JIT・SCM Now!

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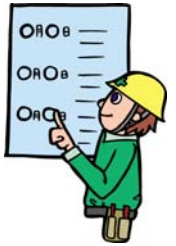


To attain shortest Lead Time and Non defect production

1, How and Why Toyota was TPS produced?

Mr. Taichi Ohon's Efforts and History to make TPS at 1950-1970

2,Structure and Technologies of JIT (Major elements)

JIT key methods (For example) : Pokayoke and Stop String to keep non defect production. , SMED(Single-Minute Exchange of Die),

Kanban,---Etc. With Practices and Results of TPS by Video

: NUMI, Cell-System, SMED

3,SCM & the Influences by Natural Disasters on JIT

For example : East Japan great earthquake and Thailand Flood

1, How and Why Toyota was TPS produced?

Mr. Taichi Ohon's Efforts and History to make TPS at 1950-1970

Problems: Very Low Car Assemble Productivity Syste

Ford 1st made the Conveyer System

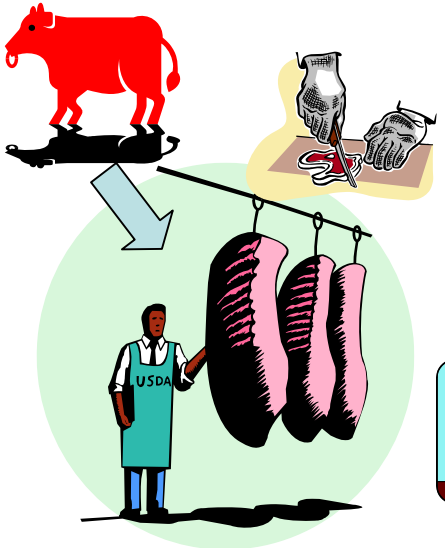
1913年

Car Parts shelf

Rope Usage Conveyer

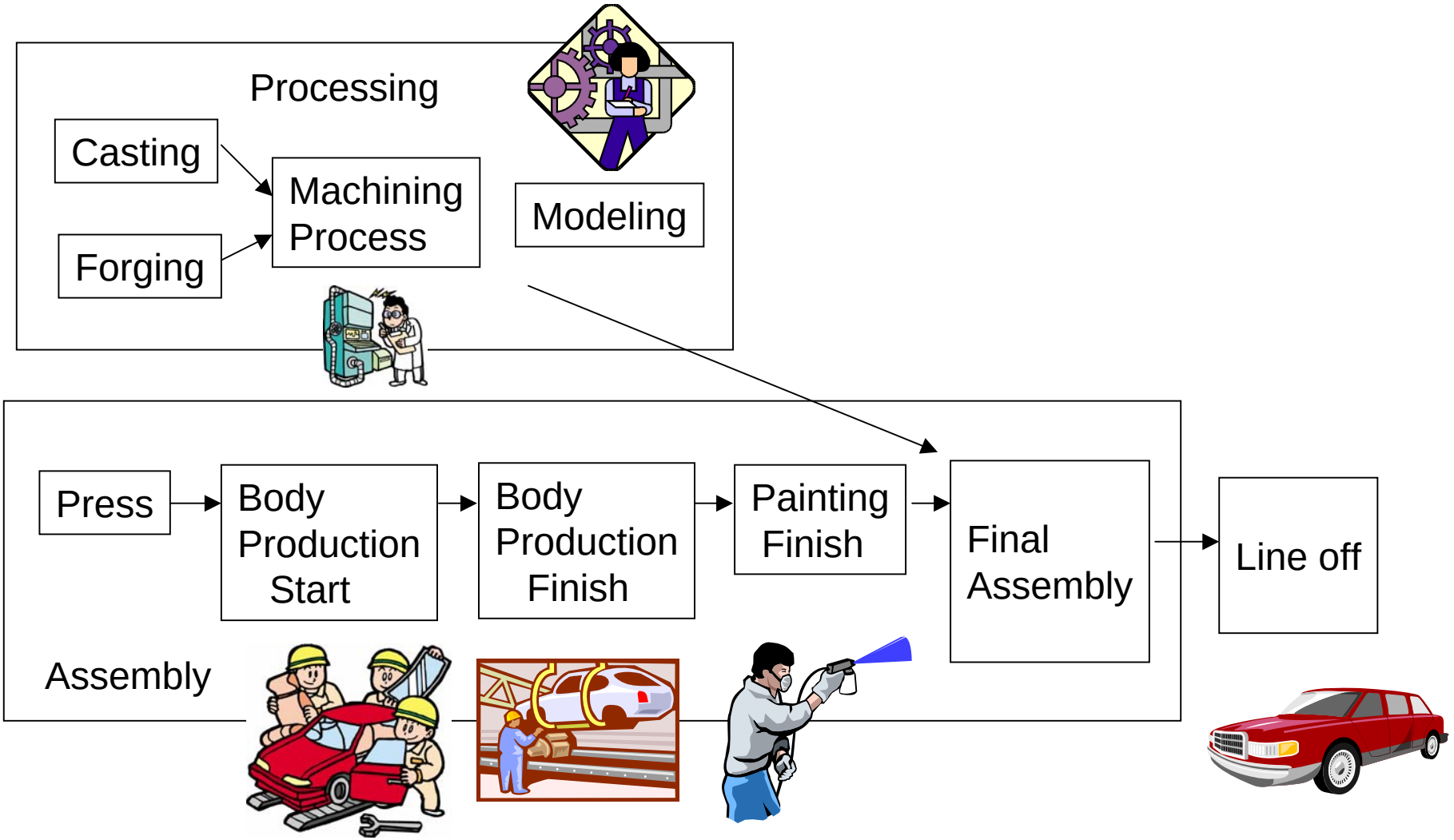
Movement state of the person

Ford 1st Look at Cow meat Foundry and gat a good Idea!



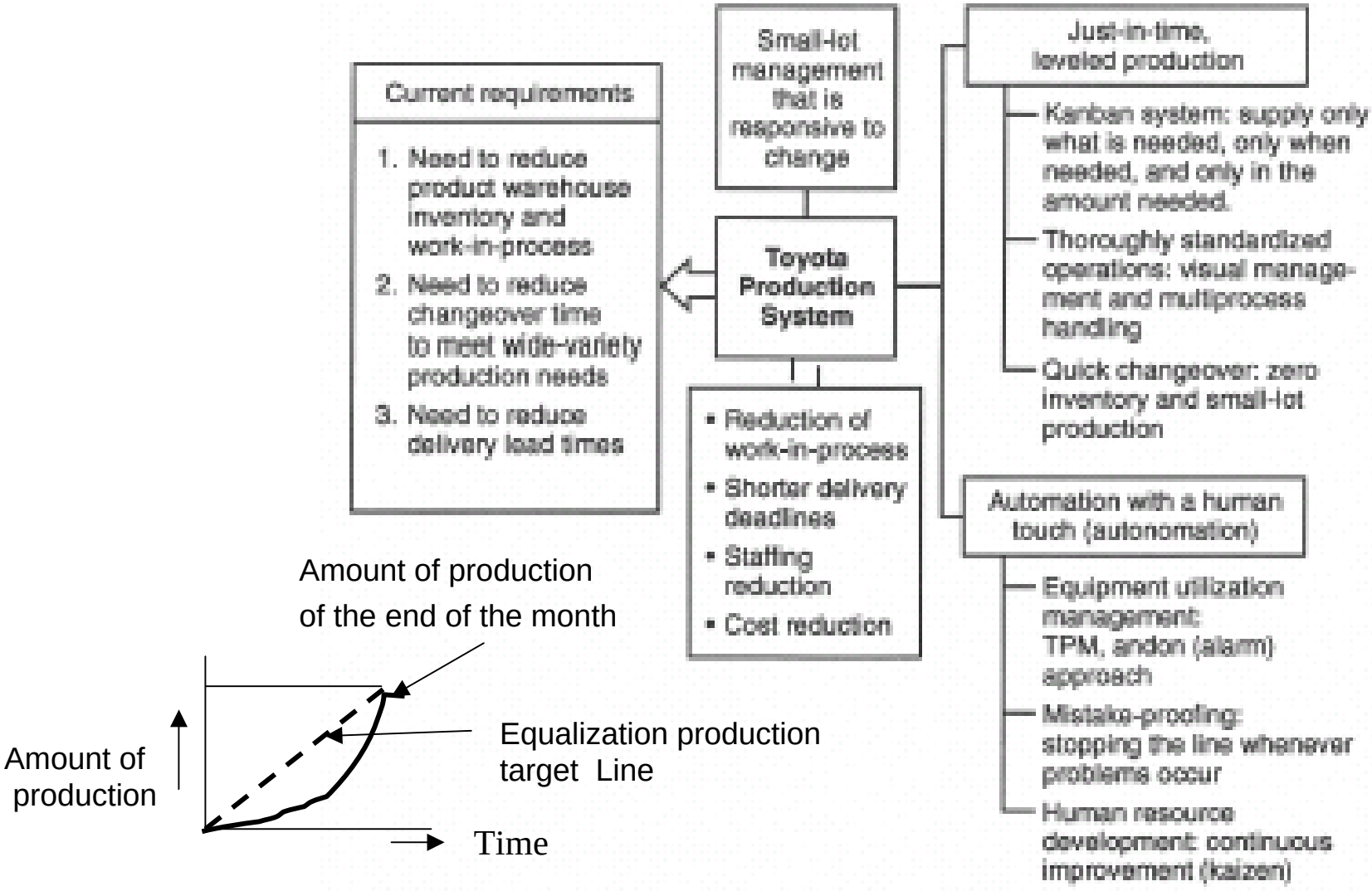
Very much movement

Production Flow of Toyota to make a car

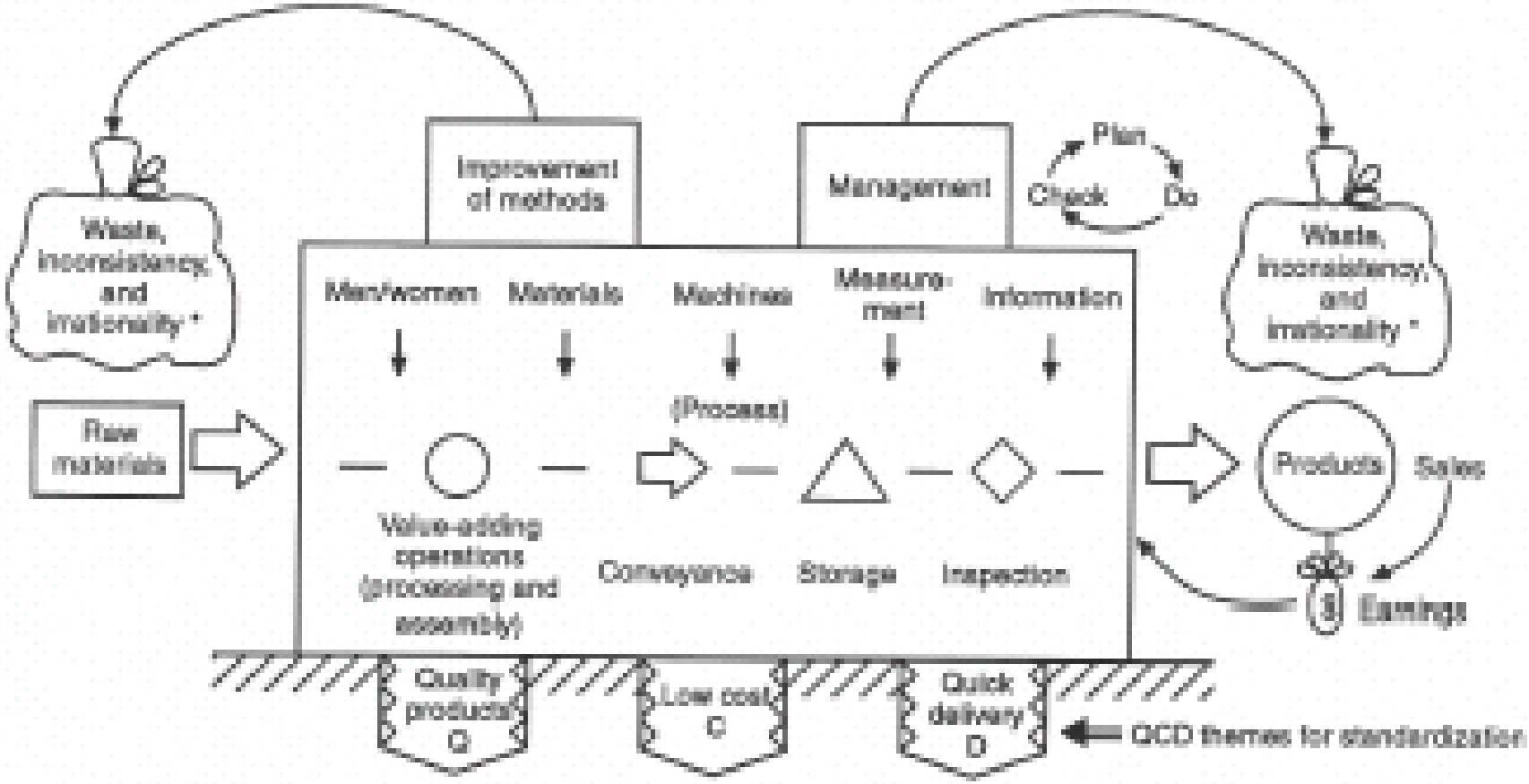


How and Why Toyota was JIT produced by Mr. Taiichi Ohno ?

At 1953 Toyota Profit was very Big Minus but had a Big W.I.P on Toyota Plant . The number of employees was 8,000 Car Production was 700(Truck production). At this Time Mr. Taiichi Ohno (Vice-president) inspect the world Best companies. And get the Supermarket System.

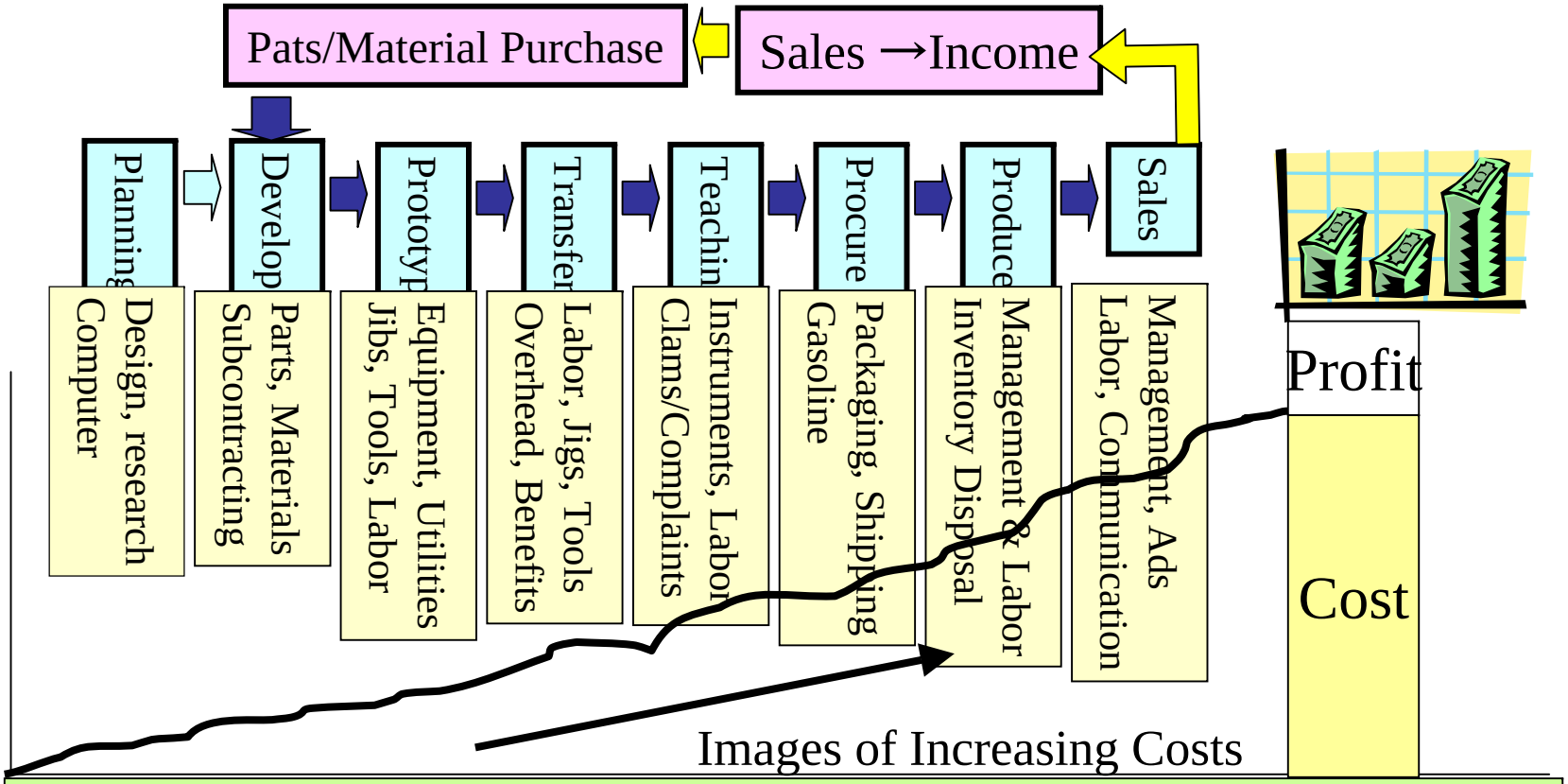


Elements of Work System



* Waste, inconsistency, and irrationality are the translations of three Japanese words — *muda*, *mura*, *muri*. These checkpoints, known as "3M," refer to situations when the effort outweighs the goal, when the effort fails to reach the goal, or when results swing inconsistently between these two poles.

A production process and cost outbreak



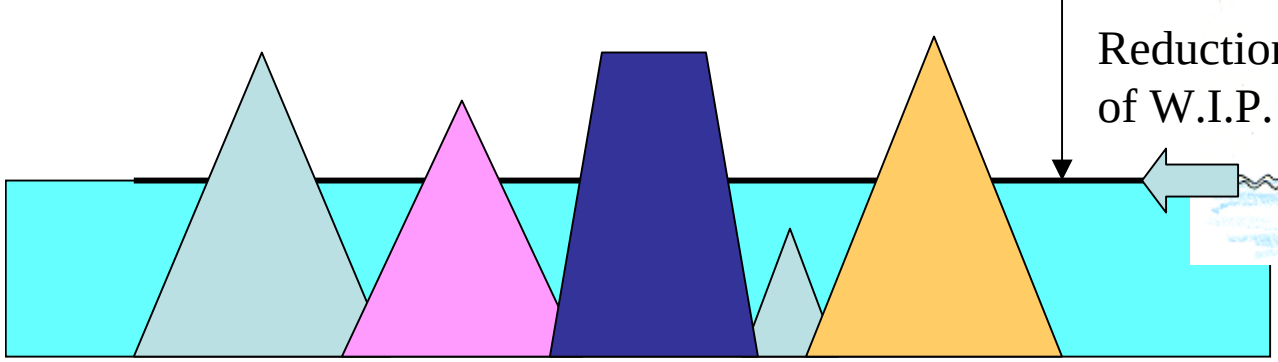
【Step 1】Grasp the actual status of cost accumulation and time spent at each process.

【Step 2】Estimate problems in terms of cost of wastes, quality, opportunity losses.

【Step 3】 Ideal – Reality = Improvement opportunities
With this concept, clarify priority measures and cost improvements.

The improvement method that JIT aims at Production Area

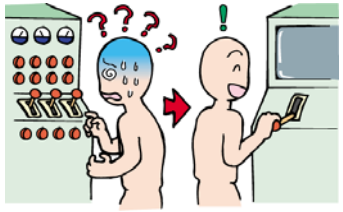
State of the present W.I.P.



Reduction
of W.I.P.

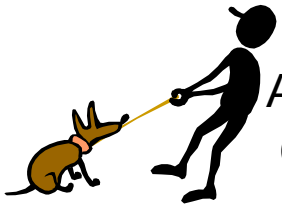
Many Bottleneck
Which you should reduce

Machine Trouble



Low Skill worker

Defects &
Re-Work



Appointed time
of delivery delay

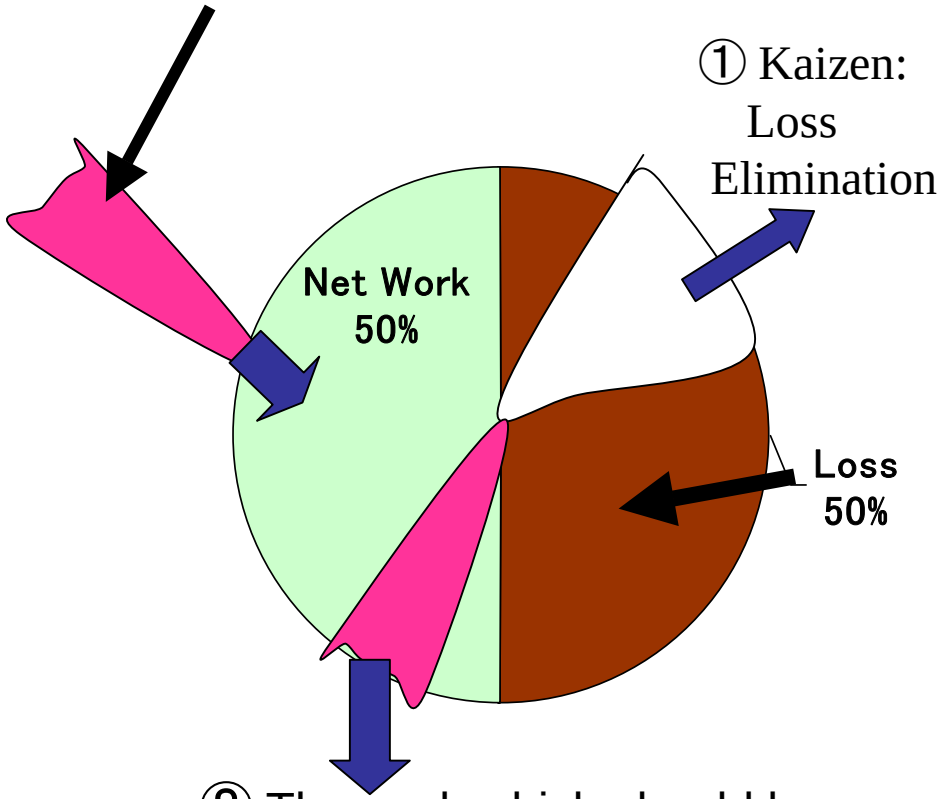
The measures that
we gave up in the past

Come to light
Problem Causes
And Improvement to a start

Concept of Kaizen

Three sorts to Time reduction

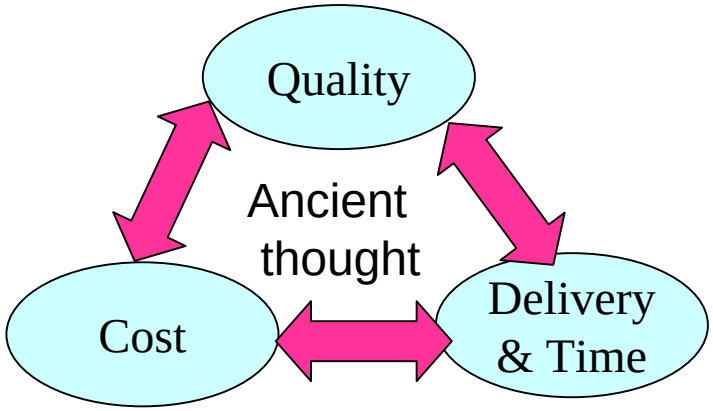
③Compulsion of speedup



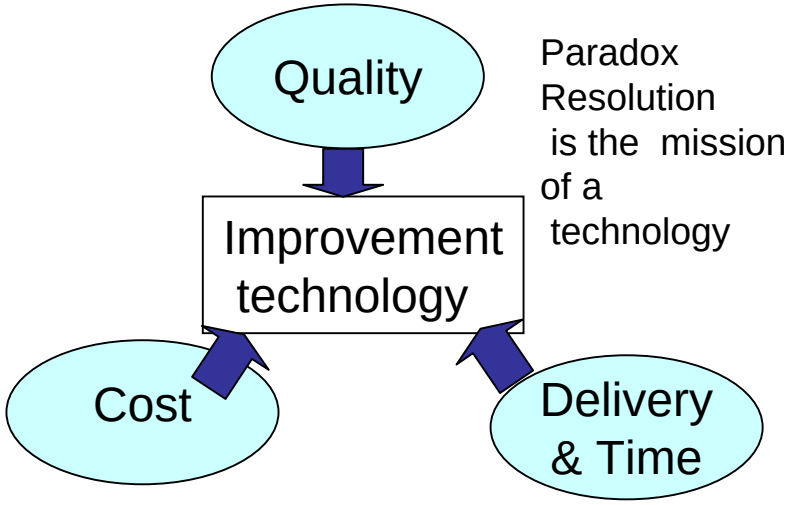
① Kaizen:
Loss
Elimination

② The work which should be done is omitted.
Japanese: Tenuki

Generalities at a Low Level
Kaizen Company



Kaizen Thinking & Action



Paradox
Resolution
is the mission
of a
technology

Quadruple Productivity Improvement, Dr. Mandel's Secrets

Early 1970s

①Method 65% × ② Work Pace 70% × ③Operating rate 75% × ④ Synchronization 70% = Result? 24% of the western first-call companies

① Method efficiency improvement: In the west, driven by labor shortages and high labor costs, work analysis with IE tools are used to establish the best methods before hiring people and for setting wages and education & training. In Japan, new comers are assigned to a job and expected to learn over time. The gap results in 65%.

② Work Pace: The work pace, especially at the bottleneck processes, is only at 70% of the international standards. Planned overtime in mind, people tend to conserve energy for later.

① Method improvement × ② Work pace improvement: In the sluggish economic time around 1975, JMAC proved doubling productivity by utilizing standard times without spending money.

③ Operating rate: Without reviewing optimal production plans or taking measures on equipment since its purchase, "working hard" yields only 70%. There is dichotomy between manufacturing and maintenance.

③ TPM activities since 1980s proved this factor of operating rate improvement.

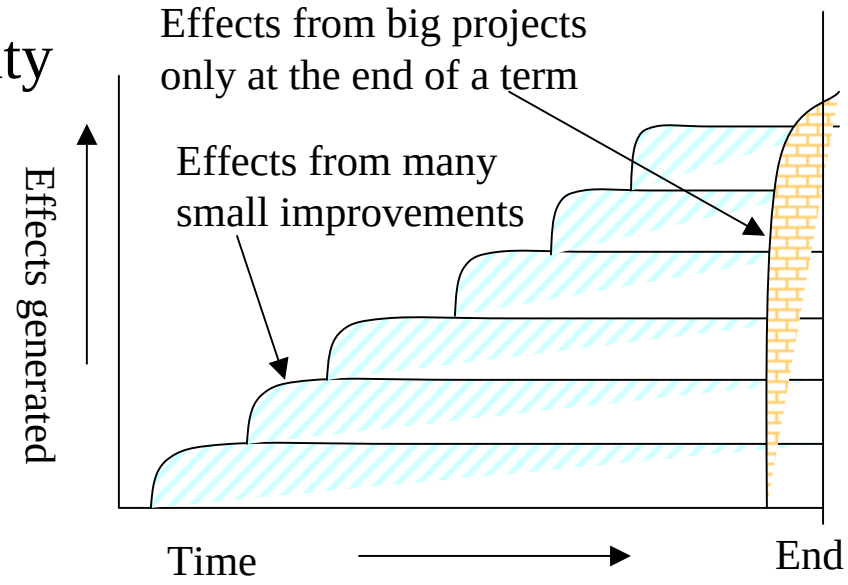
④ Synchronization efficiency: Only 70% effective due to accumulated work-in-process, lack of support between processes, lack of multi-skilled operators, and intensified production at the end of the month.

④ Many factors related to this measurement have been revealed as the JIT production system has spread in the industry since 1980 when Toyota initiated its efforts in this area.

Two Additional Productivity Indices（Time Productivity ）

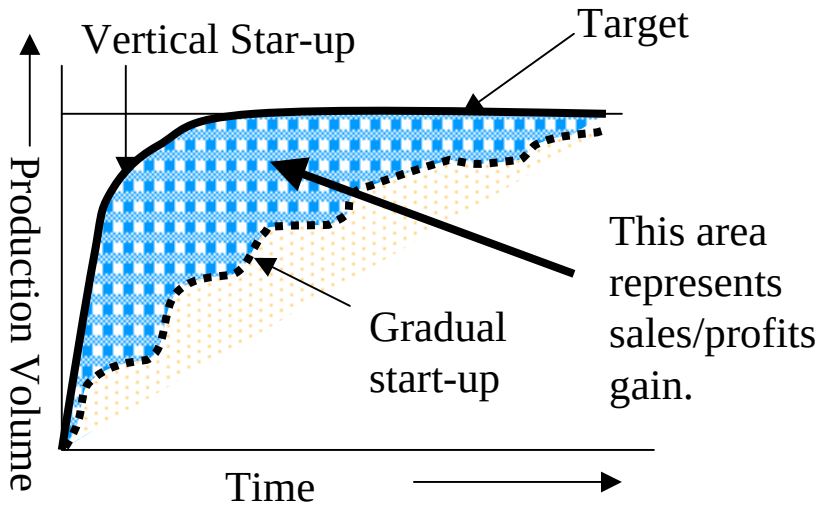
⑤ Speed productivity

AKA, Space Productivity.
Defined in 1995 for JMA/ TP Prize.



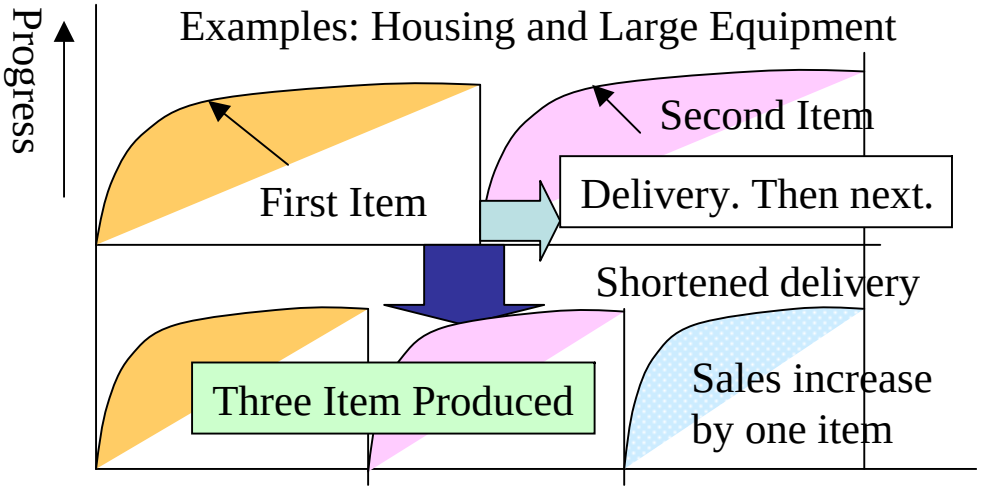
Big home-run like projects yield the results at the end of the term when they are finished, Small projects carried out throughout the term accumulate the results as they are finished, and the total results can surpass those from the big projects.

⑥ Start-Up productivity



⑦ Delivery productivity

Examples: Housing and Large Equipment



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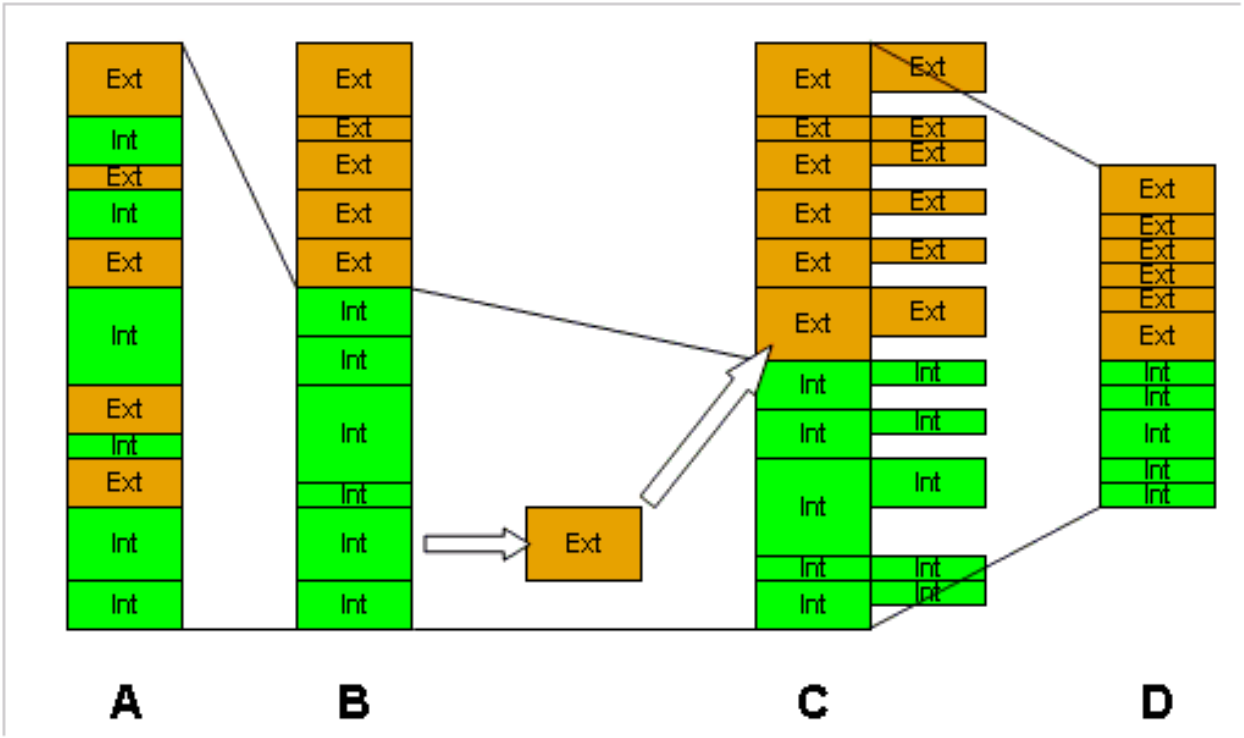
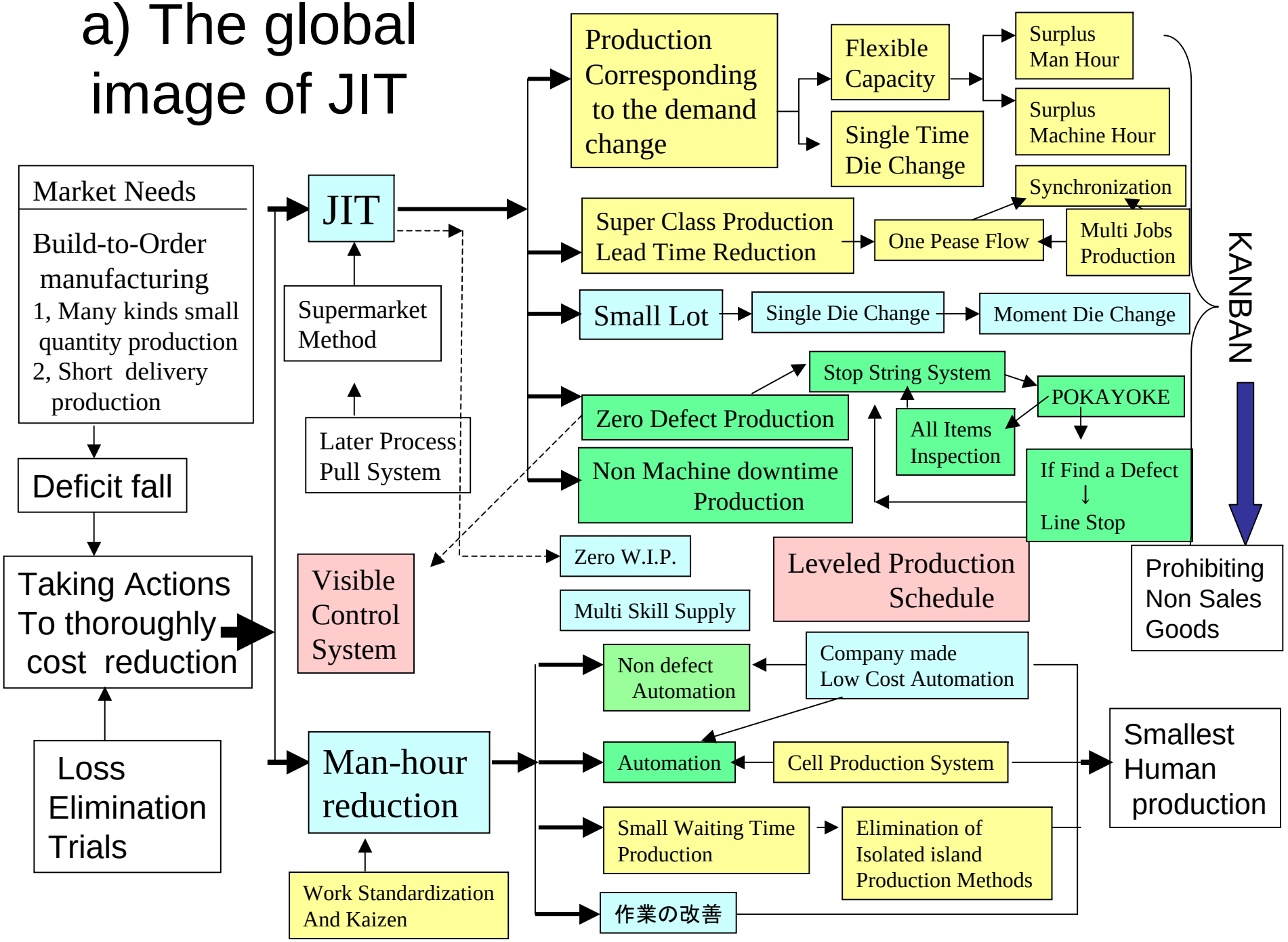
http://en.wikipedia.org/wiki/Single-Minute_Exchange_of_Die



a) The global image of JIT



JIT Thinking by Mr. Taiichi Ohno

1, Just-in-Time is a system where necessary items are received just in time as they are needed in the production time like a supermarket.

2, To use JIT, Every production process should move and function together at the same pace. This is the Production Leveling on a Production car assemble line.

3, To keep JIT Production System. Toyota uses “KANBAN”.
Kanban is a tool to achieve just-in-time production and eliminates all useless W.I.P. on any Production Line.

a, The Kanban prevents over-production on a production Line

b, The later(rear) process picks up the number of parts indicated by the Kanban at the earlier(front) process.

c, Kanban is a pull-based replenishment system.

4, Autonomation with a human element has Poka-yoke(device) and automatic stopping device to help clarify when a defective part is produced. (Non defect Machine Production System)

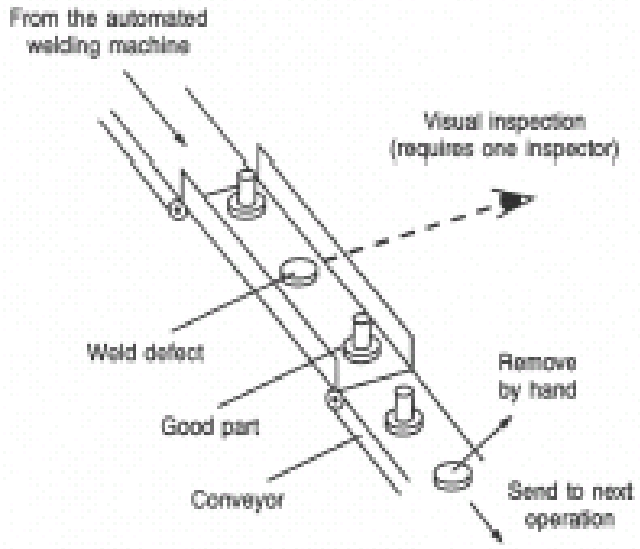
5, Flexible Manpower Line, Multi-Skilled Development and One-Piece-Flow manufacturing(Multi-Machine Handling)

6, Setup Time to change a item to other item reduction has to down ten minutes.

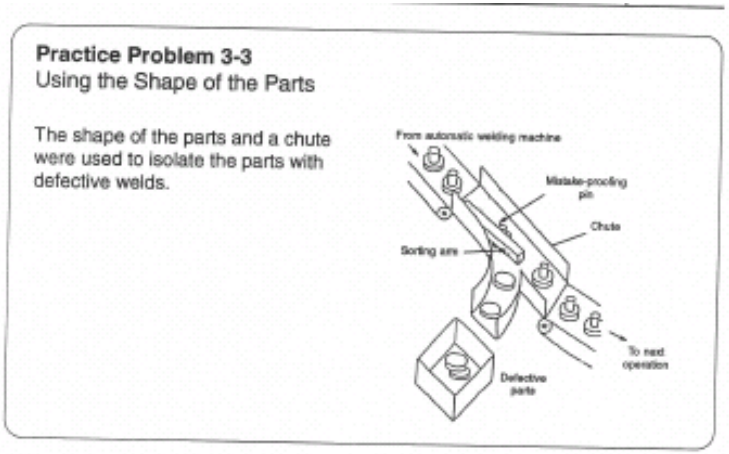
To attain JIT Toyota starts to eliminate all kinds of waste on Toyota Plant

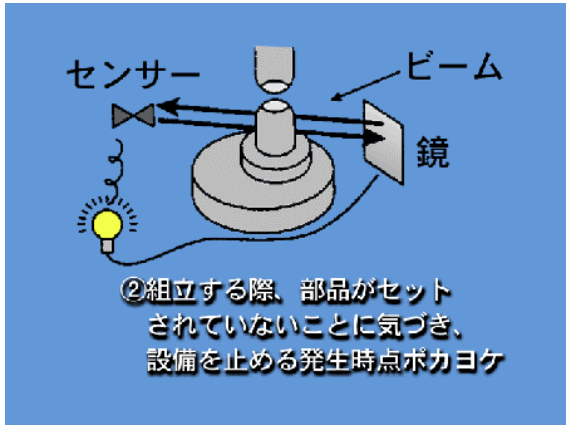
b) POKAYOKE

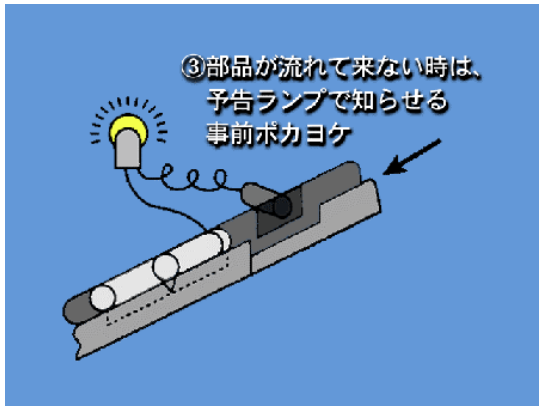
This process involves welding parts A and B to make a single part. The parts are welded on an automated machine, but occasionally the parts are fed poorly, and the weld is not accomplished. Because the following process is also automated, seven operators are used for inspection. Come up with away to mistake-proof this job. Your options are limited by the fact that time considerations make it impossible to use a mistake-proofing device in the previous process, where the weld is actually performed.



Conditions:
1. All products have a similar configuration







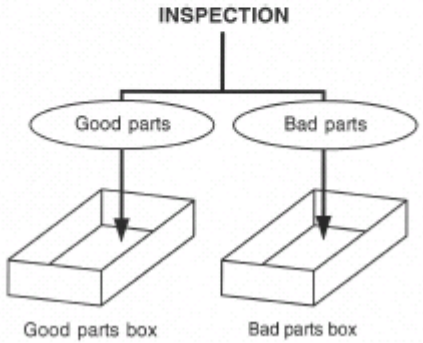
Example of Pokayoke

Practice Problem 3-7

A given part is inspected on a test rig. Parts that meet standards are placed in a box for good parts, and those that do not are placed in a bad parts box, in accordance with the mistake-proofing procedures currently in place. The cycle time for this operation is extremely short, however, and the operators occasionally place the parts in the wrong boxes. Devise a mistake-proofing method that will eliminate the defects from this operation altogether.

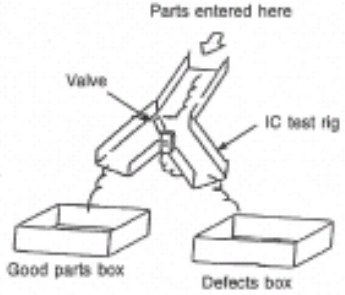
Conditions:

- The parts are fed into the boxes by means of chutes
- The cycle time for the test rig is 5 seconds per part.
- This is a very simple operation and is hence often performed by part-time personnel, but there are problems due to the fact that these people are often not familiar with the work and do not stay on the job long enough.



Practice Problem 3-7

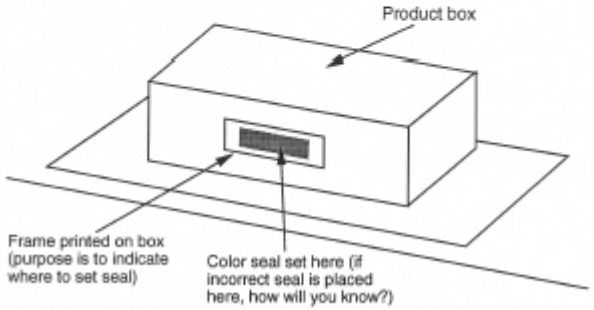
Install a gate-type device, and use a signal from the test rig to automatically open the gate to isolate bad parts.



A certain seal on a product sometimes fails to adhere. Several different QC circle group activities have studied this problem and reduced its incidence, but it still occurs from time to time. When the problem does occur, the entire lot will be lost, from the previous operation on; occasionally this has tied up as many as five operators in inspection to ensure that none of the seals has been missed. Devise a mistake-proofing procedure that will eliminate the problem.

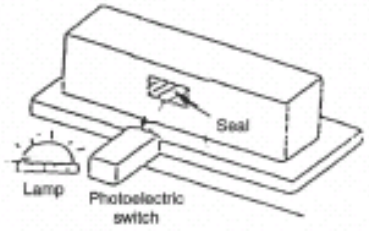
Conditions:

- The seal is colored.
- There are numerous other seals on the product in addition to this one.



Practice Problem 3-8
Use of a Sensor (to differentiate colors)

Stop line and inform of problems with a lamp, or detect problems with a sensor and take off line when problems occur.



Case Study : For Zero Defect

How do you use this statistics to get zero defect production?

Practice Problem 3-2
Using a Checksheet Example

Check Sheet for surveying the location of flaws in rubber gloves		Purpose: Check hole damage	Process: Press operation
Period: June 1 to June 30	Flaws: 65	Survey conducted by: Tomoko Nogami	

Problems Recorded
1. Defective rubber (2 cases)
2. Cracks (1 case)
3. Problems with holes (62 cases)

Problem:

The "Bamboo Shoot" QC circle is made up of four employees of the Design Department of company T. Three months ago, their department purchased a new model large-scale dry photocopy machine, but they found that, due to their lack of familiarity with the operation of this machine, there were many problems with copying letters and much time was wasted. They thus determined to take up the question of problems with making copies, in order to use the equipment more effectively.

To begin with, they need to understand the current situation, which they would like to do by surveying all of the defective copies made within the past week. Create a check sheet that can be used for surveying defect items caused by a dry copy machine.

Practice Problem 3-2
Solutions

Use the following data to fill in the chart below.

Month/ Day	Defect Items Found
5/10 Monday	Too dark //// Too light //// Creased / Off-position / Paper jam /// Wrong size ///
5/11 Tuesday	Too dark //// Too light //// /// Dirt // Creased / Off-position /// Paper jam //// Wrong size /
5/12 Wednesday	Too dark //// / Too light //// // Dirt // Creased / Paper tears / Paper jam / Wrong size / Other ///
5/13 Thursday	Too dark //// Too light /// Dirt /// Creased // Paper tears /// Paper jam / Wrong size / Other /
5/14 Friday	Too dark //// /// Too light //// Creased /// Paper tears / Paper jam / Other //
5/15 Saturday	Too dark / Too light /// Dirt // Creased / Paper jam /

Day / Defect Item	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday	TOTAL
Too Dark							
Too Light							
Dirt							
Creased							
Off-Position							
Paper Tears							
Paper Jam							
Wrong Size							
Other							
TOTAL							
No. of pages copied							

Model Answer

Practice Problem 3-2
Check Sheet for Surveying Copying Defects

MACHINE: JS8100 UNIT: Number of pages

Day / Defect Item	Monday May 10	Tuesday May 11	Wednesday May 12	Thursday May 13	Friday May 14	Saturday May 15	TOTAL
Too Dark	𝍸	𝍸	𝍸	𝍸	𝍸 ///	/	28
Too Light	𝍸	𝍸 ///	𝍸 //	///	𝍸	///	36
Dirt	𝍸 ///	//	//	///		//	17
Creased	/	/	/	//	///	/	9
Off-Position	/	///					4
Paper Tears			/	///	/		5
Paper Jam	///	////	/	/	/	/	11
Wrong Size	////	/	/				7
Other			///	/	//		6
TOTAL	31	23	22	19	20	8	123
No. of pages copied	683	729	823	757	982	346	4320

Some Key Points in This Exercise:

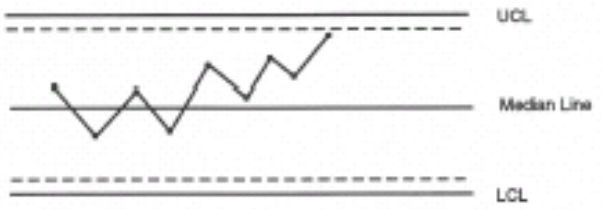
- The purpose of this exercise is not simply to collect data! If there are problems, we must always analyze them to find their causes, and then consider what corrective actions can be taken.
- Discover problems where they occur! This requires visual controls in the workplace.
- Don't just write data down on paper — the use of actual items as a part of your control system can result in outstanding applications, lead you to short cuts in dealing with defects (by bringing problems to the surface, where everyone can see them), and speed up corrective measures.

The basic idea of quality control is simple:
"No more post-mortems — take action instead!!

1. Discover problems early on, as they occur on the shop floor, with the actual products being made. Take action exactly where the problems occur.

2. Prediction by highly skilled person is important. For example, SPC:

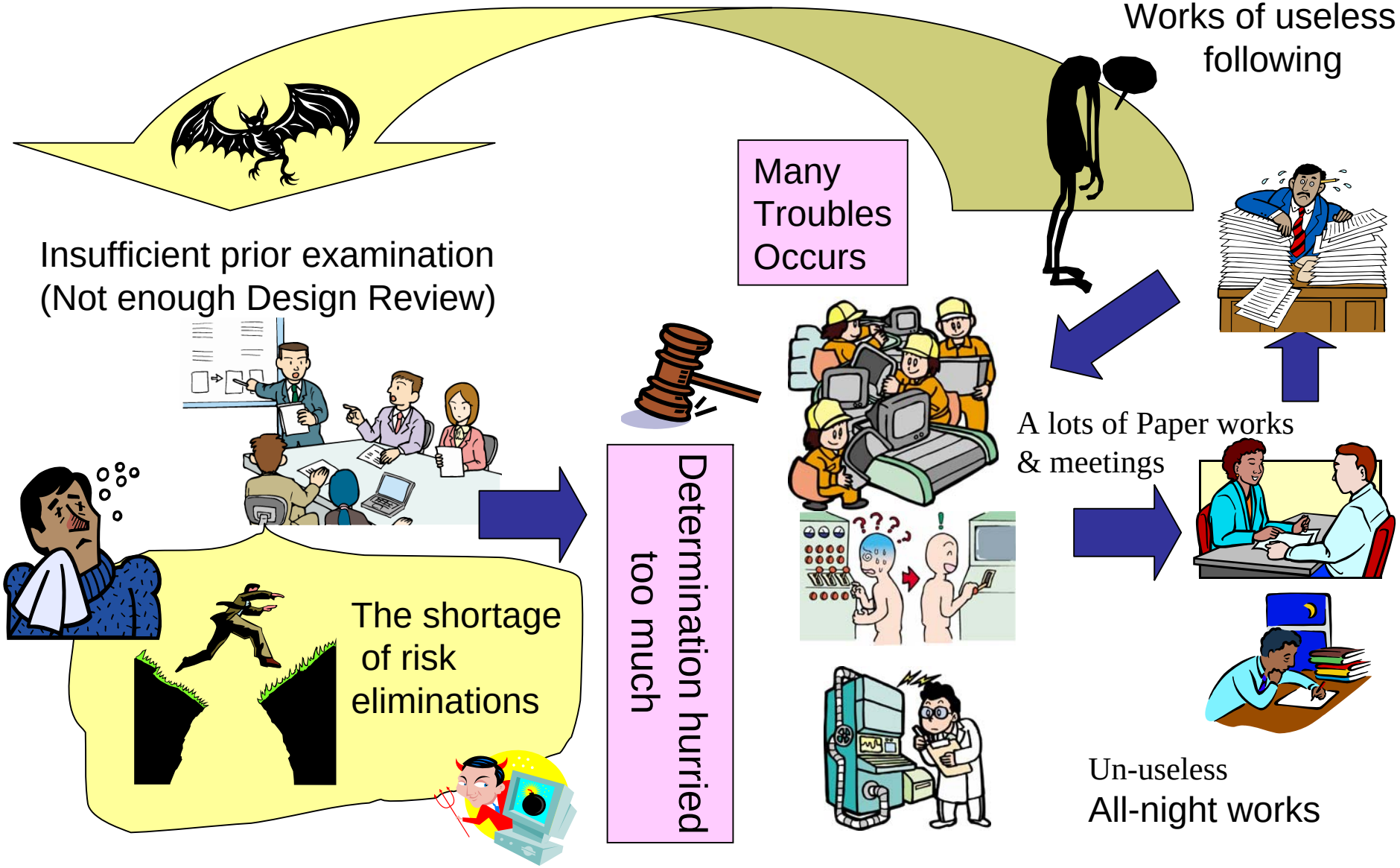
   - Establish an alarm line within the control limits
   - Display both the alarm line and action keys
   - Stress prediction and prevention.



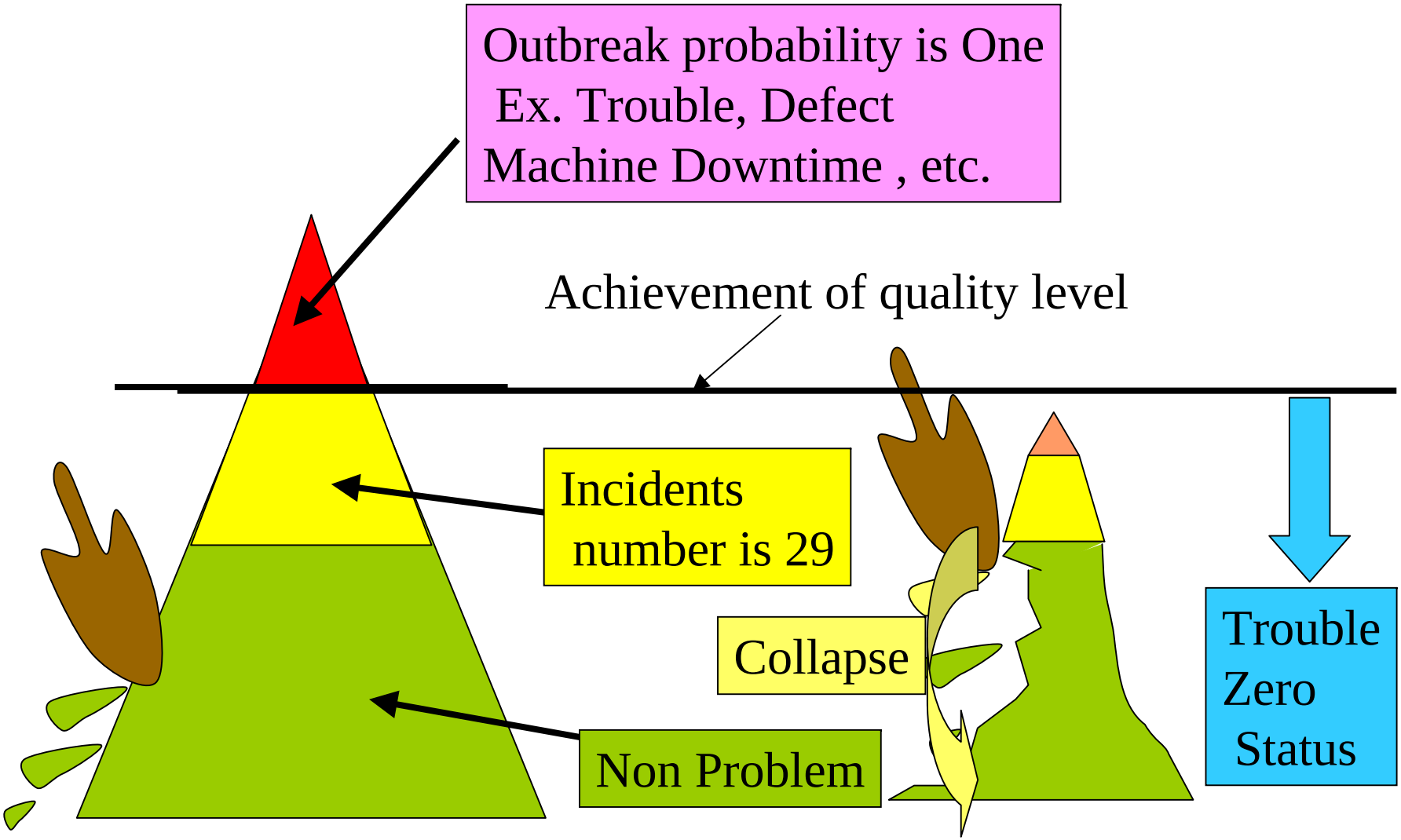
3. Remember to use reliable problem-solving methods (skills and techniques):

   - Diagram the factors
   - ↓
   - Focus on the Three "Actuals"
   - ↓
   - Analyze by asking "Why" five times and using the "5Ws and 1H" method
   - ↓
   - Conduct problem solving at the time the problem is discovered.

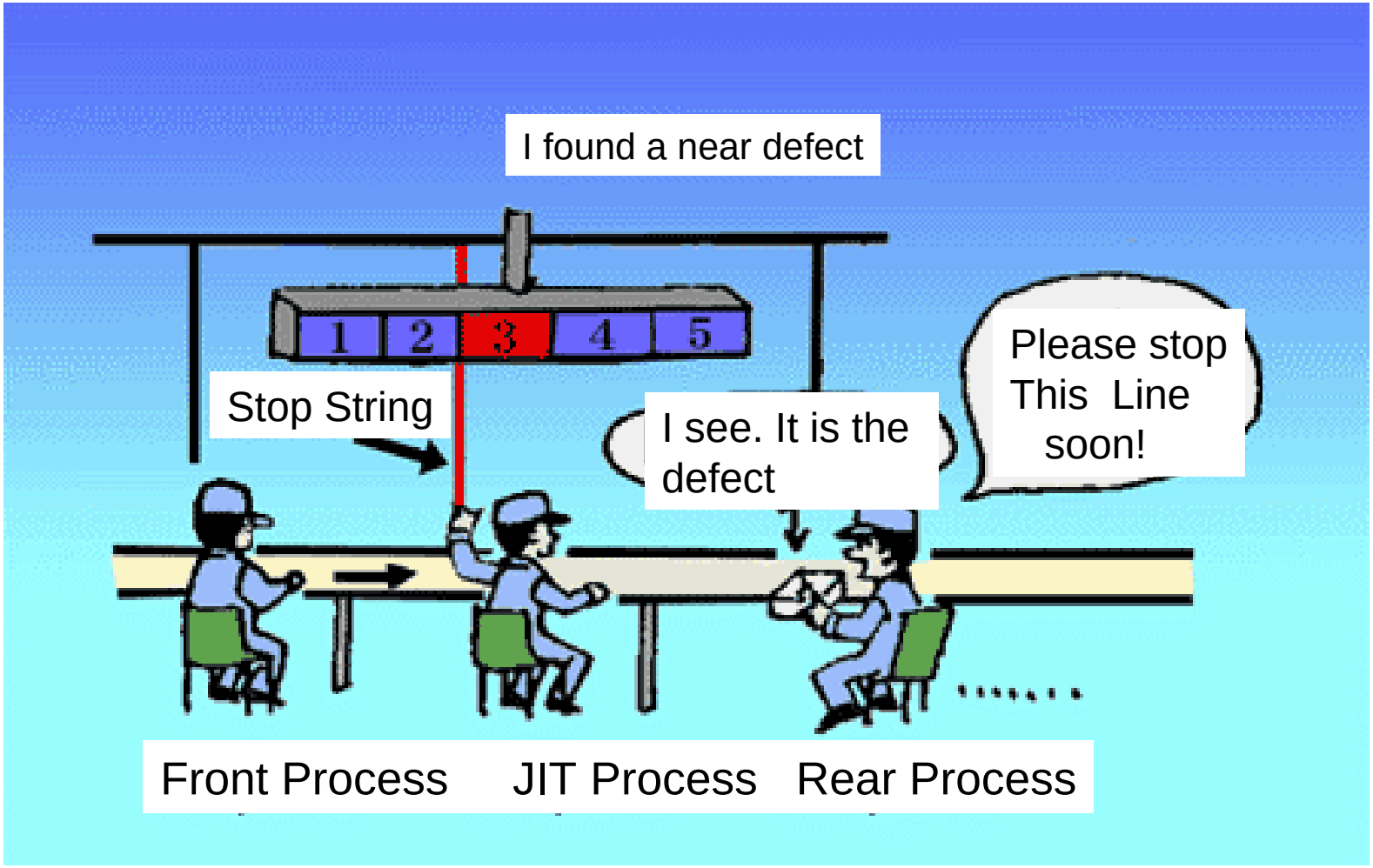
Devilish cycle



Law of Heinrich



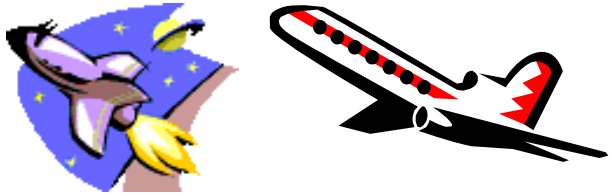
Stop String System on JIT war used at NUMI(USA)

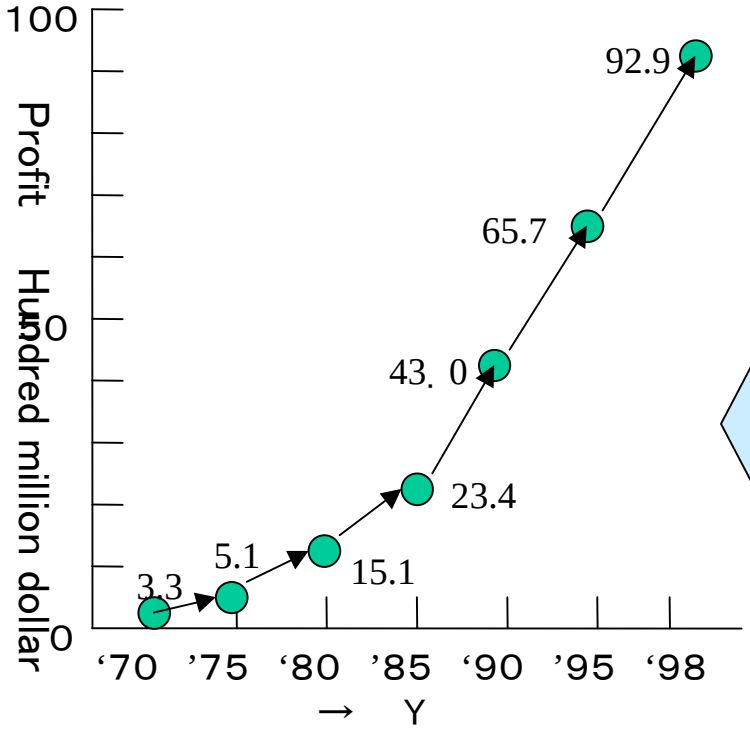


Once a operator find out a Quality problem on the floor(at Production Line), Quality Team gather the JIT Process and change the problem status. And The Team takes a action to find out the cause of the Problem and make a Beset Countermeasure on the floor immediately.

6σ on GE

σ	The number in 1 million	Reference example
3	66, 807	Random inspection
4	6, 210	TQC
5	233	PPM
6	3. 4	Best Company



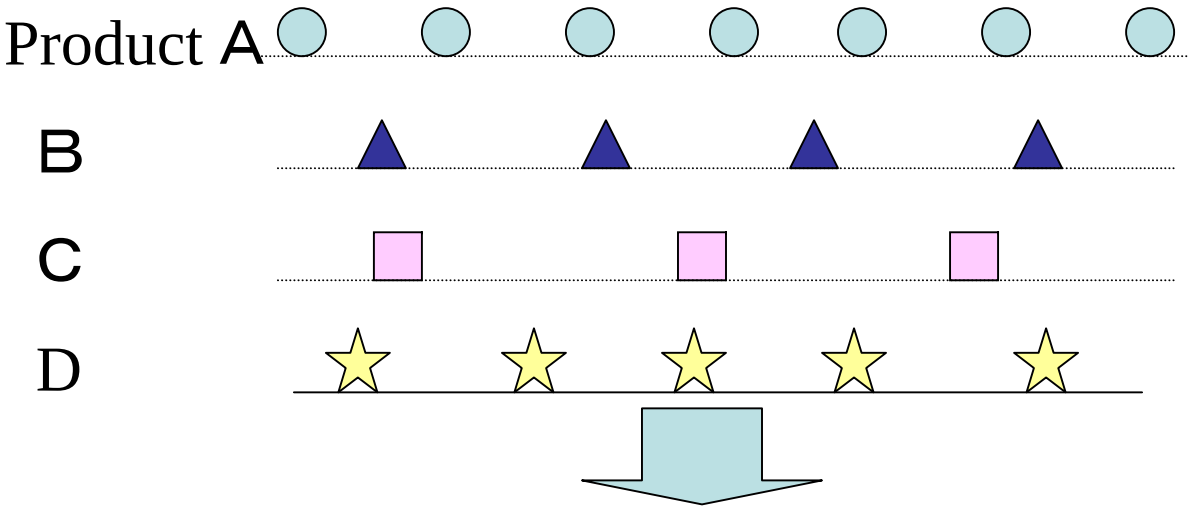


Big Effects

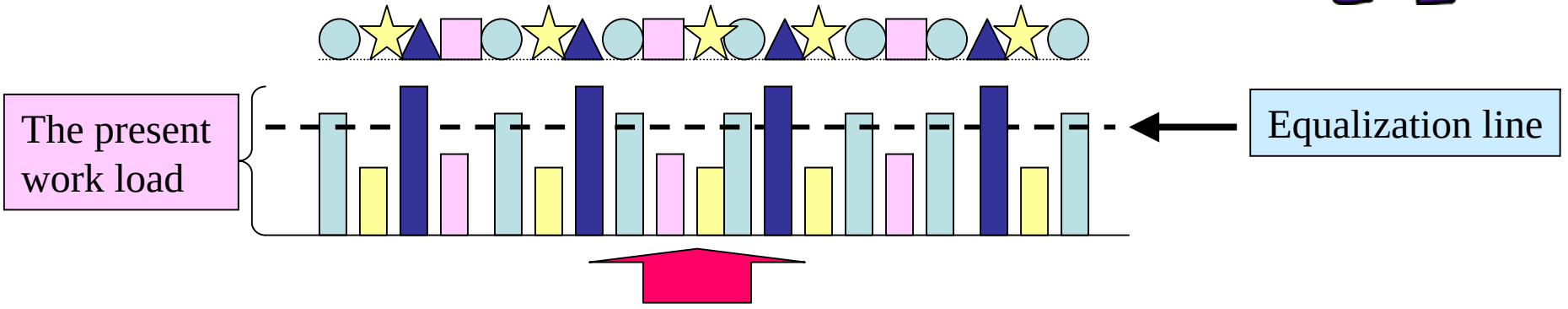
1, Poor zero measures from a new product development stage
Design-in System
2,Gate System
a)Worker guarantee of quality
b)Examination of next process
c) A problem are taking measures at the time of outbreak

c) Production leveling

Situation of the order

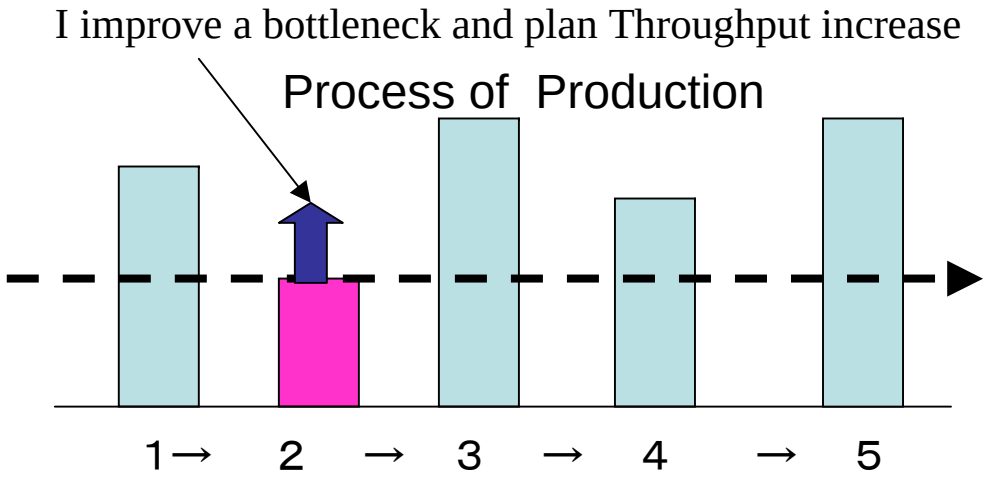


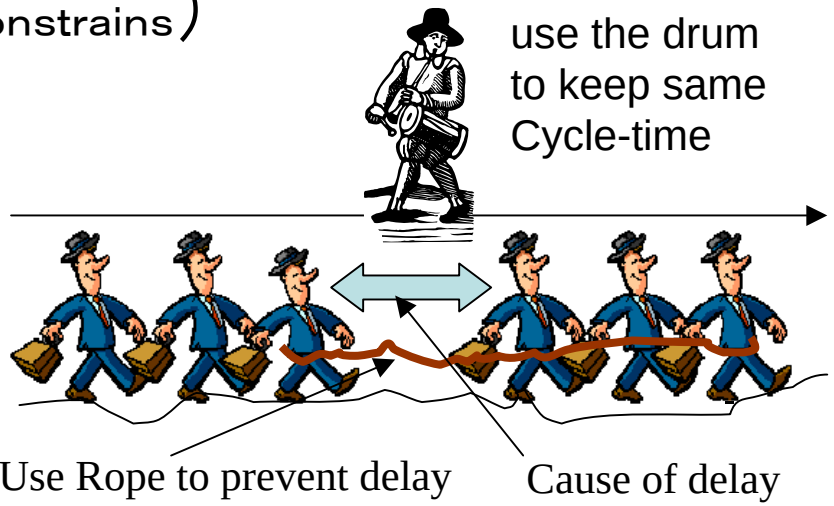
Equalization to an order at Production Line



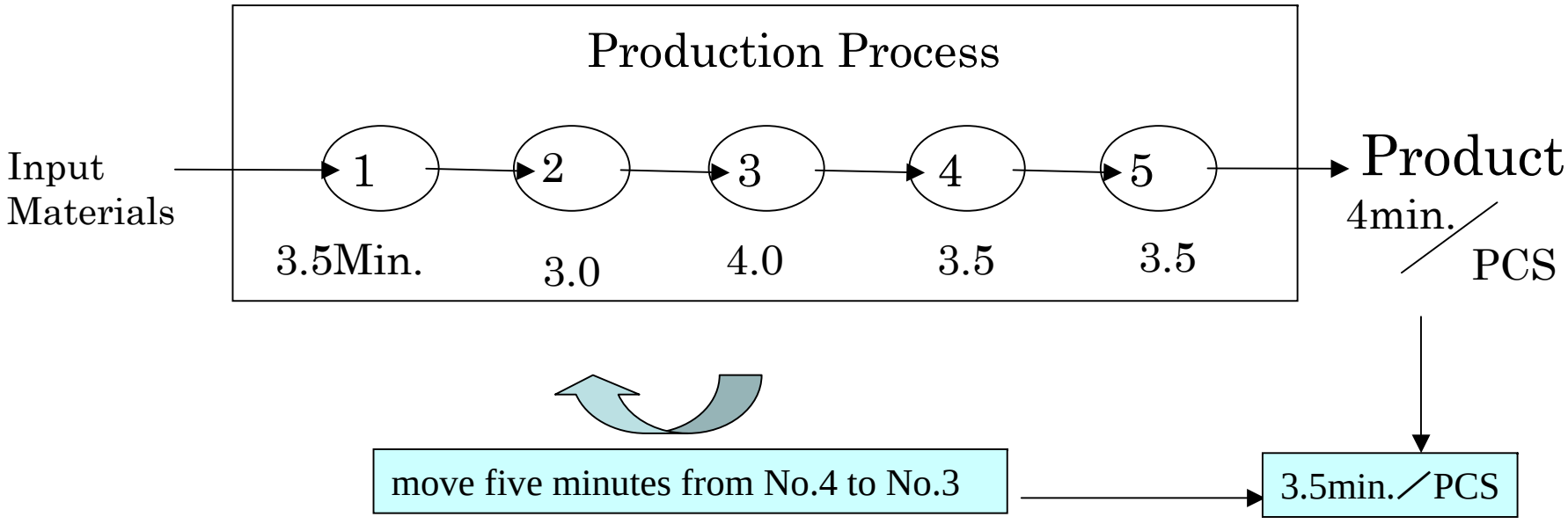
Kaizen: Even out of production by using grouping

TOC（Theory of Constrains）





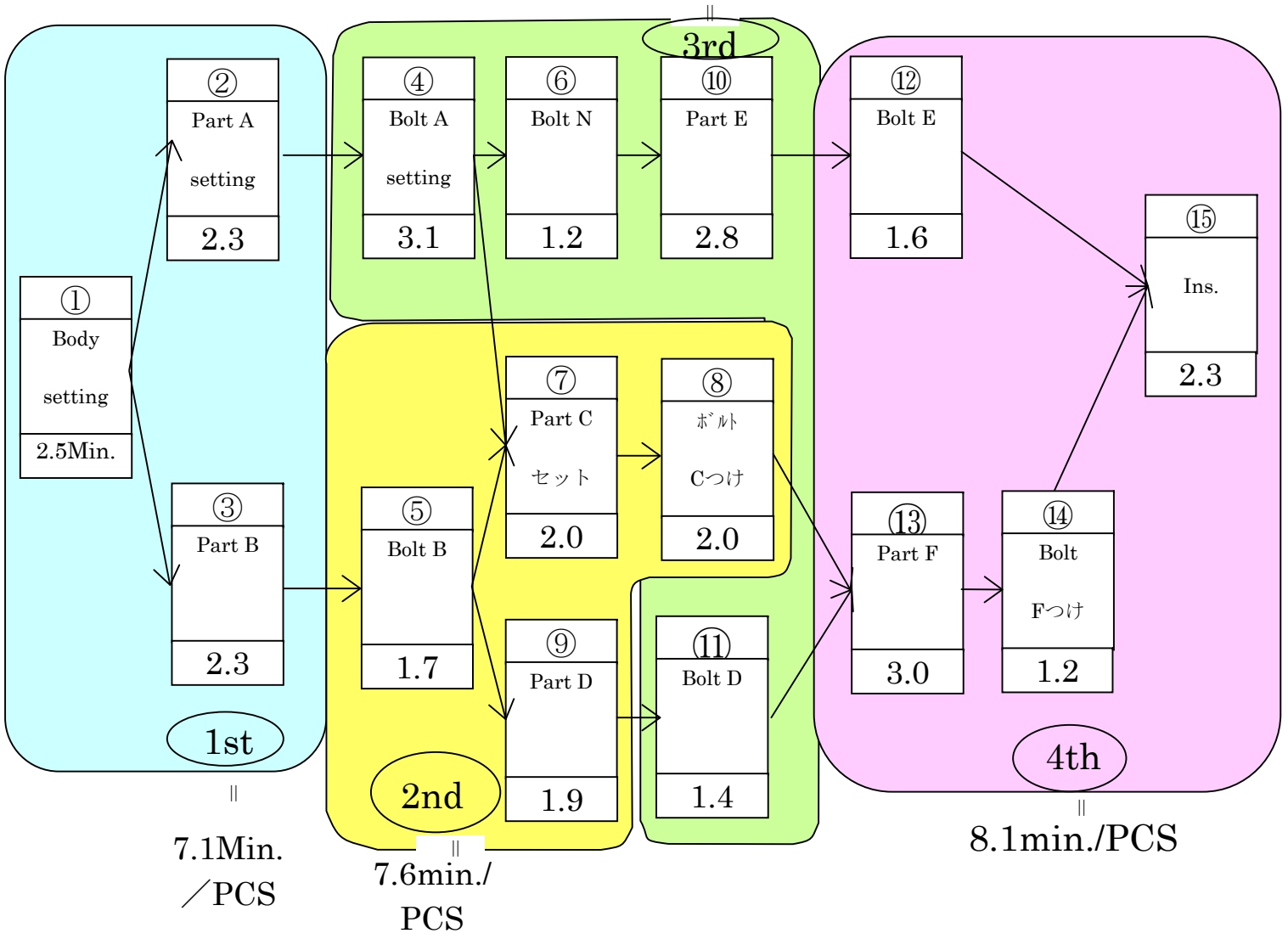
One of the TPS Approach

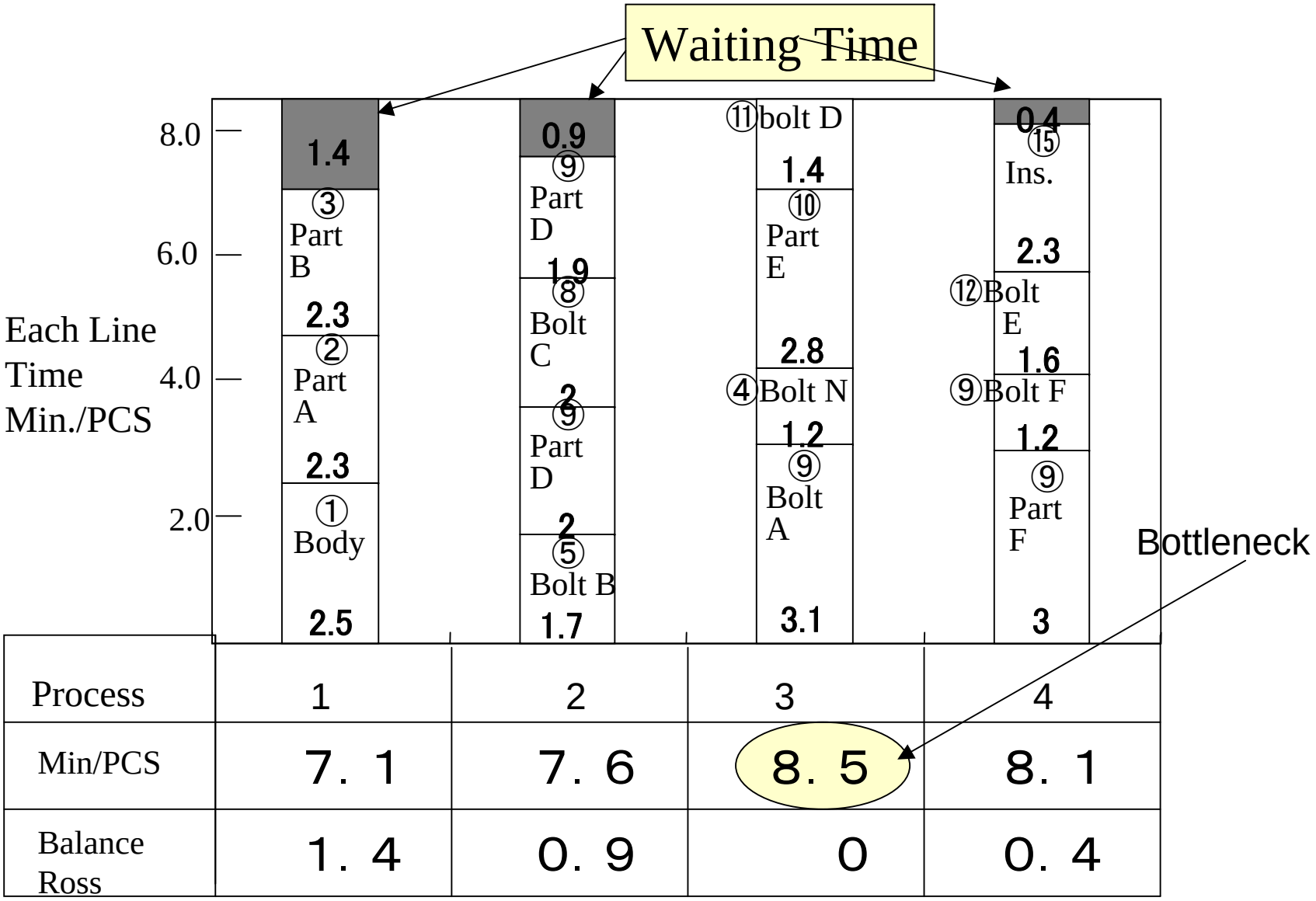


To make good Line balance

Line Balance ratio = $\frac{7.1\text{min.}+8.50+7.6+8.1}{8.5\text{min.}/\text{PCS}\times 4/\text{processes}}\times 100\%$

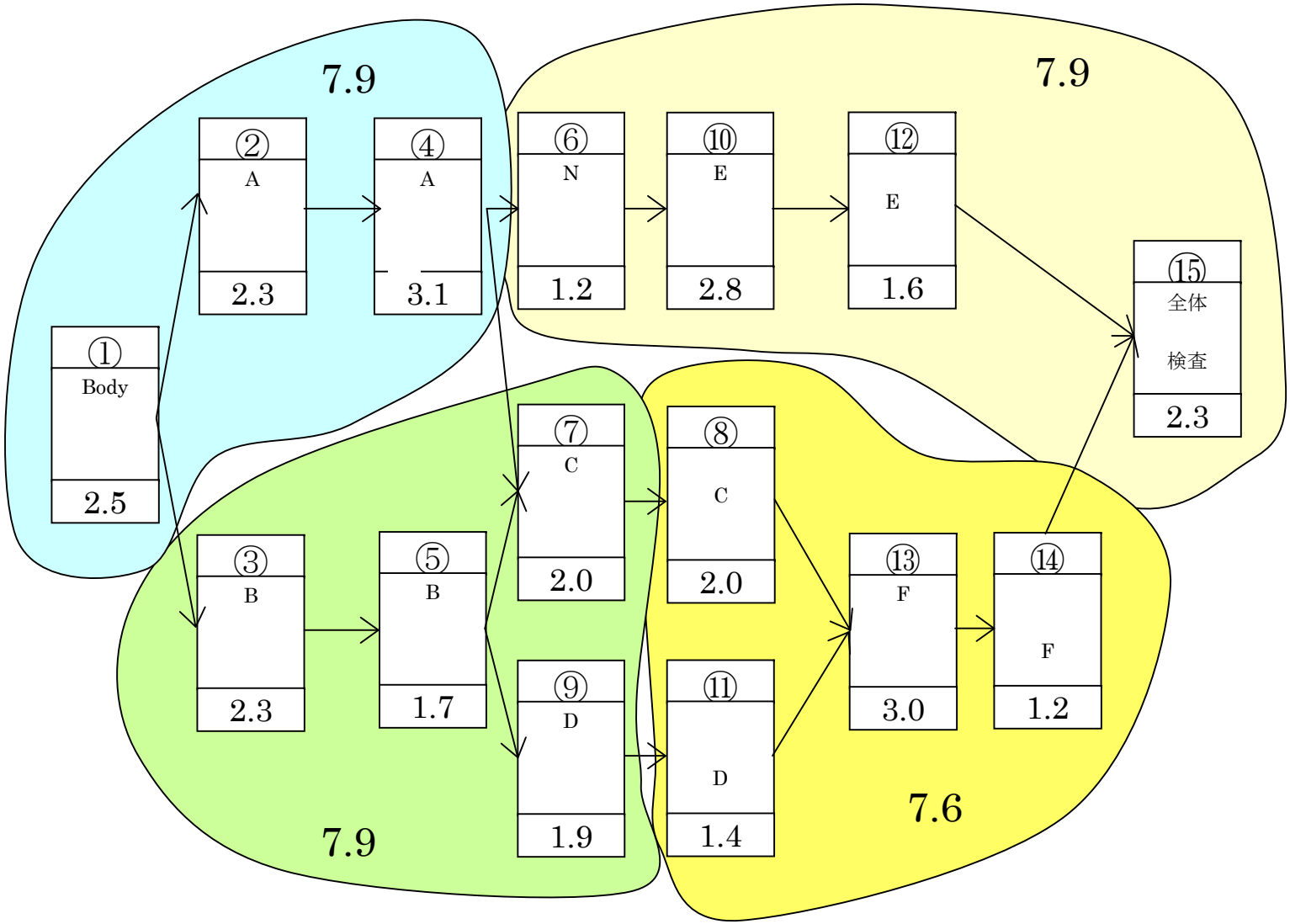
＝92．1% Very Low!





ラインバランス改善前の状況

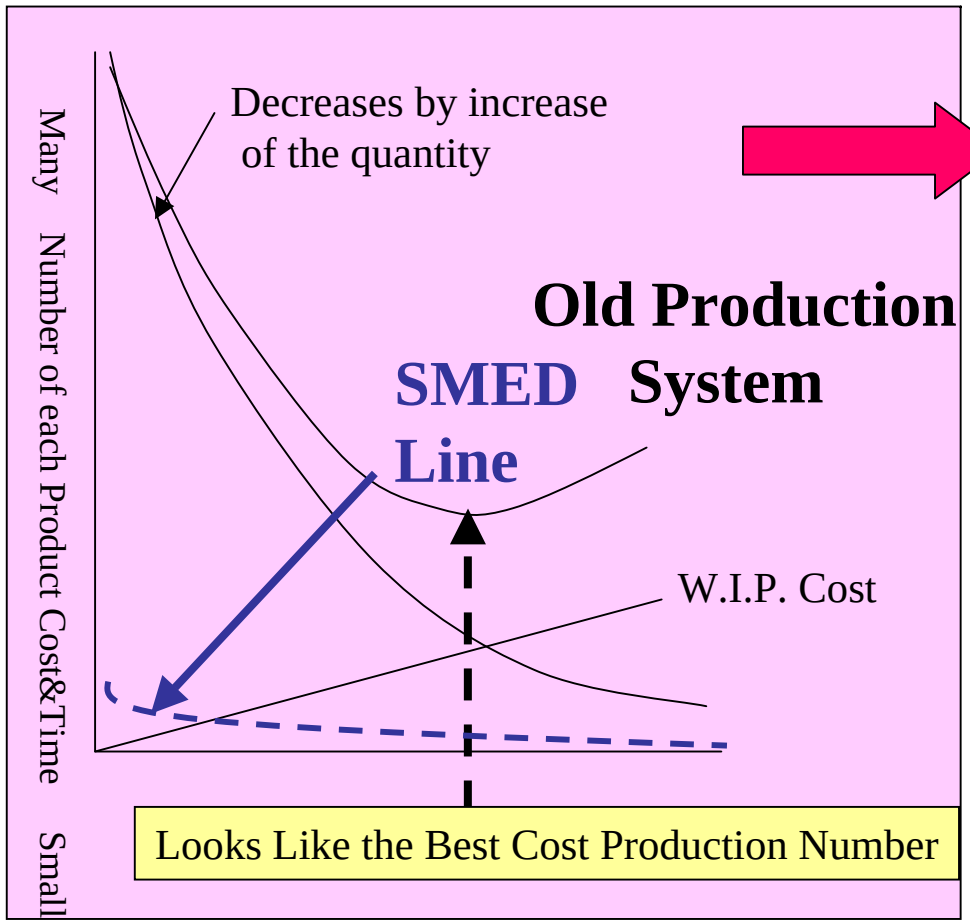
$$\text{Best balance} = \frac{7.9+7.9+7.6+7.9\ (\text{Min./PCS})}{7.9\ (\text{min./PCS}) \times 4\text{Processes}} = \frac{31.3}{31.6} = 99.1\%$$



Best balance

d) SMED: SMED (Single-Minute Exchange of Die)

Mass Production → Lot Production → One-by-One Production



SMED Hr.	Number Of each Lot	Production Hr./PCS	1個当たり作業時間	SMED Ratio
8H	100PCS	1min.	1min.＋$\frac{8\times60}{100}$ ＝5.8min.	62.5% Very Very Big
8H	10,000 PCS	1min.	1min.＋$\frac{8\times60}{10,000}$ ＝1.048	Only 0.5%

SMED Time Change

8H → 5Min.

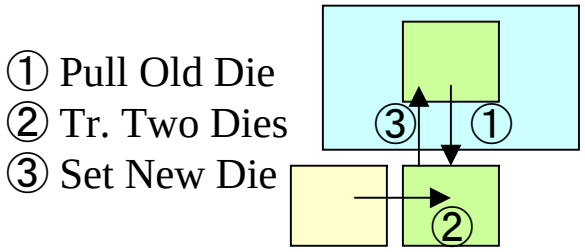
100PCS

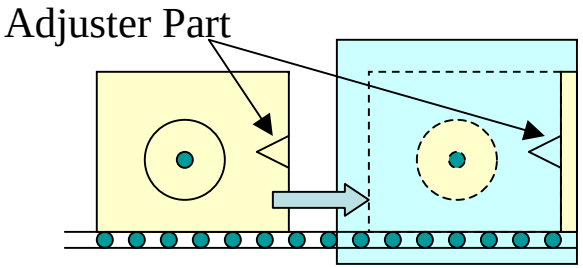
$1\text{Min.}+\frac{5\text{Min.}}{100}=1.05$

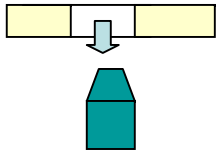
5%

SMED Techniques

①The preparation chassis use

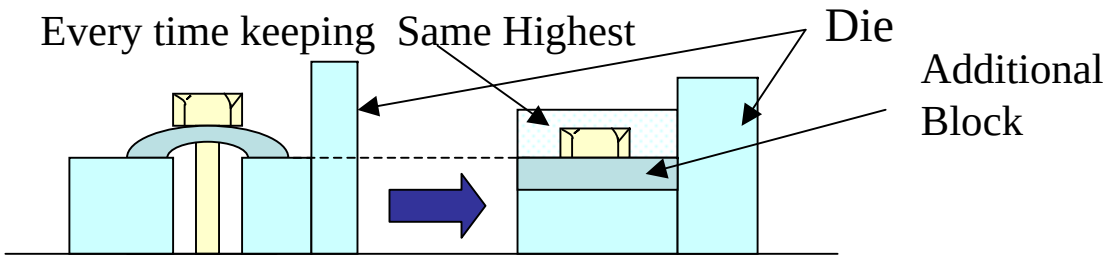




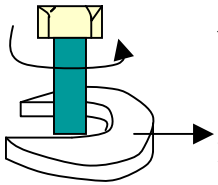


Bolster makes
Exact position
Setting

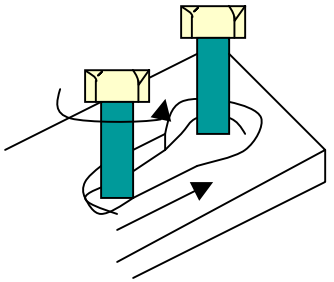
③ One-touch Fixture



16 times of screws turn but final turn decides the Fixture

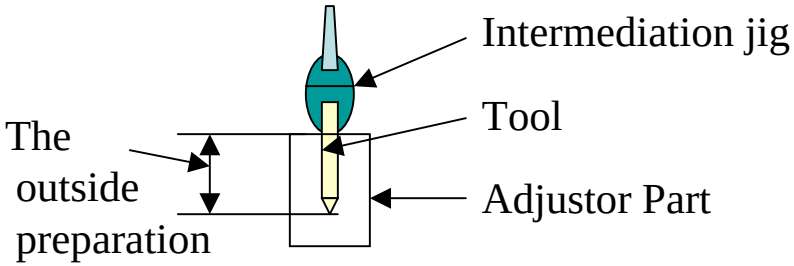


Washer
extraction
method

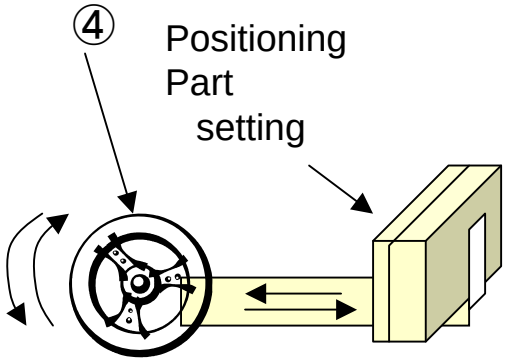


Shaped Hole
slide Method

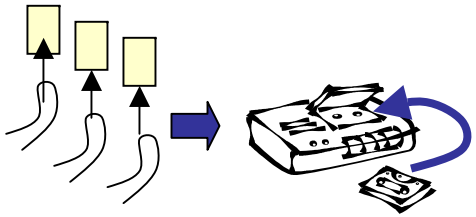
②One touch Setting Tool



④



⑤ One Touch Cassette method

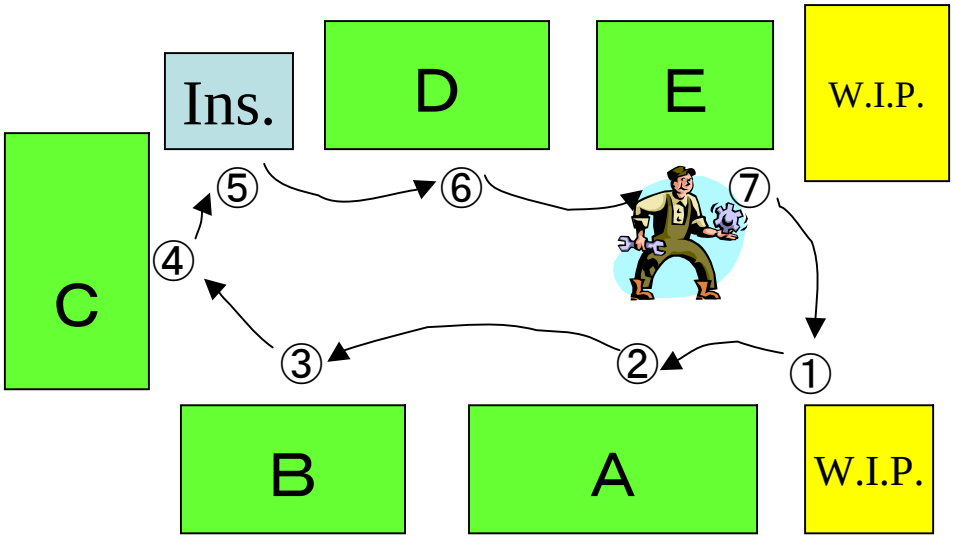


Multi-machine Handling

No	Work Process	5	10	15	20	25	30	35	40	45	50	55	60	65	70	75
①	Material handling	80	85													
②	Machine A setting															
③	Machine B															
④	Machine C															
⑤	Inspection															
⑥	Machine D															
⑦	Machine E															

Movement

Machine operation



One-Piece Flow Production

① Reduce W.I.P
② Reduce Production Lead Time
③ Decrease of the defectiveness
Need Multi-Skill Operator

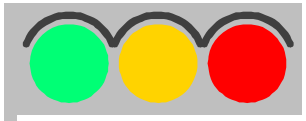
e) Visual Production Control System

① Place management

Reserved seat management

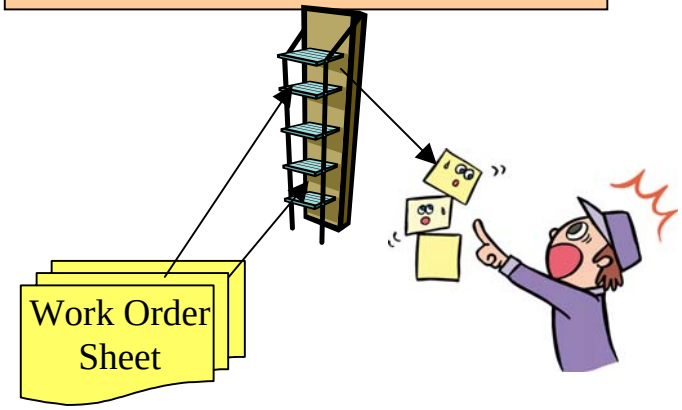
For Measures to get abnormality early in the production area

② production achievement situation

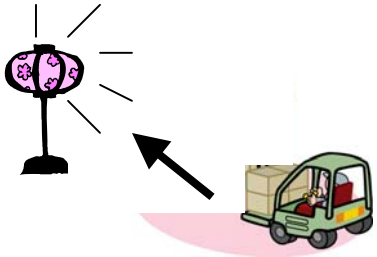


Plan	:○○PCS Time:
results	:○○PCS ±○PCS

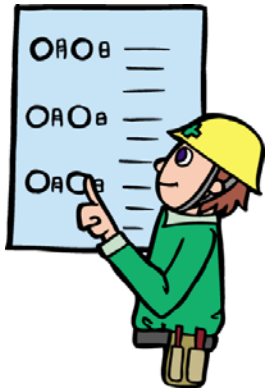
③ One by One Production instructions



④ Andon



④ Communication board

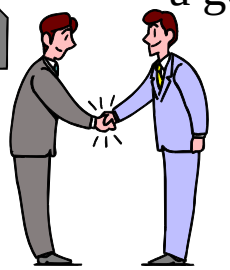


3,SCM & the Influences by Natural Disasters on TPS

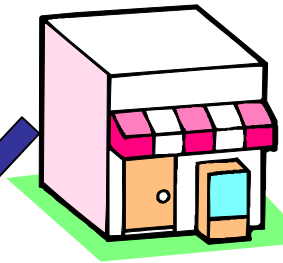
For example : East Japan great earthquake and Thailand Flood

To bone a new Product
Production+Sales makes
a good Team work

Use The new product development method that assumed the sale results the basis(90% change/Year)

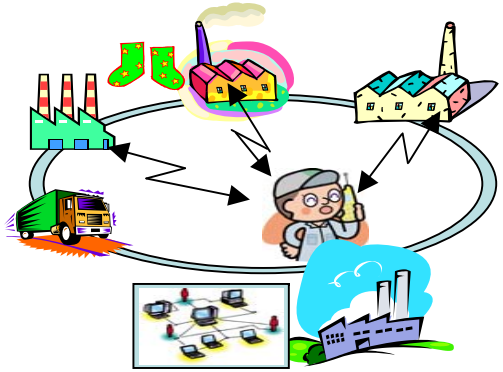


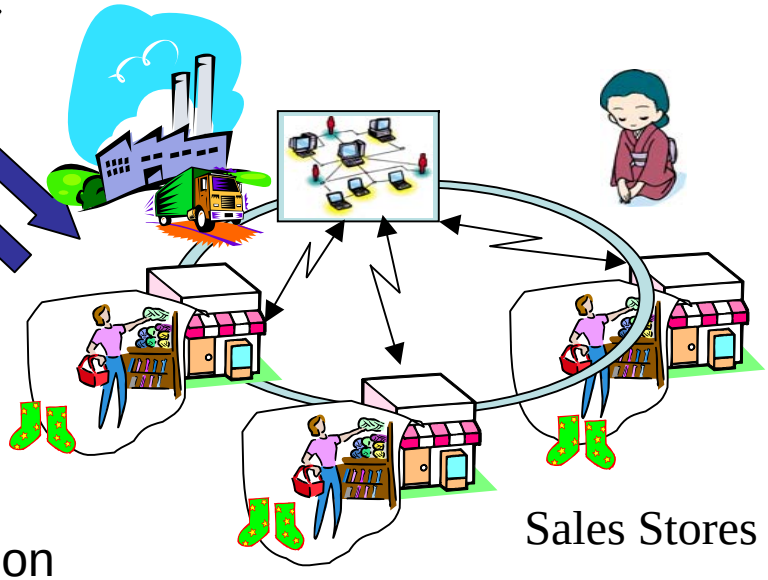
Sales forecast
with the group



VOC:
Voice of Customers

Information communalization system between supplier and parent companies





Sales Stores

All the members share the latest information

SCMの体系をモデル化した例

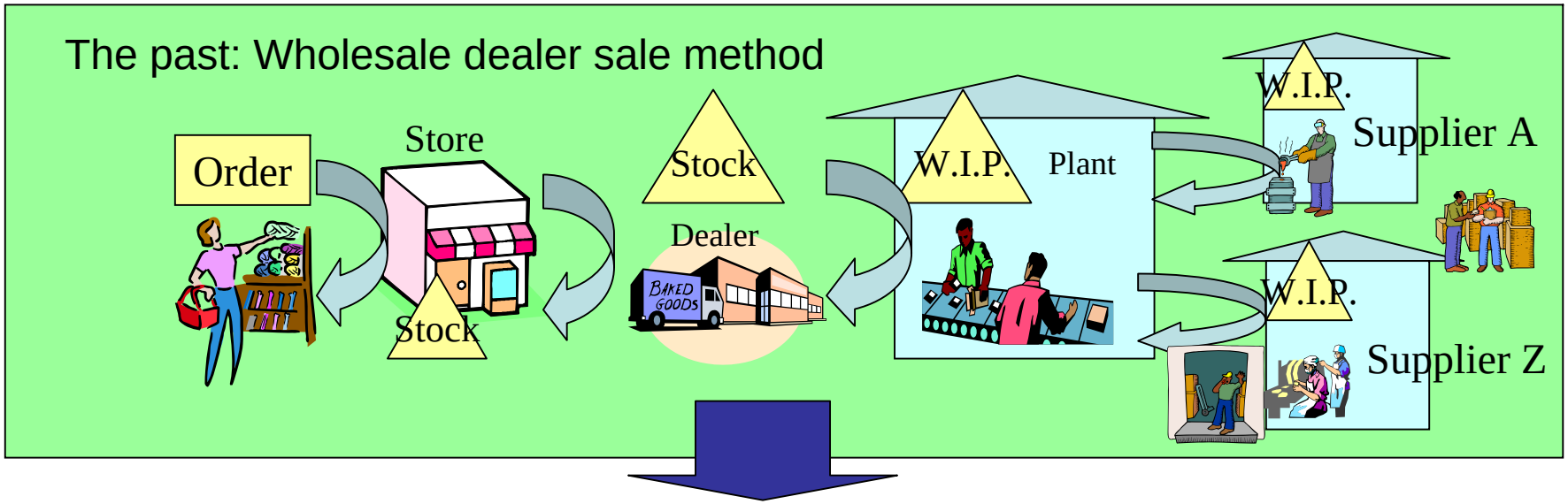
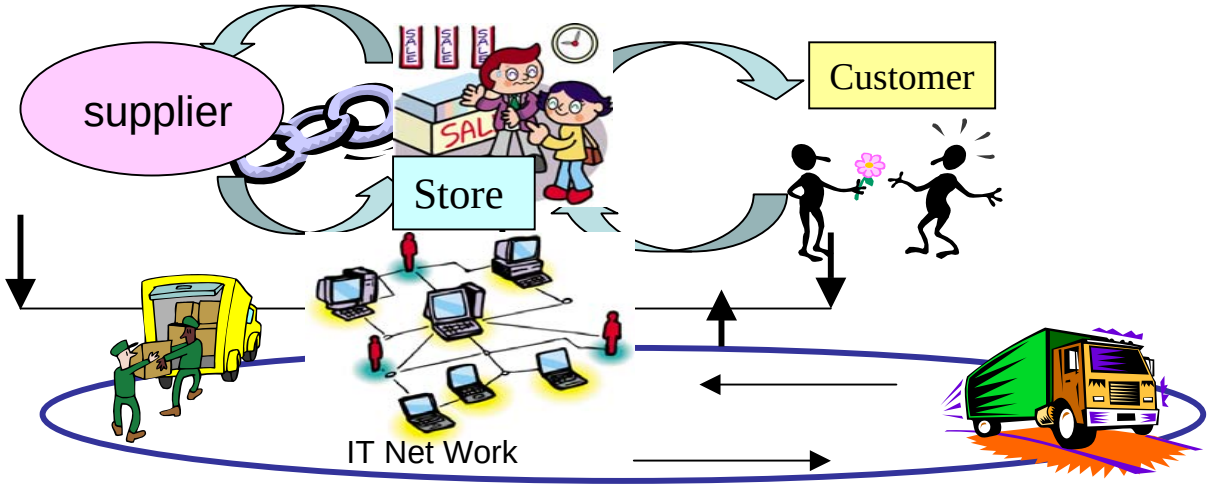


Image of SCM

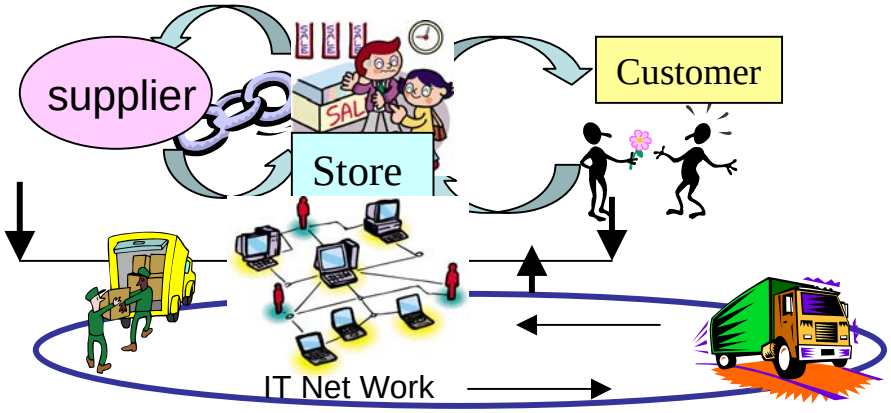


One by one order from sales shop to supplier

Difference between SCM and TPS

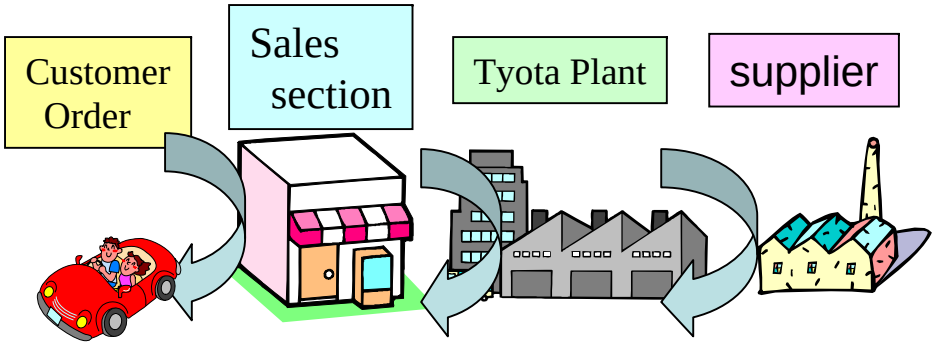
Item to compare	SCM（Ex. Convenience store）	TPS(Toyota Production Sys.)
1，Ordering to Production cycle 発注･生産計画のサイクル	Each tow Hr.	The production schedule that selected a period as one week or one month
2，Fluctuation in Production 生産の振れ	More than 10% Sometimes more than 50%	Less than 10%
3，Between order and production information 注文と生産の関連	The factory production item is the same as a market include small Prediction of the store	Sales plan of the Toyota Motor Sales section
4，Guarantee of quality responsibility 品質保証の責任	Charge supplier of each industrial goods	Toyota Product line and delivery company(keiretsu) of Toyota

Image of SCM



One by one order from sales shop to supplier

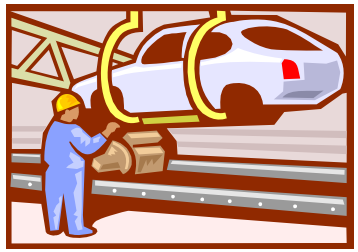
Image of TPS



Kanban: pull-based replenishment system

For One-Pease-Flow :Cell Production

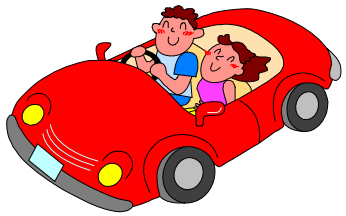
Allegory



Hard Ware
Car Assemble itself

Soft Ware
Production Control

Hart ware
Make each Car for each Customer

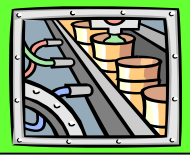


Customer get get satisfaction

JIT-CIMの場合

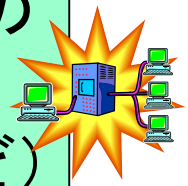
SLIM- Ⅰ

To make Good Production Line



SLIM- Ⅱ

良い管理のための装備（IT活用、目で見る管理など）



SLIM-Ⅲ

顧客に評価され継続的改善が進む活動

SLP was made by Richard Muther

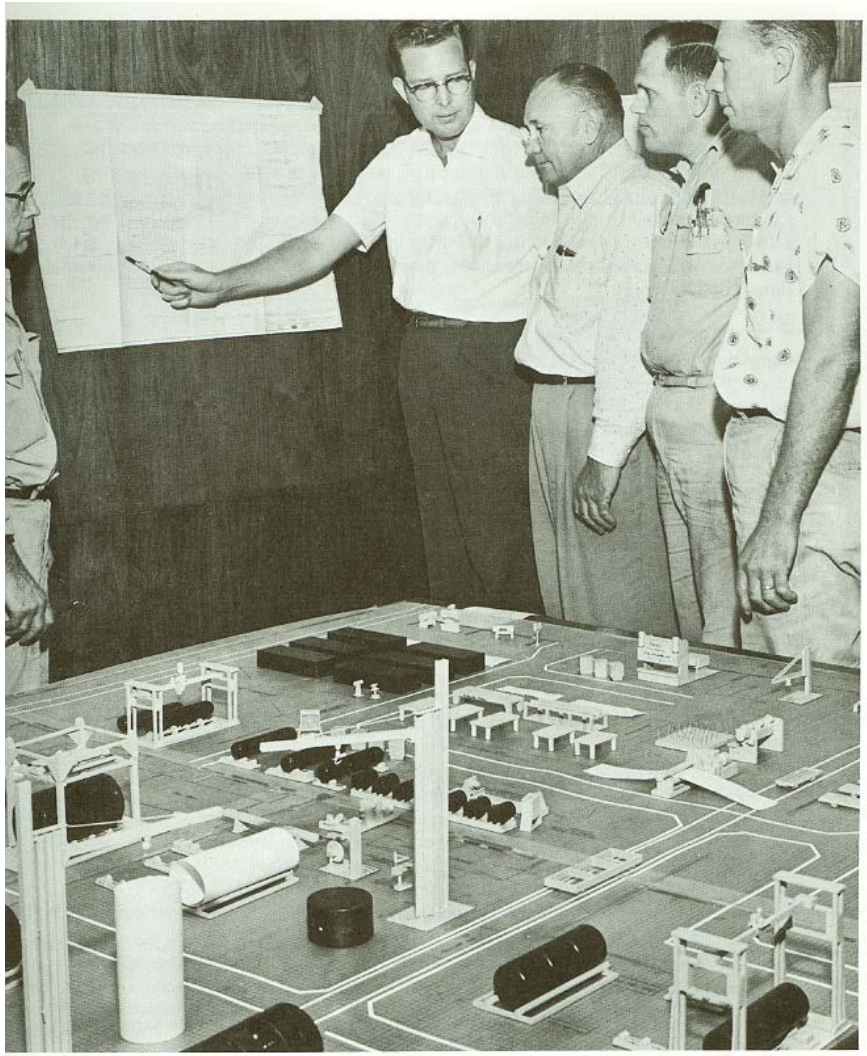
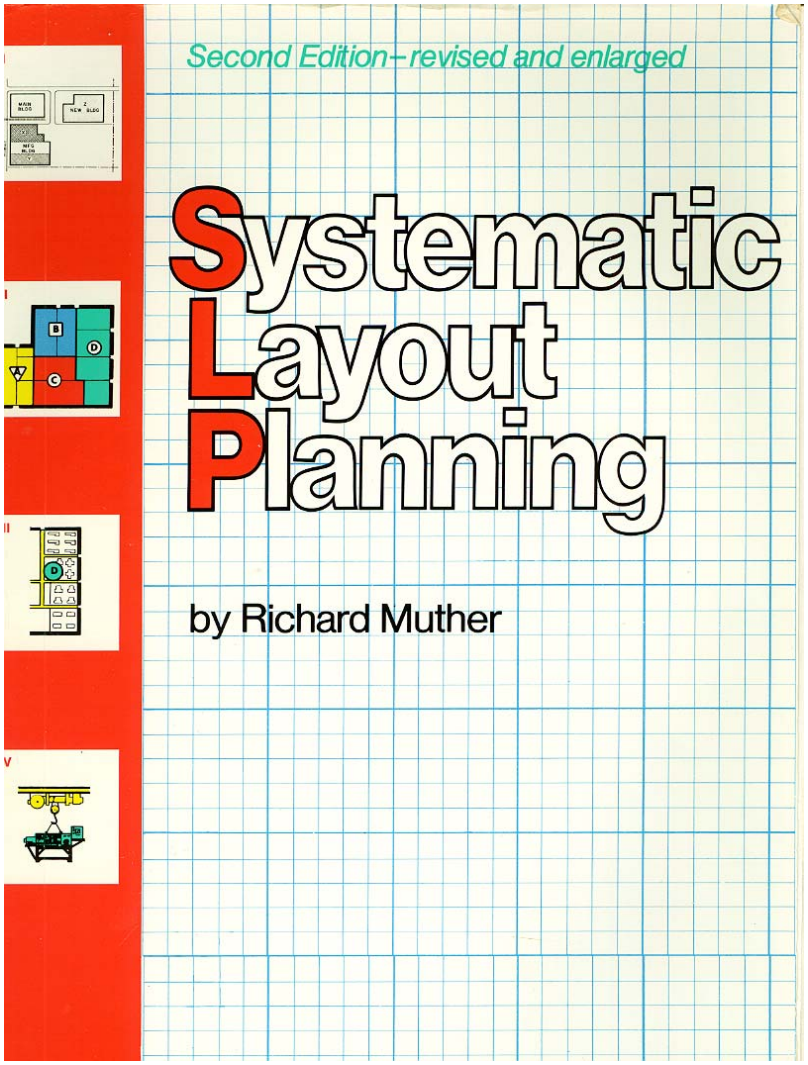


Figure 12–7. Use of drawings or two-dimensional template prints (on the wall) in conjunction with three-dimensional models in detail layout planning. The chief advantage of models is that they allow others to understand clearly what the layout engineer has planned. Here he is reviewing his layout with operating and staff personnel. This combination of drawing, or template print, and model generally affords the optimum in clearness of visualization and in ease of recording and communicating plans.

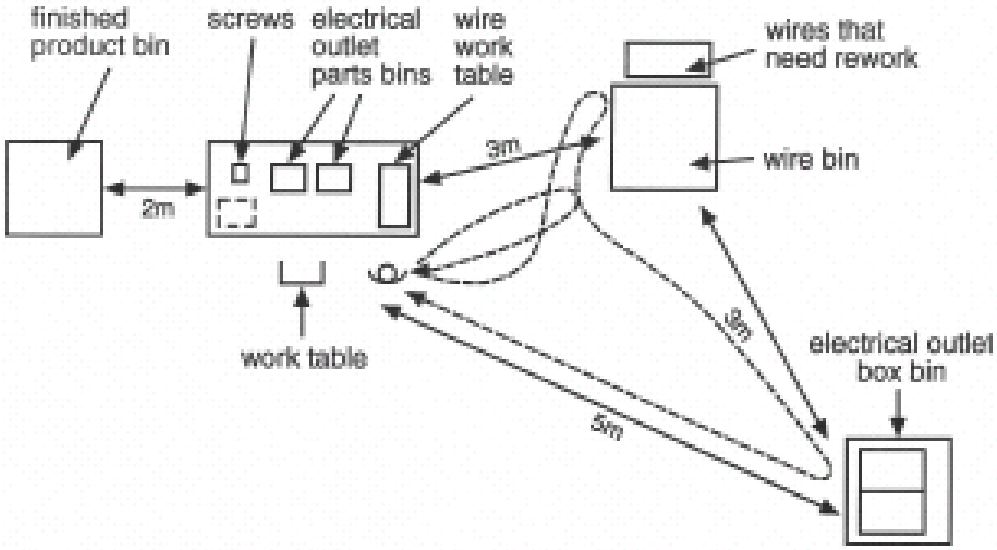


Process Analysis Method for a Work Process Kaizen

Process Analysis Symbols

Symbol	Meaning	Comments
○	Operation	Check for 100% efficiency in operation speed and contents of operations.
⇨ or ○	Transport, conveyance	Transport does not add value to the product and should therefore be eliminated whenever possible. Items that must be moved should be moved along wide paths and across short distances.
□	Inspection	A square within a circle indicates an inspection process that builds quality into products. Consider ways to increase the precision of inspections, such as by installing mistake-proofing devices (poka-yoke). When this cannot be done, try to establish rapid feedback regarding defects.
△	Delay, standby	Such nonproductive time should be minimized. Bottlenecks results from poor process balancing, poor conveyance methods, inappropriate lot organization, poor production scheduling, and so on. Make corrective improvements.

Layout of Electrical Outlet Assembly Operations



Analysis of Current Conditions in Electrical Outlet Assembly Operations

Step	Work	Transport	Hold	Inspect	Distance (m)	Time (min.)	4W1H					Comments
							What?	Where?	When?	Who?	How?	
1. Get wires	○	→	▽	□	3	0.04		✓				Can wire bin be placed closer to work table?
2. Pick up at least 20 wires	●	○	▽	□		0.20	✓					What if she picks up exactly 20 wires?
3. Carry wires to worktable	○	→	▽	□	3	0.04		✓				
4. Inspect and arrange wires	●	○	▽	■		0.02	✓				✓	What if the wires were cut at this process?
5. Return extra wires	○	→	▽	□	3	0.04		✓				
6. Go to terminal connector bin	○	→	▽	□	3	0.03		✓			✓	
7. Place connectors and outlet boxes in parts boxes	●	○	▽	□		0.20	✓					Can a cart be used to carry sets of parts and wires?
8. Return to worktable	○	→	▽	□	5	0.06		✓			✓	
9. Assemble 20 outlets	●	○	▽	□		10.00	✓					
10. Carry outlets to finished product bin	○	→	▽	□	2	0.03		✓				Can this be moved closer to the work table?
11. Return to worktable	○	→	▽	□	2	0.03		✓				

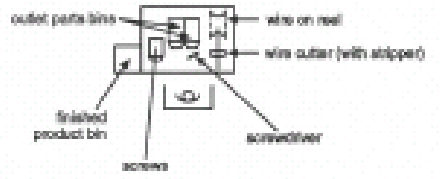
Case Study 4-1, cont'd
Process Analysis of Electrical Outlet Assembly Operation

Improvement Points:

- Wires and other electrical outlet parts were brought closer to the operator's work table.
- Wire is kept on a reel to make it more easily accessible.
- A foot-operated wire cutter is used to free the operator's hands for other work.
- The operator can pick up all needed parts and perform the assembly work while seated at the work table.
- The finished product bin has been moved next to the work table.

New Standards for Electrical Outlet Assembly Operations (After Improvement)

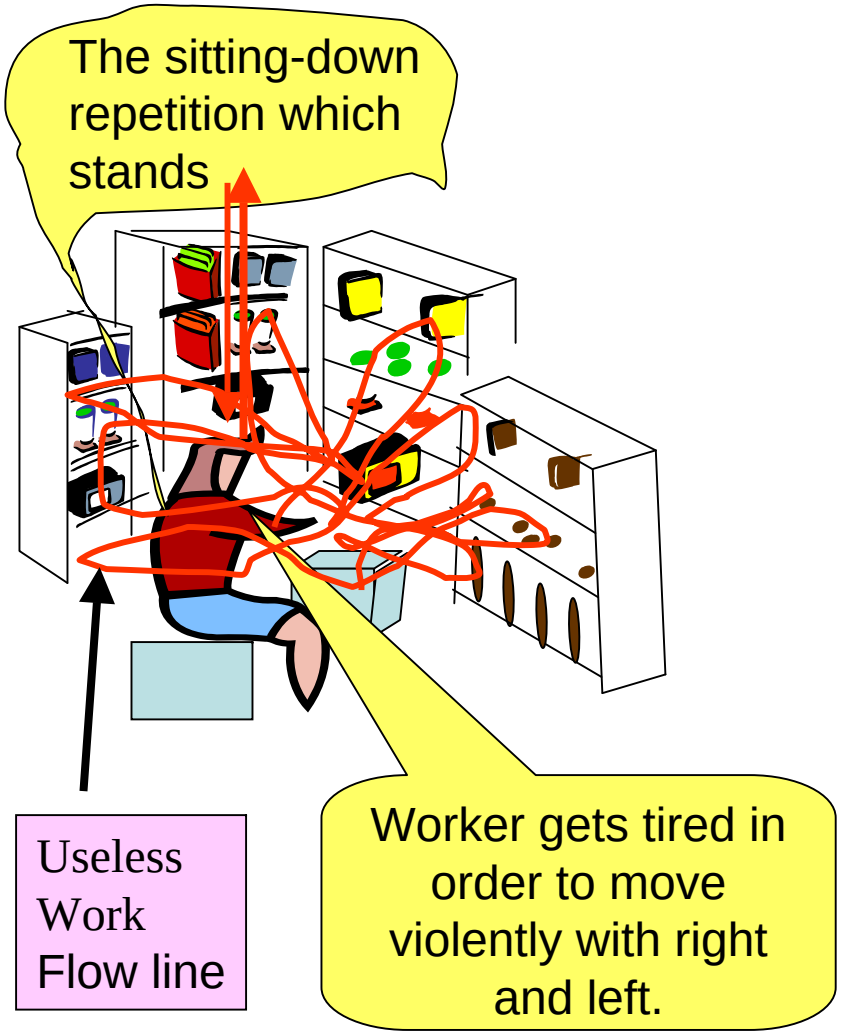
Step	Work	Transport	Hold	Inspect	Distance (m)	Time (min.)	4W1H: What?	Where?	When?	Who?	How?	Comments
1. Cut wires	●	○	▽	■		0.02	✓					Use a foot-operated wire cutter
2. Pick up terminal connectors and assemble electrical outlet	●	○	▽	□		0.30	✓					
3. Place assembled electrical outlet in finished product bin	●	○	▽	□		0.01	✓					



Note: The wire cutter blade must be checked every day. When wire on the reel runs low, an alarm lamp signals the need for a refill.

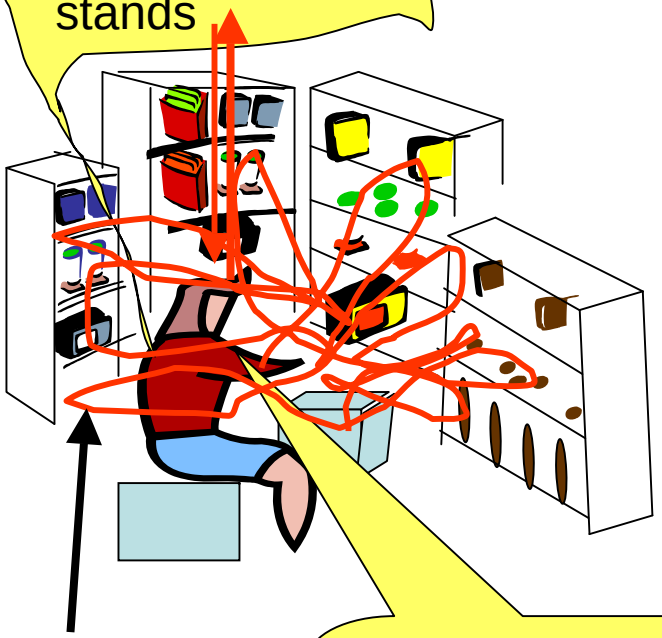
Figure 4-6

Before Kaizen



Before Kaizen

The sitting-down repetition which stands



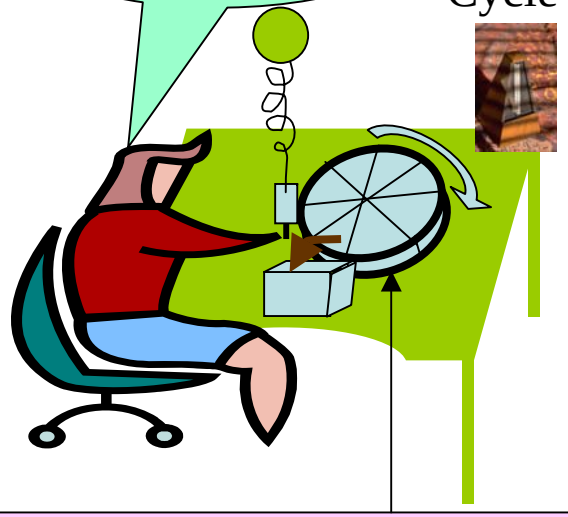
Useless Work Flow line

Worker gets tired in order to move violently with right and left.

Use JIT Assemble Work system

Very Easy Job!

Keep the company Cycle Time



Eliminate Useless Work
Flow line by using Turn Table

Kaizen to a kind of cell System

Please look at this Kaizen on URL:qcd.jp

Estimated Reduction Time 568 by Improvements

Current Working Time 22:24 = 1344 Sec.

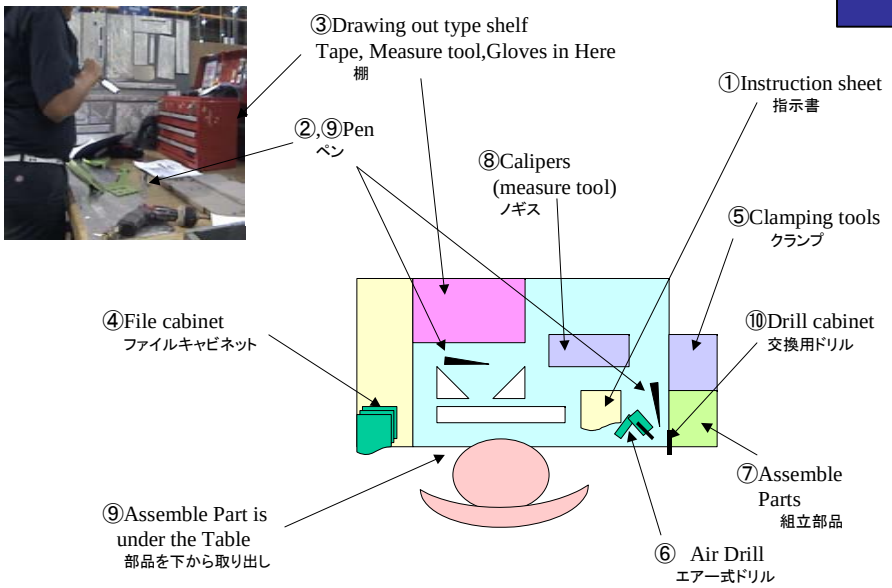
568÷1344＝42. 26% Reduce

改善前

Current Job System

3, Practices of DVD job Process on your Company

実例テーマへの適用

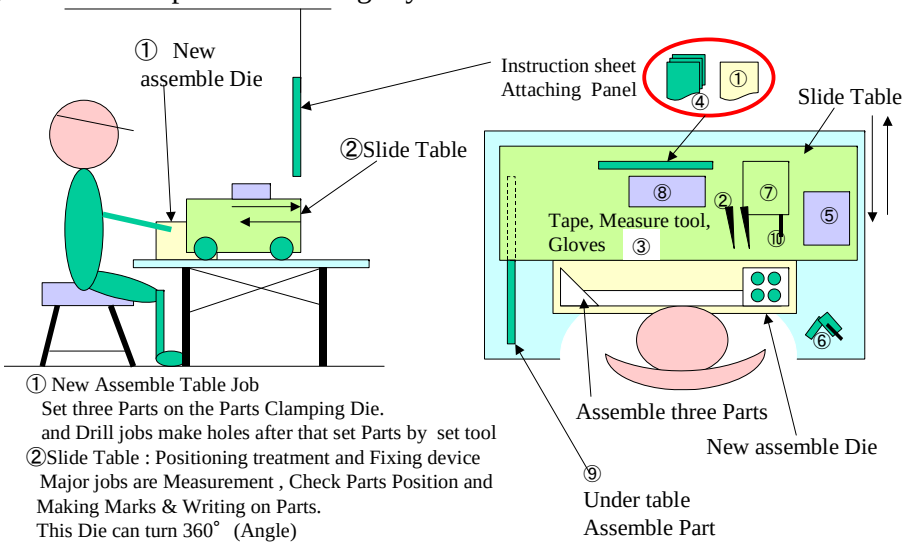


改善案

Improvement Idea

Improvement Idea about Parts Assemble Job Step

After Improved Working Style



① New Assemble Table Job
Set three Parts on the Parts Clamping Die.
and Drill jobs make holes after that set Parts by set tool
②Slide Table : Positioning treatment and Fixing device
Major jobs are Measurement , Check Parts Position and
Making Marks & Writing on Parts.
This Die can turn 360° (Angle)

Part of a Parts Assemble job

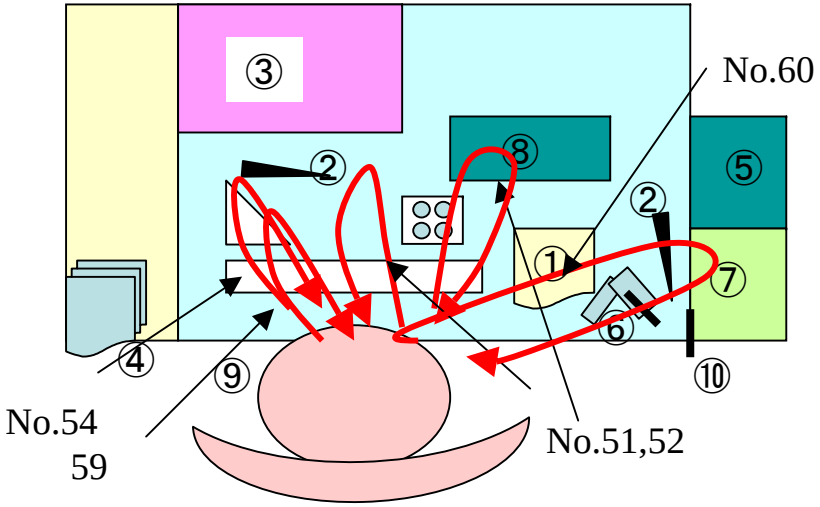
No. 55 Drill

Work that danger is somewhat attended

Reason Why?:

1, The fixation of the part unit is unstable.

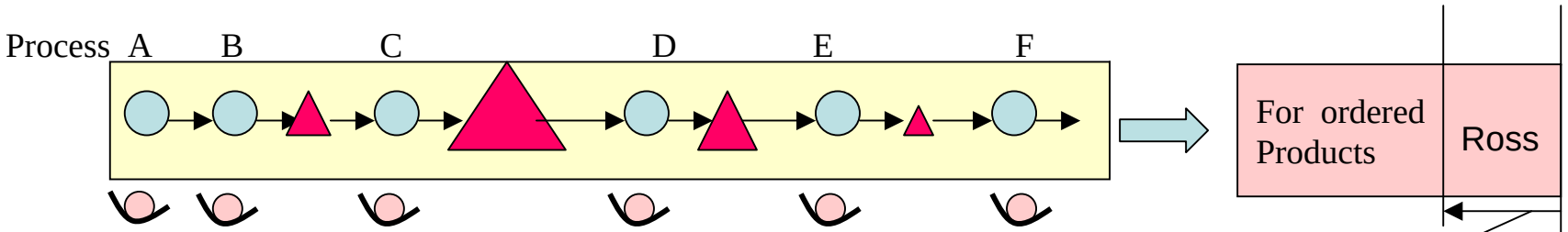
2,If the nether part unit slips, the drill might become be broken and ease to make a injury status on this Job.



No.	Work Process	IE	DVD Time	Net Time	Example of a Improvement Idea
51	Back tool	→	10:45→10:49	0:04	Cell Layout will reduce 0.02
52	Take Pen & Scale	→	10:49 →10:53	0:04	Cell Layout will reduce 0.02
53	Mark & Sign on Parts Unit	○	1053 →11:27	0:34	
54	Take Glove & Drill	→	10:27 →11:36	0:09	New Assemble Die has no Gloves 0:07
55	Drill	○	11:36 →11:44	0:08	Work that danger is somewhat attended
56	Back Drill and Take Parts	→	11:44 →11:50	0:06	Cell Layout will reduce 0.03
57	Assemble Part	○	11:50 →12:02	0:12	
58	Turn Parts Unit	→	12:02 →12:07	0:05	
59	Takes off one's gloves.	→	12:07 →12:10	0:03	New Assemble Die has no Gloves 0:03
60	Take Parts	→	12:10 →12:20	0:10	Cell Layout will reduce 0.05
	Total		95 Sec.		Estimated Reduction Time: 22 Sec.

Comparison between conveyer line and cell production

The conveyer line which needs the long-Hour for SMED

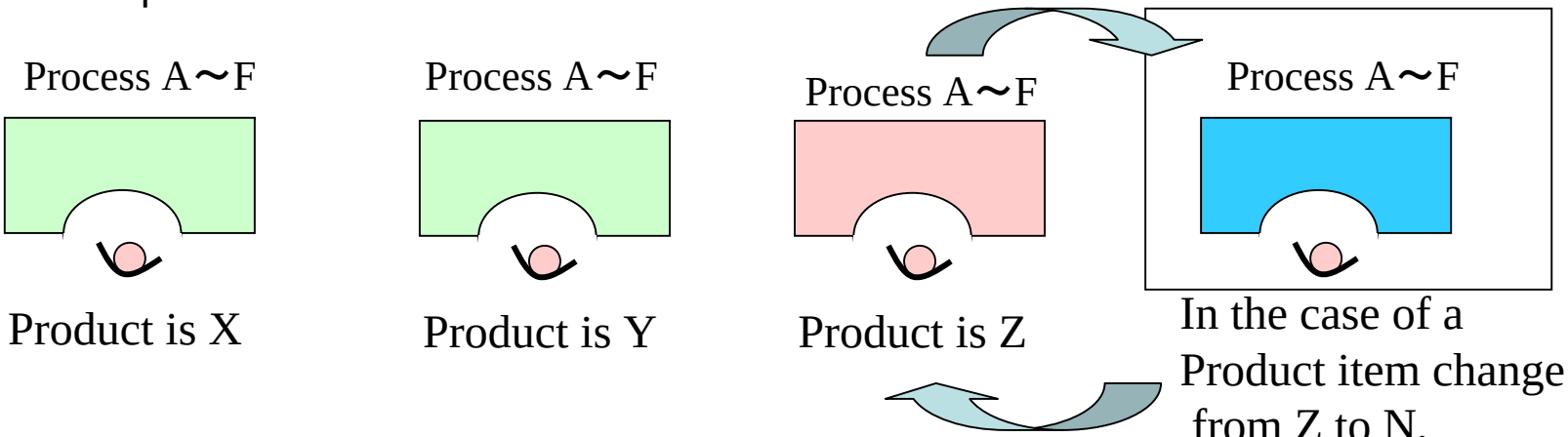


For a product left by a production change

Cell Production

One production method

A operator takes care a large number of processes

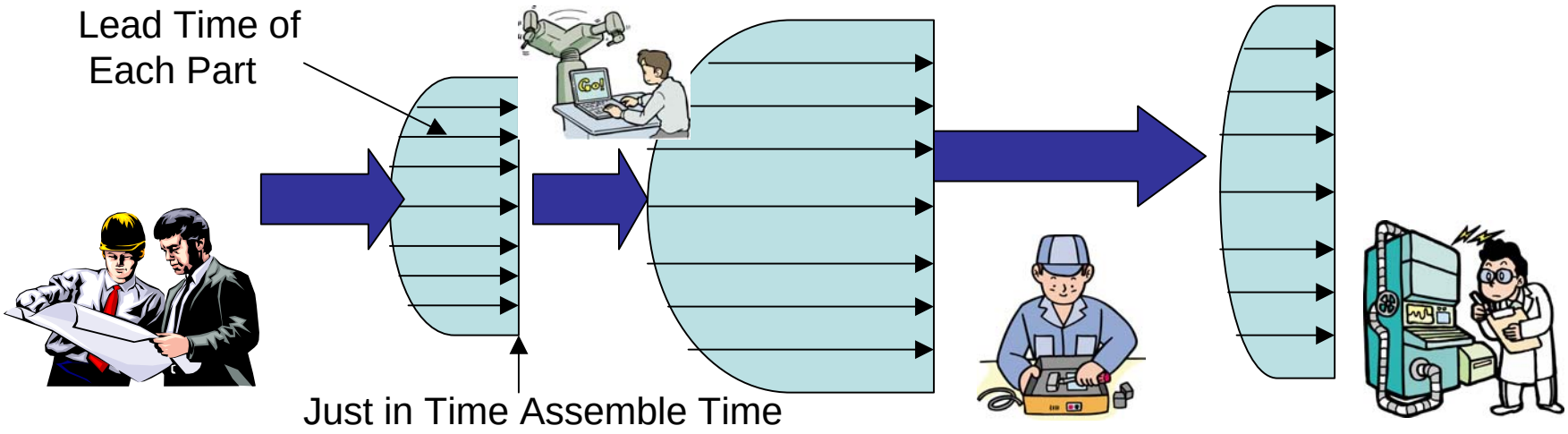


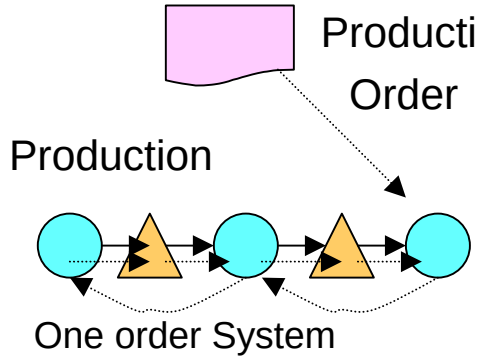
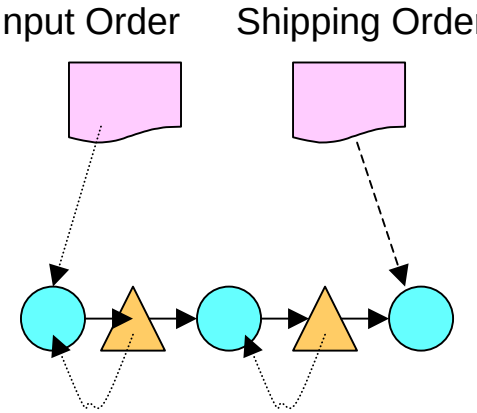
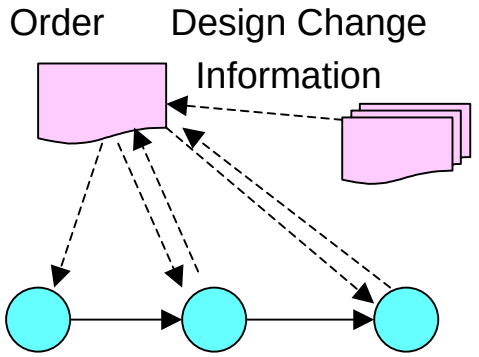
In the case of a Product item change from Z to N, The Company changes only one cell

This method is very flexible for the change of the product, but needs Multi-Skill operators.

JIT Assemble needs of Big Plant Maker Products

Each company needs its own Production Control System



TPS	General mass production	Special order production
Fluctuation in Production is Less than 10%	Fluctuation in Production is More than 20 or 50%	Method to always contain design changes
		

Quality and Delivery Strategies（Now!）

Shichifuku Towel (Imabari, Ehime）

Towel manufacturers: 500 in 1976; 100+ in 2008. While most are struggling, Shichifuku maintains excellent profits.

① Quality Strategy

（1）Developed high-end products per Tokyu Hands' request

（2）Targeted hotels to sell high absorption towels.

（3）PR on design ability at a Trade Show in US. Hollywood stars embraced it. (flexible design)

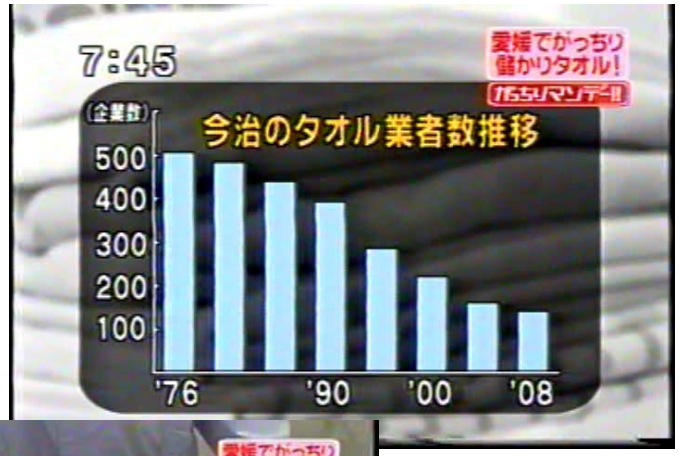
② Delivery Strategy

（1）Put company name and phone number on the products.

（2）Established a direct sales system.

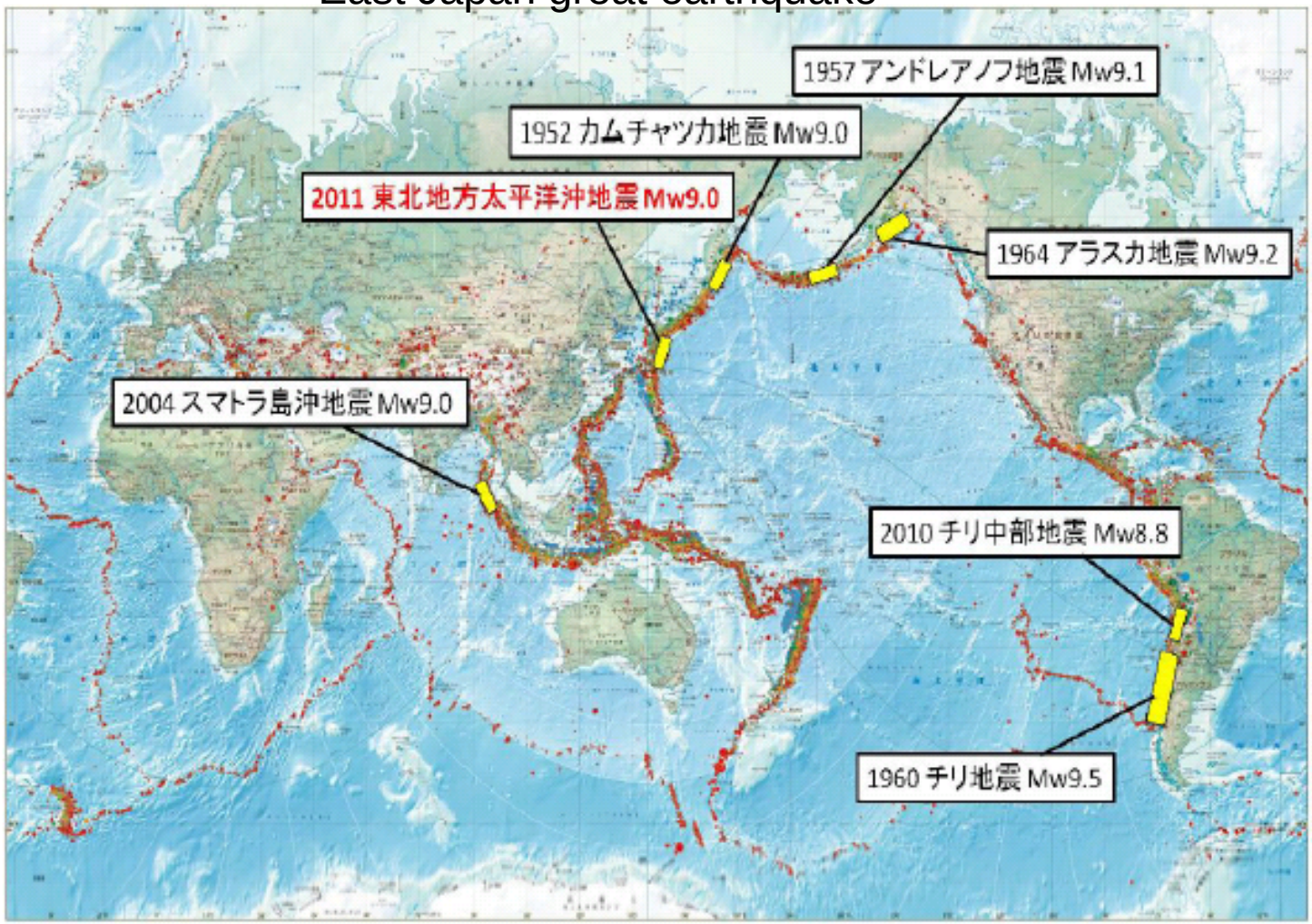
（3）Accepted design requests. The words of mouth, especially from Hollywood stars. Responded individualized needs.

Broadcasted on 8/16/2009



the Influences by Natural Disasters

East Japan great earthquake



http://www.yokohama-cci.or.jp/sangyoubousai/manual.pdf

Example of East Japan great earthquake

URL：https://skydrive.live.com/?cid=E1DE36C8302689A8&id=E1DE36C8302689A8%21577　2011-5震災ボランティアより

Influence on auto sales by the East Japan great earthquake disaster

Sales Status at Y11 June

	Car Number	Ratio to One Year ago
GM	215, 358	6. 0
Ford	194, 114	9. 2
Chrysler	120, 394	25. 2
Toyota	110, 937	▼24. 1
Honda	83, 892	▼24. 3
Nissan	71, 940	7. 1

Main points

1, Toyota and Honda gat East Japan great earthquake disaster influences and not enough for parts supply

2, Sale of Toyota car Prius sales down was 62%

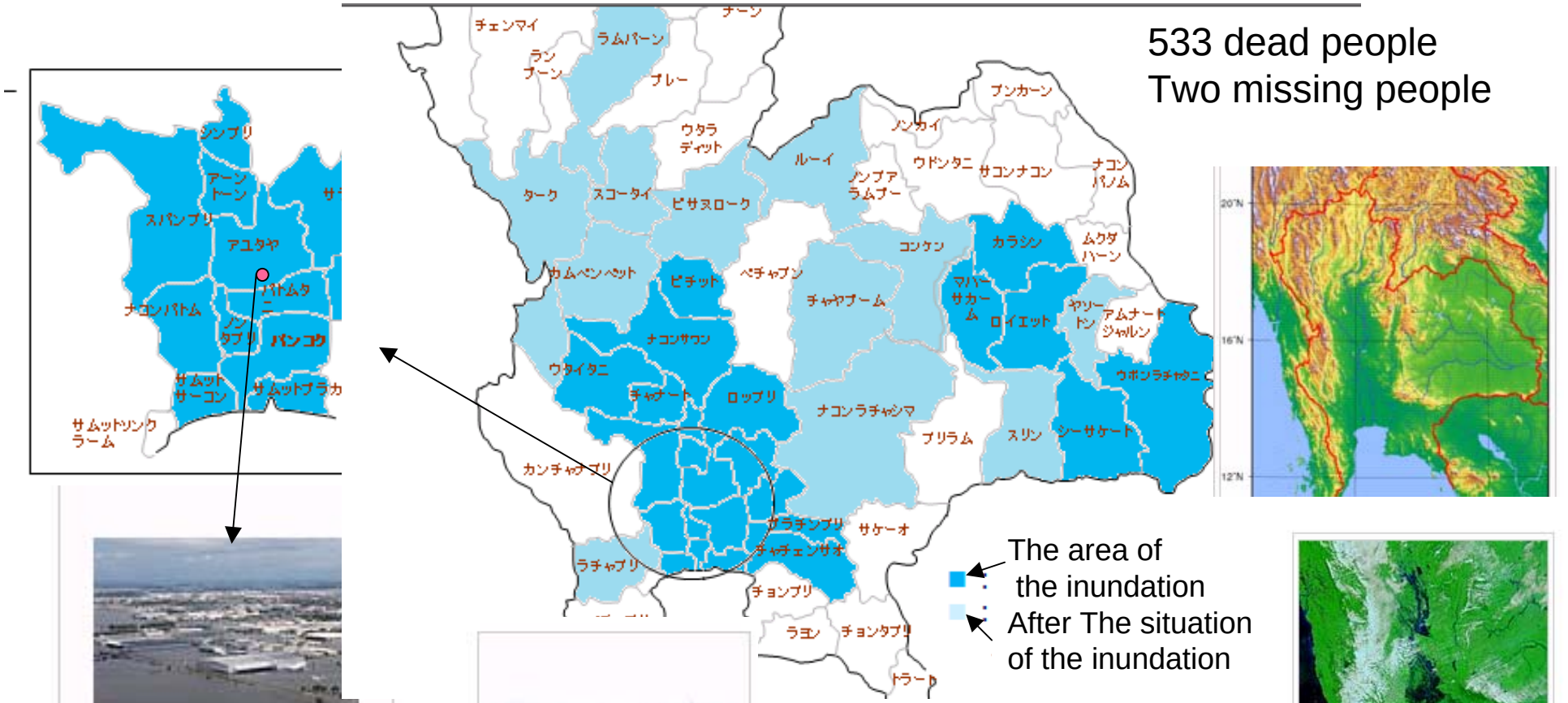
3, Toyota revive it in July, but there are many problems

Supply Chain Problems by East Japan great earthquake disaster : Examples of some parts

1, Semiconductor integrated circuit（ASIC）:
At Ibaragi Naka Area : Products made by Runesasu-Electronics were not able to be received for three months. The situation that has difficulty in substitute for an absolutely confidential study-like product

2, Synthetic rubber for Thailand and brakes made by Fukushima Kotaka-Fujikura Rubber and Additive to Rubber made by Ohouchi-Shinnko Kagaku are hard to be get.

3, Toyota Plant can not get parts soon which is more than 3,000 items.



The situation of the submergence in the November, 2011 Thailand country

URL:http://ja.wikipedia.org/wiki/%E3%82%BF%E3%82%A4%E5%A4%A7%E6%B4%AA%E6%B0%B4より抜粋・作図

October 27, 2011 influence of East Japan great earthquake disaster and the country flood in Thailand

By Newspaper Asahi

Company name	Domestic production	Export	Offshore production
Toyota	1,235,011 （▼23. 4）	665,105 （▼21. 2）	1,912,150 （▼ 7. 8）
Nissan	539,798 （▼ 6. 1）	349,860 （ 4. 1）	1,712,196 （ 18. 4）
Honda	294,234 （▼39. 5）	89,822 （▼45. 6）	936,938 （▼29. 1）
Suzuki	474,654 （▼13. 2）	122,712 （▼13. 9）	842,019 （▼ 3. 9）
Matsuda	409,393 （▼10. 6）	301,971 （▼13, 7）	159,999 （▼12. 2）
Mitsubishi	281,954 （▼12. 6）	207,363 （▼ 4. 4）	274,238 （ 14. 3）
Daihatsu	283,130 （▼14. 6）	19,004 （▼48. 1）	180,922 （ 3. 4）
Subaru	177,996 （▼27. 2）	114,054 （▼30. 6）	68,619 （▼11. 8）

For natural disaster evasion, what kind of preparations should the company plan?
I would like to present some countermeasures on a TPS seminar.

PPA（Potential Problem Analysis)

Evaluation of the risk

P	× S
5：Phenomenon to happen by all means	5：Fatal
4：Very High	4：Very Big
3：So-So	3：So-So
2：Low probability	2：Small
1：not occur	1：Nothing

Them:By When◇◇We eliminate natural Hazards

Item of Risk	Cause of Problem	P	S	Precaution	urgent measures	Act.

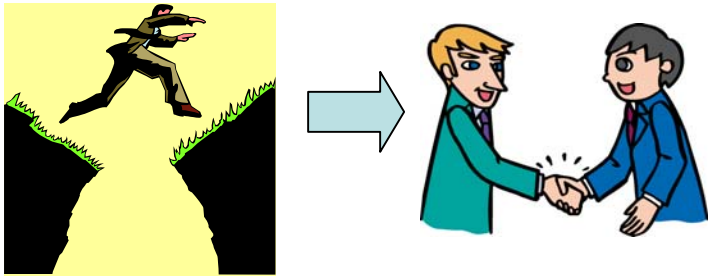
E:Easiness of the enforcement
P:Certainty of the realization

Measures entry column

Certainty of the realization
To P & S

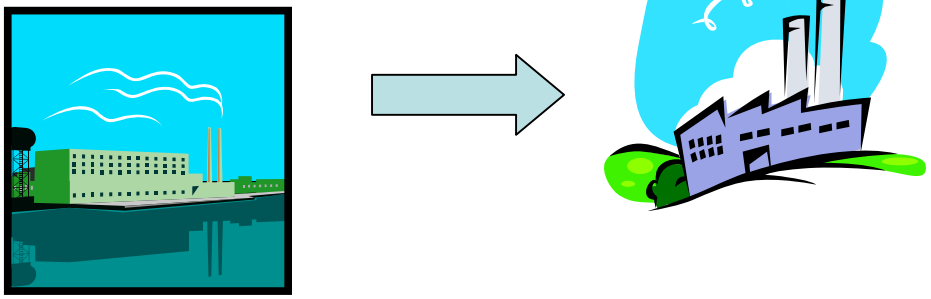
Model Idea of risk reduction to Delivery stabilization of each supplier

1, Decentralization of the risk
looking for many production bases



2, The limitation of the production base and important point reinforcement of natural disaster measures
:Financial support

3, In-house production to Key Parts



Thank you for the participation in today's seminar.