, System, Philosophy, Art

1. Introduction

Many products manufactured in Western countries have lost their lead in world markets to be replaced by Japanese products. They have started to worry about the Japanese economic invasion of their markets, threatening their position and commercial status. In the past, it was thought in the West that Japanese products were cheap there are labor costs, but studying the wage levels of employment Japanese plus other benefits shows that it is currently outweigh the many Western industrialized nations, suggesting that there are other factors that led to the superiority of the Japanese product commercially in the global markets.

The prevailing idea in the grease of Western businessmen was that Japan would not continue to lead global markets because of the tendency towards tradition and beyond, and its inability to innovate. This concept began to change in the last few years after Japan invaded world markets with new and non-counterfeit products. Thus, the administration and the economy became more interested in the problem, becoming a phenomenon worthy of study and analysis, especially since Japan emerged from World War II in late 1945. A collapsed economy after the destruction of most of its factories and tools of production, was able in a few years to stand ranks among the leading industrial countries, including the United States of America. Many economic analysts have studied the

phenomenon and analyze the causes and exit Especially as Japan, as an economic country, lacks the nature of economic and commercial growth. This lack of natural resources has led Japan to create a system that meets its needs and is in line with its limited resources. As long as we cannot deal with resources, we do not try to coexist with them, so I started to fight corruption in all its forms, as it increases the scarcity of the supplier, thus adopting the system of production on time.

What is the nature of this system, which the latest strife in his presence as an entity in terms of the philosophy of being a technical, or art, and how its content and its aftermath, and how the efficacy of its application in a backward country like Algeria Industries Development?

To address this topic problematic Follow these steps:

- I Emergence of the production system on time and concepts
- II The JAT any type of institution (the application of philosophy)
- III Apply the philosophy of production tools on time
- IV Create cultures associated Pal JAT
- V Conclusion

2. The Emergence of the Production System on Time and Its Concepts

One of the most important of these practices is the comprehensive philosophy that is expressed in terms of the

system of production (JAT / JIT). This term, which has not been accurately translated into various languages?

2.1. The Emergence of the on Time Production System

The birth of this system in the automobile industry was not a coincidence. The car is a highly consumable product subject to periodic changes in demand. On the other hand are items of relatively large value with a medium added value so that it is not logical for a plant to retain important stocks of this product. If we do not want as stagnant cars, we do not have to produce more than consumers demand. There are two ways to solve this problem (Yves Pimor. 2003): either improve sales forecasts or wait for an order to start manufacturing. Here everyone goes to apply the first solution; Economic situation is fraught with serious upheaval, where it is difficult to make appropriate predictions beyond a few months, if not a few weeks. As for the second solution, it seems impossible to investigate, since the consumer is not ready to wait a week or two to get a car. However, the opposite shows that the customer is able to wait in return for receiving what he wants exactly and in specific specifications. He has to wait for the orders of the two vehicles to manufacture the appropriate cars. Here is the third solution adopted by TOYOTA, which is to withdraw manufacturing through orders rather than through the manufacturing plan.

2.2. The Definitions of the Production System on Time

2.2.1. Philosophy, Technology or Art

The on-time production system is a technique because it calls for the introduction of strict techniques in the process of management (Alain Courtois, C. Martin- Bonne fous, M. Pillet. 2001), while it is an art because it transcends the boundaries of methods and techniques to include even intellectual culture (Patrick Llerena1987). As for the philosophy that is due to the application of the process of application of the introduction of a new vision in the industrial institution (Alain Courtois & al; 2001). This production philosophy has aroused a lot of controversy among the workers in the production sector between supporters and fairs. Many of the workers in the field of automatic industries, especially the American automobile industry, have accused this philosophy of being linked to and appropriate to Japanese cultures. They tried to apply them in the American car industry and did not achieve what was expected to failure in the application in America and the inability to reduce the inventory as in the Japanese industries due to geographical problems Japanese industry is characterized by the proximity of assembly plants of parts suppliers and the idea of time Deliverable delivery while US industries rely on parts produced in other countries and get them from long distances, which reduces the effectiveness of application time entry and lead to high risk due to failure to arrive orders on time or not delivery of sufficient parts or delivery of parts In violation of specifications which affects the scheduling of the assembled parts that follow these parts resulting in delayed delivery. However, many results from recent studies have shown that

this philosophy is a continuous process of continuous improvement and reflects the long-term commitment of the Department to achieve perfection in all aspects of the productive process. This philosophy is also a method of governance (Alain Courtois & al; 2001) in that, By "Kanban" "cards" techniques, production in time (JIT) compensates in some areas the traditional methods of routing.

2.2.2. Different Definitions

There are several definitions assigned to the production system on time are summarized as follows:

- Word at a time in time means the time or a particular moment does not completely accepted and usually the US may not then, and if a little and took place on the use of this word to express something to happen on schedule completely to him without any deviations, the production of goods that wants rates where consumers meet their needs without defects and does not extravagant (A. Mekhimer1994).

- This philosophy is based on the clarification of choke points, quality and supply problems and other problems that result in detectable to work to resolve them and problems thus implement production more effectively lead to reduced production time for ways to reduce the preparation period and the change of the machines cycle which is reflected in its impact on improve productivity decisions (S. El Bekri 1999).

- The JT aims to generally adjust flows from suppliers to end consumers." In order to understand this, it should be noted that there are no vehicles in Japan with showrooms and that cars are sold in direct trade with the customer (Lionel Dupont. 1998).

- If the JIT is the real and actual proof because it has become possible flows of coordination between different institutions and that such coordination in supply does not stand by the doors of the institution threshold (Yves Pimor 2003).

JIT The system seeks to meet the demand of the time that appears in it, fixed quantity and quality required, and it is designed to reduce costs and time limits depending on the flow of production procedures without waiting for any clenched and does not stock (Jean Luc Charron; Sabine Sépari. 2001).

JIT is the philosophy of the management goal is to eliminate wasteful of all kinds and from all aspects of production, as well as related activities, while the term reflects in itself produce only what is needed and when it is required quantities (Armand Dayan and al. 1999).

What should be noted is that the first impression left by the term JIT leads to the conjecture that this system of production seeks to control time (Muriel Bellivier, 1996), but in fact aims to manufacture multiple products in small quantities in order to better meet the needs of customers (Jacques Plante ans al. 2003). For quality and productivity in all the activities of the foundation supported by two basic principles, fighting wastefulness throughout the institution and respect for the individual. The principle of eliminating the excesses is reflected in the periods of JIT, where we observe its launch from Japan to spread in the United States of America in the beginning of the eighties and in France from 1986, if we look at these three periods indicate difficult economic periods,

requiring the economy to the maximum extent Resources: The end of the war in Japan, meaning the status of the total destruction of human economic and financial forces while the period of slow economic activity in both USA and France (Muriel Bellivier 1996). And some go to define it on the basis of linking it to the extent of the response of the institution (Richard Calvi 1998).

In an abbreviated definition, APICS (American Company for Production and Inventory Control): The JAT is a production philosophy based on the systematic elimination of waste and continuous improvement (Anne Gratacap, 2002). And the latest definition we see of Herve Brunet et Yves Le Denn (Herve Brunet et Yves Le Denn, 1990), where they define the JAT as manufacturing products when it is as close as possible to the demand.

2.3. Zero Targets of System of Production JIT

The philosophy of the JAT to focus on zero goals, which are summarized as follows (Lionel Dupont 1998):

2.3.1. Zero Accident

It is frequent to find at the entrance of institutions or workshops Signs indicate the number of days that passed without incident, the attempt of the Directorate to clearly announce the desire and preference for security of users, at the same time improve the atmosphere within the institution, Visitors and thus reduce insurance costs. It requires accident minimization to know the reasons first, so ordinary tools use the Pareto method (here too we find the 80/20 law where 80 accidents are accounted for by 20% of the causes)... Once the main causes of accidents are eliminated, In the workshop, based on the health and security of the institution, and by integrating the total users for at least maintaining the security conditions and better to improve them.

2.3.2. Zero Conflict

Everyone can understand the benefit accruing to the institution and workers together and the migration of the absence of conflicts, some conditions can help achieve this goal and are the conditions of work and lease the correct policies of approaching users...

2.3.3. Defective Zero

This is achieved by improving the quality of defects of design, garbage, what it needs touches, the fault of the customer all these are sources of wasteful waste.

2.3.4. The Term Zero

The shortening of the total deadlines has become necessary for the institution. The first period to be set if the new products in the market are to be developed only the rapid development of the expectations of consumers, technologies, competing products. The short term of the institution to obtain for some time a stable position, the minimum times for placing in the markets depends on the concept of dual mechanization. The second term is the delivery period, where it is necessary to work on decreasing it. At the same time, it is necessary to respect the deadlines. This requires a minimum of actual

production cycles, but also the administrative deadlines for preparing the transport and transportation time between the institution and the customer.

2.3.5. Crash Zero

This point leads us to put forward the general formula of the method of equipment management and maintenance where the institution is required to use the TPM The following are the five conditions to be respected: meet the basic conditions of dealing with the machine (regulation lubrication...), Equipment to the first situation as soon as it begins to be obsolete without waiting for the failure, repair the faults and try to understand where the failure of the equipment and try to improve them, improvement and continuous methods of testing and maintenance to warn of human errors during exploitation and production. The TPM must precede the phase where the 5 s method is applied.

2.3.6. Paper Zero

Referring to the information system. It can be seen from two angles: simplification of administrative procedures, elimination of pseudo forms and the aim of securing a more flexible regulation to allow easier reading of decision centers. The second angle is to adopt the best management of information. The information that is useless and the retention of the competency. The general trend towards the flow of information is through automated media. Physical information workshops are compensated by the flow of non-material information. Technical plans and data are managed by technical data management systems, quality procedures and documents through document management systems.

2.3.7. Zero Inventories

Zero defects and zero inventories are the two codes of production according to the JIT. If the goal of the zero defect is not met with objections, the objective of the zero stock which undoubtedly raises controversy. The reason is most likely that the institution without stocks becomes vulnerable to disruptions as stocks contribute to the dependency class rather than the various subsystems of the chain as a customer institution resource. In this regard, the Japanese administration has taken an interest in the period of preparation as its interest in the actual duration of production. Because the period of religious preparation is lacking in a low-cost, low-cost economic chain, the economic diminution of stocks becomes striking (Vincent Giard. 2003).

What should be added is that this Japanese design, which leads to a significant reduction in inventories, represents the best way to develop production elasticity (Vincent Giard. 2003), which is defined as the ability to respond quickly to changes in the ocean, which are exacerbated by the low level of stocks.

Others add other zeros, such as:

2.3.8. Zero Deprivation

The goal here is to integrate all workers and encourage them to participate and express their views without depriving them of their achievements (H. BENYAHYIA 2004).

2.4. Additions

Some know wastefulness as: every consumption is useless for materials and time (Jaques Laverty; René Demeestère. 1990). Or any process that does not exceed the value of the product (the excess of production that leads to unnecessary stocks, useless manipulations, defective production...) (Philippe Vallin. 2001). JIT counts seven kinds of extravagance as follows (Jean Nollet, Joseph Kélada, Mattio O. Diorio. 1994):

2.4.1. Overproduction

In the sense of mass production, this exceeds demand.

2.4.2. Waiting

It includes all interrupted times and unplanned pauses, because they are considered to be very dangerous and have a negative impact on respect for delivery deadlines.

2.4.3. Transportation and Handling

Represent a potential source of waste.

2.4.4. Ineligible Transfers of the Product

Each conversion process does not add value to the product, it is waste.

2.4.5. Excess Stocks

They incur financial costs, management and control costs, costs of loss of value, and obsolescence. Thus, the disappearance of stocks improves the flexibility of the enterprise (rapid change of the product) and has a direct impact on quality, where the worker or rather directs the worker to the result of his work seeking quality instead of his obsession with profitability and loss of inventory. (Jacques Laverty et al. 1990).

2.4.6. Useless Movements

Any movement that does not add any value must be eliminated.

2.4.7. Defective Production

Defective production: Any defective product will be directed either to waste or to re-manufacture, which may result in delays in the delivery times or re-call of products that have already been sold. And therefore this defect is in fact loss of materials and value added and all that was consumed to produce this defect (Jacques Laverty et al. 1990).

Others argue that there are other obstacles limit the effectiveness of the system, which must be eliminated and are as follows (Jacques Laverty et al. 1990):

2.4.8. Quality Control at the End of the Production Process

Monitoring and quality control teams are assigned to quality control at the end of the production process, usually leading to a delayed identification of the product (which is known late), which continued throughout the manufacturing process, thus creating an accumulation of useless added values And make it difficult to identify or identify the causes. Therefore, it was necessary to devise a method of quality control that limits the defect and not only detects it, and it must

be monitored immediately during each process.

2.4.9. Control of the Parts Delivered by the Suppliers During the Receipt

These operations take time, and use a space, which costs handling costs. Therefore, a quality system must be put in place by the supplier. This will facilitate, by moving towards the source, eliminating useless costs.

2.4.10. Frequent Failures of the Machine

These failures have a direct cost of freezing machines and individuals while their indirect costs are the delay fees, the chaos that prevails in the production line to compensate the delay, deterioration of the brand image of the institution which does not deliver in time the quantities may be lost opportunities lost profit loss In addition, the risk of this risk leads to expensive behavior, the creation of safety stocks, for fear, the organization may not be able to meet the agreed deadlines and increase the waiting times for users in the remote duty stations, which will create additional costs.

2.4.11. Length of Machine Tuning

The accumulation of these unproductive times is very costly: freezing the machine, cost of labor, this leads to a lack of flexibility in production, while taking into account the planning times cause a lack of response to demand changes, In the business number.

3. The Application of Philosophy

Many believe that the application of the JAT is a monopoly on industrial production, but in fact it is suitable for any kind of activities, service activities (banks, insurance companies, transport, trade...), although it is difficult to transfer the techniques applied in the factory, The pressure of flows, the identification of problems and the elimination of their causes play an important role in the third sector and translate global goals regardless of the size of the organization and whatever type of activity.

Analysis of the management process can be similar to an industrial production process (Anne Gratacap et al, 2001): flows to be analyzed are not flows of products and products, but document flows have long paths, through many successive processes achieved in specialized interests, And customer dissatisfaction, objections and new documents requiring treatment? Long-term routines often lead to parallel paths that generate unjustified costs, quality problems that lead to customer objections, high reprocessing costs, and error checking and debugging. The JIT principles (simplification, multitasking, task pooling, timeliness, quality control since the cradle...) in this field are important for the application. In the same way, the management of customers and those who come to offer them a service in a center, An agency (management, hospital, bank, restaurant...) will gain time by trying to minimize waiting time. The stocks of customers are the times necessary for useless transfers... which are a source of customer dissatisfaction. Here also ask questions, multiple skills or specialization of these centers, the speed of response

to requests, the quality of services provided.

For example (Anne Gratacap et al, 2001), in a hospital, the JIT system can be applied in different fields: management of administrative procedures, especially customer waiting, and the use of productive capacity. This is the case if customers wait to analyze the deadlines between patient arrival and discharge, Waiting for analysis, specialized operations...), which costs costs and does not satisfy the customer. It is also about making bottlenecks perfect: for some services the demand is predictable (filtering...) for others it is improvised...). In the hospital (like the factory) and during periods of high demand, the flow of the flow becomes critical, as the bottlenecks of the suffocation (excitation, resuscitation, x-rays) appear here. The same is true for the simplification of administrative procedures. Acceptance, exit, harmonization and planning of material and economic resources allow for the provision of a larger number of contaminants in the same number of families. This reduction in waiting lines leads to the determination of: (a) Infectious infections, minimization of space used, reduction of tensions and errors. Overall, the importance of the economic services sector justifies the bulk of the JIT extension to this field.

4. Tools Application of Production Philosophy on Time

4.1. Re-positioning of Productivity Tools: Lines and Cells

It is rare for plants to take the size of their internal specifications completely from the beginning. The continuous expansion of activities leads to the increase of new equipment, without moving the existing machines to ensure an ideal position for both new and old equipment. This is one of the explanations given to justify the bad expectations, while the second interpretation reflects the traditional organization of the factories, which was according to the functional method (Anne Gratacap et al, 2001). The application of the JAT principles for the re-positioning of the production machinery has two main objectives (Pierre Berranger, 1995): to bring the work stations that perform serial operations on the same piece or the same product to the sequence of operations in such a way as to allow the machining of a piece by the end of the machine. There are two approaches to this type of organization (Jacques Laverty et al, 1990):

The principle of Japanese-style linearity: different and characterized by the intervention of observers directly on the line, the stage of installation is divided linearly on the number of observers necessary to reach the desired speed or to achieve balance, and control of quality... In this type of regulation,, But becomes a real center of work since all the pieces pass in the hands of all observers to add each of them a number of additional operations, and therefore it is easy to estimate the degree of progress of production if any problem appears at the level of any center, work collectively and there is no system of bonuses (Rewards).

This type of expectation is usually organized around the "automatic cells" of U. cells where the work centers are

positioned in a way close to the last working position of the first. To allow the same observer to perform multiple operations with a small movement of pieces, the same observer should be able to manage many Different machines, which work symmetrically or sequentially: the first machine worker and in the meantime assembles the pieces manufactured by a second machine usually takes the form of the letter U, to facilitate the final intervention of the observer at many duty stations and economy movements as it moves with the piece Which it addresses For a regulation resulting from the adoption of the TGAO logic that allows for the arrangement of pieces according to their production processes and access to the concept of homogeneous families of pieces, whatever their fate in finished products.

One of the first results (Anne Gratacap et al, 2001) of this application is to minimize the distance between duty stations. This organization ensures a significant profit in the occupied areas (minimizing the area allocated for transportation and storage), achieving the desired flexibility and minimizing the handling processes. The division of the equipment helps to clearly identify the problems by virtue of the new vision of the total operations. It is obliged to act immediately so as not to disturb the functioning of the pro operations. The division of the plant into independent and self-sufficient sectors prevents the reflection of an accident in one sector (Jacques Laverty and al, 1990.).

4.2. Tools to Eliminate Waste Due to the Time of Regularity

Some (Jacques Laverty et al, 1990.) believe that the consideration of a resource is not exploited for a period of time, it is synonymous with waste is a misdirection error. The identification of the source of the error requires careful analysis by the path, but in some cases the waiting times represent a real extravagance where these times translate into: maintenance errors, long chain changes. If TPM is processed, the problems associated with string changes are gradually eliminated by SMED. Rationality allows slashes to also answer the time management factor.

4.2.1. TPM: Total Productive Maintenance: Control Equipment

1. TPM Theory or the Search for a Comprehensive Indicator of the Profitability of Machines

TPM in theory or the search for a comprehensive index of machine profitability: The TPM has emerged from the need to improve the cost-effectiveness of machines, but according to the selected cost index, it can be satisfied with a situation that appears to be true but does not represent real cost. The use of the chronological work rate reflects the good example of the previous idea, the rate of action is the ratio between the duration of the machine and the duration of the workshop.

Example (Anne Gratacap et al, 2001): If the opening time of the workshop is 7 hours per day and the machine is operated for 6 hours (since there is an hour consumed for various non-productive operations, the work rate is $6/7 \cdot 100 = 85.7\%$).

Actually, the machine does not work for the length of the

opening of the workshop, it is noted that the work of the Tigers from the unproductive stages such as preheating, changes in chains, refilling machines, maintenance.

The emergence of slums such as malfunctions that affect the operation of the machine, finally the loss of another time appears when studying the rate of "scrap" of the machine. As a result, if we are satisfied with a general productivity index as the average of the machine works of machines, the representation does not reflect the actual level of productivity of the equipment. To know and to accurately calculate the cost of the machine and to rely on it to initiate improvements, a number of details must be available. The Japanese Institute of Maintenance (JIPM) in 1970 introduced a new approach called TPM: Total Productive Maintenance (Anne Gratacap et al, 2001). It was first experimented with Nippon Datso, a subsidiary of Toyota, which produces electronic vehicle vehicles, Maintenance Department (Anne Gratacap et al, 2001) This is the origin of the idea of reducing the interventions of the maintenance service and in return to pay other workers to do this work, especially workers on machinery. The basic principle of TPM is not a fundamentally variable maintenance technique but can be rounded to a comprehensive approach to equipment management to improve industrial performances P. Pontier 1998 (Anne Gratacap et al, 2001). TPM relies on the following columns (Lionel Dupont 1998):

1. Improve processing productivity measured by TRS improvement.

2. to give the observers part of the maintenance process, in the sense of making them independent from the maintenance service, "independent maintenance" starts from cleaning machines, the formation of simple methods and methods of spontaneous search for the improvement of roads and equipment.

The message that the TPM wants to convey to the hearing is that the unit of action is above all a complete system between the individual and the machine, and within each system of this type, the individual plays the first role and therefore this requires the observers to cancel the neglect behaviors in front of the excesses they may observe and from achieving full harmony Between the work of the individual and the work of the machine. There are three stages of the TPM that we mention as follows: (Anne Gratacap et al, 2001):

* Stage 01: Be careful to use the machine as it should, where the observers receive a basic configuration allows them to absorb the outline of the operation, at the same time encourages these observers to monitor and maintain the machine at best to work and ensure cleanliness.

* Phase 02: Observers are formed in the field of maintenance of the first class (care, current, minor repairs), especially the formation of the intervention of the maintenance team once it becomes clear to them that the method of work is doubtful. Suggestions that lead to (and are rewarded) improved changes are encouraged. These processes help to extend preventive maintenance cycles or reduce the risk of disruption between two preventive interventions.

* Phase 03: situational maintenance mode, care processes are created through fault detectors that can be developed and

processed. The goal is to reduce maintenance costs again and to extend as much as possible the working cycles without malfunction.

This leads us to the presentation of an analytical index that takes into account the three sections of inefficiencies that reduce processing productivity. Which is due to: known stops, various slowdowns, defective. This index carries several names (Francis Lanbersand 1999): TRG for some or TRS for others, and can be calculated in several ways, either on a sequence of proportions or more modestly as equal to the actual productivity divided by the total number of pieces that were Which is supposed to be produced during the opening period based on the theoretical capacity (N) where the calculation is the following equation (Anne Gratacap et al, 2001):

$$TRS = \frac{P - Def}{N} \quad (1)$$

P- Def = Productivity minus defective production = actual productivity.

N = Theoretical ability.

This first method of calculation does not allow for the validation of various causes of inactivity, so TRS analysis has to be simplified.

We know the crude rate of machine operating (TBF), which translates specific stops (Anne Gratacap et al, 2001):

$$T_{BF} = \frac{\text{Opening time} - \text{Stopping times}}{\text{Opening time}} = \frac{TBF}{TO} \quad (2)$$

We know the net rate of machine operation (Anne Gratacap et al, 2001):

$$TNF = \frac{\text{Realized production} \times \text{real cycle time}}{\text{Opening time} - \text{Stopping times}} = \frac{P.TCR}{TBF} \quad (3)$$

The real time of the cycle is only the real duration of the piece manufacturing (during the appropriate unit), while the theoretical time of the cycle is based on the default duration of one piece manufacturing.

It should be noted that the more cost-effective the machine becomes, the greater the real time relative to its theoretical value, the lower the R, then it is rare within institutions to equal both real capacity and nominal capacity. The R is the following equation (Anne Gratacap et al, 2001):

$$R = \frac{\text{Theoretical cycle time}}{\text{Real cycle time}} = \frac{TCT}{TCR} \quad (4)$$

The rate of the net operating rate and the R rate gives an indicator called the "performance rate" (this name is not common among the economists because some define the net rate of occupancy at the rate of performance) and shows the effect of the slowdowns and small stops. This performance rate takes the following form (Anne Gratacap & Co, 2001):

$$T_p = \frac{P.TCR}{TBF} \cdot \frac{TCT}{TCR} = \frac{P.TCT}{TBF} \quad (5)$$

Finally, consideration should be given to the impact of refugee status, since the presence of certain products reduces the number of products that can be sold and is expressed at a rate of quality (Anne Gratacap et al, 2001):

$$T_q = \frac{\text{Realized Production} - \text{Defective products}}{\text{Realized Production}} = \frac{P - Def}{P} \quad (6)$$

Finally, we obtain TRS by the following equation (Anne Gratacap et al, 2001):

$$T_{RS} = T_{BF} \cdot T_p \cdot T_q \Leftrightarrow T_{RS} = \frac{TBF}{TO} \cdot \frac{P.TCT}{TBF} \cdot \frac{P - Def}{P} = \frac{P - Def}{TO} \cdot TCT \quad (7)$$

II. TPM in Practice or Search for Overall Efficiency of Equipment

The TPM takes into account all industrial maintenance activities throughout the production process. The objective is to look for the reasons why machines are not prepared and actively fought.

In practice, it is about reducing downtime during downtime and ensuring optimum flow of production. The TPM covers three axes (Anne Gratacap et al, 2001):

- * Maintenance of good equipment: It is about "maintenance" which is shown by cleaning, taking care (Checking levels, monitoring degree of deterioration, lubrication) and repairs.

- * The maintenance of machines must meet the necessary performance of the activity: hence the term "productivity" improves equipment productivity.

- * Reference to the concept of Total: It is assumed, on the one hand, that all the "functional" aspects of maintenance must be taken into account (from the simple and everyday care of the workplace with a vacuum cleaner and cloth to the heavier and more sensitive processes of changing or repairing a defective piece). Enterprise workers must be TPM partners. The TPM falls within a strategic approach where it cannot be approached as a project.

III. The TPM Requirement: The 5S Method

This is the way that Nakajima (Anne Gratacap et al, 2001) brought the way to the JAT by the institution wishing to do so. This method is used to eliminate any waste of cleanliness or chaos. Its purpose is to rid the work station of the things that are not useful, The place is arranged and within the range of the eye, allowing it to be cleaned regularly and finally introducing the necessary procedure for the good execution of the work. This method consists of 5 basic principles where their names begin with the letter "S" in Japanese (Anne Gratacap et al, 2001), respect for the order is as follows (Anne Gratacap et al, 2001):

- 1 Ranking = Seiri
- 2 Regulation = Seiton
- 3 Cleaning = Seiso
- 4 Purity = Seiketsu

5 Moral education = Shitsuke

Some people add a sixth word to become Rule 6S instead of 5S, the second nature of Shukan. Any organization can at any time use "5S" for each interest or duty station. The five principles (Jacques Plante et al., 2003):

- * Raises health level and internal security level (eg = low risk of falling people and objects).

- * Raise the quality of life of its workers.

- * Raises its degree of effectiveness.

- * Minimize the number of times the machine crashes.

These principles are due to the fact that the total number of managers and workers is not fully aware that the chaos within the productive unit is the source of many problems, which are reflected in reactions, for example the following observations (Jacques Plante et al., 2003):

- * It takes more time to find the piece than the time it was manufactured.

- * Absence of a paper may prompt you to review all documents to find it.

- * The abundance of tools scattered on the ground may lead to the workers to stumble and harm them.

Therefore, this rule has a significant impact not only on security, productivity and quality, but even on the atmosphere of productive unity.

4.2.2. Improve the Times of Change Series: SMED Single Minute Exchange of Die

Centered core idea about minimizing the duration of interventions between processes and in this regard show how SMED means all of the terms Single Minute that the necessary time in minutes to change should not exceed the number is incremented by one (no more than Sundays), and it can SMED defined by AFNOR NF X50 - 310: " is a way of organizing and searching for the minimization of systematically is time to change the strings from the goal size "(Jacques Plante et al, 2003), and for this it was necessary to differentiate between net manufacturing length and duration of the meal (Francis Lambersend, 1999): net production for: is it necessary for the passage of quantities of pieces on the time series of the subject for several transfers to access the full product and graduated from the other end. When the list of products is homogeneous, meaning that require a regular change in the tools, and the degree of heterogeneity it to be manufactured determine the degree of change tools products. Time spent in performing these tasks is a period of preparation.

I. Stages of the SMED Method According to S. SHINGO (Jacques Plante et al, 2003)

There are four stages of SMED application, but some (others) refers to the initial stage preceding these four stages where awareness and awareness of the need for effort will be made and summarize the four stages as follows (Kamematsu Matsuder. 1998):

Stage 01: This phase requires the collection of some information relating to the duration of the initial change, the traditional method used, as well as the equipment and tools. A videotape detailing the precise arrests of operations. Calculating the duration of each stage of change as well as

operations, allows the provision of important information, this stage is likely to lead to the need for the application of the 5S. This first stage is generally low-cost and allows for significant improvements in results.

Stage 02: Determining internal and external processes. It is about finding profits in time that could be due to time lag. According to P. Pontier (1998), it is rare to make a profit of between 30% and 50% Phase I and II.

Phase 03 Transfer of internal processes to external operations, which usually requires investments, for example liquid vehicles that have been preheated and blended with the machine. This can be done in advance using other processing. Thus, the feeding of the machine is done directly, since the mixture is pre-existing and at the appropriate temperature, this stage has a kind of complexity during its application because conversion is not always easy and can be expensive for the institution.

Phase 04 Search for minimizing the execution time of the operations whether internal or external rationalization:

- * It is about simplifying simple movements that require a period of time (setting adjustments or fixations). In practice this translates into elimination by either partial or total, by minimizing the movements (especially in the case of refinements), by standardizing the equipment (unifying the type of screws...).

- * It is also a matter of predicting the conditions of the setting by setting up function values, preferring methods without setting (constant) (use of functional settings).

II. SMED Requirement: Continuous Improvement: Kaizen

Is a philosophy that seeks to improve all factors related to processes and activities that transform inputs into outputs on an ongoing basis, including equipment, methods, materials and personnel (Anne Gratacap et al, 2001). This calls for a change in the traditional view that shortened maintenance and repair in cases where some of them to the disruption and stop the need for improvement and maintenance periodically and continuously before reaching the cases of cessation. Kaizen processes are based on the culture that encourages proposals by individuals working in an effort to improve their operations. For example, a minor improvement by smelters can be applied in white instead of black, improving the worker's vision and improving the quality Welding also significantly improves employee satisfaction (Kamematsu Matsuder, 1998).

4.2.3. Control of slums AMDEC

The management of slums, which are involved in the strategic design of time management and technology, is a major preoccupation of the contemporary institution. Among the different methods used to control slums is the AMDEC method. The method of analyzing imbalances by their criticality and background is a very well-known tool, particularly in the automotive industry. The main principle is to show more quickly the important imbalances associated with the production process or the product itself, by integrating the operators into the group's work (Armand Dayan and al. 1999). Control of slums results from a comprehensive, preventive (and not curative) approach to

quality management. This method is organized around four stages. The causes of imbalances must be identified and their effects analyzed." Hence, from a "drip" system, a sequential order of imbalances is developed. Finally, corrective workers must be followed proactively (Anne Gratacap et al, 2001). The AMDEC index is based on the extent to which the process is critical (Critical, unimportant, critical...) as well as the point of repetition of the imbalance (Anne Gratacap et al, 2001). Quantitative aspects are combined here in order to converge towards the unification of design and exploitation functions.

4.3. The Elimination of Wasteful Resulting from Excess Production and Non-useful Stocks: Kanban System

4.3.1. The Nature of the System

The word Kanban "is the English word for a Japanese word means card, adhesive or card (S. El Bekri, 1999). This method is based on the circulation of cards developed after World War II in Japan, developed by T. OHNO within the Toyota Motor Company and in 1958, some Toyota Motor Company production lines successfully applied this method (S. El Bekri, 1999). T. OHNO observed that "factory personnel always tend to overproduce" (Anne Gratacap et al, 2001) and therefore began to search for a means of production. At the time it is requested (not before and not yet), by the quantity requested (no more and no less). This translates into the production workshop by not producing the first (former) production except as requested by the second (later) center, which should not produce only what was requested by the work station and so on and so forth... until we reach the last center Which is required to produce according to customers' needs only (Anne Gratacap et al, 2001). The information system should be developed quickly to raise the needs of the last duty station to the first. This system is called the card system. It is an information system and a way of organizing and managing the workshop which does not in any way integrate elements of industrial management such as planning (Anne Gratacap et al, 2001).

The appearance of the system is credited to the master and engineer of Toyota in 1953 - Taiichi Ohno, which is attributed to the status of inspiration when it came to study the American markets: as the arrival of the customer to the cash settlement fund with the acquisition of more, it makes the need to supply the gallery, because The customer (the post center) feeds his needs in the gallery (the tribal center), which in turn (the gallery) the need to supply (the necessity of production) to compensate for the pieces taken by the customer (consumed by the post office) (A. Mekhimer, 1994).

The card plays a transformative role for the information on the level of consumption - and accordingly the level of production that will decide the start - and thus believes the dual role of a "follow-up paper" and "order of manufacture" and exported by the post office. The card contains a set of information contained in it, which we supply as follows (Alain Courtois and al. 2001): Item reference: name, number. The places sent to and to him: post center / and tribal.

It is the speed of the card that controls the rate of

manufacture (the speed of the card is in itself the rate of consumption of the pieces), if the center stops after the use of some pieces, the tribal center automatically stops production since it does not receive any order to manufacture, so it is not possible That excess production occurs. The color reminder on the ground is one of the elements of the signal, which facilitates the physical organization of the flow of information and resources within the plant.) (Alain Courtois and al. 2001).

4.3.2. Card System

The card system uses three main types of cards (the system may use only one or two of them): Transport Card: Some are used to describe the name of the transport card (Alain Courtois and al. 2001), the production card (Alain Courtois and al. 2001) and suppliers card (Anne Gratacap et al. 2001).

4.3.3. Card System Rules

The efficiency and effectiveness of this system is due to the following rules (Vincent Giard 1998):

1. It is not possible to move any container without the attachment of a card.

2. No unit of any class shall be produced in any center unless there is a production card. If a production center ceases to exist because of the absence of production cards, the workers shall maintain and clean the machines on which they work or participate in road improvement programs Work in their department or even participate in a commutation of the workload at a center with urgent requests.

Each container shall have a single transport or production card, the containers shall be for each class, no non-modular containers shall be allowed, or quantities greater than or less than the quantity specified for each container. No container shall be used more or less than The specified number, by a well thought out administrative decision by the Department. (Vincent Giard 1998):

5. Create Cultures Associated to the JIT System

5.1. The Waste of Poor Cooperation: The Role of Industrial Partnership

The efficiency of this type of relationship results from a dual integration (technical, organizational and social) (Vincent Giard 2003). This partnership contributes to the extension of the JIT philosophy beyond the processes that take place within the factories or on the production lines. The concept as we mentioned above is comprehensive, all, when this concept is applied to purchases, it means buying in very limited quantities and making frequent deliveries, which may amount to several times per day. The Japanese are like this with the hippopotamus helped by its light weight and movement to float on the surface of the water, Do several rounds (A. Mekhimer, 1994). Japanese enterprises tend to deal with a limited number of suppliers year after year, which helps suppliers develop their capabilities to the extent that they are fully in line with the requirements of the procured enterprises

in terms of quality, time, place and quantity considerations in the procurement process

5.1.1. Relationship with Suppliers

In this relationship, the JIT philosophy sees an excess of excess inventory, by minimizing demand and supply in the light of the needs of the procuring entity. The mutual trust between the buyer and the supplier works in two directions. The first is to reduce the investment in the safety stock to the lowest level, and it is not surprising that the amount of safety stocks in many Japanese companies do not exceed the needs of a limited number of working hours. The second is to build trust between suppliers and buyers and to confirm them through repeated transactions for long periods of time. Suppliers have been able to develop the methods of work in their factories and use the advanced methods of controlling the quality of their products to the extent that many Japanese purchasing companies themselves do not need delivery and inspection of incoming materials, It is often the supply of supplier cars to the production lines directly without papers and models, without the minutes of delivery and inspection without delay or contravening the specifications. In this regard, mention is made of the following example (A. Mekhimer, 1994):

In the Hewlett Packard unit by eliminating supplier invoices (reducing bureaucracy), the procurement cycle was streamlined by recording delivery receipts in accounting once a week.

5.1.2. One or More Source of Supply

The JIT philosophy tends to be careful and careful to provide all of its needs of a particular category or part of a single resource or a very limited number of them. A supplier that sells 60% or 70% of its products to one organization is the most flexible and responsive to the requirements of this organization. (Jacques Plant et al, 2003).

5.1.3. Specifications

In Japan, according to JIT, the buyer's primary interest is in the specifications and characteristics associated with the performance of these parts. On the understanding that the supplier has the experience and ability to determine the specifications required for these parts (A. Mekhimer, 1994).

5.1.4. Long-Term Contracts

Under the JIT philosophy, the trend towards long-term contracts with a limited number of suppliers is chosen on an approved basis (Anne Gratacap and al. 2001), since long-term contracting provides the supplier with many risks, which will prompt him to try to maintain his semi- To supply the agreed terms even if this is at the expense of the short-term contracts of this supplier with other customers.

5.2. Human Resource Management

Human resources management: New rules for the management of production users:

Adopting the JIT philosophy and applying its techniques requires a profound change of thought. This change is

primarily concerned with the personnel employed, as well as by the heads of other departments (quality, maintenance, mechanization...), as well as supervisors and accountants. The new organization has three aspects (A. Mekhimer, 1994):

i. Multiply the skills of observers by virtue of the need to operate different machines contained in the same cell, interference in many cells according to the level of work, and therefore the observer is required to exceed the mere being competent in one process or the leadership of one type of machines.

ii. The second aspect is the method of stimulation where the collective performance of the cell must be considered and the performance monitoring should be based on the criteria of the team rather than the individual. The constant and continuous recognition of the efforts of individuals within the institution is one aspect of the development of the spirit of loyalty among workers, which is a kind of motivation.

iii. The most recent aspect of the erosion of the traditional division between executive, supervisory and managerial functions is that decision-making has become a factor for the workers of the centers, whose area of responsibility has gradually grown, with weak and limited intervention by the higher authorities throughout the manufacturing process.

Human resources management and new objectives must therefore be adapted (Philip Marris: 1994):

- Open the door to entrepreneurship.
- Raising the level of training and expanding the field of tasks.
- Adaptation of labor quality standards and new goals (complete and almost mandatory abolition of pay as cost, and assessment of multiple skills and initiative).

6. Conclusion

The desire to adopt the system of production on time in institutions is not an easy de The desire to adopt the system of production on time in institutions is not an easy decision taken overnight, because this system and in the framework of the elimination of all kinds of waste requires the need to continue to search for problems, no matter how improved the system, like the traveler who tries to achieve The horizon is a journey without end, where the horizon of the production process aims zero system. Therefore, the system must be studied and analyzed, and it is necessary to know both the organizational analysis and the industrial economy. This is to identify the reasons and circumstances that led to the emergence of the system (economic, historical, political and social...) and allowed to puberty The idea of trying to adopt the system is rejected. The fact that the wheel is continuing to work does not mean that it can not be improved. The Roman tracks linking Paris to Marseilles Is still valid and valid, but it costs at least 15 days to travel. If no one takes the lead in order to accept the process of change, we may not have stayed in the Stone Age.

There may be some drawbacks to this system, especially in our Algerian institutions, and this is natural because there are obstacles that we can do as follows:

- 1 - There is a huge difference between the Japanese

economy and the Algerian economy, our institutions still suffer from the problem of economic dependence on the import of raw materials and must be the formation of stocks in order to reduce the costs of transport and purchase and benefit from the reductions.

2 - The problem of importation of the technology of the machine in the breakdown requires spare parts are sometimes and should be imported because of the difficulty of understanding and dealing with technology manufacturing and may require this importation of a long time reflects the losses suffered by the institution from the loss of investment opportunities and money and the work of unemployed but paid Pay.

3 - Absence of a sense of belonging to the worker and his conviction that he is only required to perform his work and is not interested in anything else.

However, the application of this system or at least the selection of what can be applied, and in line with the realities of the national economy, of the principles after its revision leads to the institution towards efficiency, for example allowed to diversify in production significantly, raising the quality of products, Minimizing the costs of quality and material management, minimizing the space used, minimizing the productive cycle, increasing the quality of relations with suppliers, increasing flexibility, ease and speed of adaptation, increasing customer satisfaction by delivering quality products at the right time and place. Competitive, low or no disruption or delay The supply, the minimization procedures and paperwork and documents, and thus won the time. However, the concepts must be carefully grasped and exploited or tried to exploit as much as possible to adapt them to the extent possible and the requirements of the Algerian industry, and should not be underestimated anything and reflect on the complexities that drain from this docking before embarking on this experiment, which is at the same time profitable And required.

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