## CHAPTER 6

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Basic System On Automobile Production

Success in operation industry business in the present time, is dependent on the producer who is capable of producing good quality of goods and is capable of selling at justifiable price. In being capable in doing likewise, the producer in necessary to have technology in efficient production.

Automobile production is the production system which brings principle production factor for use, which are equipment, raw materials and manpower for use efficiently by trying to get rid of a waste in production which calls it "muda", irregularity "mura" and things beyond capability "muri". In addition, the 'just in time' working system as well as quality control in steps of production has been included in the production system, which enables production in pattern become perfect.

Automobile production type has 4 principal targets

1. To reduce cost production as much as possible by trying to get rid of all thing that would cause a waste.
2. To be capable of producing good quality of goods.
3. To enable working system to have high efficiency, capable of adjusting itself rapidly to any change.
4. Create good working atmosphere, create understanding between staff and company and let the staff see the importance of himself.
6.1 Company Profit and Cost Reduction.

Philosophy in operating business is based on the principle that better cars have to be produced at cheaper prices so that more people can make use of them. This is in order to respond to society.

In being able to respond to society, that business has to perform work continuously on firm base and structure and is able to earn profit at suitable level from such performance in order to improve and develop the work accordingly.

Every company realizes that profit is the most important thing in operating business. How should we do to gain profit wherein in earning profit, we have to look at the cost price and ask what is profit. Profit means to deduct cost price with sale price, we will obtain profit. There are 3 methods for making profit:

- Put up the sale price.
- Sell more
- Deduct the cost price.

6.1.1 Put up the sale price.

This method is difficult to make profit. The important reason being that the market is not supportive because there are many companies in car industry wherein each company tries to create special characteristic of their cars to be different from other companies and if the company puts up price, it is difficult to compete with other companies. The sale price is also specified by the market, that we cannot adjust the price as we like. Therefore, to put up the sale price is not a correct method.

6.1.2 Sell more.

This is already the company's target. But if we look at market situation wherein if we produce more customer's demand
will lessen, therefore, increasing profit by selling more is not the correct method.

6.1.3 Deduct the cost price.

Cost price includes raw material, spare parts, procurement/purchase, maintenance of product, equipment and utensils, labour force and other expenses which may include expenses in selling, research and development of expenses on immovable property, expenses on administration, etc. Therefore, in assembling one car many expenses are involved. But the thing to be considered in reducing the cost production is there should not be any impact on quality of ready-made piece of work. There are many patterns in reducing the cost production, such as, capable of using the raw material for beneficial use, increasing working efficiency, apply new technology, reduce the steps of work, set the clock in order to spend less time in production and reduce stocking raw materials.

The most important thing in reducing the cost price is to cooperate, give advice in remedying the problem, trust and be truthful between staff and chief of such unit. In general, car market throughout the world, it will be seen that each company will produce cars with different characteristics and the profit would naturally be different. This is because production system in each company is not the same, which if compared the cost price of raw materials, it will have slight difference. For labour force in each company we will find that actually the expenses are the same. Things which are relevant to production system is the important point for making profit, or we may say easily that, the real cost price is dependent on production method, for example, in stocking, whether it be stocking of raw materials or spare parts, it will increase cost price to a higher one, because the
more we stock things, the more we will have to pay in stocking, or arrangement about work is not as efficient as it should be, for example, let 4 staffs work on a piece of work, but if new arrangement is made, staff may be reduced from 4 to 2 persons, by obtaining production similarly to that of 4 persons.

6.2 Principal In Reducing Cost Price.

General criteria which uses in reducing the cost price is reducing a waste (muda), reduce irregularity (mura) and get rid of what is beyond our capability (muri).

Reducing a waste (Muda)

In performing general work, there will be 2 characteristic, i.e. the actual work and a waste. Philosophy which adheres to it truly is find a way to get rid of a total waste.

A total waste which occurs in a job and must get rid of are in 7 categories as follows:

1). Muda of Correction.

If there is a waste from production, it will waste time and labour force in repairing which will increase in cost price. But in certain cases, there is an example, i.e. repair machinery which, if the first repair has been made, there ought to be a correction so that it does not happen again.

2). Over-Production.

There are 2 categories of production:

1. Producing more than what is required
2. Producing goods at a higher speed than required.

What should be done to remedy category 2 to become 'just in time'. Produce only what is required and deliver the
goods in time. We ought to consider about their suit of over-production.

2.1 It is necessary to prepare production equipment and time.

2.2 Raw materials and spare parts have been brought for use.

2.3 Loss of energy and increase cost of fuel and cost of electricity.

2.4 More number of pallets has to be used.

2.5 More forklift for moving goods is needed.

2.6 Construct go-down for stocking raw materials in order to cover more production.

2.7 Steps in controlling the warehouse is respective.

2.8 Opportunity in getting rid of waste.

Wherein if we produce more than what is required, there will be more expense involved, that is pallet for containing goods, expenses in moving goods during production steps and getting rid of rust, increasing cost of wear and tear of equipment wherein this category of waste is the source of many categories of waste.

3). Waste from steps of work (Muda in Processing)

If the steps of work is far more than necessary and has no relation with work or it is to improve the quality of production, i.e. certain work does not require thorough work, it can be done roughly. But somethings the staff tries to do that piece of work very thoroughly according to his habit, therefore, it is a waste during step of work.
4). Waste in conveying things (Muda in conveyance). This does not increase any piece of work. It is to move around only. We should avoid moving object as much as possible. In distributing things, there ought to be time for distribution. In arranging things, it must be near the place of use.

5). Waste of inventory (Muda of inventory). When there are too many raw materials which exceeds the need for production process, or when we need raw materials immediately, there will be problem in finding raw materials and it will be a waste unnecessarily.

6). A waste in motion. (Muda of motion) In moving around, either it be a person or machinery, it does not create added value, therefore, we treat it as a waste, i.e. waste of time in finding a tool which has been kept in a disorderly manner, etc.

7). A waste due to idle hand.

For example waiting to see the machinery move automatically until completing one round wherein sometimes we cannot avoid in waiting. Therefore, we ought to find ways to remedy in increasing efficiency when there is nothing to do.

In producing pattern, apart from getting rid of so many things as mentional above, measure for reducing cost price and maintaining quality of the company, it has to get rid of irregularity and things which is beyond our ability.

Irregularity (Mura)

It means irregularity from production plan or number of production which is abnormal and there is a change in steps wherein the bad result obtained from irregularity is a waste, because we do not know the exact volume of production, therefore, it is necessary to have neccessary equipment, raw materials, sufficient number of staff
towards level of production, i.e. if there is every day change in pumping work, the collection of spare parts is not definite and raw materials used for pumping is not regular. And in order to avoid following problem, it is neccessary to increase stock.

Things which are beyond capability (Muri)

When a person or machinery is used beyond capability, the thing which follows is problem on quality and saftiness or in the case of a machinery the machine will be out of order, produce lower quality of goods wherein these things instead of reducing cost price, it will be a direct increase of cost price.

It will be seen that a total waste, irregularity and things which we have to get rid of, because it is the important part of reducing cost price. Reducing cost price is very neccessary for increasing profit which will make our business prosper and has part in giving service to society. At the same time, raise the standard of living to a higher one. We will meet with success through cooperation of staff and administrator until the business is progressive in the future.

6.3 Creating quality in each step of production.

Necesssity in creating quality in production process.

In producing each car, consideration has to be made as to what the customer require as a main point.

Majority of people before making decision to buy a new car one has to consider beforehand that such cas has good quality, can be used suitably, has high saftiness, suitable price, if sold that person will get a good price, consumer little fuel, has beautiful pattern and many things more, but most of the customers will select a good quality car as a first point.
Good quality means, good quality in every step of the car beginning from the design, strong and enduring or has low maintenance cost, but in assembling a car more than 10,000 spare parts has to be used and each spare part has different duty. Before assembling each step, the staff has to be certain that every spare part is perfect and can perform its duty correctly and can be trusted until the end of age of the car. The thing which will cause confidence is necessary to create quality in each production process.

6.3.1 Basic principle in creating quality in production process.

Factory staff has performed work with good conscience. There is responsibility in every body's heart. In performing the part of work that he is responsible, he has to realize always that he does not send problematic spare part or lower than standard to the next working unit by realizing that the next working unit is our customer.

6.3.2 Control method in order to create quality in production process.

1). Control the system and working mechanism of a person. In assembling a car, various spare parts will be sent to the next working unit by using conveyor system, a mishap may happen if such spare part is below standard or a staff forgets to fix in certain spare part. If such problem happens, the staff who happens to find out must pull the signal which is hanging on top of our head, signal light will show at the control label. The objective of the signal light is to notify the chief that there is now a problem at his working unit.

When signal light at the control switch board sends signal, the chief will have to run to the problematic spot
immediately and quickly remedy the problem, or pull the spoiled spare part out and put it separately. Thought this method there will be no spare part lower than standard or forget to assemble. This method is considered very important in creating quality of production and every chief realizes that these things are important and must give highest responsibility.

2). Control the system and working mechanism of equipment and machinery with equipment for protecting forgetfulness of fool-proof devices which has been designed to install with the machinery and various equipments in the factory in order to prevent abnormal or defective spare part to pass through the section and it is an equipment of help reduce responsibility of staff in having to wait and inspect every piece of work thoroughly. Moreover, it deputizes in assisting the foreman not to be careless, because a highly capable foreman can make a mistake.

The interested thing which can be noticed is the equipment for preventing carelessness wherein most of it is advice from each staff who is working in such unit. This is because those who perform their regular work knows the work as well as problem. Therefore, they ought to be the person who is able to give suggestion guideline in preparing equipment for preventing carelessness.

3). Controlling system of automatic machinery by using Jidoka' examiner without using any manpower. If there is abnormal thing happens and we know too that about it, it means produced and may have been passed through other unit already. JIDOKA' examiner, therefore, is equipment to seek peculiar spare parts when some abnormal thing has already happened, the ‘JIDOKA’ examine will control the machinery to stop working automatically. JIDOKA' examiner is the
equipment which helps the production as follows:

1). Can obtain 100% quality goods.

2). It prevents the equipment or machinery from becoming dilapidated or spoiled during production.

3). Increase efficiency in working because one staff is able to control many machineries at the same time.

6.3.3 Duty of Manager and chief of unit in creating quality of production process.

Although there is a control method by using 'ANDON,' 'BAKA-YOKE' or 'JIDOKA' in order to prevent wasting spare parts, or to prevent it from being sent to the next section, but responsibility of manager and chief do not stop at this point. There are still some things to control and to seek method to create quality in production process.

1) See that staff perform work according to working standard. The manager and the chief must be confident that every staff understands the various rules thoroughly by giving training, follow-up, inquire and revise throughout the time in order to perform truly.

2) Method for remedying the situation to return to normal as soon as seeing the lighting signal which means there is a problem. The chief must immediately go to the problematic spot to help in order to resume to normal situation by losing as little time as possible.

3) Try to find the real source of noise or defective part, examine immediately. Condition of problems will not be
know precisely if we leave some time to pass. The real cause of problem will be found in that working unit or the spot of work which problem happens.

Method for trying discover the real cause, we should use "5 Why" by raising a question why, why, why,why,why (5 item) by beginning from the real problem that happens which will allow us to know about the source, and do it likeness until completing 5 items which the last source will be the real source.

4) Find preventive measures not to let that problem repeat again. This is direct responsibility of the chief to act as leader in remedying the problem, in order to be confident that such problems will not happen again.

Through the effort of the manager and chief to remedy problem, the result obtained was every produced is a high quality car, is famous and is praised in general.

Good quality car has been created in each step and in every production process by being sure that a spoiled of defective spare part will not be sent to the next working unit.