

Basic concept of Monozukuri

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1. What is Monozukuri ?

- ① Monozukuri is an industry and the word which shows the spirit and history.
- ② Prosperity of a Japanese industry is in Japanese traditional culture.
The way of thinking which originates.
- ③ “Monozukuri” is ancient Japanese language=Yamato kotoba (Japan, peculiar word).
- ④ Monozukuri in an enterprise
Monozukuri Way Hitachi metal
Toyota Way
Komatsu Way

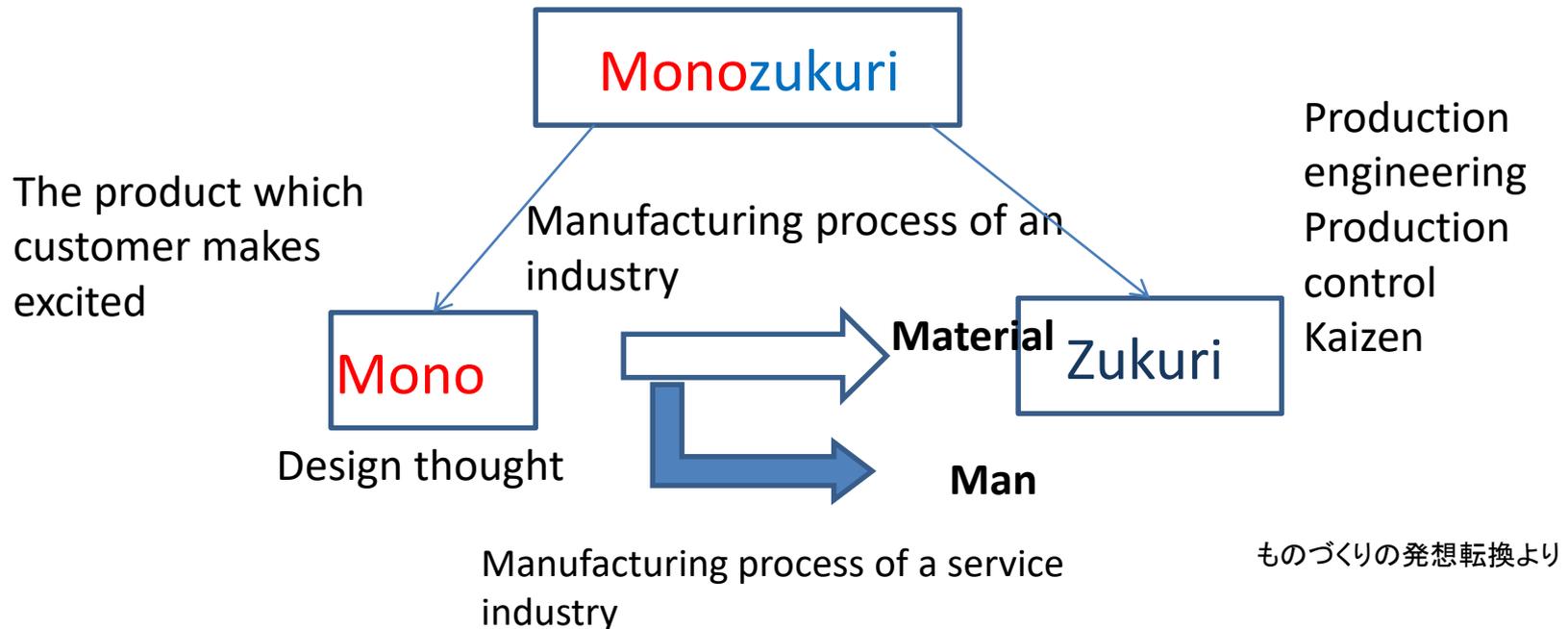
2. Way of thinking of Monozukuri

MonoZukuri = Mono + Zukuri

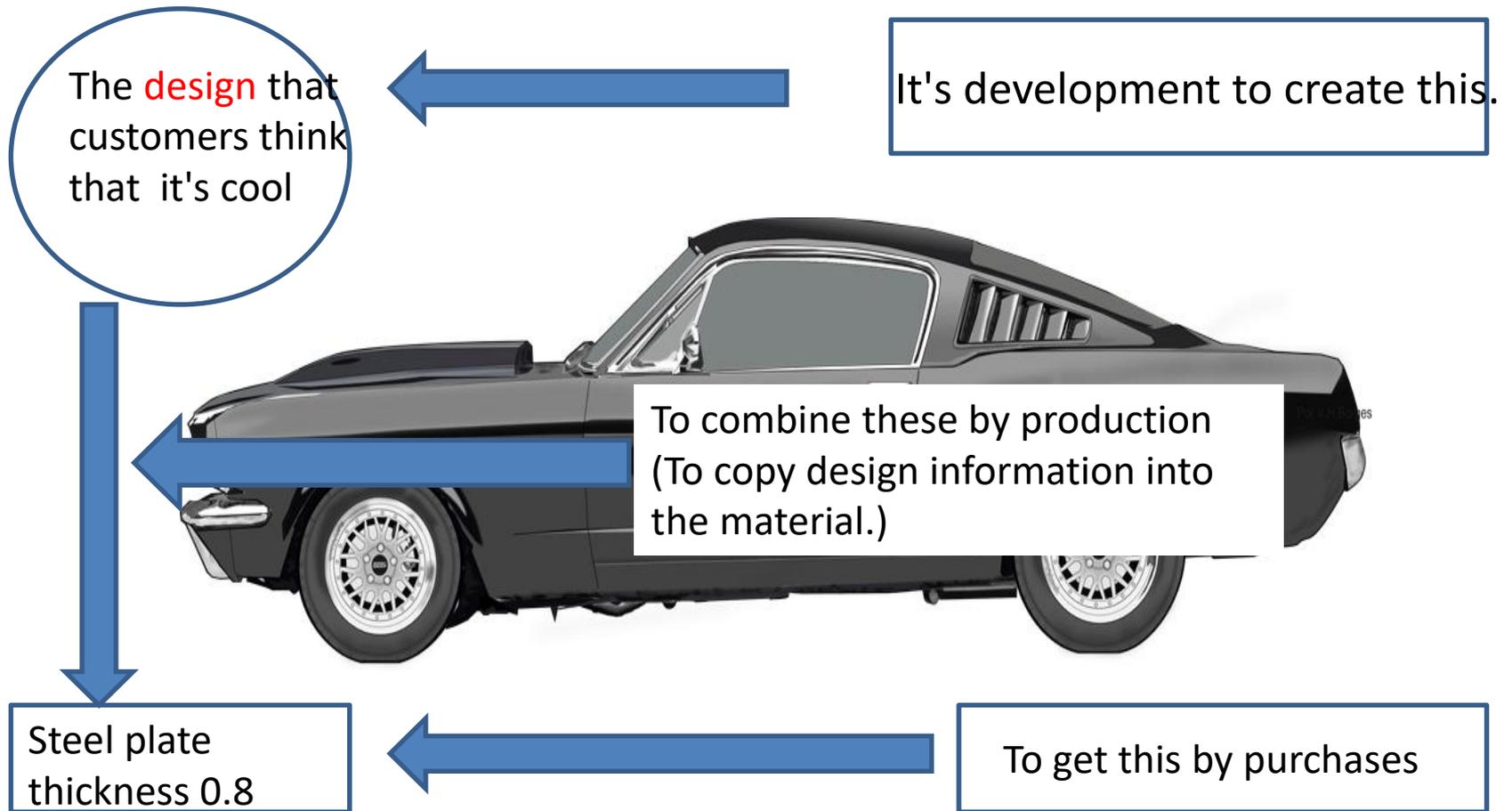
Mono (Thing): It is not a form but a thought and way of thinking
(In the Head) Idea 「Story」・

Zukuri: The process which gives the form in detail to the expectation and idea

(In the hand and foot) By an industry, “production activities”

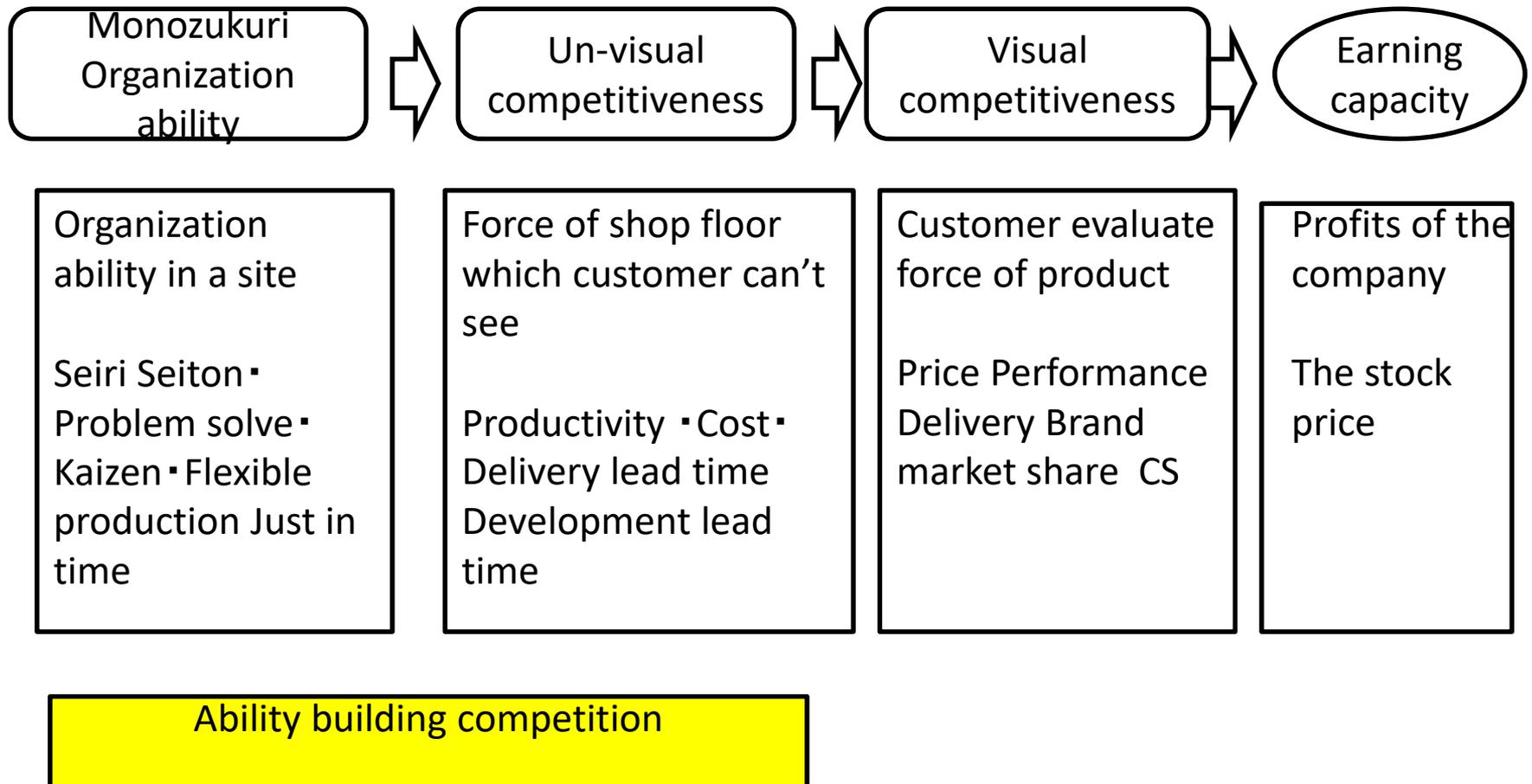


3. Concept of Monozukuri

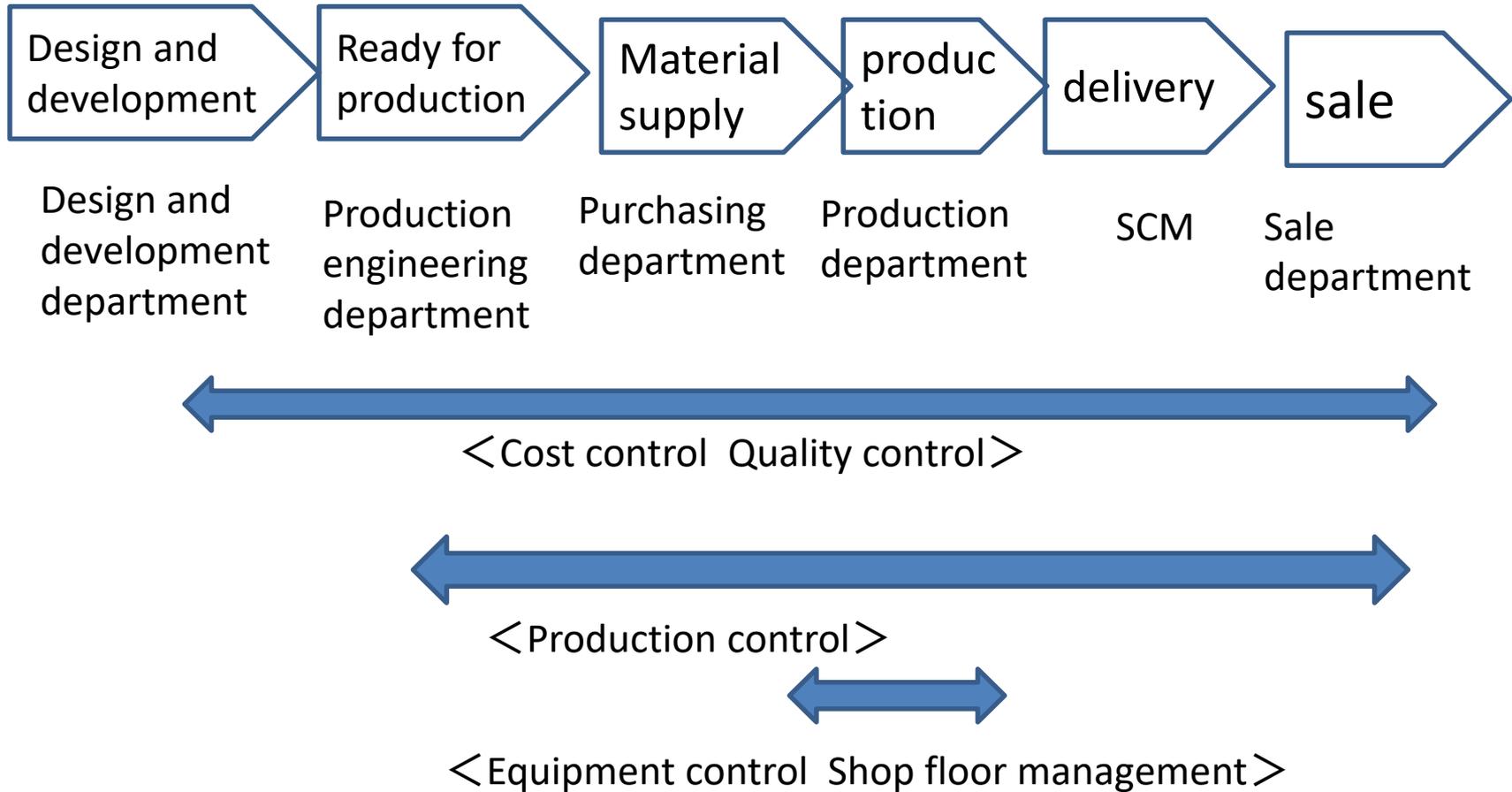


- Monozukuri =
Total system (Design + Production + Purchasing)
- The organizing ability of the Monozukuri isn't copied easily.
It won't be possible to buy it immediately.
- They're better than an other company with advantage of organization ability of manufacturing, site
It's to do creation of a design information and copying.
The one of the organization whole tied to competitive power of an in-house product Force.

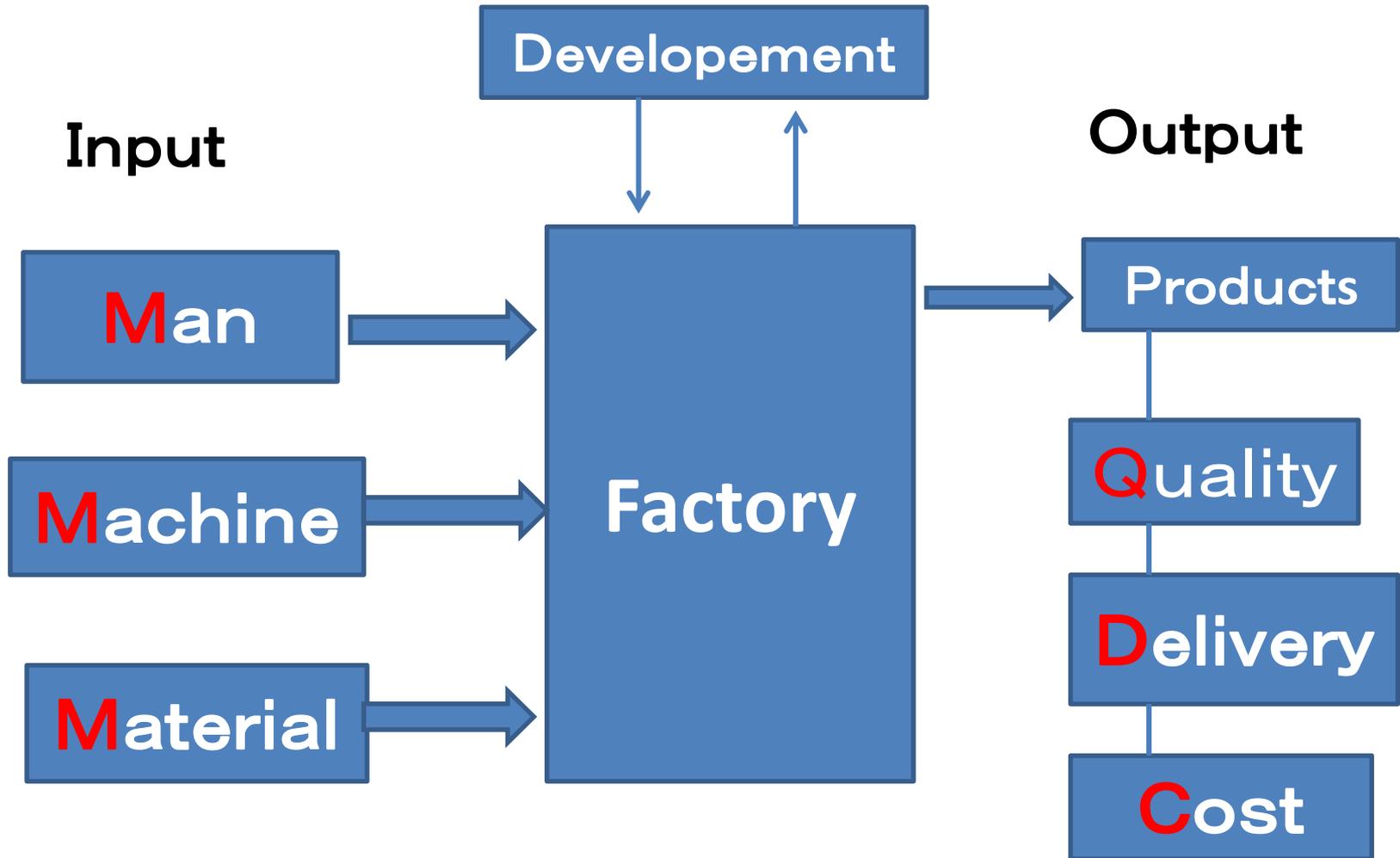
Competitiveness and earning capacity at manufacturing



4. Monozukuri Process



Positioning of Monozukuri



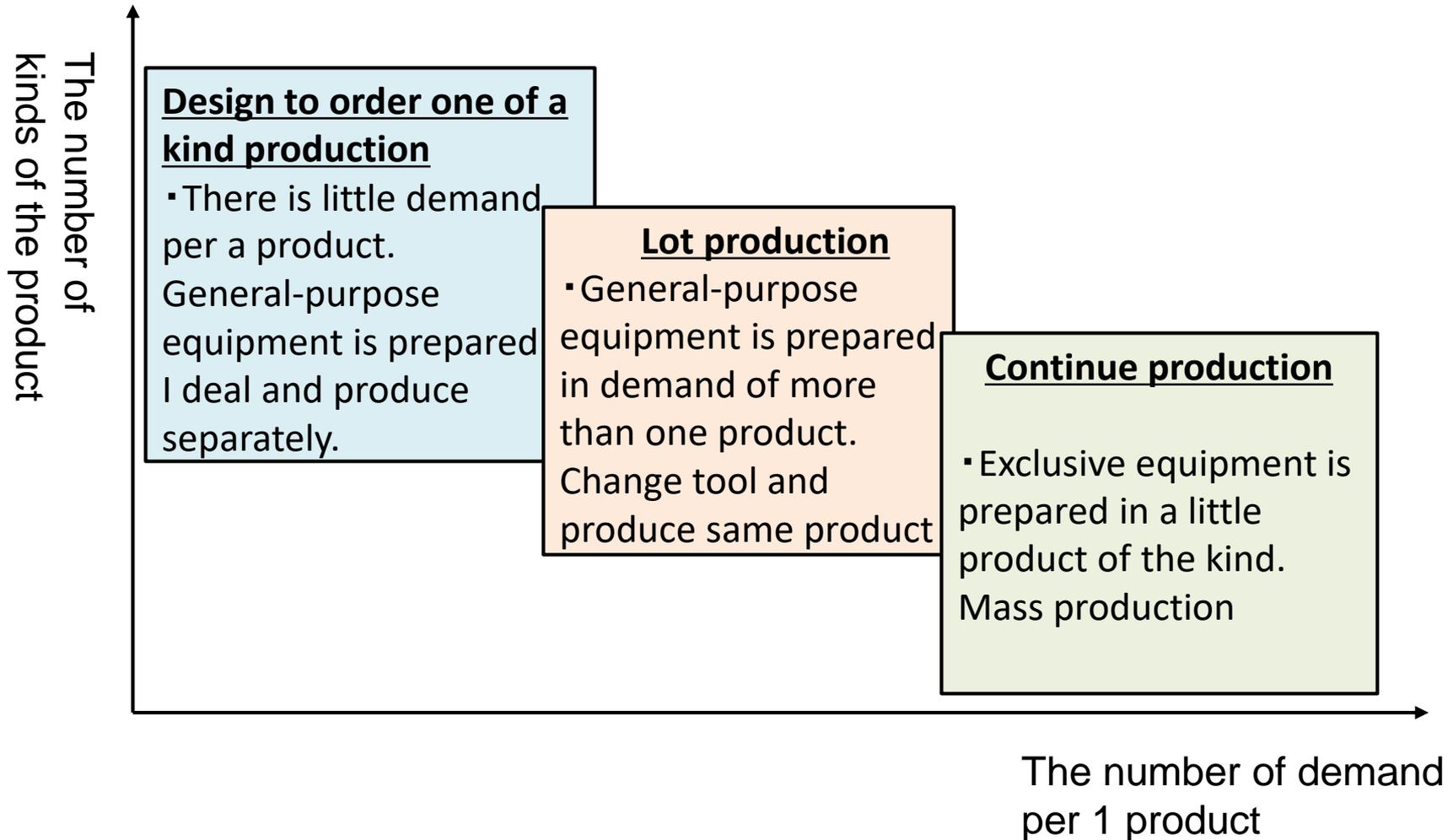
5. Type of manufacturing (order-receiving point)



- ① Stock sale (STS: Shop to Stock)
(Counter sale like a fresh food and cloth)
- ② Stock production (MTS: Make to Stock)
(Electronic)
- ③ Order-receiving assembling production
(ATO: Assemble to Order)
(Export Car)
- ④ Order-receiving specification assembling
production (CTO: Configure to Order)
(Domestic car with maker option)

- ⑤ Order-receiving processing assembling production(BTO: Built to Order)
(Dell computer)
- ⑥ Order-receiving processing (MTO: Make to Order)
General-purpose construction machine
(machining center)
- ⑦ Order-receiving design production (ETO: Engineering to Order) Special purpose machine
- ⑧ Order-receiving design production
(DTO: Design to Oder)
(Cruise ship)

6. Type of manufacturing (the production scale)



7. Production system

① Linear production system

A process of processing and assembly and a operator are being placed on a line and the flowing part is being continued continually. A flow work operation is synonym.



The feature

- * Be stable demand.
- * It's simple work because work is divided.

Car, airplane and medicine

② Cell production system

It's called non-line and opposite against line type of mass-production.

Several workers process it and put together from 1 person.

The production system by which 1 worker manages numerous processes unitarily.



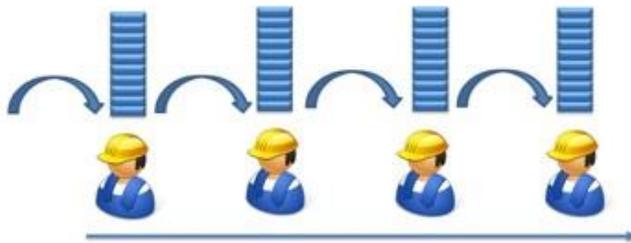
The feature

- * The production product can be changed easily.
 - * Operation times are long, so operational practice is important.
- The home electronics

③ Lot production system

In the same process of operation produce together.

Lot



One by one



The feature

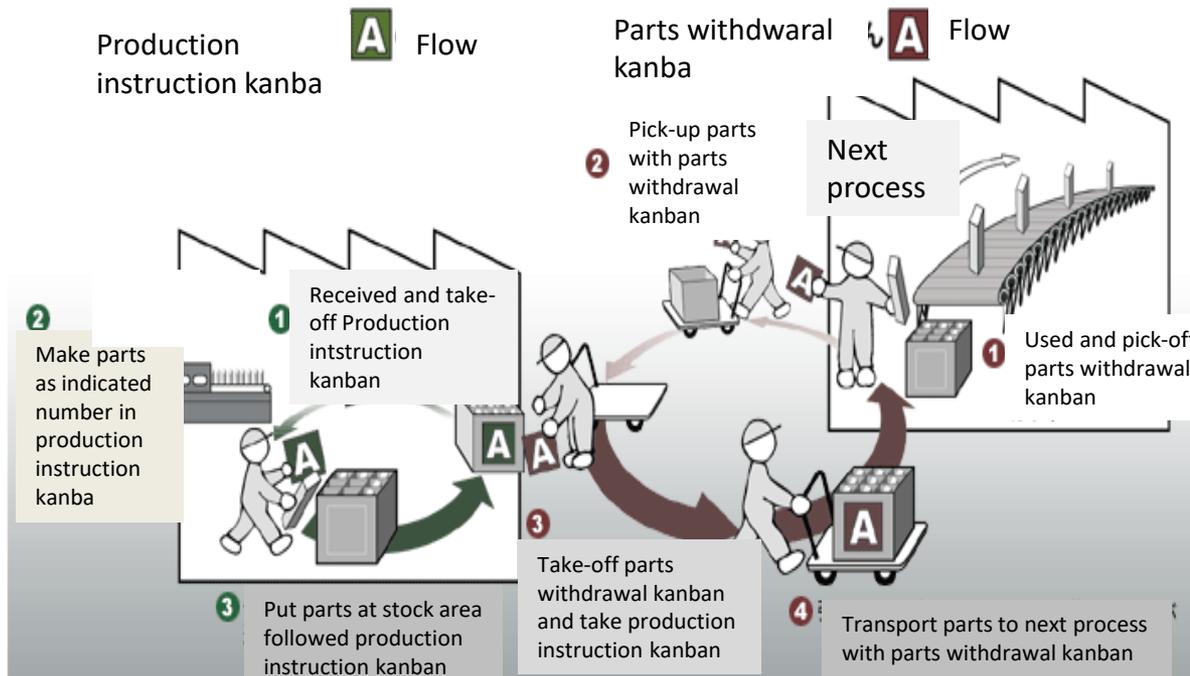
The kind is much.

We are adjustable production which are mass production and small demands.

④ JIT KANBAN

Parts withdrawal kanban

Concept Kanban



- ① Used and pick-off parts withdrawal kanban
- ② Pick-up parts with parts withdrawal kanban
- ③ Take-off parts withdrawal kanban and take production instruction kanban
- ④ Transport parts to next process with parts withdrawal kanban

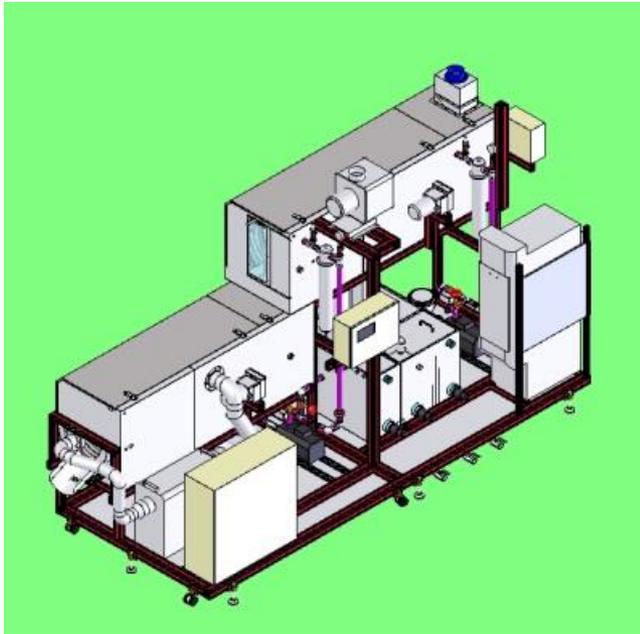
Production instruction kanban

- ① Received and take-off Production instruction kanban
- ② Make parts as indicated number in production instruction kanba
- ③ Put parts at stock area followed production instruction kanban

⑤ Discrete production system

It corresponds to customer's request, order and order.

The, every time, the manufacturing system produced from a design.



The feature

The number of kinds is 1 according to the customer.

The specification according to the customer.

A producer often decides a due date.

Every ordering we make and produce a procedure plan and a schedule plan.

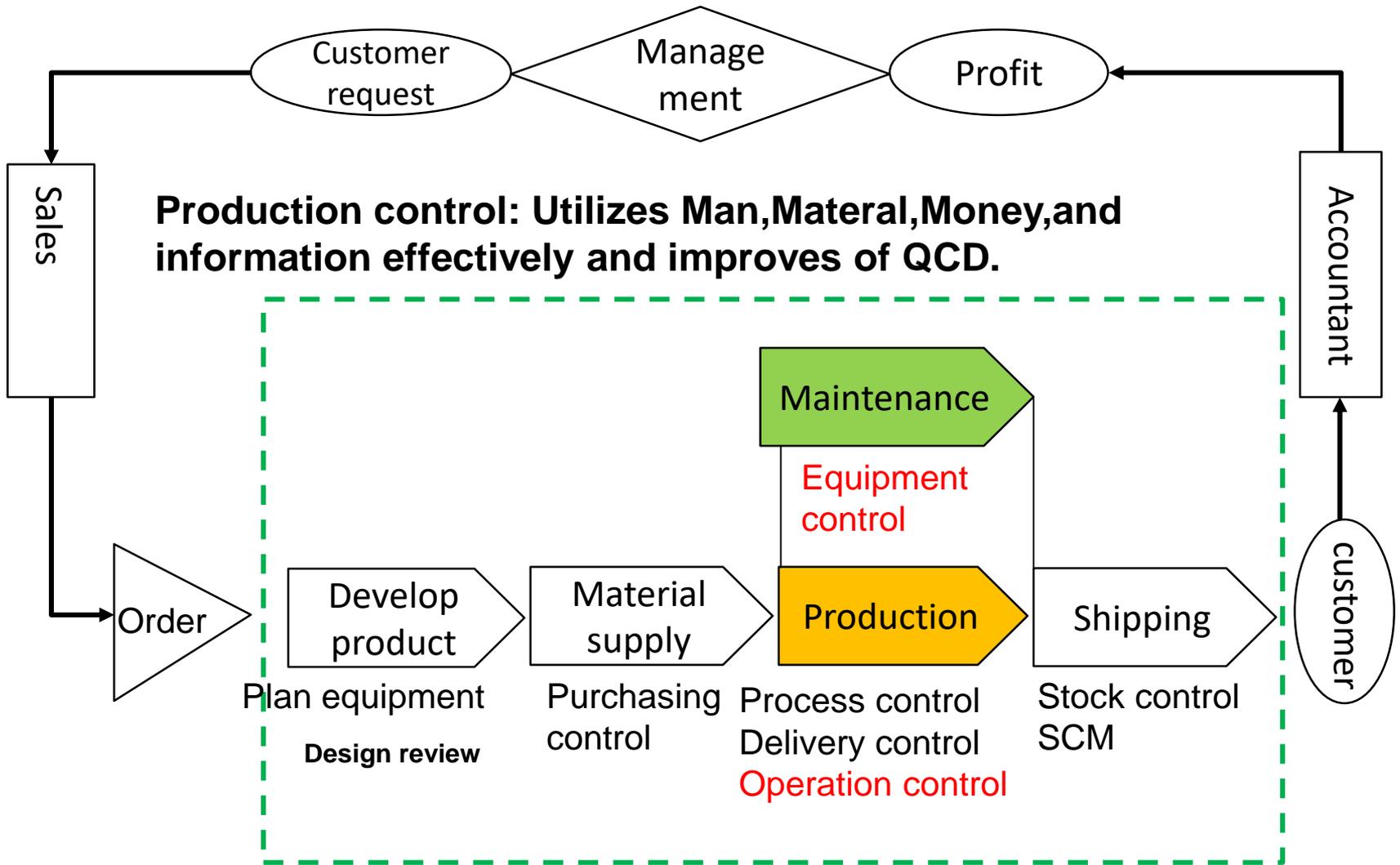
Cost management is managed accurately, it's necessary to do.

Ship/ Equipment(Machine)

8. Ranking parts maker

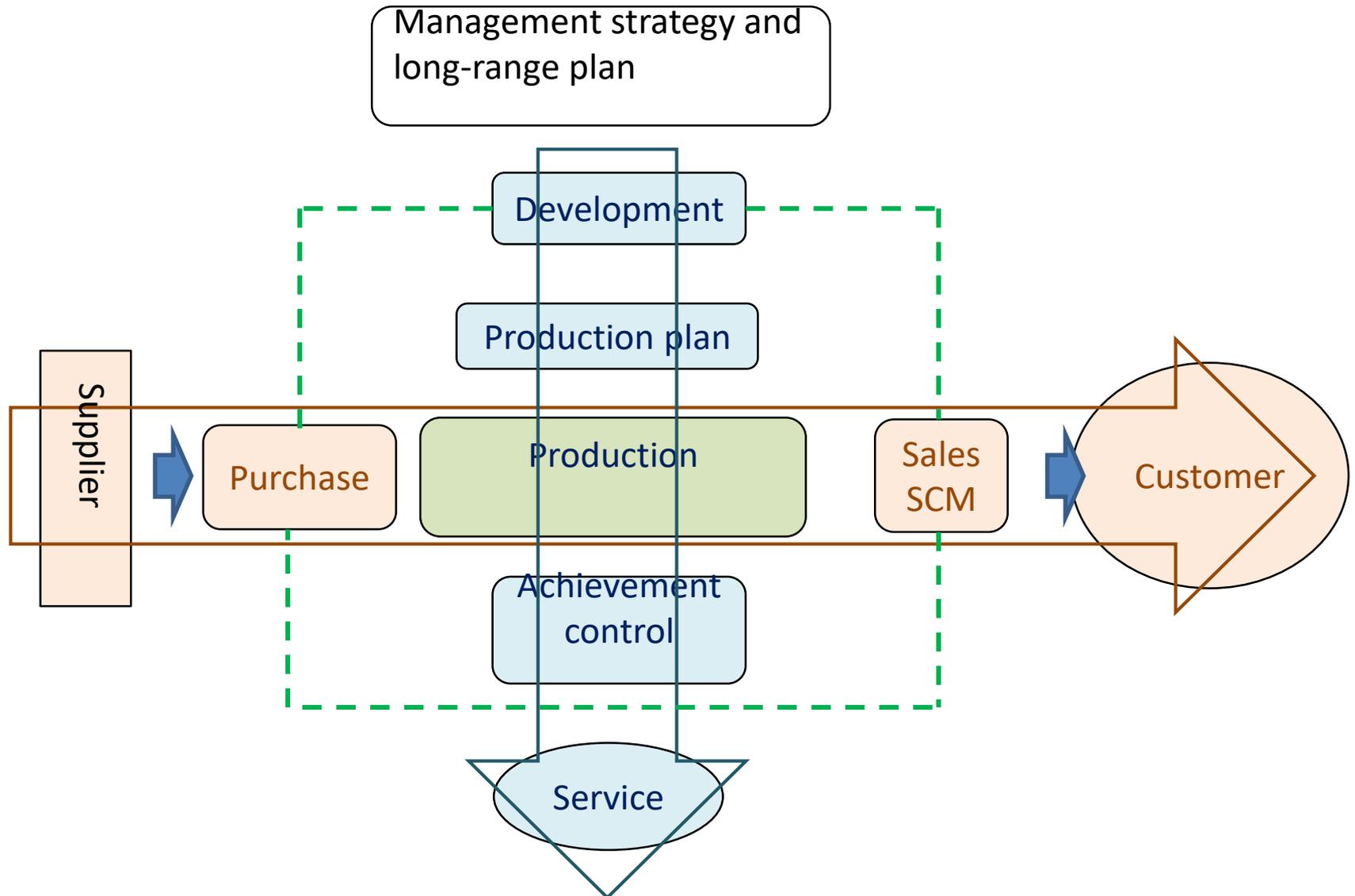
- ① Request origin even does a detailed design and parts maker produces with the drawing. (Loan figure) Bolt Bracket covers
- ② Request origin draw to rough detail drawing and specification.
A parts manufacturer will complete a in-depth drawing.
(Approved drawing and trust figure based on a specification figure)
Oil-pan Brake disc
- ③ Request origin show specification and the outward appearance.
Parts maker make detailed design. (Approved drawing based on a specification and trust figure) Head lamp radiator
- ④ A parts maker plans as a house brand and develops it.
Request origin purchases that. (Articles on free market)
Battery tire oil

9. What is production control ?



Q:Quality C:Cost D:Delivery

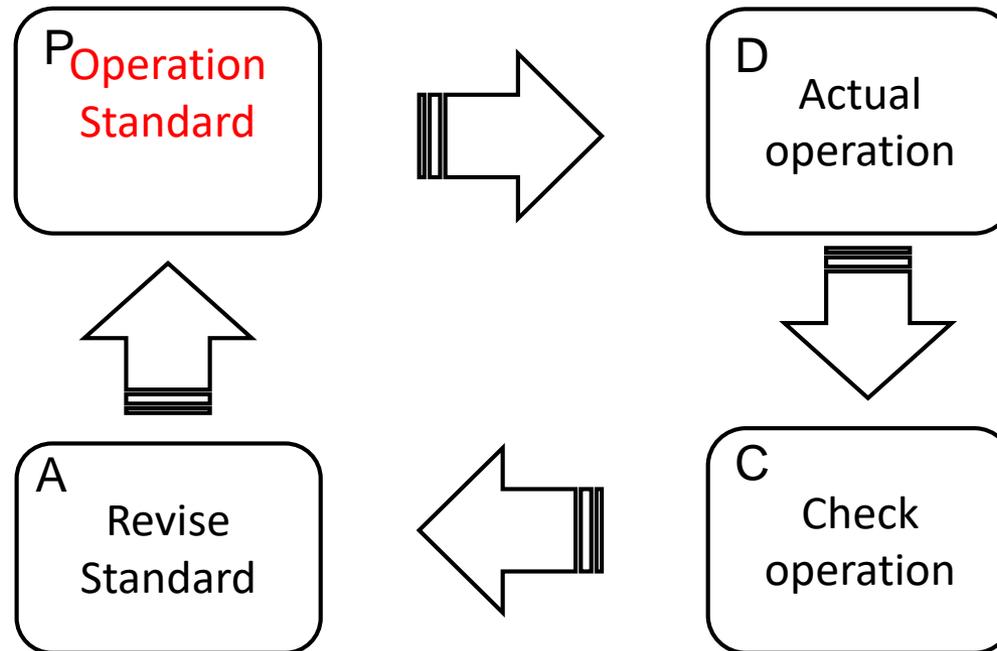
Flow of 2 big business in a factory



① Kind of Production Control

Plan	Term	Main purpose	Input	Relation
Long term	1 ~ 5year	Long term development and investment	Long prediction of demand, circumstances of research and development and business trends	Technical innovation and market trend
Periodical	yearly	Make clear complement of equipment, the number of persons, the data and funds.	Sales plan Productive capacity	Fiscal year budget. It'll be a basis of an execution plan.
Monthly Plan	Monthly	The time when I need the mechanical equipment, the number of persons and the investment wealth of the ingredient is set.	The quantity demanded, the total stock and the productive capacity	Basis of the monthly budget.
Schedule	Weekly Daily	Start production date and time.	Monthly production plan Due date and the productive capacity	The sales trend also makes them reflect.

② Operation control



- To advance a process control and schedule management smoothly.
- Improvement of the productivity by improving a bad part.
- IE is used as a way of job improvement.

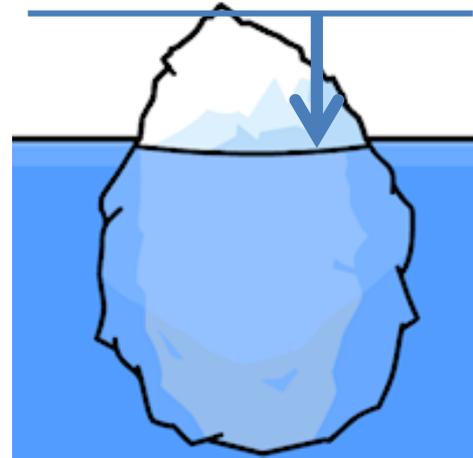
③ The merit which does inventory control

A strong company is doing inventory control thoroughly.

TOYOTA ▪ Seven-Eleven ▪ Costco ▪ Apple

< Merit >

- Improvement cash-flow
- Improvement trust of company
- Improvement productivity
- Decreasing overhang of stocks
- Making space
- Shortage decreases.
- The quality becomes stable.
- It'll be a safe workplace.
- The standard and judgment will be make.



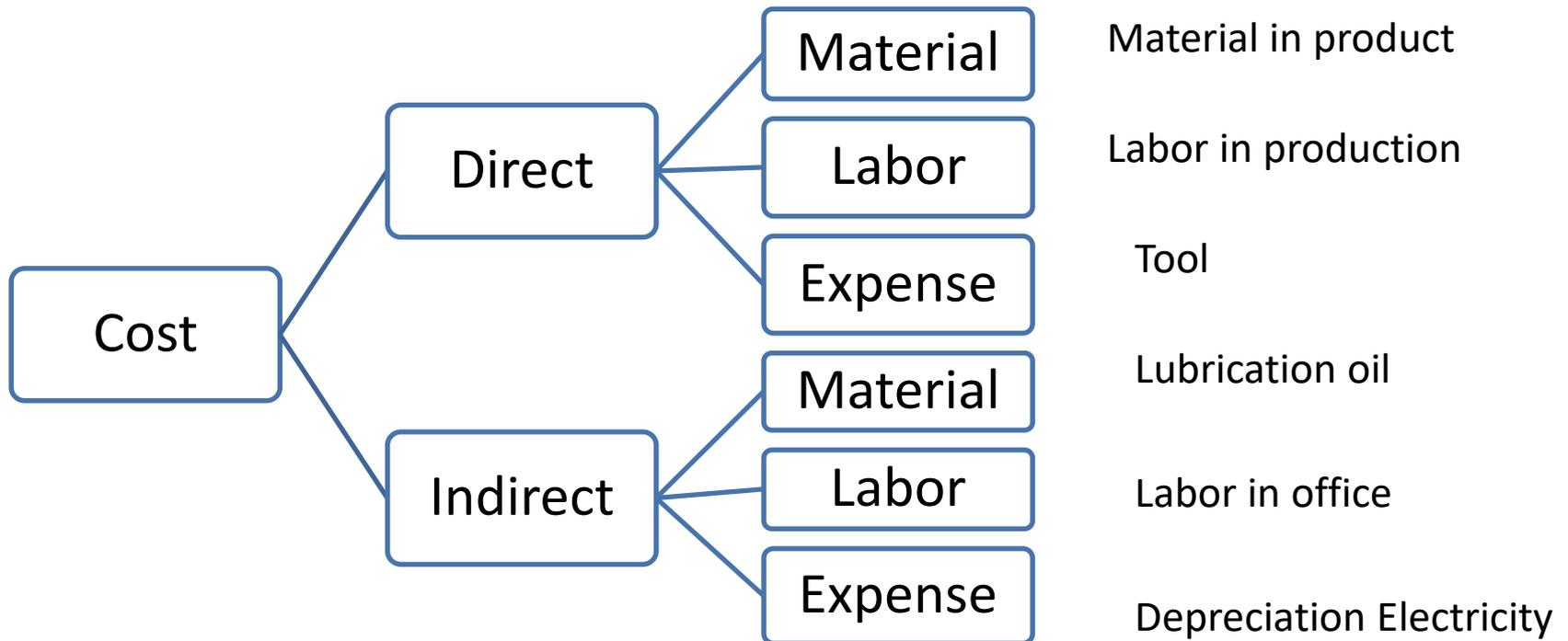
Stock conceals a bad thing.
The water level is lowered and
(stock is reduced), and we clarify
the bad.

④ Cost control

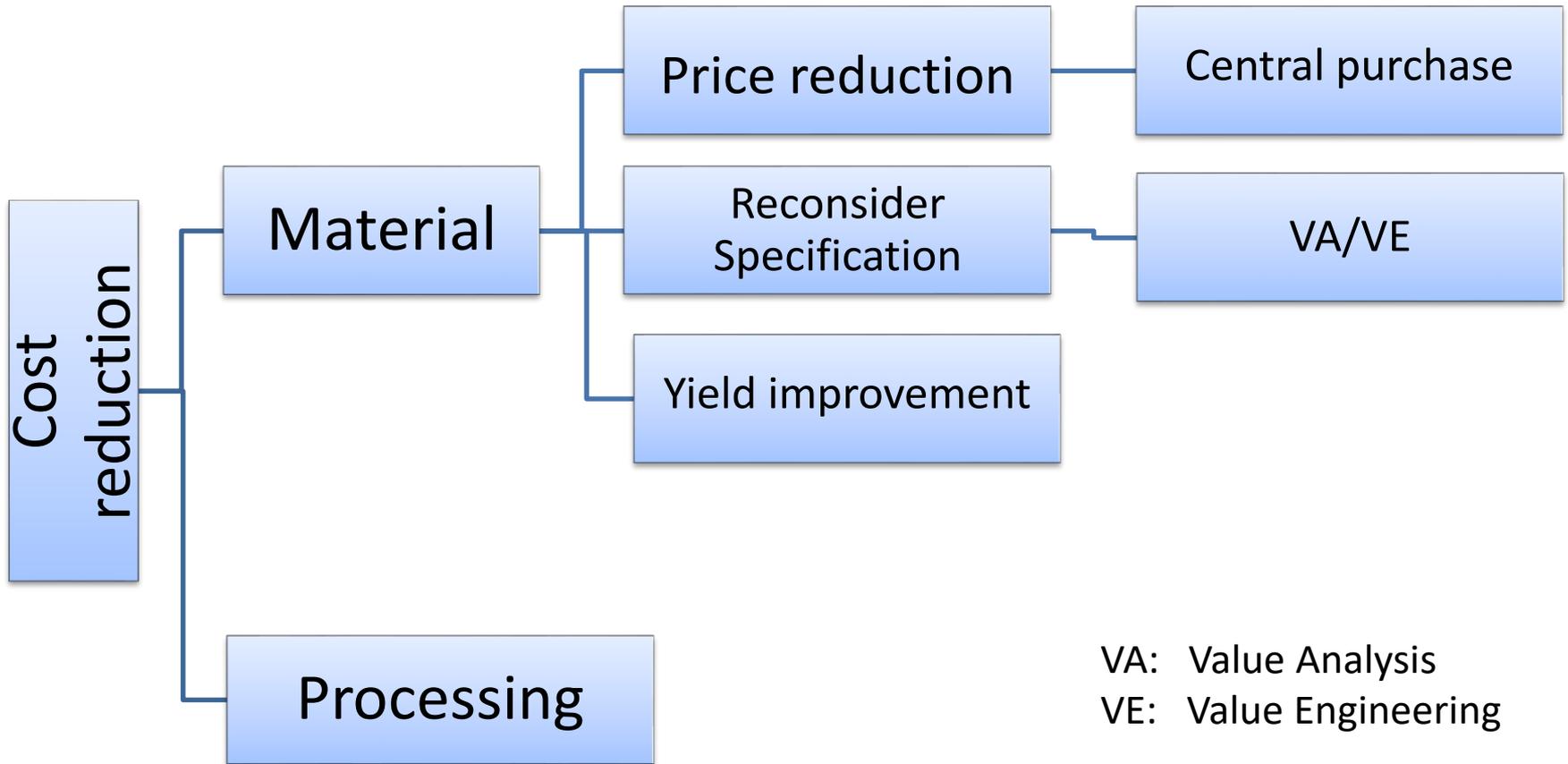
$$\text{Price} = \text{Cost} + \text{Profit} \quad \text{or} \quad \text{Price} - \text{Profit} = \text{Cost}$$

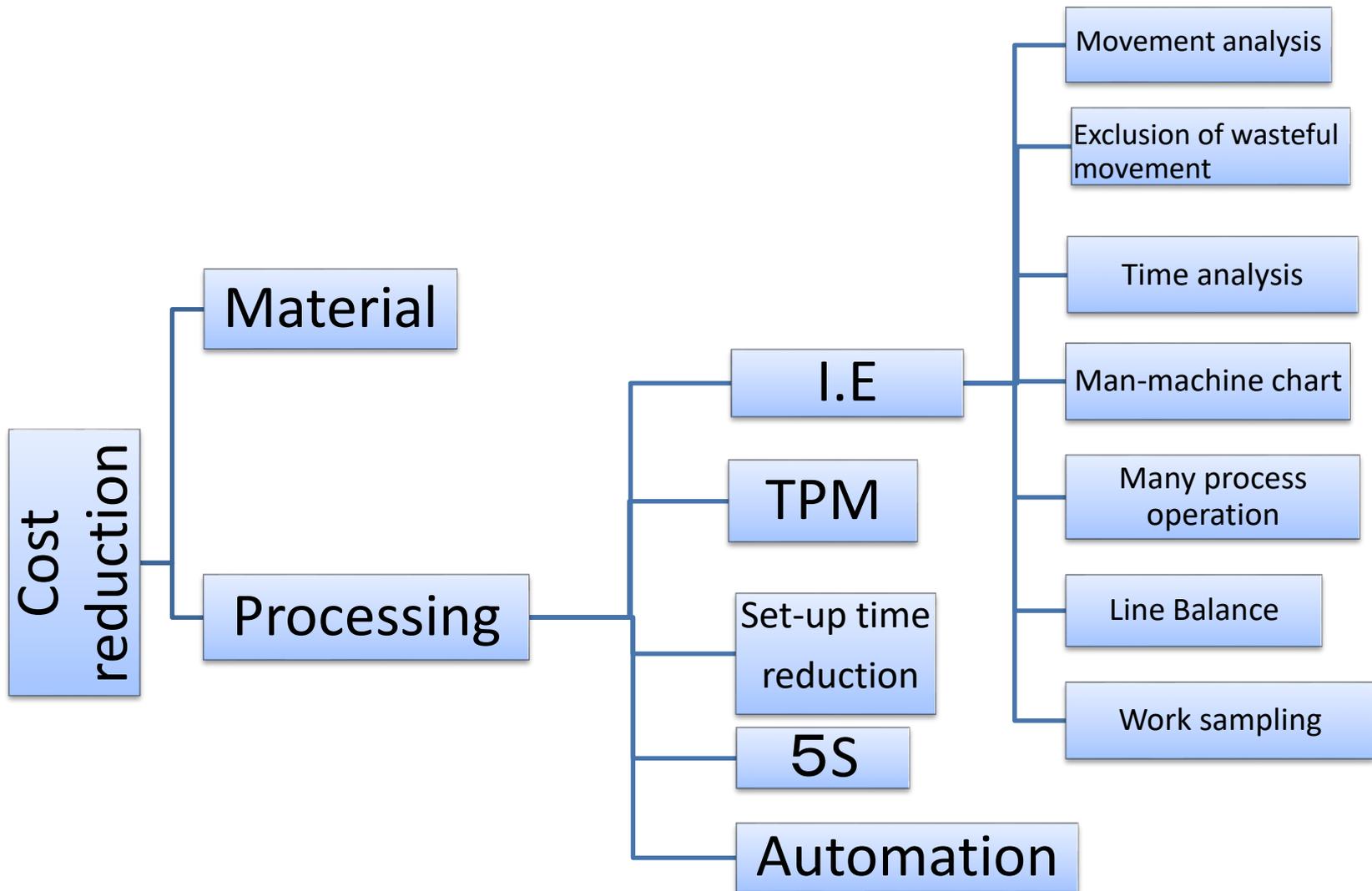
< Way to make the profit big >

- i The selling price is made expensive. -> A competition other company is here, and it's difficult.
- ii Number is increased. -> Demand doesn't develop. Equipment is necessary for production increase.
- iii The production cost is lowered. -> An effort can be made with the material cost, a labor cost and the expenses.



11. Cost reduction





12. Quality control

What is quality control?

Thing of the quality which meets the consumer's request or the system to produce service economically. I wrestle at all sections.

< Basic way of thinking >

1. Quality First
2. Customer Oriented
3. Next process are customer
4. Control process
5. It's oriented to emphasis and it's managed. (The quality is made with a process and it's crowded.)
6. Management based on fact
7. Control cycle (PDCA Cycle)
8. Management of variation balance
9. Point of change of management
10. Visualization

① QC 7tools

	QC 7tools	New QC 7tools
1	Pareto diagram	Affinity diagram
2	Characteristic diagram	Input-output diagram
3	Graph(Control chart)	Schematic diagram
4	Control chart	Matrix diagram
5	Check seat	Arrow diagram
6	Histogram	PDPC(Process Decision Program Chart)
7	Scatter chart	Matrix data analysis
8	Stratification	
	At a manufacturing shop-floor, numerical analysis of a defect analysis.	Directionality of a problem by linguistic information of an indirect section is found.

② QC Circle

What is QC circle?

QC circle are small groups which are continuously improving the quality of product and service in front of workplace.

Bottom-up Activity



A proprietor and an administrator support and guide this activity. And the humanity is respected and at full participation and support are performed for development of an enterprise.

③ QC Story

Procedure		Action	Tool
1	Theme select	1.Bring problem 2.Evaluation and Squeeze 3.Selection Them	Brainstorming Stratification Matrix diagram &Pareto diagram
2	Research on present level	1.Correcting data 2.Research an approach of problem solving	Pareto diagram Graph
3	Setting target	1.Setting concrete target (what. when. how many)	Pareto diagram Graph
4	Action plan	1.Create detail action plan	
5	Analysis of the factor	1.Checking factor 2.Analysis factor 3.Research root cause	Characteristic diagram Matrix diagram Why why
6	Study countermeasure	1.Setting countermeasure 2.Evaleate countermeasure and refine.	Brainstorming Matrix diagram
7	Implement countermeasure	1.Clear 5W1H 2.Make actual plan	Check sheet
8	Confirm of effectiveness	1.Correct data and evaluate each countermeasure 2.Check level against target 3.Check Intangible effects	Pareto diagram Graph Check sheet
9	Establish of standard and control	1.Standardization 2.Inform to relation ship	5W1H
10	Review and next plan	1.Review action 2.Make countermeasure of new problem	Check sheet Matrix diagram

13. Facilities management

What is Facility management?

<Importance>

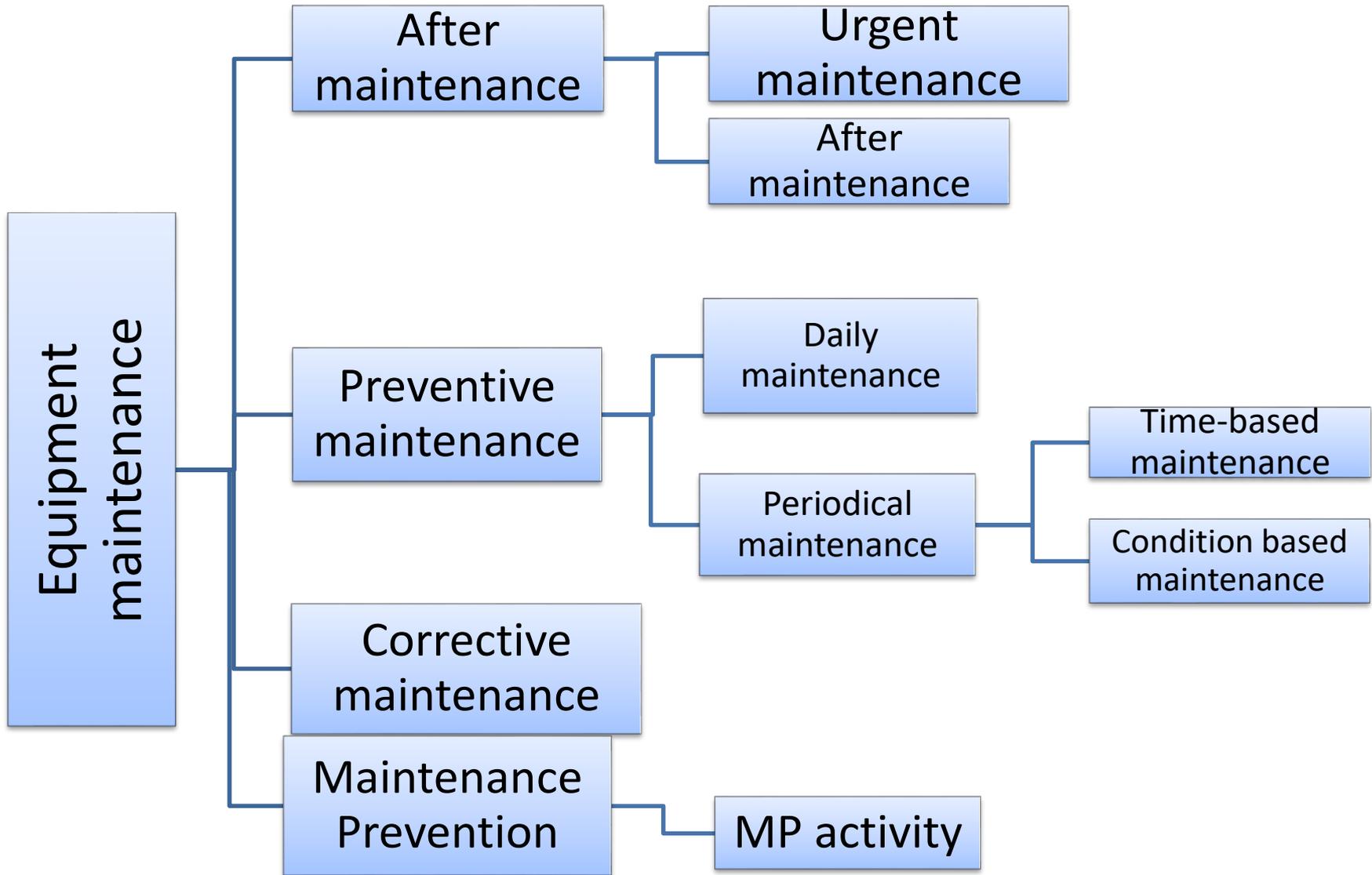
Quality (Q), Cost (C) and Delivery (D) are influenced by equipment big.

- The influence to business profit by defect present of equipment is enormous, and the high preservation technology which doesn't make equipment stop is indispensable.

<Roles>

- Level-up productivity of equipment and facility.
- The money-like value of the equipment is raised.
- Formation of the human group the energy which said strong human education and workplace making to equipment overflows.

① Style of Equipment maintenance



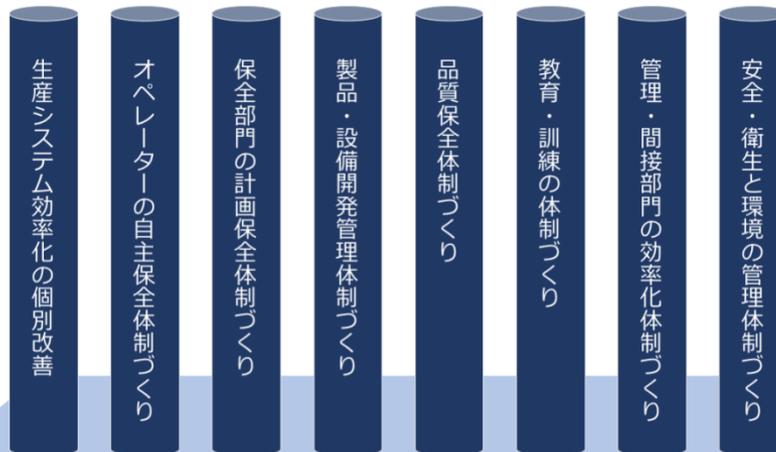
②TPM

TPM (Total Productive Maintenance)

History: After maintenance ⇒ Preventive maintenance ⇒
Productive maintenance ⇒ TPM

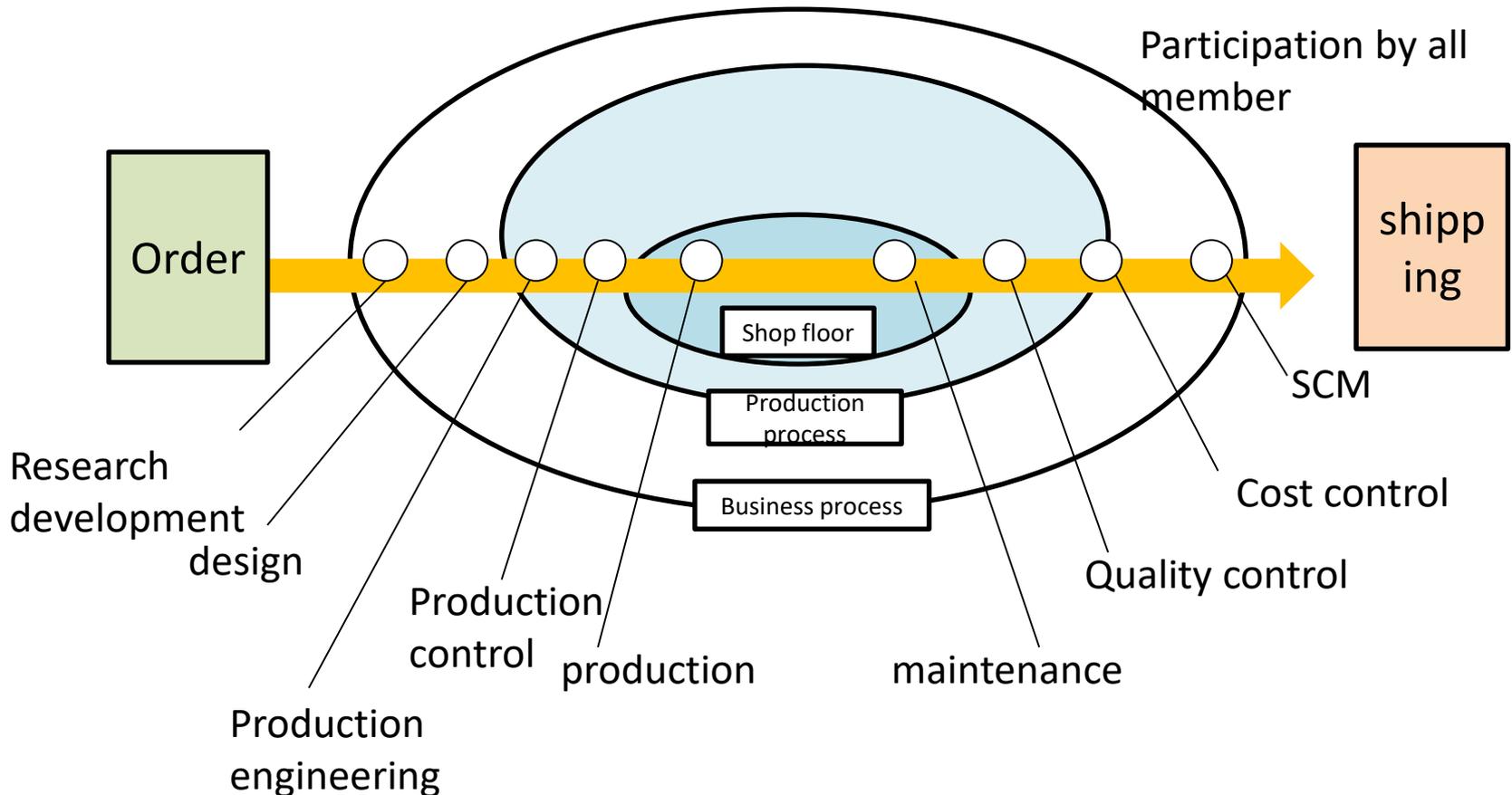
Purpose: Reforming for enterprise aiming improvement
of productivity

TPMの8本柱



1. Individual improvement of production efficiency
2. Independent preservation by an operator
3. Plan preservation of a preservation section
4. Product and equipment development management
5. Quality control
6. Education and practice
7. Efficiency of a management indirect section
8. Safety, the hygiene and environmental management 1.

TPM reforms "manufacturing premise", "production process" and "business process".



TPM and JIT

Basic concept	JIT	TPM
Company-wide manufacturing technology directly connected with management	IE make money.	TPM make money
Exclusion of thorough waste	<ol style="list-style-type: none"> 1.Muda of over production 2.Muda of waiting 3.Muda of conveyance 4.Muda of process 5.Muda of inventory 6.Muda of motion 7.Muda of correction 	<ol style="list-style-type: none"> 1.Brake –down 2.Setting –up adjustment 3.Tool –change 4.Start –loss 5.Choko –tei(small stop) 6.Low speed 7.Correction
Prevention	<ol style="list-style-type: none"> 1.Failsafe device(poka-yoke) 2. Prevention better than cure 	<ol style="list-style-type: none"> 1.Maintenance prevention 2.Prventive maintenance 3.Corrective maintenance
Hand-on physical (actual place actual goods)	<ol style="list-style-type: none"> 1.Kanban 2.Visual control management 	<ol style="list-style-type: none"> 1.To make ideal style in equipment 2.Visual control EFU 3.TPM activity board
Participation in management	<ol style="list-style-type: none"> 1.Multi processing handling 2.Paticipate production system 3. job satisfaction 	<ol style="list-style-type: none"> 1.Autonomass maintenance 2.Accident zero brake-down zero correction zero 3. lively workplace

TPM and TQC

	TQC	TPM
Purpose	Improvement of the physical condition	
Objection of control	Quality (out put side result)	Equipment (input side cause)
Accomplishing objective means	Systematization of management (system standard) Soft wear oriented	Realization of the true form of the site actual article Hard wear oriented
Human development	management technology oriented (QC)	Peculiar technology oriented (Equipment technology and preservation skill)
Small group activity	QC circle	Uniting of office organization activity and small group activity
Target	Quality PPM level	Drastic exclusion of loss waste

14. The improvement power of the genba of Japanese monozukuri

① Deep accumulation of the industry, the technology and the skill which are in the country enterprise

The industrial accumulation high by the full line-up from the material of the wide field to an final product

There are various elemental technology and accumulation of a skill.

② Uniting of a maker and a user

A maker and a user bring up mutual while carrying on a dialog through goods, and it's in the relation raised each other. There is culture when the maker with expectation who says "He'd like to make a customer glad to make something good." achieves that while catching user's severe expectation (unreasonable demand) and challenging.

③ Genba emphasis and the problem solved ability of the genba

Genba emphasis and the problem solved ability of the genba The process a site finds a problem by itself and considers a reform measure personally, and which plans for problem solving, the organization is often doing internal organs.

④ Emphasis Multi skill worker

Each engineer is consistent by himself from development to a design and production, and the feature which can be common to a Japanese fine small-to-medium-sized manufacturing enterprise is performed all round skilled labor.

A cell manufacturing system is to raise employee's motivation by upbringing of all round skilled labor and reinforcement, and it's the system to plan for productivity improvement.

⑤ Emphasis of a sense of togetherness and belonging consciousness of the teamwork organization.

Work by a team and a group is emphasized by a Japanese company, and the coordination will be an important element in addition to the leadership power for the quality a person in charge of a team can find.

The power of the group which said that I worked on a problem of a team will be a cluster, and one of the advantages of the Japanese company.

⑥ The enthusiasm with which something better is made

Fine commitment to support-less of the corner cutting, the quality and the function of the Japanese product is supported by the national character with the spirit to which I say "I'd like to make a person glad always to make something good."

15. Problem of Japanese Monozukuri

① Rapid increase non-regular employees

- Change in employee's belonging consciousness

② Quality problem

< Huge of Recalls >

- Swell of the design man-day by the reduction in development time and sophisticated function.
- Impoverishment in a site by the restructuring. (engineer's loss)
- hundred-percent subcontracting.
- Skill decline by increase of non-regular staff and black box of a process.
- Weakening of Human resource development by internal education. (OJT)
- Increase of built-in software.
- Rise of consumers side's demand standard.

Basic Outline of Monozukuri

Fin