Training:

RCA – Root Cause Analysis

The purpose of using the Ishikawa Diagram?

- ***What is an Ishikawa Diagram?***

•A **Visual Tool** to identify, explore and graphically display, **all** the **Possible Causes** related to a problem or condition, to discover its **Root Causes**

- Focuses team on the content of the problem
- Creates a snapshot of the collective knowledge of team
- Creates consensus of the causes of a problem
- Builds support for resulting solutions

Focuses the team on root causes not symptoms

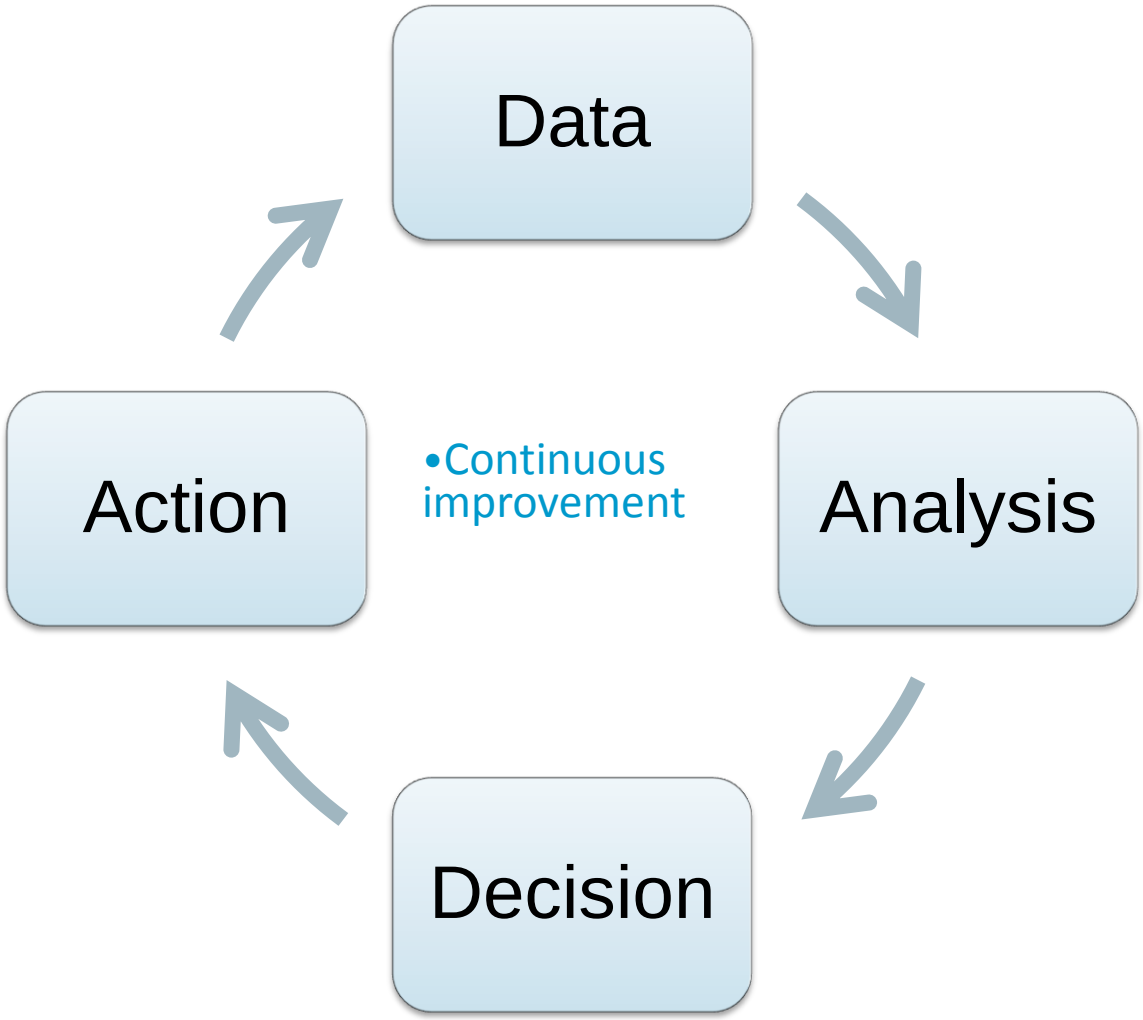
The purpose of using the Ishikawa Diagram?

- ***What is the big idea?***

- Starting from a well defined problem statement the fishbone tool is an effective and simple way of deriving the real root causes of a problem.

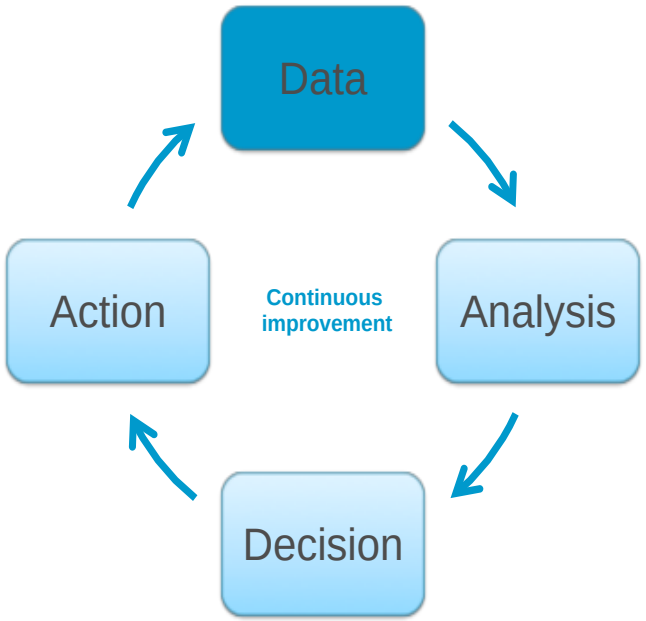
How do we select a problem?

DADA loop



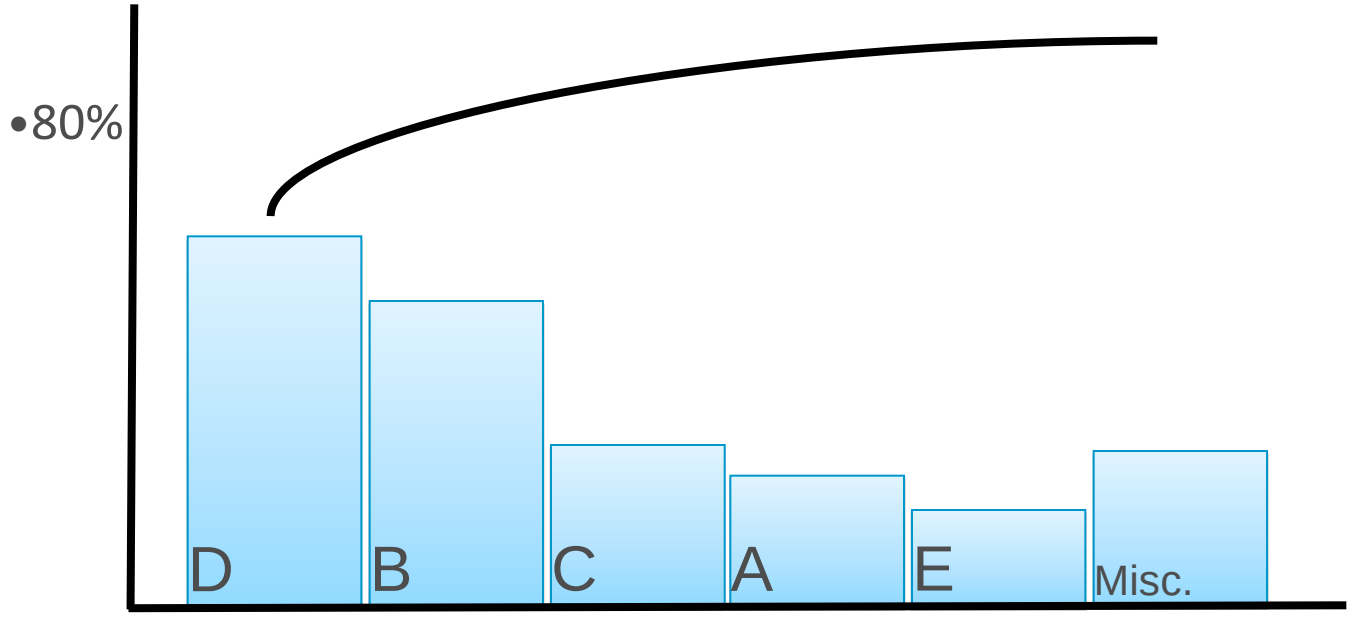
Collect data
Documenting current state

- Process flow diagrams
- KPI‘s
- Photographs and videotape
- Performance metrics
- Written procedures
- Survey and audit findings



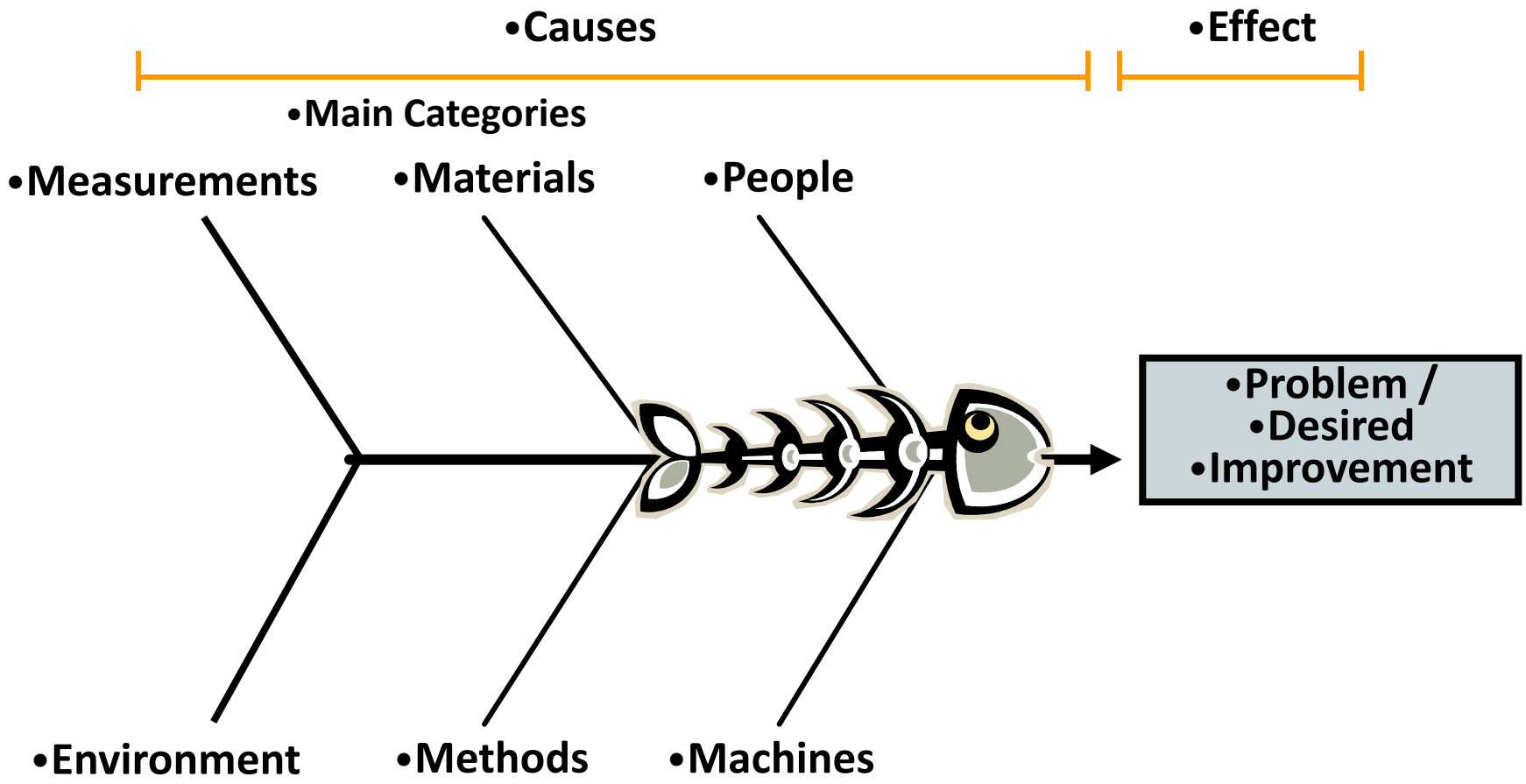
Pareto Diagram
Focused efforts

Helps leverage team's time and energy by focusing on resolving 20 percent of the contributors that account for 80 percent of the occurences



Efforts concentrated on eliminating the root cause(s) for the few categories that account for the majority of the issues

What is the basic structure of an Ishikawa diagram



Also know as “Fishbone” or “Cause and Effect” diagrams

•An example of categories for Ishikawa diagrams

- Not firmly defined, can vary according to the situation, or the type of problem

Manufacturing (4 M's)	Service/Transactional (4 P's)
Man	Policies
Machine	Personnel
Method	Procedures
Material	Plant Facilities

Additional for both types

Measurement	Environment

The categories above work well for most scenarios, but use the best categories to suit the situation being studied

KEY PRINCINPES

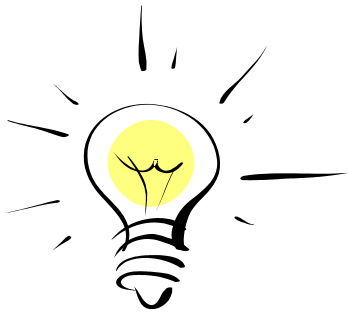
- Start with a well stated problem: a problem well stated is a problem half solved. This can be easier said than done therefore some items to bear in mind when creating a problem statement are mentioned below:
- 1) A factual statement of the problem, using the “SMART” rules: Specific, measurable, achievable (acceptable), realistic , trackable
- 2) The problem statement is likely to be KPI-driven, or cost-driven from the results plan
- 3) Even objective statements need to be sense-checked. The sponsor and attendees need confidence that this is a real issue and worth going after

- Therefore the head of the fish should always contain a statement like the following:

Introduction of new products increased the queue for the quality control from 2 hrs to 5 hrs.

PRE - REQUISITIES

- The problem statement as such has to be defined before starting the root cause analysis
- Everyone involved in the RCA has to agree on the problem statement
- Practical preparation:
  - Prepare a set of “empty” fishbones on brown paper in function of the number of problem statements: each fishbone consists out of a “head” (for the problem statement) and several major cause categories (see template)
  - Post its to collect causes/Marker Pens
- **Explain your approach** and be sure that everyone understands:
- Explain that you will be **challenging the mentioned causes**: only by detecting the real causes, change becomes possible



KEY STEPS IN THE PROCESS

- **Step 1** - Place a **problem statement** in the head of the fish.

- **Step 2** - Set **major cause categories** – ideally these are detected during the definition of the problem in a previous step and foresee an "**other**" category (for example: process, knowledge, organisation, method, people, material, procedure, policies (but this can be more specific depending on what subject you're working on)

- **Step 3** - Start up a **brainstorm to detect the causes** – keep the participants focused by asking them:
  - Determine one or two causes on all of the major causes
  - Think of a cause as: "what will change with regard to the **problem** if this cause is solved" (not yet solution!)

KEY STEPS IN THE PROCESS

- **Step 4** - Collect the brainstormed causes **in the appropriate category** – do it an a fast way, to have an overview of the kind of causes/the variety (*make this clear during your introduction)*; cluster them in groupings, use those in the workshop to assist with this.

- **Step 5** - Start with a major cause category and take a cluster on which the causes seem to be most important.
  Start with a clear statement and **challenge** it by:
  - Asking **why 5 times**
  - Checking the relationship with the problem statement: "**what will change if this cause is solved?"** (but no solutions yet)
  - Complete this for all the collected causes

- **Step 6** - When the "real root cause" is reached, make clear that you want to switch to solution mode on these causes.
  - Ask "**How can this be solved**" and ask for the expected result with regard to the problem
  - "**In what way can we measure the effect** of this solution? "

5 WHYs

- It helps reveal the root cause of a problem
- Accomplished by asking “why” several times until you have determined the ultimate reason for the problem
- It keeps teams from talking only about symptoms and from automatically accepting the initial response they receive about what the problem is
- Encourages team members to uncover the deeper issues that are causing problems

WHAT TO DO WITH THE RESULTS?

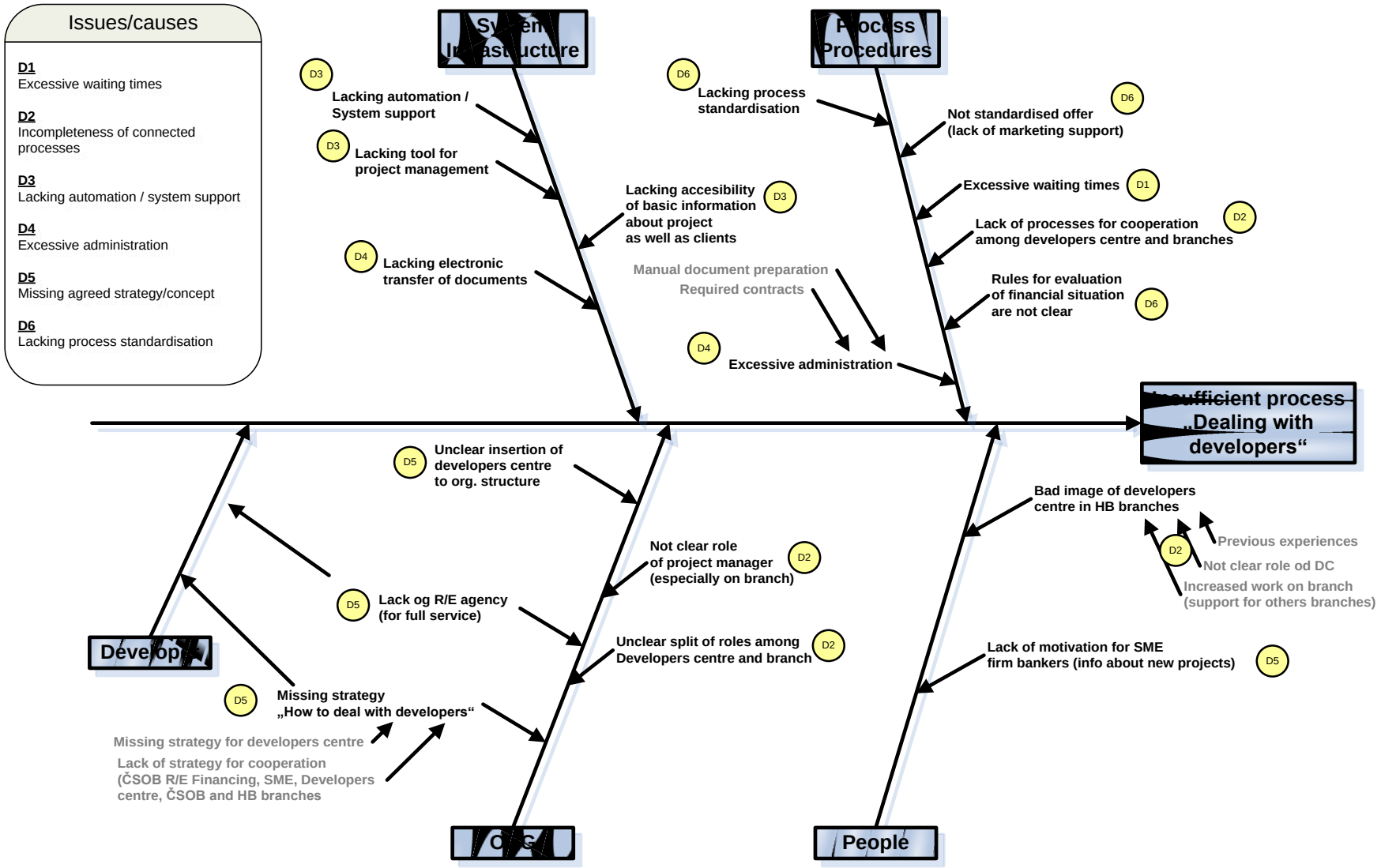
- An action log should be completed for each of the root causes
- These should have a clear link with the **KPIs**, because they should improve by taking these actions.
- Very important: behave as the **devil's advocate** and **make it clear upfront** that you will act that way. This will set the expectation and avoid attendees feeling uncomfortable or attacked in any way.
- Be sure to end up with causes out of the different major categories; in general 4 to 6 real root causes for one fish is OK;
- Capturing of results on the why's or on the actions is best done by a second facilitator
- Timing aspects:
  - In general: think on 40% prep – 20 % acting – 40% post processing
  - The duration of one session depends on the phase of the project and the complexity of the problem.

Some other Tips for Successful Cause and Effect Sessions

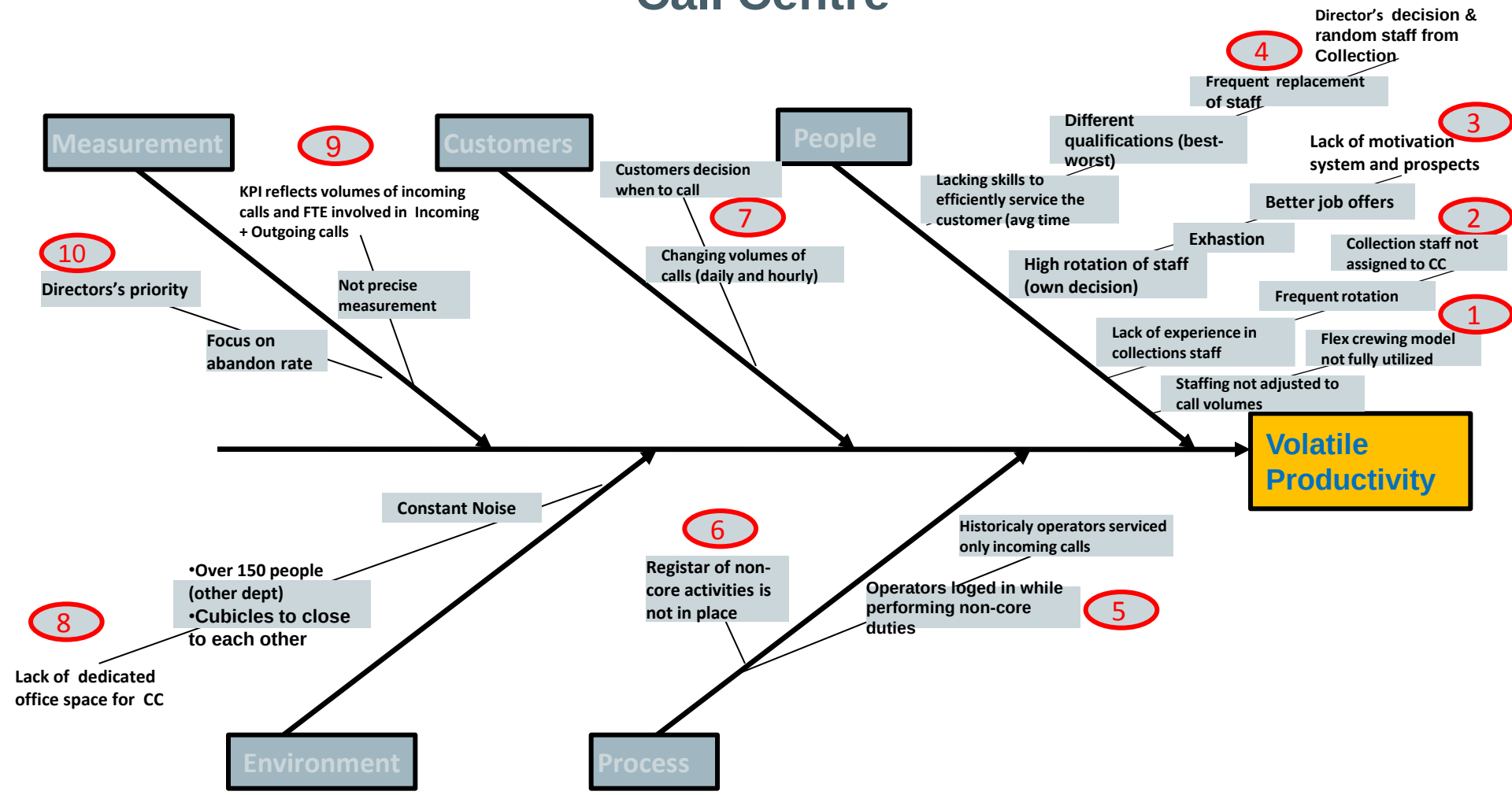
- Appoint a facilitator
- Have a mixed team – including people close to and remote from the process
- Ensure the team understand the objective and have an adequate understanding of the process – walk the process, see the service or product
- Allocate someone to record all information
- Keep it “fast and furious” – go for quantity rather than quality at first
- If stuck within a category move to the next
- Park any causes not easily placed into a category
- Re-define cause categories if struggling for causes
- The same cause may appear in more than one category
- Know when to stop

EXAMPLES

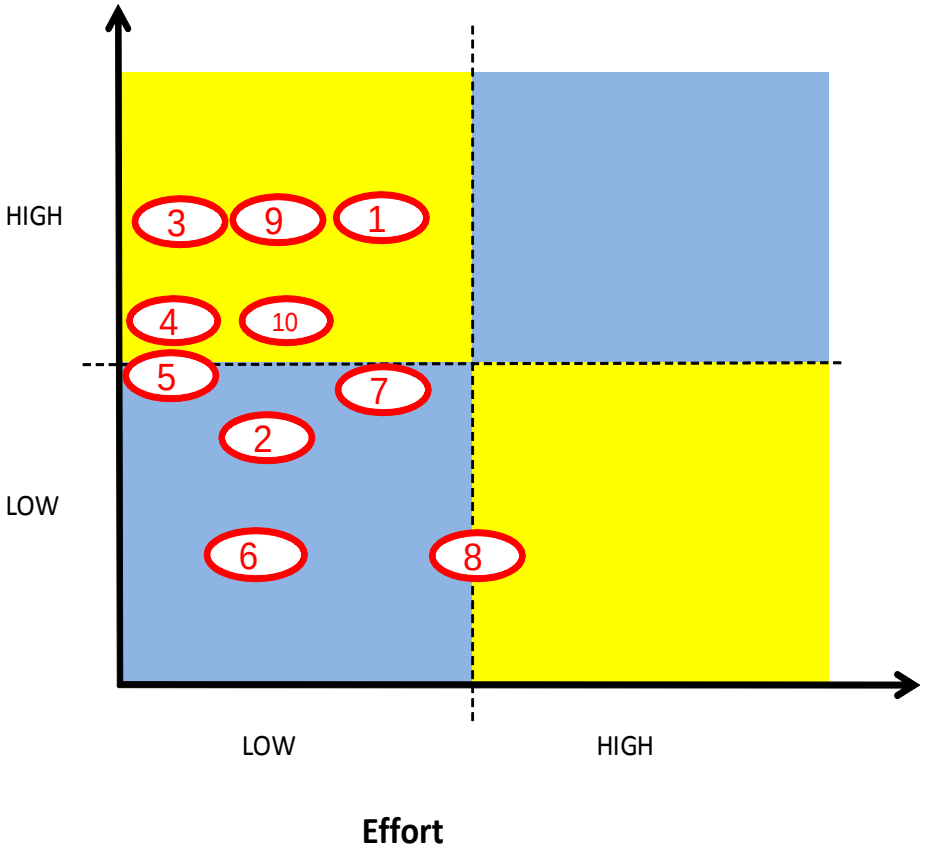
Example of a completed Ishikawa diagram



Example of RCA for volatile *productivity* in Call Centre



Prioritization of root causes for volatile *productivity*



1. Flex crewing model not fully utilized
2. Collection staff not assigned to CC
3. Lack of motivation system and prospects
4. Frequent replacement of staff
5. Operators loged in while performing non-core duties
6. Registar of non-core activities is not in place
7. Changing volumes of calls (daily and hourly)
8. Lack of dedicated office space for CC
9. KPI reflects volumes of incoming calls and FTE involved in Incoming + Outgoing calls
10. Focus on abandon rate

•Causes

•Effect

•Material

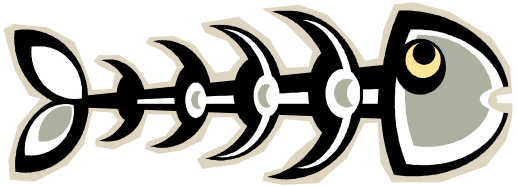
•Machines

•Systems and Processes

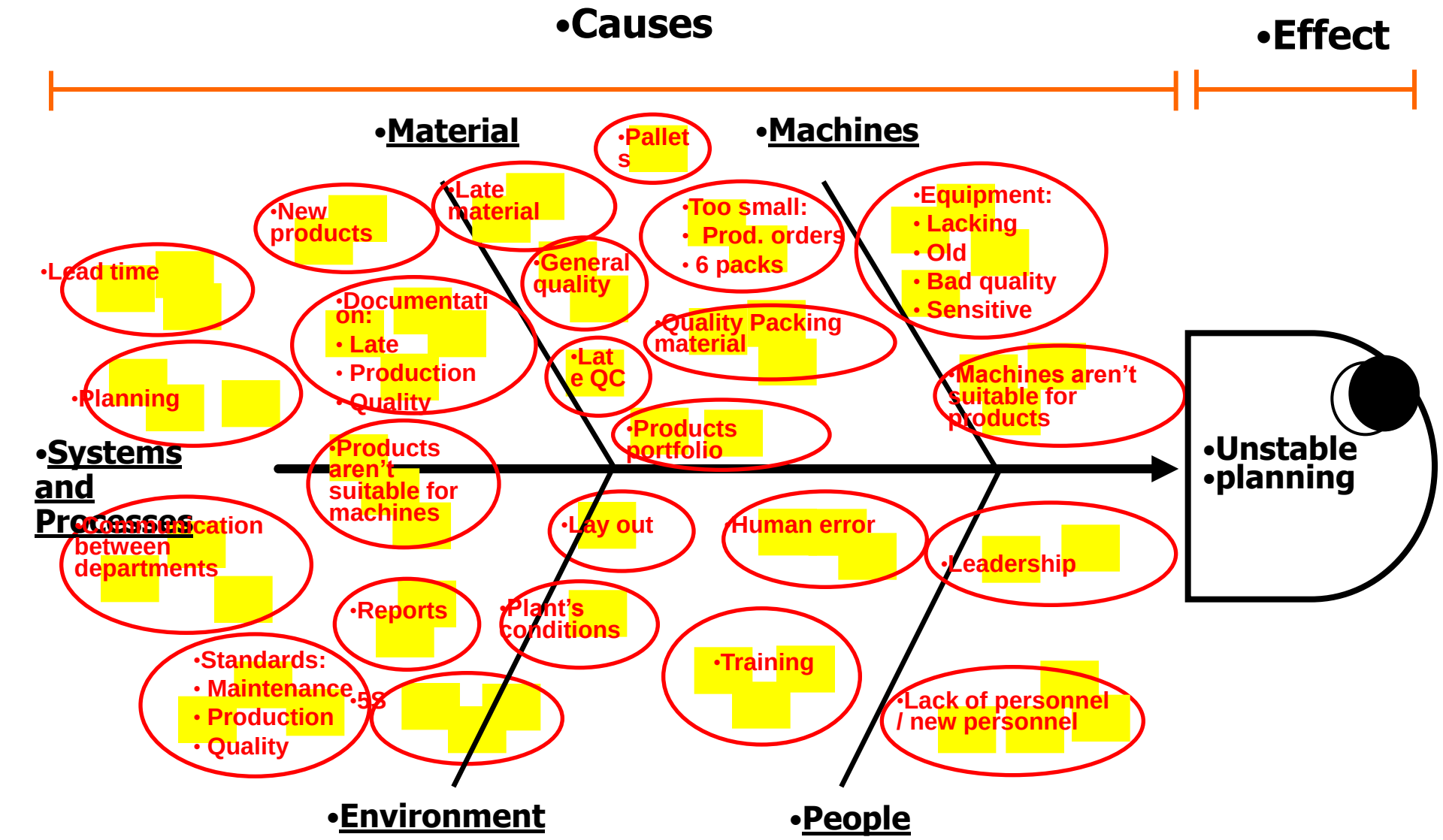
•Unstable •planning

•Environment

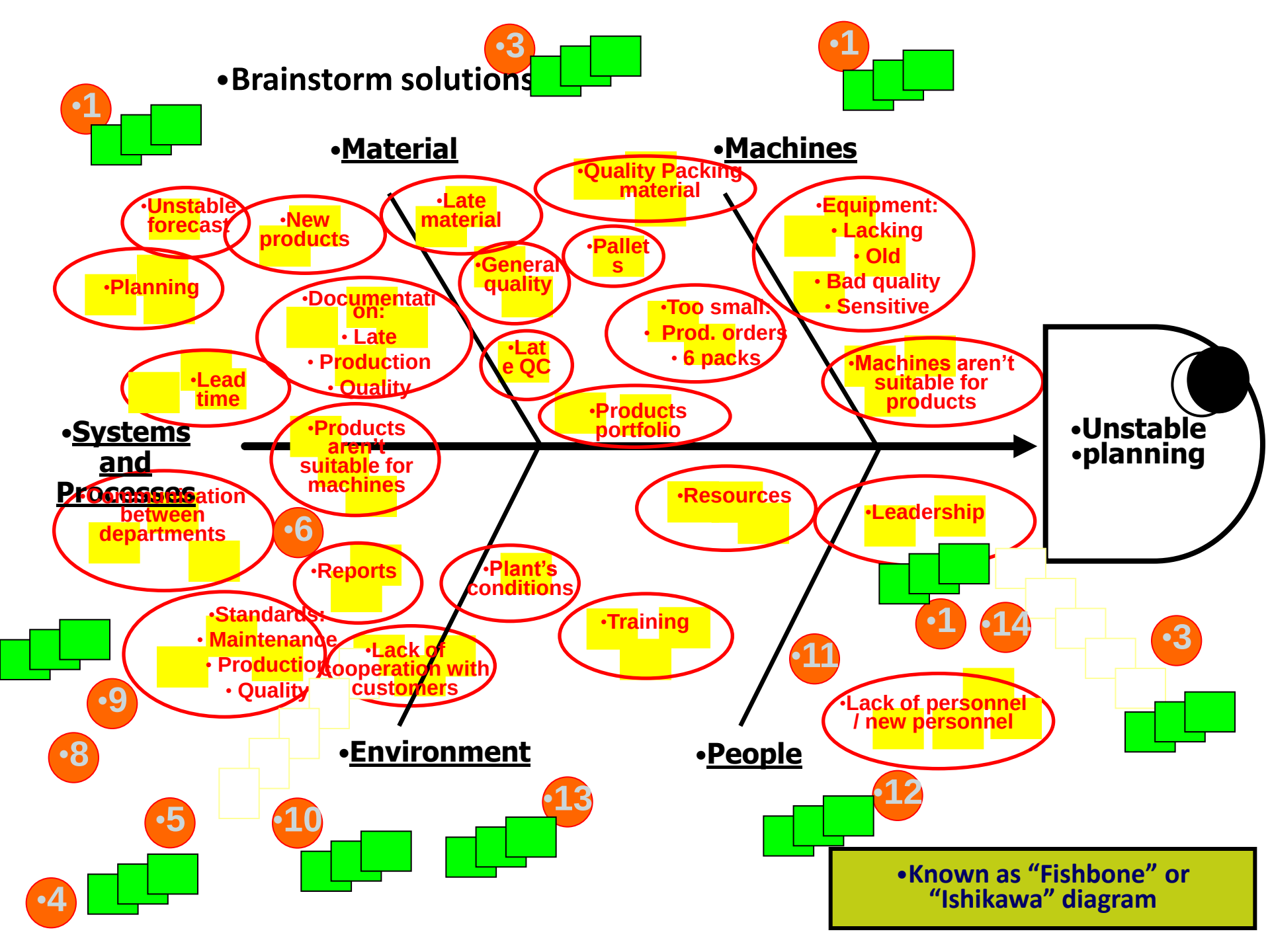
•People



•Known as “Fishbone” or “Ishikawa” diagram



•Known as "Fishbone" or "Ishikawa" diagram


•Brainstorm solutions
•Material
•Machines
•Systems and Processes
•Environment
•People
•Unstable •planning
•Unstable forecast
•New products
•Late material
•Quality Packing material
•Equipment:
• Lacking
• Old
• Bad quality
• Sensitive
•Planning
•General quality
•Pallets
•Documentation:
• Late
• Production
• Quality
•Too small: • Prod. orders • 6 packs
•Late QC
•Machines aren't suitable for products
•Lead time
•Products portfolio
•Products aren't suitable for machines
•Communication between departments
•Resources
•Leadership
•Reports
•Plant's conditions
•Training
•Standards:
• Maintenance
• Production
• Quality
•Lack of cooperation with customers
•Lack of personnel / new personnel
•Known as "Fishbone" or "Ishikawa" diagram

Summary of RCA workshop (example): "Production plan not executed in production"

1. Root cause - Roles & responsibility

- A) Change of plan……
- B) More involvement from R/D when its products problems
- C) Waiting for products
- D) Missing forecast/sales info.
- E) Unclear responsibility
- F) Cooperation between marketing/sales,PD/Technologist, production, between shifts
- Not clear procedures roles , responsibility in prod. department management.
- Wrong placed responsibility in production department.
- Wrong purchasing.

Why, why, why..?

- A) Machine problems
- A) Set up time
- A) Information
- A) Sales development not equal prognosis
- A) Lack of raw materials
- A) Direct only for sales?
- B) Not interested.
- B) Prefer to make new products.
- C) Wrong purchasing
- C) Staging to late.
- C) Follow up purchasing plan
- D) Missing info from customers
- D) Not focus.
- E) Missing job description
- E) Not good instructions/ and not detailed job descriptions.
- F) Lack of interest about work in another's departments.
- F) Bad communication
- F) Not strict rules/No clear agenda.
- Lack of behaviour management "silo mindset"

Solution to solve root cause

- A) Get machine operators to do the set ups
- B) Make a clear agenda
- C) Make clear responsibility
- D)
- E)
- F) Improve communication.
- F) Make clear agenda, Strict rules
- F) Think the company/factory as one customer.
- F) Trust each other.
- F) Management have to learn to respect employees

Summary of RCA workshops (example): “Production plan not executed in production”

2. Root cause: Training:

- A) Bad/Lack training politics
- B) Qualification instructors.
- C) To long changeover time
- D) Lack capacity technologist.
- E) More Knowledge about machines.
- F) More training operators.
- G) Lack of training programs for operators.
- H) Skill of people.
- I) More knowledge about production from planning.
- J) Skills of manager/leader SAP.

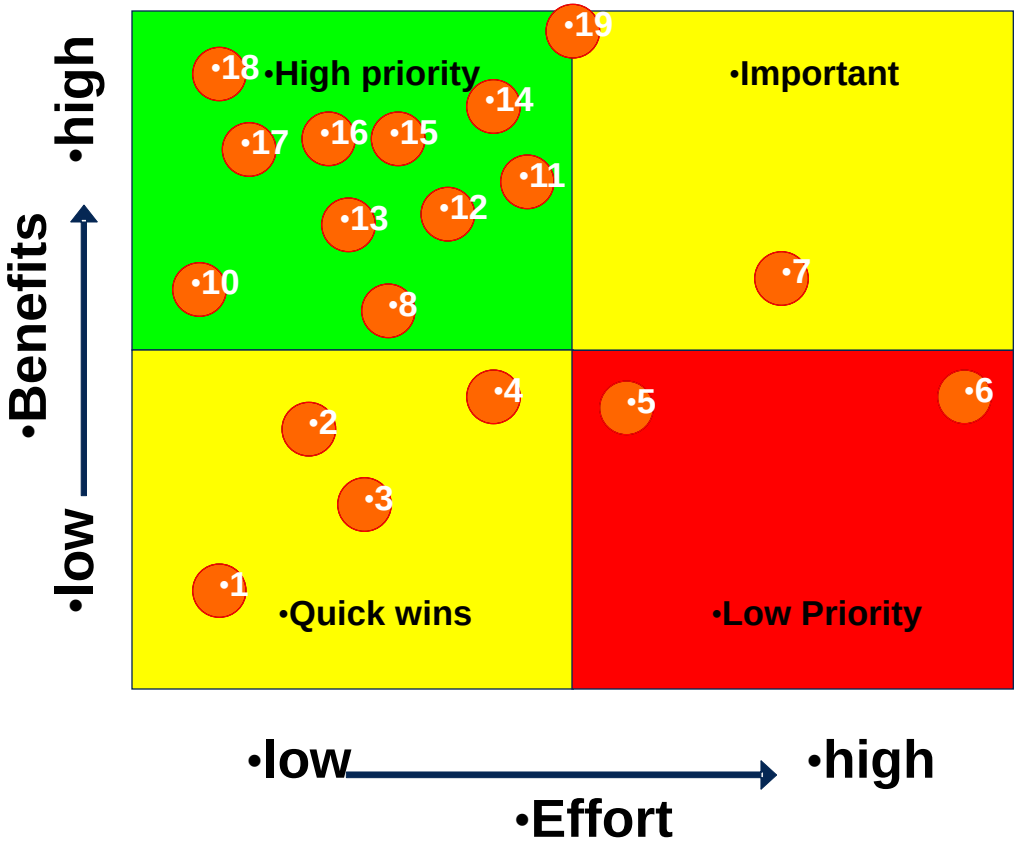
Why, why, why?

- A) Little time to make them.
- B) Bad training program
- C) Lack of focus on changeovers
- D)
- E) Little time to learn.
- E) “Fire fighting”, not do preventive maintenance.
- F) Little time.
- F) No focus
- G) Little time.
- G) No focus
- H) Focus.
- I) Lack of information.
- J) SAP doc. are to complex.
- J) No training in SAP.
- J) Little Time.

Solution to solve root cause

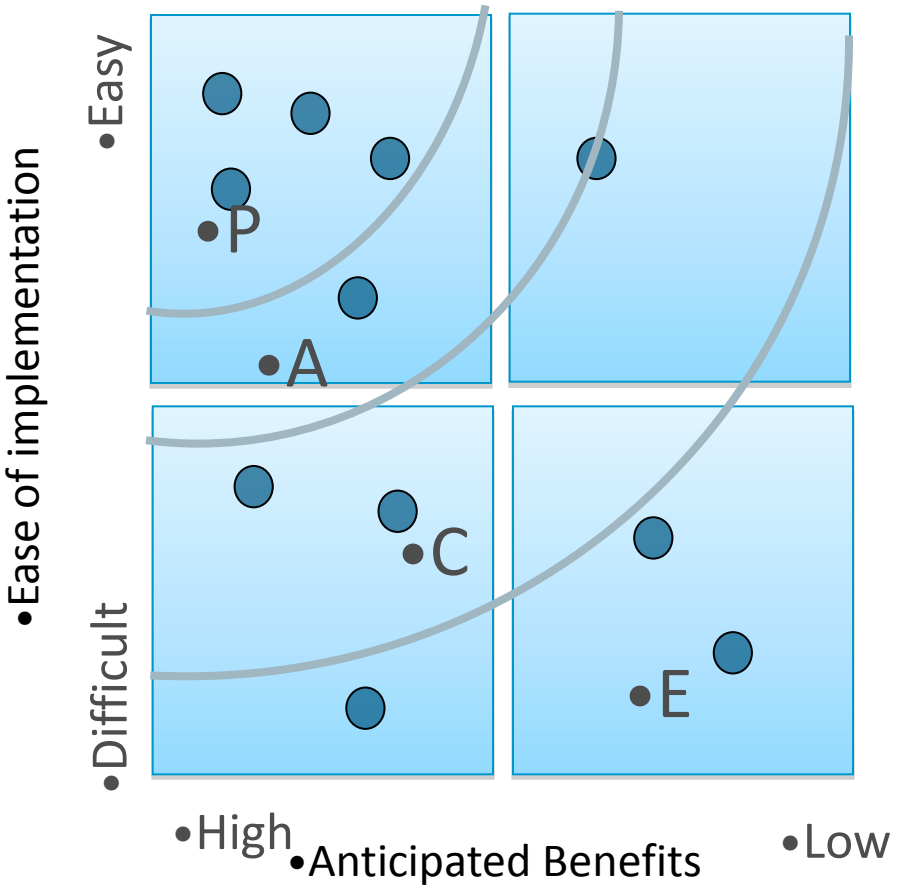
- Individual training
- Have to be aligned to production plan
- Establish training program in all levels/tasks
- Trainer pool in different tasks.
- Individual training
- Time to do training.
- Rieber academy
- Establish SMED program, and stick to it.

Prioritization matrix (example)



1. Producing allergens – build in parts of the Rest Filling
2. Returning raw material from Filling – must be faster, more staff, other organising
3. All products and components must be in place before the plan is made (Packaging)
4. Train operators in basic maintenance
5. Hire more people in case of sick leave (Mixing Depart.)
6. Flexible staff ”everyone can run all machines”
7. Improve communication between departments – both tel and email
8. Lock the production plan on a daily basis to avoid changes
9. Better control of the specifications on raw material (Q+ Purchasing)
10. Start up and change time
11. Upgrade equipment for higher speed (electric comp.)
12. Preventive maintenance and follow up.
13. Preventive maintenance Process and follow up
14. Preventive maintenance Mixing and follow up
15. Preventive maintenance packaging to prevent wearing and unnecessary stops
16. Maintenance plans part of the production plans
17. Process order ready before start – Mixing
18. Service level – customer vs. work in capital

Prioritize ideas – another way



- Priority
- Action
- Consider
- Eliminate

Summary of the key steps(RCA)

- **Identify issues**
- **Record them**
- **Classify or group them**
- **Agree groups titles**
- **Drill down to the Root Cause**
- **Solutions Brainstorming**
- **Rank and prioritize topics**
- ***Set actions***
- ***Implementation***