



Process Management: BPI vs. Reengineering

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BPI – Business Process Improvement

- **Business Process Improvement (BPI) is a systematic approach to help any organization make significant changes in the way it does business. The organization may be a for-profit business, a non-profit organization, a government agency, etc...**
- **BPI works by:**
 - **Defining the organization's strategic goals and purposes**
(Who are we, what do we do, and why do we do it?)
 - **Determining the organization's customers or stakeholders**
(Who do we serve?)
 - **Aligning the business processes to realize the organization's goals**
(How do we do it better?)

Kaizen philosophy

- The word Kaizen is derived from two Japanese words “Kai” meaning “Change” and ”Zen” meaning “Good” which when roughly translated, Kaizen means “change for the better”.
- Kaizen is a term that has had its fair share of press both good and bad since the boom of Lean Manufacturing in the late 1980’s.

Kaizen method

- **The Kaizen method of continuous incremental improvements is an originally Japanese management concept for incremental (gradual, continuous) change (improvement)**
- **Kaizen is actually a way of life philosophy, assuming that every aspect of our life deserves to be constantly improved**
- **The Kaizen philosophy lies behind many Japanese management concepts such as Total Quality Control, Quality Control circles, small group activities, labour relations**
- **Key elements of Kaizen are quality, effort, involvement of all employees, willingness to change, and communication**

Reengineering

- **Reengineering (or re-engineering) is the radical redesign of an organization's processes, especially its business processes**
 - Rather than organizing a firm into functional specialties (like production, accounting, marketing, etc.) and looking at the tasks that each function performs, we should, according to the reengineering theory, be looking at complete processes from materials acquisition, to production, to marketing and distribution
 - The firm should be re-engineered into a series of processes.....

BPR - Business Processes Reengineering

- The goal of BPR is a radical change in the performance of an organization, rather than a series of incremental changes
 - Hammer and Charpy popularized this radical model in their book “Reengineering the Corporation: A Manifesto for Business Revolution” (1993)
 - Hammer and Charpy stated that the process was not meant to impose trivial changes, such as 10 percent improvements or 20 percent cost reductions, but was meant to be revolutionary

Hammer & Charpy

- In a series of books including *Reengineering the Corporation*, *Reengineering Management*, and *The Agenda*, Hammer and Charpy argue that far too much time is wasted passing-on tasks from one department to another.
- They claim that it is far more efficient to appoint a team who are responsible for all the tasks in the process.
- In *The Agenda* they extend the argument to include suppliers, distributors, and other business partners.

Reengineering philosophy

- **Re-engineering is the basis for many recent developments in management.**
- **The cross functional team has become popular because of the desire to re-engineer separate functional tasks into complete cross-functional processes**
- **Also, many recent management information systems developments aim to integrate a wide number of business functions.**
- **ERP (Enterprise Resource Planning), SCM (Supply Chain Management), HR management Systems, Customer Relationship Management Systems all owe a debt to re-engineering theory.**

Philosophy of management

- **USA/Europe**: dramatic change and innovation (process re-engineering) approach focused on final result (short term approach)
- **Japan**: continuous improvement approach focused on process development (long term approach)

KAIZEN

What is Kaizen?

- In business management, kaizen is a Japanese tradition which is now used internationally, modified by each culture to best suit their own business environments. A literal translation of kaizen could be "to become good through (small) change“
- At its most basic the concept of kaizen is one of restructuring and organizing every aspect of a system to ensure it remains at peak efficiency
- Kaizen is founded upon five primary elements

Five primary elements

1. **Quality Circles:** Groups which meet to discuss quality levels concerning all aspects of a company's running
2. **Improved Morale:** Strong morale amongst the workforce is a crucial step to achieving long-term efficiency and productivity, and kaizen sets it as a foundational task to keep constant contact with employee morale
3. **Teamwork:** A strong company is a company that pulls together every step of the way. Kaizen aims to help employees and management look at themselves as members of a team, rather than competitors
4. **Personal Discipline:** A team cannot succeed without each member of the team being strong in themselves. A commitment to personal discipline by each employee ensures that the team will remain strong
5. **Suggestions for Improvement:** By requesting feedback from each member of the team, the management ensures that all problems are looked at and addressed before they become significant.

Kaizen principles

- In addition to the foundations, a number of principles exist in kaizen
- These include standardizing as many aspects of the corporation as is possible, removing all inefficiency, and the five rules for a good environment:
 1. Tidiness (Seiri)
 2. Orderliness (Seiton)
 3. Cleanliness (Seiso)
 4. Clean-Up Time (Seiketsu)
 5. Discipline (Shitsuke)

5 “S” management approach

- The name is taken from the initial “s” of the following Japanese words
 1. **Seiri**: classify and select (the needs, the priorities, ...)
 2. **Seiton**: tidy up and standardize (the ideas, the actions, the components, ...)
 3. **Seiso**: clean up (the work place, the data, ..)
 4. **Seiketsu**: share and communicate (information, ideas, results, ...)
 5. **Shitsuke**: control and discipline (workers, ourselves, ...)

Company culture revolution

- **Traditional culture**
 1. **Big batches mean low cost**
 2. **When quality increase, costs will increase**
 3. **Workers muscular and “ignorant”**
- **Kaizen culture**
 1. **Small batches mean good quality**
 2. **Good quality mean low cost**
 3. **Thinking worker is a productive worker**

Kaizen introduction

- Kaizen activities should be owned by the **workgroup** and be within their jurisdiction to implement with the minimum of support
- The ideal Kaizen should be able to be developed and **implemented during a single shift**. This is the level of continuous small improvement
- Activity which **Toyota** boasts returns them a ten percent cost down on internal processes year on year.

Jishuken

- The next level of improvement activity is known as a **Jishuken activity**, this is where a workgroup encounter a problem that they are unable to overcome as a collective. They will then escalate this concern via the daily problem and countermeasure system where an external support member will be assigned to co-ordinate the activity
- **Jishuken means 'fresh eyes'** and the approach is to combine personnel from outside the workgroup with the internal team to give a different perspective on the problem and also to bring specialist knowledge

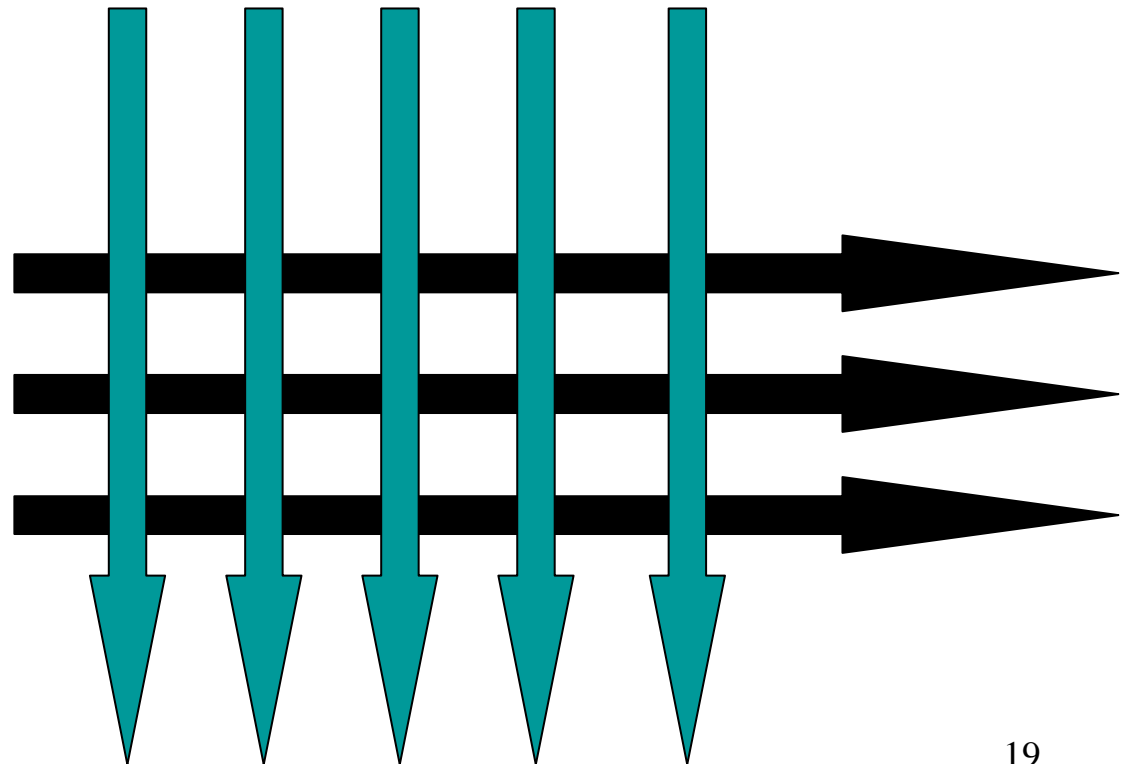
Kaikaku

- The final level of improvement is **Kaikaku meaning 'large step change'** these are relatively rare and focus on a major task such as re-laying out a production cell or installing a new piece of capital equipment within an ongoing production area.
- Again a co-ordinator would be assigned to ensure that the planned schedule is adhered to and if not escalate concerns to ensure swift resolution.
- All of the above **improvement activities is controlled and documented** and the savings gained known before the activity commences and this is then used as a measure of the activities success.

Kaizen cross functional process: QCS

Line functions

- Quality
- Cost
- Scheduling
(time & service)



Cross functional matrix

	Marketing	R&D	Budgeting	Purchasing	Production	Sales	
Quality	High correlation	High correlation	Low correlation	High correlation	High correlation	Medium correlation	Cross functional management
Cost	Medium correlation	Medium correlation	Medium correlation	High correlation	High correlation	Low correlation	
Scheduling (Time)	High correlation	Low correlation	High correlation	High correlation	High correlation	Low correlation	
Delivery (Service)	Low correlation	Low correlation	High correlation	High correlation	High correlation	High correlation	
	Line management						

Toyota

- **Toyota has been the first company in the world to introduce cross functional management (1962) with the following statements:**
 1. **The board will declare to the wide organization their strategic goals**
 2. **Will be necessary to introduce a new coordination system among divisions**

Toyota

- **Toyota identified following critical process:**
 1. **Product range identification**
 2. **Product development**
 3. **Budgeting**
 4. **Components purchasing**
 5. **Manufacturing**
 6. **Audits**
 7. **Sales and after sales**
 8. **Total quality**

Toyota

- **Toyota identified the following tasks for the cross functional management committee:**
 - **Targets definitions**
 - **Ways to achieve targets**
 - **Planning (new products, plants, production, sales, ...)**
 - **Others strategic elements**

Kaizen decision management

- **Strategic decisions \Rightarrow Board**
- **Annual strategy \Rightarrow Top management**
- **Cross functional strategy \Rightarrow Top cross functional committee**
- **Operations management \Rightarrow Line/Division managers**
- **Actions \Rightarrow Supervisors**

Kaizen introduction program

- **A well structured Kaizen program is structured into 3 different aspects:**
 - 1. Kaizen management oriented**
 - 2. Kaizen teams oriented**
 - 3. Kaizen people oriented**

Kaizen elements

	Management oriented	Teams oriented	People oriented
Techniques	7 statistical techniques + individual skills	7 statistical techniques	Individual behaviour
Involvement	Manager	Quality team members	Everybody
Goals	Organization	Department	Work place
Timing	Project time	4-5 month	Continuous
Project	To decide	2/3 per year	A lot
Support	Project team (line + staff)	CQ teams, Counselling	Counselling
Targets achieved	Performances improvement, new procedures	New standards achieved,, more involvement	Individual skill improvement, more discipline

1. Management oriented

- **Plants and machinery**
 - **Planning performances**
 - **Layout changes**
 - **Process modifications**
 - **New proxy system**
- **Just in time**
 - **Cycle time reduction**
 - **No value activities reduction**
 - **Stock reduction**
 - **Problems identification**

2. Teams oriented

- **Informal approach**
 - **Involvement and team spirit**
 - **Communication and co-operation**
 - **Workers-Employees-Managers relationship improvement**
 - **Skills improvement**
 - **Safety and environmental approach**

3. People oriented

- **Individual task improvement**
- **Energy saving**
- **Environmental improvement**
- **Process improvement**
- **Product quality increasing**
- **New product development ideas**
- **Devices and tooling development**

Kaizen management

- **Main tasks in managerial activities are:**
 1. **Business maintenance**
 2. **Kaizen development**

- **Kaizen management is based on 2 strategic key factors:**
 1. **Cross functional management (co-ordination of functions to achieve Kaizen targets)**
 2. **Policy deployment (Kaizen activities carrying on)**

Kaizen approach

- Kaizen is based on different approach to modify the situation:
 - **MUda (waste, loss)** \Rightarrow avoid loss and defects, focusing on waste and inefficiency reduction
 - **MUri (excess)** \Rightarrow reject excess, focusing on trend and standard procedure introduction
 - **MUra (incompatibility)** \Rightarrow avoid incompatibility, focus on discrepancy and discontinuity removal

Kaizen check list

- **Employees**
- **Know-how**
- **Timing**
- **Plant and machinery**
- **Tooling and devices**
- **Raw materials**
- **Production volumes**
- **Stocks**
- **Environment**
- **Culture**

Kaizen questions

- **Who?**
- **What?**
- **Where?**
- **When?**
- **How?**
- **Why?**

Kaizen “7” techniques to identify problems and analyze situation

To assure a right analytical approach to identify improvement areas, Kaizen propose 7 statistical techniques:

1. Data collection
2. Histogram
3. Ishikava diagram
4. Pareto diagram
5. Stratification analysis
6. Correlation analysis
7. Control chart

1. Data collection

Every new process proposal could start after data collection step. To collect data is necessary to project a specific form.

Criteria:

- easy to read
- easy to fulfill
- difficult to make mistakes
- a collection method must be declared

1. Data collection

example

- airport
- shop with new best-seller on sale
- check and identification of customer profile:
 - Female
 - Age: 20-60
 - family status: not relevant

Data: 25 Sett.
 Località: aeroporto di xxx
 Orario: 10-11

Sesso		Soli ?		Età				
M	F	Si	No	10	20	40	60	> 60
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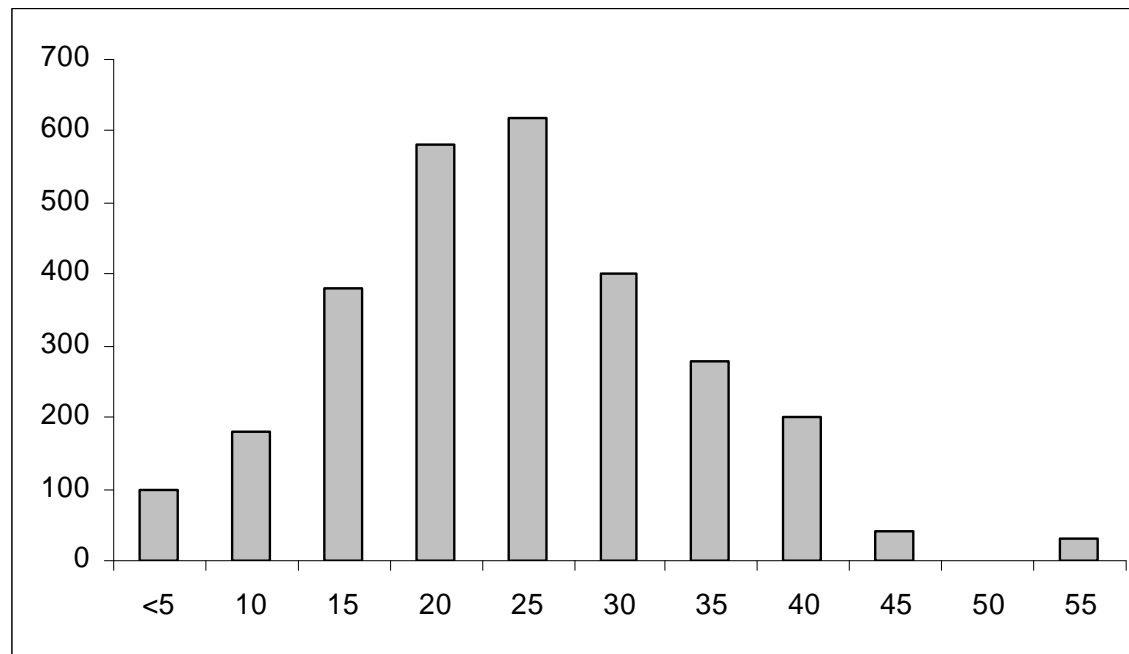
2. Histogram

To make an histogram is necessary:

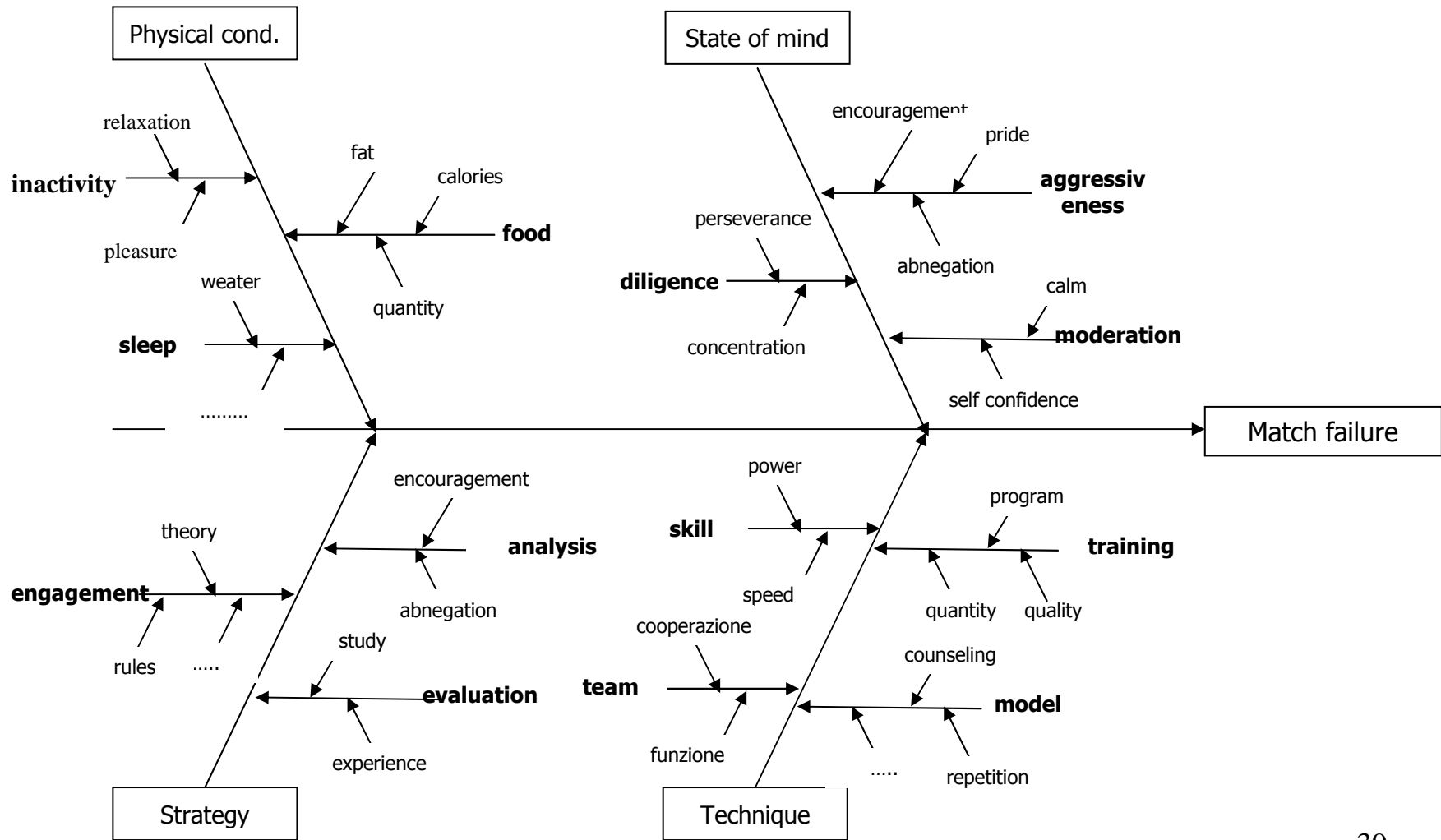
- To measure a data dispersion between min and max value
- Intervals definition
- Make a data form
- Make a histogram

2. Histogram

- It's a drawing representation of data distribution
- The range of values for a defined variable is divided into more and identical intervals
- Each measurement is represented in a referred column



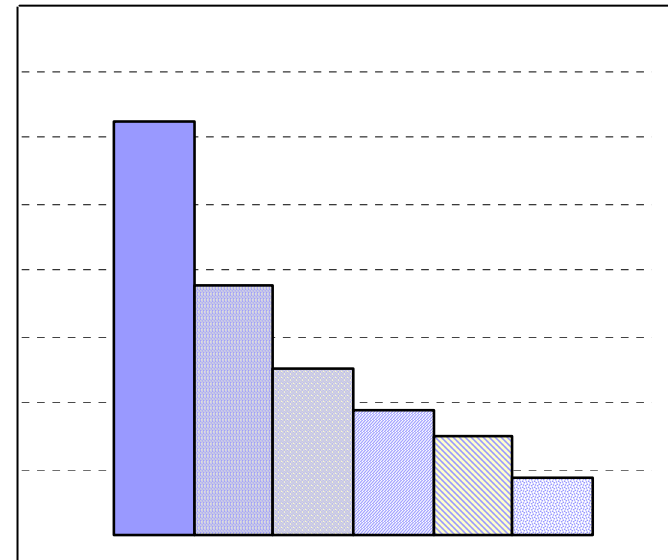
3. Ishikawa diagram



4. Pareto diagram

Pareto diagram show, in decreasing order, the key factors responsible for the inspected issue, starting from the main element

With these information it's possible to define the priorities to follow and to define the best action plan and its timing



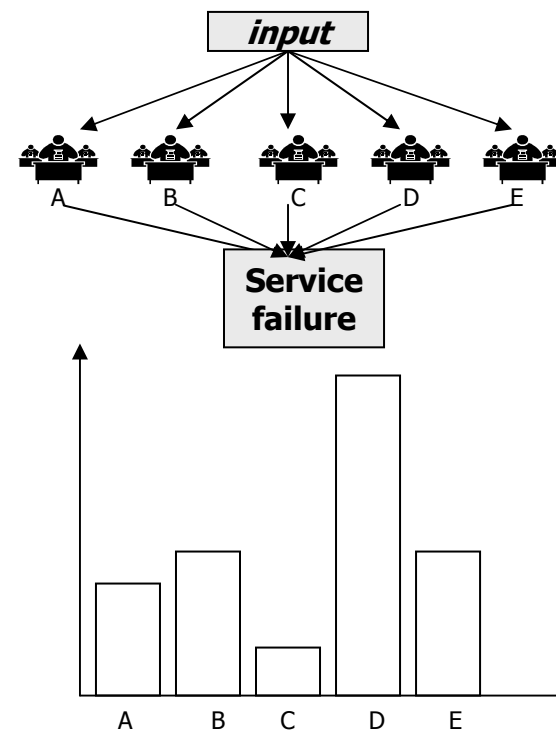
5. Multilevel analysis

This technique is used when the process is too complicated and Ishikava diagram can't provide complete information. On these cases would be better to analyze separately different elements

Ex:

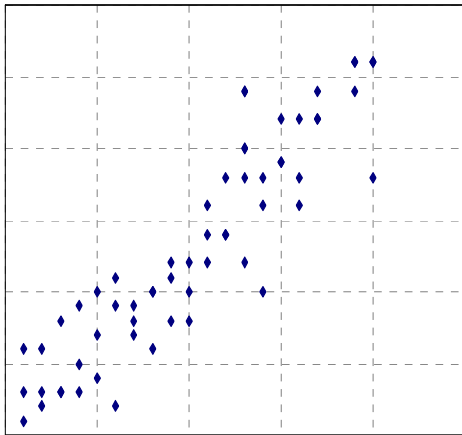
After more customers claims, the first approach verify that the same service is delivered by 5 different operators.

The check of claims for each operator show a bad quality delivered by operator D

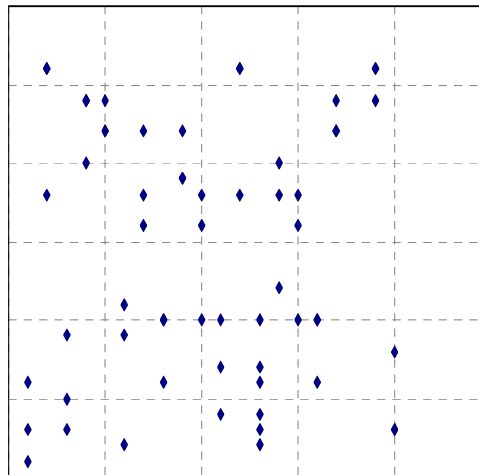


6. Correlation diagram

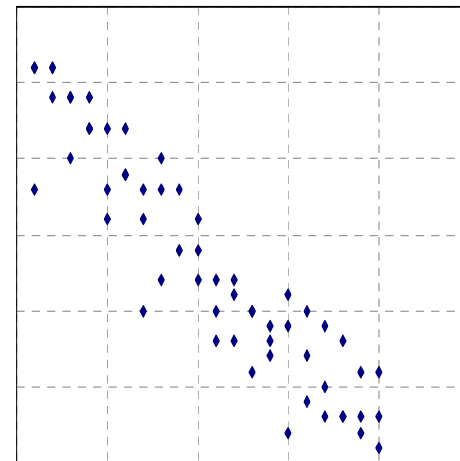
This diagram show possible correlation between 2 or more variables



correlation



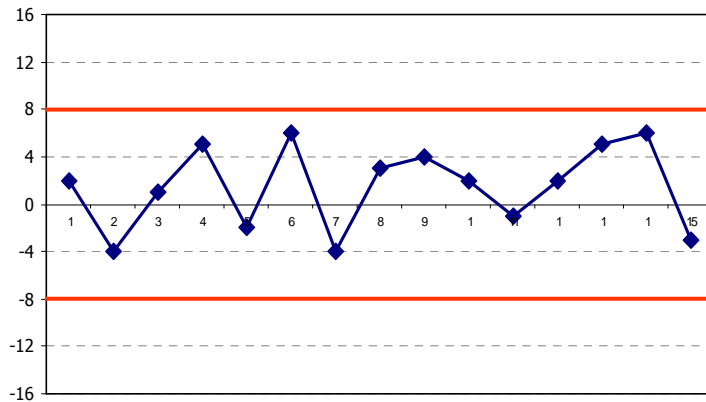
Any correlation



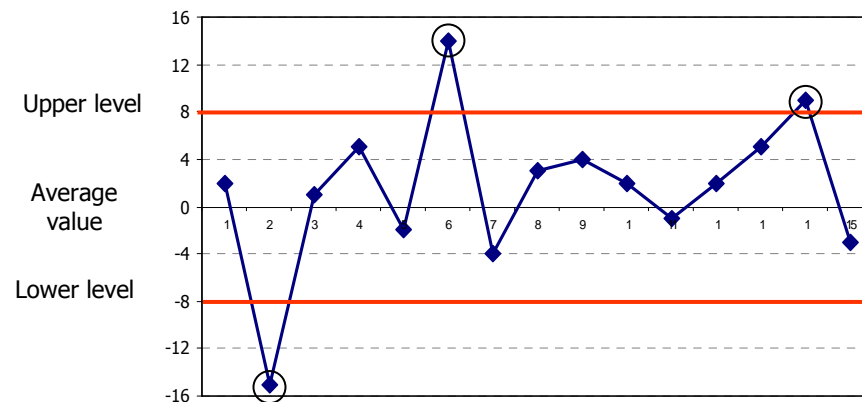
correlation

7. Control chart

Fixing upper and lower level admitted for our variable, this device show if the process is under control or not



Standard situation



Critical situation

New 7 techniques

- **Relations diagram**
- **Brain storming**
- **“Tree” diagram**
- **Matrix**
- **PDPC (Process Decision Program Chart)**
- **PERT (Program evaluation and Review Technique)**
- **CPM (Critical path method)**

Kaizen umbrella

- **Kaizen is the philosophy under more approach:**
 - **Customer oriented approach**
 - **Strong discipline**
 - **Quality small teams approach**
 - **Soft industrial relationship**
 - **Zero mistakes**
 - **“Counselling” approach**
 - **Automation**
 - **New products development**

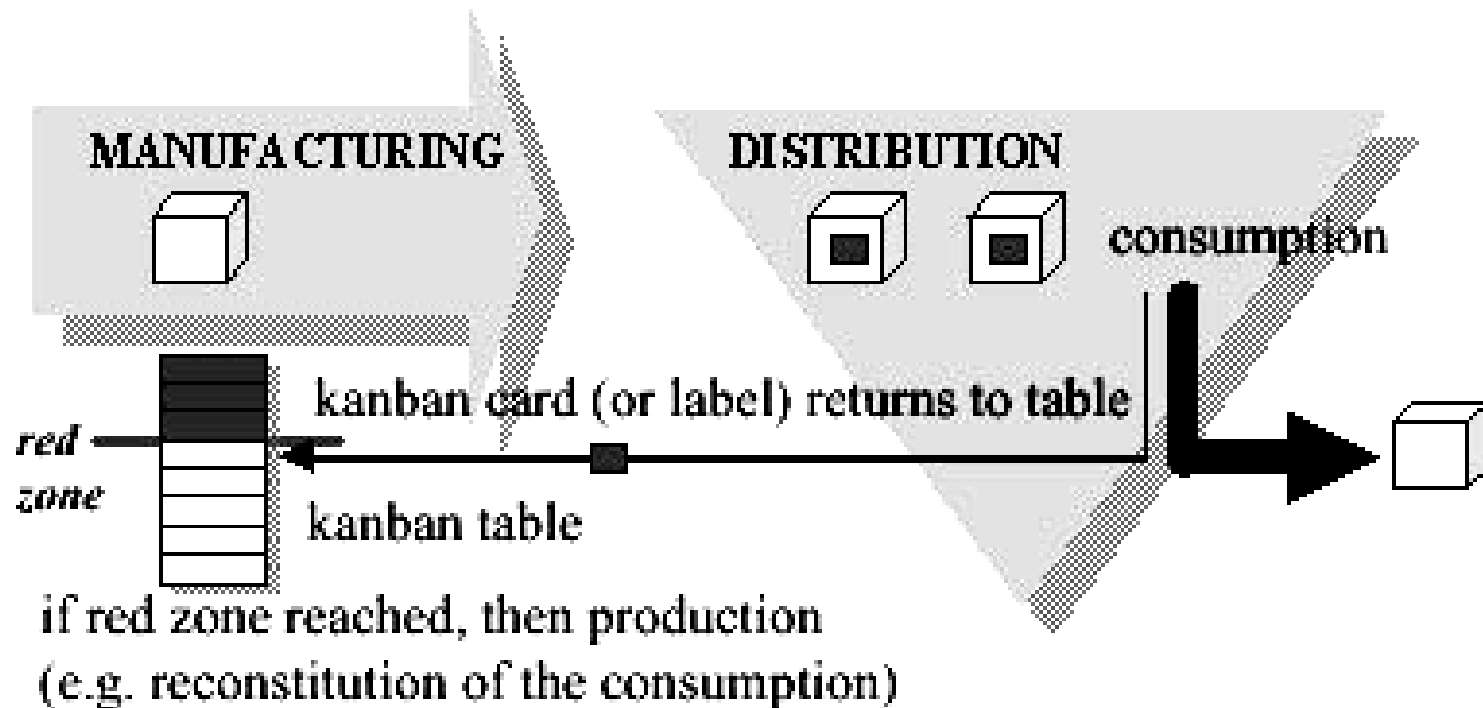
Kaizen umbrella

- **Kaizen is the philosophy under more techniques:**
 - **Kanban**
 - **TPM – Total Productivity Management**
 - **TQM – Total Quality Management**
 - **Deming cycle or PDCA cycle**
 - **Just in time**
 - **QFD - Quality Functional Deployment**
 - **Six Sigma method**

Kanban

- Kanban (where **"kan"** means **visual**, and **"ban"** means **card or board**) is a concept related to Lean production, The Japanese word "kanban" is a common everyday term meaning "signboard"
- Kanban is a signaling system. As its name suggests, Kanban historically uses cards to signal the need for an item. However, other devices such as plastic markers (Kanban squares) or balls (often golf balls) or an empty part trolley can also be used to trigger the movement, production, or supply of a unit in a factory
- It was out of a need to maintain the level of improvements that the kanban system was devised by Toyota. Kanban became an effective tool to support the running of the production system as a whole. In addition, it proved to be an excellent way for promoting improvements because restricting the number of kanban in circulation highlighted problem areas

Kanban



Source : "CIM: Principles of Computer Integrated Manufacturing",
Jean-Baptiste Waldner, John Wiley & Sons, 1992. Reproduced with author's authorization

TQM – Total Quality Management

- **Total: Organization wide**
- **Quality: With its usual Definitions, with all its complexities (External Definition)**
- **Management: The system of managing with all steps like planning, organizing, directing, leading, controlling ,**

TQM – Total Quality Management

- **Total quality is called total because it consists of 3 qualities :**
 - **Quality of return to satisfy the needs of the shareholders**
 - **Quality of products and services to satisfy some specific needs of the consumer (end customer)**
 - **Quality of life - at work and outside work - to satisfy the needs of the people in the organization. This is achieved with the help of upstream and downstream partners of the enterprise.**

TQM – Total Quality Management

- **Total Quality Management (TQM) is a management strategy aimed at embedding awareness of quality in all organizational processes**
- **TQM has been widely used in manufacturing, education, government, and service industries, as well as NASA space and science programs**
- **Total Quality provides an umbrella under which everyone in the organization can strive and create customer satisfaction at continually lower real costs.**

TQM – Total Quality Management

- **Definitions:**

"TQM is a management approach for an organization, focused on quality, based on the participation of all its members and aiming at long-term success through customer satisfaction, and benefits to all members of the organization and to society."

(International Standard Organization (ISO))

"One major aim is to reduce variation from every process so that greater consistency of effort is obtained".

(Royse, D., Thyer, B., Padgett D., & Logan T., 2006)

TQM – Total Quality Management

- In Japan, TQM comprises four process steps:
 - ***Kaizen*** – Focuses on "Continuous Process Improvement", to make processes *visible, repeatable* and *measurable*.
 - ***Atarimae Hinshitsu*** – The idea that "things will work as they are supposed to" (for example, a pen will write).
 - ***Kansei*** – Examining the way the user applies the product leads to improvement in the product itself.
 - ***Miryokuteki Hinshitsu*** – The idea that "things should have an aesthetic quality" (for example, a pen will write in a way that is pleasing to the writer).
- TQM requires that the company maintain this quality standard in all aspects of its business. This requires ensuring that things are done right the first time and that defects and waste are eliminated from operations

TQM – Total Quality Management

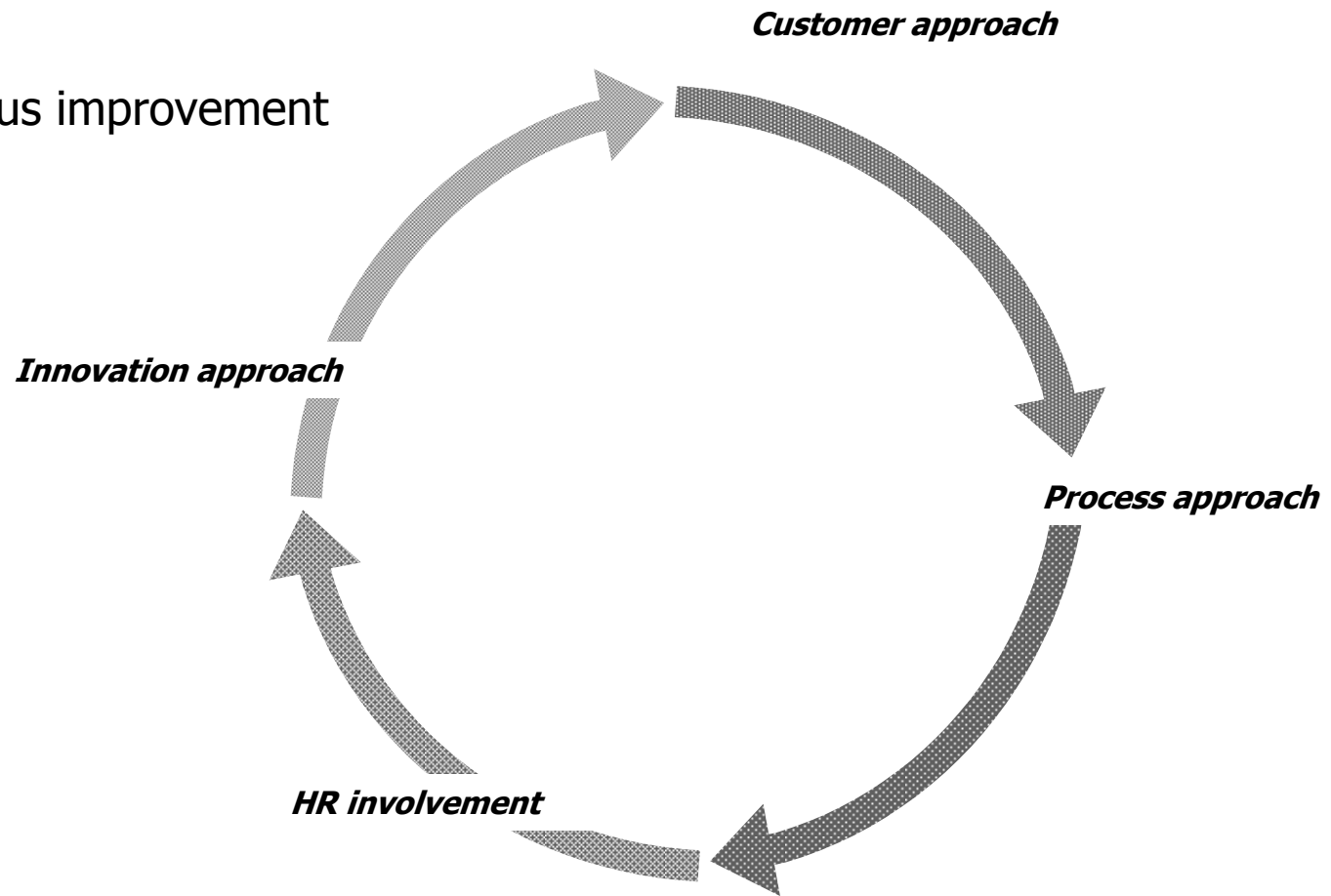
- **Quality assurance through statistical methods is a key component in a manufacturing organization, where TQM generally starts by sampling a random selection of the product. The statistical distributions of important measurements are tracked**
- **It is important to record not just the measurement ranges, but what failures caused the failure**
- **The causes of any failures are isolated, secondary measures of the production process are designed, and then the causes of the failure are corrected.**
- **After TQM has been in use, it's very common for parts to be redesigned**

TQM – Total Quality Management

- **TQM is the main way for Kaizen: it's managerial approach, not technical approach.**
- **3 main elements are characteristics of continuous cycle :**
 - **Software (procedures, rules, planning, ..)**
 - **Hardware (plant, machinery, assets, ...)**
 - **Humanware (people, skills, know-how)**

TQM – Total Quality Management

Continuous improvement cycle



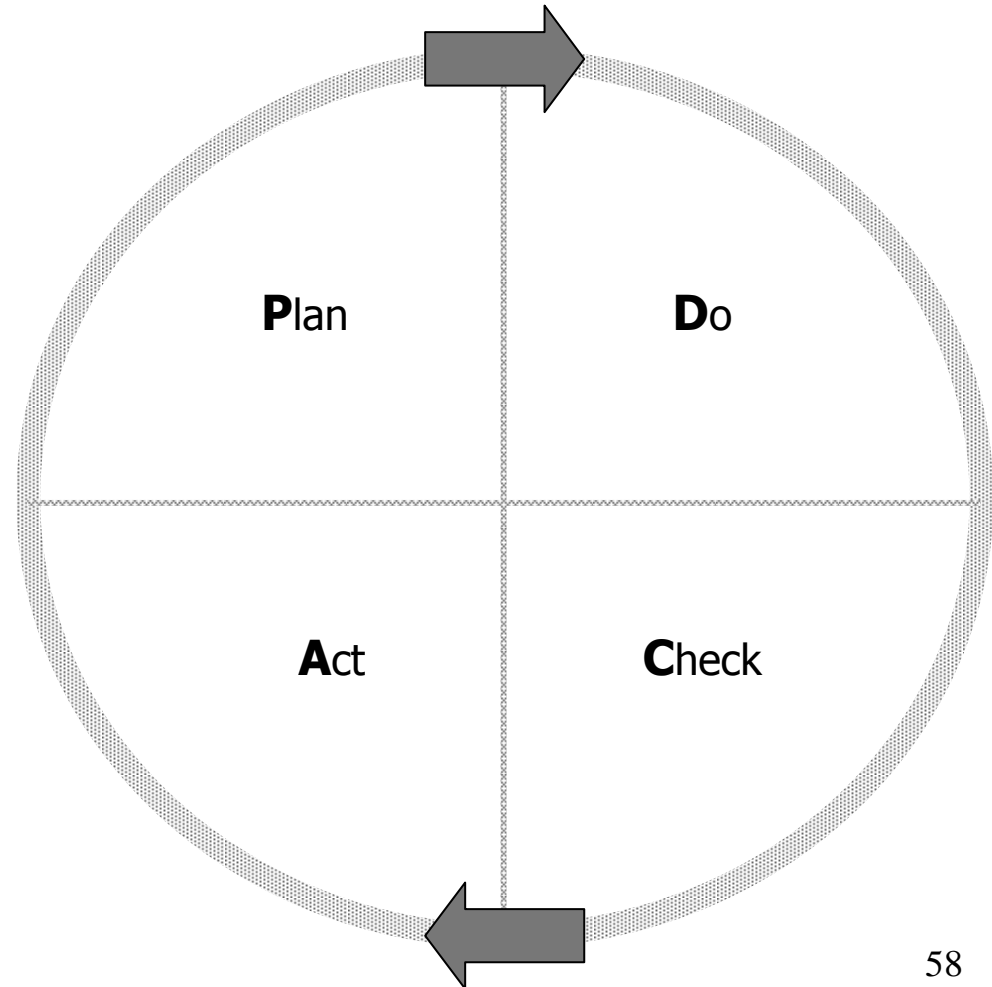
PDCA

- **The PDCA Cycle is a checklist of the four stages which you must go through to get from 'problem-faced' to 'problem solved'**
- **The four stages are Plan-Do-Check-Act, and they are carried out in the cycle illustrated below.**

PDCA

Deming (or PDCA) cycle

- P** = plan (analyze and plan activities)
- D** = do (implement actions)
- C** = check (measure results and verify)
- A** = act (change and restart)



PLAN

P = Plan thoroughly leaving nothing to chance

Plan to improve your operations first by finding out what things are going wrong (that is identify the problems faced), and come up with ideas for solving these problems.

DO

D = Do the activity exactly as planned

Do changes designed to solve the problems on a small or experimental scale first. This minimises disruption to routine activity while testing whether the changes will work or not.

CHECK

C = Check and confirm that the activity has delivered the desired results

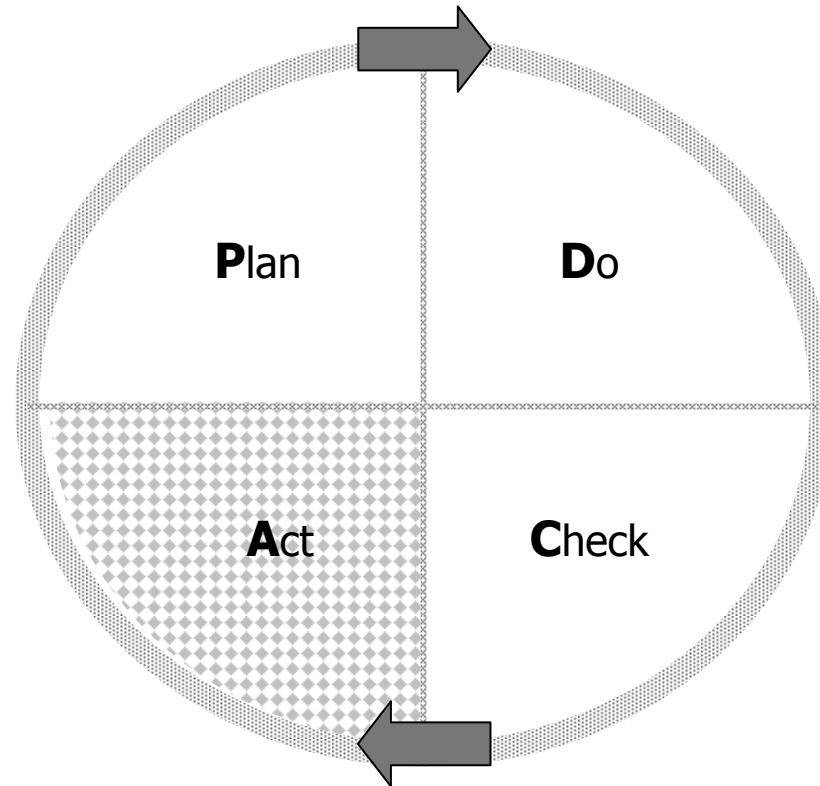
Check whether the small scale or experimental changes are achieving the desired result or not. Also, continuously Check nominated key activities (regardless of any experimentation going on) to ensure that you know what the quality of the output is at all times to identify any new problems when they crop up.

ACT

A = Act swiftly to solve any outstanding issues, or standardise the new method.

Act to implement changes on a larger scale if the experiment is successful. This means making the changes a routine part of your activity. Also Act to involve other persons (other departments, suppliers, or customers) affected by the changes and whose cooperation you need to implement them on a larger scale, or those who may simply benefit from what you have learned (you may, of course, already have involved these people in the Do or trial stage).

PDCA



Step "act" could mean:

- Standardize new process
- Re-start to find new possible improvements

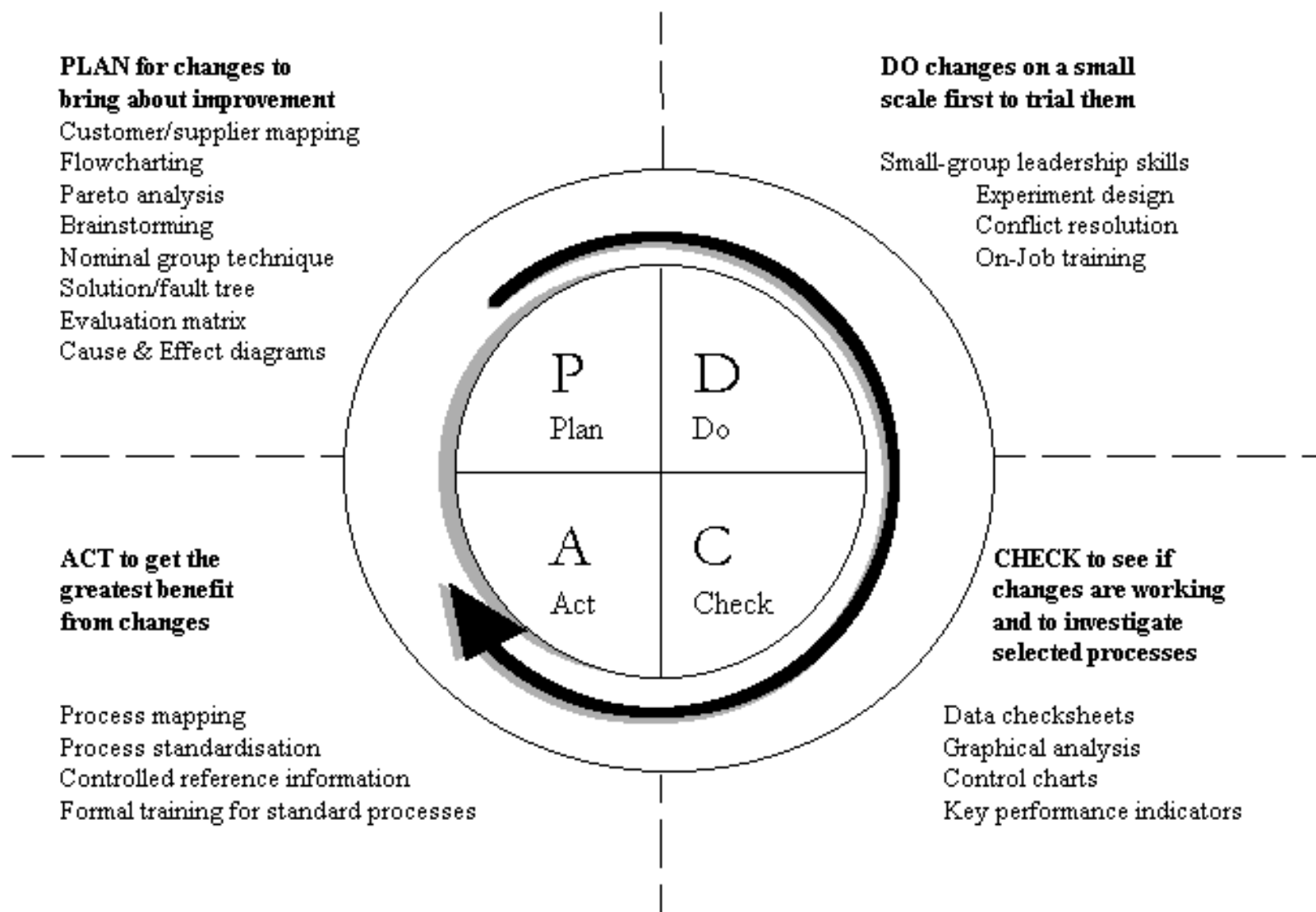
PDCA

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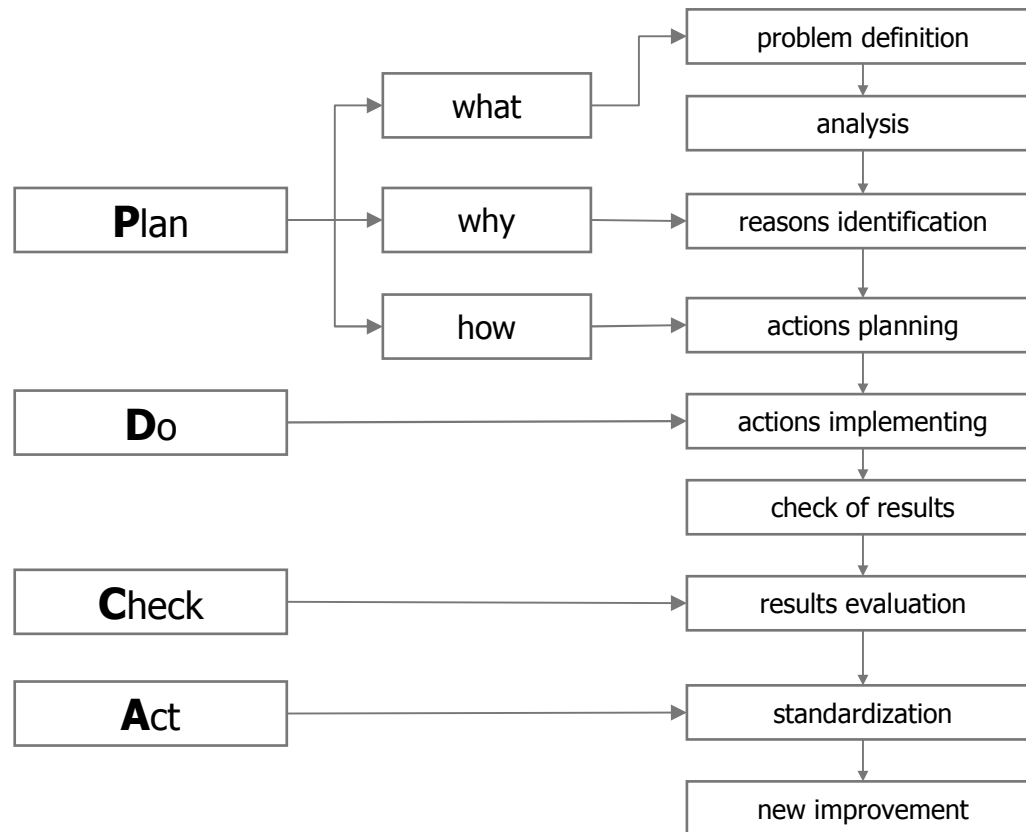
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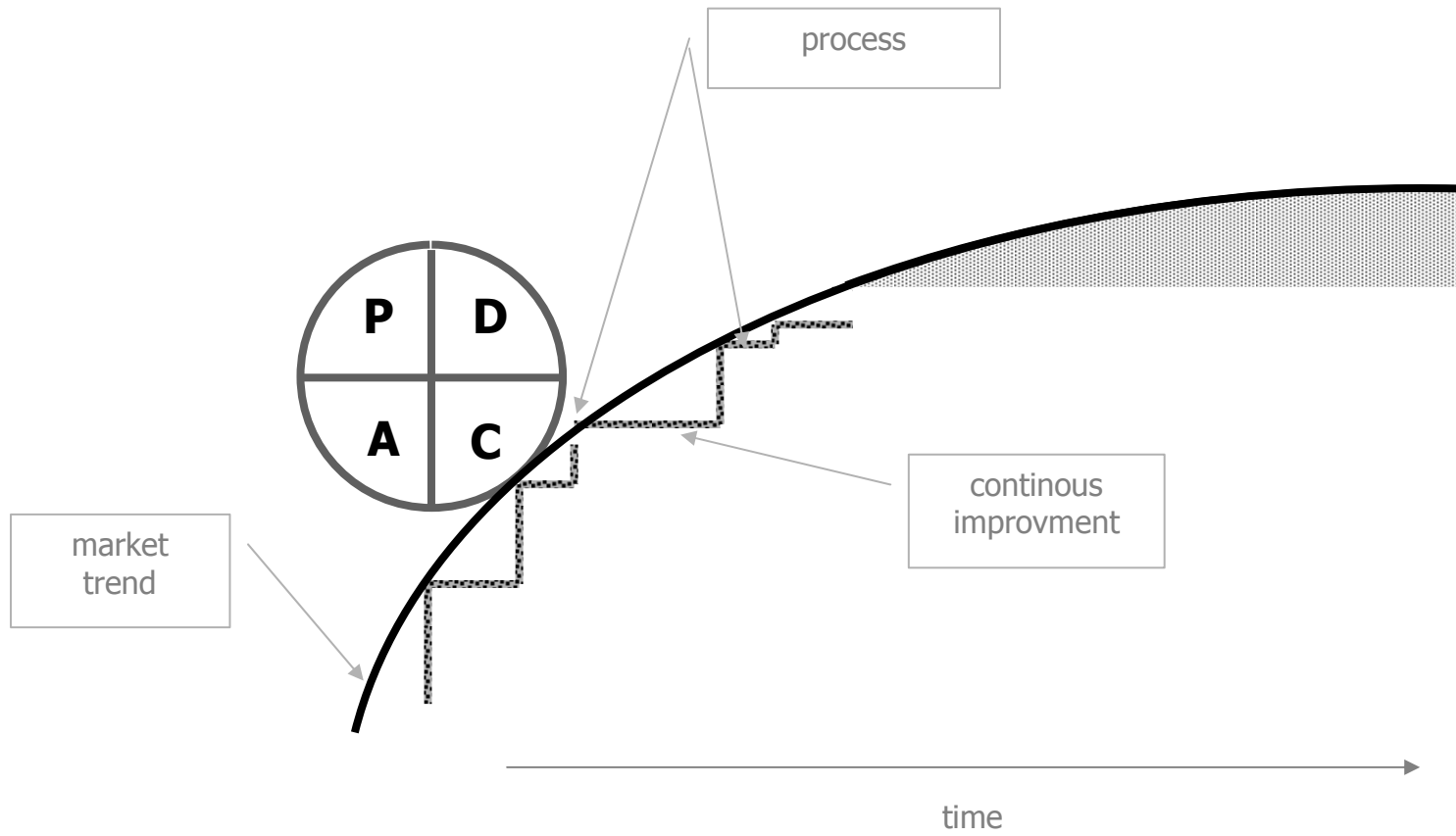
PDCA Tools



PDCA



PDCA



Just In Time - JIT

- **Just In Time (JIT) is an inventory strategy implemented to improve the return on investment of a business by reducing in-process inventory and its associated costs**
- **The process is driven by Kanban technique that tell production processes when to make the next part.**
- **When implemented correctly, JIT lead to dramatic improvements in a manufacturing organization's return on investment, quality, and efficiency.**

JIT

- **Inventory is seen as incurring costs, or waste, instead of adding value, contrary to traditional accounting**
- **This does not mean to say that JIT is implemented without an awareness that removing inventory exposes pre-existing manufacturing issues**
- **Under this way of working, businesses are encouraged to eliminate inventory that doesn't compensate for manufacturing issues, and then to constantly improve processes so that less inventory can be kept.**
- **Secondly, allowing any stock habituates the management to stock keeping to hide problems within the production system.**
- **These problems include backups at work centres, machine reliability, process variability, lack of flexibility of employees and equipment, and inadequate capacity among other things.**

JIT

- The philosophy of JIT is simple:
 - Inventory is defined to be waste.
 - Just-in-time (JIT) inventory systems expose the hidden causes of inventory keeping and are therefore not a simple solution that a company can adopt
 - The ideas in this way of working come from many different disciplines including statistics, industrial engineering, production management and behavioral science
- In short, the just-in-time inventory system is all about having **“the right material, at the right time, at the right place, and in the exact amount”**

JIT

- **JIT philosophy is based on subcontractors relationship**
- **Tasks:**
 - **Improve standard stocks level**
 - **Reduce lead time**
 - **Improve order processing**
 - **Improve communication**
 - **Improve logistic and distribution parameters**
- **Kaizen approach is based on suppliers co-operation**

JIT Effects – TPS case

- **JIT effects in Toyota Productions System (TPS):**
 1. **a huge amount of cash appeared, apparently from nowhere, as in-process inventory was built out and sold**
 2. **the response time of the factory fell to about a day. This improved customer satisfaction by providing vehicles usually within a day or two of the minimum economic shipping delay**
 3. **many vehicles began to be built to order, completely eliminating the risk they would not be sold. This dramatically improved the company's return on equity by eliminating a major source of risk.**

JIT Effects – TPS case

- **Since assemblers no longer had a choice of which part to use, every part had to fit perfectly. The result was a severe quality assurance crisis, and a dramatic improvement in product quality.**
- **Eventually, Toyota redesigned every part of its vehicles to eliminate or widen tolerances, while simultaneously implementing careful statistical controls**
- **Toyota had to test and train suppliers of parts in order to assure quality and delivery. In some cases, the company eliminated multiple suppliers.**

JIT Effects – TPS case

- **When a process problem or bad parts surfaced on the production line, the entire production line had to be slowed or even stopped**
- **No inventory meant that a line could not operate from in-process inventory while a production problem was fixed. Many people in Toyota confidently predicted that the initiative would be abandoned for this reason (In the first week, line stops occurred almost hourly).**
- **But by the end of the first month, the rate had fallen to a few line stops per day**
- **After six months, line stops had so little economic effect that Toyota installed an overhead pull-line, that permitted *any* worker on the production line to order a line stop for a process or quality problem. Even with this, line stops fell to a few per week.**

JIT – Other appliances

- **JIT is used not only to manufacturing operations but also applied to other segments of the supply chain in several types of industries.**
- **In the commercial sector, it meant eliminating one or all of the warehouses in the link between a factory and a retail establishment.**

JIT - Benefits

- ***Set up times are significantly reduced in the factory.***
Cutting down the set up time to be more productive will allow the company to improve their bottom line to look more efficient and focus time spent on other areas that may need improvement. This allows the reduction or elimination of the inventory held to cover the "changeover" time, the tool used here is named SMED
- ***The flows of goods from warehouse to shelves are improved.***
Having employees focused on specific areas of the system will allow them to process goods faster instead of having them vulnerable to fatigue from doing too many jobs at once and simplifies the tasks at hand. Small or individual piece lot sizes reduce lot delay inventories which simplifies inventory flow and its management
- ***Employees who possess multiple skills are utilized more efficiently.***
Having employees trained to work on different parts of the inventory cycle system will allow companies to use workers in situations where they are needed when there is a shortage of workers and a high demand for a particular product.

JIT - Benefits

- ***Better consistency of scheduling and consistency of employee work hours.*** If there is no demand for a product at the time, workers don't have to be working. This can save the company money by not having to pay workers for a job not completed or could have them focus on other jobs around the warehouse that would not necessarily be done on a normal day
- ***Increased emphasis on supplier relationships.*** No company wants a break in their inventory system that would create a shortage of supplies while not having inventory sit on shelves. Having a trusting supplier relationship means that you can rely on goods being there when you need them in order to satisfy the company and keep the company name in good standing with the public
- ***Supplies continue around the clock keeping workers productive and businesses focused on turnover.*** Having management focused on meeting deadlines will make employees work hard to meet the company goals to see benefits in terms of job satisfaction, promotion or even higher pay.

JIT - Problems

- **Just In Time leaves the supplier and downstream consumers open to supply shocks and large supply or demand changes**
One of the other key tools to manage this weakness is production levelling techniques to remove these variations. In fact Just In Time is a means to improving performance of the system, not an end.
- **With very low stock levels meaning that there are shipments of the same part coming in sometimes several times per day**
The factory is especially susceptible to an interruption in the flow. For that reason, is careful to use two or more suppliers for most assemblies.
- **A strong, long-term relationship with a few suppliers is preferred to short-term, price-based relationships with competing suppliers.**
This long-term relationship has also been used by Toyota to send his staff to improve their suppliers' processes. These interventions have been going on for twenty years and result in improved margins for Toyota and the supplier as well as lower final customer costs and a more reliable supply chain. Toyota encourages their suppliers to duplicate this work with their own suppliers.

QFD - Quality Function Deployment

- **It's a flexible and comprehensive group decision making technique used in product or service development, brand marketing, and product management.**
- **QFD can strongly help an organization focus on the critical characteristics of a new or existing product or service from the separate viewpoints of the customer market segments, company, or technology-development needs.**
- **The results of the technique yield transparent and visible graphs and matrices that can be reused for future product/service developments.**

QFD - Quality Function Deployment

- **QFD transforms customer needs into engineering characteristics and test methods of a product or service, prioritizing each characteristic while simultaneously setting development targets for product or service development**
- **Acquiring market needs by listening to the Voice of Customer (VOC), sorting the needs, and numerically prioritizing them are the early tasks in QFD**
- **a “House of Quality” is just an example of one tool of QFD. Other tools extend the analysis beyond quality to cost, technology, reliability, function, parts, technology, manufacturing, and service deployments.**

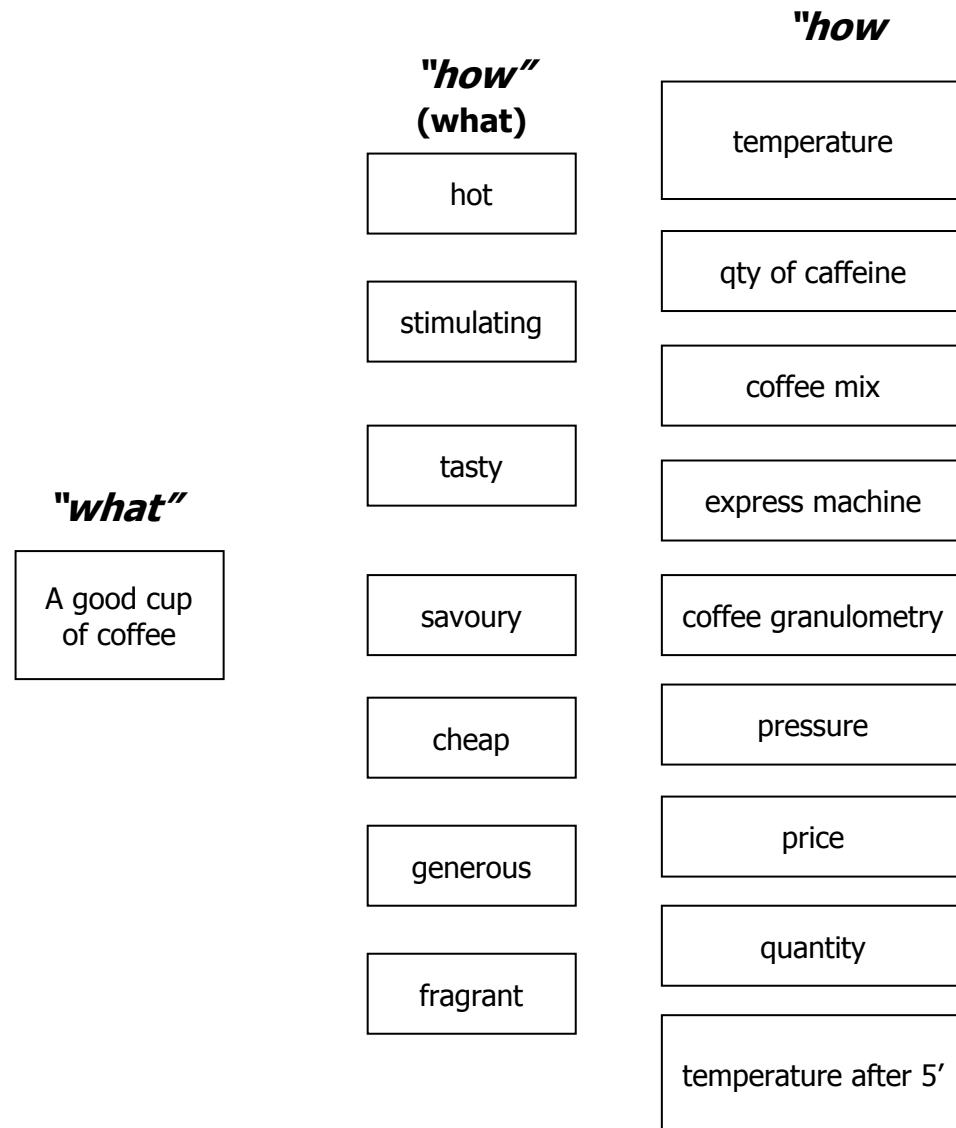
QFD

QFD - *Quality Function Deployment* is a process to translate customers needs in technical specifications of our product, service

Ex. Product:

Cup of "espresso" coffee

[elaborazione da : W. Eureka, N. Ryan :
L'azienda guidata dal cliente]



QFD

how

what

	temperature	qty of caffeine	coffee mix	express machine	coffee granulometry	pressure	price	quantity	temperature after 5'
hot	⊙								○
stimulating	○	○							
tasty	△	△	⊙	○					
savoury					⊙	○			
cheap									
generous								⊙	
fragrant	○								⊙

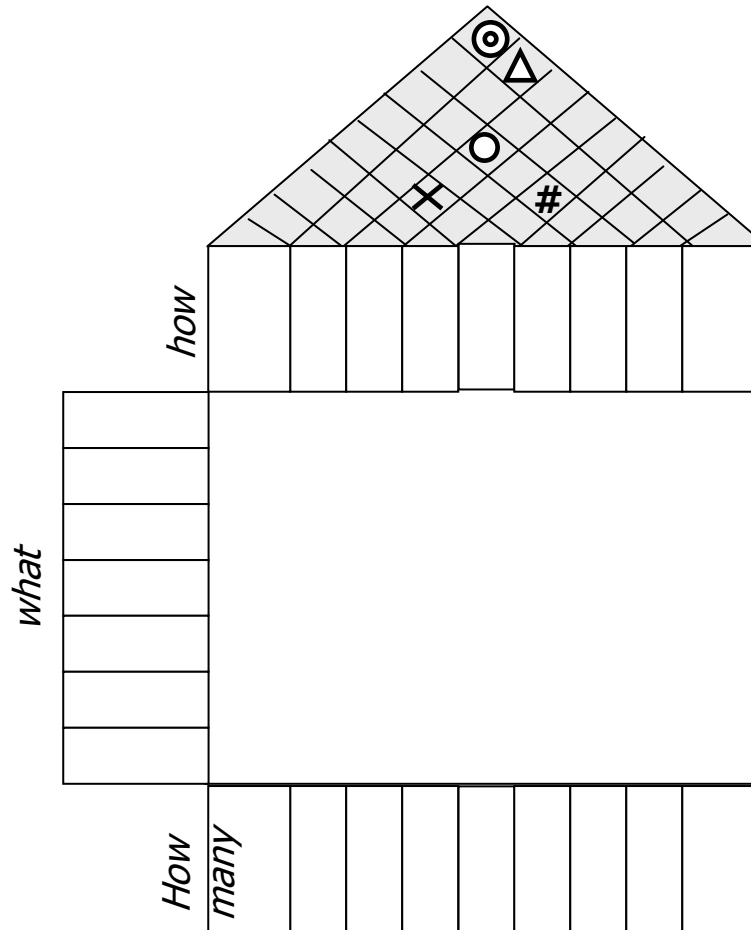
- △ Low correlation
- Standard correlation
- ⊙ High correlation

[W. Eureka, N. Ryan : L'azienda guidata dal cliente]

QFD

The "quality house"

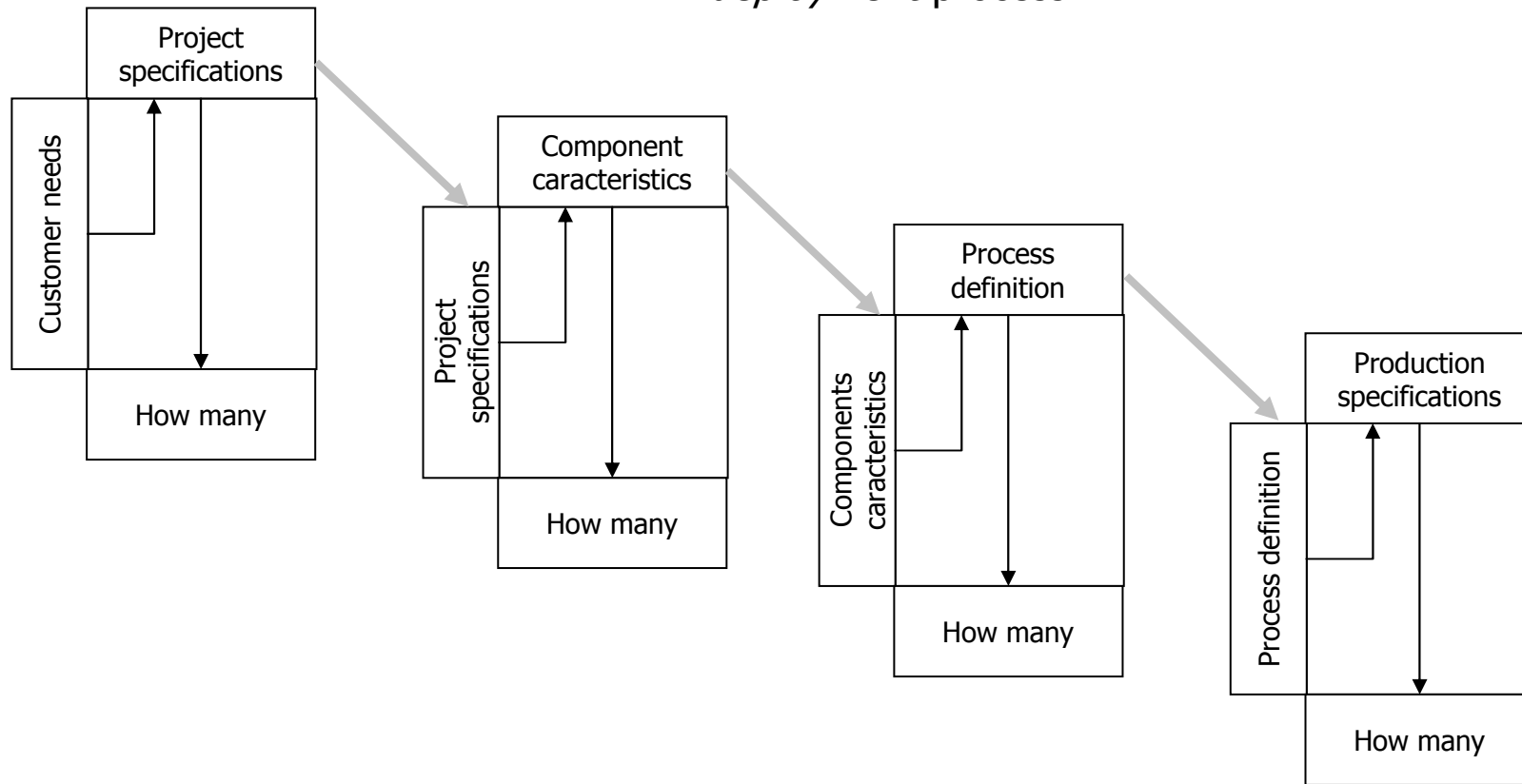
- ✕ Very low correlation
- △ Low correlation
- Standard correlation
- ◎ High correlation
- # Very high correlation



[W. Eureka, N. Ryan : L'azienda guidata dal cliente]

QFD process

... deployment process:



Six Sigma

- Six Sigma methodology improves any existing business process by constantly reviewing and re-tuning the process.
- To achieve this, Six Sigma uses a methodology known as DMAIC (Define opportunities, Measure performance, Analyze opportunity, Improve performance, Control performance)
- Six Sigma Strives for perfection. It relies heavily on statistical techniques to reduce defects and measure quality.
- Six Sigma methodology can also be used to create a brand new business process from ground up using DFSS (Design For Six Sigma) principles. Typically its easier to define a new process with DFSS principles than refining an existing process to reduce the defects

What “Six Sigma” ?

- Six Sigma stands for Six Standard Deviations (Sigma is the Greek letter used to represent standard deviation in statistics) from mean.
- Six Sigma methodology provides the techniques and tools to improve the capability and reduce the defects in any process
- It was started in Motorola, in its manufacturing division, where millions of parts are made using the same process repeatedly.
- Eventually Six Sigma evolved and applied to other non manufacturing processes. Today you can apply Six Sigma to many fields such as Services, Medical and Insurance Procedures, Call Centers.

Six Sigma

- Six Sigma incorporates the basic principles and techniques used in
 - Business
 - Statistics
 - Engineering
- These three form the core elements of Six Sigma. Six Sigma improves the process performance, decreases variation and maintains consistent quality of the process output. This leads to defect reduction and improvement in profits, product quality and customer satisfaction
- Six Sigma methodology is also used in many Business Process Management initiatives these days.
- These Business Process Management initiatives are not necessarily related to manufacturing. Many of the BPM's that use Six Sigma in today's world include call centers, customer support, supply chain management and project management

When to apply the Kaizen philosophy?

- Although it is difficult to give generic advice it is clear that it fits well in incremental change situations that require long-term change and in collective cultures.
- More individual cultures that are more focused on short-term success are often more conducive to concepts such as Business Process Reengineering.

Reason of possible Kaizen failure

- The good press stems from the people implementing change understanding the ethos behind kaizen, whereas the bad press is centred upon failed improvement activities
- In fact these failures are usually created by one or more of the following reasons.
 - Quick wins to demonstrate the power of kaizen.
 - Lack of understanding of a Lean Production System and Tool interactions.
 - Not involving those who do the job during the improvement activity.
 - Unsustainable improvements blamed on operators.

Kaizen vs. BPR

- When Kaizen is compared to BPR is it clear the Kaizen philosophy is more people-oriented, more easy to implement, requires long-term discipline
- BPR on the other hand is harder, technology-oriented, enables radical change but requires major change management skills
- While many Western models to increase business productivity look at radical shifts to create drastic changes and immediate improvements, kaizen takes a continuous, long-term approach to improvement. As with Zen itself, kaizen views business productivity as a continually unfolding process.

Kaizen vs. BPR

- The emphasis, therefore, is on the constant bettering not only of one's relation to the workplace, but of oneself as a person. This emphasis makes companies utilizing the kaizen approach much more oriented towards the well-being of their employees, with a more "people-centric" view by management
- Unlike many Western management techniques, which treat employees as numbers to be crunched for maximum efficiency, kaizen takes the opposite outlook, proposing essentially that a happy employee is a productive employee
- Kaizen has been proven effective in a number of major Japanese and Western companies, and many large corporations in America and Europe are adopting the model — even corporations which have for years utilized hard-line Western approaches such as business process engineering

Kaizen vs. BPR

	Kaizen	BPR
Effect	Long term results, quiet	Short term results, emotional
Speed	Slow	Fast
Timing	Continuous	On/off
Process changes	Small and soft changes	Hard and dramatic changes
Involvement	Everybody in the organization	Small team selected
Approach	Systematic approach	Individual ideas
Method	Maintenance and improvement	Demounting and re-building
Element	Know-how, people skills	New technology, innovation
Investment	Low	High
Key factors	People	Technology
Evaluation criteria	Process results	Money results and profit
Advantages	Good in standard scenario	Good in case of turbulence

Kaizen + BPR

