Introduction of Speaker

Harry. B. Flotemersch has more than 28 years of experience in manufacturing engineering, quality science and workshop facilitation as an engineer, quality engineering department head and consultant. He has earned a bachelor's degree in Electrical Engineering from Rose-Hulman Institute of Technology, and a master's degree in Manufacturing Management from Kettering University.

He has a passion for tackling tough challenges with optimism and has learned multiple methodologies to help him finish them.   Mr. Flotemersch has deployed his multiple methodology flexibility successfully to the point of winning quality and innovation awards from Delphi Automotive, DaimlerChrysler and BAE Systems.

As a Senior Consultant at Shainin LLC, Harry is applying this experience while delivering Resilient Design & Development services to their clients.

Presenter: Harry B. Flotemersch,

Sr. Consultant, Shainin LLC

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Shainin's Global Reach

Shainin, a global consulting company, solves and prevents critical problems in any environment.

Seattle
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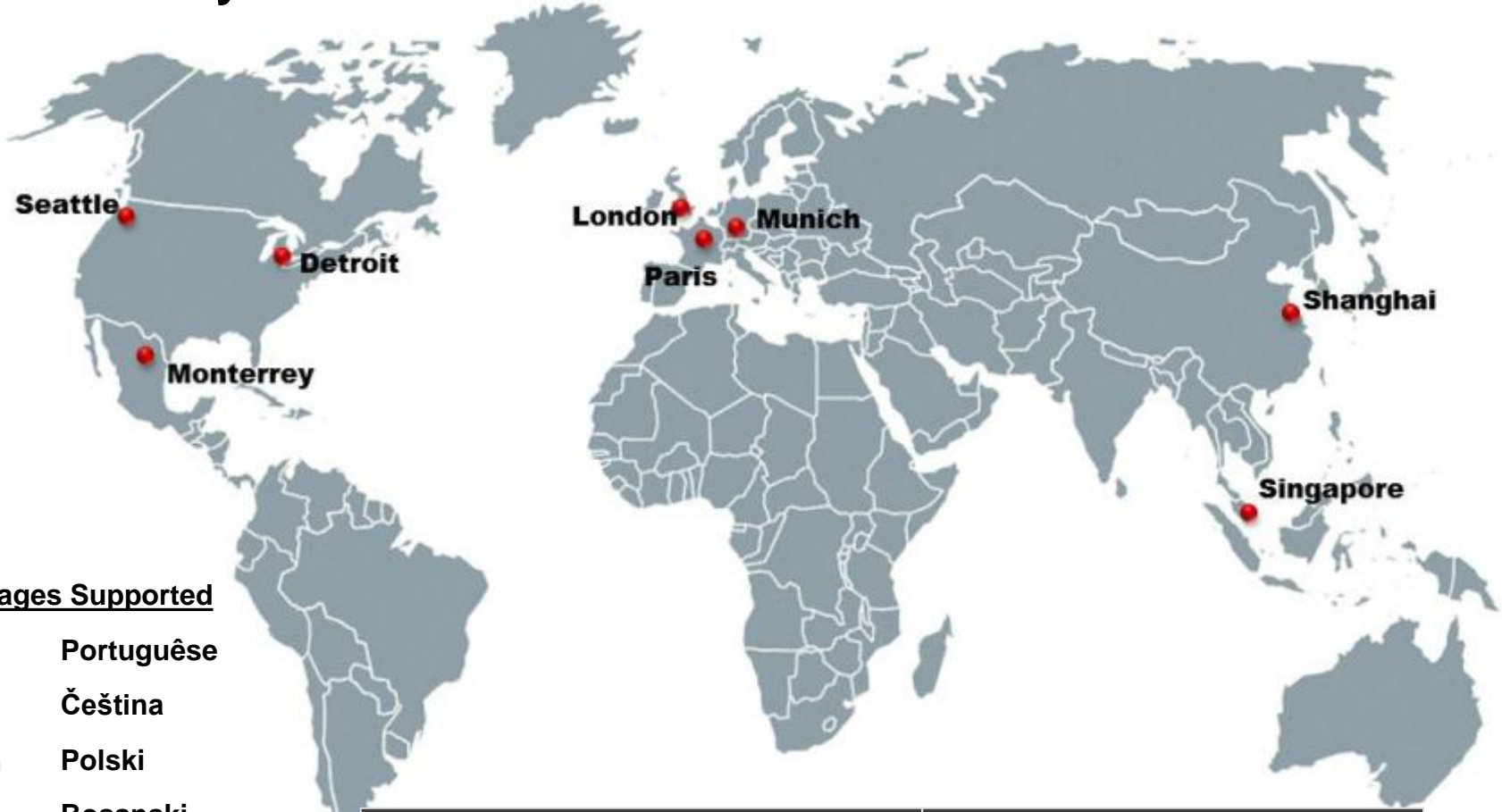
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普通话	Bosanski
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→ *Knowledge Base and Practical Experience of 1.000.000 Projects* → *Proprietary, Proven Methodologies & Tools*

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Innovation Tools applied to Problem Solving Processes

Presented by

Harry Flotemersch
Sr. Consultant, Shainin LLC

November 7, 2012

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- Creativity in problem solving projects

- What is your process for this?

- Project needed to be closed faster

- Leverage known structured creative methods

- First paradigms to adopt now

- Question and Answer, Open Discussion

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Do problem solvers ever say this when stalled?

- *We don't have a measurement system to understand it"*

- *"We can't replicate the malfunction that is reported"*

- *"We don't a have containment action yet that is acceptable!"*

- *"We know the root cause now but haven't come up with a corrective action that we can get implemented"*

These seem to be about creating, not evaluating or assessing.

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Aren't these calls for NEW CONCEPTs

- *"We don't have a measurement system to understand it"*

Concept for measurement system

- *"We can't replicate the malfunction that is reported"*

Concept for chain of events
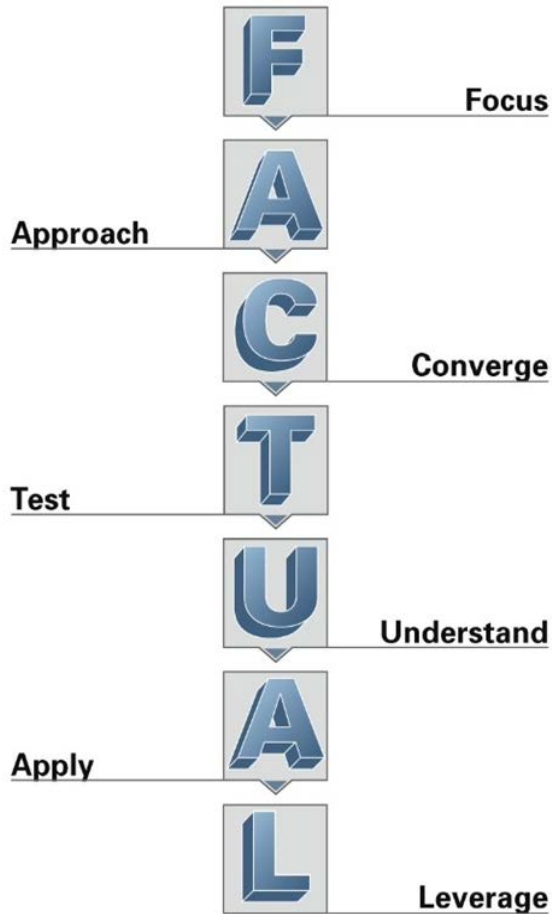
- *"We don't have containment action yet that is acceptable!"*

Concept for implementable containment

- *"We know the root cause now but haven't come up with a corrective action that we can get implemented"*

Concept for implementable corrective action

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We hope needed fixes will appear quickly!

F — Focus
A — Approach
C — Converge
T — Test
U — Understand
A — Apply
L — Leverage

We have lots of *very* evolved tools to provide discipline to analyze and evaluate information

KT® KEPNER-TREGOE

5 Why

8D

Business Processes Inc.
Results Through Systematic Thinking
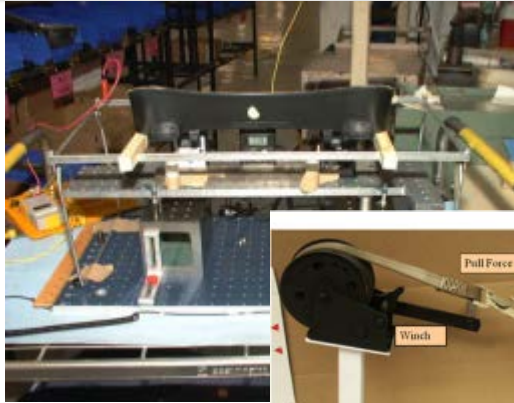
Define → Measure → Analyze → Improve → Control
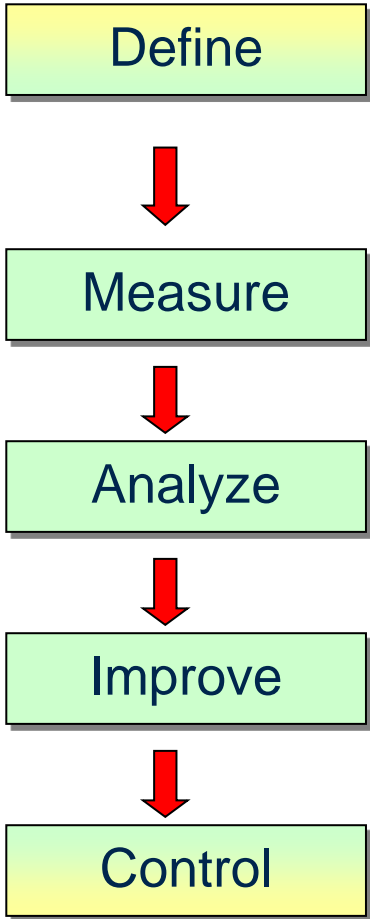
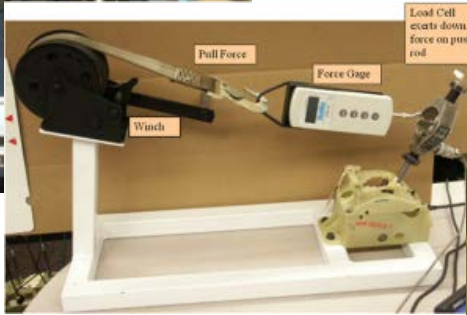What if the project is stuck without a way to do something?

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These creations helped close projects....

Need to measure static charge on molded plastic housing

Measurement

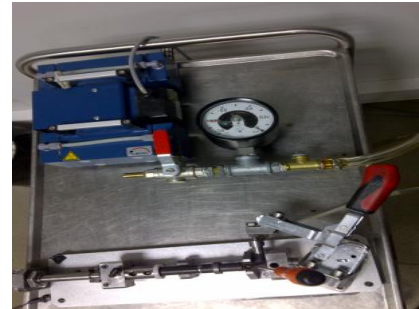*Quantifying the force to overcome a safety feature*

Containment

Quickly auditing gap on 100% of production

Recreating Field Event Malfunctions

Measuring vacuum leak rate of a seal

Corrective Action

Tuning out assembly stack up error in complex plastic parts

What Process do I use to create *new measurement concepts* when acceptable ones don't exist?

What Process do I have to create new corrective action concepts when there is a conflict of requirements blocking implementation?

If you don't have a process, how many people can really work together quickly?

High speed collaboration with anything requires familiarity with a structured process.

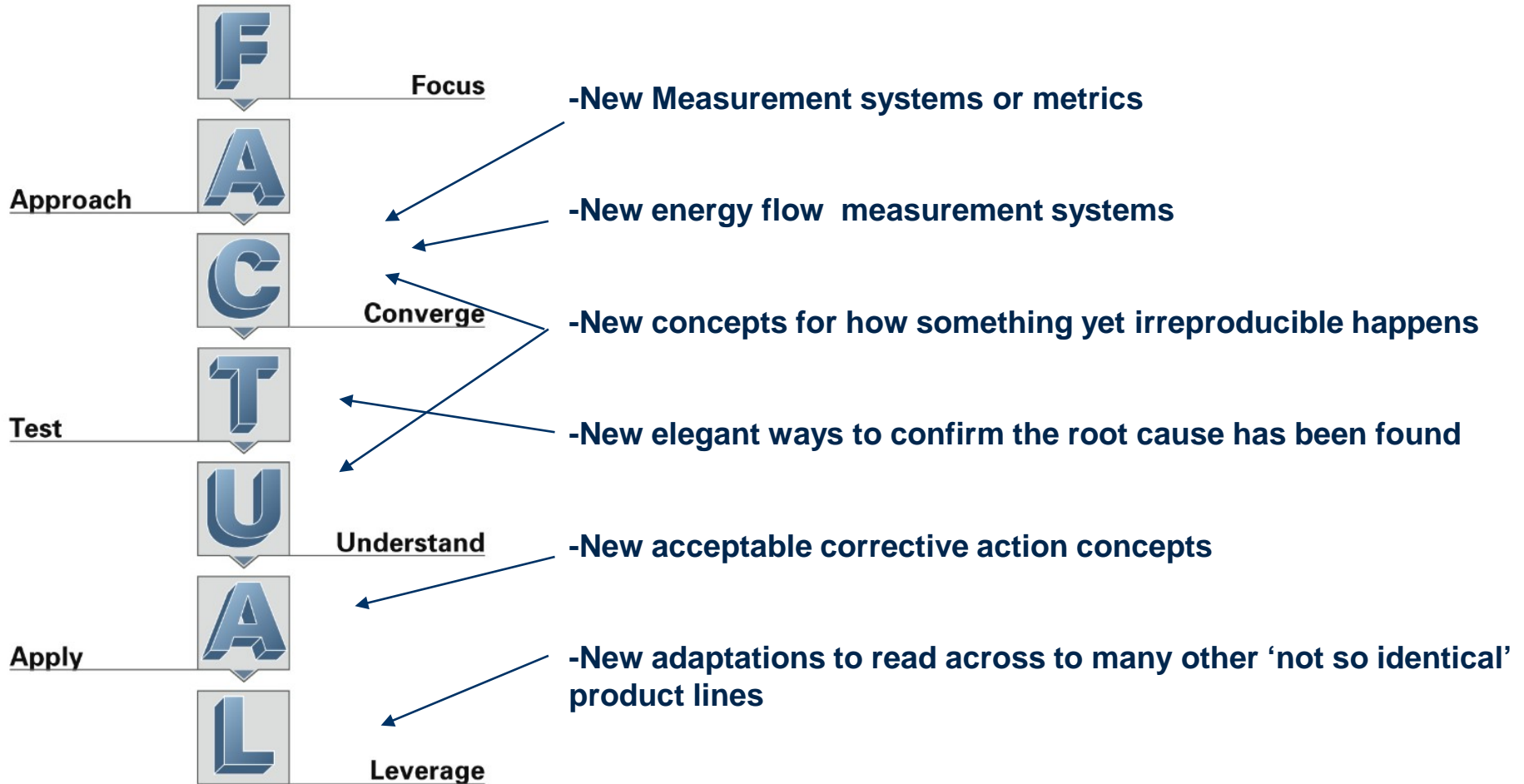**Shainin®** | Problem Solving and Prevention

- Look at your official problem solving process map

- Identify where in the steps new concepts might be demanded
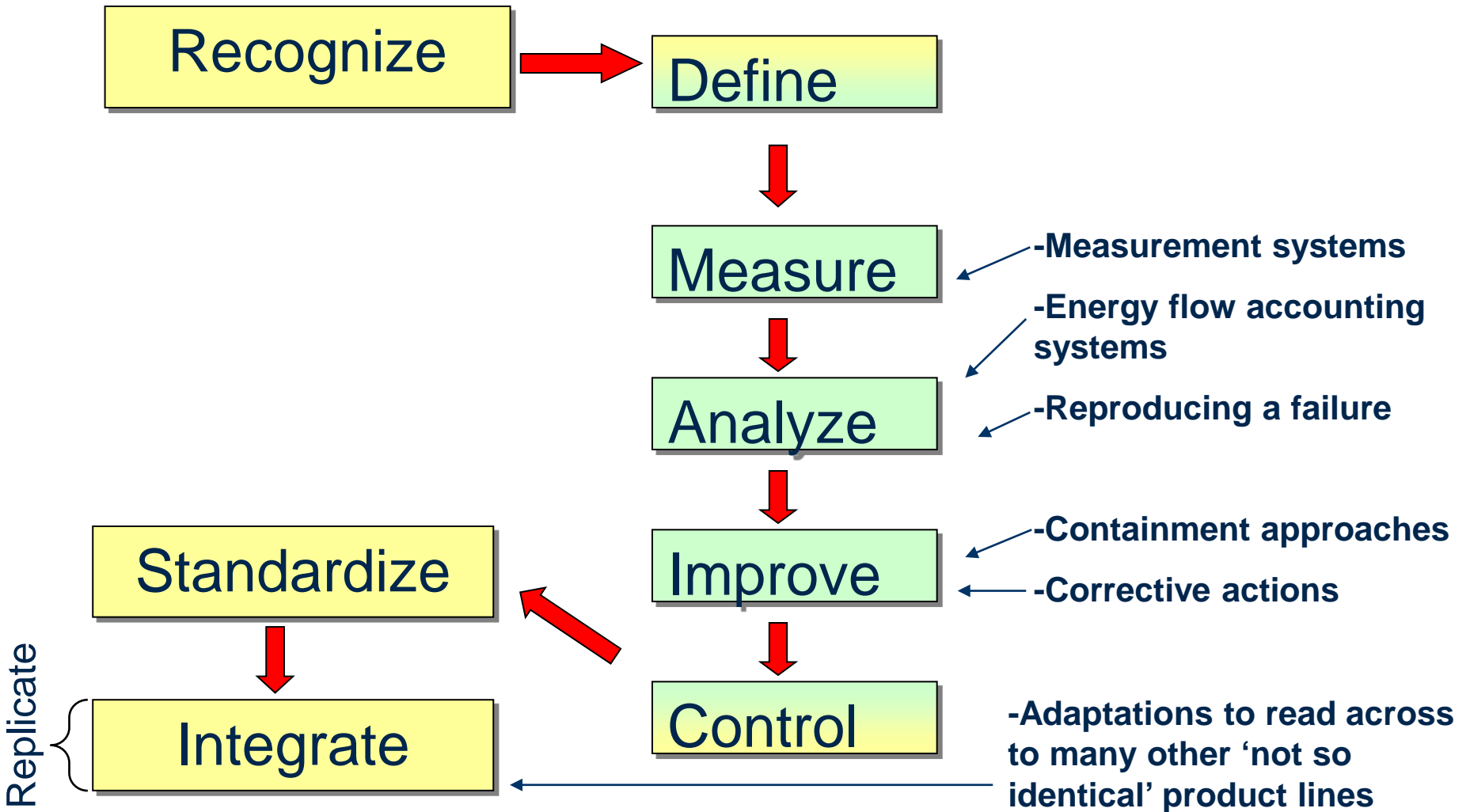
- Discuss if any of these are typically "slow spots"

Here are some examples of this mapping I've done.

Mapping Demands in Shainin's FACTUAL

F — Focus — **-New Measurement systems or metrics**

A — Approach — **-New energy flow measurement systems**

C — Converge — **-New concepts for how something yet irreproducible happens**

T — Test — **-New elegant ways to confirm the root cause has been found**

U — Understand — **-New acceptable corrective action concepts**

A — Apply — **-New adaptations to read across to many other 'not so identical' product lines**

L — Leverage

Those who are good at concepting new things often close more projects faster!

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Mapping demands in Six Sigma

```
Recognize  →  Define
                 ↓
              Measure         ← -Measurement systems
                 ↓              -Energy flow accounting
              Analyze            systems
                 ↓            ← -Reproducing a failure
                 ↓
Standardize ← Improve         ← -Containment approaches
    ↓            ↓            ← -Corrective actions
Integrate     Control
```

-Measurement systems

-Energy flow accounting systems

-Reproducing a failure

-Containment approaches

-Corrective actions

-Adaptations to read across to many other 'not so identical' product lines

Replicate

How do you approach a complex concept creation task during a problem solving project?

ASQ polling time!

1) Ask a few 'experts' to come back with something
2) Casual talk with a team as part of a meeting
3) Brainstorming with or without a facilitator
4) Structured Concepting approach with a facilitator of a team
5) Hire an outside firm to deliver the solution back to you

Should you have *just one single response* to concept needs?

NO!

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Don't we already know better than this?

Finding Root Cause
(problem solving)

**High
Complexity**

**Fishboning
Brainstorming**

Often requires
many iterations

**Low
Complexity**

**Fishboning
Brainstorming**

Often effective

*"It is not about which method fits all situations,
but which method is best suited for which situation".*

Joseph A DeFeo, President & CEO, Juran Institute, Inc. during ASQ's Oct. 2012 Webinar.

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Some know when to shift gears in a pinch

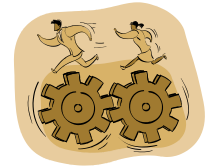|	Finding Root Cause (problem solving)	Creating New Concepts (within problem solving projects)
High Complexity	**Structured Problem Solving Process** *Often effective*	**Brainstorming Depend upon vital genius** *Often requires many iterations*
Low Complexity	**Fishboning Brainstorming** *Often effective*	**Brainstorming Depend upon vital genius** *Often effective*

Many firms have an escalation process that '*promotes problems up*' when they are solution resistant to become formal projects using Six Sigma or Shainin RED X, and many options.

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We need to do this for concept demands also!

	Finding Root Cause (problem solving)	Creating New Concepts (for problem solving)
High Complexity	**Structured Problem Solving Process** *Often effective*	**Structured Concept Development** *Your 'Plan B' faster when well executed*
Low Complexity	**Fishboning Brainstorming** *Often effective*	**Brainstorming Depend upon vital genius** *Plan A: Often effective*
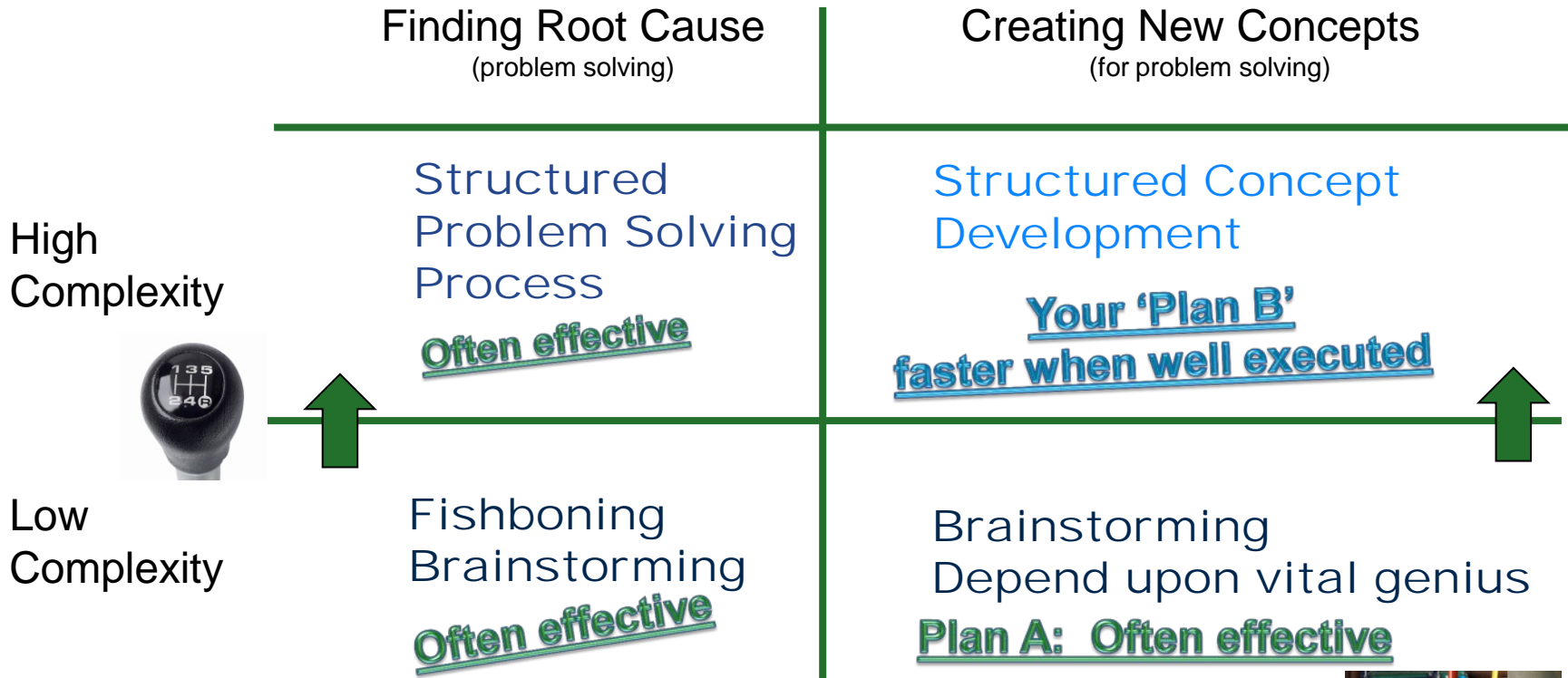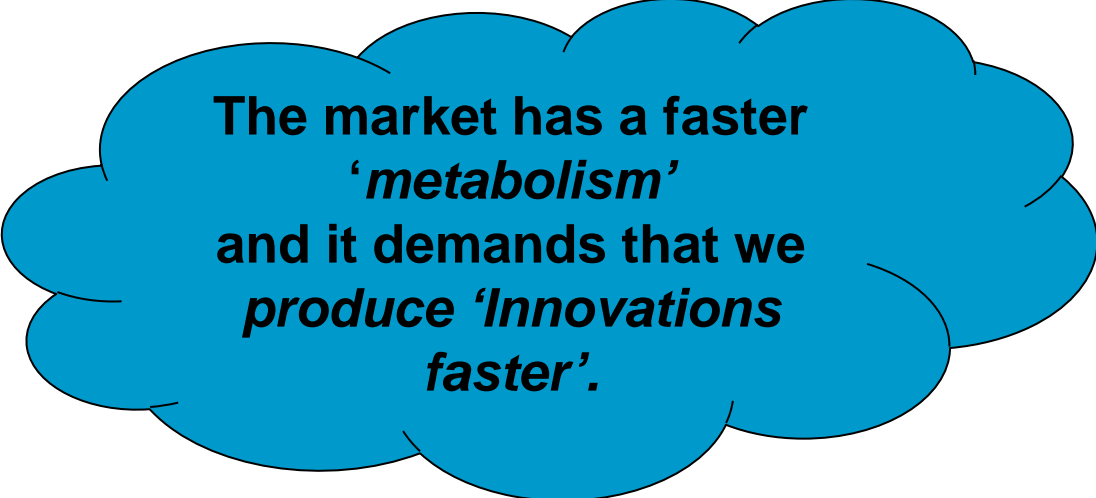
Being able to choose the appropriate approach is critical.
When in doubt, start with simple with a deadline then shift up.
The business world is less patient on critical problem solving issues.

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What has happened to business these days?

- **Customers Can**
  - Compare *Faster*
  - Purchase & Receive *Faster*
  - Change needs *Faster*
  - Switch Brands *Faster*

- **Competitors Can**
  - Join your market *Faster*
  - Understand your offering *Faster*
  - Make and sell a copy *Faster*
  - Create better options *Faster*

- **Technology is**
  - Emerging *Faster*
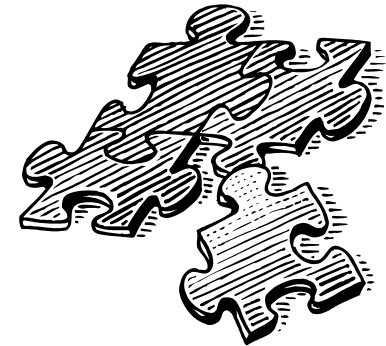 - Spreading *Faster*
  - Being adopted *Faster*

The market has a faster '*metabolism*' and it demands that we *produce 'Innovations faster'.*

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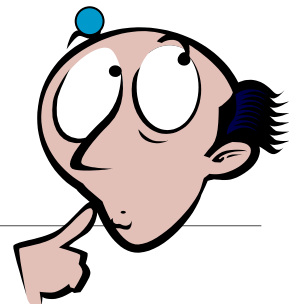
What are Innovations?

- **often a *new* combination of technical & organizational resources that increases the value / cost ratio.**

Aren't we often looking for a clever way to get something done in problem solving to finish our projects?

HOMEWORK #2
Observe how your problem solvers create. . .

How are:

1) Requirements clarified?

2) Diverse points of view included (or not)?

3) Ideas considered and captured from everyone?

4) Concepts generated and evolved?

5) Conflicting requirements overcome?
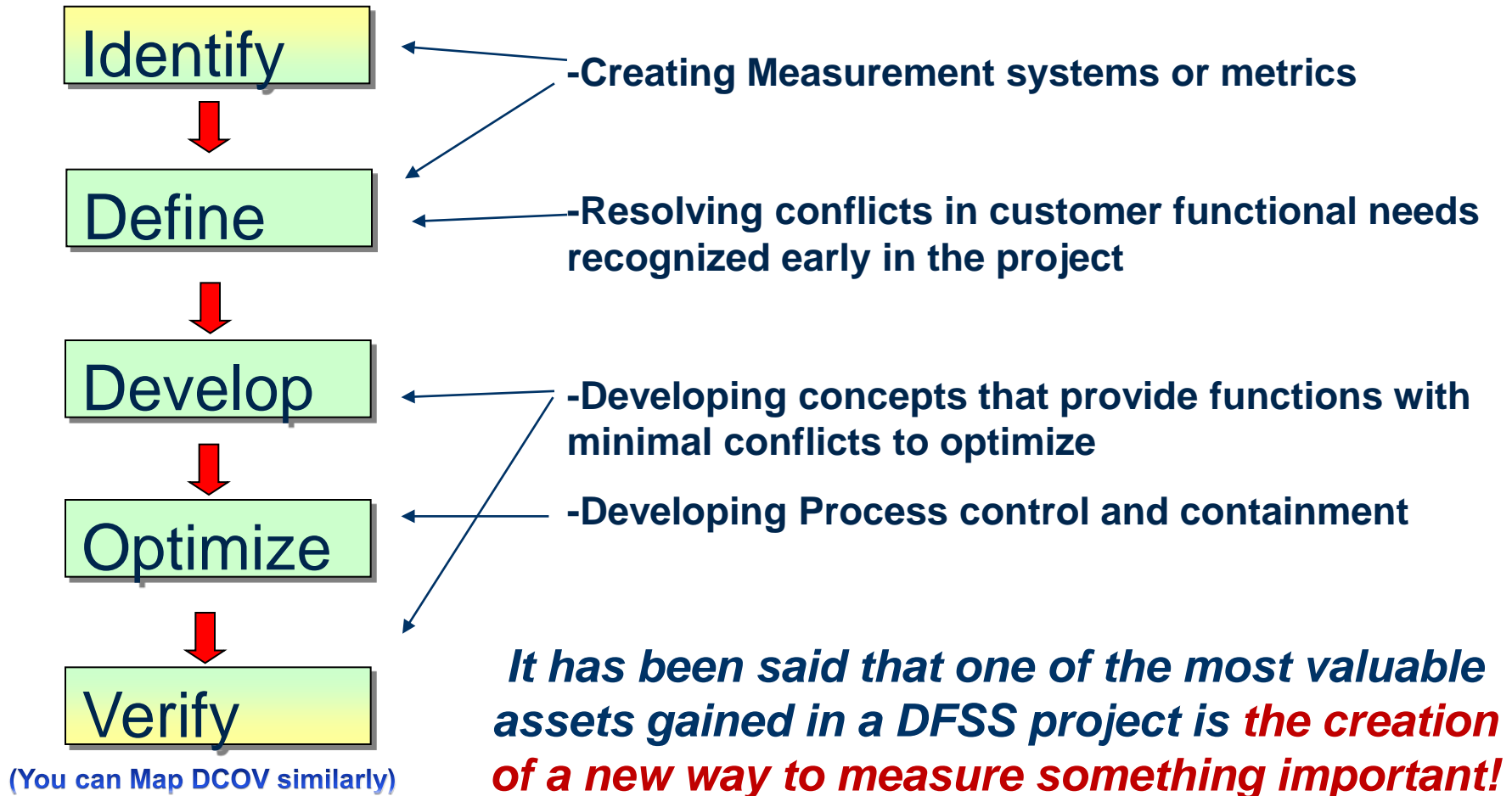
6) Evaluations and final decision made?
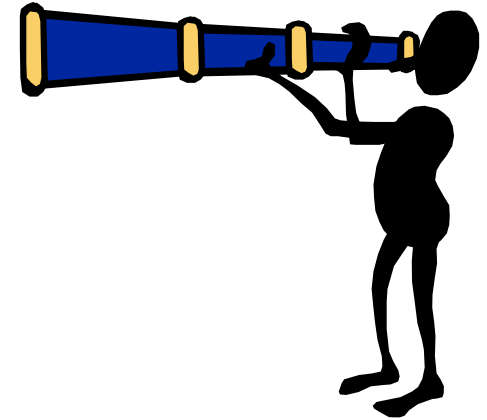
Is there a process observable that you even can detect these steps?

Is there a 'plan B' to go to when this is not effective?

Is your organization usually satisfied with the speed of this work?

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Mapping Demands in Design for Six Sigma

Identify

-Creating Measurement systems or metrics

Define

-Resolving conflicts in customer functional needs recognized early in the project

Develop

-Developing concepts that provide functions with minimal conflicts to optimize

Optimize

-Developing Process control and containment

Verify

(You can Map DCOV similarly)

It has been said that one of the most valuable assets gained in a DFSS project is the creation of a new way to measure something important!

Time out: Here's the logic so far:

Business 'metabolism' is moving faster!

Problem solving projects must go faster too!

Defining and analyzing methods are highly structured

Lots of creativity needed, often *comparatively little structure*

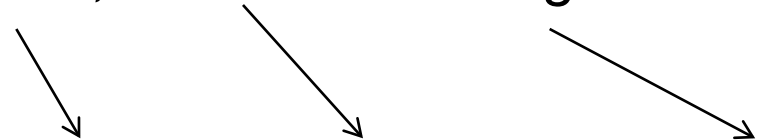Product Development uses more structure to do this task

Leverage concept creation structure in problem solving work

Reduce 'slow spots' in problem solving projects

Borrowing Paradigms form product development concept methods

How to go about creating a new concept for a complex challenge:

1. Utilize a concept development facilitator
2. Use diverse team of 4-8 people with relevant knowledge
3. Set deadline and get a place to work it out
4. Clarify Functional needs, system constraints and resources
5. Think individually then as a group in 'collaborative dialogue'
6. *Seek high quality concepts not high quantity ideas*
7. *Leave time for thinking about the whole system and exploring*
8. Clarify and resolve conceptual conflicts systematically.
9. *Converge to the best concepts for short, medium and long term*

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#1 Utilize skilled facilitator(s)

Group dynamics experience:

- Their neutrality invites wider creativity amongst the participants
- Know how to steer the dialogue with insightful questions
- They know how to form collaborative atmosphere in the room
- Manage balanced participation and documentation

Technical competency experience:

- Know how when to move through stages of development (PUGH)
- They can deploy concept conflict resolution properly (TRIZ)
- They know when revisit something after an technical breakthrough
- They can connect the discussion to the Marketing input (QFD thinking)

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#4 List all requirements up front

Brainstormers often becoming aware of the requirements of others gradually whilst they tell each other why an idea will not work.

Some people don't enjoy this so they say "no negativity" and it takes even longer to find out, or they just don't participate.

Serious Concept developers list all functional requirements, constraints and resources availabilities up front and keep it updated to make the important targets clear as possible

"We know where the RED X lives but we can't get the long term fix into production for a while.

We need a way to use the knowledge we have about the root cause now. This one problem is holding up the launch of a new product line!"

Shainin® | Problem Solving and Prevention The conversation is different than brainstorming!

#5 Individual thought then group collaboration

It is well known that blurting out ideas to a group creates the illusion of productivity but does more harm than good diversity of thought early on.

Have people write out what is on their mind first privately

Next have people quickly share and capture feedback about the their thoughts on the challenge.

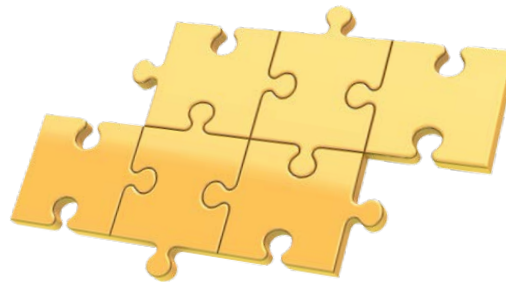Groom and cultivate groups of ideas into concepts that make sense!

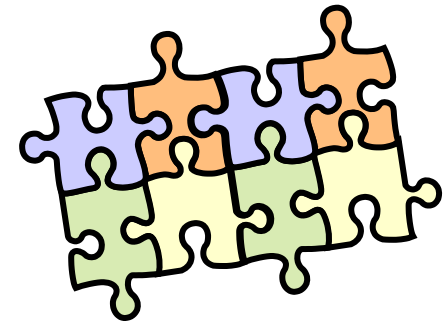Ineffective process → Individuals generate lots of ideas to sort through
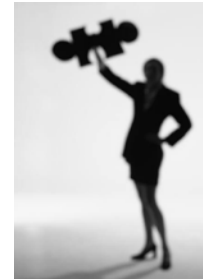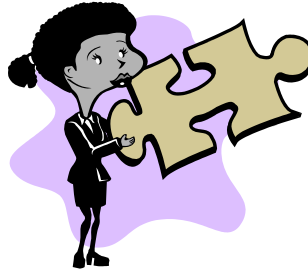
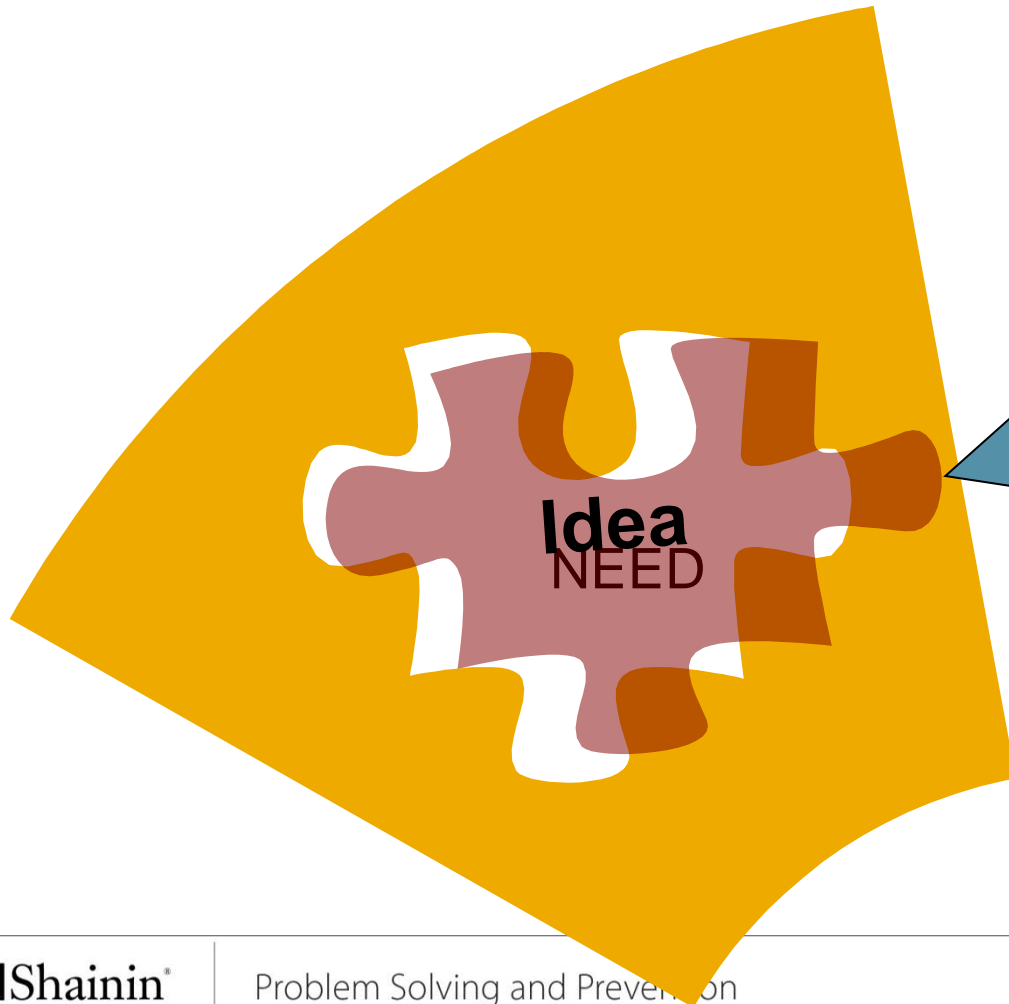Effective process → Teamwork generates 'implementable' concepts

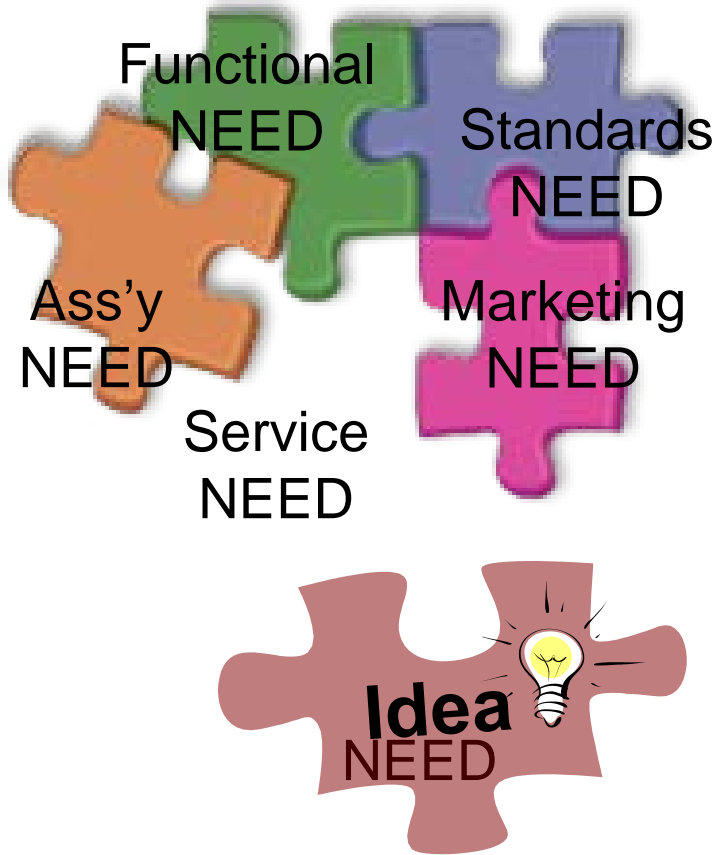**Concept #1**   **Concept #2**   **Concept #3**

Idea
NEED

Typically, someone thinks of a specific way to fill a need and says:

"I have an Idea!"

Functional NEED

Standards NEED

Ass'y NEED

Marketing NEED

Service NEED

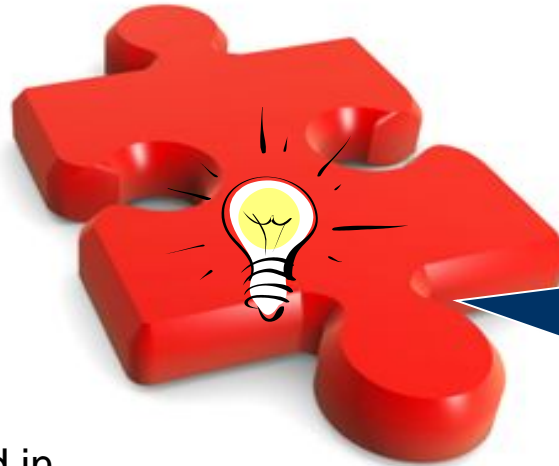**Idea** NEED

CONCEPT

Concepts are *collections* of ideas designed to meet *collections* of needs

IDEA

Often, an idea is quickly rejected because it does not fill other needs in the situation.

These are often confounded in conversations about concepts.
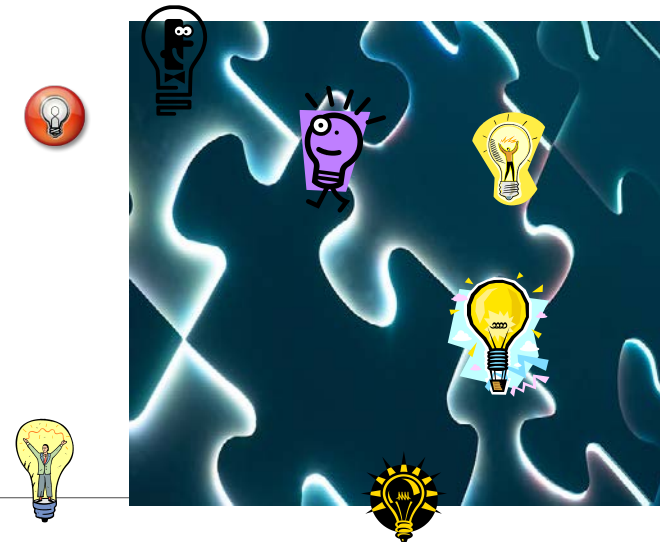
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HOMEWORK #3
How are ideas treated when they are shared?

1. How do you and your team respond to an 'idea' ……is it judged as if they were a 'concept' ?

2. Are ideas that are ahead of their time buried quickly because they didn't answer all the needs when first shared?

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This will get you a good start on a Plan B

1. Do the **homework** first, to become more aware

2. Find your company's facilitators and innovation experts and ask to be invited to new concept development workshops to see how they do it now.

3. Think about how you would deploy a 'plan B' during a project

4. Talk to others in your profession and share lessons learned.

5. Evolve and grow your capability to develop new concepts!

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Be able to shift your response when needed!

	Finding Root Cause (problem solving)	Creating New Concepts (for problem solving)
High Complexity	**Structured Problem Solving Process** *Often effective*	**Structured Concept Development** *Faster when well executed*
Low Complexity	**Fishboning Brainstorming** *Often effective*	**Brainstorming Depend upon vital genius** *Often effective*

Being able to choose the appropriate approach is critical.
When in doubt start simple but with a deadline, then shift as needed.
The business world is not patient with tinkering on critical issues.

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Further Reading "Homework"

ASQ members can download copies of Quality Progress magazine articles:.

1. **Where does TRIZ Fit With Quality Methods?** By John Dew
   Quality Progress Magazine, January 2006 p45

2. **TRIZ: A Creative Breeze for Quality Professionals** by John Dew
   Quality Progress Magazine, January 2006 p44

3. **The Importance of Concepts in Creativity and Improvement** by Lloyd P. Provost and Gerald J. Langley
   Quality Progress Magazine, March 1998, P31

4. **Creativity and Improvement: A Vital Link by Lloyd P. Provost and R. M. Sproul**
   Quality Progress magazine, August 1996, P101

Recent ASQ WEBINAR slides only :   Available to anyone

5. **How do I keep my job during difficult times?   Joseph A Defeo, April 4, 2012 ASQ Webinar.**
   http://www.asq-auto.org/files/How-to-Keep-Your-Q-Job-in-Uncertain-Times.pdf

BOOKS

6. **And Suddenly the Inventor Appeared: TRIZ, the Theory of Inventive Problem Solving by**
   Genrich Altshuller.   May 1996 ISBN-10: 0964074028 2nd Edition   (my first read, a great first exposure this topic)

7. **40 Principles: TRIZ Keys to Innovation [Extended Edition]**
   Genrich Altshuller , April 2005   ISBN-10 0964074052 (most technical with modern day examples)

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Summary: Innovation Tools applied to Problem Solving Processes

- ✓ **Business metabolism demands problems solved faster!**

- ✓ **Quality Science Project structures have helped improve analysis work**

- ✓ **Structured concept creation methods can be leveraged here too!**

- ✓ **Apply these where there is a creative 'slow spot' on a complex need.**

- ✓ **Combining good facilitation skills and specific innovation tools with a diverse group can speed up the slow spots to achieve project closure!**

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Sr. Consultant, Shainin LLC**

Email: Harry@Shainin.com

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Question and Answer period of Webinar

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Sr. Consultant, Shainin LLC**

Email: Harry @Shainin.com

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