How to find out weak point of factories

H.TORIKAI

What is Factory Diagnosis?

- Factory diagnostics is a check in a manufacturing site, but an important element of the constitution value of the whole enterprise.
- A result of the factory diagnosis is an expression of the general make-up of the enterprise.
- The advantage and the weak point of the target factory are estimated numerically and it‘s made a guideline of qualitative improvement of business of a factory.
- We can cross-cuttingly objectively in the quantitatively evaluate other own factory and other factory all so as consultant.
- For improving thoroughly factory diagnosis is here, and I investigate, itself isn‘t supposed to be the purpose.

Factory diagnosis

＜Point of Diagnosis＞

1.Production strategy(Products・Technology・Human development・Equipment）

2. 4S（Seiri・Seiton・Seisou・Seiketu）

3. Factory Layout（equipment Layout Line allocation）

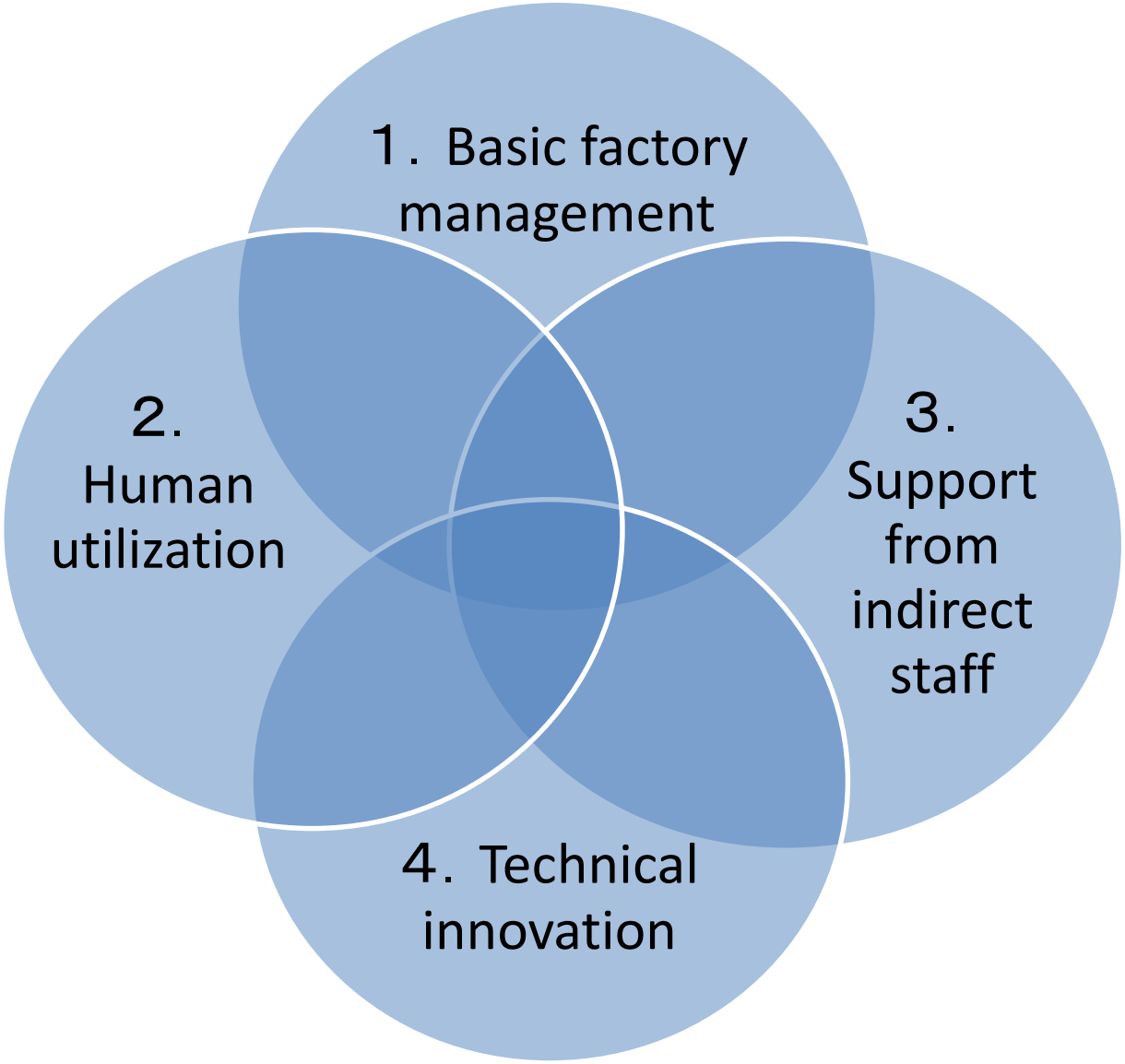
4. The operational efficiency（ Elimination of Waste ・Standardization)

5. Goods flow more（Process control・ Logistics management）

6. Quality control（ Quality standard and the process quality）

7. Development system of human resources（ multi-skill development・OJT）

Factory diagnosis



1. Basic factory management
   1.Quality control
   2.Cost management
   3.Production control
2. Human utilization
   4.Human development
   5.environment・Safety
   6.Activation of work shop
3.Support from indirect staff
   7.Material ,material handling
   8.Equipment management
   9. standardization
4.Technical innovation
   10.productivity
   11.Net work control
   12.Information management

Factory diagnosis check item①

Large	Middle	Check item	small	middle	large
1.Basic factory management	1.Quality control	1.Early stage quality control			
		2.QC process sheet			
		3.QC 7tools			
	2.Cost management	4. Utilization target cost			
		5.VA/VE activity			
		6.Cost calculation			
	3.Production control	7.Production control system			
		8.Schdule of production			
		9.Visual control			

Point	detail
1	Initial level
2	Not enough
3	lowest necessary level
4	Room for improvement
5	Ideal level

Middle point＝∑small point／N
Large point＝∑middle point／N

Factory diagnosis item②

Large	middle	Check item	small	middle	large
2. Human utilization	4.Human development	10.Training education system			
		11.Fexible organization			
		12.Multi operation			
	5.environment・Safety	13.Safety standard in shop floor			
		14.Work environment improvement			
		15.environment management system			
	6.Activation of work shop	16.Utilization 5S			
		17. Activity of Kaizen and suggestion			
		18.Small group activity			

Factory diagnosis check item③

Large	Middle	Check item	small	middle	large
3.Support from indirect staff	7.Material ,material handling	19.Materal control			
		20.Inventory control			
		21.Material handling control			
	8.Equipment management	22.Factory layout			
		23.Equipment maintenance management			
		24.Jig and tool control			
	9. standardization	25.Standard operation sheet			
		26. Calibration of measuring instruments			
		27.Standardization and utilization of product and parts			

Factory diagnosis item④

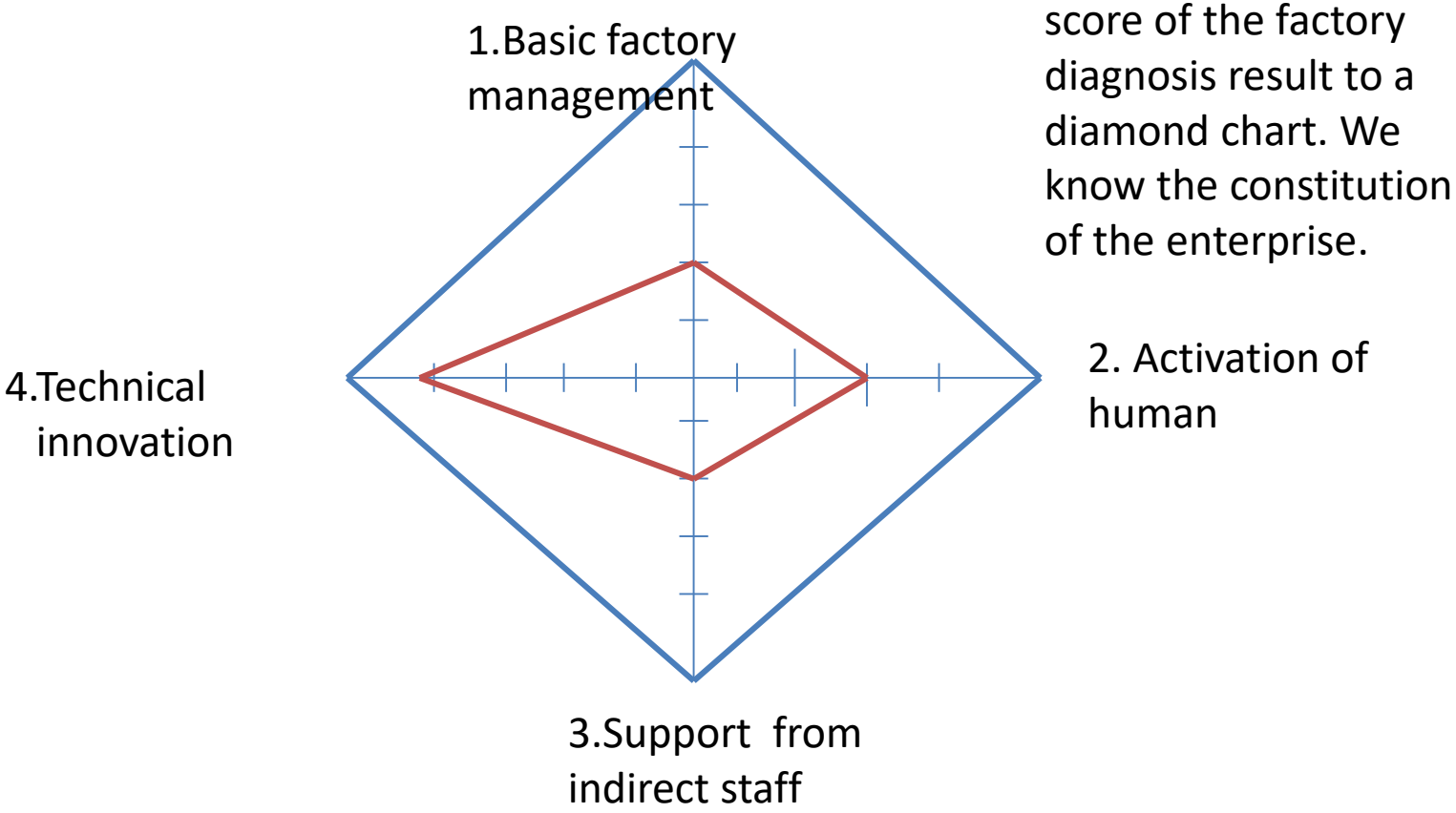
Large	Middle	Check item	small	middle	large
4.Technical innovation	10.productivity	28.Labor-saving			
		29.Production capacity control			
		30.Utilization standard time			
	11.Net work control	31.Bar cord (POP utilization)			
		32.Inter net utilization			
		33.CAD/CAM/CAE utilization			
	12.Information management	34.Drawing control			
		34.Information of claim control			
		36.Cost information control			

Radar chart（Result of diagnosis）

Sample

item	content
1	Even an on-site level doesn‘t permeate. A revise on a QC process figure is delay.
2	VE activity and cost control is not done.
3	During OJT implementation to a staff.
4	New comer training isn‘t being done. Only OJT.
5	ISO14000 isn't acquired. Safety and health activity isn't being put into effect.
6	Suggestion activity and small group activity delay.
7	Too much un-necessary good
8	Done equipment check
9	Operation sheet doesn‘t permeate.
10	ST was utilized
11	Standard time isn‘t being utilized.
12	drawing isn't shared.

Diamond chart（diagnosis result）



The one which showed the large score of the factory diagnosis result to a diamond chart. We know the constitution of the enterprise.

Concrete check evaluation standard①

1.Quality control

Point	1.Early stage quality control	2.QC process sheet	3.QC 7tools	
1p	The quality about the product which can be put just after the development is being confirmed, but there are no records.	A QC process sheet isn't being made and thinks it won't be also necessary from now on.	QC 7tools isn‘t utilized. A measure is also its place endurance.	Don’t know  Don’t need
2p	A record is left about mass-produced goods just after the development, but it isn't utilized.	It's made, but a QC process sheet is for submission to the user. It isn't used at a site.	A person understands QC 7tools. Assessment of current conditions can be even done.	Have record  Didn’t utilize
3p	There are no clear procedures about early stage quality control. I record it.	It‘s made, but a QC process sheet is never maintained.	The person who understands QC 7tools can even do assessment of current conditions accurately.	Can use in some part.  Didn’t maintenance
4p	I have a procedure manual of the early stage quality control. But it isn‘t utilized aggressively.	A QC process sheet is used. Maintenance is behind schedule.	The visual management being done. We aren't all the members yet.	Utilize  Delay maintenance
5p	A record has a procedure manual of the early stage quality control, and is utilized.	A QC process sheet is used and is also applied to works progress. Maintenance appropriate.	All the members understand QC 7tools. It‘s being utilized	Utilized OK  Maintenance OK

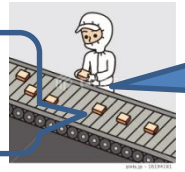
Concrete check evaluation standard②

2.Cost management

Point	4. Utilization target cost	5.VA/VE activity	6.Cost calculation	
1p	The target cost has been decided by approximate estimation. There is no will of the target achievement.	It's being put into effect spur-of-the-moment by a top management. A function analysis isn't performed.	The production cost item of expense of the factory isn't separated, and costing is of low reliability.	Don’t know target cost  Only top
2P	Component level is even allotted about an emphasis part. It isn‘t company-wide development.	The VA/VE project isn't long-lasting. A function analysis is performed by the part.	The cost item of expense of the factory is subdivided. A production cost administration section is weak.	Cost administration section is weak  VA/VE project isn’t long-lasting
3P	A product another team is organized, but it isn't functioning.	VA/VE project is performed actively, but the contents are poor.	A production cost administration section is organized , and the production cost is grasped. There is a problem with operation and the precision.	There is a problem with operation.  Team is organized
4P	Achievement activity clarifies the difference between the actual cost and the target production cost, and is put into effect.	A project start from a design cycle and VA/VE is put into effect.	Mechanism of production cost grasp is managing clearly. Target production cost setting achievement is managed.	Implementation VA/VE  Achievement activity is done
5P	Concurrent engineering does based on the highly reliable target cost, and is performed for achievement.	The VA/ value engineering activity linked with a business planning is put into effect.	A product another cost strategy and the life cycle cost are promoted strong.	Getting good result by VA/VE  Have cost strategy

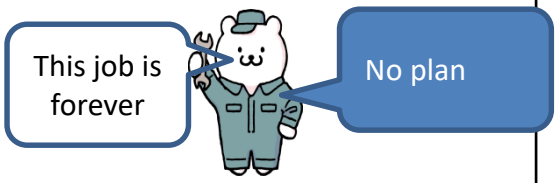
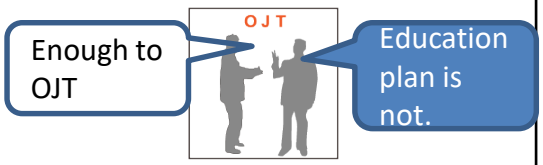
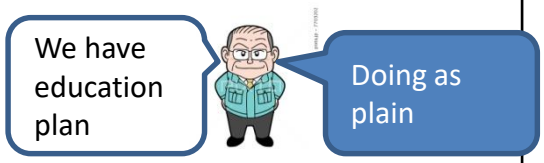
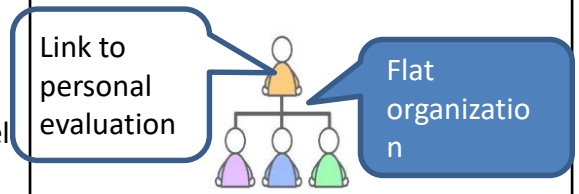
Concrete check evaluation standard③

3.Production control

Point	7.Production control	8.Schdule of production	9.Visual control	
1p	As an order from business is being turned to production just as it is. There are a lot of due date delay and outbreak overtime work.	A schedule plan isn't being made. Due date delay occurs chronically.	There are a lot of production order by oral from a supervisor. Due date delay occurs much.	Without schedule plans  Delivery delay too much
2P	A production plan is being taken out, but generation adjustment for demand power isn't made. A plan is inconsistent.	There is a plan, but it isn't utilized. A manufacturing department is moving originally.	The visual control is done, but when production order by oral go out, a loss is made.	With schedule plan  Not utilize
3P	A production plan is made and a follow-up is also put into effect. But the accuracy of a plan is low.	A monthly production plan is made, but plan change to an order-receiving fluctuation isn't timely.	5 W1H is incorporated into production order.	A follow-up is also done.  Accuracy of plan is low prod
4P	Making of a production plan is using a system. But it can't correspond to trouble quickly.	Daily schedule plan is connected with monthly schedule plan. But plan change isn't timely by the part.	Work assignment is performed rationally. When there is no plan change, I advance as planned.	Utilize system  Plan change isn't timely
5P	It's consolidated by a system from receipt of order to shipment. The person concerned can utilize, too.	A fixation plan is made and it's adjusted by an order-receiving fluctuation slightly. There is no due date delay.	The visual control is being utilized. It also corresponds to plan change flexibly.	There is no due date delay  It corresponds to plan change flexibly

Concrete check evaluation standard④

4.Human development

point	10.Training education system	11.Flexible organization	12.Multi operation	
1p	Rookie training is performed, but I don‘t go periodically. Technological skill can be improved by itself, but, motto of a company	Even if the management environment changes, the organization is hardly changing it. Trouble occurs frequently at the front line.	All round skilled labor education isn't performed. When each employee has one skill and major, it's enough.	
2p	There is no educational program. Skill training is being told in OJT, and thinks this is enough.	To make the management environment correspond, personnel are frequently transferred. You can't work calmly.	All round skilled labor is being brought up, but it isn't deliberate. The number of all round skilled labor is small.	
3p	There are rookie training, hierarchy another education and it's linked with employee evaluation. The participant is serious.	The organization is being reconsidered periodically. A project team is also organized.	Skilled labor education is performed periodically along a human resources development program. The all round skilled labor has been secured.	
4p	Professional technological skill training is making an effort toward level . Participation in the outside educational institution.	The project organization is being used according to the development business. I'm putting the emphasis on upbringing of all round skilled labor.	A human resources development program is developed smoothly, and there is much all round skilled labor.	
5p	Manager is assembling a program of skill development. We carry out and succeed in folklore of a technological skill.	It‘s being switched from the hierarchy organization to the flat organization . Please get employee’s mind to do.	I‘m advancing along a human resources development program. It’s linked with personnel evaluation.	

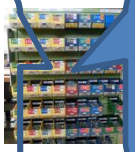
Concrete check evaluation standard⑤

5.environment・Safety

point	13. Safety standard in shop floor	14. Work environment improvement	15.environment management system	
1p	5S is imperfect and that an accident happens. Work different from Standard Operating Procedure is being performed.	Environment improvement equipment isn‘t installed. Environmental improvement is not advancing.	A pollution control facilities is installed, but it isn't managed. Periodical measurement isn't performed.	accident happens  improvement isn‘t developed
2p	A recurrence preventive measure is performed. The safety control and the safety training aren't deliberate.	Environment improvement equipment is installed a little. A good place by the operational place and a bad are clear.	Environment equipment is based upon a law, and a floor is managed.	safety control isn‘t deliberate.  There is environment equipment a little.
3p	We are planning safety control activity and are putting it into effect. There is also a safe suggestion, but there is little number.	Environment improvement by an administrator is developed. Work of the impossible posture is still seen.	Environmental management system is built and authentication of ISO14001 is got.	ISO14001 is certified.  Bad working posture is seen.
4p	Near miss activity and KYT are performed actively. New equipment is also obeying a safety standard.	Work environment improvement based on human engineering is developed and is rhythmical work.	A life cycle is considered from a product planning stage. The ingredient with the high recycling rate is being used.	near miss activity is performe d.  improvement based on human engineering is developed.
5p	An accident prevention countermeasure is got with the key word of an accident zero. The work condition of the worker center is established.	The communication is also active and a staff is working vividly.	The business activity which suppressed a load to the environment in a minimum is being tried.	By an accident zero. communicat ion is good.  The environme ntal load is made minimal.

Concrete check evaluation standard⑥

6.Activation of work shop

point	16.Utilization 5S	17. Activity of Kaizen and suggestion	18.Small group activity	
1p	Seiri and seiton of a thing aren't done. There are no manuals of 3S.	Improvement proposing system is used, but there is little suggestion number. A proposer leans.	A way of thinking of activity and a problem solving method, learning has just started.	There is no manual  Seiri and seiton are not done.
2p	3S is put into effect, but continual maintenance isn't done. Only the part is made for 5S manual.	Hierarchy education is being performed. T Improve the suggestion number, but it's distant from good level.	The promotion organization of the workplace and group organization are made. The theme it's easy to work on which is taken up.	Promotion organization is made  It's far in the expectation level
3点	We are active 5 S by the company-wide. Maintenance of a manual isn't done because the standard of the 5S lacks.	The enlightenment activities are also active introduction of an excellent case. The suggestion number and rate don't develop.	The promotion organization of company can do, and making of Action Plan is also done. I also improve the active hour, and the complete number.	5S is put into effect by company wide.  The participation rate doesn't develop.
4点	Patrol of 5S by the top is done. Commendation system is used. A manual is maintained.	Superior's commendation system is made. Manager are aggressive. Suggestion number is good level.	We are utilizing a high method and working on a theme of the high level.	We have a commendation system.  A high method is utilized.
5点	The 5S visual management is made . 5S responsibility repartition in a workplace is clear. 5S manual is followed.	We put emphasis on the quality more than the amount as a policy. The suggestion number, the participation rate and the adoption rate are the expectation level.	A case announcement is performed within and without the company. I also improve problem-solving ability and give good results.	The quality is made more centralized than the amount.  5S responsibility division is clear.

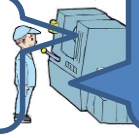
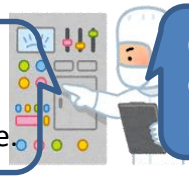
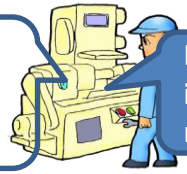
Concrete check evaluation standard ⑦

7.Material.Material Handling

	19.Material Control	20.Stock Control	21.Material Handling	
1p	Consciousness of material control is dilution. Shortage occurs all the time. There is also very much stock.	It frequently is in shortage touch from a depot and a site, the, every time, it's being arranged.	Almost all physical distribution management is handwork. I depend on a hand for heavy lift.	Shortage too much  **Material handling by manpower**
2p	It takes material control for the man-day by management by a hand, and there is also a lot of shortage and a lot of unnecessary stock.	A shortage contact from a depot and a site becomes little. It depends on ability of the person in charge more than mechanism.	Material handling is mechanized, but the rationalization using a machine and the improvement awareness are low.	Shortage are little bit small.  **Stock control by manual**
3p	Material control is educated .But it occurred sometime shortage	Consciousness of inventory control is short and slovenly. When occurring badly, stock isn't often withdrawn.	Improvement is a little developed because Material handling is being educated. The effect isn‘t seen.	Shortage occurred sometime  **Stock control is not so good at site**
4p	Material control is being put into effect along a production plan. The order system is being also fixed, and an inventory turnover is rising.	Inventory control using a computer is performed. But there are a lot of differences with the actual inventory.	Mechanization and systematization are advancing material handling equipment. The improvement consciousness is also high.	Turnover is rising  **Advancing equipment**
5p	Using a computer, the material control inked with a production plan is done.	Inventory control by a computer is carried without exception, and everyone can search easily. There are few differences with the actual inventory.	On many time and a short due date and is active by putting a CS first. Material handling administrative expense could be reduced by systematization.	Link to production plan by computer  **It is llittle difference actual with system**

Concrete check evaluation standard⑧

8.Equipment management

point	22.Factory layout	23.Equipment maintenance control	24.Tool and Jig control	
1p	There is a lot of amount of movement of the person because it's being laid out properly.	It isn't maintained. An easy breakdown can't also be repaired by themselves.	2S of a tool isn't made. The tool isn't made important.	We can't repair by ourselves  We have loss time In searching
2p	It's a layout according to the flow of work, but there is still a lot of movement of a person. We can't look through equipment.	Daily maintenance is being performed, but there are still a lot of equipment failures. I don‘t improve factory-operating ratio.	2S of a tool is made of the part, but it isn‘t a rule of organization. A place of stock isn’t decided.	Repairing on occurred break down.  We don't have place of stock.
3p	The person's movement is also little by a layout according to the flow of work mostly. There are a lot of works in process during a process.	A step of TPM cleared self check. Regular inspection is a center for maintenance of facility.	3S is attentive. A place by the tool is clear and easy to understand.	3S is attentive.  Our maintenance are periodical maintenance
4p	There is also a layout of cell production, and it's highly productive. There is little work in process stock.	Maintenance of facility is really good, and a breakdown decreases. I'm putting the emphasis on preservation education.	Calibration and inspection of a tool and a measuring instrument is being performed periodically.	Reduce break down time.  Calibration of tool are periodical.
5p	Productivity improvement and the layout which pursued operational comfort.	An equipment control data is being analyzed. Overall equipment efficiency is aiming at forecast preservation, and is high.	Standardization of a tool is also developed, and a management rule is clear.	To analyze data. OEE are high.  Productivity improvement are rising

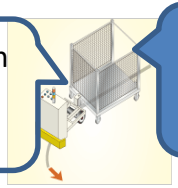
Concrete check evaluation standard⑨

9. Standardization

point	25.Standard operation sheet	26. Calibration of measuring instruments	27.Standardization and utilization of product and parts	
1p	A worker isn't protecting a standard operational note. Muri Muda Mura improvement isn't performed at all.	e calibration standard isn't set. When noticing abnormally, I'm calibrating.	Standardized necessity of a product and a part isn't felt.	We don't have SOS.  We don't think that standard is necessarily.
2p	The importance of the standard work has begun to be recognized. A certain worker isn't defending standard work.	The check calibration standard is unimproved. A traceability with a state master isn't considered by equipment.	Sharing consideration is being done by designer's dogma by design development of a similar part.	We don't have calibration standard  Some one don't keep SOS
3p	You're working on a standard operational note street. Operational Muri, Muda, Mura are also improved.	A traceability with a state master can take calibrated equipment. The check calibrating standard is the experience level.	The standardization of a product and a part is advanced but isn't perfect.	Traceability is OK  We follow SOS
4p	Muri,Muda,Mura improvement using a standard operational note is wrestling systematically.	It's being put into effect based on the check calibrating standard. It's being corrected by required quality of a measurement thing.	Designers permeate standardization and common. Frequency of using of a manual is high.	Kaizen is proceed by SOS  We keep standard of calibration
5p	Obeying of standard work is carried without exception. Improvement and improvement activity of a standard operational note are active.	It's calibrated along the check calibrated standard. Quality maintenance of a measuring instrument is carried without exception.	An idea of standardization and sharing permeates a designer. The design efficiency and production efficiency improve.	SOS is improved.  To improve productivity.

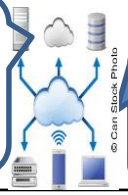
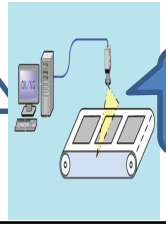
Concrete check evaluation standard⑩

10.Productivity

point	28.Labor-saving	29.Production capacity control	30.Utilization standard time	
1p	There is a lot of handwork which is non-efficiency. There is no recognition about automation and manpower saving.	Operation is as condition. Control is management after that. Efficiency calculation is hand calculation.	There are no concepts such as standard time. Ill-balance between the worker is big.	We don't know automation  No ST and ill-balance too much
2p	You save manpower of only the process it takes for a big burden for a worker.	Standard time is being taken out of the dater of results. Achievement control can be computerized.	Standard time is made partially, it's an echelon. There are a lot of individual variations and standard time isn't decided.	We have machine in bug burden process  We have ST in some process
3p	Automation and manpower saving are advanced fairly.	Standard time is being asked by a scientific method. The great difference with time of results is seen, and taking action is postponement.	Standard time by each process is decided, and the difference with time of results becomes little. Standard time is used for production management.	ST is decided and used.  Automation are advanced
4p	Automation and manpower saving are advanced, and improvement of production efficiency is seen.	One in the factory collects a dater in POP, and efficiency management is done. The difference with the results isn't canceled.	Standard time is used for a production plan, and moreover it's used for rate of work improvement and improvement.	ST is used for production plan.  ST vs actual are small difference.
5p	Automation and manpower saving are performed by the total including physical distribution in the process. Improvement of the profit rate is seen.	Standard time is also reconsidered periodically and setting up and a tool are also improved	Standard time is highly precise and the reliability can be put. The small group activity on which standard time is hung is also active.	Automation are performed.  ST are reviewed periodically

Concrete check evaluation standard⑪

11.Net work control

point	31.Bar cord (POP utilization)	32.Inter net utilization	33.CAD/CAM/CAE utilization	
1p	A barcode and a POP system aren't being put into effect in product management. There are also no introduction plans.	A PC isn't introduced yet. There are a lot of handwriting and hand calculation.	The design drawing is handwritten. A dater to NC machine is hand-made.	We don't have pop system  Data is written by manual.
2p	Introduction of a barcode and a POP system is being planned.	A PC is introduced, but it isn't connected to a network.	Drafting isn't linked to a NC dater by two-dimensional CAD. CAM is an independent system.	We are going introduce system  PC stand alone, not connect
3p	A barcode and a POP system are introduced, a dater is being collected and it's being utilized for only achievement control.	A PC is connected by internal LAN. It's being utilized for communication.	A two-dimensional CAD dater is being utilized by CAM. A NC dater is automatic creation.	PC connect by intranet.  NC data is made by CAD.
4p	It's being utilized for production management and cost management by a dater of a barcode and a POP system.	Internal LAN is connected with the internet.	3-dimensional CAD is being utilized for a product design and a three-dimensional CAM dater is being made.	PC connect to inter net and intranet.  We design by 3D.
5p	Operational directions are being performed through POP from a production plan. A thing and information can be consolidated.	Productivity improvement utilizes the internet and intranet, and is planned for at all stations.	It's 3-dimensional CAD and CAM. Further, it can be analyzed in CAE. A lead time is being reduced.	We control thing and information.  We use CAE.

Concrete check evaluation standard⑫

12.Information management

point	34.Drawing control	34.Information of claim control	36.Cost information control	
1p	A barcode and a POP system aren't being put into effect in product management. There are also no introduction plans.	The correspondence which is at the time of claim occurrence will be second mover processing very badly, and trouble is being caused to a customer.	I leave the production cost to the course. I don't know the production cost besides the accounting charge.	Trouble is being caused to customer  We don't know without accountant
2p	Introduction of a barcode and a POP system is being planned.	I leave claim correspondence to the person in charge. The claim recurs because there are no feedbacks to a related station.	Manufacturing cost isn't grasped, so the order of priority makes a mistake.	We don't know DWG control number  Claim happen again.
3p	A drawing assigns the management number and is managing in common. CAD is intermingled with a handwriting drawing.	We do claim correspondence sincerely. A claim list and a ledger are being made and it's being turned to a related department, but a measure is left to each section.	The budget and achievement count management is near estimation, and each product cost can't be even managed.	A claim list are being made.  Budget control are not individual
4p	It's being utilized for a part reduction design using a system of standard part management.	A trouble settlement system is being built. It's being investigated and it's being used for development of the next model.	A cost system is built and the individual cost can be grasped. The difference between the target cost and results is great and loose.	A trouble system is built.  We can know individual cost.
5p	CAD is widely used, and a dater search and a technical data can be made by each section.	A network is utilized and it's fed back to a related department by real time. Recurrence prevention is being performed and a product is being improved.	The target cost is set by a product planning stage. the difference with the target production cost are being performed by daily budget and achievement count management.	We can check target and actual.  We use CAD

Viewpoint of process improvement

・We make a comprehensive assessment of a obtained evaluation chart, the advice which has gone out by the check process and fact and clarify the weak point of the factory (improvement points).

・ This improvement points, and, improvement activity is advanced to the next step.

・ Next target will be the stage on one of the evaluation standards on the next works.

・When scoring evaluation low points, when there is much room of improvement, I should catch and wrestle positively.

・ When an evaluation points are plus, but profit isn‘t made in spite of a plus. We think the chance to reconsider the function of the whole company.

My watching point

・**Parking area**

Is position of car correct? Is direction correct?

⇒What does this company impression? (Their rule are clear or not ?)

・**Forklift**

How do their forklift stop?(Do they take off key?)

⇒Do they keep rule daily?(Safety company or not?)

・**Notice thing on information board**

How do their update document?(Old document are without change?)

⇒Do they decide manager?(information management is OK or not?)

・**Greeting of employee**

Do they greet hello to customer?

⇒Are they customer first or not?

・**Uniform shape of employee**

They wear same uniform and clear one.(Protector also)⇒Good team work or not?

⇒They are well-disciplined or not?

- **Floor of workshop**

Parts are dropped on floor.

⇒Quality control, cost control are OK or not?

- **Defective goods stock area**

What are their status of defective goods?(Things are matched data.)

⇒How do operate ISO9001?

- **Stock yard**

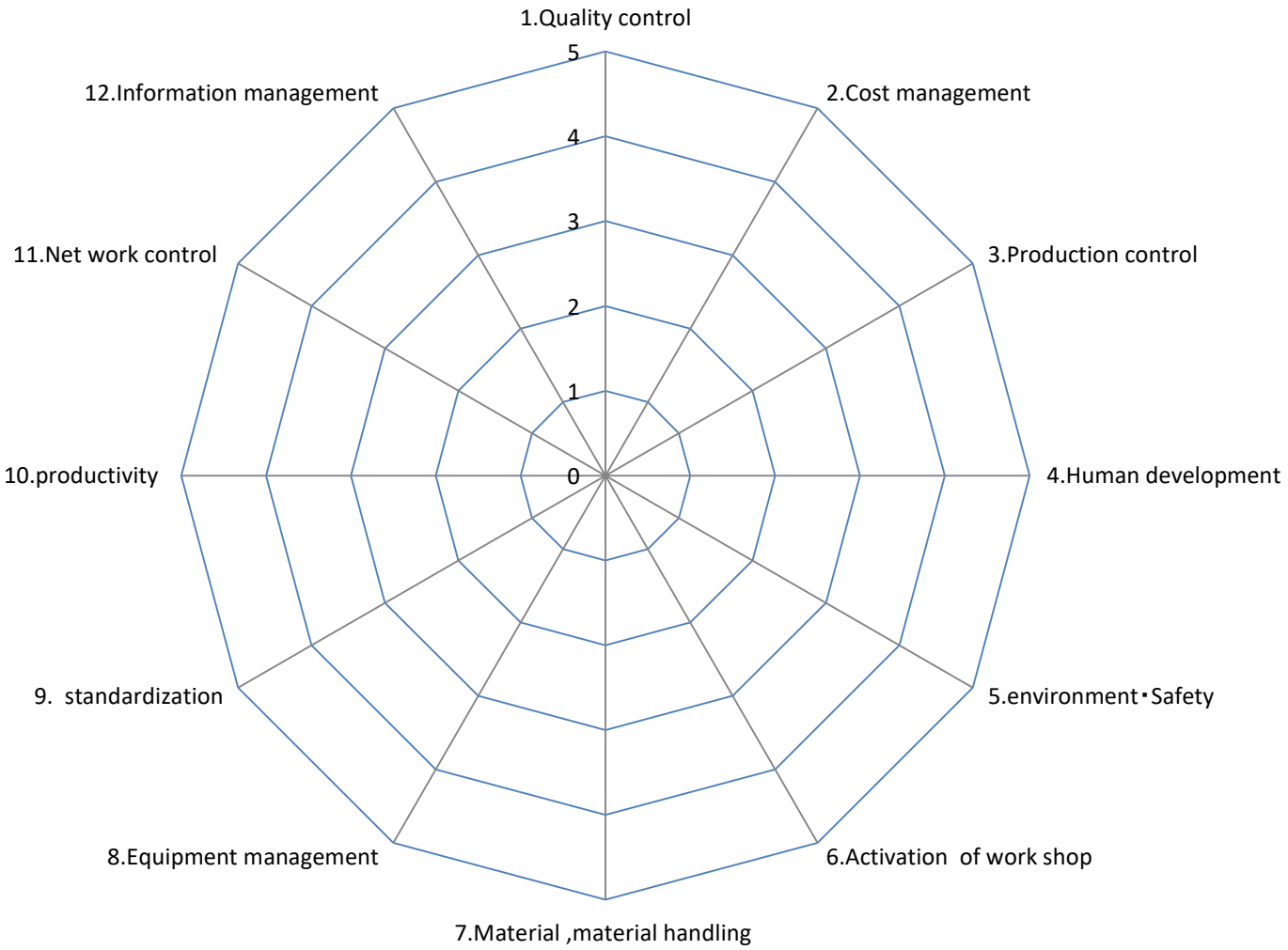
Goods and material are kept good condition or not.(Have they old goods?)

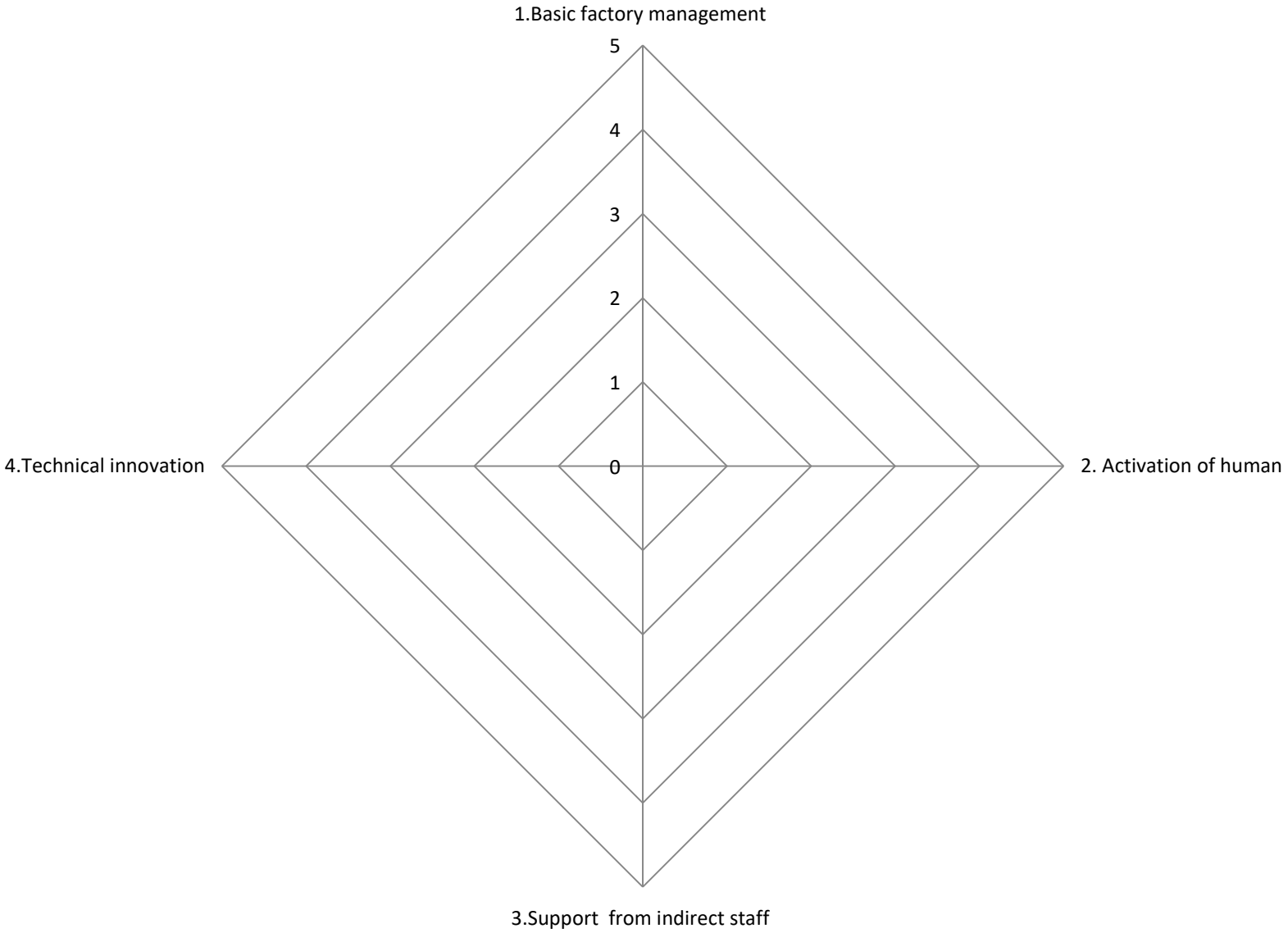
⇒Is it production control and stock control good?

- **Noise and dirty of equipment**

Have they oil leakage and dirty of equipment?(TPM are advance or not?)

⇒Is it equipment control and autonomous maintenance good?


1.Quality control
2.Cost management
3.Production control
4.Human development
5.environment・Safety
6.Activation of work shop
7.Material ,material handling
8.Equipment management
9. standardization
10.productivity
11.Net work control
12.Information management
5
4
3
2
1
0


1.Basic factory management
5
4
3
2
1
0
2. Activation of human
3.Support from indirect staff
4.Technical innovation

The end