



# Innovative problem solving guide

**By Sunit Shrestha  
& Sailendra Dev Appanah**



*“Imagination is more important than knowledge.  
Knowledge is limited. Imagination encircles the world.”*

Albert Einstein



## Case of social innovation: Green-revolution



Professor M.S. Swaminathan triggered a green revolution by introducing higher yielding wheat that allowed India to avoid a famine 40 years ago. In just a few decades, India has become a net-exporter of food.



## Case of social innovation: Rural electricity



Fabio Rosa has helped millions of rural Brazilians to have access to low-cost electricity that is 90% cheaper than the traditional electricity transmission cost.



## Case of social innovation: Quality volunteer matching



3 young MBA graduates founded MITRA's iVolunteer project acts as an online brokerage which brings thousands of highly talented volunteers to bridge the human capacity gap amongst non-profit organizations in India.



## Case of social innovation: Meal coupons against poverty.



MealExchange was conceived by a young college student to fight hunger in Canada. He created a system where unused students' meal coupons could be converted into food and groceries for the underprivileged.



# How to innovatively solve a problem?

Social entrepreneurs **make the world a better place with their social innovations** or their new way of solving social problems.

There are three key components in the social enterprise process: innovating solutions, planning and organizing.

## Social enterprise process



However, **innovating solutions, especially in bridging creative ideas into reality, is an irreplaceable task of social entrepreneurs** as other processes such as planning and organizing can be left partly for managers and team members.

So, **generating innovative ideas to solve the problem is your unique task**; although there is no one right way to solve any particular problem. However, there is a more systematic way to think of how to solve the problem innovatively.

**That's why innovative problem solving is important to you!**

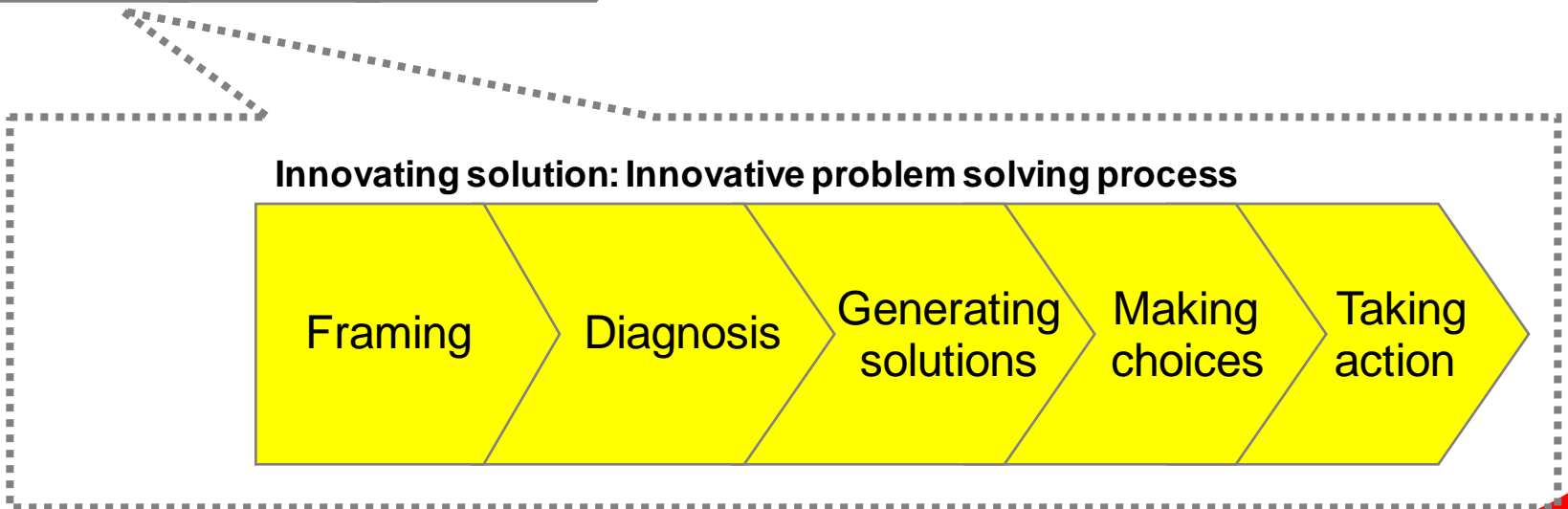
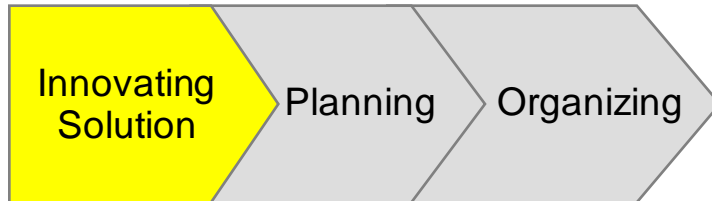


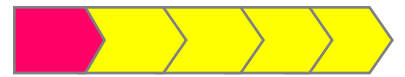
# THE PROCESS

Innovative problem solving is a process that is part of **innovating solution** stage of social enterprising.

The innovative problem solving process has five sub-stages:  
*framing, diagnosis, generating solutions, making choices and taking action.*

## Social enterprise process

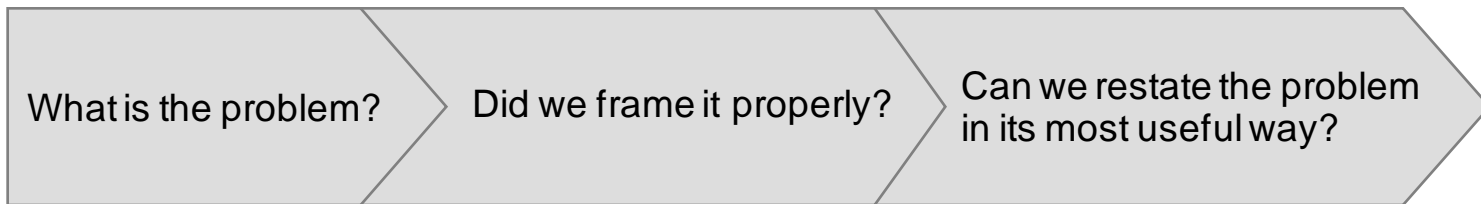




# FRAMING

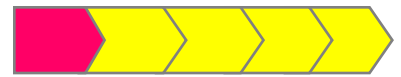
Framing or defining is all about trying our best to **ask the right question** in solving the problem.

**In framing, we should answer 3 questions**



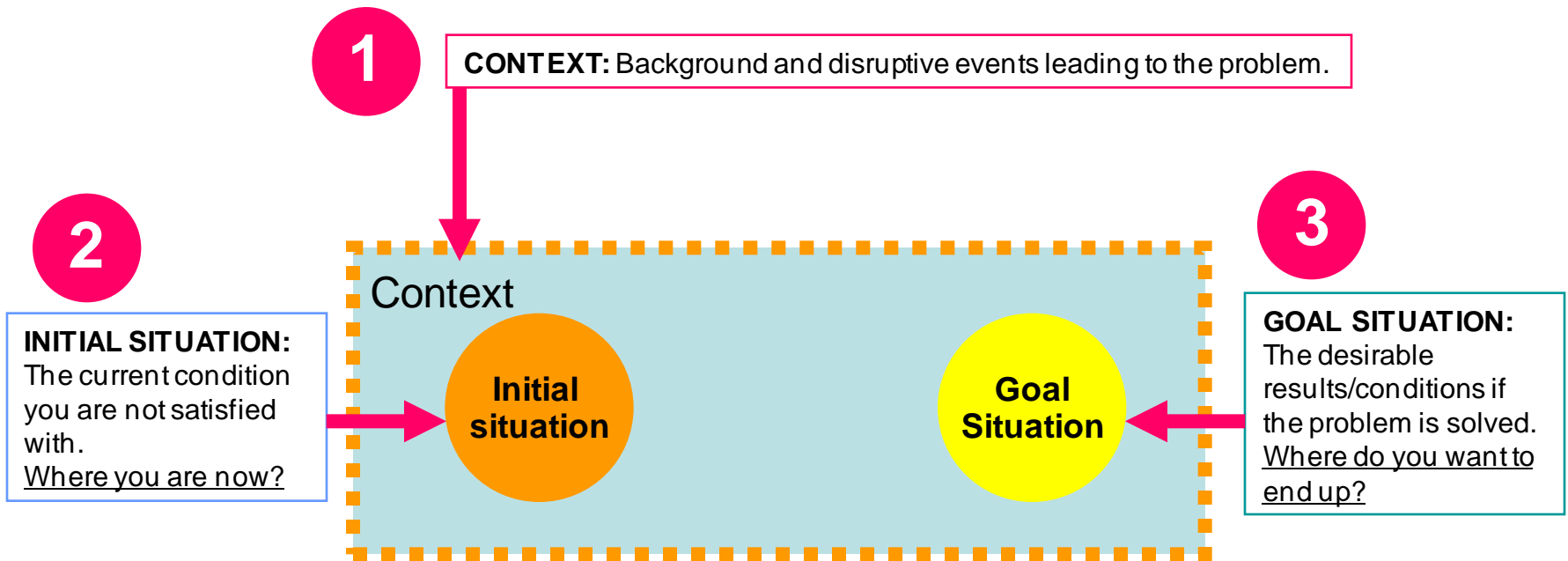
**Framing help us lock our target problem well with clarity.**

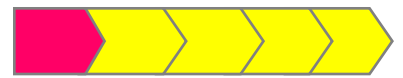
**Remember,**  
Voltaire said *“Judge a man by his questions rather than his answers.”*



# FRAMING

To answer what is the problem, we should focus on the 3 generic elements of the any problem.

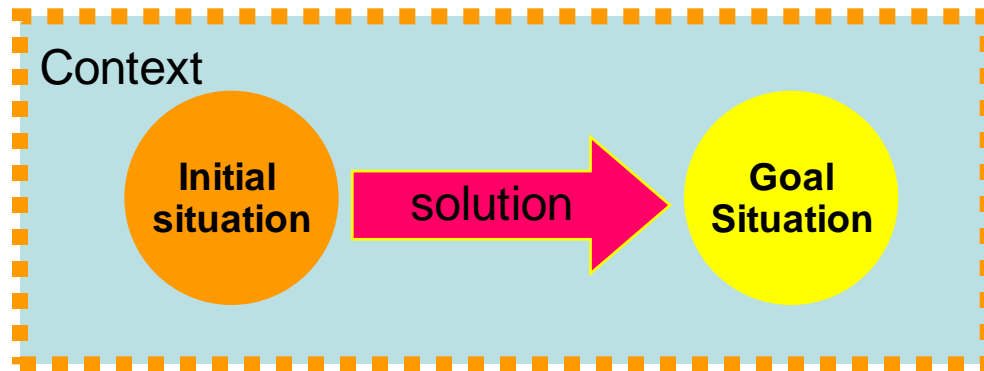


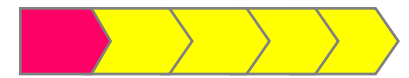


# FRAMING

A proper frame can give you a *clear sense of purpose*.

Problem solving is always about moving from **Initial situation** to **Goal situation**.





# FRAMING

## Example: The fishing village

**CONTEXT:** Fishing villages of rural India in poverty. They are using traditional fishery techniques. People die at sea and get cheated by middle men for centuries.

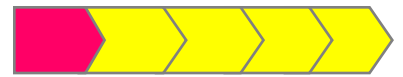
### Initial situation

No access to accurate information on weather, sea conditions and food prices results in death at sea & being cheated on sales of fish.

**solution** →

### Goal Situation

Villagers should be able to access the latest and most accurate information on weather forecasts, sea conditions and food prices so that they can catch more with safety & sell at higher price.

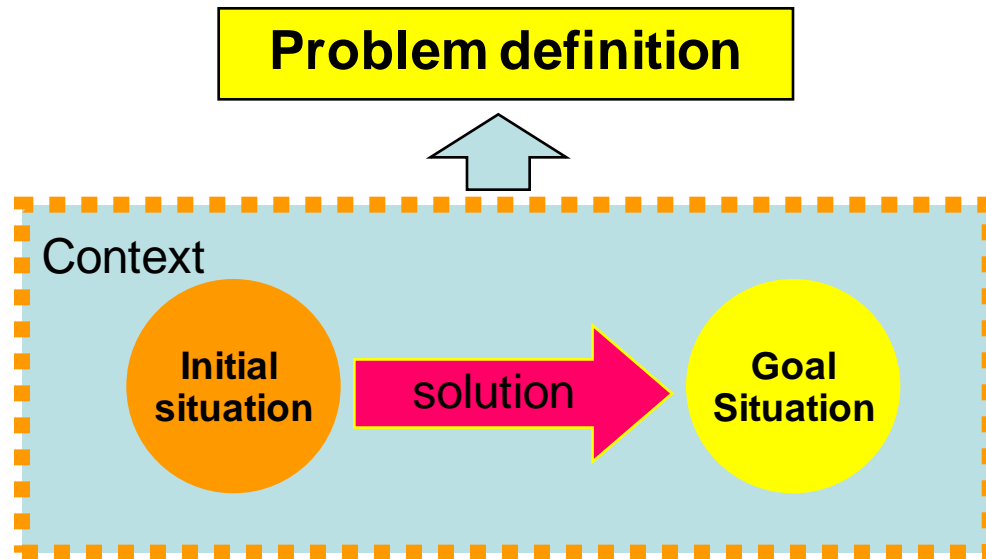


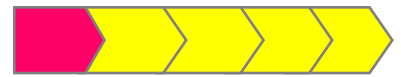
# FRAMING

## DEVELOPING PROBLEM DEFINITION

Using the context and the difference between **Initial situation** and **Goal situation**, we can define the problem more clearly.

Make sure your **problem definition** reflects your initial/goal situation as well as the context.





# FRAMING

## DEVELOPING PROBLEM DEFINITION

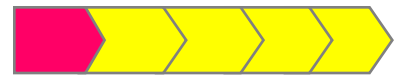
*Example*

context

Traditional fishermen in rural India don't know when or where to fish as well as the right price to sell the fish they catch, so they risk their lives and get cheated by the middlemen. Therefore, they can't fish safely or sell at higher price.

INITIAL

GOAL



# FRAMING

## FRAME TESTING & RESTATEMENT

Once we have our problem definition, we ask;

Did we frame it properly?

Which can break down into follow sub-questions...

*Is the problem definition....*

**too broad?**

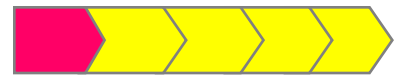
**too narrow?**

**assumption-driven?**

**solution-driven?**

If **YES**, we ask;

***Can we restate the problem in its most useful way?***



# FRAMING

## FRAME TESTING AND RESTATEMENT

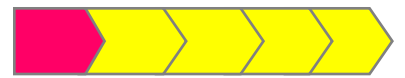
### *Example*

Too broad?

Traditional fishermen in rural India don't know when or where to fish as well as the right price to sell the fish they catch, so they risk their lives and get cheated by the middlemen. Therefore, they can't fish safely or sell at higher price.

### **Comment!**

This can be a bit too broad as the word 'don't know' can be very broad. For example, we can **narrow down to the problem of access of information** rather than the skills' needed to come up with the information by themselves. As both are different ways to solve the same problem.



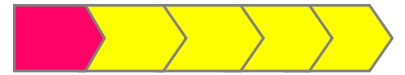
# FRAMING

## FRAME TESTING AND RESTATEMENT

*Restatement example*

Fixed!

Traditional fishermen in rural India **don't have access to accurate information on weather and prices to** so they risk their lives and get cheated by the middlemen. Therefore, they can't fish safely or sell at higher price.



# FRAMING

**“The ability to ask the right question is more than half the battle of finding the answer.”**

Thomas J. Watson, founder of IBM

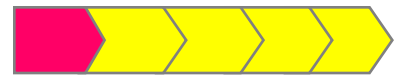
## KEY QUESTION MAKING

Once you have the most useful problem statement, you transform it into key question to be answered to solve the problem.

**PROBLEM STATEMENT**



**KEY QUESTION**



# FRAMING

## Key question making.

Example,

### **PROBLEM STATEMENT:**

Traditional fishermen in rural India **don't have access to accurate information on weather and prices to** so they risk their lives and get cheated by the middlemen. Therefore, they can't fish safely or sell at higher price.

### **KEY QUESTION:**

*How can traditional fishermen in rural India gain access to accurate information on weather and prices so they can fish safely and increase their sell price ?*

As framing is all about asking the right question, and now we've got ourselves something that might be the right question.

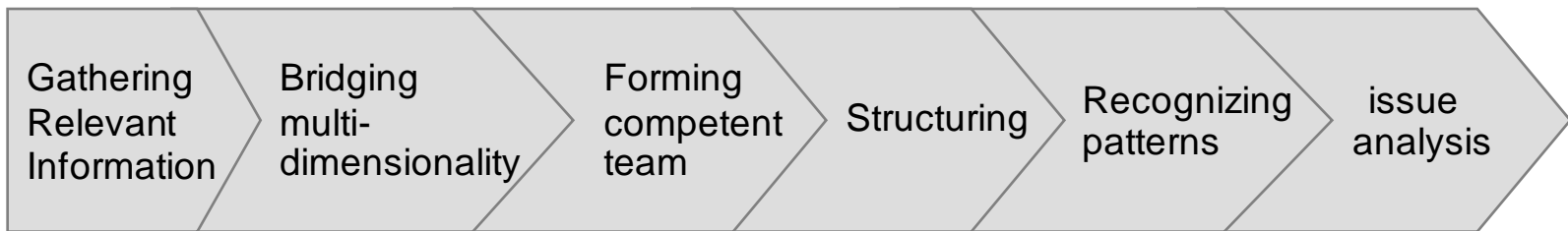
So, we've framed the problem!



# DIAGNOSIS

Diagnosing is about structuring the problem to know its causes and gains deep understanding to remove them.

**Diagnosis process in innovative problem solving includes:**



Although these components in diagnosis process need not be in linear order. However, *it is recommended to walk-through these components consecutively* as it is more logical to do so although you can jump back and forth depending on your unique situation.



# DIAGNOSIS

## Diagnosis process:



## GATHERING RELEVANT INFORMATION

*What information do we need to solve the problem?*

We should gather information related to the problem such as facts, perceptions, opinions, feelings and analysis. Many times it is very important to know where to get specific pieces of information as different type of information are from different sources. Analysis & news can be searched from the Internet but deep insight on particular issue might be better sought from expert directly.

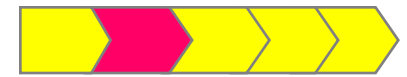
There are two things to keep in mind:

A) **Don't waste time finding information you don't really need.**

Ask "Do we have just about enough information to start solving the problem?"

B) **Information alone is not enough to innovatively solve the problem.**

This is very true as 'innovation = new' and we are not looking for routine solution, therefore, existing information and knowledge only provide ground work for us to innovate.



# DIAGNOSIS

## Diagnosis process:



## BRIDGING MULTI-DIMENSIONALITY

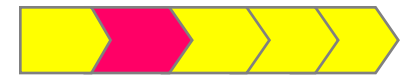
It is proven again and again that innovations, whether in science, nature, business or social sector, are driven by multi-dimensionality which is the ability to explore different sides of things as well as the intersection of diverse ideas, perceptions, incentives and world-views. It is in this chaotic potential that novelty emerges.

We can start by asking three basic key questions;

*What are the different sides/faces to the problem?*

*Who are the stakeholders involved and what are their perspectives to this problem?*

*Do you need to redefine your problem based on multi-dimensionality?*



# DIAGNOSIS

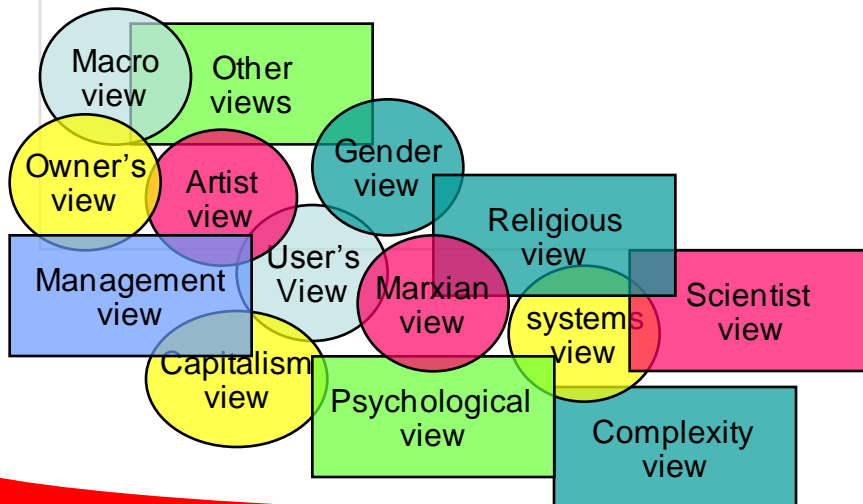
## Diagnosis process:



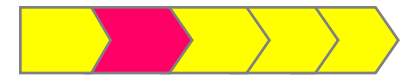
## What are different sides to the problem?

We need to look at the different sides of the problem to extend our limited perspective on it. Multi-dimensionality helps us to get ideas, innovations or models from diverse fields and cultures to perform a diagnosis and generate possible solutions. There are almost infinite sides to a single problem, of which only very few are useful angles to look at.

Jay Walker, one of the most famous contemporary inventors, said *“If you can’t find at least six sides to a problem, you’re not looking hard enough.”* We can look at different approaches to think about the problem,



We should be able to choose a few sides that are useful to solve the problem. The key is to be able *recognize and gather totally random knowledge* (it could be either from rock music, insect behavior, rocket science or business practices) *to purposefully combine them into innovative solutions*. The intersection of various disciplines, view-points, expertise and passion is among the root causes for innovation.



# DIAGNOSIS

## Diagnosis process:



### ***Who are the stakeholders involved and what are their perspectives to this problem?***

Getting to know the people involved with the problem can enhance our ability to understand the context and relationships that cause the problem. We need to know exactly who is related to the problem, both directly and indirectly. We must know their perspectives, incentives, profit/loss, and conflicts of interests to the problem.

#### **For example**



Criminal activity is a terrible problem that society faces, but the insurance industry benefits from it.



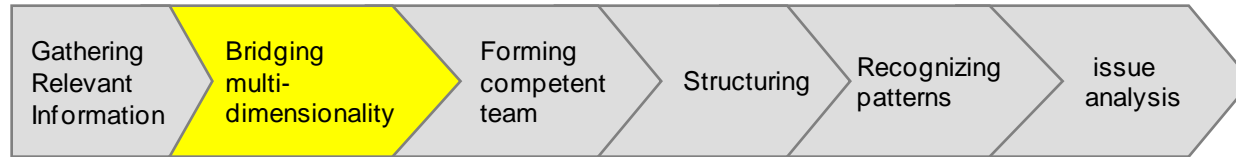
Pollution caused by automobiles is among the top contributors of global warming, yet the petroleum industry reaps huge profits.

***It is impossible to solve these types of problems without understanding the stakeholders well !***



# DIAGNOSIS

## Diagnosis process:



### Do you need to redefine your problem based on multi-dimensionality?

Based on the inclusion of dimensionality into the understanding of a problem, it might make sense to redefine the problem and go back to ask the previous question:

Can we restate the problem in its most useful way?

**For example**



# DIAGNOSIS

## Diagnosis process:



## FORMING COMPETENT TEAM

As we mentioned before, innovation comes from the intersection of diversity, therefore, bringing in people from different fields to cross the traditional boundaries of the problem is very important. Forming of competent team of passionate diverse individuals is critical for innovatively solving the well-defined problem.

In this process we need to ask two main questions:

*Who can really contribute to solving the problem innovatively?*

*Who among them should become part of the core group, mentors or advisors?*



# DIAGNOSIS

## Diagnosis process:



### *Who can really contribute in solving the problem innovatively?*

In finding who can really contribute, we must try to identify the knowledge, skills and networks required to solve the particular problem.

We might not know exactly who, but we should know people from which discipline, organization or group is needed. We know this from our multi-dimensionality workout, especially in terms of useful perspectives/dimensions.

*Then we can follow-up and identify the people later.*



# DIAGNOSIS

## Diagnosis process:

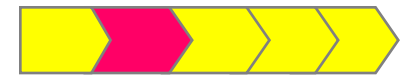


***Who among them should be part of the core group, mentor or advisor?***

Once the individuals have been identified, we should plan the type of roles that these people could play within the group.

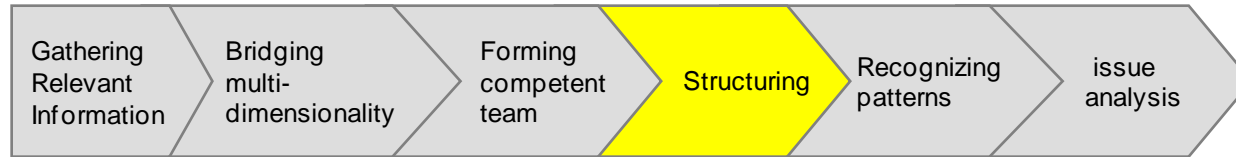
Should the person should be in the core group, advisory group, become a mentor or a distant source depending on the requirement of knowledge, skills and time availability as well as the interest of that particular person in solving the problem.

Confusing or inappropriate roles can result in a total failure in the problem solving process.



# DIAGNOSIS

Diagnosis process:



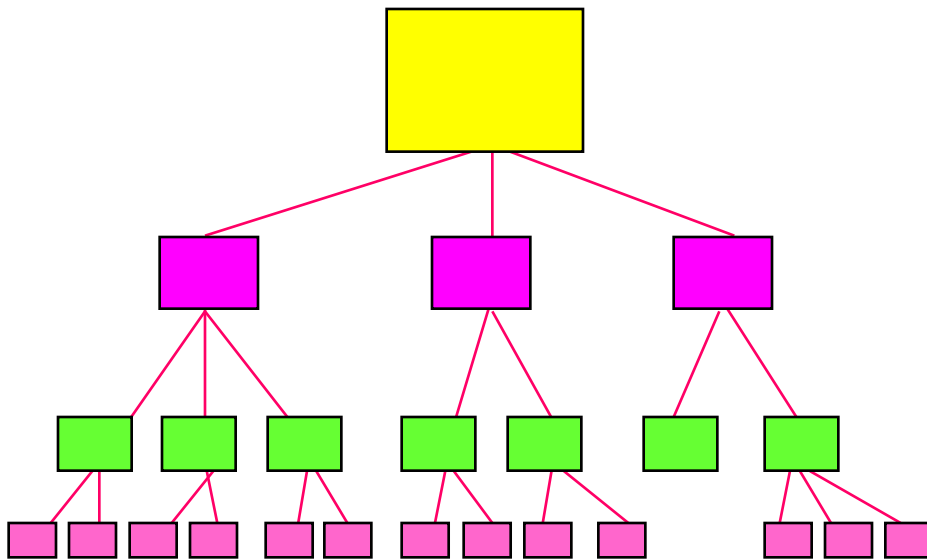
## STRUCTURING

How do you structure this problem?

Structuring is all about bringing order out of chaos. It helps us visualize the systems that deliver the problem situation. In order to deal with huge amounts of data, information and knowledge, we must impose logical order to these seemingly chaotic elements of the problem to make some sense of them.

There is a very useful structuring technique that is widely used, especially among consulting firms where problem solving is a profession for them.

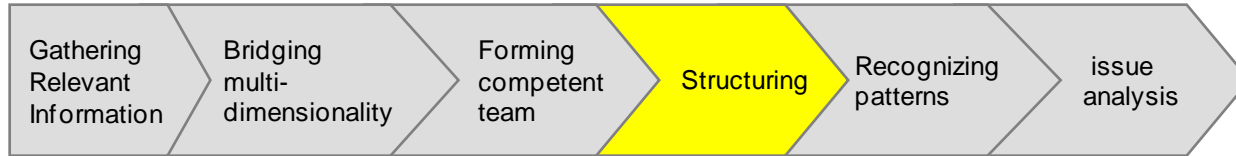
*The technique involves developing a logical pyramid or in simpler words: grouping your points/issues/ideas into a pyramid-like structure.*





# DIAGNOSIS

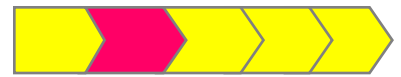
## Diagnosis process:



## GROUPING FOR PYRAMID!

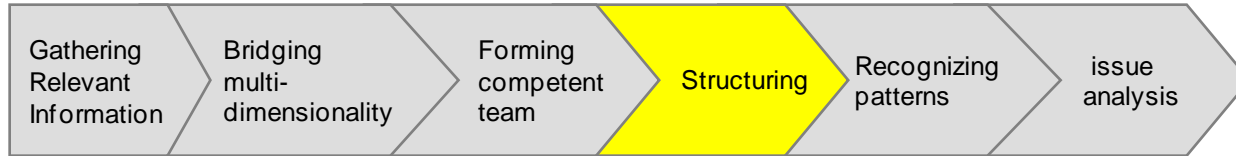
There are 3 possible ways to logically structure any system of a problems;

- > **Determine the causes of an effect.**
- > **Classify similar things.**
- > **Divide a whole into its parts.**



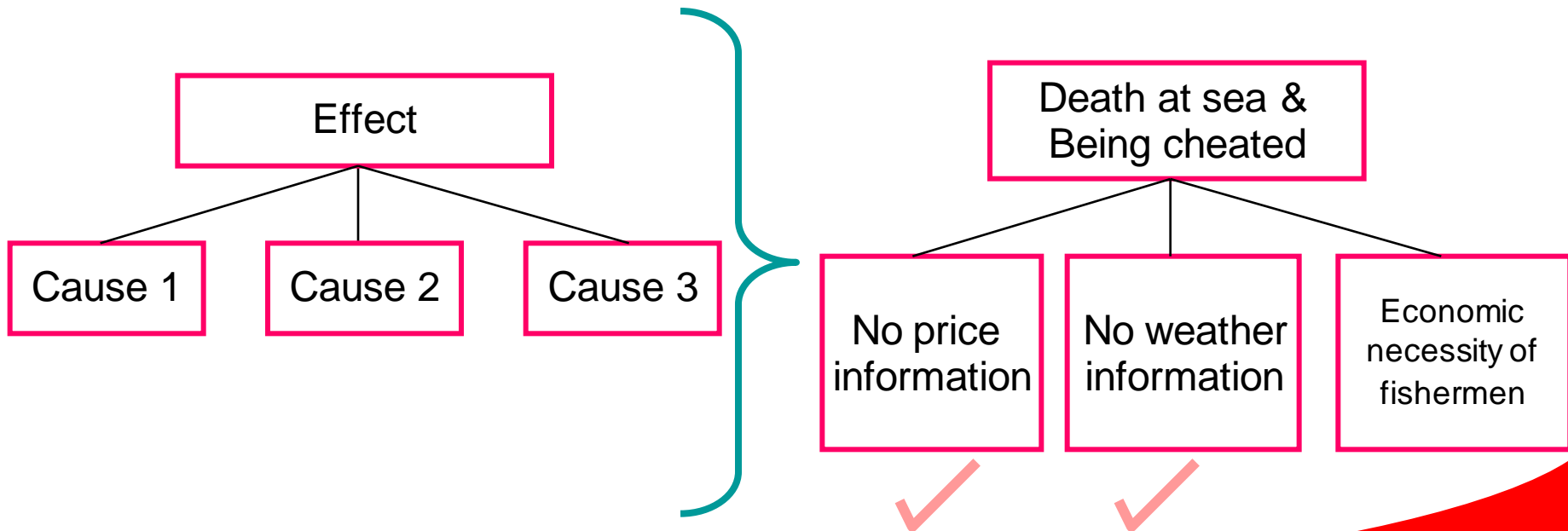
# DIAGNOSIS

Diagnosis process:



## GROUPING!

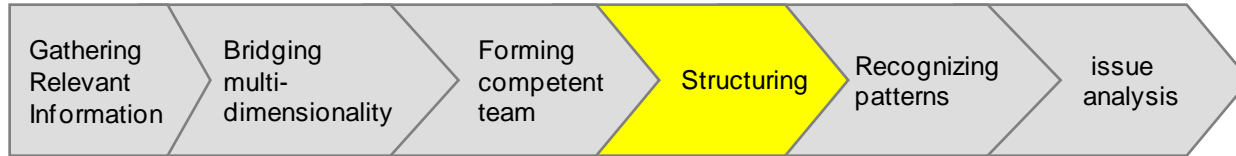
Determine the causes of an effect / **TIME-ORDER** .





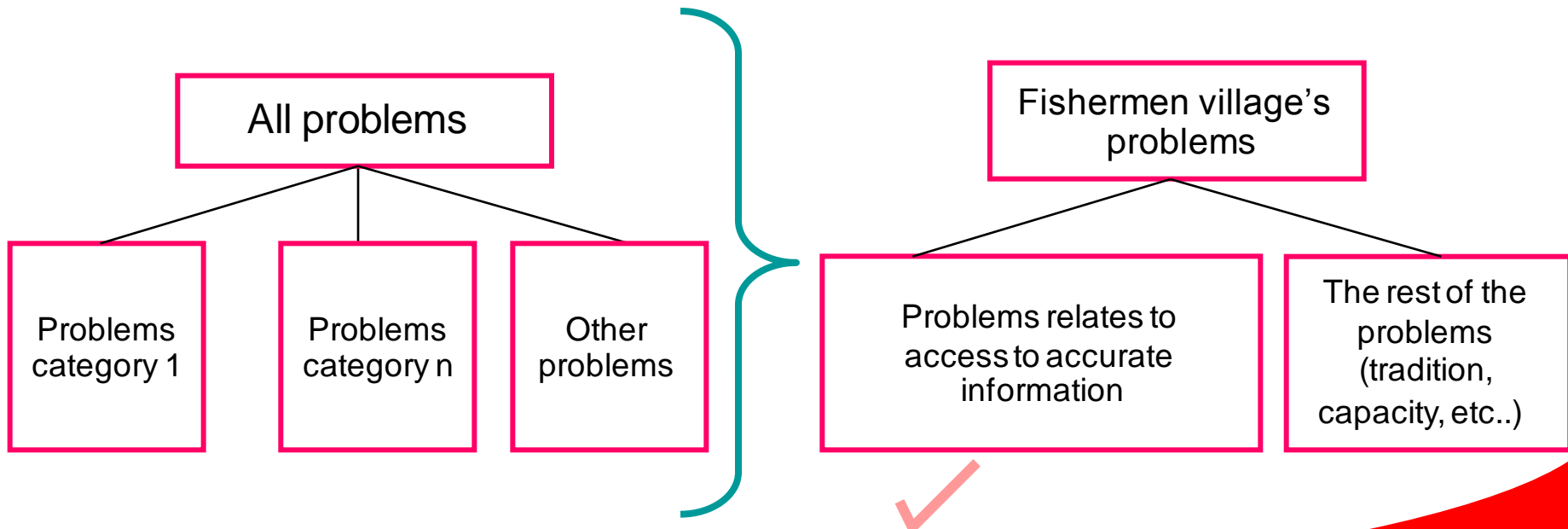
# DIAGNOSIS

Diagnosis process:



## GROUPING!

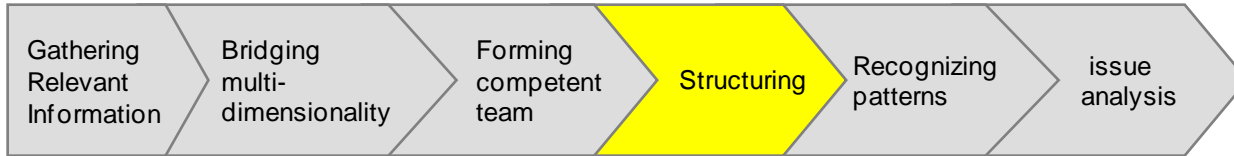
Classifying similar things / **CATEGORY ORDER**





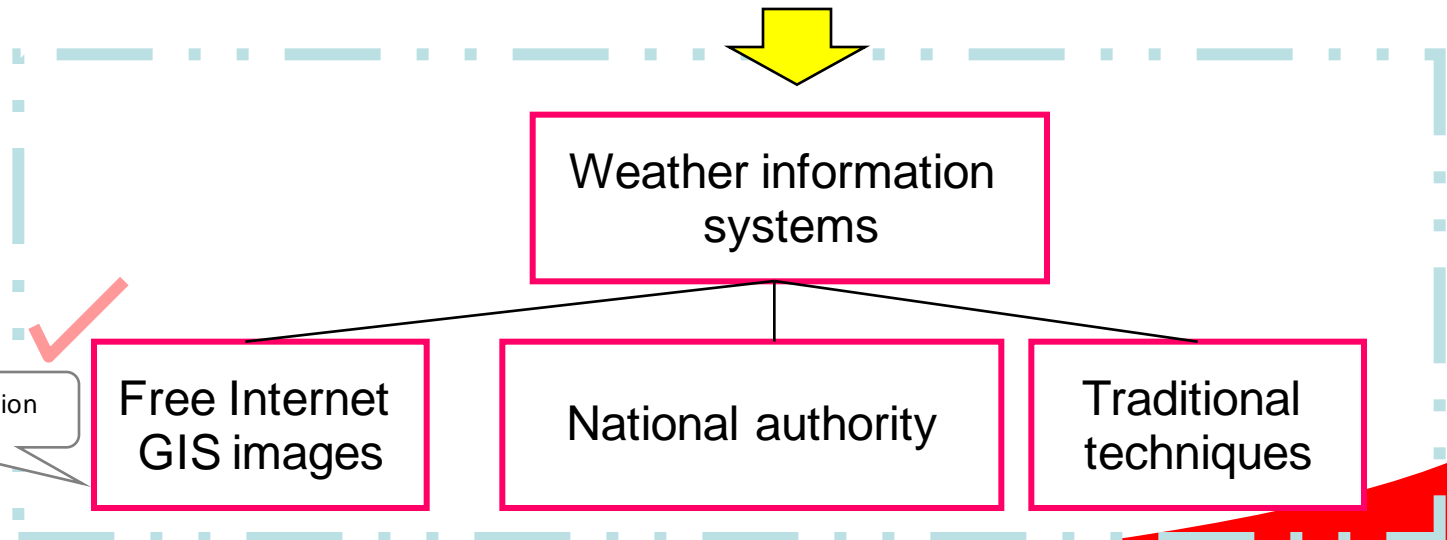
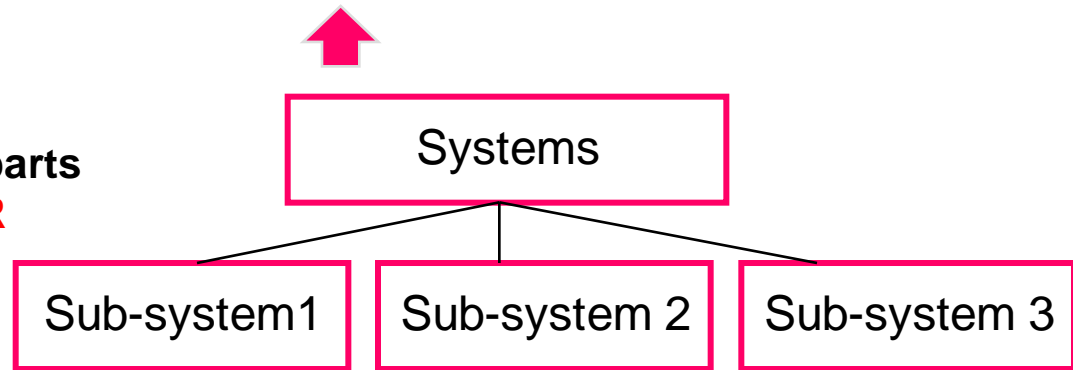
# DIAGNOSIS

Diagnosis process:



## GROUPING!

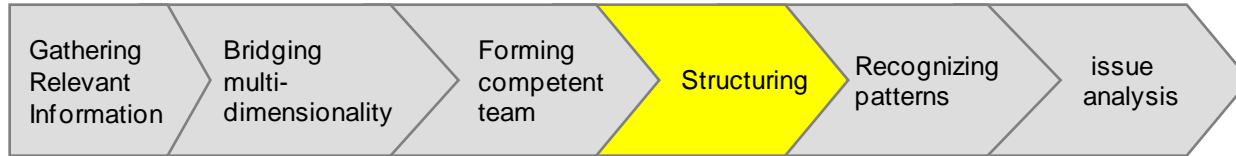
Divide a whole into its parts  
/ **STRUCTURAL ORDER**





# DIAGNOSIS

## Diagnosis process:



## RULES IN STRUCTURING A PYRAMID

There are three basic rules in building the pyramid

- Ideas at any level must be summaries of those grouped below.
- Ideas in each grouping must be the same kind.
- Ideas in each grouping must be logically structured.
- Ideas at each level must be Mutually Exclusive and Collectively Exhaustive (MECE)

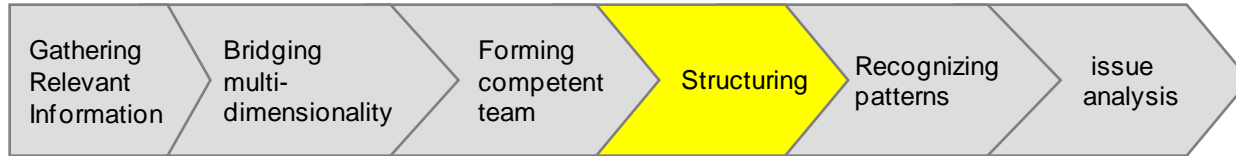
**IF NOT,**

**you will end up with a bigger mess than you start out trying to make some sense out of the problem!**



# DIAGNOSIS

## Diagnosis process:



## Pyramid helps bring insights

When you've structured the problems in pyramid format from various dimensions. You practically have forced yourself to think very logically about different elements of the problems using visual technique.

You always end up with better understanding on the problem, you've gained insights.

### EXAMPLE,

#### Some key insights from the fishermen village problem.

- We can try to deal with price and weather information in our attempt to solve the problem rather than changing the traditional job of the village.

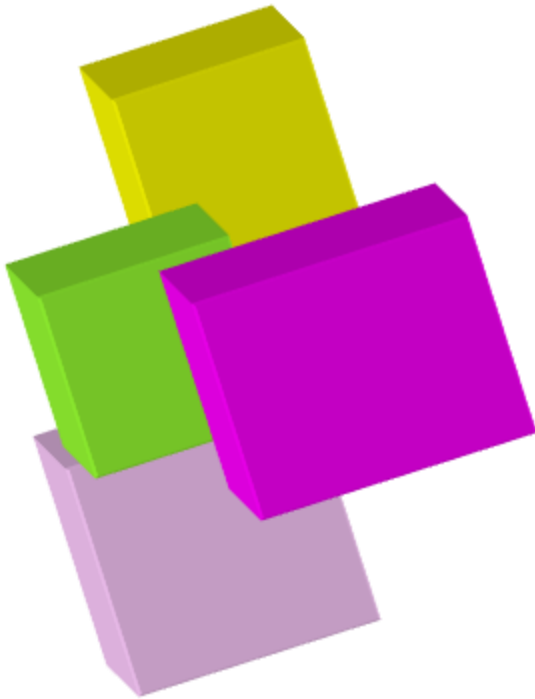
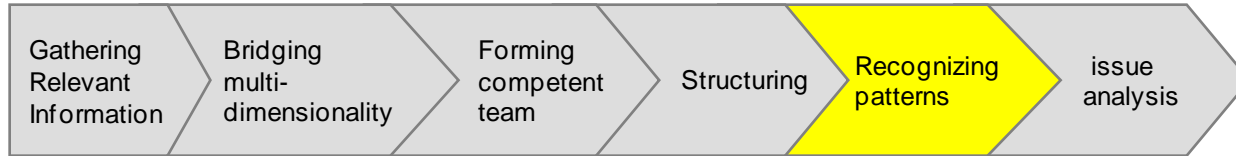
- Access to information seems to be a good category of problem' elements to work on compare to the rest of element categories.

- Source on weather information that might be the most accurate and useful to the community might be the from the Internet GIS images.



# DIAGNOSIS

## Diagnosis process:



## RECOGNIZING PATTERNS

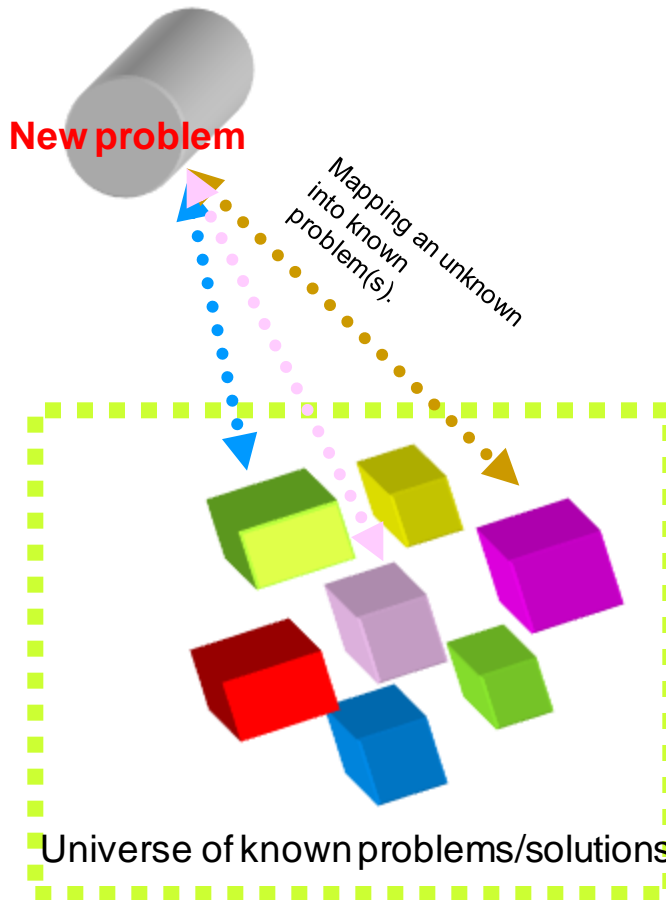
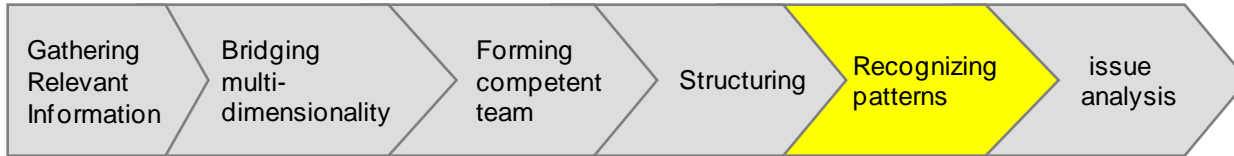
Once you have a fairly clear idea of how to structure the problem. It is very useful to try to fit the problem into familiar patterns or boxes of known problems.

You see, **although each problem is unique, there is a similarity to other known problems.** The advantage of recognizing patterns is that there might already be some people who are dealing with or have dealt with a very similar problem and its analysis or solution might be applicable to our problem.



# DIAGNOSIS

## Diagnosis process:



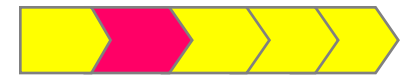
## RECOGNIZING PATTERNS (Cont.)

**The recognition of patterns is the corner stone of inventiveness.** It is true that innovators think outside the box, but before they do that, they tend to think inside the box first.

The patterns or boxes are like a stock of known analyses or solutions which innovators can draw upon to address problems.

**The trick is to spot something that already works, learn why it works and then reapply or complete the model to our problem situation.**

Pattern is all about finding the similarity of what is known that can be applied to the unknown to solve the problem.



# DIAGNOSIS

## Diagnosis process:

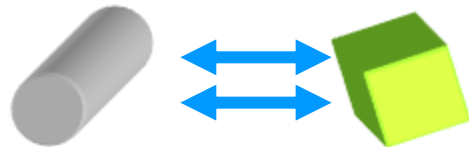


### PROBLEM

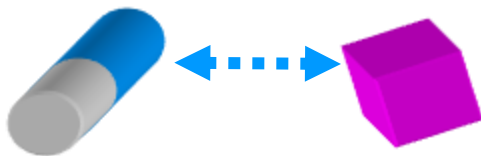
### BOXES

## Application of boxes to new problem.

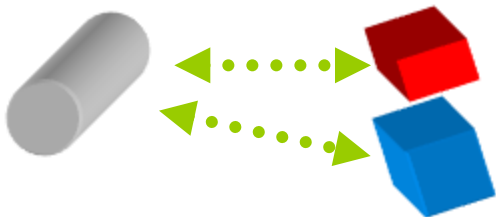
The application of known boxes to solving problems involve:



**1. Complete application of a particular box to the problem;** it might be a routine problem or a problem that can be restated as a variation of other known problems.



**2. Extend the known model to solve the new problem;** it is the problem that has part of its elements that can fit a known pattern, thus, providing a basis to solve the problem.

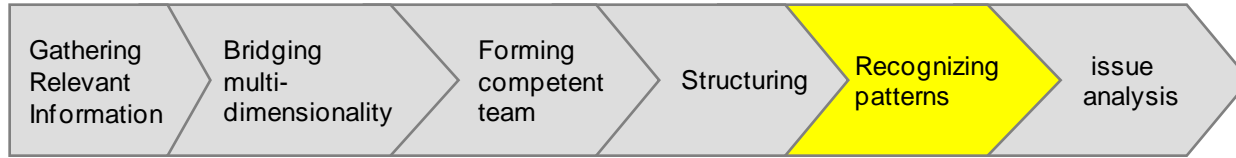


**3. Combination of many boxes,** many problems are a combination of many known patterns. Thus one must apply many boxes to solve the problem which either can be applied completely or require an extension.



# DIAGNOSIS

## Diagnosis process:

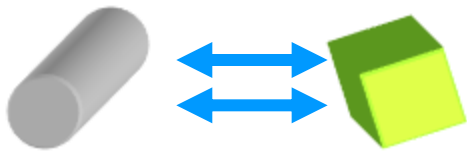


## Application of boxes to new problem.

### Example

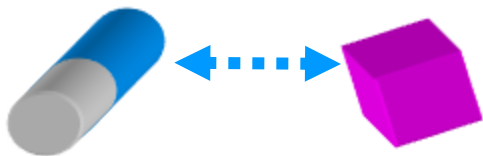
PROBLEM

BOXES



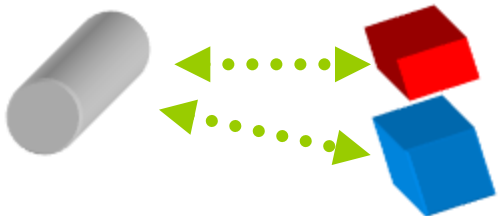
### 1. Complete application of a particular box to the problem;

**MICROCREDIT** – access to cheap credit for poor families by making community groups accountable for default on loans. Popularized by Grameen Bank and spread through out the world where rural credit is a problem.



### 2. Extend the known model to solve the new problem;

**Vera Cordeiro's Renascer** – solves chronic diseases and repeated visits to the hospital from slum children by helping their mothers with food, medicine, counseling, housing repair, job training and other types of assistance. Although she is using conventional medical method but the service is extended with social dimensions so that it is more effective in solving the problem.



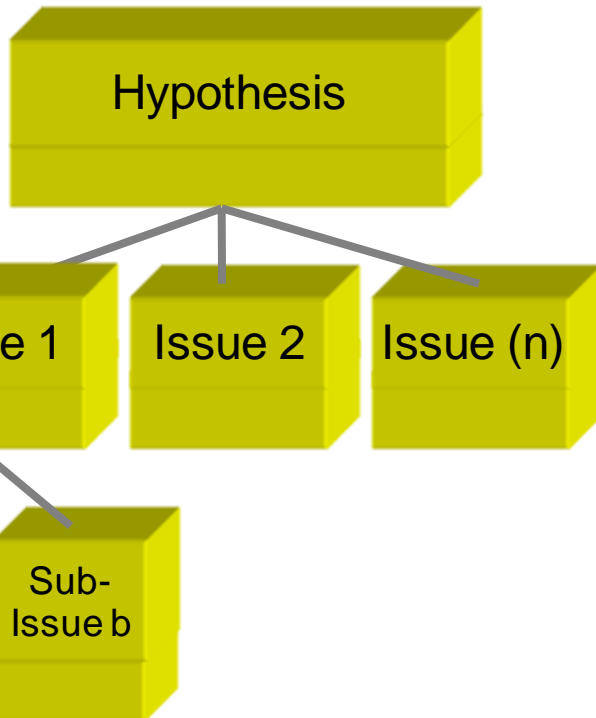
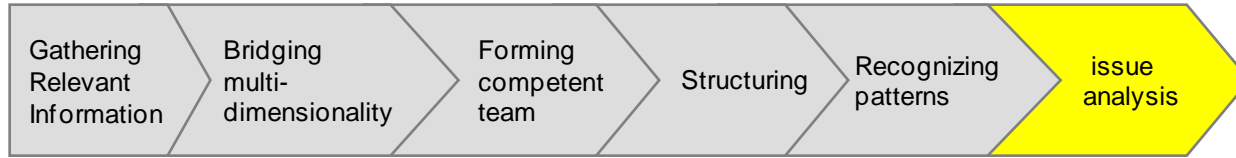
### 3. Combination of many boxes,

**Rural fishermen knowledge (ICT) center** – MSSRF in India use digital satellite GIS image, trained local interpreter and community loud-speaker to provide the villagers with accurate weather information and forecast to reduce death at sea and increase their productivity. Therefore, they combine known boxes of GIS systems and traditional village communication resulting in unique social innovation.



# DIAGNOSIS

## Diagnosis process:



## Issue analysis

Once you've identified some boxes of known problems/solutions related to what your problems' structure and elements. You might already have a better idea how to analyze the problem further in order to find a way to solve your problem. Whether you've precisely or intuitively identify how to solve your problem, issue analysis will be very useful.

Issue analysis is a process of identifying major issues that are the causes of the problem. It is the *ultimate version* of structuring. It helps narrow and pinpoint the real causes of the problem as well as helping you to make a creative leap in solving it.

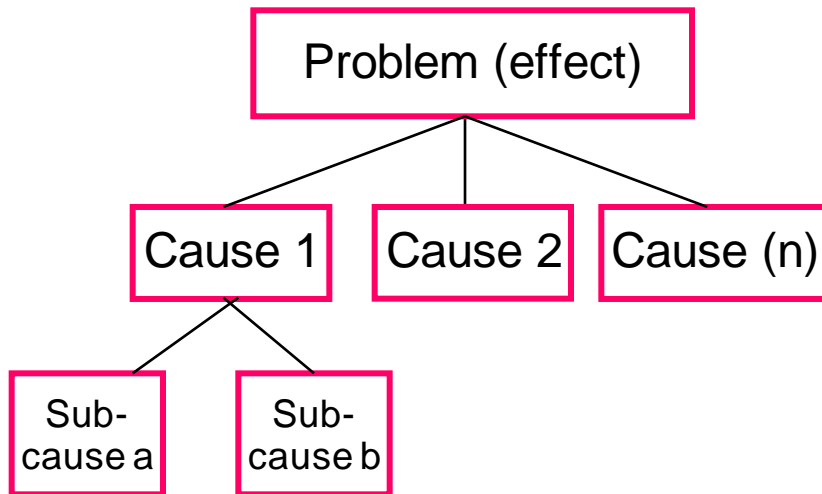
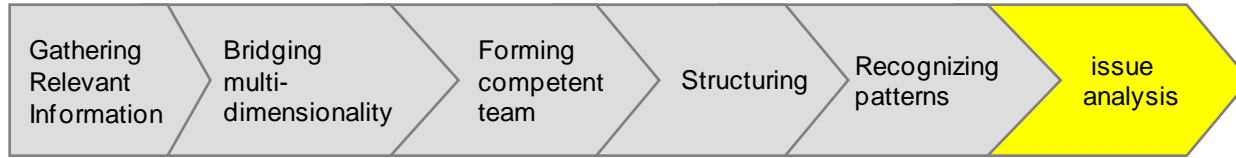
The issue analysis process involves:

- Structuring the problem and developing logical pyramid
- Hypothesizing and issue pyramid
- Hypothesis testing



# DIAGNOSIS

## Diagnosis process:



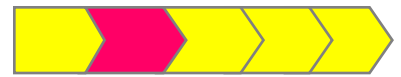
## Issue analysis

### Structuring the problem and develop logical pyramid

Structuring process is identical to that discussed previously. It basically *imposes logical order to the elements of the problems*.

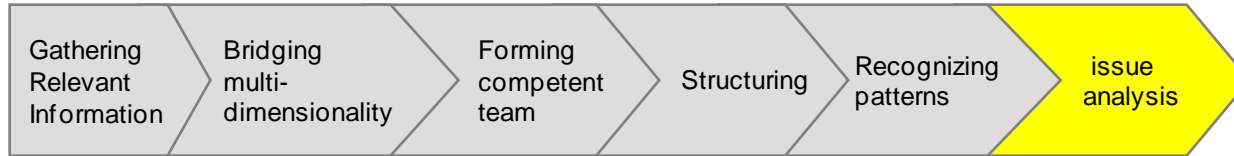
Again, there are three type of logical ordering, time-order, category-order and structural order. We must choose the most appropriate order to solve the problem.

In problem solving, the most useful order is the time-order (causes and effect) as we are trying to understand the causes in order to remove them. Other orders are good as tools for thinking in arriving at the right time-order logical pyramid.



# DIAGNOSIS

Diagnosis process:



## Issue analysis

Example:

**THE FISHING VILLAGE PROBLEM'S  
LOGICAL PYRAMID**

**Rural fishing village experiences death at sea and being cheated by the middlemen**

They lack Information access to relevant and accurate information

They lack weather which put them in danger at sea.

They lack price information which leads to getting cheated by the middlemen

They need to continue their risky and worst-off day-to-day work in order to continuously feed their poor family

They follows traditional job of their village due to social value.

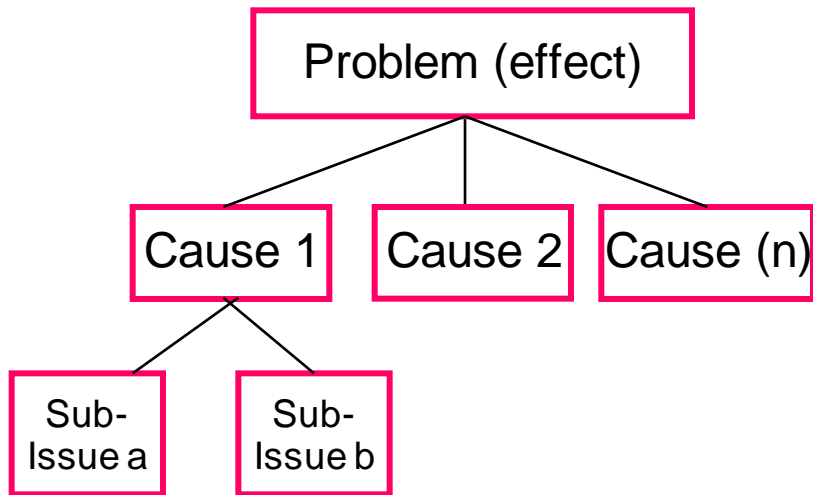
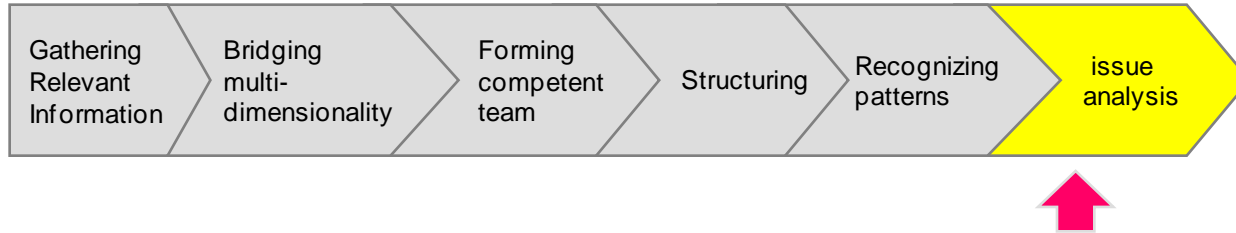
They are too poor to take risk of having no family income & food.

They can't easily switch to other occupations.



# DIAGNOSIS

## Diagnosis process:



## Issue analysis

### Hypothesizing and issue pyramid

Once the basic structure of the problem is visible, we must hypothesize the major causes of the problem based on our earlier structure.

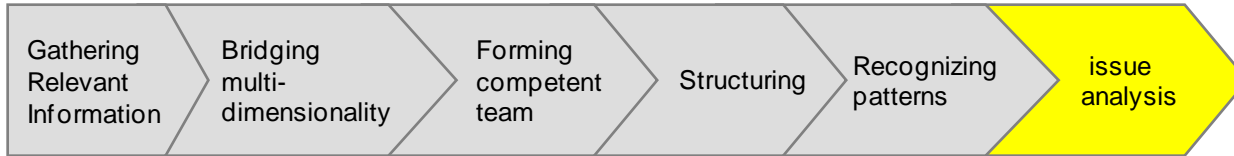
We can even choose some particular main causes of the problem from the logical pyramid that seems to be the most useful in solving the problem.

The general format of a hypothesis or argument is as follows;  
**The major causes of problem x ( moving from INITIAL to GOAL ) are CAUSE1, CAUSE2 and CAUSE3, (cause\_n)**



# DIAGNOSIS

## Diagnosis process:



## Issue analysis



### Hypothesizing and issue pyramid (Continue)

Then we structure the problem into the issue pyramid based on the importance of major causes with respect to how you plan to solve it. Where a logical pyramid is simply a structured grouping of problem's elements, issue pyramid is the series of questions or issues that must be addressed to prove or disprove a hypothesis about the root causes of the problem.

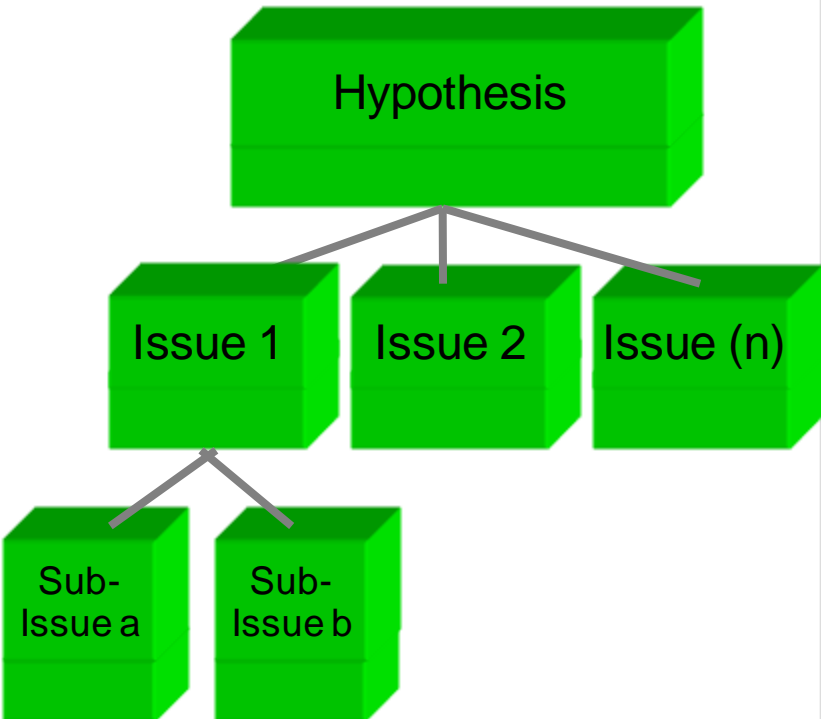
At the top level is the hypothesis of what are the most important causes of the problem that if removed, the problem is solved.

The upper level represents causes or issues that can be proven as true or false once we test them against the data. (That is, we can convert these issues into clear-cut yes or no questions.)

The statements or arguments in the lower level of the pyramid provide support for the upper level. Each level of the pyramid must provide strong reasoning so that each cause is truly a major cause of the problem.

The supportive reasoning is done either through deductive or inductive reasoning, although inductive reasoning is recommended as it is easier to establish a relationship.

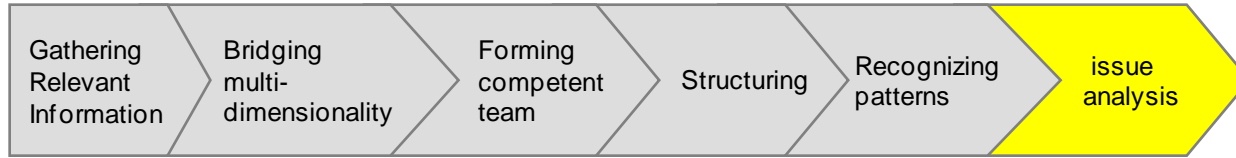
([link to more on deduction/induction](#))





# DIAGNOSIS

## Diagnosis process:



## Issue analysis

Example:

**THE FISHING VILLAGE PROBLEM'S LOGICAL PYRAMID**

**Rural fishing village experiences death at sea and being cheated by the middlemen**

**They lack Information access to relevant and accurate information**

**They need to continue their risky and worst-off day-to-day work in order to continuously feed their poor family**

**They lack weather which put them in danger at sea.**

**They lack price information which leads to getting cheated by the middlemen**

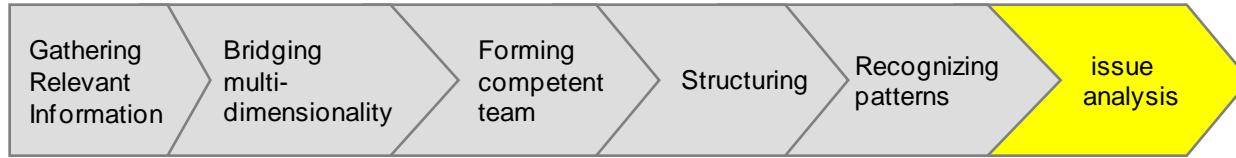
**TIPS:** In choosing where to begin making the hypothesis about the root causes of the problem. We can try to find some causes that if removed, are sufficient to solve the problem (i.e. find sufficient condition that kills the problem).

In this case, lack of information access can be sufficient condition that if removed, can already solve the problem. So we can only work with this issue to solve the problem already.



# DIAGNOSIS

## Diagnosis process:



## Issue analysis

Example:

### THE FISHING VILLAGE PROBLEM'S ISSUE PYRAMID

**HYPOTHESIS:** Rural fishermen lack Information access to relevant and accurate information so they die at sea and get cheated by the middlemen

**ISSUE:** They lack weather information which put them in danger at sea.

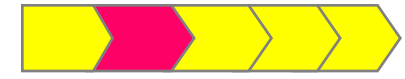
**ISSUE:** They lack price & market information which leads to getting cheated by the middlemen

**SUB-ISSUE:** They can't find accessible, timely and accurate information source.

**SUB-ISSUE:** They lack knowledge to read and communicate the weather forecast (especially GIS).

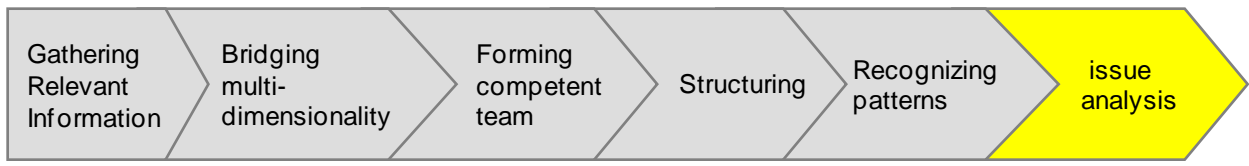
**SUB-ISSUE:** They can't find accessible, timely and accurate information source

**SUB-ISSUE:** They lack knowledge to communicate the prices & market information to their peers.



# DIAGNOSIS

Diagnosis process:



## Issue analysis

CONVERT TO QUESTION  
FORMAT OF ISSUE PYRAMID

Example:  
THE FISHING VILLAGE  
PROBLEM'S  
ISSUE PYRAMID

**HYPOTHESIS:** Can we reduce rural fishermen's death at sea and cheating by middlemen with access to relevant and accurate information?

yes/no questions

**ISSUE:** Can the weather information reduce their danger at sea?

**ISSUE:** Can the price & market information reduce their chance of getting cheated by the middlemen?

Support information / reasoning

**SUB-ISSUE:**  
Is there an accessible, timely and accurate information source for them?

**SUB-ISSUE:**  
Is there a knowledge to read and communicate the weather forecast for them? (especially GIS).

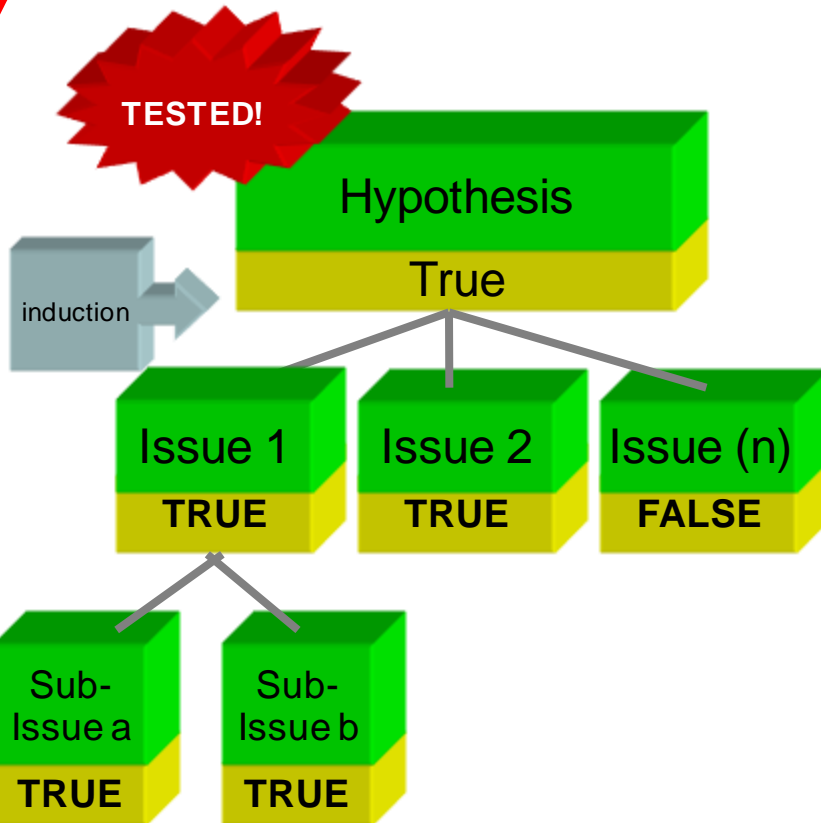
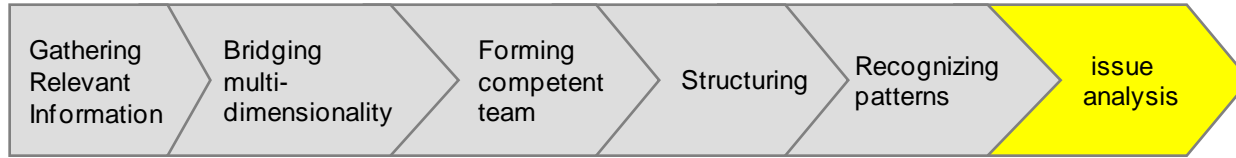
**SUB-ISSUE:**  
Is there an accessible, timely and accurate information source for them?

**SUB-ISSUE:**  
Is there a knowledge to communicate the prices & market information to their peers?



# DIAGNOSIS

## Diagnosis process:



## Issue analysis

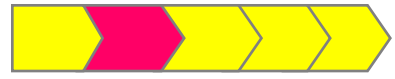
### Hypothesis testing

Once the hypothesis pyramid in setup, we can now test our reasoning by gathering more relevant data or information to prove each of the issue and its supportive statements in that particular level of the pyramid.

At the end of the testing, we must be able to prove our hypothesis as a sound argument (i.e. with logical strength and true supportive statement/premises).

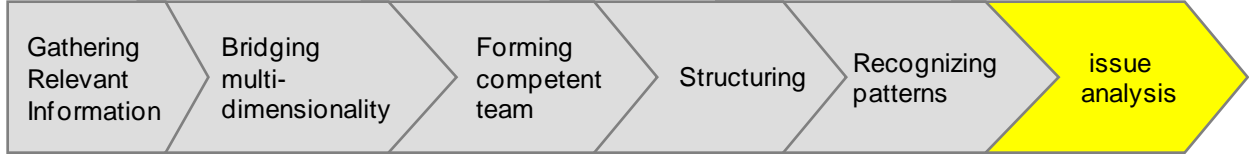
Once the testing is done, it might be useful to restate the hypothesis/argument so that it fits more with reality. It is important to note that most of the real world problems are not black or white.

Thus, issue analysis simply provides stronger logical setup for our problem analysis to pinpoint the major causes of the problem that effectively give us a better chance to come-up with proper solutions.



# DIAGNOSIS

Diagnosis process:



## Issue analysis

### HYPOTHESIS TESTING

**NOTE:** In many case, especially in using inductive reasoning, **not all issues/sub-issues have to be true to make the hypothesis true** as it might only need one sufficient issue to make it true!

**Example:**  
**THE FISHING VILLAGE PROBLEM'S ISSUE PYRAMID TEST**

**TESTING PROCESS:**  
 You always have to begin testing from down to up, your task is to find the answer all these key issues/sub-issues whether they're true or credible.

**HYPOTHESIS:** Can we reduce rural fishermen's death at sea and cheating by middlemen with access to relevant and accurate information?  
**YES**

**ISSUE:** Can the weather information reduce their danger at sea? **YES**

**ISSUE:** Can the price & market information reduce their chance of getting cheated by the middlemen? **YES**

**SUB-ISSUE:** Is there an accessible, timely and accurate information source for them?  
**YES**

**SUB-ISSUE:** Is there a knowledge to read and communicate the weather forecast for them? (especially GIS).  
**YES**

**SUB-ISSUE:** Is there an accessible, timely and accurate information source for them?  
**YES**

**SUB-ISSUE:** Is there a knowledge to communicate the prices & market information to their peers?  
**YES**



# DIAGNOSIS

## Summarizing diagnosis process

In summary, the **DIAGNOSIS** process consists of .....

gathering related information,

*understanding the multi-dimensionality  
(different sides) of the problem,*

*forming a competent team of individuals from  
diverse areas/disciplines to contribute to the  
innovative problem solving process,*

structuring the problem through imposing a logical order to elements of the problem,

**recognizing patterns or boxes of known  
problems/analyses/solutions  
to reapply to our particular problem.**

Performing issue analysis allows innovative solutions to remove  
the pinpointed root causes of the problem.



# GENERATING SOLUTIONS



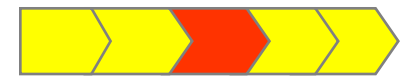
Generating solutions process is ***all about finding various ways to remove the causes of the problem, thus, effectively solving it.***

The earlier processes of innovative problem solving, whether framing or diagnosis, are just preparations for the stage of generating solutions to the original problem.

It is at this process where the intuition is the most crucial. We might have creative leap in seeing solution without going through all the earlier processes.

The process consists of answering the following questions;

- Is the problem a routine/standard, unique or the combination of both?
- Can we solve it intuitively right away? (top-down)
- Can we solve parts of the problem and aggregate them? (bottom-up)
- What are the solutions?



# GENERATING SOLUTIONS



## Is the problem a routine/standard, unique or combination of both?

By answer whether the problem is a routine/standard, unique or the combination of both, it is very useful in finding where the solutions would come from.

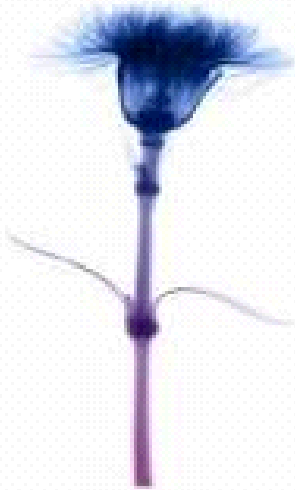
**If the problem is a routine/standard type,** we can identify the boxes of known problems and apply its solutions to our problem directly. The generation of solutions for this type would concentrate on finding existing knowledge-base on how to solve a problem. It is more important to know where to find the relevant knowledge-base than to come up with your original solution which might very well run the risk of reinvent the wheel.

**If the problem is indeed a unique type,** it is more important to focus on how to creatively solve the problem in an original way. The focus would shift to creative techniques such as brain-storming, visualization, backward induction, lateral thinking. The preparation works such as framing, problems structure, issue analysis are important ingredients to make creative leap in solving problem. It is crucial that one must not kill the possible solutions from birth, i.e. in throwing ideas to the table on how to solve the problem, one must delay the evaluation of particular idea until each idea is develop into a well-thought-of solution or its element.

**If the problem is a combination of both,** it is important to identify which part of the problem is routine/standard and which is not. Those that are routine can be solved using a boxes technique and those that are unique elements must be solved creatively!



# GENERATING SOLUTIONS

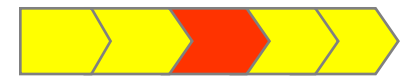


## Can we solve it intuitively right away? (top-down)

Once you identify the problem type, you can now use various outputs from your framing and diagnosis process to assist you in arriving at the solution. In some cases, especially when the problem is not complex or your intuition performs a miracle, you can solve it right away once you know the real causes of the problem.

If you answer yes to the top-down question, that would mean you intuitively grasp the solution to the problem as a whole. Most of the time, it's because you could see the pattern that the problem is a generic one that can apply other known generic solutions to it. You might also find a proper analogy that transforms a solution from one area to your target problem's area. You could easily search the boxes for solutions.

On a rare occasion, your intuition works out magic. You might very well develop an original solution to the problem intuitively. The remaining work is to provide details in solving various parts of the problem. Therefore, it is called a top-down approach.



# GENERATING SOLUTIONS

macroSOLUTION

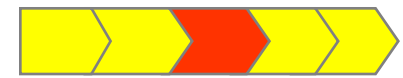


## Can we solve parts of the problem and aggregate them? (bottom-up)

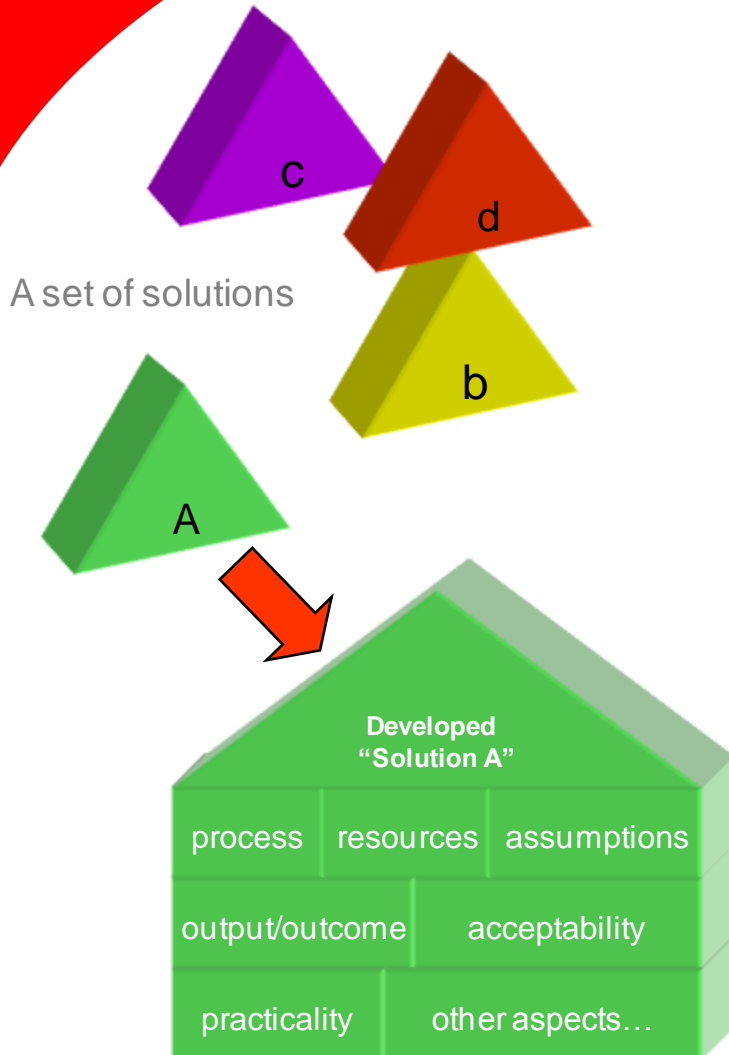
Most of the cases, especially in complex problems, it is difficult to solve the overall problem right away. The advantage of painful problem structuring and issue pyramid is that they provide a very clear pyramid structure to the problem.

Therefore, *as we break the problem down to sub-issues/problems, it is easier for us to solve smaller problems and slowly aggregate them into the original problem.* We use the same technique in solving smaller problems, i.e. see which is routine and which is unique and solve them accordingly.

It is very crucial to check whether the smaller solutions integrate back to effectively solve the original problem as many times it doesn't quite sum up or there can be unnecessary repetition in the set of solutions.



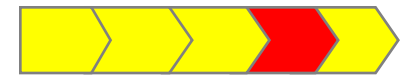
# GENERATING SOLUTIONS



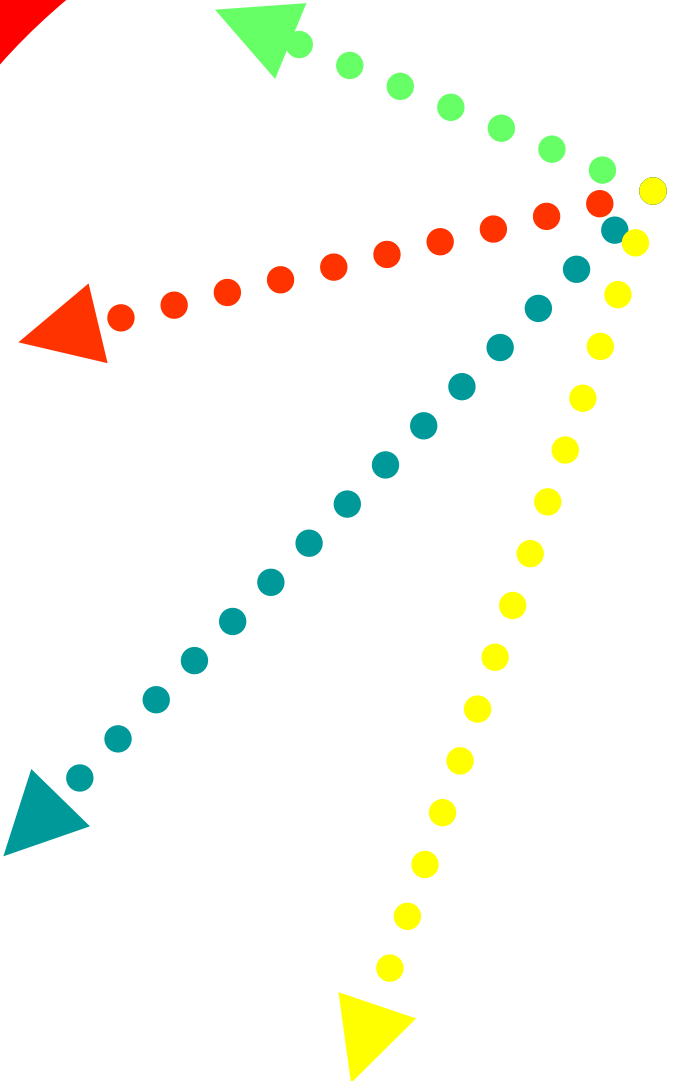
## What are the solutions?

Once we have some ideas of alternative solutions to the problem. *We must develop them in such a way that they become clearer both in term of concept and the process.*

Each solution should contain a clear process or steps in solving the problem, the resources required, assumptions and the output/outcome of the solution as well as other unique aspects of the solutions such as the degree of acceptability by the stakeholders and the practicality of the solutions.



# MAKING CHOICES



*Learning how to make the right choices is all about selecting the proper solution to solve the problem.* It consists of finding the best-fitting solution for solving the problem. In doing so, we must compare each solution against the other. Then, we can select the one that yields the best combination of benefits and risks.

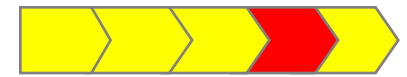
Former CIA analyst, Morgan D. Jones has developed a choice-making technique that has been proven to be very useful in making the best choices between various alternatives.

The technique is called “**Pros-Cons-Fixes (PCF)**”.

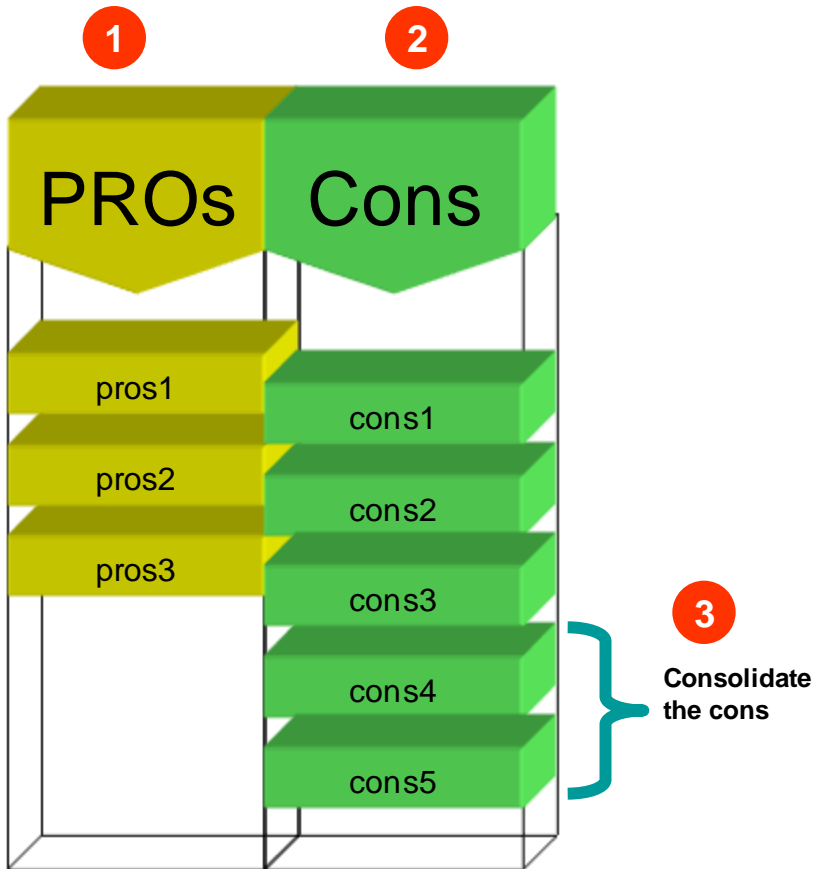
PCF’s advantage over other Pros-Cons analysis is that it focuses on eliminating unnecessary & biased negativity in human reasoning.

The PCF process consists of the following steps:

- List all the Pros.
- List all the Cons.
- Review and consolidate the Cons for merging and elimination.
- Neutralize as many Cons as possible.
- Compare the Pros and unalterable Cons against all options, pick one option at a time.



# MAKING CHOICES



## 1. List all the Pros

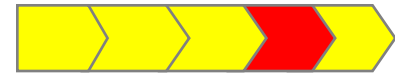
First, we try to list the Pros of a particular solution in as many varied dimensions as possible: benefits, advantages, merit, strength, practicality, acceptability, cost-effectiveness, innovativeness, scalability, sustainability, etc.

## 2. List all the Cons

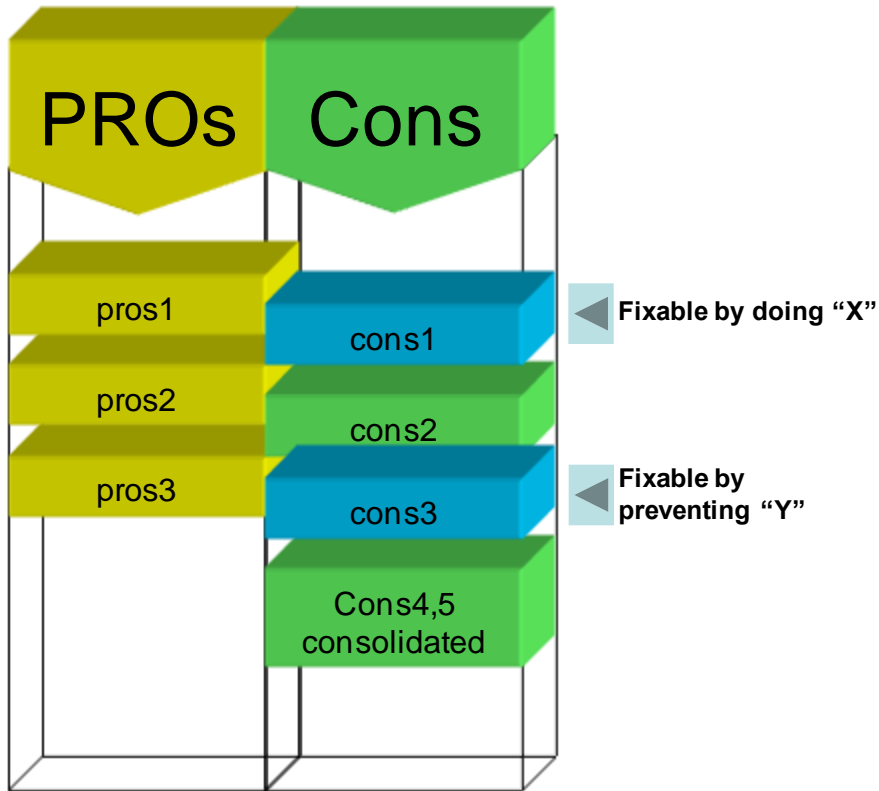
We then list all the Cons in as many varied dimensions as possible, especially in terms of risk, danger, disadvantage, weakness, threat, unacceptability, cost, etc.

## 3. Review and consolidate the Cons for merging and elimination

We try to rethink about the Cons; try to group and consolidate them, find their common attributes and eliminate those that are not relevant.



# MAKING CHOICES

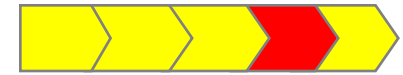


## 4. Neutralize as many Cons as possible

Frequently, the reason many Cons arise is because the solutions remain simply too new and have never really been thought-through before. Therefore, spotting the Cons in each solution can actually help modify and improve that particular solution.

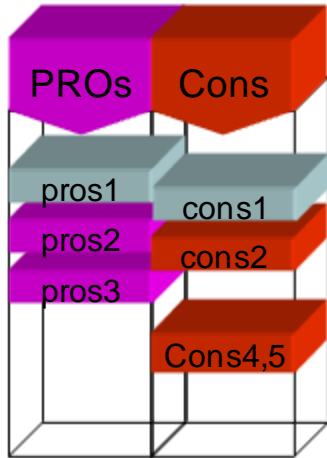
By neutralizing as many Cons as possible, *we are able to think of what can be done or what measure can be taken, to either convert each Con into a Pro or to neutralize the various Cons.*

Next to the Cons that are fixable, we should write down the types of ways we would like fix them. The Cons that can be fixed do not truly represent Cons for a new solution as they can already be prevented. We would be left with the Cons that are unfixable or unalterable, which truly represent the Cons of that particular solution.



# MAKING CHOICES

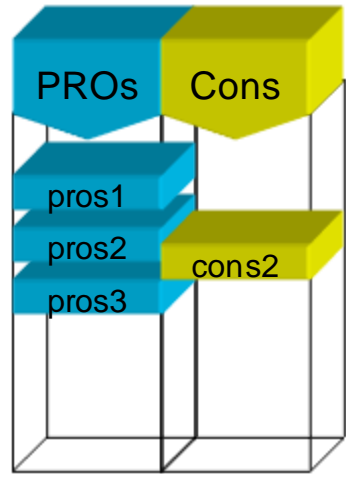
**Solution C**



◀ High risk priority!

▶ Beneficial priority

**Solution B**



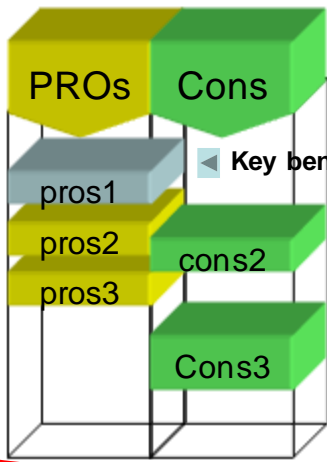
**Compare the Pros and unalterable Cons against all options; pick one option at a time**

Once the Pros and unalterable Cons for all options are visible, we should compare them against one another and pick the one that best fits our preference the most. Even with the clearest outline for all the solutions in terms of Pros and Cons in various dimensions, it is not going to be easy to compare them.

*We should instead prioritize which Pros or Cons by attaching higher or lower weights depending on their importance in our decision making process. Generally, benefits and risks are key determinants.*

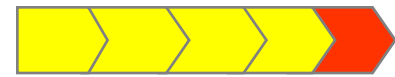
However, if we are looking for new ways of solving problems, we might have to give innovativeness a higher priority over other pros.

If we are looking for unique solutions, we might instead be willing to take on unacceptability so that the solution that we are left with is so new that it might break status quo.



◀ Key beneficial priority

**Solution A: BEST CHOICE!**



# TAKING ACTION

Taking action is **all about transforming your innovation solution into reality**. It is about realising your creative solution. For young social entrepreneurs, this would mean turning the solution into a clear plan and organizing for lasting change.

It is this process where real changes are made and the world could be transformed by the solution/social innovation. This concludes our process of innovative problem solving or innovating solutions.

We are now ready to continue to the next process of...

- Planning
- Organizing

