TQM Volume-1

Total Quality Management
in Factory Management

Prologue & What is Quality Control

2022a Edition

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Factory Management Institute

COOPERATING TO REACH EXCELLENCE

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Content

Icons:

Notes: Going and Comeback to the main theme.

The third level of the Issue provides more clearness to the structure of the text to the more relevant.

Lower levels of the Issue, commonly 6th or 7th, and, pointing out necessary explanations about pictures or graphs.

UPDATING TABLE:

Date, Version-Previous & V-Next	Chapter (I..XX...)	Chapter Point.- sub-point : (Updating)

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I. Prologue

Let us start the discussion of TQM (Total Quality Management).

Total Quality Management? …As you know, this is one of Japanese origin by Kaoru Ishikawa[1]. However, the word Total Quality "Management" is not of Japanese origin, but the USA.

Originally, K. Ishikawa advocated company-wide quality improvement as the name of CWQC (Company-Wide Quality "Control") or TQC (Total Quality "Control").

The history of TQM is old. In this way, the first trace is to go back to the visit of Mr. Rice's survey body in 1946. And, in this body, there was Dr. Deming. At this time Japan had already assimilated the technique of statistical Quality Control and Kaoru Ishikawa was called the gurú.

First, he advocated CWQC (Company-Wide Quality Control) and changed it to TQC (Total Quality Control).

Dr. K. Ishikawa showed some books and said that for customer quality assurance and quality improvement the Quality Control field which is only the place of the process is not enough, and needs Quality Management by employees and organizations. In his book, he showed a checklist for company diagnosis and showed guidelines. Now we use them in my class. The TQC Diagnostic Checklist won the Deming Award. The checklist is, therefore, very old, but it is still our guidelines and it lives on in the ISO.

Actually, the name TQM was named in the US in the 1980s. And also, Japan continued to use it.

I was his fan and got his education several times. Yes, I learned very much from him. Therefore, my description is by mixing his teaching and my experiences.

By the way, and about the concepts of Control and Management, K. Ishikawa advocated the Company-Wide Quality "Control" or Total Quality "Control". On the other hand, a US person named it Total Quality "Management". Please understand that both of them are different in strict meaning. As usual, let's understand this in Warp and Weft (from 2 dimensions[2]).

A Control is based on a standard or rule. For instance, we say that driving car by controlling speed (in speed limit). This product is required to keep the oil temperature the standard. When using the word Control, it is necessary to have a standard or rule. Yes, Control is started from a standard or a rule. On the other hand, Management; Management is required to create the standard or rule.

Let's take a look at the difference from another dimension. K. Ishikawa started TQC for “industrial process”. Moreover, he claimed the importance of **all people's participation** to improve the quality

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[1] **Dr. Kaoru Ishikawa** [English] https://en.wikipedia.org/wiki/Kaoru_Ishikawa
[Spanish]: https://es.wikipedia.org/wiki/Kaoru_Ishikawa

[2] Factory Management Fabric or Cloth:
https://archive.org/details/FactoryManagement1TheCorporateConstitutionAndManagementFramework/mode/2up Pg.43.
Tejido de Gestión de Fábrica: https://archive.org/details/GestinDeFFbrica1/page/n41/mode/2up Pg.43.
The Factory Management Framework and Fabric – Research Gate Publication 4th_ICQEM_paper_54:https://www.researchgate.net/publication/345491403_The_factory_management_framework_and_fabric_theory_for_development_the_excellence_in_corporations

of the industrial process. He required the participation of not only the production process people but also other organizations or departments such as HR (Human Resources), Accounting, (of course) Engineering (including maintenance), etc. for getting good customer satisfaction. Consequently, its purpose is the improvement of production quality.

For this, TQC requires the participation of, for instance, rational production planning by the production-planning department: Planning of Operator education & education by HR, Getting information about new products, negotiation of the delivery deadline by the sales department. Visualization of production effect in numerical data by accounting. In addition, this thought was improving to individual office departments. Consequently, the back-office organization also participated in their quality improvement by the name of **Total Quality Control**.

Total Quality Management.

The objective of TQM is not to improve quality partially but to improve quality company-wide or in all of the departments.

TQC is a company-wide activity involving all indirect departments to achieve quality improvement in the manufacturing process (order receipt, design, production planning, subcontract planning, material procurement, production, shipping, and CSI[3]). In this way, TQC is an activity to improve quality in the manufacturing process.

TQM is an advanced form of TQC, and it covers all matters related to quality-oriented operations, such as company-wide or department-wide quality improvement. TQM is a developmental form of TQC, and it covers all matters related to quality-critical business operations.

In other words, the purpose of TQM is to improve the quality of the entire company or all divisions, and at the same time, to improve all operations in the organization in a comprehensive manner.

In short, the "starting point" is different. However, there is a slight concern. That is inter-organizational collaboration. For example, one of the main techniques of TQC is the Initial Product Quality Control - IPQC activity. This is an activity to determine how we can quickly stabilize initial products, which are inevitably unstable in terms of production and quality. This project-based activity involves not only manufacturing-related departments, but also sales, human resources, accounting, general affairs, and all other indirect departments. Although, TQM lacks this kind of company-wide cooperation.

However, the term "TQM" is now being used as if the two are the same. Therefore, from now on, I would like to unify all the terms into TQM, but I would like to mix TQM and TQC in my discussion.

By the way, when comparing the Japanese and US Wikipedia, there are just a few differences, and it is indeed interesting.

> ***Japanese Wikipedia about TQM:***
>
> *The concept of TQM was first proposed in the United States in the 1980s. At the time, there was a lot of research being conducted on Japanese companies, especially in the manufacturing industry. In the course of that research, attention was paid to TQC and QC,*

[3] CSI: Customer Satisfaction Index

which had evolved uniquely in Japan. Both were brought to Japan from the U.S. TQC evolved uniquely in Japan into bottom-up activities represented by QC circles, which were called Japanese-style TQC.

TQM, a method of quality management based on a top-down decision-making process, was conceived to fit the American corporate culture by incorporating the "continuous kaizen (improvement)" characteristic of QC circles, a feature of Japanese-style TQC. It was also conceived to be applied not only in the manufacturing industry, but also in all types of businesses. TQM incorporates customer satisfaction into the concept of quality, and in fact, there are many examples of its application in the service industry.

The characteristic feature of TQM is that the management strategy established by the top management of a company is broken down into quality targets and customer satisfaction targets, which are then deployed throughout the company.

From the late 1980s to the early 1990s, TQM was introduced in many American companies and is said to have been one of the driving forces behind the American revival. In Japan, TQC gradually replaced TQM as the concept of management became more widespread.

US Wikipedia about TQM:

Total quality management (TQM) consists of organization-wide efforts to "install and make permanent climate where employees continuously improve their ability to provide on-demand products and services that customers will find of particular value."[1] "Total" emphasizes that departments in addition to production (for example sales and marketing, accounting and finance, engineering and design) are obligated to improve their operations; "management" emphasizes that executives are obligated to actively manage quality through funding, training, staffing, and goal setting. While there is no widely agreed-upon approach, TQM efforts typically draw heavily on the previously developed tools and techniques of quality control. TQM enjoyed widespread attention during the late 1980s and early 1990s before being overshadowed by ISO 9000, Lean manufacturing, and Six Sigma.

In the late 1970s and early 1980s, the developed countries of North America and Western Europe suffered economically in the face of stiff competition from Japan's ability to produce high-quality goods at a competitive cost. For the first time since the start of the Industrial Revolution, the United Kingdom became a net importer of finished goods. The United States undertook its own soul-searching, expressed most pointedly in the television broadcast of If Japan Can... Why Can't We?[4] Firms began re-examining the techniques of quality control invented over the past 50 years and how those techniques had been so successfully employed by the Japanese. It was in the midst of this economic turmoil that TQM took root.

The exact origin of the term "total quality management" is uncertain. It is almost certainly inspired by Armand V. Feigenbaum's multi-edition book Total Quality Control, and Kaoru Ishikawa's What Is Total Quality Control? The Japanese Way[5]. It may have been first coined in

[4] If Japan Can... Why Can't We: https://www.youtube.com/watch?v=vcG_Pmt_Ny4
[5] What is Total Quality Control, The Japanese Way [ENG]:
https://archive.org/details/whatistotalquali00ishi/page/n11/mode/2up
Qué es el control de calidad. La modalidad Japonesa [SP]:
https://archive.org/details/queselcontroltot00kau_2uk/mode/2up?view=theater

the United Kingdom by the Department of Trade and Industry during its 1983 "National Quality Campaign". Or, it may have been first coined in the United States by the Naval Air Systems Command to describe its quality-improvement efforts in 1985.

It is interesting to compare Japanese thinking and US & Europa. Therefore, I quite often refer to Wikipedia, which is one of the influencers in the world. I do not give my complete belief to it. Nevertheless, I think it is true that some specialists think like so whether it is the fact or not.

Automatizing TQM

Now well, my wish to write is about Human beings, and Automatizing, regarding TQM.

I have started writing this series in April 2022. I dedicated long years to leading and teaching quality in the manufacturing process from April 1968, if I think about it. And, so far the basic thinking and the components hadn't been changed, even though there were various technical transitions and changes such as QC (Quality Control; Statistical Quality Control), QC for Outsourcing, QC for Sales, QC from Design to Distribution, QC for New Products Introduction and QC to TQM in the concept of CWQC (Company-Wide Quality Control), etc... Moreover, my previous company (SUMITOMO Wiring) had the concept of GWQC (Group-wide QC). And now, there are trendy items such 6-Sigma or Lean Six-Sigma, also. However, these trendy items also are not different from the basic thinking and components.

Even now, I may be able to gain the opportunity to confirm the near future changing of basic thinking and component, which is the human-oriented process, because of the appearance of AI and RPA (Robotic Process Automation) in the manufacturing process.

And, as you already know the data gathering system is changing with the use of IoT. It is the meaning of a change of quality control system which is for instance automatic data gathering and automatic data analysis & diagnosis including 5Whys and FMEA.

However, probably the human-oriented process may be remained up to the age of Singularity. And above all, I believe we need to understand the basic thought and components of quality even using such a computing system. And, here, I would like to write the basic thinking and components by my experience and learned and also new thinking and components by gaining new learning.

II. What is QC?

Quality Control – QC, and Industrial Engineering – IE.

When I joined my previous company (Sumitomo Wiring Systems and former name of Tokai Electric Wire), my first job was Industrial Engineering (IE). I got the education and training of IE. The teaching I got was narrowly defined as Industrial Engineering by Sumitomo Electric, which was the main shareholder.

And, the teacher's word was very impressive. He had said, "IE and QC are brothers". Moreover, these must be never used separately, because if missing the consideration one side, it causes a problem.

In IE (Narrowly defined IE), there are techniques such as Process Analysis, Operation (Working) Analysis and Work sampling, Work Factor Analysis, Motion Analysis, Time Study, Material Handling and Transportation Analysis, Time Standard (PTS, MTM Methods). All of them are tools of Scientific Management[6].

On the other hand, QC has the ways (which are for instance DMAIC and QC Story) and the tools. As you know DMAIC (Define the problem, Measurement, Analysis, Improvement, and Control) is the story of 6 Sigma.

And the history of QC-Story (Deciding theme and target, Reason of deciding theme, Status Understanding and Analysis and Pursuing causes; Countermeasure and Implementation, Confirming effects, Standardization and Prevention of Reoccurrence, Review and Confirming Problem remained, Future plan) is quite old, but still new.

QC has many tools such as the renowned QC 7 tools (which are Pareto Diagram, Fish Bone Diagram & 5Why, Control Chart, Stratification Diagram, Checksheet, Histogram, Scatter Diagram), and additionally FMEA (Failure Mode Effect Analysis), FTA (Fault Tree Analysis) or, Design of experiments, Taguchi method, and KJ Method (the last one is personally added), (QCPD) QC Process Diagram. These tools are also used in 6-Sigma.

Tools of 6-Sigma

The following major tools and methods are used in each phase of 6-Sigma: 5 Whys, Statistical Methods, such as Analysis of variance, General linear model, ANOVA Gauge R&R, Regression analysis, Correlation analysis, Scatter diagram, Chi-squared test, Axiomatic design, Business Process Mapping, Check sheet, Checklist, Fishbone diagram, Scatter diagram. Other tools such as Control chart, Control plan, Cost-benefit analysis, CTQ (Critical-to quality) tree, Design of experiment, Stratification, Histogram, Pareto Diagram, Pick chart, QFD (Quality Function Deployment), Quantitative marketing research, (EFM) Enterprise Feedback Management, Root cause analysis, SIPOC analysis (Suppliers, Inputs, Processes, Outputs, Customers), COPIS analysis, Taguchi methods, Value stream mapping, etc.

[6] Scientific Management, or Taylorism [ENG] : https://en.wikipedia.org/wiki/Scientific_management
Gestión Científica o Taylorismo [ESP] : https://es.wikipedia.org/wiki/Taylorismo

Whew! …Too many! …I am writing this series for a small and medium-class manufacturing company that has quality troubles and has no heavy QA department.

As the material above, there are so many tools. However, I can say based on my experience that 99% of problems can be solved with underlined tools. I never say that it is not necessary to use all tools, but is important to use underlined tools sufficiently and correctly. It rather does not wish much for quality improvement and uses limited tools sufficiently.

By the way, IE and QC have very similar characteristics; most of the tools are the **methods of analysis.**

What is the mission to customers? …It is QCD (**Quality**, **Cost**, and **Delivery**) and to supply good quality products at reasonable price and timing required. And, long years later from the teaching by SUMITOMO, I was in the position of teaching Factory Management, and I taught my students as not to be acceptable to use IE or QC exclusively alone, and that those must be used together.

I believe I can gain your understanding of it. Even though, a very good quality, if the very high price or lost timing, there is no meaning.

here, I say that IE (or cost) without quality consideration cannot have meaning. And, Quality without IE (or cost) consideration cannot have meaning.

QC implementation concerns

Again, I talk about IE and QC exploited together. Both of them are the main tools of analysis. And, after finishing the analysis, it is necessary to create some countermeasure.

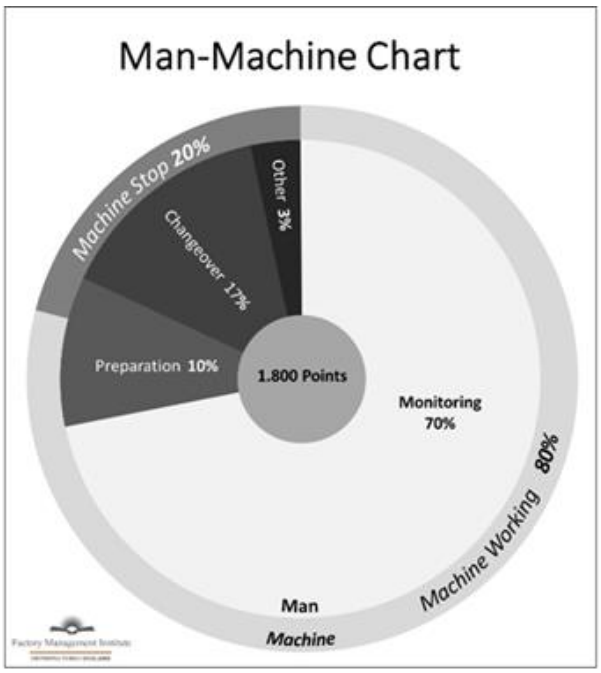
At this point, I have two concerns. One of them is No-implementation and another one is the lack of creativity and implementation capacity.

No-Implementation

For instance, doing Work Sampling and getting the answer of analysis. Showing the result of analysis or diagnosis, is that all? …For instance, Control Chart, getting information and status, is that all? …No, it is never. It is required countermeasures for quality or performance. However, I saw many factories and always saw unfortunate examples, which were to be not accompanied by ***Kaizen***.

Example of IE method (Man-Machine Diagram by Work-Study from TPM-15)

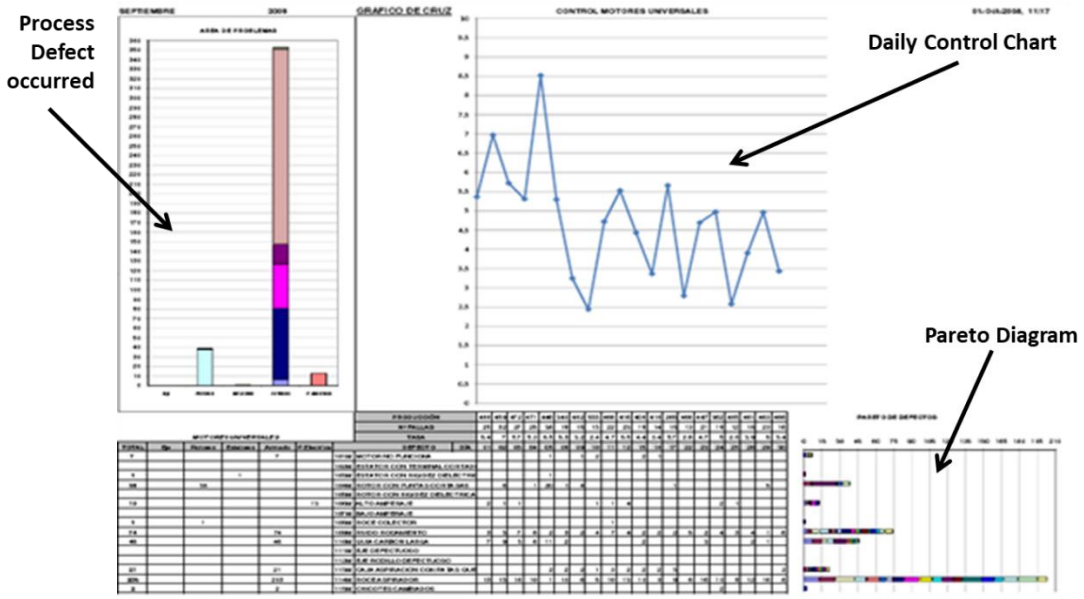
This was made by the project team of the Teaching Company and was used for countermeasures to improve labor and machine performance.



This team was a good example. However, sometimes I saw the bad custom of “act of leaving something half-finished” in some companies. Problem analysis, making countermeasures, but no implementation. So, the reasons for no implementation are stumbling in Making countermeasures, Cost control, etc.

Lack of creativity and implementation capacity.

Next shows an Example of a Control Chart (Defect analysis Cross Chart)



This diagram is my original and it is possible to analyze it on daily bases. With many troubles, the line workers make and maintain this chart and analyze it on daily bases. But, this effort couldn't reach the countermeasures. But, Why? …The cause is “*a creativity capacity and implementation capacity*”.

I believe you know the word in the QC textbook below. It says next, “*If you can reach the true cause, you could reach the solution 80% already. 80% resolved by reaching true cause*”. Is this word true? …My answer is that depending upon your factory.

And, I have said to a student company that when looking at your factory's condition, it is wrong. In addition, continuously I said that your quality data has shown insufficient results, even though you could achieve the data gathering and analysis.

True cause? …80%? …For your factory, the theory of "80% resolved by reaching true cause" is not applicable. In this way, I would introduce four stories.

1st Story. The case of a company.

He had a certain QA (Quality Assurance) department, and a data-gathering system. Nevertheless, the quality improvement trend had shown insufficient progress. It gathers data, analyze, and find causes of Muda and defect. Unfortunately, the next process is missing or poor.

Finding problems by Defect analysis Cross Chart is done. However, the solution (countermeasure and implementation) was nothing. In addition, even in creating a solution, the countermeasures are poor and the top three trends were as next.

1. The first trend of countermeasure: Education & training;
2. Second: Standardization of Work procedure;
3. Third: Increase inspection

Of course, these are never wrong. Nevertheless, most of the cases in which I saw just these solutions were not effective. It is indeed too facile ideas and poor creativity.

2nd Story: Also, poor creativity.

Long years ago, there was a funny story in my previous factory. A ***Kaizen*** suggestion scheme was examined by the ***Kaizen Suggestion*** *(companywide)* ***Committee***.

—Everyone looks at this suggestion of quality improvement —I expressed—. This was examined as 6th rank by the factory manager.

My evaluation system of Kaizen suggestions has 8 ranks.

—But everyone, do you remember this quality improvement idea and the production process? …Almost half a year before, there was a similar quality improvement idea in the same production process and it was in the 7th rank.

— Ha, ha, ha. Funny —I laughed—. Because this idea of 6th rank judged of this time is to undo from previous 7th rank idea to original.

Everybody laughed like me. Which seemed to me to be some kind of ridiculous. Indeed, "80% resolved by reaching true cause". This is also one episode of the poor capacity of "Reaching true cause", creativity & implementation.

3rd Story: Self-satisfied with the engineering department.

There was a problem in the (receiving &) shipping area. The problem was the handling of heavy product containers. Then, one idea was implemented. And, the idea was to lay the roller conveyors from the end of assembly lines to the shipping yard.

For this idea implementation, an expensive amount was invested. But soon these conveyors were taken off, because of the complaining by Gemba workers.

The complaints were about Increasing the handling. This area was Receiving & sipping area. Then, when receiving the outsourcing products and materials & parts, the laid conveyors disturbed the receiving job.

Therefore, when the timing of receiving work, it was necessary to put away the conveyors. Moreover, a chaotic situation happened when the timings of receiving and shipping were overwrapped. Ridiculous. It was indeed ridiculous.

Why such problems were not investigated before the idea implementation?

Why did the engineer focus just on the sipping handling, and lost the point of view of total material handling and quality assurance?

Why did this engineer lose to have the point of view of the investigation before process and after the process?

Why does this superior manager accept that idea? …It is quite often I saw the trouble that the idea implemented before process giving problems to after process. It is poor "power of idea and creativity".

4th Story. I'm asked about the teaching of TQM by clients.

Next is a conversation with a client.

—How can we improve quality? —my client asked me—. Our concern is that we could not stabilize the quality improvement activity constantly. When we had planned special activity whether a special project or a companywide campaign with a quality improvement action plan, it was possible to improve the quality level at the temporal timing. However, when looking at the long term, the quality level has not so much improved. Moreover, we understood that such special activities were just temporal festivals for us. Then, we decided to introduce TQM at this time.

So, please teach TQM. I have heard the Japanese success cases many by our friends.

—First of all —I said then—, please forget the success story of Japanese cases. I confirm that are Japanese cases Japanese factories in Japan, aren't they? …These success stories cannot be a reference, because Japanese nature and your countries are different in underlying.

The background of this story is quite old and some time from 1990. Recently and in generation Z, nature is changing with the spread of IT. —Besides —I continued—, your company is strange, isn't it? …So many events of quality improvement activity you have implemented. However, you could not have improved quality.

—When I teach something, first I teach ***Kata***, which is along (for instance) TQM. In addition, I require students to maintain stubbornly it. Anyway, the factory is required to maintain the ***Kata*** with no their wish or thinking. (It is the step of "***Shu***"[7].)

Your factory —I continued—. In the past 6 years, you implemented such quality improvement events. However, and unfortunately, you could not gain so many results. It is indeed strange. Why it is strange things…

—Normally, yes normally, when making such quality events or daily quality activities, it is quite natural to discover something quality maintenance or improvement ***Kata*** and having some improvement. However, during one decade, there was no remarkable quality improvement, even though no changes in business format.

[7] **Shu**, **Ha**, and **Ri** (守、破、離):

- **Shu** (守): Shu means to keep. Keeping Kata, which is taught by the teacher. Anyway, it is required to master the Kata which is like a Judo form. This step is still training level.
- **Ha** (破): Ha means to break. After keeping Kata taught, the next step is to analyze and study by himself and create better Kata.
- **Ri** (離): Ri means to leave. To understand the teacher's Kata and his own. Kata deeply. And, free from the teacher's Kata and his own Kata and break new ground including the philosophy.

—Mr. Factory manager —I request his attention—. You told me that you and main Gemba people learned TQM by inviting an instructor. Therefore, you have learned TQM already.

—Please listen —I called his attention again—. You wish my TQM teaching. But, my teaching is also the same as the contents of the instructor. I believe you have the necessary knowledge of TQM already, have you? …What do you want me to do above this?

What the contents of TQM is? …It shows only the Analysis methods and Implementation Step (DMAIC or QC Story). Once time, let us organize the things:

Your needs: Continuous quality improvement.

1. Current status: You have had several times quality event for 6 years. Also, you know TQM already. But still, you cannot have not so many results.
2. Organizing current condition.
    a. Gemba people Turnover: Not so high.
    b. Motivation: ??
    c. Organization: QA department, Engineering, Production, Procurement, PM (Preventive Maintenance), etc. There are as normal.
    d. Investment to quality activity: normal. Even several times quality events and events of education. Inspection tools and quality devices.
3. Implementation capacity.
    a. Planning capacity (event): normal. Several times quality events.
    b. Planning capacity (Action plan): Poor. (When looking at the past planning, both idea quality and action plan Kata including numerical target and responsibility were very poor.)
    c. Effect of Action item: Poor.
    d. Ideas in the action plan: Very poor (no creativity).
4. Implementation capacity in Gemba.
    a. Usage of QC 7 tools: Vey poor (almost nothing).
    b. Daily control: Poor.
    c. Training & education to workers.
    d. Follow-up system in Gemba: Poor.
    e. Review system by management: Poor (no reviewing system itself).
    f. Visibility of implementation: Poor.
    g. Visibility of skills training: Nothing.
    h. Responsibility system: Very poor. Nobody takes the responsibility for no improvement.

I recommended to this company to evaluate more detail with my Factory Management Checklist. But, at that time, I diagnosed this company by the above interview simply.

The things, which I could know.

1) Quality management system had not been the ***Kata*** of a complete cycle.
2) Lack of Division of duties and/or observance.

In such a status, it is impossible to implement quality management, even abundant quality data gathered by a computer keeper manager.

Corollary about the thinking of “80% resolved by reaching true cause”

"80% resolved by Reaching true cause" which QC textbooks tell us is incorrect for your company if you have no sufficient level of Factory management and poor creativity & implementation capacity.

Moreover, please, understand that my TQM teaching is "TQM in Factory Management”. Because just TQM teaching has no meaning and cannot have the effect if you have no base status of Factory Management.

> ***Generation Z (From Wikipedia)***
>
> *Generation Z (English: the generation Z) or Generation Z is a generation born generally from the mid-1990s to the end of the 2000s [2]. They are the first generation to be born as digital natives. It is named "Z" because it is the generation following Generation Y (also known as Generation Y and Millennial Generation).*
>
> *They are the first generation of digital natives in the sense that the Internet was available at birth. This is a generation in which digital devices and the Internet have been commonplace since birth, and they perceive and use the Web as part of their everyday scenery. They are also the "smartphone generation (iGen)", who use smartphones more than PCs daily and have become a part of their lives. Furthermore, they are also called "Zoomers" because of their heavy use of the video calling service Zoom. Since they took Web 2.0 for granted when they were growing up and are skilled at disseminating information, a large number of influencers have emerged from this generation.*

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III. My TQM teaching in this series

I wish to write this series as TQM to be one of the tools for Factory Management.

You have read the success story of quality improvement by TQM. But these success stories have a basic condition. **A basic condition**? …It is a certain level of Factory Management.

Whether TQM or 6-Sigma, these are the tools of analysis. Of course, it is necessary to have a factory management base to use such analysis tools. However, the most important capacity is to use these analysis data and create improvement ideas & implementation. Analyzed, but poor ideas. I showed in the above example stories.

And, implementation capacity. I showed the example of poor implementation capacity in the Teaching Company series. And, I introduce one word below.

「竜頭蛇尾」This word is shown in a ***Zen*** book.

- 竜頭 (***Ryu-Tou***): Dragonhead.
- 蛇尾 (***Da-Bi***): Snake-Tail.

According to the dictionary, the meaning is as below.

- "The beginning is big and the end is small."
- "The momentum is good at the beginning and the end is sloppy."
- "Strong beginning and weak ending; anti-climax."

How about your company? …Is this Teaching Company[8] a special case? …No, it is not. Unfortunately, such case is very common in small & medium companies. Then, I write next through this TQM series: Logical thinking using QC tools, Implementation capacity & Kata by example, and the necessary Factory condition by Kata of factory management.

IV. So, What is QC?

QC is to Control Quality. Yes, it is. However, it is Ridiculous, because it is too obvious.

Too obvious? …All right then, I make a question for you. In the first place, what is Quality? …And, What is Control? …I don't want to spend many hours on the first part of the story. Then, I introduce some voices as below.

> ***Quality*** *in the narrow sense defined by ISO and JIS (Japanese Industrial Standards) means that there is no deviation from the specifications set by the provider or consumer. Quality in the broad sense of the term includes a very wide range of concepts and is difficult to define in general, but it can be thought of as the degree of conformity of a product or service with the characteristics demanded by the buyer, the customer (consumer) (a high degree of conformity is said to indicate high quality).*

[8] **Teaching Company:** Change process described previously in TPM series.

…By Wikipedia

Quality is defined as "*the degree to which a collection of characteristics (3.10.1) inherent in an object (3.6.1) satisfy requirements (3.6.4)".*

…By ISO 9000 (the year 2015)

It is…

The first number, 3.6.2, etc., is the classification number as defined in ISO-9000.

The following is an explanation of the above items:

> *3.6.1 Object; entity, item: Everything that can be recognized or considered. Examples are product, service, process, person, organization, system, and resource.*
>
> *3.10.1 Characteristic: characterizing property.*
>
> *3.6.4 Requirement: A need or expectation that is explicitly stated, usually implicitly understood, or required as an obligation.*

*The totality of characteristics relating to the ability of a "thing" to satisfy an expressed or implied need. *All qualities, whether tangible or intangible, are qualities.*

Scope of what quality means:		
QUALITY	***Product Quality***	*Design Quality (Quality of aim)*
		Manufacturing Quality (Quality of Workmanship)
	Service Quality	*After-sales, follow-up, delivery, price, communication, etc.*

I do not want to spend many hours on the first part of the story. Then, I introduce some voices as above.

I think you could understand what Quality is. However, I would like to add a little bit more: The adding thing is **Cost**.

Please remember that **Quality** is **Cost**.

My first experience and duty as a teacher were to teach IE to new employees who were assigned to engineering, quality, accountancy, etc. The purpose is to teach **Cost** from manufacturing. It did not teach **Cost** directly, but rational manufacturing process.

> For instance, Design engineering. Engineering trends to bias to sever dimensions tolerance, higher specification materials unnecessarily. However, a quality person tends to be biased in sever inspection & inspection tools, requiring a lot of data to Gemba unnecessarily. Moreover, an office staff tends to be biased and increase unnecessary work by the name of

Analysis. However, “Quality” is also “Cost”. Consequentially, each and every employee is required to keep a **Cost-mind**.

What is Control?

Control is control within something like a rule or standard? ...A job of teaching is very interesting and required study more deeply than students do. Fortunately, some students had very much individuality in my class.

—Sensei —a student asks me—, why your name is Kimura?

First of all, what is the root of a name?

—Tony —I answered politely—. Why your name is Anthony? …My name is Koichi (Kouichi). And, Why so different by individual country? …Tony —I recognize—, It is a good thing to have an interest and questions.

—I have heard that sometimes you were fun by others —I continued—. But, I believe you have a very flexible Right Brain, which is for instance useful to make a discussion of FMEA, FTA 5Why, Fish Bone Diagram, QFD (Quality Function Deployment, and KJ).

—Listen everyone —I asked the classroom—. Please train to have questions and doubts. Because one of my concerns about a company is too poor creativity. For instance, 5Why activity. I have not seen a good example of 5Why.

—For instance, a company got a quality concern (claim) from its customer. Consequentially, the customer is required to find the solution to the defect by 5Why analysis. Although, their solution based on the 5Why analysis was "Education & Training of operators"…

—Therefore, they implemented the 5-Why analysis with many efforts for finding a solution against the defect by human error. And, their answer was "Education & Training of the operators". Even though, It is indeed ridiculous…

—Everyone—I call their attention again—. Do you believe that the solution is effective for a defect by Human-error? …Of course, it is not —I asked without waiting for their answer, and I asked then—, what is a good solution?

Then one student answered —It is necessary to devise a Poka-Yoke.

—Very good —I answered politely—. Nevertheless, please understand that it is difficult to create a solution, if you lack creativity, even though you could implement a good analysis.

—Consequentially —I wrapped up—, No, it is wrong. You cannot even use any analysis tools if you lack creativity as the above case shows —and I continued changing trying to be more specific…

—There was a question about What Quality is. However, somebody laughed against the simple question. Please, think for yourself about what Quality is.

Then, they implemented the discussion by using the KJ-method[9]. And, one good answer was as next: "Quality is the function required by the customers".

Now I would like you to deep into the concept of Control we are explaining at the present point. Therefore, What Control is?

But firstly, What Management is? …Let us consider these in PDCA (As you know Plan, Do, Check, and Action) which is Deming Cycle. How different Control and Management is?

Management

Dr. James Dragger says, "The meaning of the word 'management' is 'a series of activities to control an organization', and when applied to a company, the meaning changes to 'business administration'.

The basic idea is that management requires a management function that plans, executes, analyses the results, and rationalizes new plans.

Management is also based on the definition of management proposed by Dr. James Dragger, the "father of management'. The definition is that "management is the function or mechanism that enables an organization to achieve results", and that the manager is the person who manages, is "responsible for the results of the organization".

Control

A dictionary says, "Domination (to do), policing, management, supervision, control, restraint (power), control, discipline, regulation, restraint (power)"

Moreover, the original meaning is "Record in the list". However, another dictionary explains the meaning by examples as below:

1) To adjust or control to just the right degree. Control.
   To control the room temperature.
2) In ball games, the ability to throw or kick a ball where one wants it to go. A pitcher with good control.
3) In wrestling, a form of groundwork techniques. In wrestling, one of the techniques used in the art of lying on all fours is to control an opponent from above.

[9] KJ-Method Youtube video: https://www.youtube.com/watch?v=PwuPv7JwzCA
KJ-Method explained by Sensei Kimura [English]: https://archive.org/details/to-my-friend-and-kj-method
KJ-Method enhanced into the Book The System of Excellence, Annex A[English]: https://www.amazon.com/dp/B09FC6C3NS
Método KJ explicado por el Sensei Kimura [Spanish]: https://archive.org/details/a-mi-amigo-mio-y-metodo-kj
Método KJ apliado en el libro El sistema de la excelencia, Anexo A [Spanish]: https://www.amazon.es/dp/B08XCPRNRK

So based on the above information, I explained these by PDCA as below.

First, PDCA is not a Control Cycle, but Management Cycle (by narrow meaning).

And, the relation of Control and Management is

- **P** (Plan)
- **D** (Do, Implementation)
- **C** (Check)
- **A** (Action)

…

Then, I standardized Control as next: Control is controlled within something of **rule** or **standard**.

PDCA Cycle (by Wikipedia[10])

The PDCA cycle (PDCA cycle, plan-do-check-act cycle) is a method of continuous improvement in Quality Control and other business management, in which operations are continuously improved by repeating the four steps of Plan→ Do→ Check (evaluation) → Act (improvement). Where A is sometimes called Action[11].

…

After World War II, in Japan, Edwards Deming, a disciple of Walter Schuchart, gave a lecture on Statistical Quality Control at the Japan Federation of Science and Technology (JUSE). It is said that an executive of JUSE who heard this lecture proposed the PDCA cycle.

The name PDCA cycle is a combination of the initial letters of the following four steps that make up the cycle.

***Plan:** Business plans are created based on past performance and future projections.*

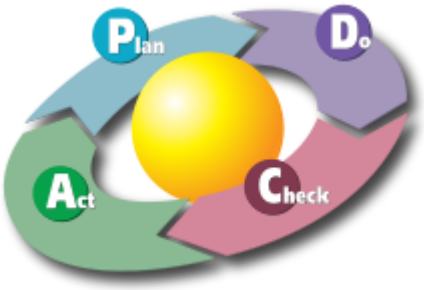
***Do (Execution):** Perform operations according to the plan.*

***Check (Evaluation):** Evaluate whether the implementation and results of operations are in line with the plan and goals.*

***Act (Improvement):** Examine areas where implementation is not in line with the plan and make improvements.*

*After completing one round of these **four** steps in sequence, the final Act is connected to the next PDCA cycle, and the level of each step is increased (spiral up) with each round, as if drawing a spiral, to continuously improve operations.*

[10] PDCA [Japanese] original transcription at June-2022:
https://ja.wikipedia.org/wiki/PDCA%E3%82%B5%E3%82%A4%E3%82%AF%E3%83%AB
PDCA [English]: https://en.wikipedia.org/wiki/PDCA
PDCA [Spanish]: https://es.wikipedia.org/wiki/Ciclo_de_Deming
[11] ACT: Some Authors speak about ADJUST.



Act: *Take action based on what you learned in the study step. If the change did not work, go through the cycle again with a different plan. If you were successful, incorporate what you learned from the test into wider changes. Use what you learned to plan new improvements, beginning the cycle again.*

Originally, this procedure was a tool of the QC circle movement in factories as statistical quality control (QC), but as many business people have tried to apply it to broader management activities in general, the shortcomings and problems of PDCA have been pointed out. To solve this problem, the OODA loop, a general theory of strategy, has been proposed. However, the OODA loop and the resourceful warfare theory that utilizes it have been described by Boyd himself as an example of the Japanese Toyota Production System, an example of the PDCA cycle, which anticipated the resourceful warfare theory in business. The company is known for its traditional emphasis on the PDCA cycle, but Tsutomu Harada points out that what the company refers to as the "PDCA cycle" is in effect similar to the OODA[12] *loop.*

Check: *Check is the stage of performance evaluation. Check is not a mere confirmation of whether the product and process have been executed as planned, but a measurement of the directional deviation from the longer-term policy and goals. Check is not a mere confirmation that the project has been executed as planned, but a phase to measure the misalignment of direction with respect to longer-term policies and goals, and to obtain intelligence for correcting the direction.*

Another book speaks about PDCA as next: *"The four letters of PDCA refer to the four processes in business operations, which in turn go through stages starting from P, reaching A, and then back to P again. In other words,* ***PDCA is a cycle of four processes that goes around and around like a spiral staircase****, thereby aiming to continuously improve the efficiency of business operations. For this reason, it is also called the 'PDCA cycle', and is used as a way to 'turn the PDCA cycle around at high speed' in order to promote speedy efficiency".*

Thinking PDCA

Long years ago, yes, very long years ago, I learned PDCA. And, at that time PDCA cycle it was very simple and says as follows: When executing quality improvement, please think deeply and make a Plan, and next, of course, it is necessary to implement in order to the method, which is considered in the planning. And next, let us check 2 points which are the progress to be in the plan and also the

[12] **OODA Loop:** O; Observe, O; Orient, D; Decide, A; Act and Loop; Implicit Guidance & Control and Feedforward / Feedback Loop. It is an easy-to-understand theorization of the decision-making process that a commander should have.

method planned to be effective. And next, let us take effective action in the two cases which are the progress not to be in Plan and the method to be required small modification.

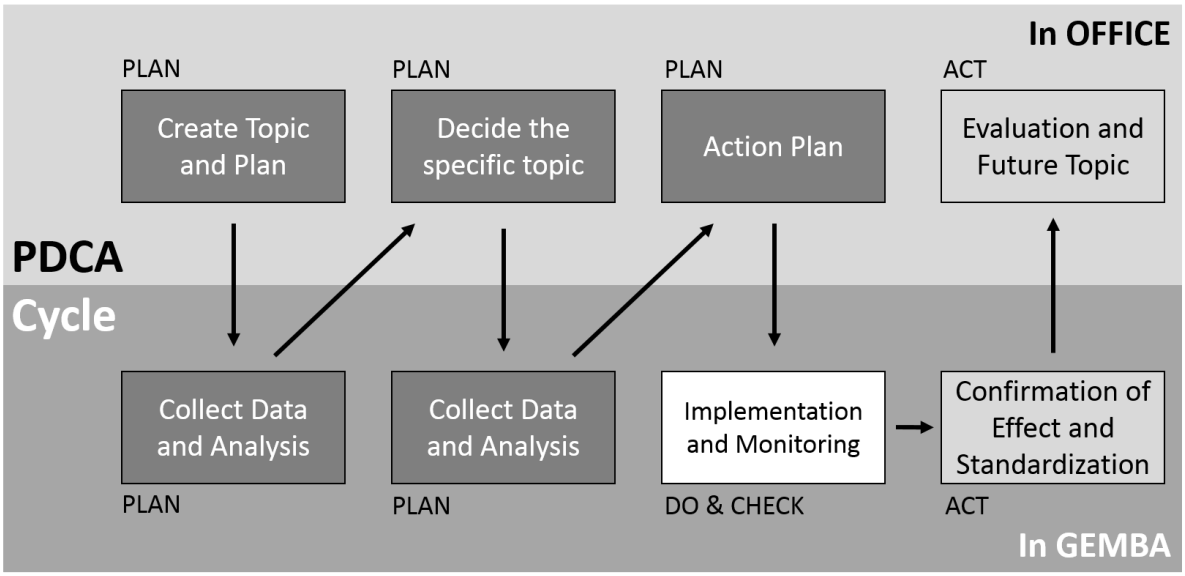
As you feel and I think, my PDCA I was taught in the IE (Industrial Engineering) course in SUMITOMO is different from your image because of two reasons.

Firstly, it is not a "Cycle". And, Is a "Small modification of method" the return to "Plan"? …The answer is No. If occurring large modification, the planning is judged to be failed. And, it is canceled with big expenses, which are not only the investment but also, the personnel reputation. Moreover, the theme is replanned. But it is not called the cycle of PDCA. It is considered a new plan in the next if it is considered and still exists an effect of quality against the expected investment. The important thing is to never stick to and to throw away the theme that failed. Therefore, PDCA has no characteristic of a Cycle.

Secondly, there is no thinking of "Spiral up".

One theme is one PDCA. When looking at the PDCA in some social networking services, the theory was added without permission by the advocator who has no Gemba experience, and in the end, it is becoming something that is not used. The thinking of PDAC is important. Therefore, I recommend you go back to the original thinking way.

Next, I write W-type P & DCA. Please understand that this is not to divert from PDCA but to complement it. In this way, I introduced my PDCA in Factory Management-2 in the next picture.



Honestly, I don't like PDCA. Because I had seen so many failures in Planning. In that way, I saw many Plan, Plan, Plan, etc, but no execution.

A real story about PDCA

I introduce a real story for you to get a good understanding of why I don't like PDCA.

When I was invited by a company, I have been shown a Quality Improvement Plan. And, the QA Manager told me —Mr. Kimura, our plan implementation rate is 70% which I think is good execution.

The 70% is the ratio of ideas implemented and the total number of ideas but is not the ratio of effect. In my heart, What poor planning it is!

—But unfortunately, we cannot achieve the target quality ratio as the factory.

And I told him —Can you believe your way is correct with your confidence?

—Of course, yes —the Quality Manager (QM) answered me—. I believe my way is correct because the ideas were implemented at a very high ratio of 70%.

—So, why do you worry about it? …You believe your way is correct firmly. But unfortunately, the target is not achieved. Mr. QM. Dalai Lama said: "If you have an answer, don't worry. It is useless to worry if there is no answer". Then, my recommendation is to stop worrying. Because there is no meaning for you.

— Mmmm —the QM hesitated—. But I need to improve and resolve the quality issues.

—But do you believe your way is correct, don't you? …Although you cannot improve the quality issue. Mr. QM. I suggest you a solution for your company: Please quit the position of QA manager. This is the best answer for you and your company.

—Mmmm —speechless, and after thinking he answered—. I cannot. I have a mission to the quality issue.

—I see. You have the mission to respond to your company. But as you feel, you cannot achieve the mission. Because you fell into the negative spiral loop. Making a plan, Some implementation, But no effect, And Making a plan with similar ideas and Continuing this spiral…

—Mr. QM —I had to be honest—. I don't want to waste my time. Please take my suggestion which you take a rest. In this way, I introduce you to a suggestive word. "If you have a problem but with an answer, don't bother." And, "If you have a problem but without an answer, there is no useless of worrying about it". I remember this line from the young Dalai Lama well, and it comes to mind when I am in trouble. (I have introduced these words somewhere. Where was it?). —And I just continued as next— "Let's be very troubled about the point of whether there is an answer or not". Please take a rest and think about the Dalai Lama's suggestive words.

—Mr. Kimura —He asked me—. Please wait. I'm asking about the method to improve quality based on the action plan. Take a rest!? …I have no such wasting time.

—So, you may say to be busy. Therefore, I recommend you to take a rest for example a daily stroll. Do you make a stroll? …When making a stroll, you need to have a technique. I learned this technique from Beethoven. You know Ludwig van Beethoven, don't you? Even if you are not interested in classical music, you probably know this name. Beethoven's morning habit of getting new ideas is actually a morning stroll.

—Beethoven's compositional method was unique. He would go out for a walk with a pencil and a few sheets of music paper in his pocket and write down the musical ideas that came to him. While walking, he composed his masterpieces as if he were waiting for ideas to fall from the heavens. And, there is an important technique to get ideas. In his case, he needs to forget or leave the composition process. In your case, you need to leave from current problems or

*quality issues. It is difficult. Indeed difficult. Leaving from coming to your mind about troubles, worries, or an interesting matter and seeking **Mu** (Nothingness)state…*

*—There are techniques such as **Zen**, Yoga, or Mindfulness. However, it is difficult to do these daily bases. Therefore, I recommend the Beethoven method. A morning stroll doesn't require the strict **Mu** (Nothingness) state, but gives enjoying a walk and helps to leave from coming to your mind about your matter of concern…*

—I know when walking, soon the matter of concern comes to the brain. Now technique. You throw away 80% of the occasion of matter of concern, and when coming it in the brain, look at the landscape. And, 20% think on the matter that concerns. Please —I beg him—, try this one week.

The story of Beethoven who liked the morning walk and creating ideas is true. But the 80% rule isn't his story, but my experience.

—And, If you like —I let him—, let us meet one week later.

One week later I asked him —Could you leave the negative spiral loop?

—Yes —he said—, yes probably I did.

—Now let us consider the solution to your matter of concern. I believe you know the PDCA step, do you? …Into this process, there is difficult to implement correctly? …P? D? …Or C & A?

—I think we have the capacity to implement these steps correctly. Nevertheless, to unite the way of thinking, I believe PDCA is not a step, but a cycle.

—Good —I answered him—. It is the cycle. However, it must be the cycles for just one theme, which is the meaning of no continuous step-up stage…

—Your action plan has some items, which are past ideas not to be executed. Moreover, you listed up in the action plan in the name of step-up. This thought is a misunderstanding. In addition, "step-up", such matter cannot be useful and is ridiculous.

—If you have the corporate and departmental annual policy, the priority of action items is changed by the surrounding business circumstances. If the picture below shows the meaning of step-up in the same theme, it is indeed ridiculous…

—Also, the quality theme priority is changed by the production status. In addition, probably, consider and make up the action plan of quality improvement by each financial term, do you? …And the story of an action plan is, Corporate Annual Policy, Division Annual Policy, Divisional Target, and Action items, isn't it?

Finally, after several objections from the Quality Manager I objected—OK. This step is not related to the difficulty of implementation directly—. Even though my mind thought the contrary, actually, it is related deeply, but for now, please, we should ignore it in order to clarify the lesson of this story.

—Again, what is the root cause of implementation difficulty? —I asked him. Although I made a long speech is useless to describe I finally asked him again, —Did you do daily stroll and the Beethoven method?

He answered yes, and I continued —Very good. Moreover, what is your thought what the implementation difficulty is?

—There are several issues. One is the capacity of the person in charge including time allowance and necessary knowledge. Another one is the capacity of Gemba operators to include the negative reaction to the improvement idea. Finally, it is the budget.

—I may be able to affirm that the cause of lack of implementation and no sufficient effect is even implemented. It is the lack of Planning. In addition, I think you did not do the first step of PDCA:

- ***The capacity of the person in charge:*** *Why you do not confirm the capacity against the theme given?*
- ***The Capacity of the Gemba operators:*** *No programing of operator education & training depending upon the theme necessary?*
- ***The Operator's cooperation:*** *Do not you provide the time to explain and discuss with the operator? …Did you involve relevant operators to create improvement ideas? …Did you do the true PLAN process which makes up the ideas in the round trip between Gemba and the Office.*
- ***The Budget:*** *I lose my word. Why such a thing is discovered in the stage of DO?*

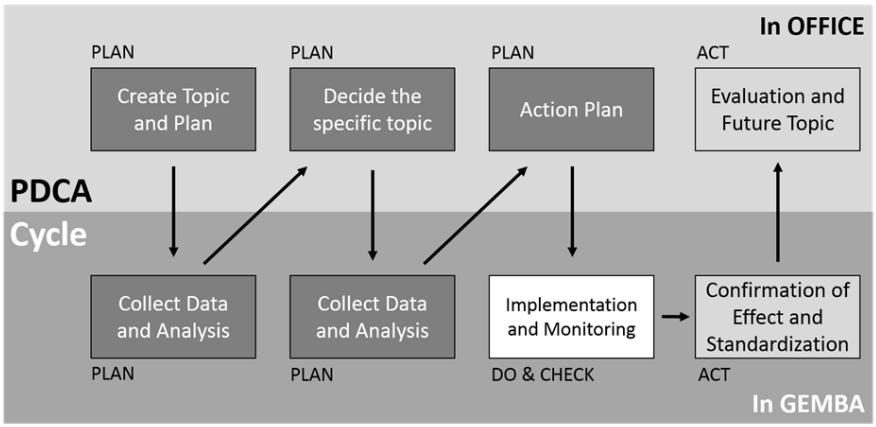


Figure 1: W Type for PDCA

— Mhmm… —the Quality Manager (QM) tried to explain all those issues unsuccessfully and was speechless.

—By the way Mr. QM —I requested him again—. Do you know the word "Rotten Avocado Syndrome"? —I knew it was something he did not know, but I usually take this expression to explain the same issue.

—Plan, plan, plan, you fell into "Rotten Avocado Syndrome".

—Rotten avocado syndrome? —he asked showing a surprised expression on his face.

—Yes, I call such an action plan, which is so poor planning a "Rotten avocado syndrome". —It is just a metaphor, but there is no such illness.

—Plan, plan, plan —I repeated—. It is the state of hanging an avocado (or others) from the tree (or others). Do you know the avocado tree and have you seen it? …As a matter of fact, avocado is my favorite. And, sometimes I come across defective avocados which are discolored inside. Yes, these are defects and it looks the same, but not eatable.

—Ehm????? —He hesitated—. Mr. Kimura, what are you talking about? …Yes, I know it and have seen it.

Japan has abundant varieties of Mimetic Words. And, the Mimetic word "Plan, plan" shows (for instance) the state of hanging from a tree and swaying in the wind. The left photo shows the status of the avocado hanging from the tree. And, the metaphor of swaying avocados from the tree is the situation of many quality improvement ideas.

—Ha, ha, ha —I laughed—. It is just idle talk. —I said to leave from the matter of concern.

—Now, Mr. Quality Manager — I called his attention again—. Your quality action plan has many ideas but has fatal defects. Yes, it is indeed many. But poor. An action plan should prepare not only the ideas but also some mandatory items.

—The mandatory items are one the evaluation of expected effect & result and the evaluation method by numerical indexes, secondly the person in charge & responsibility, and thirdly the follow-up schedule.

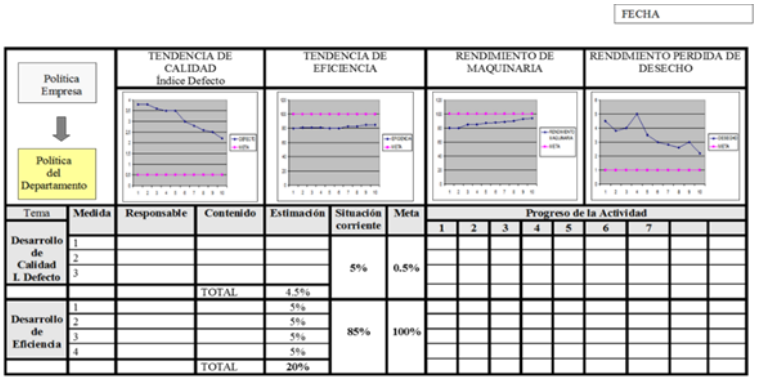
—In the first place, this action plan has no policy statement. Your quality action is only the wish list and the planning stage of PDCA is too poor. I call such a poor action plan a "Rotten Avocado Syndrome"…

—When looking at the past action plan, there are the same ideas repeatedly. Why do the same quality improvement items repeat emerge? —I asked finally.

—It is a PDCA Cycle —The Quality Manager answered—. These are important items. But unfortunately, we couldn't execute these. Therefore, again and again, we pick up these to re-challenge as a step-up cycle of PDCA.

Indeed, he misunderstood PDCA. Or PDCA gives such misunderstanding. Or I think PDCA itself is wrong.

*Please refer the **Policy Control** in Factory Management-2, about the **Action Plan**[13]*



—Mr. Quality Manager, If you apply PDCA for a quality issue, it must be used for an isolated issue —I advised him and continued—. And, spiral up? —I asked figuratively.

—If you apply for a structural issue which is required some steps and long term to achieve the goals the step-up is understandable in setting steps, such as a Quality strategy. However, nobody uses PDCA Cycle for long-term strategy…

—Nevertheless, if you apply it for a quality issue that must be resolved in short term for instance in one term, Check & Action must be "Control activity". You need to understand that —I pointed out each and every step of the PDCA cycle as…

*—**PLAN** is not only the listing up of idea items but also providing the methods by concrete method, evaluation of effect by numerical figure, investment, human capacity & education & training, trial & error, and timing schedule in this stage.*

*—**DO** is as you understand the step of implementation of above.*

*—**CHECK & ACTION**, is to check whether each item is going as planned or not. And if there is a delay, it is required to accelerate to match the plan. If there is a problem that disturbs the progress, is required to make quick countermeasures to meet to schedule.*

—Mr. Qualty Manager —I call his attention—, please understand the root cause of no achievement is the lack of PLAN step. Moreover, when planning, its step also needs the consideration of 5M elements: Man, Machine, Material, Money, and Method.

- ***Man:** People's education & training and HR resources.*
- ***Machine:** Tools and/or process.*
- ***Material:** Consideration material by data*
- ***Money:** Investment (against the effect)*
- ***Method:** Total implementation method, Follow-up method.*

—Step-up? —I asked again figuratively, and I answered to myself— Ridiculous!!. You should put the end to each quality improvement item by term.

[13] Factory Management II [English]: https://archive.org/details/FactoryManagement2PolicyDeploymentControl
Gestión de fábrica II [español]:
https://archive.org/details/GestinDeFFbrica2ElDespliegueYElControlDeLaPoloticaCorporativa1.5

—A long-term strategy is divided in to stages by term and individual stage should be put the end to the term. If you take quality improvement as a corporate strategy, you need to provide some steps which must be put to an end.

In this way, and apart from the speech to the Quality Manager, I have seen the corporate constitution improvement or for instance business expansion as the strategy, but haven't seen such quality improvement issue as a strategy.

—You don't do the PLAN step correctly —and I detailed it more deeply—. Listen. If you implement the PLAN stage correctly and sufficiently, it is 60% of the process of the action plan to be done. Then, I recommend you to take W type Plan, Do, Check & Action.

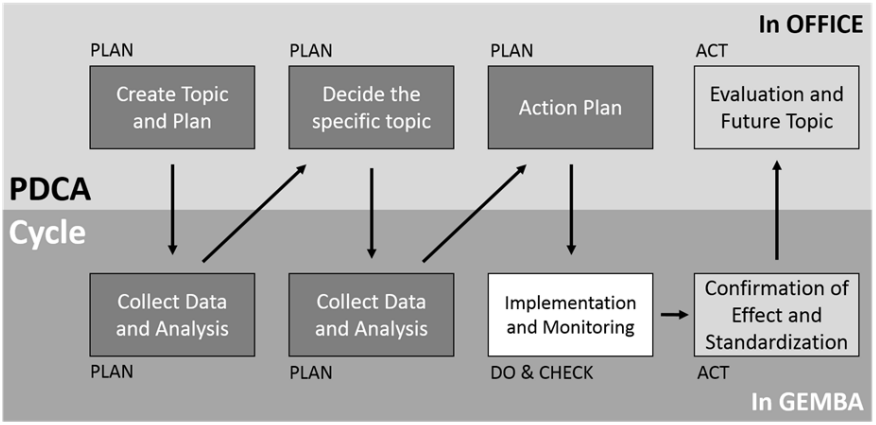


Figure 2: W Type PDCA

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V. Teaching Company[14]

At last, the phantom president has appeared. And, the continuation of this company was decided to be continued by the leadership of the new president. This was indeed good news, but also, there was bad news, which was the exchange of management team members. Particularly, the dismissal of the sales manager was the worst information.

I thought in my heart that this stupid person. It was true that there were conflicts with some management team members. However, it was also true that the Kata which I taught wasn't deepened yet because of the time consuming, but was being maintained by their effort. With many troubles, I taught the basic factory management ***Kata*** such as the management of the management-team activity, construction of data gathering system & the usage, and Gemba-Committee to include the ***kaizen***, QC-Circle, 5Ss & Safety which are affected to the improvement of Employee Engagement.

This phantom President and the Managing Director told me about destroying the ***Kata***. He excused and told me that they didn't intend to destroy it, but to be important and maintain and improve. And he promised to stop the replacement of some management team members. However, the dismissal of the Sales manager was insisted (Humph, have it your own way, it is not my matter, decided to cut my connections with your company).

By the way, a few months later, I spoke this story with the next 2 stories in a lecture in a company and was required to discuss it with the students to find the answers to the next questions.

- *How should it be?*
- *How to improve or maintain it?*

"There is a saying that 'bad law is also law'.

Socrates

This is a word derived from the words of the Greek philosopher Socrates. The meaning is that even if it is a bad law, it must be obeyed as a law, and no matter how bad the law is, if it is a law-abiding country, the law must not be broken without permission. He is tried and sentenced to death. He then looks up to the poisoned cup himself and dies.

"Crying and slashing Ma Su" means "discarding your loved ones and loved ones by abandoning his personal feelings in order to keep discipline".

Zhuge Liang

[14] **Teaching company** is a series of a real story about the implementation of TPM and TQM in a medium sized company by Sensei Kimura. They are deployed throughout TPM-7 to TPM-16 Lectures. The beginning of these series is in:

- TPM-7 page 31 One Lecture in a Company [English]: https://archive.org/details/TPM7SeisoInJishuHozen/page/n29/mode/2up?view=theater
- TPM-7 page 31 Una conferencia en la Empresa [Spanish]: https://archive.org/details/TPM7SeisoEnJishuHozen/page/n29/mode/2up?view=theater

> *There are various 'disciplines' in the world, but when a loved one disturbs the discipline, it will inevitably be hard to protect.*
>
> *During the Three Kingdoms of China, was crying and slaughtered because his vassal Ma Su, who was a regular servant, did not obey orders and was defeated by Wei. To keep it, even if it is a loved one, the violator should be severely punished.*

These 2 stories are in contrast. The first one is "Bad rule, but choosing to obey it". The second one is "Rule to be must be kept, but choosing to break it"

As an organization, how it should be? …Moreover, how a remote organization controlled should be? …This discussion and conclusion were made by several groups with KJ-Method as usual.

In the discussion, there was a claim that we cannot know the background of the stories of Socrates and Zhuge Liang and therefore it is not possible to continue the discussion.

Then I said them that we don't know both backgrounds. However, you don't need to know the detail of these backgrounds, but imagine by yourself and based on your imagination, discussing with cards and creating images and find the conclusion based on the imagination.

The function of KJ cards is to imagine each other imagination and create the answer. I omit the detail of this KJ activity, but they found their conclusions.

I introduce some.

The standing position of Socrates and Ma Su.

- Don't run for self-righteousness.
- They needed the patience to appeal to and persuade their opinions.
- Lack of dialogue.

The standing position of the Government and Zhuge Liang

- Supported the decision of Zhuge Liang as his standing position.
- The dialogue must open.

And their conclusion was: "Open and sufficient dialogue"

Regarding this Teaching company… This Teaching company at least made the right decision and let the Managing Director resident at the factory. This decision should be given a high rating.

And, how about the treatment of the Sales Manager? …He is not Socrates and appealed his complaining and the stupid policy. He refused the dismissal. On the other hand, the Managing Director told him the dismissal to keep the organization. And as the result, the Sales Manager left the company by himself.

Now, I'd like to write about the consideration of that stupid policy of prohibition of receiving the order in red.

The policy of prohibition receiving the order in red

Red?! …Against what? …It is against Operating Income. The policy of this Teaching company was to prohibit receiving the order in red of Operating Income.

Again, what is Operating Income?

Classification		*Subjects*	*Remarks*	*Note*
	1	Sales amount & Sales KMH(Kilo Standard Hours)		Actual amount & sales products x Standard H/P
Planned	2	Planned Labour Cost		ΣProduct Sold x SH x Standard Unit Labour Cost
Direct Cost	3	Planned Material Cost		ΣMaterial Used in Sold x Planned Material (Standard) Cost
	4	**Planned Marginal Profit**	4=1-(2+3)	Marginal Profit=Sales amount-Variable cost
Direct Cost	5	Actual Labour cost		Actual working hours x Planned unit cost ÷ Achieved Efficiency
Modification	6	Planned Labour Cost		Same to 2.
	7	**Labour Cost Modification**	7=5-2	
		(Labour Efficiency. Planned & Actual%. Repair Cost		
		Quality Defect Ratio, Actual & Plan of Production KMH)		
	8	Actual Material Cost		Actual result of material cost.
	9	Planned Material Cost		Same to 3.
	10	Loss on disposal of waste		the part of material cost. Actual material scrap loss.
		(Loss rate. Planned & Actual %)		
	11	**Material Cost Modification**	11=8-3	
	12	**Direct Cost Modification Total**	12=7+11	
	13	Outsourcing Cost		Treated as Direct Cost and Variable Cost
		(Outsourcing, Planned & Actual KMH)		
	14	**Actual Marginal Profit**	14=4-12-13	
	15	Direct Expenses		Other than Outsourcing (Metal mold, Tools, etc.)
	16	Factory (Manufacturing) Overhead		Indirect Material, Indirect Labour and other Indirect Expenses (Machine & Equipment Depreciation)
	17	**Gross Profit**	17=14-(15+16)	
Actual	18	Selling Expenses		Sales commission, sales promotion cost (advertising cost)
Other Cost	19	General and administrative expense		Personnel costs (salaries, bonuses, various allowances) for indirect departments, costs for operating the office of indirect departments etc.)
	20	**Operating Profit**	20=17-(18+19)	
	21	Non-Operating Income		
	22	Non-Operating expense		
	23	**Ordinary Profit**	23=20+21-22	
	24	Extraordinary Income or Loss		
	25	Tax		
	26	**Net Profit**	26=23-24-25	

Above is the monthly P/L Statement of my previous company[15]. (From TPM-15 & TPM-16)

As you understand, Operating Profit is calculated as below:

$$OP\ (20)\ =\ Gross\ P\ (17) - Selling\ Ex\ (18) - General\ \&\ Ad\ (19)$$

$$Gross\ P\ =\ Marginal\ Profit - Direct\ Ex\ (15)\ +\ F\ Overhead\ (16)$$

[15] TPM-15 [Englsh]: https://archive.org/details/tpm-15-cost-reduction-3-and-consultancy-job-contnuation
TM-15 [Spanish]: https://archive.org/details/tpm-15-reduccion-de-costes-y-el-trabajo-de-consultoria-contnuacion

Cost Classification		Material	Labour	Expense
		Cost of goods consumed to manufacture the product	Personel cost for employees involved in manufacturing such as direct work, indirect work, and back office.	Cost of Outside of Material & Labour
Direct	Clearly recognized ammount consumed for particular product.	Raw material and Purchased parts	Consumption wages for direct working hours in which direct workers to be involved in the manufacturing	Outsourcing Air, Gas, Water, Utility, Electricity.
Indirect	Unclear consumption for each product	Auxiliary material cost: Paints, dyes, fuel cost for manufacturing machinery, Factory consumable cost, the consumable cost in the production process, machine oil, consumable tools & fixtures, spare parts that are outside of fixed assets.	All other than the above are classified as indirect labour costs: Welfare, Bonus, Allowance, Provision for retirement benefits, etc. Wages for supervisors, line leaders, inspectors, material handlers, shipping or receiving clerks, maintenance technician.	Welfare facility, Rental, Insurance, Depreciation, Patent.

Again, Operating Income is calculated by subtracting Direct Expenses, Factory Overhead, Selling Expenses, and General & Administrative Expenses from Marginal Profit.

The problem is the allocation of these Indirect Costs such as some kinds of Direct Expenses (15), Factory Overhead (16), Selling Expenses (18), and General & Administrative Expenses (19).

These are allocated to the product's cost.

All Selling, General & Administrative Expenses were charged to the income statement as incurred in the period as cost of the period.

Period Cost

Period costs are costs that correspond directly to sales in the period in which they are incurred. Typically, Selling, General & Administrative Expenses are treated as Period costs.

For factory management, for instance, to review the factory P/L statement, I recommend using the above format and investigating the contents of Marginal Profit. Because.

In the above P/L statement, Direct Expenses (15), and Factory Overhead (16) can be controlled by the factory and possibly increased or decreased by the factory.

However, Selling Expenses (18) and General & Administrative Expenses are not controllable by the factory. Also, these are Period Costs.

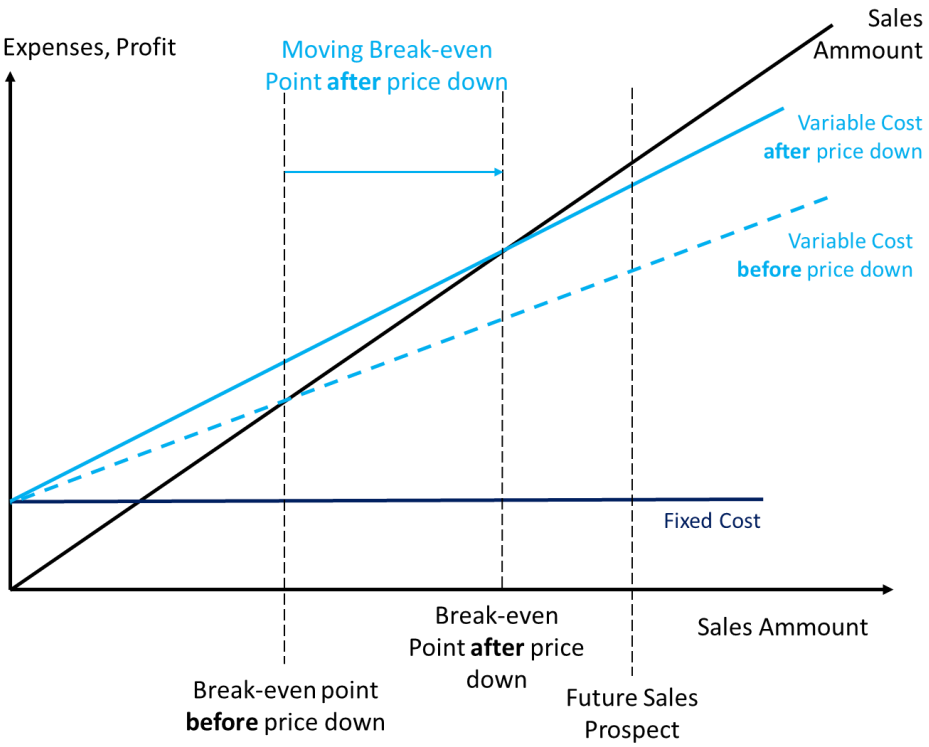
Direct cost is characteristic of instant cost. On the other hand, Selling Expenses and General & Administrative Expenses are the Period Cost.

Another reason is that the speed is different. A factory is fighting daily. And a Period Cost is not suitable for daily or monthly fighting (factory evaluation).

Teaching Company's Direct Costing and Total costing.

The reason for raising the standard of revolt by the Sales manager. The Sales Manager and the Accounting manager visited my hotel and asked for my advice regarding the sales promotion of a new products series, which had high future potential in the relevant market. However, one barrier was the high price. Then we discussed and considered the promotion strategy from the price by the Break-Even Point Diagram.

Fig-1. Price down



Points confirmed in the meeting:

1) Future sales prospect by marketing;
2) Price down in the resources of variable costs.
   A cost is constructed of fixed cost and variable cost. And, most of the fixed costs which is the category of Period cost and must be allocated to the product costs.
   I don't like the word Cost Reduction (or Down). And, instead of this word, I use Costs Efficiency Improvement. Because a cost itself is an investment. From such thinking, it is necessary to consider whether its cost can be the benefit for the cost or not.
   The approach to cost efficiency improvement of Fixed costs such as General & Administrative Costs and Selling costs and variable costs such as Direct material costs, Direct labor costs, or Outsourcing, all of them are different.
   And I'm writing about Factory Management from the point of view of the ***Production-Gemba***.
   Therefore, I pick up the variable cost improvement which can be controllable by the factory.

Of course, Fixed costs are also the target of Cost Efficiency Improvement. But here, I make the theme just variable cost.
(Please don't forget that Fixed costs are also a target of Cost Efficiency Improvement by (for instance) organization innovation, Office work reformation.)

3) The progress of the Action Plan of Cost Efficiency Improvement (Profit recovery) by the project team.
4) Capacity confirmation for production increase (production line formation; labor, machines & tools, and quality assurance)

Based on these materials, we discussed the new product promotion.

Then, the sales department started the sales promotion in "Receiving order in red".

In parallel, the Sales Manager and the Accountant Manager explained the sales promotion in the regular and weekly management team meetings. Initially, they expected good feelings from other managers. However, the mood of this meeting was changed by one comment by the Engineering Manager.

—Why did you start this promotion before getting our acceptance? —asked the Engineering Manager.

I omit the rest of the questions and doubts from him. Now I rather present the relevant interventions.

—Basically —pointed out the Production Manager—, you broke the top policy which is "Prohibition of receiving an order in red". Do you have the right to break corporate policy? …Before our management team meeting which is the Decision - making body, you started the sales promotion.

—Everyone —begged the Sales Manager—, please listen. Many times, I explained our position in the market, price competitiveness, and no possibility of sales expansion — He continued his speech, however in this case I continue with other interventions.

—My opinion —the accountant manager intervened—, is that it is necessary to reconsider the policy because it is wrong to use the Operating Income for sales price strategy. This Operating Income (Profit) is calculated in Total Costing Accounting. And This Total Costing Accounting System is used to determine a Period of Profit/Loss. Anyway, the important things are the next two —he pointed out—:

1) Operating Income is not suitable for determining a sales price, but Marginal Profit should be used for it. Because Operating income doesn’t embody the true cost, but an expedient cost, the indirect costs such as Sales & Administrative Cost is distributed to products by some standard.
2) A sales price is determined by the market condition and Marginal Profit.

—Sorry —questioned one manager—. We don't understand your explanation. But just one thing. You abandoned the corporate policy with your own thought. It is more serious for us.

—Everyone —the Sales Manager explained and repeated—, everyone! Please understand —he begged—. It is not possible to make business with our cost. Our products indeed have high potential in the market, but the price is too high.

The speeches, later on, were more deliberations but even those generate even more confusion.

Now, as I wrote before, I was disturbed the short rest for waiting for my flight by the visit of the phantom President, Managing Director, and the Accountant Manager. And, there was a little argument. Basically, I had bad emotions about their visit, which disturbed my modest and short rest. The contents were as next:

- Their wish was the continuation of my teaching, but I politely refused that offer.
- The good news for this factory was the Managing Director to a resident as the factory president.

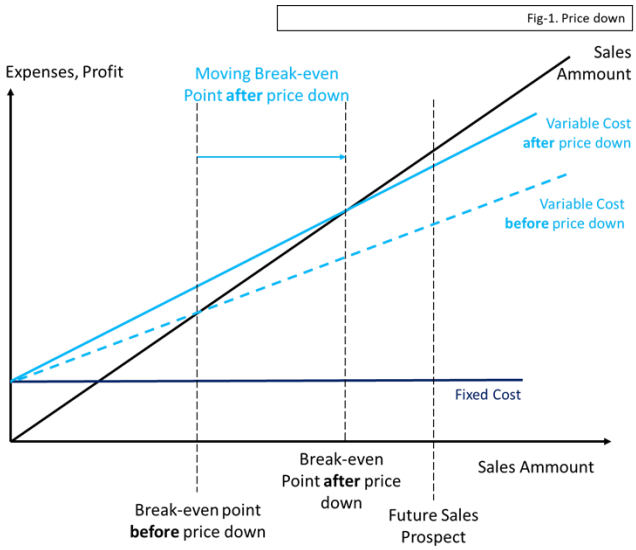
Bad items of news were:

- Exchange of some members of the management team. (It was canceled based on my suggestion.)
- Another bad news was the Sales Manager to be dismissed.
- An argument was the stupid policy "Prohibition of receiving the order in red".

Stupid policy!? —The Managing Director asked—. Do you say that the policy about Prohibition of receiving the order in red is a stupid policy?

—Yes, I do —I answered clearly and I tried to explain more deeply—. Listen Mr. Managing Director, for a price strategy, it is stupid to determine it by just Operating Income. It must be considered the business advantage & competency, and price in the market…

—I believe that you recognize the products which sales department wished to promote have the advantage & competency of them. But unfortunately, these are too expensive. According to the information of SD, some customers expressed their wish to use these, but are too expensive…



—Then the Sales Manager and his team surveyed the potential market and possible price. And based on this information, they made the investigation of P/L based on the Break-Even Point Diagram. They never did such activity by a play in a haphazard way. —And I concluded— It is indeed a stupid policy.

—Mr. Managing Director —I called his attention gain—. I never deny the importance of Operating Income calculation based on the Total Costing. It is important to determine the Period Profit which must be reported to all shareholders. But it doesn't embody the actual cost, but for convenience.

—It is quite a good thing that you will stay in the factory and contribute to the unity of internal decisions. However—I pointed out—, that still, I have a concern, which is this second stupid policy. Because the first one was the outsourcing policy which was already corrected.

—I don't mind that you manage your company in your way, because I already left my consulting job at your company. But please listen to my final advice about the next two things. The First one is to stop the stupid policy of "Prohibition of receiving an order in red" and consider marginal profit than

Operating income for factory management. And the second one is to keep Kata which I taught. There is a words of ***Shu***, ***Ha***, and ***Ri***. And your management team level is still in the entrance of ***Shu***[16].

(Annotation; Above is the contents of my later after day wrote to the phantom president, eh Managing Director and the Accountant Manager. Basically, my English skill is poor, and cannot speak like above in face-to-face dialogue.)

Total Costing Calculation and Direct Costing Calculation.

The difference between Total Costing and Direct Costing is as next.

Total Costing and Direct Costing.

In cost accounting, all **manufacturing costs** are aggregated into product costs as product costs to calculate month-end work-in-progress and finished goods costs. In addition, all Selling & General Administrative expenses are recorded as Period Costs, with the amount incurred during the period recorded as an expense on the P/L statement.

Fixed costs are normally included in **product costs**. However, in Direct costing, fixed costs are not included in product cost.

In Direct costing, manufacturing costs are broken down into variable costs and fixed costs. Then, product costs are calculated using only variable manufacturing costs, and fixed manufacturing costs are Period Costs. And, the fixed costs are allocated to the product cost by some rule.

The difference between Total Costing and Direct Costing can be summarized in the following formula.

$$\boldsymbol{Total\ Costing} = All\ Products\ Cost\ +\ Selling\ Expenses\ +$$

$$+\ General\ \&\ Administrative\ Expenses.$$

All Products Cost contents are the below table. And, below products cost plus Selling Expenses + General & Administrative Expenses is Total Costing.

$$\boldsymbol{Direct\ Costing}\ =\ Variable\ Products\ Cost\ +\ Fixed\ Product\ Cost\ +$$

$$+\ Selling\ Expenses\ +\ General\ \&\ Administrative\ Expenses.$$

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[16] ***Shu***, ***Ha***, and ***Ri*** (守、破、離):
Shu (守): ***Shu*** means to keep. Keeping Kata, which is taught by the teacher. Anyway, it is required to master the ***Kata*** which is like a Judo form. This step is still training level.
Ha (破): ***Ha*** means to break. After keeping ***Kata*** taught, the next step is to analyze and study by himself and create better ***Kata***.
Ri (離): ***Ri*** means to leave. To understand the teacher's ***Kata*** and his own. ***Kata*** deeply. And, free from the teacher's ***Kata*** and his own ***Kata*** and break new ground including the philosophy.

Again, the kinds of manufacturing (products) cost[17].

Cost Classification		**Material**	**Labour**	**Expense**
		Cost of goods consumed to manufacture the product	Personel cost for employees involved in manufacturing such as direct work, indirect work, and back office.	Cost of Outside of Material & Labour
Direct	Clearly recognized ammount consumed for particular product.	**Raw material and Purchased parts**	**Consumption wages for direct working hours in which direct workers to be involved in the manufacturing**	Outsourcing Air, Gas, Water, Utility, Electricity.
Indirect	Unclear consumption for each product	Auxiliary material cost: Paints, dyes, fuel cost for manufacturing machinery, Factory consumable cost, the consumable cost in the production process, machine oil, consumable tools & fixtures, spare parts that are outside of fixed assets.	All other than the above are classified as indirect labour costs: Welfare, Bonus, Allowance, Provision for retirement benefits, etc. Wages for supervisors, line leaders, inspectors, material handlers, shipping or receiving clerks, maintenance technician.	Welfare facility, Rental, Insurance, Depreciation, Patent.

Total costing is used to determine a period P/L, but not suitable to use for Factory Management (for instance monthly factory P/L review). However, for Factory Management, Direct Costing is a better use.

And, it particularly reviews the direct labor & materials (green marked) and Outsourcing. Of course, the factory overheads also are reviewed. As you understand, these are controllable and should be controlled by the factory himself.

The green part and outsourcing are very easy to identify. However, it sometimes might be difficult to classify the Variable products cost and Fixed products cost. But please never mind. The classification can be general and not necessary for getting nervous (because of not so large amount).

Manufacturing costs and Product cost

I would describe the definition of Manufacturing cost, Product cost, and Cost of sales. Because these kinds of names give confusion to readers.

Manufacturing Cost is the cost of manufacturing a product. The opposite of manufacturing cost is Selling, General & Administrative Expenses.

Product costs are costs that are aggregated in the product account. The opposite of product cost is Period Cost.

[17] TPM-14 [English]: https://archive.org/details/tpm-14-clasification-of-cost-and-oiling
TPM-14 [Spanish]: https://archive.org/details/tpm-14-control-de-la-lubricacion-4

Again, Period Cost is the cost of the "period" in which it is incurred.

It can be thought of as the rent you pay per month. It can be rephrased as one in which correspondence to income is not a product, but a period of time. In other words, it can be thought of as a kind of rent that is paid per month. The most important feature of Direct Costing is that fixed manufacturing costs are not included in product costs.

P/L
Sales Ammount
Manufacturing Cost
Gross Margin
Selling Expensenses
General and Admnistrative Expense
Operating Profit
Non-Operative Income
Non-Operative Expense
Ordinary Profit
Extraordinary Profit
Extraordinary Loos
Tax
Net Profit

Now let's look at P/L Statements.

I showed some kinds of P/L Statements in my descriptions. Next is one of the typical P/L Statements[18]. As you understand it is the P/L Statement by Total Costing. There is the name of "Manufacturing Cost" to calculate Gross Margin. The next spreadsheet is on Making a stream of production-3[19]

Basic Structure of income statement / Managerial accounting

+	Sales Amount		
-	Cost of Sales		Labor cost, Material cost, Expenses (in factory)
		Labor Cost	Salaries
		Material Cost	Direct materials for production
		Factory expenses	Utility cost, gas, spare parts, oil, lubricant, jogs & tools
			Repair cost
=	Gross profit		
-	Selling Expenses		Sales commission, advertisement and promotion expenses
			Travel and transportation expenses, Parking cost
			Transportation cost, Entertainment expenses
-	General and Administrative expenses		Salaries, Executive pay, Bonus, Severance pay, Welfare costs
=	Operating profit		
-	Non-operating income		Financial income, Receives rest and land rent
-	Non-Operating expenses		Financial charges, Exchange loss, Loss on sales of securities
			Inventory write-downs, Amortization of deferred assets
=	Ordinary income		
-	Extraordinary loss		
=	Profit before tax		
-	Tax		
=	Net income		

[18] TPM-15 [Englsh]: https://archive.org/details/tpm-15-cost-reduction-3-and-consultancy-job-contnuation
TM-15 [Spanish]: https://archive.org/details/tpm-15-reduccion-de-costes-y-el-trabajo-de-consultoria-contnuacion

[19] Making the stream of production-3 [English]:
https://archive.org/details/makingstreamofproduction13_202001/Making%20stream%20of%20production-3/
Estableciendo la corriente de producción-3 [Spanish]:
https://archive.org/details/establecerlacorrientedeproduccion13_202001/Establecer%20la%20corriente%20de%20producci%C3%B3n-3/

There is the name of "Cost of sales" to gain the Gross margin (Gross profit). And another one is also from TPM-15.

Classification		*Subjects*	*Remarks*	*Note*
Planned Direct Cost	1	Sales amount & Sales KMH(Kilo Standard Hours)		Actual amount & sales products x Standard H/P
	2	Planned Labour Cost		ΣProduct Sold x SH x Standard Unit Labour Cost
	3	Planned Material Cost		ΣMaterial Used in Sold x Planned Material (Standard) Cost
	4	**Planned Marginal Profit**	4=1-(2+3)	Marginal Profit=Sales amount-Variable cost
Direct Cost Modification	5	Actual Labour cost		Actual working hours x Planned unit cost ÷ Achieved Efficiency
	6	Planned Labour Cost		Same to 2.
	7	**Labour Cost Modification** (Labour Efficiency. Planned & Actual%. Repair Cost Quality Defect Ratio, Actual & Plan of Production KMH)	7=5-2	
	8	Actual Material Cost		Actual result of material cost.
	9	Planned Material Cost		Same to 3.
	10	Loss on disposal of waste (Loss rate. Planned & Actual %)		the part of material cost. Actual material scrap loss.
	11	**Material Cost Modification**	11=8-3	
	12	**Direct Cost Modification Total**	12=7+11	
	13	Outsourcing Cost (Outsourcing, Planned & Actual KMH)		Treated as Direct Cost and Variable Cost
	14	**Actual Marginal Profit**	14=4-12-13	
Actual Other Cost	15	Direct Expenses		Other than Outsourcing (Metal mold, Tools, etc.)
	16	Factory (Manufacturing) Overhead		Indirect Material, Indirect Labour and other Indirect Expenses (Machine & Equipment Depreciation)
	17	**Gross Profit**	17=14-(15+16)	
	18	Selling Expenses		Sales commission, sales promotion cost (advertising cost)
	19	General and administrative expense		Personnel costs (salaries, bonuses, various allowances) for indirect departments, costs for operating the office of indirect departments etc.)
	20	**Operating Profit**	20=17-(18+19)	
	21	Non-Operating Income		
	22	Non-Operating expense		
	23	**Ordinary Profit**	23=20+21-22	
	24	Extraordinary Income or Loss		
	25	Tax		
	26	**Net Profit**	26=23-24-25	

There are the names of "Labour Cost and Material Cost" to gain Marginal Profit. And, as you can understand, Labour Costs and Material Costs are the Variable Costs which are called Variable Products cost.

Once again:

$$\boldsymbol{Total\ Costing} = All\ Products\ Cost\ + Selling\ Expenses\ +$$

$$+ General\ \&\ Administrative\ Expenses.$$

$$\boldsymbol{Direct\ Costing}\ = Variable\ Products\ Cost\ + Fixed\ Product\ Cost\ +$$

$$+ Selling\ Expenses\ + General\ \&\ Administrative\ Expenses.$$

Again, there are the items of Manufacturing Cost, Cost of sales, and (Variable) Products Cost. And these are subtracted from Sales Amount to calculate Gross Margin (Gross profit) or Marginal Profit.

Firstly I'd like to explain the Manufacturing Cost and the Products Cost, even it seems just a little duplicated explanation.

Manufacturing cost is "the cost of producing a product or service (hereinafter collectively expressed as product). The cost of the raw materials to be needed to manufacture the product, the cost of the equipment used to perform the manufacturing, and the labor costs of the people who manufacture the product are all manufacturing costs.

The difference between Product cost and Manufacturing cost is as follows:

- **Product cost:** When determining costs, the cost of a product is aggregated on a product-by-product basis.
- **Manufacturing costs:** Manufacturing costs are the amount of money spent to produce a product, such as materials, labor, and expenses.

In conclusion, Product Costs and Manufacturing Costs are the same.

They are the same, but the words are used differently to explain the concepts.

There are two types of costs: "manufacturing costs" for manufacturing products and "Selling and General & Administrative expenses" for other costs. Also, from another point of view, there are two types of costs: "product cost," which is the value of the product (inventory), and "period cost," which is the amount incurred during the period (fiscal year). Generally, Manufacturing Cost = Product Cost. And,

$$Selling, General\ \&\ Administrative\ =\ Period\ cost.$$

I could understand this matter is a little bit confused and it can give you a headache. Consequently, I understand your confusion. Therefore, I'm trying to describe Cost from some points sides. And, next is the material from the manager's accounting class at my previous company.

When I was promoted to manager, I was given the opportunity of learning cost and accounting. Next is the material of this course.

Example of Direct Costing Method P/L Statement:

Example of P/L Statement			
P/L Statement (1980.Apr~1981.End Mar)			
Sales Amount			6,000
Variable Cost Sales			2,000
	Manufacturing Margen		**4,000**
Variable Selling cost			1,000
	Marginal profit		**3,000**
Fixed Cost			
	Fixed Product Cost	500	
	Fixed Selling Cost and General & Admin Cost	1,500	
Operating Income			**1,000**

Again, new names appeared…

Manufacturing margin.

In the P/L Statement under Direct costing, Variable Cost of Sales is first subtracted from Sales Amount. The profit or loss calculated by subtracting the Variable Cost of Sales from the Sales Amount is called the Manufacturing margin.

Marginal profit (Contribution).

In fact, some people believe that Contribution profit and Marginal profit are "the same thing. In such a view, "they are just different words for the same meaning of profit.

On the other hand, there is a management accounting theory that regards the two as different profits, so please be careful. When I was educated, they were explained to be one and the same.

P/L Statement model with Total Costing method

If described by Total Costing, the P/L Statement is as next:

Example of P/L Statement		
P/L Statement (1980.Apr~1981.End Mar)		
Sales Amount		6000
Cost of Sales		2500
Gross Profit		**3500**
Selling Cost and General & Admin Cost		2500
Operating Income		**1000**

In Total Costing, Gross profit is indicated by subtracting Costs of sales from the Sales amount. Then, from Gross profit, Selling and General & Administrative expenses are subtracted to show Operating income. The portion below Operating income is the same in both cases.

Again, in Total Costing, Operating income is calculated by first subtracting Costs of sales from the Sales amount and then subtracting Selling and General & Administrative expenses.

In contrast, in Direct Costing, Operating income is calculated by firstly subtracting Variable costs from Sales amount and then subtracting Fixed costs.

In both, are Operating incomes the same? …Yes, but there is a strict condition. That is when there is no work-in-process and product at the beginning and end of the period.

In some descriptions, I wrote the importance of the inventory turnover ratio. And, my best record of it was 24 times.

$$Inventory\ turnover\ = \frac{Sales\ amount\ (of\ the\ month)}{Inventory}$$

The 24 times is the meaning of 1/24 months inventory against sales, which means an Inventory for less than one day.

Again, the calculation of inventory turnover is the Sales amount divided by the total inventory amount. And the inverse calculation (Inventory/Sales) shows how much inventory has against sales.

"no work-in-process and product at the beginning and end of the period"

Is there such a manufacturing company? …I haven't seen such a company. And even Toyota, which implements JIT, has the work-in-process and product at the beginning and end of the period. And regarding this Teaching Company (who had or still "has" a lot of work-in-progress, products and obsolescence, and excess stock in his warehouse) is not special, but near to common.

Now, if a company has work-in-progress, inventory of materials and products, how is different the P/L statements in Total costing and Direct costing? …Again, from my very old teaching materials, I show you a very simple example. First Assumed data.

1. Production results for the month		
Work in progress at the beginning of the period	0	pcs.
Started in the current period	500	
Total	500	
Work in progress at the end of the period	0	
Finished products	500	

2. Sales results for the month		
Products at the beginning of term	100	pcs.
Finished products in the current period	600	
Total	700	
End of term products	200	
Sales quantity	500	

3. Selling price and cost data				
Selling price		@	10,000	
Manufacturing costs				
Variable cost		@	2,000	
Fixed cost	600,000	@	1,000	
Selling expenses				
Variable cost		@	1,000	
Fixed cost	100,000			
Generaland administrative expenses	150,000			

In the above condition, let us make the P/L Statements. And, both P/L statements will be prepared up to Operating income.

Total Costing

The P/L statement starts with the Sales Amount. From following units are **1,000** yen;

$$Sales\ amount\ =\ Selling\ price\ @\ \mathbf{10}\ x\ quantity\ sold\ \mathbf{500}\ units\ =\ \mathbf{5,000}\ yen$$

In Total costing, gross profit is calculated by subtracting cost of sales from net sales.

$$\boldsymbol{Cost\ of\ Sales} =$$

$$= Variable\ manufacturing\ costs\ +\ Fixed\ manufacturing\ costs$$

$$= Variable\ cost\ rate\ @\ \mathbf{2}\ x\ sales\ volume\ \mathbf{500}\ units + Fixed\ cost\ rate\ @\ 1\ x\ sales\ volume\ 500\ units\ =\ \mathbf{1,500}$$

$$\boldsymbol{Gross\ Profit} =\ Sales\ amount\ \mathbf{5,000}\ -\ Cost\ of\ sales\ \mathbf{1,500} =\ \mathbf{3,500}$$

Where:

$$Fixed\ cost\ ratio\ =\ \left(\frac{Fixed\ cost}{Sales\ amount}\right) x\ 100$$

$$Variable\ cost\ ratio\ =\ \left(\frac{Variable\ cost}{Sales\ amount}\right) x\ 100$$

Next, Selling & General administrative expenses:

$$Selling\ \&\ General\ Administrative\ Expenses = = Selling\ expenses\ +\ General\ \&\ administrative\ expenses =$$

$$= Variable\ selling\ expenses\ +\ Fixed\ selling\ expenses + Fixed\ General\ \&\ administrative\ expenses$$

(There is no variable general & administrative expenses)

$$= Variable\ cost\ rate\ @\ 1\ x\ Sales\ quantity\ \mathbf{500}\ units\ +\ Fixed\ sales\ cost\ 100 + Fixed\ General\ administrative\ cost\ 150\ =\ \mathbf{750}$$

Finally, subtract Selling, General & Administrative expenses from Gross profit to obtain Operating income.

$$Operating\ Profit\ =$$

$$= Gross\ profit\ \mathbf{3,500}\ -$$

$$-\ Selling\ \&\ General\ \&\ administrative\ expenses\ \mathbf{750,000}\ yen = \mathbf{2,750}$$

The P/L statement is as next:

P/L Statement			
Sales Amount	5,000		
Cost os Sales		-	1,500
Gross Profit	3,500		
Selling and Cost General & Admin. Cost		-	750
Operating Income	**2,750**		

And in **Direct costing**:

As you see the Operating incomes of Total and Direct costing are different.

- Total costing: **2,750**.
- Direct costing: **2,650**.

P/L Statement			
Sales Amount	5,000		
Variable Cost of Sales		-	1,000
Manufacturing Margen	4,000		
Variable Selling Cost		-	500
Marginal proft	3,500		
Fixed Cost			
Fixed Product Cost		-	600
Fixed Selling Cost		-	100
Fixed General & Admin Cost		-	150
Operating Income	**2,650**		

P/L Statement in Direct Costing

The P/L statement starts with the Sales amount.

$$Sales\ amount\ =\ Selling\ price\ @\ \mathbf{10}\ \times\ sales\ quantity\ \mathbf{500}\ units\ =\ \mathbf{5,000}$$

In Direct costing, the Variable costs of sales is subtracted from the Sales amount to calculate Manufacturing margins.

$$Variable\ cost\ of\ sales\ =\ Variable\ manufacturing\ cost\ =$$
$$=\ Variable\ cost\ rate\ @\ \mathbf{2}\ x\ Sales\ quantity\ \mathbf{500}\ units\ =\ \mathbf{1,000}$$

$$Manufacturing\ Margin\ =$$
$$=\ \mathbf{5,000}\ (Sales\ amount)-\ \mathbf{1,000}\ (Variable\ cost\ of\ sales)==\ \mathbf{4,000}$$

Next, Variable Selling expenses are calculated.

$$Variable\ Selling\ Expenses\ =$$
$$=\ Variable\ cost\ rate\ @\ \mathbf{1}\ x\ Sales\ quantity\ \mathbf{500}\ units==\ \mathbf{500}$$

Then, the Marginal profit is calculated by subtracting the Variable Selling expenses from the Manufacturing margin.

$$Marginal\ Profit = \\ = \mathbf{4,000}\ (Manufacturing\ margin) - \mathbf{500}\ (Variable\ Selling\ expenses) = \\ = \mathbf{3,500}$$

Next, calculate Fixed costs.

$$Fixed\ cost = Fixed\ manufacturing\ cost\ \mathbf{600} + Fixed\ Selling\ cost\ \mathbf{100} + \\ + Fixed\ general\ \&\ Administrative\ cost\ \mathbf{150} = \mathbf{850}$$

Finally, Fixed costs are subtracted from the Marginal profit to obtain Operating profit.

$$Operating\ Profit = Marginal\ profit\ \mathbf{3,500} - Fixed\ cost\ \mathbf{850} = \mathbf{2,650}$$

Direct costing calculates manufacturing margins by subtracting the variable cost of sales from net sales.

Again, the Operating incomes of Total and Direct costing are different:

- Total costing: 2,750;
- Direct costing: 2,650.

From what the difference does come? …The difference in Operating income between Direct costing and Total costing is due to the difference in Fixed manufacturing costs.

Again, if there were no work-in-process and products at the beginning and end of the period, the Operating profit would have been the same for both Total and Direct costing. However, if there are products and work in process at the beginning and end of the period, the Operating profit will not be the same.

In my textbook example, Operating profit is **100** more into the Total cost.

Let us consider where this **100** difference comes from.

- Total costing: Fixed manufacturing cost **500;**
- Direct costing ... Fixed product cost **600.**

Thus, we can see that the reason is the Fixed manufacturing costs. All amounts are the same except for Fixed manufacturing costs. However, my old textbooks are a bit dull but bear with me a little longer. As I write this, I am once again remembering what cost is.

The difference in Fixed manufacturing costs

Second, why is there a difference in Fixed manufacturing costs? …In Total costing, Fixed manufacturing costs are included in the cost of the product sold along with Variable manufacturing costs.

Therefore, **under Total costing, Fixed manufacturing costs for the portion not sold are not included in the Fixed manufacturing costs on the P/L statement**.

It is the problem to use the Total Costing for factory management or sales price strategy because we cannot know the current true cost capacity in Total costing. Later, I will describe the Standard Costing system which I used in the previous company for a monthly P/L review meeting. (It is quite a useful method for controlling a target cost and cost reduction. And therefore, Direct costing is more suitable than Total costing for factory management. (Of course, Total costing is also important to determine the Period P/L. Because "P/L statement based on Direct costing" is not acceptable for external reporting, it must be revised to "P/L statement based on Total costing.)

Again, the Fixed manufacturing costs for the portion not sold are included in the cost of the product carried forward to the next period.

Against, Direct costing, Fixed manufacturing costs are calculated as periodic costs, such as Fixed Selling expenses and Fixed General & Administrative expenses.

Therefore, under Total costing, Fixed manufacturing costs for the portion not sold are not included in the Fixed manufacturing costs on the P/L statement.

This difference causes a difference in Fixed manufacturing costs between the "P/L statement with Total costing" and the "P/L statement with Direct costing".

Conclusion

Direct costing is a costing method in which Fixed costs are not included in the product cost.

In Direct costing, manufacturing costs are broken down into Variable and Fixed costs. Then, product costs are calculated using only Variable manufacturing costs, and Fixed manufacturing costs are treated as periodic costs in the same way as Selling costs and General & Administrative expenses.

The advantage of the Direct costing method is that it provides useful information for the cost management of a company because it can clarify the relationship between cost, capacity utilization, and profit, which is useful for short-term profit planning by preparing a P/L statement.

Direct costing and Total costing do not show the same Operating profit.

This is because Direct costing, which includes all Fixed manufacturing costs, and Total costing, which only includes the Fixed manufacturing costs of products sold, have different Fixed manufacturing costs.

In Direct costing, Selling and General & Administrative Expenses are treated as periodic costs, the same as in Total costing.

I try to explain by a little different word.

In Total costing, Operating income is calculated by first subtracting the Cost of sales from the sales amount and then subtracting Selling and General & Administrative Expenses.

In contrast, in Direct costing, Operating profit is calculated by first subtracting Variable costs from sales amount and then subtracting Fixed costs.

If there are no work in process and products at the beginning and end of the period, Operating profit will be the same in both Total costing and Direct costing.

Cost, cost, cost, …It is indeed cost is difficult. A little more, continuing the story of cost.

Backing to the conversation with the Managing Director and the Phantom President.

—The voice or report is reaching to me —Said the Managing Director—. But I cannot feel their enthusiasm. I think one of their lack is enthusiasm. therefore, they cannot move the customers. As you recognized, we have excellent products which have sufficient competitiveness. But unfortunately, such advantages don't reach the customers because of the lack of enthusiastic appeal of the sales department. I will take my leadership to lead the sales department. Of course, I will listen to their direct voice.

At this moment I thought he is like as Japanese. Does he believe in the "Kamikaze spirit"?

Kamikaze spirit

It is a Japanese favorite Spiritual word. Any difficulty can be resolved if having a strong spirit.

Kamikaze? …Kamikaze Squadron

Recently, we hear the name Kamikaze, Kamikaze Drone, or Kamikaze Attack after the beginning of the war between Ukraine and Russia.

The root of this kamikaze is the Kamikaze Special Attack Unit consists of a ramming unit (special attack unit) formed by the Imperial Japanese Navy in World War II.

The target of the attack is a US battleship. The abbreviations are "Kamikaze" and "Kamikaze Special Attack Squadron".

The essence of that spirit is "To protect the national polity by a life. Then the kamikaze will surely blow." (By Wikipedia)

The word Kamikaze was the symbolic word for the soldiers who did suicide attacks and died. Origin of Kamikaze (or Shin-Puu;神風)

Moreover, if going back further to the root, it was the battle between the Mongolian Invasion and Kamakura Samurai.

A storm that caused great damage to the Mongol army during the two Mongol invasions in the roles of Bun'ei (1274. Kamakura period) and Koan (1281. Kamakura period).

The Mongolian Gen, who almost controlled the Chinese continent and the Korean Peninsula, urged Japan to become his client state and tribute to Japan. When Tokimune Hojo, the governor of the Kamakura Shogunate, rejected this request, he attacked the mainland of Japan with a large fleet in order to carry out an armed merger twice in 1274 (Bun'ei 10) and 1281 (Koan 4). At this time, the large fleet followed the forces of Goryeo and others who had been annexed by the Mongols.

In the first role of Bun'ei of the Mongol invasion, according to the historical material "Goryeosa" on the Gen side, the Gen army that landed from Hakata Bay received fierce resistance from the Japanese army, and the deputy commander, Liu Fuheng, left deputy commander. Gen's military commander, Liu Fuheng, said, "Use exhausted soldiers to face the ever-increasing number of enemy troops, not a perfect solution," according to "Son's Military

Law (The Art of the War).". It should be withdrawn. "The Gen army is said to have decided to withdraw.

"The art of War says, 'The strength of a small enemy is the sword of a large enemy.'

"Even if a small number of soldiers (Gen army) fight stubbornly without regard to their abilities, they will end up being prisoners of war in front of a large number of troops (Japanese army)."

And, the Gen army, which forced a dangerous night withdrawal, was hit by a storm during the withdrawal process, and when it returned to Gappo on the Korean Peninsula, it had more than 13,500 non-returnees.

In the second role of the Mongol invasion, Koan, the side of the Mongolian army was forced to struggle in the onslaught of the Japanese army (Battle of Shikashima, Battle of Iki Island, and Battle of Takashima offshore) and stagnated at sea for nearly two months. Mongolian army was confused due to the great damage caused by the typhoon and was destroyed by the total attack of the Japanese army (Mikuriya Maritime Battle / Takashima Mopping Battle). The number of POWs on the side of the Mongolian army reached 20,000.

It was true that the fights of the Japanese Samurai were remarkable. However, the biggest damage to both battles was by the typhoon.

*And people said the 神風**Shin-Puu** (Kamikaze) blew.*

- *神 **Shin** = **Kami**; God.*
- *風 **Fuu** or **Puu** = **Kaze**; Wind.*

—Mr. Managing Director —I pointed out—. your order of stupid policy is like "Capture a deer with a fishing rod and fish a fish in the bottom of the sea with a hunting gun". I haven't seen such a stupid policy —nevertheless and actually, I saw some companies applying such policy—. Moreover, it is ridiculous to use operating income to decide or limit the price than marginal profit and the market situation. My final suggestion is to stop this stupid policy immediately.

—Please listen, Mr. Managing Director —I begged him—. Your company has still many risks.

—Risks!? —he asked surprisingly.

—Yes, there are many risks —I call this attention—. One risk is the high turnover. As usual, your factory had the problem of high turnover by all working Gemba (staffs and production Gemba). And recently, the situation was getting better based on the Gemba-Committee activity which affected the improvement of Employee Engagement…

—As you recognized —I continued—, I taught the 3 ways dimensions which are Gemba Committee Kata, Management Team & Organization Kata, and Management system by Data gathering & use. But again, please understand that these ***Kata's*** maturity is still level ***Shu*** and are required more time. The time and experience bring up the Katas to a sufficient level. The level Shu requires to keep ***Kata*** as taught…

—The decision of dismissal of the Sales manager was very much sorry. And it will cause another turnover to other employees. —And I asked figuratively— did you make dialogues with the sales manager and his staff? —I answered to myself—…Probably, not…

—What did you want to keep by the dismissal of the sales manager? …You wished to keep the command hierarchy of your company…

—Mr. Managing Director —I pointed out—. You are like a "Chief retainer" of the Japanese ***Edo*** period. A vassal (Sales manager) did a clearly good thing. But it was a violation of the orders of the family of ***Daimyo*** (Japanese feudal lord). And, the chief retainer ordered him ***Seppuku*** (***Hara-kiri***)

The Edo period was in the feudal system (Feudal System; From Kamakura period to Edo.). And the order from the top of the hierarchy was absolute to keep the system, even though the act of the lower samurai is correct.

—You look like a chief retainer. —And I detailed just a little more— but please consider the corporate Employee Engagement. I explain it from a little different point. Your company didn't reach a certain level of "Share the sense of value" with employees. Share the sense of value (by employees with the company)…

—Mr. Managing Director, It is very important to increase the purpose of a company. And this point is also one of concern area. Of course, it is also the cause of Employee Engagement.

Now I rather omit further conversations and I describe how the employee engagement theme.

VI. Next Lecture.

My Encounter with Quality Control and its Roots. The Break Even Point Diagram. And finally Continuation of Teaching Company.

Koichi Kimura CC4 – June-2022.

Factory Management Institute