

Made In Morocco: DINNA Diagram

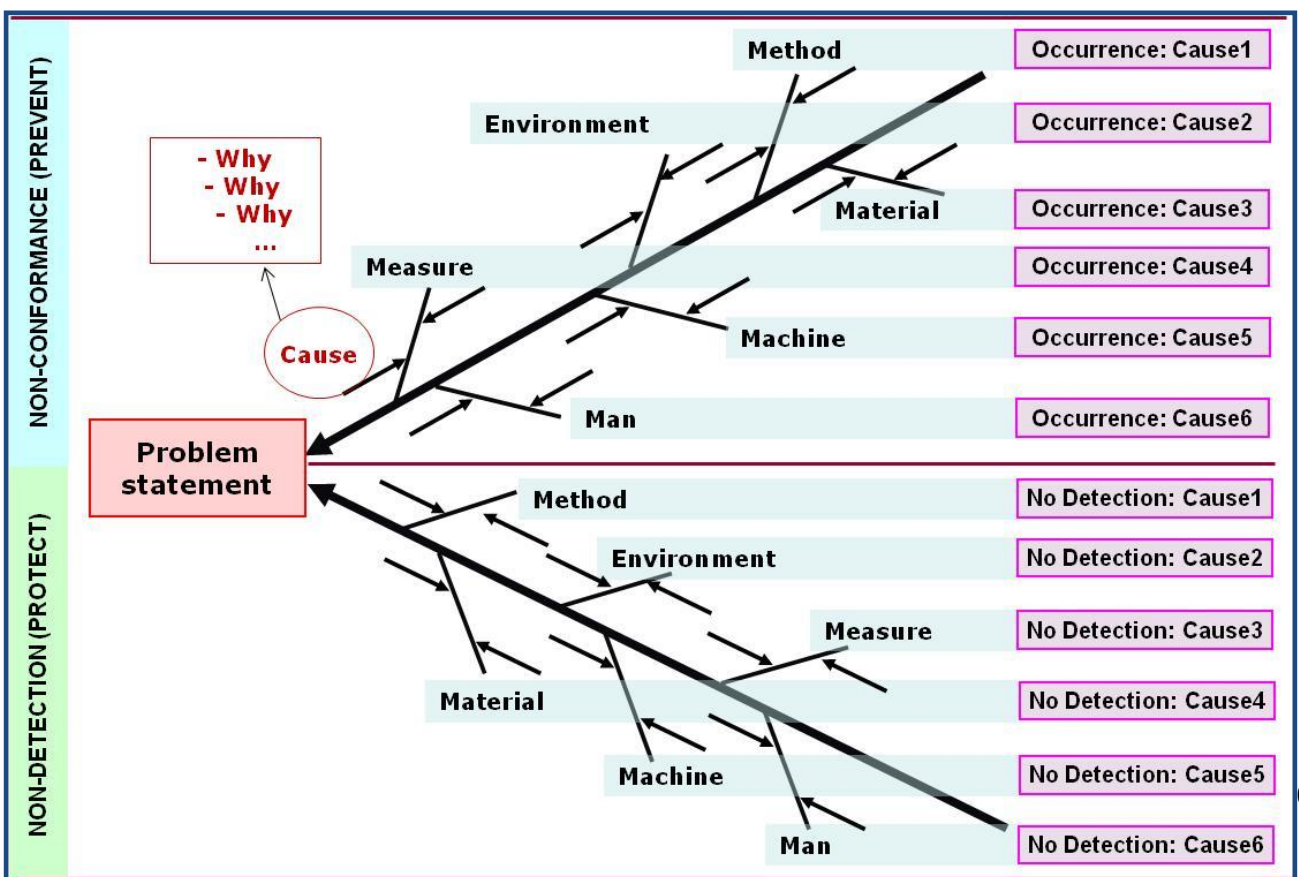
(Double Ishikawa and Naze Naze Analysis)

First of all, this is the first time that I publish this research after many years of 8D methodology practitioner (more than 1200 reports) on semiconductor, automotive wiring systems and plastics industries. I hope that will be helpful and by the way, one cogitates (think deeply) item to develop in the future. I present the experimental design of DINNA Diagram (Double Ishikawa and Naze Naze Analysis) discussing the novel approach we have taken to defect and root cause classification and the mechanisms we have used to connect between the different diagrams. We then present the results of our analyses and describe the best way to get it. We conclude with lessons learned from the methodology and resulting ongoing improvement activities.

Double Ishikawa diagram:

The Ishikawa diagram is one of Seven Basic Tools of Quality, (also called fishbone diagrams, herringbone diagrams, cause-and-effect diagrams, or Fishikawa) are causal diagrams created by Kaoru Ishikawa (1968) that show the causes of a specific event. This diagram illustrates the cause and effect diagram or 5ME (Material, Man, Machine, Method, Measure and Environment). For each branch all potential causes are described. Indeed, the purpose is to break down (in successive layers of detail) causes that potentially contribute to a particular effect.

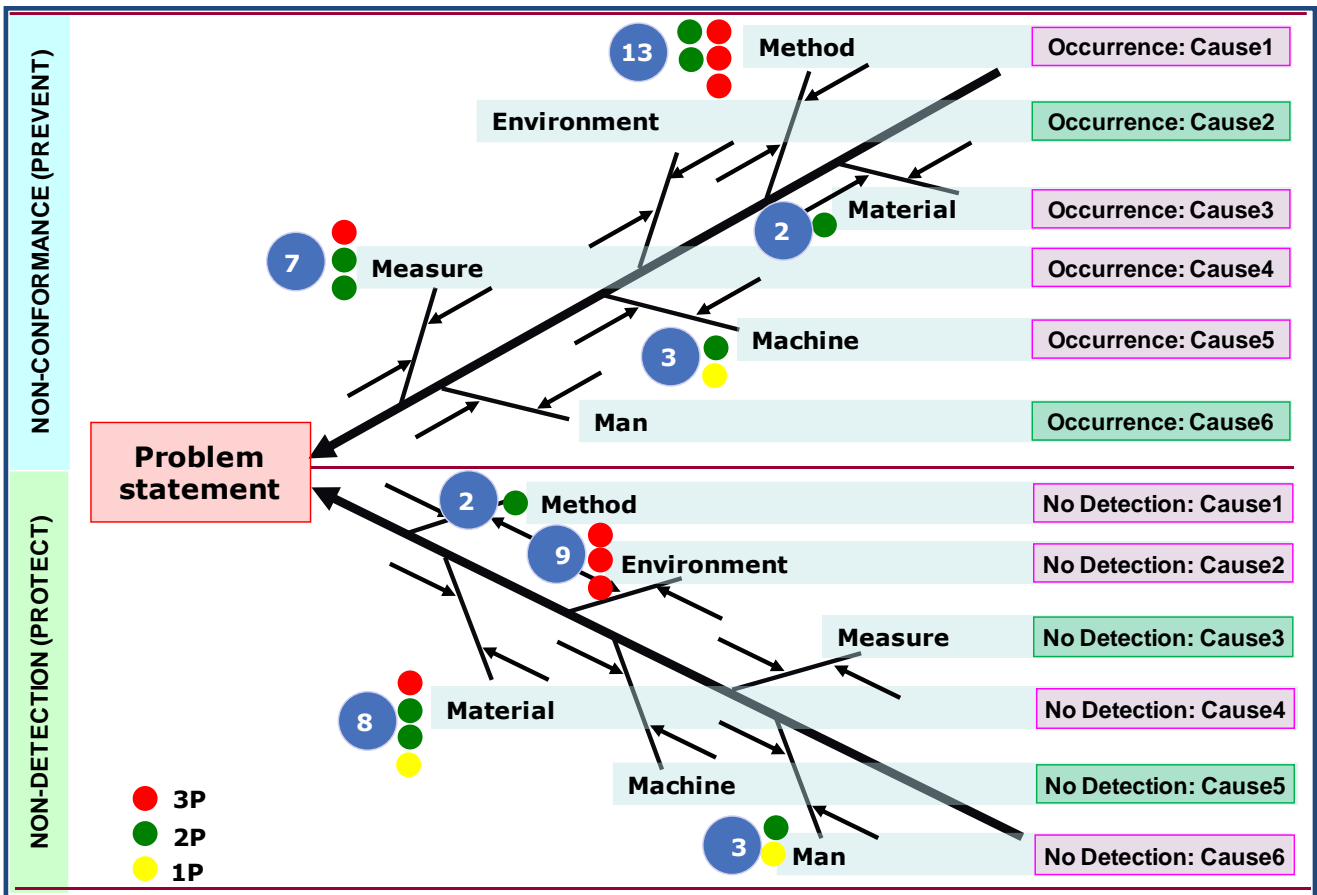
Mostly if not always, we treat only the occurrence (*why it happened*) and we forget the non detection (*why it wasn't detected*) root causes. That's why, double Ishikawa diagram is very important to complete the analysis. And, we keep the "Man" for the last, to not be influenced.



There are two ways to verify the causes, by reproducing the defect or by team voting.

By reproducing the defect: We try to reproduce the defect based on hypotheses given by team members, but this method is limited by time allocated to the analysis and also if there is combination of several causes.

By team voting: Sometimes it is very difficult to verify the causes by reproducing the defect. In this case, the team formulates hypotheses that can be objectively tested. The approach is that each team member gives a causes weight (3P, 2P, 1P) based on their feedback and expertise, and in the end we sum the points which giving a final number as shown in the example below.



Naze Naze Analysis:

5 Why's are widely used to find the real root cause, invented by **Taiichi Ohno** which was the great quality guru working for Toyota, 5 Why's are also called Naze Naze in Japanese (Naze=Why). The principal is to ask several times the question *Why* until you hit the *real* root cause.

And for sure, the question Why can be asked less or more than 5 times. Also, make sure the root cause is connected to the initial problem with a logical link.

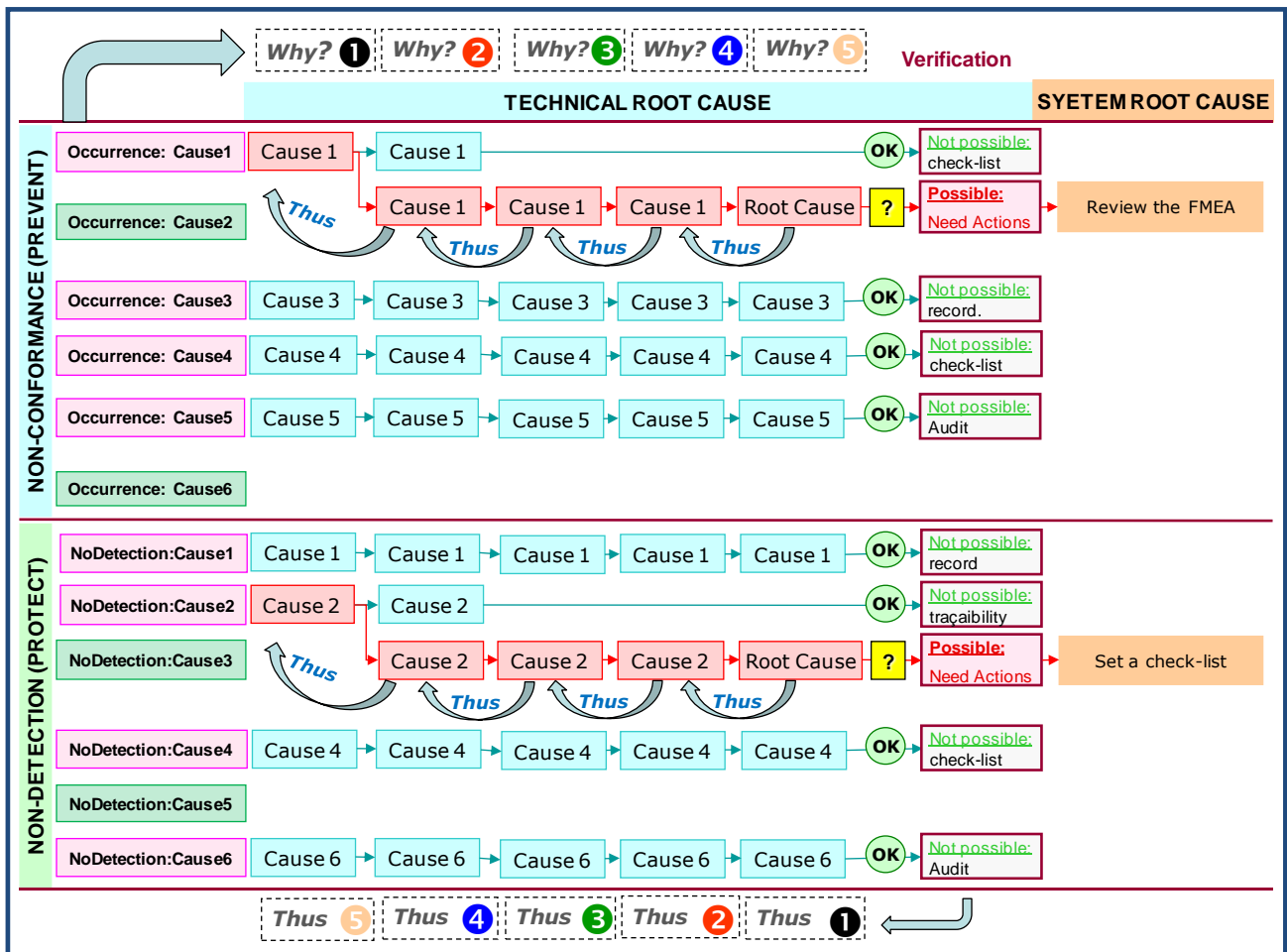
Which is the Reel Root Cause?

- The reel root cause must be well described: need to be accurate, measurable, specific and without interpretation.
- The reel root cause is the one identified that satisfies the requirement of completely explaining the effect. It is the single verified reason that accounts for the problem.
- The reel root cause is supported by the facts without contradiction.
- The reel root cause is the one whose removal should make the effect stop permanently.

The Double Ishikawa (or the list of initial causes) is the starting point. That could be the problem itself but that will be less accurate.

Methodology:

Step 1: select one initial cause from the Double Ishikawa. For each branch all potential causes are described: Advantage of this in description of a problem: you will not forget anything.



Step 2: repeat “why” until the answer can trigger a countermeasure. It’s important to note that the “5 Whys” technique can break into multiple chains when a particular “why?” has multiple answers. This is the time to apply the Pareto method and determine which pathway has the greatest effect in causing the performance gap. When choosing between two courses of action, it’s better to address the causes with an 80% impact on the problem first, before dealing with causes that have a lesser impact. See below (Occurrence: cause 1, in the first why, we get two causes, one was verified as not possible the second one, guide us to the reel root cause).

Step 3: Ask « thus » at every cause to verify the root cause. In fact, to verify that the analysis is correct, you should be able to propose a countermeasure to the root cause and apply the word “thus” or “therefore” to verify that the countermeasure addresses each cause in the chain. This is what we call the “reversible” aspect of the 5 Why’s to verify the reel root cause.

Good example:

“I was late” → why → because “my car did not start”

Do you mean “your car did not start so you were late”? Yes! so the cause is confirmed

Bad example:

“I was late” → why → because “I had a party yesterday evening”

Do you mean “your had a party yesterday so you were late”?

Cannot be Yes, because you may have a party and be just in time. Being late is due to something else → this cause is not confirmed.

Four dimensions of Naze Naze Analysis:

The Naze Naze Analysis splits into 4 dimensions:

- 1) The **Occurrence** (non conformity)
 - Why do we have the problem?
- 2) The **Escape** (non detection)
 - Why did we not detect the problem?
- 3) The **System** (preventive)
 - Why did the system allow this problem to happen?
- 4) The **System** (predictive)
 - Why did the system allow this problem to not be detected?

The system reel root causes are identified after the technical root cause which are the end of the Occurrence and Escape 5Why’s.

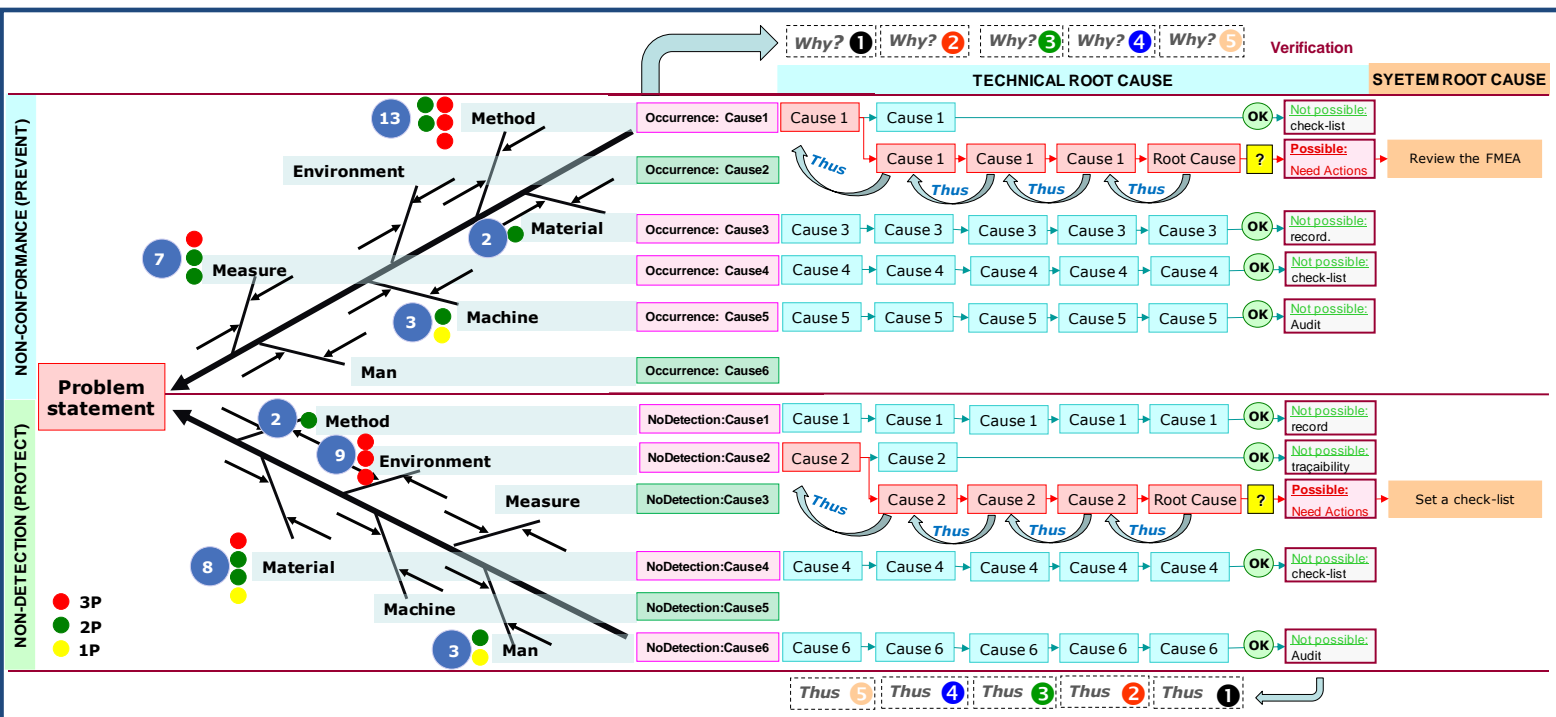
DINNA Diagram (Double Ishikawa and Naze Naze Analysis):

DINNA Diagram is a powerful problem solving methodology which is an iterative effort that requires strong leadership, good teamwork and relentless follow-through. If it were easy, you wouldn't need to spend time diving deep in an effort to understand the real root causes and solutions. You'd simply solve the problem.

In lean manufacturing, real root cause countermeasure tools are often used to help perform the necessary discovery and analysis, and to provide the insight needed to develop an effective and permanent solution. This approach is exactly what we found when we use DINNA Diagram, it will help you to gain time, to effectively determine the real root cause(s), and to avoid the recurrence.

The DINNA Diagram is complete resolving problem methodology if it is used correctly, we should not stop until ALL real root causes have been identified; Occurrence and Escape, Technical and System.

Remind that when the real root cause is identified it provides an opportunity to prevent it happening again thus reducing the possible recurrence, increasing customer satisfaction, etc...Finally, customers often require a 5 Why's from their supplier because they think that it is a key tool to find the real root cause and then to prevent recurrence. That's why; DINNA Diagram is well designed to force us to go down to the real root causes using fact-based links between the cause and the effect.



My intent in this article has been to give you a framework for solving specific problems through real root cause analysis, as well as inspiration for applying problem-solving techniques rigorously to continuously improve the quality and the efficiency of your analysis. The same philosophy of continuous improvement drives my tools development such as 8D report methodology and 8D TOYOTA Assessment which will be exposed for the next article.

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